

webMethods Integration Server Built-In Services Reference

Version 10.15

October 2022

This document applies to webMethods Integration Server 10.15 and to all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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Document ID: IS-BIS-RF-1015-20240626

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The *webMethods Integration Server Built-In Services Reference* describes the built-in services provided with a standard installation of the webMethods Integration Server. Services are also installed with webMethods add-on packages, such as adapters and monitoring tools. You will find documentation for those services in the user guide provided with the add-on product.

Note:

This guide describes features and functionality that may or may not be available with your licensed version of webMethods Integration Server. For information about the licensed components for your installation, see the **Server > Licensing** page in the webMethods Integration Server Administrator.

Document Conventions

Convention	Description
Bold	Identifies elements on a screen.
Narrowfont	Identifies service names and locations in the format <i>folder.subfolder.service</i> , APIs, Java classes, methods, properties.
<i>Italic</i>	Identifies: Variables for which you must supply values specific to your own situation or environment. New terms the first time they occur in the text. References to other documentation sources.
Monospace font	Identifies: Text you must type in. Messages displayed by the system. Program code.
{ }	Indicates a set of choices from which you must choose one. Type only the information inside the curly braces. Do not type the { } symbols.
	Separates two mutually exclusive choices in a syntax line. Type one of these choices. Do not type the symbol.
[]	Indicates one or more options. Type only the information inside the square brackets. Do not type the [] symbols.
...	Indicates that you can type multiple options of the same type. Type only the information. Do not type the ellipsis (...).

Online Information and Support

Product Documentation

You can find the product documentation on our documentation website at <https://documentation.softwareag.com>.

In addition, you can also access the cloud product documentation via <https://www.softwareag.cloud>. Navigate to the desired product and then, depending on your solution, go to “Developer Center”, “User Center” or “Documentation”.

Product Training

You can find helpful product training material on our Learning Portal at <https://learn.softwareag.com>.

Tech Community

You can collaborate with Software AG experts on our Tech Community website at <https://techcommunity.softwareag.com>. From here you can, for example:

- Browse through our vast knowledge base.
- Ask questions and find answers in our discussion forums.
- Get the latest Software AG news and announcements.
- Explore our communities.
- Go to our public GitHub and Docker repositories at <https://github.com/softwareag> and <https://containers.softwareag.com/products> and discover additional Software AG resources.

Product Support

Support for Software AG products is provided to licensed customers via our Empower Portal at <https://empower.softwareag.com>. Many services on this portal require that you have an account. If you do not yet have one, you can request it at <https://empower.softwareag.com/register>. Once you have an account, you can, for example:

- Download products, updates and fixes.
- Search the Knowledge Center for technical information and tips.
- Subscribe to early warnings and critical alerts.
- Open and update support incidents.
- Add product feature requests.

Data Protection

Software AG products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR). Where applicable, appropriate steps are documented in the respective administration documentation.

1 About Built-In Services

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Integration Server is installed with an extensive library of built-in services for performing common tasks. In addition to services, Integration Server includes document types that can be referenced from other services and specifications that can be used to define a service signature.

List of Public Folders

The service descriptions in this book are divided into the following folders. These folders reside in the WmPublic package, unless otherwise specified.

Folder	Contains services you use to...
Alert Folder	Manage alerts as well as create and update notifications.
ART Folder	(WmART package) Manage adapter components, including connections, adapter services, listeners, and notifications.
Assets Folder	Retrieve information about assets on Integration Server.
Cache Folder	Perform tasks on caches.
Client Folder	Formulate and submit requests to HTTP, FTP, e-mail, and LDAP servers.
Date Folder	Generate and format date values.
Datetime Folder	Build and increment date/time values.
Db Folder	(WmDB package) Access JDBC-enabled databases. The webMethods Adapter for JDBC also provides services that perform operations against JDBC-enabled databases. See the <i>webMethods Adapter for JDBC Installation and User's Guide</i> for information.
Document Folder	Perform operations on documents in the pipeline.
Event Folder	Build audit and event handler services.
File Folder	Perform operations on the local file system.
Flat File Folder	(WmFlatFile package) Convert between Flat File documents and IS documents. For more information, see <i>Flat File Built-in services Guide</i>
gRPC Folder	(WmGRPC package) Send responses to gRPC clients.
Flow Folder	Perform debugging and utility-type tasks in a flow service.
Hashtable Folder	Create, update, and get information about the hashtable.
IO Folder	Convert data between byte[] and InputStream representations.
JDBC Folder	Obtain information about Integration Server JDBC pools.
JMS Folder	Send and receive JMS messages.

Folder	Contains services you use to...
JSON Folder	Convert JSON content to IData and vice versa as well as validate JSON content.
List Folder	Retrieve, replace, or add elements in an Object List, Document List, or String List; convert String Lists to Document Lists.
Math Folder	Add, subtract, multiply, or divide string-based numeric values.
MIME Folder	Create MIME messages and extract information from MIME messages.
MQTT Folder	Publish MQTT messages and define the signature for MQTT trigger services.
OAuth Folder	Authorize a client application to access data on Integration Server using the OAuth 2.0 Authorization Framework.
Packages Folder	Install, load, and/or alter the status of a package on the Integration Server.
Parquet Folder	(WmParquet package) Read an Apache Parquet file and convert to IData[] and write IData [] to a Parquet files.
Publish Folder	Publish and deliver documents to other Integration Servers via Software AG Universal Messaging or webMethods Broker.
Remote Folder	Invoke services on remote webMethods Integration Servers.
Replicator Folder	Replicate packages across webMethods Integration Servers.
Report Folder	Apply an output template to the values in the pipeline.
Scheduler Folder	Schedule services to execute at the times you specify.
Schema Folder	Validate objects or values in the pipeline.
Security Folder	Control which client certificates are sent to other services and digitally sign data and process digital signatures. Store and retrieve outbound passwords to access secure resources.
SMIME Folder	Create digitally signed and/or encrypted MIME messages. Process signed and encrypted MIME messages.
SOAP Folder	Send, receive, and retrieve data from SOAP messages. Register custom SOAP processors.
Storage Folder	Create, close, delete, and register repository data stores. Insert and retrieve information from data stores.
String Folder	Perform string manipulation and substitution operations.
Sync Folder	Coordinate the execution of services.

Folder	Contains services you use to...
Synchronization Folder	Perform latching and cross-referencing operations in a publish-and-subscribe integration.
Trigger Folder	Create and delete triggers and manage document retrieval and document processing for individual webMethods messaging triggers. Create, delete, enable, disable, or suspend one or more JMS triggers.
TX Folder	Perform administrative tasks for guaranteed delivery transactions.
UniversalName Folder	List the contents of the Universal Registry and look up services by their universal names.
Utils Folder	Retrieve the values of server properties
XML Folder	Perform operations on XML documents.
XMLData Folder	Work with XML documents in the form of XMLData documents.
XSLT Folder	(WmXSLT package) Transform an XML stream into a byte array, file, or XML node, and to maintain the XSLT stylesheet cache.

Access Permissions for Built-In Services

Built-in services generally have the following default access permissions:

For this type of permission...	Built-in services are assigned to this ACL...	
List	Developers	Members of the Developers ACL can see, in webMethods Integration Server or Software AG Designer, that a service exists.
Read	WmPrivate	The WmPrivate ACL is a virtual ACL designed to protect the proprietary code in the built-in services. As this ACL has no members, no user can edit a service or view its source.
Write	WmPrivate	
Execute	Internal	Members of the Internal ACL can execute a service.

Note:
These default access permissions cannot be changed (that is, another ACL cannot be selected).

About Deprecated Services

The *webMethods Integration Server Built-In Services Reference* describes all of the public built-in services provided with a standard installation of the webMethods Integration Server, including deprecated services. A deprecated service continues to work and is supported by Software AG, but may be removed in a future release. Software AG recommends against using deprecated functionality in new projects. Use the replacement service, if one is available.

Note:

Built-in services that have been removed from webMethods Integration Server are not included in *webMethods Integration Server Built-In Services Reference*. Review the release readme for a list of services removed in a release.

2 Alert Folder

- Summary of Elements in this Folder 20

Integration Server generates alerts for pre-defined events to provide visibility into the system behavior. For example, alerts are raised when Integration Server license is about to expire or a security certificate is about to expire. These alerts are displayed as notifications in Integration Server Administrator based on system or user-defined criteria.

You can create and manage notifiers using the services in the notifier sub-folder. A notifier defines settings to fetch alerts and perform related tasks. For example, you can create a notifier that can be used to fetch alerts for server errors that are critical and send the notification to an administrator.

Note:

The jobs created for the notifiers follow the exactly-once processing model for all the alerts.

In Integration Server Administrator, if you select the **Disable Alerts and Notifications** option on the **Server > Quiesce** page and the server is in quiesce mode, alerts are not emitted, and running alerts and notifier services throws an exception.

Summary of Elements in this Folder

The following services are available in this folder:

Element	Package and Description
pub.alert.notifier:create	WmPublic. Creates a notifier.
pub.alert.notifier:delete	WmPublic. Deletes the specified notifier.
pub.alert.notifier:disable	WmPublic. Disables the specified notifier.
pub.alert.notifier:enable	WmPublic. Enables the specified notifier.
pub.alert.notifier:list	WmPublic. Lists all notifiers in the system.
pub.alert.notifier:update	WmPublic. Updates the settings of the specified notifier.
pub.alert:channels	WmPublic. Gets all alert channels in the system.
pub.alert:countAll	WmPublic. Gets the count of all alerts in the system, read and unread, or a subset of alerts that meet the filter criteria.
pub.alert:countUnread	WmPublic. Fetches all the unread alerts in the system or a subset of unread alerts for the notifier and filter criteria.
pub.alert:deregisterChannel	WmPublic. Deregisters a registered custom channel.
pub.alert:emit	WmPublic. Generates an alert for the configured alert channel.
pub.alert:fetchAll	WmPublic. Fetches all alerts in the system, read and unread, or a subset of alerts that meet the filter criteria.
pub.alert:fetchUnread	WmPublic. Fetches all the unread alerts in the system or a subset of unread alerts for the notifier and filter criteria.
pub.alert:getChannel	WmPublic. Gets the details of a specific channel.

Element	Package and Description
pub.alert:getSettings	WmPublic. Gets the settings of the system notifier.
pub.alert:markAllAsRead	WmPublic. Marks all alerts as read.
pub.alert:markAsRead	WmPublic. Marks a specific alert as read.
pub.alert:markAsUnread	WmPublic. Marks a specific alert as unread.
pub.alert:registerChannel	WmPublic. Registers a custom alert channel.
pub.alert:setSettings	WmPublic. Updates the settings of the system notifier.
pub.alert:severities	WmPublic. Lists all the severities in the system.
pub.alert:updateChannel	WmPublic. Updates the settings of a registered custom channel.

pub.alert.notifier:create

WmPublic. Creates a notifier.

Input Parameters

<i>name</i>	String. Name of the notifier.
<i>enabled</i>	<p>Boolean. Optional. Specifies whether the notifier is enabled or not. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to enable the notifier. ■ <code>false</code> to disable the notifier. This is the default. <p>If a notifier is disabled, alerts are not fetched for the notifier.</p>
<i>consumptionMode</i>	<p>String. Optional. Specifies whether notifications are created for all alerts or only the latest alerts. Set to:</p> <ul style="list-style-type: none"> ■ <code>earliest</code> to get notifications for all alerts in the system. This is the default. ■ <code>latest</code> to get notifications only for the alerts emitted after the notifier is created.
<i>autoMark</i>	<p>Boolean. Optional. Specifies whether notifications are automatically marked as read or a user must do it manually. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to automatically mark a notification as read after the service specified in the notifier settings is invoked. This is the default. ■ <code>false</code> to manually dismiss a notification from Integration Server Administrator, which marks the notification as read.

<i>channelIds</i>	Object[] . Identifies the channels for which you want to receive notifications. You can specify either an individual channel identifier or a list of identifiers. For example, <i>channelIds[0]</i> as 2 for "Server Error" or <i>channelIds[1]</i> as 10 for "Threat Protection" or <i>channelIds[0]</i> as 2 and <i>channelIds[1]</i> as 1 for both.				
<i>intervalInSeconds</i>	Short . Time in seconds after which the system task created for the notifier should check for unread alerts.				
<i>severityCutoff</i>	<p>String. The severity to consider for fetching alerts. For example, if you set this value as <i>Critical</i>, you will receive notifications only for critical events. If you set this value as <i>Error</i>, you will receive notifications for critical and error events. Set the parameter to one of the following values:</p> <ul style="list-style-type: none"> ■ <i>Critical</i>. This is the default. ■ <i>Error</i> ■ <i>Information</i> ■ <i>Warning</i> 				
<i>notifyInstantly</i>	<p>Boolean. Optional. Specifies whether or not notifications are generated as soon as an alert is raised. Set to:</p> <ul style="list-style-type: none"> ■ <i>true</i> to instantly generate a notification for an alert. ■ <i>false</i> if an instant notification is not required for an alert. This is the default. <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p>Note: If <i>intervalInSeconds</i> is also specified, the <i>notifyInstantly</i> parameter takes precedence.</p> </div>				
<i>websocketEnabled</i>	<p>Boolean. Optional. Specifies whether or not Integration Server uses a WebSocket connection to send notifications. Set to:</p> <ul style="list-style-type: none"> ■ <i>true</i> to enable a WebSocket connection to send notifications. ■ <i>false</i> to disable a WebSocket connection. This is the default. 				
<i>websocketSender</i>	<p>Document. Optional. Sends a message on a connected WebSocket session.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Key</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr> <td><i>endpointURL</i></td> <td>String. The URL of the remote WebSocket server that Integration Server uses to send notifications.</td> </tr> </tbody> </table>	Key	Description	<i>endpointURL</i>	String . The URL of the remote WebSocket server that Integration Server uses to send notifications.
Key	Description				
<i>endpointURL</i>	String . The URL of the remote WebSocket server that Integration Server uses to send notifications.				
<i>serviceInvokeEnabled</i>	<p>Boolean. Optional. Specifies whether a service is invoked with the notifier parameters as pipeline variables or not. Set to:</p> <ul style="list-style-type: none"> ■ <i>true</i> to invoke a service using the notifier parameters. ■ <i>false</i> to disable service invocation for the notifier. This is the default. 				

serviceInvokeSender **Document.** Optional. Invokes a service for alerts fetched for this notifier.

Key	Description
-----	-------------

<i>nsName</i>	String. The namespace of the service. For example, <code>pub.flow:tracePipeline</code> .
---------------	---

smtpEnabled **Boolean.** Optional. Specifies whether Integration Server uses an SMTP server to send notifications or not. Set to:

- `true` to use an SMTP server to send notifications.
- `false` if you do not want to use an SMTP server to send notifications. This is the default.

smtpSender **Document.** Optional. Details of the SMTP Server and client used to send the notifications.

Key	Description
-----	-------------

<i>to</i>	String. E-mail address of the recipient for a notification. If you specify multiple addresses, separate them with commas.
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<i>from</i>	String. E-mail address of the sender. If you do not specify this value, Integration Server uses the value specified for the <code>mail.smtp.from</code> JVM property. Furthermore, if a value is not specified for that property, Integration Server uses the default value, <code>user@servername</code> , where the <code>user</code> is the operating system user ID, and <code>servername</code> is the host name of Integration Server.
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<i>mailhost</i>	String. Hostname of the SMTP server.
-----------------	---

<i>mailhostPort</i>	Integer. Optional. The port on which the SMTP server listens to incoming connections.
---------------------	--

<i>auth</i>	Document. Optional. Authorization information that the SMTP service submits to the SMTP server.
-------------	--

Key	Description
-----	-------------

<i>user</i>	String. Username that Integration Server uses to send notifications.
-------------	---

<i>pass</i>	String. Password associated with the user.
-------------	---

<i>secure</i>	Document. Parameters specifying the security protocol and trust store information to perform certificate validation, which Integration Server uses to communicate with the SMTP server port.
---------------	---

Key	Description
-----	-------------

transportLayerSecurity **String.** Type of the security protocol that Integration Server uses to communicate with the SMTP server port. Set to:

- `none`, to use a non-secure mode to communicate with the port on the SMTP server. This is the default.
- `explicit`, to use explicit security when communicating with the port on the SMTP server. With explicit security, Integration Server establishes an un-encrypted connection to the e-mail server, and then switches to the secure mode.
- `implicit`, to use implicit security to communicate with the port on the SMTP server. With implicit security, Integration Server always establishes an encrypted connection to the e-mail server.

truststoreAlias **String.** Alias for the truststore that contains the list of certificates that Integration Server uses to validate the trust relationship. If you do not specify a truststore alias, the default truststore alias is used.

Output Parameters

message **String.** Indicates whether the notifier is successfully created or not.

Usage Notes

If you specify the *intervalInSeconds* parameter while creating a notifier, Integration Server creates a simple interval task that runs in the background and does the tasks specified in the notifier such as invoking a service or sending a mail, and so on.

Prior to Integration Server version 10.15, the `pub.alert.notifier:create` service included the `smtpSender/secure/useJSSE` input parameter which specified whether Integration Server created the outbound connection using the Java Secure Socket Extension (JSSE) library. Beginning with Integration Server version 10.15, Integration Server establishes all secure outbound connections with JSSE. If you migrated to Integration Server 10.15 and a migrated service invokes `pub.alert.notifier:create`, the `smtpSender/secure/useJSSE` parameter still appears in the pipeline. However, Integration Server ignores the value of the `smtpSender/secure/useJSSE` parameter, proceeding as if `useJSSE` were set to yes.

pub.alert.notifier:delete

WmPublic. Deletes the specified notifier.

Input Parameters

name **String.** Name of the notifier that you want to delete.

Output Parameters

message **String.** Indicates whether the specified notifier is deleted or not.

Usage Notes

The simple interval task scheduled for a notifier executes once, even after the notifier is deleted or disabled.

Each notifier maintains a separate record of read and unread alerts. These records are cleared when the notifier is deleted. However, the alerts themselves are not deleted.

pub.alert.notifier:disable

WmPublic. Disables the specified notifier.

Input Parameters

name **String.** Name of the notifier that you want to disable.

Output Parameters

message **String.** Indicates whether the specified notifier is disabled or not.

Usage Notes

The simple interval task scheduled for a notifier executes once, even after the notifier is deleted or disabled.

pub.alert.notifier:enable

WmPublic. Enables the specified notifier.

Input Parameters

name **String.** Name of the notifier that you want to enable.

Output Parameters

message **String.** Indicates whether the specified notifier is enabled or not.

pub.alert.notifier:list

WmPublic. Lists all the notifiers in the system.

Input Parameters

None.

Output Parameters

notifiers **Document List.** The list of notifiers in the system. Each notifier has the following keys:

Key	Description
<i>name</i>	String. Name of the notifier.
<i>enabled</i>	Boolean. Specifies whether the notifier is enabled or not. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that the notifier is enabled.■ <code>false</code> indicates that the notifier is disabled. If a notifier is disabled, alerts are not fetched for the notifier.
<i>consumptionMode</i>	String. Specifies whether notifications are created for all alerts or only the latest alerts. A value of: <ul style="list-style-type: none">■ <code>earliest</code> indicates that the notifications are generated for all alerts in the system.■ <code>latest</code> indicates that the notifications are generated only for the alerts emitted after the notifier is created.
<i>autoMark</i>	Boolean. Specifies whether notifications should be automatically marked as read or a user must do it manually. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that the system automatically processes the notification. For example, a notification is automatically marked as read after the service specified in the notifier settings is invoked.

	<ul style="list-style-type: none"> ■ <code>false</code> indicates that a user must manually mark the notification as read. 				
<i>channelIds</i>	Object[] . List of identifiers of the channels for which you want to receive notifications.				
<i>intervalInSeconds</i>	Short . Time in seconds after which the notifier should check for unread alerts.				
<i>severityCutoff</i>	String . The severity to consider for fetching alerts. For example, if this value is <code>Critical</code> , you will receive notifications only for critical events. If this value is <code>Error</code> , you will receive notifications for critical and error events. This parameter can have one of the following values: <ul style="list-style-type: none"> ■ <code>Critical</code> ■ <code>Error</code> ■ <code>Information</code> ■ <code>Warning</code> 				
<i>notifyInstantly</i>	Boolean . Specifies whether or not notifications is generated as soon as an alert is raised. A value of: <ul style="list-style-type: none"> ■ <code>true</code> indicates that notifications are generated instantly for an alert. ■ <code>false</code> indicates that notifications are not generated instantly for an alert. 				
	<p>Note: If <i>intervalInSeconds</i> is also specified, the <i>notifyInstantly</i> parameter takes precedence.</p>				
<i>webSocketEnabled</i>	Boolean . Specifies whether or not Integration Server uses a WebSocket connection to send notifications. A value of : <ul style="list-style-type: none"> ■ <code>true</code> indicates that a WebSocket connection is enabled to send notifications. ■ <code>false</code> indicates that a WebSocket connection is disabled. 				
<i>webSocketSender</i>	Document . Sends a message on a connected WebSocket session.				
	<table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>endPointURL</i></td> <td>String. The URL of the remote WebSocket server that Integration Server uses to send notifications.</td> </tr> </tbody> </table>	Key	Description	<i>endPointURL</i>	String . The URL of the remote WebSocket server that Integration Server uses to send notifications.
Key	Description				
<i>endPointURL</i>	String . The URL of the remote WebSocket server that Integration Server uses to send notifications.				
<i>serviceInvokeEnabled</i>	Boolean . Specifies whether a service is invoked with the notifier parameters as pipeline variables or not. A value of:				

- `true` indicates that a service can be invoked using the notifier parameters.
- `false` indicates that a service invocation is disabled for the notifier.

service **Document.** Invokes a service for alerts fetched for this notifier.

InvokeSender

Key	Description
<i>nsName</i>	String. The namespace of the service. For example, <code>pub.flow:tracePipeline</code>

smtpEnabled **Boolean.** Specifies whether Integration Server uses an SMTP server to send notifications or not.

smtpSender **Document.** Details of the SMTP Server and client used to send the notifications.

Key	Description
<i>to</i>	String. E-mail address of the recipient for a notification. Multiple addresses are separated with commas.
<i>from</i>	String. E-mail address of the sender. If you do not specify this value, Integration Server uses the value specified for the <code>mail.smtp.from</code> JVM property. Furthermore, if a value is not specified for that property, Integration Server uses the default value, <code>user@servername</code> , where the user is the operating system user ID, and <code>servername</code> is the host name of Integration Server.
<i>mailhost</i>	String. Hostname of the SMTP server.
<i>mailhostPort</i>	Integer. The port on which the SMTP server listens to incoming connections.
<i>auth</i>	Document. Authorization information that the SMTP service submits to the SMTP server.

Key	Description
<i>user</i>	String. Username that Integration Server uses to send notifications.
<i>secure</i>	Document. Parameters specifying the security protocol and trust store information to perform certificate validation, which Integration Server uses to communicate with the SMTP server port.

Key	Description
<i>transportLayerSecurity</i>	<p>String. Type of the security protocol that Integration Server uses to communicate with the SMTP server port. Set to:</p> <ul style="list-style-type: none">■ <i>none</i>, to use a non-secure mode to communicate with the port on the SMTP server. This is the default.■ <i>explicit</i>, to use explicit security when communicating with the port on the SMTP server. With explicit security, Integration Server establishes an un-encrypted connection to the e-mail server, and then switches to the secure mode.■ <i>implicit</i>, to use implicit security to communicate with the port on the SMTP server. With implicit security, Integration Server always establishes an encrypted connection to the e-mail server.
<i>truststoreAlias</i>	<p>String. Alias for the truststore that contains the list of certificates that Integration Server uses to validate the trust relationship. If you</p>

do not specify a truststore alias, the default truststore alias is used.

Usage Notes

Prior to Integration Server version 10.15, the `pub.alert.notifier:list` service included the `smtpSender/secure/useJSSE` output parameter which specified whether Integration Server created the outbound connection using the Java Secure Socket Extension (JSSE) library. Beginning with Integration Server version 10.15, Integration Server establishes all secure outbound connections with JSSE. If you migrated to Integration Server 10.15 and a migrated service invokes `pub.alert.notifier:list`, the `smtpSender/secure/useJSSE` parameter still appears in the pipeline. However, Integration Server ignores the value of the `smtpSender/secure/useJSSE` parameter, proceeding as if `smtpSender/secure/useJSSE` were set to yes.

pub.alert.notifier:update

WmPublic. Updates the parameters of an existing notifier.

Input Parameters

<i>name</i>	String. Name of the notifier.
<i>enabled</i>	Boolean. Optional. Specifies whether the notifier is enabled or not. Set to: <ul style="list-style-type: none">■ <code>true</code> to enable the notifier.■ <code>false</code> to disable the notifier. This is the default. If a notifier is disabled, alerts are not fetched for the notifier.
<i>consumptionMode</i>	String. Optional. Specifies whether notifications are created for all alerts or only the latest alerts. Set to: <ul style="list-style-type: none">■ <code>earliest</code> to get notifications for all alerts in the system. This is the default.■ <code>latest</code> to get notifications only for the alerts emitted after the notifier is created.
<i>autoMark</i>	Boolean. Optional. Specifies whether notifications are automatically marked as read or a user must do it manually. Set to: <ul style="list-style-type: none">■ <code>true</code> to automatically mark a notification as read after the service specified in the notifier settings is invoked. This is the default.■ <code>false</code> to manually dismiss a notification from Integration Server Administrator, which marks the notification as read.

<i>channelIds</i>	Object[] . Identifies the channels for which you want to receive notifications. You can specify either an individual channel identifier or a list of identifiers. For example, <i>channelIds[0]</i> as 2 for "Server Error" or <i>channelIds[1]</i> as 10 for "Threat Protection" or <i>channelIds[0]</i> as 2 and <i>channelIds[1]</i> as 1 for both.				
<i>intervalInSeconds</i>	Short . Time in seconds after which the system task created for the notifier should check for unread alerts.				
<i>severityCutoff</i>	<p>String. The severity to consider for fetching alerts. For example, if you set this value as <code>Critical</code>, you will receive notifications only for critical events. If you set this value as <code>Error</code>, you will receive notifications for critical and error events. Set the parameter to one of the following values:</p> <ul style="list-style-type: none"> ■ <code>Critical</code>. This is the default. ■ <code>Error</code> ■ <code>Information</code> ■ <code>Warning</code> 				
<i>notifyInstantly</i>	<p>Boolean. Optional. Specifies whether or not notifications are generated as soon as an alert is raised. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to instantly generate a notification for an alert. ■ <code>false</code> if an instant notification is not required for an alert. This is the default. <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p>Note: If <i>intervalInSeconds</i> is also specified, the <i>notifyInstantly</i> parameter takes precedence.</p> </div>				
<i>websocketEnabled</i>	<p>Boolean. Optional. Specifies whether or not Integration Server uses a WebSocket connection to send notifications. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to enable a WebSocket connection to send notifications. ■ <code>false</code> to disable a WebSocket connection. This is the default. 				
<i>websocketSender</i>	<p>Document. Optional. Sends a message on a connected WebSocket session.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Key</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr> <td><i>endpointURL</i></td> <td>String. The URL of the remote WebSocket server that Integration Server uses to send notifications.</td> </tr> </tbody> </table>	Key	Description	<i>endpointURL</i>	String . The URL of the remote WebSocket server that Integration Server uses to send notifications.
Key	Description				
<i>endpointURL</i>	String . The URL of the remote WebSocket server that Integration Server uses to send notifications.				
<i>serviceInvokeEnabled</i>	<p>Boolean. Optional. Specifies whether a service is invoked with the notifier parameters as pipeline variables or not. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to invoke a service using the notifier parameters. ■ <code>false</code> to disable service invocation for the notifier. This is the default. 				

serviceInvokeSender **Document.** Optional. Invokes a service for alerts fetched for this notifier.

Key	Description
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<i>nsName</i>	String. The namespace of the service. For example, <code>pub.flow:tracePipeline</code> .
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smtpEnabled **Boolean.** Optional. Specifies whether Integration Server uses an SMTP server to send notifications or not. Set to:

- `true` to use an SMTP server to send notifications.
- `false` if you do not want to use an SMTP server to send notifications. This is the default.

smtpSender **Document.** Optional. Details of the SMTP Server and client used to send the notifications.

Key	Description
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<i>to</i>	String. E-mail address of the recipient for a notification. If you specify multiple addresses, separate them with commas.
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<i>from</i>	String. E-mail address of the sender. If you do not specify this value, Integration Server uses the value specified for the <code>mail.smtp.from</code> JVM property. Furthermore, if a value is not specified for that property, Integration Server uses the default value, <code>user@servername</code> , where the user is the operating system user ID, and <code>servername</code> is the host name of Integration Server.
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<i>mailhost</i>	String. Hostname of the SMTP server.
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<i>mailhostPort</i>	Integer. Optional. The port on which the SMTP server listens to incoming connections.
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<i>auth</i>	Document. Optional. Authorization information that the SMTP service submits to the SMTP server.
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Key	Description
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<i>user</i>	String. Username that Integration Server uses to send notifications.
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<i>pass</i>	String. Password associated with the user.
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<i>secure</i>	Document. Parameters specifying the security protocol and trust store information to perform certificate validation, which Integration Server uses to communicate with the SMTP server port.
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Key	Description
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transportLayerSecurity **String.** Type of the security protocol that Integration Server uses to communicate with the SMTP server port. Set to:

- `none`, to use a non-secure mode to communicate with the port on the SMTP server. This is the default.
- `explicit`, to use explicit security when communicating with the port on the SMTP server. With explicit security, Integration Server establishes an un-encrypted connection to the e-mail server, and then switches to the secure mode.
- `implicit`, to use implicit security to communicate with the port on the SMTP server. With implicit security, Integration Server always establishes an encrypted connection to the e-mail server.

truststoreAlias **String.** Alias for the truststore that contains the list of certificates that Integration Server uses to validate the trust relationship. If you do not specify a truststore alias, the default truststore alias is used.

Output Parameters

message **String.** Indicates whether a notifier is successfully updated or not.

Usage Notes

When a notifier is enabled, if *consumptionMode* is changed from `earliest` to `latest`, all alerts generated until then are marked as read.

Prior to Integration Server version 10.15, the `pub.alert.notifier:update` service included the `smtpSender/secure/useJSSE` input parameter which specified whether Integration Server created the outbound connection using the Java Secure Socket Extension (JSSE) library. Beginning with Integration Server version 10.15, Integration Server establishes all secure outbound connections with JSSE. If you migrated to Integration Server 10.15 and a migrated service invokes `pub.alert.notifier:update`, the `smtpSender/secure/useJSSE` parameter still appears in the pipeline. However, Integration Server ignores the value of the `smtpSender/secure/useJSSE` parameter, proceeding as if `useJSSE` were set to `yes`.

pub.alert:channels

WmPublic. Gets all alert channels in the system. Channels help classify alerts and lets you subscribe to a specific type of alerts.

Input Parameters

None.

Output Parameters

Channels

Document List. The list of alert channels in Integration Server. By default, there are 13 channels.

All channels have the following keys:

Key	Description
<i>id</i>	Integer. Identifier of a channel. This is a system assigned value and cannot be modified. Note: Channel IDs for custom channels start with 1001.
<i>displayName</i>	String. Name of the alert channel.
<i>description</i>	String. Description for the channel.
<i>emissionEnabled</i>	Boolean. Indicates whether an alert is generated for the channel and stored in the database or not. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that alerts are emitted for the channel and stored in the database.■ <code>false</code> indicates that alerts are disabled for the channel.
<i>systemNotificationEnabled</i>	Boolean. Indicates whether an alert generated for the channel is displayed as a notification or not. <ul style="list-style-type: none">■ <code>true</code> indicates that notifications are generated for the channel.■ <code>false</code> indicates that notifications are disabled for the channel.

Usage Notes

The default channels, events when alerts are raised for a channel, and the corresponding severity are described in the following table:

Channel ID	Channel Name	Events	Severity
1	Service Error	Service execution errors. Note: By default, service error notifications are disabled.	Error
2	Server Error	Server errors such as HTTP 404. Note: By default, server error notifications are disabled.	Error
3	Password Management	A user password expires. A user password is about to expire. Default administrator password is not changed.	Critical Warning
4	License Management	Integration Server license expires. Integration Server license is about to expire.	Critical Warning
5	Certificate Management	A security certificate is about to expire.	Warning
6	Account Locking	Multiple login attempt failures that result in a locked account. A locked account is unlocked.	Critical Information
7	Server Configuration	Server configuration properties (watt properties) are updated, which requires a server restart. JDBC or LDAP configuration is changed, which requires a server restart.	Warning Warning
8	Authentication	Login failure limit is reached.	Error
9	Package Management	Package subscription (Delivery) Package subscription (Release) Note: By default, package management notifications are disabled.	Information

Channel ID	Channel Name	Events	Severity
10	Threat Protection	Enterprise Gateway deny rule violation.	Critical
		Enterprise Gateway allow rule violation.	Warning
11	Metering Log	Errors connecting to the Metering agent server.	Error
12	User Management	User management related alerts	Warning
13	Master Password	A master password expires.	Warning
		Default master password is not changed.	
14	Hybrid Connections	Tenant connection disconnected	Error
		Tenant connection restored	Information
		Account disconnected	Error
		Account restored	Information

Note:

The hybrid connectivity alerts are introduced as part of PIE-81176 in IS_10.15_Core_Fix4.

pub.alert:countAll

WmPublic. Gets the count of all alerts in the system, read and unread, or a subset of alerts that meet the filter criteria.

Input Parameters

filter **Document**. Optional. To get the count of a subset of alerts, specify the criteria using the following keys:

Key	Description
<i>startTime</i>	Long . Optional. Start of the time interval in which alerts are emitted. Specify the value in UNIX epoch format in milliseconds.
<i>endTime</i>	Long . Optional. End of the time interval in which alerts are emitted. Specify the value in UNIX epoch format in milliseconds.
<i>severities</i>	String[] . Optional. List of severities.
<i>channelIds</i>	Object[] . Optional. List of channel identifiers.

- user* **String**. Optional. The Integration Server user who triggered the alerts or Administrator for alerts emitted by the server. For example, specify Administrator for Password Management alerts.
- keyword* **String**. Optional. A keyword that identifies the alerts.

Output Parameters

- count* **Long**. The count of all alerts in the system, read and unread, or a subset of alerts, if the *filter* criteria are passed as inputs.

Usage Notes

To get the count of all alerts in the system, read and unread, do not specify the *filter* criteria as inputs.

pub.alert:countUnread

WmPublic. Gets the count of all unread alerts in the system or a subset of unread alerts for the notifier and filter criteria.

Input Parameters

- notifierName* **String**. Optional. Name of the notifier for which alerts are to be fetched. If you do not specify the notifier name, all unread alerts in the system or a subset of the unread alerts that meet the filter criteria are considered.
- filter* **Document**. Optional. To get the count of a subset of unread alerts, specify the criteria using the following keys:

Key	Description
<i>startTime</i>	Long . Optional. Start of the time interval in which alerts are emitted. Specify the value in UNIX epoch format in milliseconds.
<i>endTime</i>	Long . Optional. End of the time interval in which alerts are emitted. Specify the value in UNIX epoch format in milliseconds.
<i>severities</i>	String[] . Optional. List of severities.
<i>channelIds</i>	Object[] . Optional. List of channel identifiers.
<i>user</i>	String . Optional. The Integration Server user who triggered the alerts or Administrator for alerts emitted by the server.

For example, specify `Administrator` for Password Management alerts.

keyword

String. Optional. A keyword that identifies the alerts.

Output Parameters

count

Long. The count of all unread alerts in the system or a subset of unread alerts, if the notifier name and the *filter* criteria are specified.

Usage Notes

Integration Server uses the `pub.alert:countUnread` service to display the count of unread notifications on the **Notifications** icon in Integration Server Administrator.

When *notifierName* is specified in the `pub.alert:countUnread` service, the *severities* and *channelIds* parameters under *filter* are evaluated in the following manner:

- When only *notifierName* is specified without the *severities* and *channelIds* parameters under *filter*, the notifier's *severityCutoff* and *channelIds* parameters are considered to get the count of unread alerts.
- When *notifierName* is specified along with the *severities* and *channelIds* parameters under *filter*:
 - If none of the *channelIds* under *filter* match with the notifier's *channelIds*, the notifier's *channelIds* are considered to get the count of unread alerts. The *channelIds* under *filter* are ignored.
 - If none of the *severities* under *filter* are within the notifier's *severityCutoff*, the notifier's *severityCutoff* is considered to get the count of unread alerts. The *severities* under *filter* are ignored.
 - Otherwise, the *channelIds* and *severities* under *filter* are considered to get the count of unread alerts.

Consider a notifier with the following settings and the *notifierName* is passed to the `pub.alert:countUnread` service.

- *channelIds*: 1001, 1002
- *severityCutoff*: Error

The following table describes how filter values are evaluated against notifier settings using sample values.

#	Scenario	Evaluation
1	<i>filter</i> <i>channelId[0]: 1001</i>	Is one of the notifier's <i>channelIds</i> .

severities[0]: Critical Is within the notifier's *severityCutoff*.

Result: Unread alerts for *channelId*: 1001 with *severity*: Critical are considered.

2 filter

channelId[0]: 1004 Is not among the notifier's *channelIds*.

severities[0]: Critical Is within the notifier's *severityCutoff*.

Result: Unread alerts for *channelIds*: 1001 and 1002 with *severity*: Critical are considered. *channelId[0]: 1004* is ignored.

3 filter

channelId[0]: 1001 Is one of the notifier's *channelIds*.

severities[0]: Warning/Information Is not within the notifier's *severityCutoff*.

Result: Unread alerts for *channelId*: 1001 with *severity*: Error or Critical are considered. *severities[0]: Warning/Information* is ignored.

4 filter

channelId[0]: 1005 Is not among the notifier's *channelIds*.

severities[0]: Warning/Information Is not within the notifier's *severityCutoff*.

Result: Unread alerts for *channelIds*: 1001 and 1002 with *severity*: Error or Critical are considered. *channelId[0]: 1005* and *severities[0]: Warning/Information* are ignored.

pub.alert:deregisterChannel

WmPublic. Deregisters a registered custom channel.

Input Parameters

channelId **Integer**. Identifier of the channel that you want to deregister.

Output Parameters

deregistered **Boolean**. Indicates whether the channel is deregistered or not. A value of:

- `true` indicates that the channel is deregistered.
- `false` indicates that the channel is not deregistered.

Usage Notes

Channel IDs for custom channels are generated by the system and cannot be modified. The first custom channel gets 1001 as the channel ID and subsequent custom channels have consecutive numbers. Once a custom channel is deregistered, the channel ID is no longer available for a new custom channel until Integration Server is restarted.

Deregistering a channel also deletes all the alerts for that channel.

pub.alert:emit

WmPublic. Generates an alert when a pre-configured condition is met. For example, User or Master Password Expiry, License Key Update, Enterprise Gateway Rule Violation, Service Error, and so on. This service is invoked by Integration Server components to raise alerts.

Input Parameters

<i>channelID</i>	Integer. Identifier of the channel associated with the alert.
<i>severity</i>	String. Severity associated with the alert channel.
<i>subject</i>	String. Subject of the alert message.
<i>contentType</i>	String. Type of information in the alert. For example, <code>text/plain</code> .
<i>content</i>	String. Content of an alert. For example, <code>Alert {0} Message Size Limit filter failed.\nClient IP Address: {1}\n Request URL : {2}\n Date & Time : {3}</code>

Output Parameters

<i>alertId</i>	Long. A unique identifier assigned to each alert emitted.
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pub.alert:fetchAll

WmPublic. Fetches all alerts in the system, read and unread, or a subset of alerts that meet the filter criteria.

Input Parameters

filter **Document.** Optional. To fetch a subset of alerts, specify the criteria using the following keys:

<u>Key</u>	<u>Description</u>
------------	--------------------

<i>startTime</i>	Long. Optional. Start of the time interval in which alerts are emitted. Specify the value in the UNIX epoch format in milliseconds.
<i>endTime</i>	Long. Optional. End of the time interval in which alerts are emitted. Specify the value in the UNIX epoch format in milliseconds.
<i>severities</i>	String[]. Optional. List of severities.
<i>channels</i>	Object[]. Optional. List of channel identifiers.
<i>user</i>	String. Optional. The Integration Server user who triggered the alerts or Administrator for alerts emitted by the server. For example, specify Administrator for Password Management alerts.
<i>keyword</i>	String. Optional. A keyword that identifies the alerts.
<i>sortOrder</i>	String. Optional. The order in which the fetched alerts are sorted. Select ASC or DESC. The default is DESC.
<i>sortBy</i>	<p>String. Optional. The criteria to sort the fetched alerts. Select one of the following options:</p> <ul style="list-style-type: none"> ■ channel ■ severity ■ subject ■ timestamp <p>The default is timestamp.</p>
<i>pageSize</i>	Integer. The number of notifications on a page.
<i>pageNumber</i>	Integer. In a paginated list of notifications, the page where Integration Server loads the notifications.

Note:
Page number starts with 0.

Output Parameters

<i>alerts</i>	Document List. A list of the alerts retrieved by the service. Each alert has the following details:				
	<table> <thead> <tr> <th><u>Key</u></th> <th><u>Description</u></th> </tr> </thead> <tbody> <tr> <td><i>id</i></td> <td>Long. Alert identifier.</td> </tr> </tbody> </table>	<u>Key</u>	<u>Description</u>	<i>id</i>	Long. Alert identifier.
<u>Key</u>	<u>Description</u>				
<i>id</i>	Long. Alert identifier.				

<i>ts</i>	Long. Date and time when the alert is generated, in the UNIX epoch time format.
<i>serverId</i>	String. IP address of the host where Integration Server is running.
<i>memberName</i>	String. Member name of the machine that hosts Integration Server in a cluster.
<i>user</i>	String. Integration Server user who triggered the alert.
<i>channelId</i>	Integer. Channel identifier for the alert.
<i>channel</i>	String. Channel for the alert.
<i>severityId</i>	Integer. Severity identifier of the alert.
<i>severity</i>	String. Severity of the alert.
<i>subject</i>	String. Subject of the alert message.
<i>contentType</i>	String. Text that identifies the type of content in the alert such as <code>text/plain</code> and <code>text/html</code> .
<i>content</i>	String. Content of the alert.

Usage Notes

To fetch all read and unread alerts in the system, do not specify the *filter* criteria as inputs.

The number of notifications on a page is identified by *pageSize* and the current page is identified by *pageNumber*.

pub.alert:fetchUnread

WmPublic. Fetches all the unread alerts in the system or a subset of unread alerts for the notifier and filter criteria.

Input Parameters

notifierName **String.** Optional. If you do not specify the notifier name, all the unread alerts in the system or a subset of the unread alerts that meet the filter criteria are fetched.

filter **Document.** Optional. To fetch a subset of alerts, specify the criteria using the following keys:

Key	Description
<i>startTime</i>	Long . Optional. Start of the time interval in which alerts are emitted. Specify the value in the UNIX epoch format in milliseconds.
<i>endTime</i>	Long . Optional. End of the time interval in which alerts are emitted. Specify the value in the UNIX epoch format in milliseconds.
<i>severities</i>	String[] . Optional. List of severities.
<i>channelIds</i>	Object[] . Optional. List of channel identifiers.
<i>user</i>	String . Optional. The Integration Server user who triggered the alerts or <i>Administrator</i> for alerts emitted by the server. For example, specify <i>Administrator</i> for Password Management alerts.
<i>keyword</i>	String . Optional. A keyword that identifies the alerts.
<i>sortOrder</i>	String . Optional. The order in which the fetched alerts are sorted. Select <i>ASC</i> or <i>DESC</i> . The default is <i>DESC</i> .
<i>sortBy</i>	<p>String. Optional. The criteria to sort the fetched alerts. Select one of the following options:</p> <ul style="list-style-type: none"> ■ <i>channel</i> ■ <i>severity</i> ■ <i>subject</i> ■ <i>timestamp</i> <p>The default is <i>timestamp</i>.</p>
<i>pageSize</i>	Integer . The number of notifications on a page, identified by <i>pageNumber</i>
<i>pageNumber</i>	Integer . In a paginated list of notifications, the page where Integration Server loads the notifications.

Note:
Page number starts with 0.

Output Parameters

alerts **Document List**. A list of the alerts fetched by the service. Each alert has the following details:

Key	Description
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<i>id</i>	Long. Alert identifier.
<i>ts</i>	Long. Date and time when the alert is generated, in the UNIX epoch time format.
<i>serverId</i>	String. IP address of the host where Integration Server is running.
<i>memberName</i>	String. Member name of the machine that hosts Integration Server in a cluster.
<i>user</i>	String. Integration Server user who triggered the alert.
<i>channelId</i>	Integer. Channel identifier for the alert.
<i>channel</i>	String. Channel for the alert.
<i>severityId</i>	Integer. Severity identifier of the alert.
<i>severity</i>	String. Severity of the alert.
<i>subject</i>	String. Subject of the alert message.
<i>contentType</i>	String. Text that identifies the type of content in the alert such as <code>text/plain</code> and <code>text/html</code> .
<i>content</i>	String. Content of the alert.

Usage Notes

Integration Server uses the `pub.alert:fetchUnread` service to display the unread notifications in Integration Server Administrator.

When *notifierName* is specified in the `pub.alert:fetchUnread` service, the *severities* and *channelIds* parameters under *filter* are evaluated in the following manner:

- When only *notifierName* is specified without the *severities* and *channelIds* parameters under *filter*, the notifier's *severityCutoff* and *channelIds* parameters are considered to fetch the unread alerts.
- When *notifierName* is specified along with the *severities* and *channelIds* parameters under *filter*:
 - If none of the *channelIds* under *filter* match with the notifier's *channelIds*, the notifier's *channelIds* are considered to fetch the unread alerts. The *channelIds* under *filter* are ignored.
 - If none of the *severities* under *filter* are within the notifier's *severityCutoff*, the notifier's *severityCutoff* is considered to fetch the unread alerts. The *severities* under *filter* are ignored.
 - Otherwise, the *channelIds* and *severities* under *filter* are considered to fetch the unread alerts.

Consider a notifier with the following settings and the *notifierName* is passed to the `pub.alert:fetchUnread` service.

- *channelIds*: 1001, 1002
- *severityCutoff*: Error

The following table describes how filter values are evaluated against notifier settings using sample values.

#	Scenario	Evaluation
1	<i>filter</i>	
	<i>channelId[0]</i> : 1001	Is one of the notifier's <i>channelIds</i> .
	<i>severities[0]</i> : Critical	Is within the notifier's <i>severityCutoff</i> .
		Result: Unread alerts are fetched for <i>channelId</i> : 1001 with <i>severity</i> : Critical.
2	<i>filter</i>	
	<i>channelId[0]</i> : 1004	Is not among the notifier's <i>channelIds</i>
	<i>severities[0]</i> : Critical	Is within the notifier's <i>severityCutoff</i> .
		Result: Unread alerts are fetched for <i>channelIds</i> : 1001 and 1002 with <i>severity</i> : Critical. <i>channelId[0]</i> : 1004 is ignored.
3	<i>filter</i>	
	<i>channelId[0]</i> : 1001	Is one of the notifier's <i>channelIds</i> .
	<i>severities[0]</i> : Warning/Information	Is not within the notifier's <i>severityCutoff</i> .
		Result: Unread alerts are fetched for <i>channelId</i> : 1001 with <i>severity</i> : Error or Critical. <i>severities[0]</i> : Warning/Information is ignored.
4	<i>filter</i>	
	<i>channelId[0]</i> : 1005	Is not among the notifier's <i>channelIds</i> .
	<i>severities[0]</i> : Warning/Information	Is not within the notifier's <i>severityCutoff</i> .
		Result: Unread alerts are fetched for <i>channelIds</i> : 1001 and 1002 with <i>severity</i> : Error or Critical. <i>channelId[0]</i> : 1005 and <i>severities[0]</i> : Warning/Information are ignored.

The number of notifications on a page is identified by *pageSize* and the current page is identified by *pageNumber*. If *pageSize* is 10 and *pageNumber* is 0, with *sortBy* and *sortOrder* having default values, the latest 10 notifications are listed on the first page.

pub.alert:getChannel

WmPublic. Gets the details of a specific channel.

Input Parameters

channelId **Integer.** Identifier of the channel that you want to retrieve.

Output Parameters

displayName **String.** Name of the channel.

description **String.** Description for the channel.

emissionEnabled **Boolean.** Indicates whether an alert is generated for the channel and stored in the database or not. A value of:

- `true` indicates that alerts are emitted for the channel and stored in the database.
- `false` indicates that alerts are disabled for the channel.

systemNotificationEnabled **Boolean.** Indicates whether an alert generated for the channel is displayed as a notification or not.

- `true` indicates that notifications are generated for the channel.
- `false` indicates that notifications are disabled for the channel.

pub.alert:getSettings

WmPublic. Gets the settings of the system notifier.

Input Parameters

None.

Output Parameters

enabledEmissionChannels **Object[].** List of channels for which alerts can be generated and stored in the database.

enabledSystemNotifierChannels **Object[].** List of channels for which alerts are generated and displayed as notifications.

systemNotifierSeverityCutoff **String.** Notifications are generated only for alerts with severity equal to, or more than this value.

retentionPeriodInDays **Integer.** Determines how long the alerts are stored in the database.

certificateExpiryWarningInDays **Integer.** Number of days before the certificate expiry date, when the alert should be generated.

pub.alert:markAllAsRead

WmPublic. Marks all alert messages as read.

Input Parameters

notifierName **String.** Optional. Name of the notifier for which all the alerts are to be marked as read. If you do not specify the notifier name, alerts of system channels are marked as read.

Output Parameters

updateCount **Long.** Updated count of the unread alerts in the system.

Usage Notes

Invoke `pub.alert:markAllAsRead` to dismiss all notifications at once.

pub.alert:markAsRead

WmPublic. Marks the specified message as read.

Input Parameters

alertId **Long.** Specifies the alert that should be marked as read.

notifierName **String.** Optional. Name of the notifier for which for which the alert should be marked as read.

Output Parameters

updateCount **Long.** Updated count of the unread alerts in the system.

Usage Notes

Integration Server invokes `pub.alert:markAsRead` to dismiss a specific notification.

pub.alert:markAsUnread

WmPublic. Marks a specific alert as unread.

Input Parameters

<i>alertId</i>	Long. The alert that you want to mark as unread.
<i>notifierName</i>	String. Optional. The notifier for which the alert should be marked as unread.

Output Parameters

<i>updateCount</i>	Long. Updated count of the unread alerts in the system.
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pub.alert:registerChannel

WmPublic. Registers a custom channel.

Input Parameters

<i>displayName</i>	String. Name of the channel that you want to register.
<i>description</i>	String. Optional. Description of the channel.
<i>emissionEnabled</i>	Boolean. Optional. Indicates whether an alert is generated for the channel and stored in the database or not. Set to: <ul style="list-style-type: none">■ <code>true</code> to emit alerts for the channel and store them in the database.■ <code>false</code> to disable alerts for the channel. The default value is <code>true</code> for custom channels as well as system channels other than Service Error and Server Error.
<i>systemNotificationEnabled</i>	Boolean. Optional. Indicates whether the alert generated for the channel is displayed as a notification or not. Set to: <ul style="list-style-type: none">■ <code>true</code> to generate notifications for the channel.■ <code>false</code> to disable notifications for the channel. The default value is <code>true</code> for custom channels as well as system channels other than Service Error and Server Error.

Output Parameters

channelId

Integer. Identifier of the registered channel.

Note:

Channel IDs for custom channels start with 1001.

Usage Notes

For custom channels, channel IDs are generated by the system and cannot be modified. The first custom channel gets 1001 as the channel ID and subsequent custom channels have consecutive numbers. Once a custom channel is deregistered, the channel ID is no longer available for a new custom channel until Integration Server is restarted.

pub.alert:setSettings

WmPublic. Updates the settings of the system notifier.

Input Parameters

enabledEmissionChannels

Object[]. List of channels for which alerts can be generated and stored in the database.

enabledSystemNotifierChannels

Object[]. List of channels for which alerts are generated and displayed as notifications.

systemNotifierSeverityCutoff

String. Notifications are generated only for alerts with severity equal to, or more than this value.

retentionPeriodInDays

Integer. Determines how long the alerts are stored in the database.

certificateExpiryWarningInDays

Integer. Number of days before the certificate expiry date when the alert should be generated.

Output Parameters

message

String. Indicates whether the system notifier settings are updated or not.

Usage Notes

Based on the value of the `retentionPeriodInDays` parameter, a purge job clears the alerts stored in the database.

pub.alert:severities

WmPublic. Lists the pre-defined severities that you can associate with an alert channel. The severity associated with an alert lets you assess the relative impact of a business event on the system.

Input Parameters

None.

Output Parameters

Severities **Document List.** The list of default severities available in the system. By default, 4 severities are configured.

Key	Description
<i>id</i>	Integer. Identifier for a severity. The default severities and their IDs are as follows: 0: Critical, 1: Error, 2: Warning, 3: Information
<i>displayName</i>	String. The severity name.

pub.alert:updateChannel

WmPublic. Updates the settings of a channel.

Input Parameters

channelId **Integer.** Identifier of the alert channel that you want to update.

Note:

Channel IDs for custom channels start with 1001.

description **String.** Optional. Description of the channel.

emissionEnabled **Boolean.** Optional. Indicates whether an alert is generated for the channel and stored in the database or not. Set to:

- `true` to emit alerts for the channel and store them in the database.
- `false` to disable alerts for the channel.

The default value is `true` for custom channels as well as system channels other than Service Error and Server Error.

systemNotificationEnabled **Boolean.** Optional. Indicates whether the alert generated for the channel is displayed as a notification or not. Set to:

- `true` to generate notifications for the channel.
- `false` to disable notifications for the channel.

The default value is `true` for custom channels as well as system channels other than Service Error and Server Error.

Output Parameters

message **String.** Indicates whether the channel is successfully updated or not.

Usage Notes

Invoke the `pub.alert:updateChannel` service to ignore a notification of a specific type or restore an ignored notification from Integration Server Administrator.

3 ART Folder

- Summary of Elements in this Folder 54

You use the elements in the art folder to manage adapter components, including connections, adapter services, listeners, and notifications.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.art:listRegisteredAdapters	WmART. Returns the display name and adapter type name of all registered adapters.
pub.art.connection:disableConnection	WmART. Disables a connection node.
pub.art.connection:enableConnection	WmART. Enables an existing connection node.
pub.art.connection:getConnectionStatistics	WmART. Returns current usage statistics for a connection node.
pub.art.connection:listAdapterConnections	WmART. Lists connection nodes associated with a specified adapter.
pub.art.connection:queryConnectionState	WmART. Returns the current connection state (enabled/disabled) and error status for a connection node.
pub.art.listener:disableListener	WmART. Disables a listener.
pub.art.listener:enableListener	WmART. Enables an existing listener.
pub.art.listener:listAdapterListeners	WmART. Lists listeners associated with a specified adapter.
pub.art.listener:queryListenerState	WmART. Returns the current state for a listener.
pub.art.listener:resumeListener	WmART. Resumes a specified listener.
pub.art.listener:setListenerNodeConnection	WmART. Changes the connection node used by a specified listener.
pub.art.listener:suspendListener	WmART. Suspends a specified listener.
pub.art.notification:disableListenerNotification	WmART. Disables a listener notification.
pub.art.notification:disablePollingNotification	WmART. Disables a polling notification.
pub.art.notification:disablePublishEvents	WmART. Disables the publishing of events for an adapter notification.

Element	Package and Description
pub.art.notification:enableListenerNotification	WmART. Enables an existing listener notification.
pub.art.notification:enablePollingNotification	WmART. Enables an existing polling notification.
pub.art.notification:enablePublishEvents	WmART. Enables the publishing of events for an adapter notification.
pub.art.notification:listAdapterListenerNotifications	WmART. Lists the listener notifications associated with a specified adapter.
pub.art.notification:listAdapterPollingNotifications	WmART. Lists the polling notifications associated with a specified adapter.
pub.art.notification:queryListenerNotificationState	WmART. Returns the current state (enabled/disabled) for a listener notification.
pub.art.notification:queryPollingNotificationState	WmART. Returns the current state for a polling notification.
pub.art.notification:resumePollingNotification	WmART. Resumes a specified polling notification node.
pub.art.notification:setListenerNotificationNodeListener	WmART. Changes the listener used by a specified listener notification.
pub.art.notification:setPollingNotificationNodeConnection	WmART. Changes the connection node used by a specified polling notification.
pub.art.notification:suspendPollingNotification	WmART. Suspends a specified polling notification.
pub.art.service:listAdapterServices	WmART. Lists adapter services associated with a specified adapter.
pub.art.service:setAdapterServiceNodeConnection	WmART. Changes the connection node used by a specified adapter service.
pub.art.transaction:commitTransaction	WmART. Commits an explicit transaction.
pub.art.transaction:rollbackTransaction	WmART. Rolls back an explicit transaction.
pub.art.transaction:setTransactionTimeout	WmART. Manually sets a transaction timeout interval for implicit and explicit transactions.
pub.art.transaction:startTransaction	WmART. Starts an explicit transaction.

pub.art:listRegisteredAdapters

WmART. Returns the display name and adapter type name of all registered adapters.

Input Parameters

None.

Output Parameters

registeredAdapterList **Document List** Information for each adapter registered with the WmART package.

<u>Key</u>	<u>Description</u>
<i>adapterDisplayName</i>	String The localized name that the Integration Server Administrator displays.
<i>adapterTypeName</i>	String The name of the adapter as registered with the WmART package. This value can be used as input for the inventory services that take <i>adapterTypeName</i> as input.

pub.art.connection:disableConnection

WmART. Disables a connection node.

Input Parameters

connectionAlias **String** Name of the connection node you want to disable.

Output Parameters

None.

See Also

[pub.art.connection:enableConnection](#)

pub.art.connection:enableConnection

WmART. Enables an existing connection node.

Input Parameters

connectionAlias **String** Name of the connection node you want to enable.

Output Parameters

None.

See Also

[pub.art.connection:disableConnection](#)

pub.art.connection:getConnectionStatistics

WmART. Returns current usage statistics for a connection node.

Input Parameters

aliasName **String** Name of the connection node for which you want usage statistics returned.

Output Parameters

connectionStatistics **Document List** Information for each connection node.

<u>Key</u>	<u>Description</u>
<i>TotalConnections</i>	Integer Current number of connection instances.
<i>BusyConnections</i>	Integer Number of connections currently in use by services, notifications, and listeners.
<i>FreeConnections</i>	Integer Total number of connections created and available for use.
<i>TotalHits</i>	Integer Number of times this connection node successfully provided connections since the last reset.
<i>TotalMisses</i>	Integer Number of times this connection node unsuccessfully provided connections since the last reset (when the request timed out).

See Also

[pub.art.connection:queryConnectionState](#)

pub.art.connection:listAdapterConnections

WmART. Lists connection nodes associated with a specified adapter.

Input Parameters

adapterTypeName **String** The name of the adapter as registered with the WmART package.

Output Parameters

connectionDataList **Document List** Information for each connection node registered with the specified adapter.

<u>Key</u>	<u>Description</u>
<i>connectionAlias</i>	String The name of the connection node.
<i>packageName</i>	String The name of the package in which the connection node resides.
<i>connectionState</i>	String Current state of the connection node. The state will have one of these values: <ul style="list-style-type: none">■ <code>disabled</code> - Connection node is disabled■ <code>enabled</code> - Connection node is enabled.■ <code>shuttingdown</code> - Connection node is in the process of shutting down.■ <code>unknown</code> - Connection node is registered but has not yet established its state.

See Also

[pub.art:listRegisteredAdapters](#)

[pub.art.connection:queryConnectionState](#)

pub.art.connection:queryConnectionState

WmART. Returns the current connection state (enabled/disabled) and error status for a connection node.

Input Parameters

connectionAlias **String** Name of the connection node for which you want the connection state and error status returned.

Output Parameters

connectionState **String** Current connection state (enabled/disabled).

hasError **Boolean** Flag indicating if any error was detected on connection. The values are:

- true if an error was detected.
- false if no error was detected.

See Also

[pub.art.connection:getConnectionStatistics](#)

[pub.art.connection:enableConnection](#)

[pub.art.connection:disableConnection](#)

pub.art.listener:disableListener

WmART. Disables a listener.

Input Parameters

listenerName **String** Name of the listener you want to disable. The listener should have a state of enabled or suspended.

forceDisable **String** Optional. Flag to disable the listener regardless of whether it is still waiting for data from a back-end resource. The string may have one of these values:

- true to disable the listener.
- false to keep the listener enabled.

Output Parameters

None.

See Also

[pub.art.listener:enableListener](#)

pub.art.listener:enableListener

WmART. Enables an existing listener.

Input Parameters

listenerName **String** Name of the listener you want to enable.

Output Parameters

None.

Usage Notes

If you do not enable the connection resource associated with the listener, this service will return without performing any action, and the listener will remain disabled. Therefore, you should invoke [pub.art.listener:queryListenerState](#) before calling this service to confirm that the listener has been enabled.

See Also

[pub.art.listener:queryListenerState](#)

[pub.art.listener:disableListener](#)

pub.art.listener:listAdapterListeners

WmART. Lists listeners associated with a specified adapter.

Input Parameters

adapterTypeName **String** The name of the adapter as registered with the WmART package.

Output Parameters

listenerDataList **Document List** Information for each listener registered with the specified adapter.

<u>Key</u>	<u>Description</u>
<i>listenerNodeName</i>	String The name of the listener.

<i>packageName</i>	String The name of the package in which the listener resides.
<i>listenerEnabled</i>	<p>String Current state of the listener. The state will have one of these values:</p> <ul style="list-style-type: none"> ■ disabled if the listener is disabled. ■ enabled if the listener is enabled. ■ enablePending if the listener is in the process of starting. ■ disablePending if the listener is in the process of disabling. ■ suspended if the listener is suspended. ■ suspendPending if the listener is in the process of suspending.

See Also

[pub.art:listRegisteredAdapters](#)

[pub.art.listener:queryListenerState](#)

pub.art.listener:queryListenerState

WmART. Returns the current state for a listener.

Input Parameters

listenerName **String** Name of the listener for which you want the current state returned.

Output Parameters

listenerState **String** Current state of the listener. The state will have one of these values:

- disabled if the listener is disabled.
- enabled if the listener is enabled.
- enablePending if the listener is in the process of starting.
- disablePending if the listener is in the process of disabling.
- suspended if the listener is suspended.

- `suspendPending` if the listener is in the process of suspending.

See Also

[pub.art.listener:enableListener](#)

[pub.art.listener:disableListener](#)

pub.art.listener:resumeListener

WmART. Resumes a specified listener.

Input Parameters

listenerName **String** The name of the suspended listener you want to resume. The service returns an error if you specify an invalid listener.

Output Parameters

None.

Usage Notes

If the requested transition is not valid (for example, trying to resume a disabled listener or a listener that is already resumed), the service ignores the request.

After you use this service, you can use [pub.art.listener:queryListenerState](#) to verify `pub.art.listener:resumeListener` correctly changed the state of the listener.

See Also

[pub.art.listener:queryListenerState](#)

[pub.art.listener:suspendListener](#)

pub.art.listener:setListenerNodeConnection

WmART. Changes the connection node used by a specified listener.

Input Parameters

listenerName **String** Name of the listener for which you want to change the connection node.

connectionAlias **String** Name of the new connection node to use with the listener.

Output Parameters

None.

Usage Notes

Calling this service for a listener that is disabled is permitted.

Calling this service for a listener that is suspended changes the state of the listener to `disabled`. The user must enable the listener before using it.

See Also

[pub.art.listener:disableListener](#)

pub.art.listener:suspendListener

WmART. Suspends a specified listener.

Input Parameters

<i>listenerName</i>	String The name of the listener you want to suspend. The service returns an error if you specify an invalid listener.
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Output Parameters

None.

Usage Notes

If the requested transition is not valid (for example, trying to suspend a disabled listener or a listener that is already suspended), the service ignores the request.

After you use this service, you can use [pub.art.listener:queryListenerState](#) to verify `pub.art.listener:suspendListener` correctly changed the state of the listener.

See Also

[pub.art.listener:queryListenerState](#)

[pub.art.listener:resumeListener](#)

pub.art.notification:disableListenerNotification

WmART. Disables a listener notification.

Input Parameters

notificationName **String** The name of the listener notification you want to disable.

Output Parameters

None.

See Also

[pub.art.notification:enableListenerNotification](#)

pub.art.notification:disablePollingNotification

WmART. Disables a polling notification.

Input Parameters

notificationName **String** The name of the polling notification you want to disable. The polling notification should have a state of enabled or suspended.

Output Parameters

None.

See Also

[pub.art.notification:enablePollingNotification](#)

pub.art.notification:disablePublishEvents

WmART. Disables the publishing of events for an adapter notification.

Input Parameters

notificationName **String** The name of the notification for which you want to disable the publishing of events.

Output Parameters

None.

See Also

[pub.art.notification:enablePublishEvents](#)

pub.art.notification:enableListenerNotification

WmART. Enables an existing listener notification.

Input Parameters

notificationName **String** The name of the listener notification you want to enable.

Output Parameters

None.

See Also

[pub.art.notification:disableListenerNotification](#)

pub.art.notification:enablePollingNotification

WmART. Enables an existing polling notification.

Input Parameters

notificationName **String** Name of the polling notification you want to enable.

Output Parameters

None.

Usage Notes

You must schedule the polling notification before you can run this service. See your adapter user documentation for instructions to schedule the polling notification.

See Also

[pub.art.notification:disablePollingNotification](#)

pub.art.notification:enablePublishEvents

WmART. Enables the publishing of events for an adapter notification.

Input Parameters

notificationName **String** The name of the notification for which you want to enable the publishing of events.

Output Parameters

None.

See Also

[pub.art.notification:disablePublishEvents](#)

pub.art.notification:listAdapterListenerNotifications

WmART. Lists the listener notifications associated with a specified adapter.

Input Parameters

adapterTypeName **String** The name of the adapter as registered with the WmART package.

Output Parameters

notificationDataList **Document List** Information for each listener notification registered with the specified adapter.

<u>Key</u>	<u>Description</u>
<i>notificationNodeName</i>	String The name of the listener notification.
<i>packageName</i>	String The name of the package in which the listener notification resides.
<i>notificationEnabled</i>	String The current state of the listener notification. The state will have one of these values: <ul style="list-style-type: none">■ no if the listener notification is disabled.■ yes if the listener notification is enabled.

See Also

[pub.art:listRegisteredAdapters](#)

[pub.art.notification:queryListenerNotificationState](#)

pub.art.notification:listAdapterPollingNotifications

WmART. Lists the polling notifications associated with a specified adapter.

Input Parameters

adapterTypeName **String** The name of the adapter as registered with the WmART package.

Output Parameters

notificationDataList **Document List** Information for each polling notification registered with the specified adapter.

<u>Key</u>	<u>Description</u>
<i>notificationNodeName</i>	String The name of the polling notification.
<i>packageName</i>	String The name of the package in which the polling notification resides.
<i>notificationEnabled</i>	<p>String The current state of the polling notification. The state will have one of these values:</p> <ul style="list-style-type: none"> ■ no if the polling notification is disabled. ■ yes if the polling notification is enabled. ■ pending if the polling notification is in the process of shutting down. ■ suspended if the polling notification is suspended.

See Also

[pub.art:listRegisteredAdapters](#)

[pub.art.notification:queryPollingNotificationState](#)

pub.art.notification:queryListenerNotificationState

WmART. Returns the current state (enabled/disabled) for a listener notification.

Input Parameters

notificationName **String** The name of the listener notification for which you want the current state (enabled/disabled) returned.

Output Parameters

notificationState **String** The current state (enabled/disabled) for the listener notification.

See Also

[pub.art.notification:enableListenerNotification](#)

[pub.art.notification:disableListenerNotification](#)

pub.art.notification:queryPollingNotificationState

WmART. Returns the current state for a polling notification.

Input Parameters

notificationName **String** The name of the polling notification for which you want the current state and schedule settings returned.

Output Parameters

notificationState **String** The current state (enabled, disabled, pending disable, pending suspend, or suspended) for the polling notification.

scheduleSettings **IData** Object that contains the notification's schedule settings as follows:

<u>Key</u>	<u>Description</u>
<i>notificationInterval</i>	Integer Polling frequency of the notification.
<i>notificationOverlap</i>	Boolean Flags whether the notification can overlap. The values are: <ul style="list-style-type: none">■ true if the notification can overlap.■ false if the notification cannot overlap.

notificationImmediate

Boolean Flags whether the notification can fire immediately. The values are:

- `true` if the notification can fire immediately.
- `false` if the notification cannot fire immediately.

See Also

[pub.art.notification:enablePollingNotification](#)

[pub.art.notification:disablePollingNotification](#)

pub.art.notification:resumePollingNotification

WmART. Resumes a specified polling notification node.

Input Parameters

notificationName

String The name of the polling notification you want to resume. The service returns an error if you specify an invalid polling notification.

Output Parameters

None.

Usage Notes

If the requested transition is not valid (for example, trying to resume a disabled polling notification or a polling notification that is already resumed), the service ignores the request.

After you use this service, you can use [pub.art.notification:queryPollingNotificationState](#) to verify `pub.art.notification:resumePollingNotification` correctly changed the state of the polling notification to `enabled`.

See Also

[pub.art.notification:queryPollingNotificationState](#)

[pub.art.notification:suspendPollingNotification](#)

pub.art.notification:setListenerNotificationNodeListener

WmART. Changes the listener used by a specified listener notification.

Input Parameters

<i>notificationName</i>	String Name of the listener notification for which you want to change the listener.
<i>listenerNode</i>	String Name of the new listener to use with the listener notification.

Output Parameters

None.

Usage Notes

This service returns an error if the listener notification is enabled.

You can use this service for synchronous and asynchronous listener notifications.

See Also

[pub.art.notification:disableListenerNotification](#)

pub.art.notification:setPollingNotificationNodeConnection

WmART. Changes the connection node used by a specified polling notification.

Input Parameters

<i>notificationName</i>	String Name of the polling notification for which you want to change the connection node.
<i>connectionAlias</i>	String Name of the new connection node to use with the polling notification.

Output Parameters

None.

Usage Notes

The polling notification must be in a `disabled` or `suspended` state before you call this service. This service returns an error if the polling notification is enabled.

If you use this service on a suspended polling notification, the service changes the state of the polling notification to `disabled`.

See Also

[pub.art.notification:disablePollingNotification](#)

pub.art.notification:suspendPollingNotification

WmART. Suspends a specified polling notification.

Input Parameters

notificationName **String** The name of the polling notification you want to suspend. The service returns an error if you specify an invalid polling notification.

Output Parameters

None.

Usage Notes

If the requested transition is not valid (for example, trying to suspend a disabled polling notification or a polling notification that is already suspended), the service ignores the request.

After you use this service, you can use [pub.art.notification:queryPollingNotificationState](#) to verify `pub.art.notification:suspendPollingNotification` correctly changed the state of the polling notification to suspended.

See Also

[pub.art.notification:queryPollingNotificationState](#)

[pub.art.notification:resumePollingNotification](#)

pub.art.service:listAdapterServices

WmART. Lists adapter services associated with a specified adapter.

Input Parameters

adapterTypeName **String** The name of the adapter as registered with the WmART package.

Output Parameters

serviceDataList **Document List** Information for each adapter service registered with the specified adapter.

<u>Key</u>	<u>Description</u>
<i>serviceName</i>	String The name of the adapter service.
<i>packageName</i>	String The name of the package in which the adapter service resides.

See Also

[pub.art:listRegisteredAdapters](#)

pub.art.service:setAdapterServiceNodeConnection

WmART. Changes the connection node used by a specified adapter service.

Input Parameters

<i>serviceName</i>	String Name of an existing adapter service for which you want to change the connection node.
<i>connectionAlias</i>	String Name of the new connection node to use with the adapter service.

Output Parameters

None.

Usage Notes

The new connection node must be enabled before you call this service.

See Also

[pub.art.connection:enableConnection](#)

pub.art.transaction:commitTransaction

WmART. Commits an explicit transaction.

Input Parameters

<i>commitTransactionInput</i>	Document List Information for each commit request.
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<u>Key</u>	<u>Description</u>
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transactionName **String** The name of an explicit transaction that you want to commit. The *transactionName* must have been previously used in a call to [pub.art.transaction:startTransaction](#).

This value must be mapped from the most recent [pub.art.transaction:startTransaction](#) that has not previously been committed or rolled back.

Output Parameters

None.

Usage Notes

This service is available only if your adapter supports built-in transaction management services, which you can confirm by checking the user guide for the adapter.

This service must be used in conjunction with the [pub.art.transaction:startTransaction](#) service. If the *transactionName* parameter was not provided in a prior call to [pub.art.transaction:startTransaction](#), a run-time error will be returned.

See Also

[pub.art.transaction:startTransaction](#)

[pub.art.transaction:rollbackTransaction](#)

pub.art.transaction:rollbackTransaction

WmART. Rolls back an explicit transaction.

Input Parameters

rollbackTransactionInput **Document List** Information for each rollback request.

<u>Key</u>	<u>Description</u>
<i>transactionName</i>	<p>String The name of an explicit transaction that you want to roll back. The <i>transactionName</i> must have been previously used in a call to pub.art.transaction:startTransaction.</p> <p>This value must be mapped from the most recent pub.art.transaction:startTransaction that</p>

has not previously been committed or rolled back.

Output Parameters

None.

Usage Notes

This service is available only if your adapter supports built-in transaction management services, which you can confirm by checking the adapter's user guide.

This service must be used in conjunction with the [pub.art.transaction:startTransaction](#) service. If the given *transactionName* parameter was not provided in a prior call to [pub.art.transaction:startTransaction](#), a run-time error will be returned.

See Also

[pub.art.transaction:startTransaction](#)

[pub.art.transaction:commitTransaction](#)

pub.art.transaction:setTransactionTimeout

WmART. Manually sets a transaction timeout interval for implicit and explicit transactions.

Input Parameters

timeoutSeconds **Integer** The number of seconds that the implicit or explicit transaction stays open before the transaction manager marks it for rollback.

Output Parameters

None.

Usage Notes

This service is available only if your adapter supports built-in transaction management services, which you can confirm by checking the user guide for the adapter.

When you use this service, you are temporarily overriding the Integration Server transaction timeout interval.

You must call this service within a flow before the start of any implicit or explicit transactions. Implicit transactions start when you call an adapter service in a flow. Explicit transactions start when you call the [pub.art.transaction:startTransaction](#) service.

If the execution of a transaction takes longer than the transaction timeout interval, all transacted operations are rolled back.

This service only overrides the transaction timeout interval for the flow service in which you call it.

See Also

[pub.art.transaction:startTransaction](#)

pub.art.transaction:startTransaction

WmART. Starts an explicit transaction.

Input Parameters

startTransactionInput

Document List Information for each start transaction request.

Key	Description
<i>transactionName</i>	String Optional. Specifies the name of the transaction to be started. If you leave this parameter blank, Integration Server will generate a name for you. In most implementations it is not necessary to provide your own transaction name.

Output Parameters

startTransactionOutput

Document List Information for each start transaction request.

Key	Description
<i>transactionName</i>	String The name of the transaction the service just started.

Usage Notes

This service is available only if your adapter supports built-in transaction management services, which you can confirm by checking the user guide for the adapter.

This service is intended for use with the [pub.art.transaction:commitTransaction](#) or [pub.art.transaction:rollbackTransaction](#) service. The *transactionName* value returned by a call to this service can be provided to [pub.art.transaction:commitTransaction](#) (to commit the transaction) or [pub.art.transaction:rollbackTransaction](#) (to roll back the transaction).

See Also

[pub.art.transaction:commitTransaction](#)

[pub.art.transaction:rollbackTransaction](#)

4 Assets Folder

■ Summary of Elements in this Folder	78
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You use the service in the assets folder to get the checksum of one ore more assets on Integration Server.

Summary of Elements in this Folder

The following asset is available in this folder:

Element	Package and Description
pub.assets:getChecksums	WmPublic. Retrieves the checksums for assets, specifically namespace elements, on Integration Server.
pub.assets:getHostedAPIs	WmPublic. Retrieves the list of APIs in a package on Integration Server.

pub.assets:getChecksums

WmPublic. Retrieves the checksums for assets, specifically namespace elements, on Integration Server. You can calculate the checksum for specific assets or all of the assets in a package. A checksum is a digest for an asset that is generated using all the properties and contents of the asset. Each asset on Integration Server has a unique checksum. Two assets on different Integration Servers have the same checksum if the assets are identical.

Input Parameters

<i>packages</i>	<p>String List Optional. Names of the packages for which you want to get the checksum of each asset in the package. A package must be enabled and loaded for Integration Server to get checksums for the assets. If a package is partially loaded, Integration Server gets checksums for the loaded assets only.</p> <p>You must specify a value for <i>packages</i> or <i>assets</i>. If you specify a value for both <i>packages</i> and <i>assets</i>, Integration Server uses the <i>packages</i> value and ignores <i>assets</i>. If you specify neither, the <code>pub.assets:getChecksums</code> service ends with an exception.</p>
<i>assets</i>	<p>String List Optional. List of the fully qualified names of the specific assets for which you want to get the checksum.</p> <p>You must specify a value for <i>packages</i> or <i>assets</i>. If you specify a value for both <i>packages</i> and <i>assets</i>, Integration Server uses the <i>packages</i> value and ignores <i>assets</i>. If you specify neither, the <code>pub.assets:getChecksums</code> service ends with an exception.</p>

Output Parameters

checksums **Document List** List of checksums for the assets in the specified packages or the specified assets.

Key	Description
<i>package</i>	String Name of the package containing the asset.
<i>name</i>	String Fully qualified name of the asset.
<i>checksum</i>	String Checksum for the asset. The checksum value is null for an asset listed in <i>assets</i> if the specified asset does not exist on Integration Server.

Usage Notes

The `pub.assets:getChecksums` service ends with an exception if a package identified in *packages* does not exist or is not enabled.

The *checksums/checksum* output parameter contains a null value if an asset specified in *assets* does not exist.

If you do not have List access to a particular asset, the service returns only the asset *name*. The *package* and *checksum* values for the particular asset are null.

You can only compare packages and assets from the same version of Integration Server. Comparison of assets across different versions of Integration Server is not supported. Internal changes in assets from one release to another might result in functionally identical assets being reported as different.

pub.assets:getHostedAPIs

WmPublic. Retrieves the list of APIs in a package on Integration Server.

Input Parameters

packageList **String List.** A package or a list of packages for which you want to view APIs.

Output Parameters

packages **Document List.** The list of packages that contains APIs.

Key	Description
<i>packageName</i>	String. Name of a package.

*api***Document List.** The list of all APIs in a package.

Key	Description
<i>apiName</i>	String. The name of an API.
<i>type</i>	String. Type of the API. Supported types are WSDL, SWAGGER, and OPENAPI.
<i>endpointUrl</i>	String. The URL of the API.

Note:

The service does not retrieve the *endpointUrl* for a consumer REST API or REST API descriptor.

5 Cache Folder

■ About Checkpoint Restart	82
■ Summary of Elements in this Folder	83

You use the elements in the cache folder to place data in a cache and retrieve it again later. You can also use the services in the cache folder to perform administrative operations such as enabling, disabling, and clearing a cache, or to implement checkpoint restart in services you write. Integration Server uses Terracotta Ehcache internally for all of the services in the cache folder. Before using these services, you need to create a cache manager and cache using Integration Server Administrator. For instructions, see the section *Understanding Caches and Cache Managers* in the *webMethods Integration Server Administrator's Guide*.

Note:

The key you use for the services in the cache folder must be an object that overrides the equals() method from java.lang.Object. Failure to use such an object can cause the service to return incorrect results.

Note:

You cannot use an IS document object as a key for storing objects in the cache because IS document objects do not implement the equals() method.

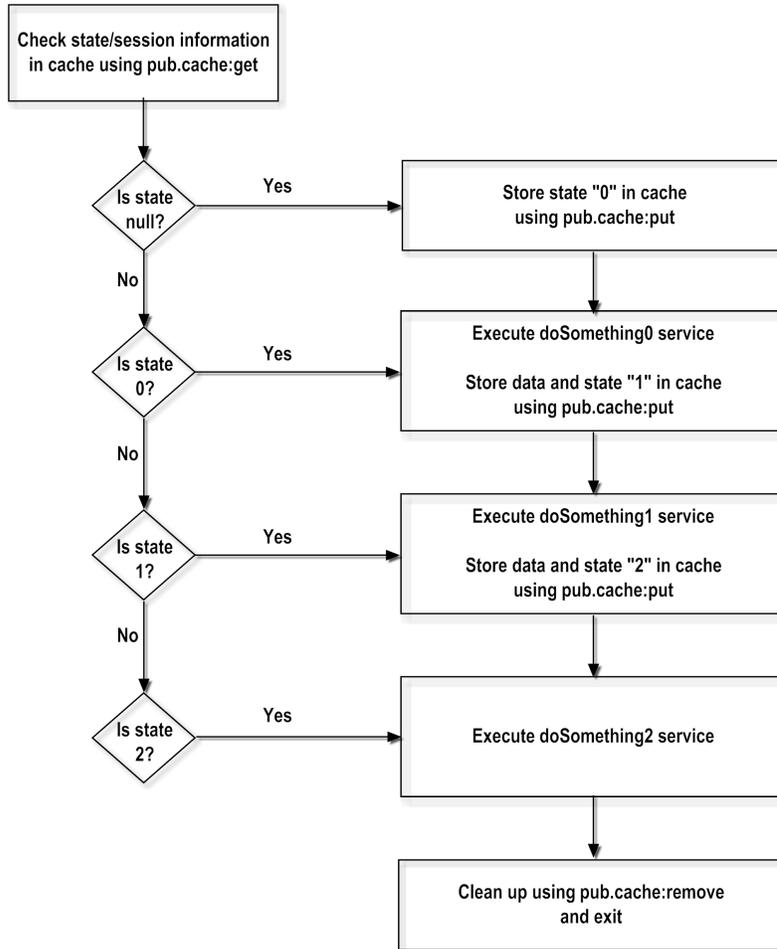
About Checkpoint Restart

You can use the pub.cache services to implement checkpoint restart in services that you write to make them more robust. You use the pub.cache services to write state information and other pertinent data to the cache. If the Integration Server on which your service is executing becomes unavailable, your service will be able to check the state information in the cache and resume processing at the point where the service was interrupted.

Note:

The pub.cache services are a tool for maintaining state information for the short term. It is up to the developer of the services to make sure they keep track of state information and correctly handle restarts.

The following diagram shows the logic of a flow service that uses checkpoint restart.



Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.cache:containsKey	WmPublic. Checks whether an element with the specified key exists in the cache.
pub.cache:get	WmPublic. Retrieves the value of a cached element for the specified key.
pub.cache:getAll	WmPublic. Retrieves the values of the cached elements for the specified keys.
pub.cache:getKeys	WmPublic. Retrieves the keys of all elements available in the cache.
pub.cache:put	WmPublic. Populates a cached element with a specified key-value pair.

Element	Package and Description
pub.cache:putAll	WmPublic. Populates a collection of elements in the cache with the specified key-value pairs.
pub.cache:remove	WmPublic. Removes the cached element associated with the specified key.
pub.cache:removeAll	WmPublic. Removes the cached elements associated with a list of keys or, if no keys are specified, removes all elements from the cache.
pub.cache:search	WmPublic. Searches through an indexed cache and returns the results.
pub.cache.admin:clearAllCaches	WmPublic. Deletes all of the elements from all caches contained in the specified cache manager.
pub.cache.admin:clearCache	WmPublic. Deletes all elements from the specified cache.
pub.cache.admin:disableCache	WmPublic. Disables a cache.
pub.cache.admin:enableCache	WmPublic. Enables a cache.
pub.cache.admin:evictExpiredElements	WmPublic. Deletes all of the expired elements from a cache.
pub.cache.admin:isCacheDisabled	WmPublic. Checks whether the cache is disabled.
pub.cache.atomic:putIfAbsent	WmPublic. Adds an element to the cache if the cache does not contain an element with the specified key.
pub.cache.atomic:remove	WmPublic. Removes the cached element associated with the specified key and value.
pub.cache.atomic:replace	WmPublic. Replaces the cached element value with the supplied value.
pub.cache.atomic:replaceIfKeyExists	WmPublic. Replaces the cached element if an element for the specified key exists in a cache.
pub.cache.bulk:isClusterBulkLoadEnabled	WmPublic. Checks whether the cache on at least one Integration Server node in the Terracotta Server Array cluster is enabled for bulk loading.
pub.cache.bulk:isNodeBulkLoadEnabled	WmPublic. Checks whether the cache of the current Integration Server node in the Terracotta Server Array cluster is bulk-load enabled.

Element	Package and Description
pub.cache.bulk:setNodeBulkLoadEnabled	WmPublic. Enables or disables bulk loading mode in the current Integration Server node for the cache.
pub.cache.bulk:waitUntilClusterBulkLoadComplete	WmPublic. Indicates whether Integration Server delays execution of the next step in a flow service until all of the Integration Server nodes in the Terracotta Server Array cluster disable bulk loading for the cache.
pub.cache.lock:acquireLock	WmPublic. Acquires a lock on the cached element that contains the specified key.
pub.cache.lock:isLockedByCurrentThread	WmPublic. Checks whether the current thread is holding a lock on the cached element for the specified key.
pub.cache.lock:releaseLock	WmPublic. Releases a lock on the element for the specified key.
pub.cache.serviceResults:addCacheEntry	WmPublic. Adds cached entry into service results for the service without executing the actual service. This service can be useful to perform bulk load of service results at Integration Server startup.
pub.cache.serviceResults:listServiceCache	WmPublic. Returns a list of the cached service results for a particular service.
pub.cache.serviceResults:resetServerCache	WmPublic. Resets the cache for all services in the service results cache, resulting in the removal of all cached service results for all services from the service results cache.
pub.cache.serviceResults:resetServiceCache	WmPublic. Resets the cache for specific service, resulting in the removal of cached service results for the service.

pub.cache:containsKey

WmPublic. Checks whether an element with the specified key exists in the cache.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
-------------------------	---

<i>cacheName</i>	String Name of the cache that contains the key. This parameter is case sensitive.
<i>key</i>	Object Key of the element for whose existence you are checking.

Output Parameters

<i>found</i>	String Indicates whether the key exists in the cache. <ul style="list-style-type: none">■ <code>true</code> indicates that the key exists in the cache.■ <code>false</code> indicates that the key does not exist in the cache.
--------------	---

Usage Notes

The `pub.cache:containsKey` service does not verify whether the element is expired. If the element of the specified key is expired, and the element is present in the cache, `pub.cache:containsKey` returns *found* with a value of `true`.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache:get

`WmPublic`. Retrieves the value of a cached element for the specified key.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache from which to retrieve the element. This parameter is case sensitive.
<i>key</i>	Object Key associated with the cached value.
<i>useLoader</i>	String Optional. Indicates whether to use a cache loader to retrieve the element from the cache. Set to: <ul style="list-style-type: none">■ <code>true</code> to use a cache loader to retrieve the element if it is not already in the cache.

Note:

If *useLoader* is `true` and no loaders are configured for the cache, Integration Server issues a `ServiceException`.

- `false` to retrieve the element from the cache without a cache loader. This is the default setting.

Output Parameters

value **Object** Value of the element retrieved from the cache.

Usage Notes

If *useLoader* is set to `false` and `pub.cache:get` finds the key in the cache, the results contain the value of the element. If the key does not exist in the cache, `pub.cache:get` returns a null in the *value* parameter.

If *useLoader* is set to `true` and `pub.cache:get` cannot find the specified key in the cache, it uses the configured cache loader to find the key in the system-of-record (SOR). If the SOR contains the key, `pub.cache:get` returns the value of the element. If the key does not exist in the SOR, `pub.cache:get` returns a null in the *value* parameter.

The `pub.cache:get` service returns a null in the *value* parameter if:

- You run the service on a disabled cache.
- The service cannot find the specified key.
- The element associated with the specified key is expired.

Integration Server issues a `ServiceException` in the following cases:

- If *useLoader* is `true` and no loaders are configured for the cache.
- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache:getAll

WmPublic. Retrieves the values of the cached elements for the specified keys.

Input Parameters

cacheManagerName **String** Name of the cache manager that manages the cache. This parameter is case sensitive.

<i>cacheName</i>	String Name of the cache from which to retrieve the elements. This parameter is case sensitive.
<i>keys</i>	Object List Keys associated with the cached elements for which you want to retrieve values.
<i>useLoader</i>	String Optional. Indicates whether to use a cache loader to retrieve the elements from the cache. Set to: <ul style="list-style-type: none">■ <code>true</code> to use a cache loader to retrieve an element if the element is not already in the cache. <div data-bbox="540 569 1365 699" style="background-color: #f0f0f0; padding: 5px;">Note: If <i>useLoader</i> is <code>true</code> and no loaders are configured for the cache, Integration Server issues a <code>ServiceException</code>.</div> <ul style="list-style-type: none">■ <code>false</code> to retrieve an element from the cache without a cache loader. This is the default setting.

Output Parameters

elements **Document List** An `IData[]` containing the values for the requested cached elements.

Key	Description
<i>key</i>	Object Key associated with the cached element.
<i>value</i>	Object Value of the element retrieved from the cache.

Usage Notes

The `pub.cache:getAll` service can be memory-intensive because it loads all of the specified keys into memory.

If *useLoader* is set to `false` and `pub.cache:get` finds the key in the cache, the results contain the value of the element. If the key does not exist in the cache, `pub.cache:getAll` returns a null in the *value* parameter.

If *useLoader* is set to `true` and `pub.cache:get` cannot find the specified key in the cache, it uses the configured cache loader to find the key in the system-of-record (SOR). If the SOR contains the key, `pub.cache:get` returns the value of the element. If the key does not exist in the SOR, `pub.cache:getAll` returns a null in the *value* parameter.

The `pub.cache:getAll` service returns a null in the *elements/value* parameter if:

- You run the service on a disabled cache.
- The service cannot find the specified key.

- The element associated with the specified key is expired.

Integration Server issues a `ServiceException` in the following cases:

- If `useLoader` is `true` and no loaders are configured for the cache.
- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache:getKeys

WmPublic. Retrieves the keys of all elements available in the cache.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache from which to retrieve the keys. This parameter is case sensitive.
<i>excludeExpiredKeys</i>	String Optional. Indicates whether the service results exclude keys for expired elements. Set to: <ul style="list-style-type: none"> ■ <code>true</code> to exclude the keys of expired elements. This is the default. ■ <code>false</code> to include the keys of all elements.

Output Parameters

<i>keys</i>	Object List List of keys of elements in the cache.
-------------	---

Usage Notes

Retrieving all of the keys from a cache may negatively impact the performance of the calling service. This may be especially true when retrieving all of the keys for a large, distributed cache.

Retrieving all of the keys from a cache is a memory-intensive activity. It is possible for the list of available keys to be larger than the memory available on your system. In such cases, Integration Server might issue an `OutOfMemoryError` and become unresponsive.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.

- If a cache operation fails.

pub.cache:put

WmPublic. Populates a cached element with a specified key-value pair.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache in which to put the element. This parameter is case sensitive.
<i>key</i>	Object Key of the cached element.
<i>value</i>	Object Value of the cached element.
<i>useWriter</i>	String Optional. Indicates whether to use a cache writer to populate the value of the cached element in the system-of-record (SOR). Set to: <ul style="list-style-type: none">■ <code>true</code> to use a cache writer to add the <i>value</i> to the cached element <i>and</i> the SOR.■ <code>false</code> to add the <i>value</i> to the cached element without writing to the SOR. This is the default setting.

Note:

If the *value* already exists in the cache, `pub.cache:put` replaces the value.

Output Parameters

None.

Usage Notes

If your cache is a distributed cache or is configured to use disk store or BigMemory, *key* and *value* must be Java Serializable objects.

If the element with the specified *key* does not already exist in the cache, the `pub.cache:put` service puts the element in the cache. If the element with the specified *key* already exists in the cache, `pub.cache:put` updates the element with the specified *value*.

If you run `pub.cache:put` on a disabled cache, the cache discards the call.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If *useWriter* is set to `true` and no writer is configured for the cache.

- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache:putAll

WmPublic. Populates a collection of elements in the cache with the specified key-value pairs.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache in which to put the elements. This parameter is case sensitive.
<i>elements</i>	Document List An IData[] containing the key-value pairs to put in the cache.

<u>Key</u>	<u>Description</u>
<i>key</i>	Object Key of the cached element.
<i>value</i>	Object Value of the cached element.

Output Parameters

None.

Usage Notes

If your cache is a distributed cache or is configured to use disk store or BigMemory, *key* and *value* must be Java Serializable objects.

The *key* and *value* input parameters cannot be null. The service might end with a NullPointerException if any *key* or *value* parameters are null.

If the element with the specified *key* does not already exist in the cache, the pub.cache:putAll service puts the element in the cache. If the element with the specified *key* already exists in the cache, pub.cache:putAll updates the element with the specified *value*.

If you run pub.cache:putAll on a disabled cache, the cache discards the call.

Integration Server issues a ServiceException in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache:remove

WmPublic. Removes the cached element associated with the specified key.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache from which to remove the element. This parameter is case sensitive.
<i>key</i>	Object Key of the element to remove.
<i>useWriter</i>	String Optional. Indicates whether to use a cache writer to remove the value of the cached element from the system-of-record (SOR). Set to: <ul style="list-style-type: none">■ <code>true</code> to use a cache writer to remove the <i>value</i> from the cached element <i>and</i> the SOR.■ <code>false</code> to remove the <i>value</i> to the cached element without using a cache writer. This is the default setting.

Output Parameters

<i>removed</i>	String Indicates whether the element was removed. <ul style="list-style-type: none">■ <code>true</code> indicates that the element was removed from the cache.■ <code>false</code> indicates that the element was not removed from the cache.
----------------	---

Usage Notes

If the element associated with the specified key does not exist, `pub.cache:remove` returns `false` for *removed*.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache:removeAll

WmPublic. Removes the cached elements associated with a list of keys or, if no keys are specified, removes all elements from the cache.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache in which to put the elements. This parameter is case sensitive.
<i>keys</i>	Object List Optional. Keys of the elements to remove from the cache. If you do not specify any keys, the service removes all of the elements from the specified cache.

Output Parameters

None.

Usage Notes

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache:search

`WmPublic`. Searches through an indexed cache and returns the results. The `pub.cache:search` service accepts the selection criteria as an `IData` object and performs the search by converting the `IData` object to a search query of Terracotta Ehcache.

Note:

Before using this service, you must make the cache searchable. For more information about making a cache searchable, see the section *Making a Cache Searchable* in the *webMethods Integration Server Administrator's Guide*.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache from which the search results are to be returned. This parameter is case sensitive.
<i>includeAttributes</i>	String Optional. List of attributes that should be included in the search results.

<i>includeKey</i>	<p>String Optional. Indicates whether or not the keys should be returned as part of the search results.</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates that the keys should be returned as part of the search results. ■ <code>false</code> indicates that the keys should not be returned as part of the search results. This is the default. <p>Note: You should set this parameter to <code>true</code> only if the value is required for your programming logic.</p>								
<i>includeValue</i>	<p>String Optional. Indicates whether or not the values should be returned as part of the search results.</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates that the values should be returned as part of the search results. ■ <code>false</code> indicates that the values should not be returned as part of the search results. This is the default. <p>Note: You should set this parameter to <code>true</code> only if the value is required for your programming logic.</p>								
<i>criteria</i>	<p>Document A document (IData) that specifies the conditions based on which the data in the cache is to be queried.</p> <table border="1"> <thead> <tr> <th style="text-align: left;">Value</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr> <td><i>OP1</i></td> <td>String or Document A string operand or a nested document type that can be evaluated by a logical operator.</td> </tr> <tr> <td><i>OPR</i></td> <td>String A logical (<code>and</code>, <code>or</code>, and <code>not</code>) or comparison operator (<code>between</code>, <code>gt</code> (greater than), <code>eq</code> (equal to), and so on). For a complete list of operators that Integration Server supports as the value for the <i>criteria</i>\<i>OPR</i> parameter, see the Usage Notes for this service.</td> </tr> <tr> <td><i>OP2</i></td> <td>String, Document, Object, or Object List A string operand, nested document type, object, or object list that can be evaluated by a logical operator.</td> </tr> </tbody> </table>	Value	Description	<i>OP1</i>	String or Document A string operand or a nested document type that can be evaluated by a logical operator.	<i>OPR</i>	String A logical (<code>and</code> , <code>or</code> , and <code>not</code>) or comparison operator (<code>between</code> , <code>gt</code> (greater than), <code>eq</code> (equal to), and so on). For a complete list of operators that Integration Server supports as the value for the <i>criteria</i> \ <i>OPR</i> parameter, see the Usage Notes for this service.	<i>OP2</i>	String, Document, Object, or Object List A string operand, nested document type, object, or object list that can be evaluated by a logical operator.
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<i>OP2</i>	String, Document, Object, or Object List A string operand, nested document type, object, or object list that can be evaluated by a logical operator.								
<i>maxResults</i>	<p>String Optional. The maximum number of results to return. If <i>maxResults</i> is not specified, Integration Server returns all the results.</p>								
<i>groupBy</i>	<p>String List Optional. The unique values of specified attributes based on which the search results are to be grouped. The attributes that you specify</p>								

for grouping the results must be included in the list of attributes specified for the *includeAttributes* parameter.

orderBy

String Table Optional. Whether the service results are to be returned in ascending or descending order.

Values for this parameter must be specified as a two-dimensional string array comprising the field name and whether DESCENDING or ASCENDING (case sensitive) in the following format:

```
{{"fieldName","order"}, {"fieldName","order"}}
```

Where *order* is ASCENDING or DESCENDING.

For example, if you have configured name and age as the search attributes for the *personCache* cache that stores name, age, and address, the *orderBy* parameter can be specified as shown below:

```
{{"name", "ASCENDING"}}
```

-or-

```
{{"name", "ASCENDING"}, {"age", "DESCENDING"}}
```

aggregator

String Table Aggregator function such as average, count, max, min, or sum that you want to be applied on the search results. Values for this parameter should be specified as a two-dimensional string array in the following format:

```
{{"fieldName","aggregator"}, {"fieldName","aggregator"}}
```

Where *aggregator* can be average, count, max, min, or sum (case-insensitive).

For example, `{{"age", "Max"}}` or `{{"income", "Average"}}`.

If you want to use the aggregator function, you must:

- Specify a value for the *groupBy* parameter.
- Set the *includeKey* and *includeValue* parameters to `false`.

Output Parameters

result

Object List The returned results of the search.

Each object in the *result* parameter is of type `com.wm.app.b2b.client.cache.config.SearchResult`. For more information about `com.wm.app.b2b.client.cache.config.SearchResult` type, see *webMethods Integration Server Java API Reference*.

Each object contains information about the cache element, key, value, search attribute values, and aggregator results, if any.

Usage Notes

If you want to search a document (IData) in the cache, you must first create an attribute extractor class and identify the search attributes for the cache. Terracotta Ehcache uses the extractor class and the provided search attribute information to search the cache when the `pub.cache:search` service executes.

A sample IData that you can specify as the *criteria* input parameter is given below. The following input searches the `personCache` cache for entries, where age is greater than 60 and gender is female.

```
IData idata = IDataFactory.create();

//Cache information

    IDataMap map = new IDataMap(idata)    ;
    map.put("cacheManagerName", "SearchTestManager")    ;
    map.put("cacheName", "personCache")    ;
    map.put("includeKey", "true")    ;
    map.put("includeValue", "true")    ;

//Condition 1 - Age > 60

    IData input1 = IDataFactory.create()    ;
    IDataCursor cursor1 = input1.getCursor()    ;
    IDataUtil.put(cursor1, "OP1", "age")    ;
    IDataUtil.put(cursor1, "OPR", "gt")    ;
    IDataUtil.put(cursor1, "OP2", 60)    ;

//Condition 2 - Gender == Female

    IData input2 = IDataFactory.create()    ;
    IDataCursor cursor2= input2.getCursor()    ;
    IDataUtil.put(cursor2, "OP1", "gender")    ;
    IDataUtil.put(cursor2, "OPR", "eq")    ;
    IDataUtil.put(cursor2, "OP2", Person.Gender.FEMALE)    ;

//Joining conditions, condition 1 && condition 2

    IData input3 = IDataFactory.create()    ;
    IDataCursor cursor3 = input3.getCursor()    ;
    IDataUtil.put(cursor3, "OP1", input1)    ;
    IDataUtil.put(cursor3, "OPR", "AND")    ;
    IDataUtil.put(cursor3, "OP2", input2)    ;
    map.put("criteria", input3)    ;

//Run the search

    IData result = invoke(NSName.create("pub.cacheimpl:search"),
        idata);
```

```
Object[] objectList = (Object[]) IDataUtil.get(result.getCursor(),
"result");
```

```
for (int i = 0; i < objectList.length; i++) {
    Person value = (Person) ((SearchResult) objectList[i]).getValue();
    System.out.println(value.getGender());
    System.out.println( value.getAge());
}
```

When using the `between` operator for the `criteria\OPR` parameter, you must specify start and end values. That is, you must specify a two-element Object List with the 0 element as the start value and the first element as the end value. For example:

```
//Condition 1 < age <10
    IData input1 = IDataFactory.create() ;
    IDataCursor cursor1 = input1.getCursor() ;
    IDataUtil.put(cursor1, "OP1", "age") ;
    IDataUtil.put(cursor1, "OPR", "between") ;
    IDataUtil.put(cursor1, "OP2", {1,10}) ;
```

Integration Server supports the following operators as the value for `criteria\OPR` parameter:

Operators	Description
and	AND logical operator
between	Comparison between two values.
eq	Equals
gt	Greater than
ge	Greater than or equal to
ilike	Regular expression matcher using '?' and '*'.
in	Comparison operator meaning in the collection given as an argument.
isNull	Checks whether the value of an attribute is null.
lt	Less than.
le	Less than or equal to
not	NOT logical operator
ne	Not equal to
notNull	Checks whether the value of an attribute with given name is NOT null.
or	OR logical operator

Because the state of the cache can change between search executions, include all of the aggregators to the search query at the same time, so that the returned aggregators are of the same iteration of the cache.

By default a search will return an unlimited number of results. If too many results are returned, Integration Server might issue an `OutOfMemoryError` and become unresponsive. Limit the size of the results using the `maxResults` parameter.

To ensure that Integration Server does not issue an `OutOfMemoryError` while invoking the service using Designer, do the following:

1. Copy the `ehcache-ee.jar` from `Software AG_directory/common/lib/` to the `Software AG_directory/Designer/eclipse/plugins/com.softwareag.is.runtimejars` folder.
2. Edit the `Software AG_directory/Designer/eclipse/plugins/com.softwareag.is.runtimejars/META-INF/MANIFEST.MF` file by appending `ehcache-ee.jar` to the "Bundle-ClassPath:" property. Maintain the characters per line in the `MANIFEST.MF` file while editing.
3. Restart Designer using the `-clean` option:

```
Software AG_directory
/Designer/eclipse/ eclipse.exe -clean
```

This cleans the folders in the following directory: `<workspace_location>\.metadata\.plugins\com.softwareag.is.runtimejars`.

pub.cache.admin:clearAllCaches

WmPublic. Deletes all of the elements from all caches contained in the specified cache manager.

Input Parameters

cacheManagerName **String** Name of the cache manager that manages the cache. This parameter is case sensitive.

cachePrefix **String** Optional. Prefix of the name of the caches from which to delete elements. If you do not specify a prefix, the service deletes elements from *all* caches in the cache manager.

Note:

If `pub.cache.admin:clearAllCaches` does not find any caches with the specified prefix, the service does not clear any caches.

Output Parameters

status **String** The status indicating either Error or Success.

message **String** The status message.

Usage Notes

Note:

Only users with administrator privileges can execute this service.

Important:

The elements you delete from the caches are deleted permanently. You cannot undo this action.

If `pub.cache.admin:clearAllCaches` does not find any caches with the specified prefix, the service does not clear any caches, but returns `Success` for `status`.

You cannot clear caches managed by system cache managers.

If you have any existing locks on any of the elements in the cache, the `pub.cache.admin:clearAllCaches` service waits indefinitely until all locks are released.

Integration Server returns a `status` of `Error` in the following cases:

- If the cache is managed by a system cache manager.
- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager.
- If a cache operation fails.

pub.cache.admin:clearCache

WmPublic. Deletes all elements from the specified cache.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache from which to delete the elements. This parameter is case sensitive.

Output Parameters

<i>status</i>	String The status indicating either <code>Error</code> or <code>Success</code> .
<i>message</i>	String The status message.

Usage Notes

Note:

Only users with administrator privileges can execute this service.

Important:

The elements you delete from the cache are deleted permanently. You cannot undo this action.

You cannot clear caches managed by system cache managers.

If you have any existing locks on any of the elements in the cache, the `pub.cache.admin:clearCache` service waits indefinitely until all locks are released.

Integration Server returns a *status* of `Error` in the following cases:

- If the cache is managed by a system cache manager.
- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache.admin:disableCache

WmPublic. Disables a cache.

Input Parameters

cacheManagerName **String** Name of the cache manager that manages the cache. This parameter is case sensitive.

cacheName **String** Name of the cache to disable. This parameter is case sensitive.

Output Parameters

status **String** The status indicating either `Error` or `Success`.

message **String** The status message.

Usage Notes

Note:

Only users with administrator privileges can execute this service.

When you disable a cache, the cached elements are unavailable for cache operations but still present in the cache. Use the [pub.cache.admin:enableCache](#) service to make the disabled cached elements available again.

You cannot disable caches managed by system cache managers.

After the `pub.cache.admin:disableCache` service disables a cache, other services cannot add, modify, delete, or retrieve its contents. For example, calls to the `pub.cache:get` service will return null.

The disabled state of a cache lasts only for the lifetime of its cache manager. When the cache manager is restarted, either by restarting Integration Server or clicking the reload icon on the **Settings > Caching** page in Integration Server Administrator, the cache is enabled.

When you disable a cache, Integration Server:

- Discards operations such as `pub.cache:get`, `pub.cache:remove`, and `pub.cache.atomic:replace` calls on the cache.
- Returns a null for `pub.cache:get` calls on the cache.

Integration Server returns a *status* of `Error` in the following cases:

- If the cache is managed by a system cache manager.
- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache.admin:enableCache

WmPublic. Enables a cache.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache to enable. This parameter is case sensitive.

Output Parameters

<i>status</i>	String The status indicating either <code>Error</code> or <code>Success</code> .
<i>message</i>	String The status message.

Usage Notes

Note:
Only users with administrator privileges can execute this service.

You cannot enable caches managed by system cache managers.

When you disable a cache, the cached elements are unavailable but still present in the cache. Use `pub.cache.admin:enableCache` to make the cached elements available again.

Integration Server returns a *status* of `Error` in the following cases:

- If the cache is managed by a system cache manager.
- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache.admin:evictExpiredElements

WmPublic. Deletes all of the expired elements from a cache.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache from which you want to delete the expired elements. This parameter is case sensitive.

Output Parameters

<i>status</i>	String The status indicating either Error or Success.
<i>message</i>	String The status message.

Usage Notes

Note:
Only users with administrator privileges can execute this service.

Important:
The elements you delete from the cache are deleted permanently. You cannot undo this action.

The `pub.cache.admin:evictExpiredElements` service can take longer to delete expired elements depending on the number of elements contained in the cache. If the cache contains a large number of elements, `pub.cache.admin:evictExpiredElements` might take longer to process the request than when the cache contains fewer elements.

Integration Server returns a *status* of `Error` in the following cases:

- If the cache is managed by a system cache manager.
- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache.admin:isCacheDisabled

WmPublic. Checks whether the cache is disabled.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache for which you want to check the status (whether it is disabled or enabled). This parameter is case sensitive.

Output Parameters

<i>isDisabled</i>	String Indicates whether the cache is disabled. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that the cache is disabled.■ <code>false</code> indicates that the cache is enabled.
<i>status</i>	String Conditional. The status indicating <code>Error</code> . The service returns <code>Error</code> for <i>status</i> only if the service fails when checking whether the cache is disabled.
<i>message</i>	String Conditional. The status message of the error. The service returns <i>message</i> with <i>status</i> only if an error occurs when checking whether the cache is disabled.

Usage Notes

Note:

Only users with administrator privileges can execute this service.

pub.cache.admin:isCacheDisabled returns `Error` for *status* and an accompanying *message* in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache.atomic:putIfAbsent

WmPublic. Adds an element to the cache if the cache does not contain an element with the specified key.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache to which to add the element. This parameter is case sensitive.
<i>key</i>	Object Key of the element.
<i>value</i>	Object Value to add to the element.

Output Parameters

<i>keyExists</i>	String Indicates whether an element with the specified key exists in the cache. <ul style="list-style-type: none">■ <code>true</code> indicates that an element with the key already exists in the cache.■ <code>false</code> indicates that an element with the key does not exist in the cache.
<i>oldValue</i>	Object Conditional. Value of the element that already exists in the cache. Returned only if <i>keyExists</i> is <code>true</code> .

Usage Notes

The `pub.cache.atomic:putIfAbsent` service adds the specified *value* to the cache only if the specified *key* does not already exist in the cache. If the specified *key* already exists in the cache, `pub.cache.atomic:putIfAbsent` returns `true` for *keyExists* and the value of the cached element for *oldValue*.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

`pub.cache.atomic:remove`

`WmPublic`. Removes the cached element associated with the specified key and value.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
-------------------------	---

<i>cacheName</i>	String Name of the cache from which to remove the element. This parameter is case sensitive.
<i>key</i>	Object Key of the element to remove.
<i>value</i>	Object Value of the element to remove.

Output Parameters

<i>removed</i>	<p>String Indicates whether the service removed the element.</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates that the element was removed from the cache. ■ <code>false</code> indicates that the element was not removed from the cache. The service returns <code>false</code> if the specified <i>key</i> and <i>value</i> do not exist in the cache.
----------------	--

Usage Notes

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache.atomic:replace

WmPublic. Replaces the cached element value with the supplied value.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache that contains the value you want to replace. This parameter is case sensitive.
<i>key</i>	Object Key of the cache element whose value you want to replace.
<i>oldValue</i>	Object Value of the cached element.
<i>newValue</i>	Object Value with which to replace the value of the cached element.

Output Parameters

<i>replaced</i>	String Indicates whether the service replaced <i>oldValue</i> with <i>newValue</i> in the cache. <ul style="list-style-type: none">■ <code>true</code> indicates that the value was replaced in the cache.■ <code>false</code> indicates that the value was not replaced in the cache.
-----------------	--

Usage Notes

The `pub.cache.atomic.replace` service replaces an element in the cache *only* if an element with the values of the specified *key* and *oldValue* parameters already exist in the cache. If an element exist in the cache with the specified *key* and *oldValue*, `pub.cache.atomic.replace` replaces the cached element with the specified *key* and *newValue*.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

`pub.cache.atomic:replaceIfKeyExists`

WmPublic. Replaces the cached element if an element for the specified key exists in a cache.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache that contains the key. This parameter is case sensitive.
<i>key</i>	Object Key of the element whose value you want to replace.
<i>value</i>	Object Value with which to replace the value of the cached element.

Output Parameters

<i>keyExists</i>	String Indicates whether the element with the passed key exists in the cache. <ul style="list-style-type: none">■ <code>true</code> indicates that the element with the key already exists in the cache.
------------------	---

- `false` indicates that the element with the key does not exist in the cache.

oldValue

Object Conditional. Value of the element the service replaced with *value*. Returned only if *keyExists* is `true`.

Usage Notes

The `pub.cache.atomic:replaceAllKeyExists` service replaces an element in the cache *only* if the specified *key* already exists in the cache. If an element with the specified *key* exists, `pub.cache.atomic:replaceAllKeyExists` replaces value of the cached element with the one specified in *value*.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache.bulk:isClusterBulkLoadEnabled

`WmPublic`. Checks whether the cache on at least one Integration Server node in the Terracotta Server Array cluster is enabled for bulk loading.

Input Parameters

cacheManagerName **String** Name of the cache manager that manages the cache. This parameter is case sensitive.

cacheName **String** Name of the cache to check for bulk loading. This parameter is case sensitive.

Output Parameters

enabled **String** Indicates whether the cache on at least one Integration Server node of the Terracotta Server Array cluster is in bulk-load mode.

- `true` indicates that at least one node is in bulk-load mode.
- `false` indicates that the node is not in bulk-load mode.

Usage Notes

The `pub.cache.bulk:isClusterBulkLoadEnabled` service applies only to distributed caches. If you run `pub.cache.bulk:isClusterBulkLoadEnabled` on a local cache, the service returns `false` for *enabled*.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

`pub.cache.bulk:isNodeBulkLoadEnabled`

`WmPublic`. Checks whether the cache of the current Integration Server node in the Terracotta Server Array cluster is bulk-load enabled.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the distributed cache to check for bulk loading. This parameter is case sensitive.

Output Parameters

<i>enabled</i>	String Indicates whether the cache is enabled for bulk loading. <ul style="list-style-type: none">■ <code>true</code> indicates that the Integration Server node calling the service is the same one that enabled bulk-loading.■ <code>false</code> indicates one of the following:<ul style="list-style-type: none">■ The Integration Server node calling the service was not the same node that enabled bulk loading.■ The specified cache is a local cache.
----------------	---

Usage Notes

The `pub.cache.bulk:isNodeBulkLoadEnabled` service applies only to distributed caches.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache.bulk:setNodeBulkLoadEnabled

WmPublic. Enables or disables bulk loading mode in the current Integration Server node for the cache.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache on which to enable or disable bulk loading. This parameter is case sensitive.
<i>bulkMode</i>	String Indicates whether to enable the bulk-load mode for the cache. Set to: <ul style="list-style-type: none">■ <code>true</code> to enable the bulk-load mode. This is the default.■ <code>false</code> to disable the bulk-load mode.

Output Parameters

None.

Usage Notes

The `pub.cache.bulk:setNodeBulkLoadEnabled` service applies only to distributed caches.

The `pub.cache.bulk:setNodeBulkLoadEnabled` service does nothing if you:

- Try to enable bulk loading (*bulkMode* set to `true`) when the node is already in bulk-load mode.
- Try to disable bulk loading (*bulkMode* set to `false`) when the node is not already in bulk-load mode.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache.bulk:waitUntilClusterBulkLoadComplete

WmPublic. Indicates whether Integration Server delays execution of the next step in a flow service until all of the Integration Server nodes in the Terracotta Server Array cluster disable bulk loading for the cache.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache on which to hold processing. This parameter is case sensitive.

Output Parameters

None.

Usage Notes

The `pub.cache.bulk:waitUntilClusterBulkLoadComplete` service applies only to distributed caches.

If none of the nodes are bulk-load enabled, Integration Server immediately executes the next step in the flow service without waiting.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If a cache operation fails.

pub.cache.lock:acquireLock

WmPublic. Acquires a lock on the cached element that contains the specified key.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache that contains the element to lock. This parameter is case sensitive.
<i>key</i>	Object Key of the cached element to lock.
<i>lockType</i>	String Optional. Type of lock you want to place on the cached element.

<u>Key</u>	<u>Description</u>
<i>read</i>	Places a read lock on the key. This is the default.
<i>write</i>	Places a write lock on the key.

lockWaitTime **String** Optional. Amount of time in milliseconds to wait to acquire a lock before timing out.

Key	Description
Any integer less than 0	The service waits indefinitely until it acquires a lock.
0	The service fails if it is unable to acquire the lock immediately. This is the default.
Any integer greater than 0	The service fails if it is unable to acquire the lock within the specified time.

Output Parameters

None.

Usage Notes

If the `pub.cache.lock:acquireLock` service acquires a lock, the element remains locked until released with the `pub.cache.lock:releaseLock` service.

You must acquire and release a lock in the same thread in which `pub.cache.lock:acquireLock` is executing. Failing to do so could cause the key to remain locked indefinitely.

When using the debug flow service to step through a flow service, depending on your breakpoint settings Designer might use a new thread for each step. You cannot release a lock acquired in a previous step of the same flow if break points are triggered on Designer or if you are stepping through a flow service. To avoid orphaned locks, disable invocations of `pub.cache.lock:acquireLock` and `pub.cache.lock:releaseLock` before stepping through the flow service or make sure that `pub.cache.lock:acquireLock` and `pub.cache.lock:releaseLock` services are called between the boundaries of two breakpoints.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- Whether or not a cached element needs to be locked depends on the application that is using the element. For example, if an application retrieves and holds an element for a time and needs to prevent another client from changing the element during this time, the application should acquire a lock on the element. However, if the application does not hold the element, a lock might not be required.
- If Integration Server cannot find the specified cache manager or cache.
- If `pub.cache.lock:acquireLock` is unable to acquire a lock.
- If the specified *lockWaitTime* is not a valid integer.
- If a cache operation fails.

pub.cache.lock:isLockedByCurrentThread

WmPublic. Checks whether the current thread is holding a lock on the cached element for the specified key.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache that contains the key. This parameter is case sensitive.
<i>key</i>	Object Key for which you want to check locks.
<i>lockType</i>	String Optional. Type of lock for which to check the cached element.

<u>Key</u>	<u>Description</u>
<i>read</i>	The service checks whether the read lock is held for the current thread. This is the default.
<i>write</i>	The service checks whether the write lock is held for the current thread.

Output Parameters

<i>locked</i>	String Indicates whether the cached element is locked by the current thread. <ul style="list-style-type: none">■ <code>true</code> indicates that the element is locked.■ <code>false</code> indicates that the element is not locked.
---------------	--

Note:

If the specified cache is a local cache and the specified *lockType* is *read*, the service always returns `false`.

Usage Notes

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.

pub.cache.lock:releaseLock

WmPublic. Releases a lock on the element for the specified key.

Input Parameters

<i>cacheManagerName</i>	String Name of the cache manager that manages the cache. This parameter is case sensitive.
<i>cacheName</i>	String Name of the cache that contains the key. This parameter is case sensitive.
<i>key</i>	Object Key of the cached element to unlock.
<i>lockType</i>	String Optional. Type of lock you want to release from the cached element.

Key	Description
<i>read</i>	Releases a read lock. This is the default.
<i>write</i>	Releases a write lock.

Output Parameters

None.

Usage Notes

You must call `pub.cache.lock:releaseLock` from the same thread from which you call `pub.cache.lock:acquireLock`. Failing to do so could cause the key to remain locked indefinitely.

Integration Server issues a `ServiceException` in the following cases:

- If you do not specify all required input parameters.
- If Integration Server cannot find the specified cache manager or cache.
- If you try to release a read lock on a cached element for which a write lock is set, or release a write lock on a cached element for which a read lock is set.

pub.cache.serviceResults:addCacheEntry

`WmPublic`. Adds cached entry into service results for the service without executing the actual service. This service can be useful to perform bulk load of service results at Integration Server startup.

Input Parameters

<i>serviceName</i>	String Name of the service for which to add the cache entry into cached service results.
<i>input</i>	Document An <code>IData</code> containing the key/value pairs for the cached service input.

output **Document** An IData containing the key/value pairs for the cached service output.

Output Parameters

None.

Usage Notes

If the *serviceName* service does not exist in Integration Server, or it is not enabled to cache service results, Integration Server throws an exception.

pub.cache.serviceResults:listServiceCache

WmPublic. Returns a list of the cached service results for a particular service.

Input Parameters

serviceName **String** Name of the service for which you want to view the cached service results.

Output Parameters

elements **Document List** Conditional. A document list (IData []) containing the cached service results for the specified service. The `pub.cache.serviceResults:listServiceCache` service returns the elements output only if the service results cache contains cached results for the specified service. For each set of cached service results, the `pub.cache.serviceResults:listServiceCache` returns the following information:

Key	Description
<i>key</i>	String Optional. Key for the cached element containing the service results.
<i>input</i>	Document Optional. An IData containing the key/value pairs for the cached service input.
<i>output</i>	Document Optional. An IData containing the key/value pairs for the cached service output.

Usage Notes

If *serviceName* specifies a service that does not exist or a service for which Integration Server does not cache service results, Integration Server returns an empty *elements* output parameter.-

You can use the `pub.cache.serviceResults:listServiceCache` with a public service results cache only. You cannot use the `pub.cache.serviceResults:listServiceCache` with the `ServiceResults` system cache.

For the `pub.cache.serviceResults:listServiceCache` service to return results, make sure that the service results cache is searchable and that the cache allows automatic indexing for keys. That is, for the service results cache, the **Searchable** check box must be selected and the **Key** check box next to **Allow Automatic Indexing** must be selected.

Exposing the contents of the service results cache via the `pub.cache.serviceResults:listServiceCache` may represent a security risk.

`pub.cache.serviceResults:resetServerCache`

WmPublic. Resets the cache for all services in the service results cache, resulting in the removal of all cached service results for all services from the service results cache.

Input Parameters

None.

Output Parameters

message **String** Message indicating whether Integration Server cleared the entire service results cache successfully. If it did not, review the server and error logs to determine the reason.

`pub.cache.serviceResults:resetServiceCache`

WmPublic. Resets the cache for specific service, resulting in the removal of cached service results for the service.

Input Parameters

serviceName **String** Fully qualified name of the service in the format `folder.subfolder:serviceName` for which you want to remove cached service results.

input **Document** Optional. An `IData` containing key/value pairs that indicate the cached elements to remove.

Output Parameters

message **String** Message indicating whether or Integration Server cleared the service results cache for the specified service successfully. If it did not, review the server and error logs to determine the reason.

Note:

If *serviceName* specifies a service that does not exist, or no cached entry with the specified input exists, the message output parameter returns the message "Cache reset successfully," to avoid revealing whether a service exists.

6 Client Folder

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You can use the elements in the client folder to formulate and submit requests to HTTP, FTP, SFTP, e-mail, WebSocket, and LDAP servers.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.client.ftp	WmPublic. Performs a series of FTP actions.
pub.client.ftp:append	WmPublic. Appends data to a remote file.
pub.client.ftp:cd	WmPublic. Changes the working directory on the FTP server. (This service corresponds to the standard FTP command <code>cd dirpath</code> .)
pub.client.ftp:cdls	WmPublic. Changes the working directory on the FTP server and retrieves a list of file names. (This service corresponds to the standard FTP commands <code>cd dirpath</code> and <code>ls namePattern</code> .)
pub.client.ftp:delete	WmPublic. Deletes a file in the current working directory on an FTP server. (This service corresponds to the standard FTP command <code>delete somefile</code> .)
pub.client.ftp:dir	WmPublic. Retrieves the file list during an FTP session. (This service corresponds to the standard FTP command <code>dir namepattern</code> .)
pub.client.ftp:get	WmPublic. Retrieves a file from a remote FTP server. (This service corresponds to the standard FTP command <code>get</code> .)
pub.client.ftp:getCompletedNotification	WmPublic. A publishable document type that represents the document published to notify parties that an FTP get command has completed.
pub.client.ftp:login	WmPublic. Connects to a remote FTP server and logs in with a specified user name and password.
pub.client.ftp:logout	WmPublic. Logs off of the FTP server and ends the current FTP session.
pub.client.ftp:ls	WmPublic. Retrieves the file list during an FTP session. (This service corresponds to the standard FTP command <code>ls namepattern</code> .)
pub.client.ftp:mdelete	WmPublic. Deletes multiple files in the current working directory on an FTP server. (This service corresponds to the standard FTP command <code>mdelete pattern</code> .)

Element	Package and Description
pub.client.ftp:mget	WmPublic. Transfers multiple files from the remote FTP server. (This service corresponds to the standard FTP command <code>mget</code> .)
pub.client.ftp:mput	WmPublic. Transfers multiple files to a remote FTP server. (This service corresponds to the standard FTP command <code>input</code> .)
pub.client.ftp:put	WmPublic. Transfers a file to a remote FTP server. (This service corresponds to the standard FTP command <code>put</code> .)
pub.client.ftp:putCompletedNotification	WmPublic. A publishable document type that represents the document published to notify parties that an FTP <code>put</code> command has completed.
pub.client.ftp:quote	WmPublic. Executes a given FTP command.
pub.client.ftp:rename	WmPublic. Renames a file on a remote FTP server. (This service corresponds to the standard FTP command <code>rename</code> .)
pub.client.ftp:sessioninfo	WmPublic. Returns session information for all of the FTP servers that users are currently logged into.
pub.client:http	WmPublic. Issues an HTTP request that you specify and returns the HTTP response.
pub.client.ldap:add	WmPublic. Inserts a new entry into the directory.
pub.client.ldap:bind	WmPublic. Performs an LDAP bind operation that associates the connection with the specified principal.
pub.client.ldap:cancelNotification	WmPublic. Cancels a previously created notification request.
pub.client.ldap:compare	WmPublic. Compares the value of an attribute in the LDAP directory with a value specified by the service.
pub.client.ldap:delete	WmPublic. Removes an entry from the directory.
pub.client.ldap:modify	WmPublic. Performs an LDAP modify operation that allows you to specify a list of attributes with corresponding lists of values to add to, replace, or remove from the directory entry.
pub.client.ldap:registerNotification	WmPublic. Creates a notification (or "persistent search") that causes Integration Server to listen for LDAP events. When the notification gets an event, the specified service is called.
pub.client.ldap:rename	WmPublic. Performs an LDAP rename (move) operation allowing you to rename an entry.

Element	Package and Description
pub.client.ldap:search	WmPublic. Performs an LDAP search operation with the specified parameters and returns the results of the search.
pub.client.oauth:executeRequest	WmPublic. Allow clients to access protected resources using an OAuth token.
pub.client.oauth:getExternalAccessToken	WmPublic. Requests an access token from the authorization server.
pub.client:restClient	WmPublic. Creates and sends REST API requests over HTTP or HTTPS. This service is internal to Integration Server and you must not execute this service manually.
pub.client.sftp:cd	WmPublic. Changes the working directory on the remote SFTP server.
pub.client.sftp:chgrp	WmPublic. Changes the group ownership of one or more remote files.
pub.client.sftp:chmod	WmPublic. Changes permissions of one or more remote files.
pub.client.sftp:chown	WmPublic. Changes the user of one or more remote files.
pub.client.sftp:get	WmPublic. Retrieves a file from a remote SFTP server and saves it on the local machine.
pub.client.sftp:login	WmPublic. Creates a secure connection to the SFTP server using the specified user alias or configuration parameters.
pub.client.sftp.admin:getDefaultAlgorithms	WmPublic. Returns the default key exchange algorithms, Message Authentication Code (MAC) algorithms, and ciphers for the specified SFTP client version.
pub.client.sftp.admin:getHostKey	WmPublic. Gets the host key from the SFTP server.
pub.client.sftp:logout	WmPublic. Logs off the user from the SFTP server and ends the current SFTP session.
pub.client.sftp:ls	WmPublic. Retrieves the remote directory listing of the specified path or current remote directory if path is not specified.
pub.client.sftp:mkdir	WmPublic. Creates a new remote directory.
pub.client.sftp:put	WmPublic. Transfers a file to a remote SFTP server.
pub.client.sftp:pwd	WmPublic. Displays the remote working directory on the SFTP server.

Element	Package and Description
<code>pub.client.sftp:rename</code>	WmPublic. Renames a file or directory on a remote SFTP server.
<code>pub.client.sftp:rm</code>	WmPublic. Deletes one or more remote files on the SFTP server.
<code>pub.client.sftp:rmdir</code>	WmPublic. Deletes one or more remote directories on the SFTP server.
<code>pub.client.sftp:symlink</code>	WmPublic. Creates a symbolic link between the old path and the new path of a file.
<code>pub.client:smtp</code>	WmPublic. Sends a MIME-type e-mail message.
<code>pub.client:soapClient</code>	WmPublic. Creates and sends SOAP 1.1 and SOAP 1.2 messages over HTTP, HTTPS, or JMS transports for any style/use combination supported by Integration Server.
<code>pub.client:soapHTTP</code>	WmPublic. <i>Deprecated</i> - There is no replacement service. Submits a SOAP message to a server via HTTP or HTTPS.
<code>pub.client:soapRPC</code>	WmPublic. <i>Deprecated</i> - There is no replacement service. Submits a SOAP remote procedure call via HTTP or HTTPS.
<code>pub.client:websocket</code>	WmPublic. Establishes a WebSocket connection to the URL captured in the identified WebSocket client endpoint.

pub.client:ftp

WmPublic. Performs a series of FTP actions.

This service executes the following sequence:

1. Logs on to an FTP server.
2. Changes to a specified working directory.
3. Performs one of the following FTP commands: `ls`, `put`, or `get`.
4. Logs off the FTP server.

Important: Integration Server allows you to invoke the `pub.client:ftp` service to get a file from a remote FTP server and place it in the `WmRoot` folder, which may be a security concern.

Input Parameters

<code>serverhost</code>	String Name or IP address of the FTP server (for example, <code>ftp.netscape.com</code>).
<code>serverport</code>	String Port number of the FTP server (for example, <code>4566</code>).

<i>username</i>	String Valid FTP user of the remote FTP server (for example, anonymous).
<i>password</i>	String Optional. Valid password of the FTP user.
<i>command</i>	String One of the following FTP commands: <code>ls</code> , <code>put</code> , or <code>get</code> .
<i>dirpath</i>	String Working directory of the FTP server (for example, <code>/tmp/pub</code>). If the directory does not exist, the server throws an exception.
<i>transfermode</i>	String One of two FTP file transfer modes: <code>ascii</code> or <code>binary</code> . The default is <code>ascii</code> .
<i>transfertype</i>	String One of two FTP data transfer types: <code>passive</code> or <code>active</code> . The default is <code>active</code> .
<i>localfile</i>	String When <i>command</i> is set to <code>put</code> , this parameter specifies the name of the local file you want to transfer. (If <i>content</i> is specified, this field is ignored.) When <i>command</i> is set to <code>get</code> , this parameter specifies the name of the local file in which you want the retrieved content saved.
<i>remotefile</i>	String When <i>command</i> is set to <code>put</code> , this parameter specifies the name of the remote file in which you want to save the data you are sending. When <i>command</i> is set to <code>get</code> , this parameter specifies the name of the remote file that you want to retrieve.
<i>content</i>	java.io.InputStream, byte[] , or String Data to be transferred when <i>command</i> is set to <code>put</code> .
<i>encoding</i>	String Optional. Character set in which the document is encoded. Specify an IANA-registered character set (for example, <code>ISO-8859-1</code>). This information is required to correctly convert the <code>String</code> object to bytes when performing a <code>get</code> . If parameter is null, the default JVM encoding is used.
<i>serverencoding</i>	String Optional. Specifies the encoding this service uses to convert the incoming FTP command string to encoded bytes that are supported by IANA and the FTP server. If the parameter is null, the service uses the 'UTF-8' character set to encode the FTP command <code>String</code> to bytes.
<i>timeout</i>	String Time (measured in seconds) this service waits for the FTP server response on the command channel before timing out and aborting the request. Default is to wait forever.
<i>putunique</i>	String Optional. Indicates whether to send a <code>STOR</code> or a <code>STOU</code> (Store as Unique File) command to the remote FTP server. Set to: <ul style="list-style-type: none">■ <code>true</code> to send a <code>STOU</code> (Store as Unique File) command.■ <code>false</code> to send a <code>STOR</code> command. This is the default.
<i>secure</i>	Document Indicates whether the FTP session is with a secure FTP server.

Note:Integration Server does not support FTPS (FTP over SSL) requests through FTP proxy.

Key	Description
<i>auth</i>	<p>String The kind of authentication mechanism to use: <code>None</code>, <code>SSL</code>, <code>TLS</code>, or <code>TLS-P</code>.</p> <p><code>None</code> specifies that the FTP session is with a non-secure FTP server. This is the default. If the value of <i>auth</i> is <code>None</code>, the <i>securedata</i> variable is ignored.</p> <p><code>TLS-P</code> is a shortcut that is equivalent to the sequence <code>AUTH TLS, PBSZ 0, and PROT P</code>. If the value of <i>auth</i> is <code>TLS-P</code>, the <i>securedata</i> variable is ignored.</p>
<i>securedata</i>	<p>String Use the value <code>false</code> for a client sending <code>PROT C</code> (Data Channel Protection Level Clear).</p> <p>Use the value <code>true</code> for a client sending <code>PROT P</code> (Data Channel Protection Level Private).</p> <p>Note: If you do not set a value, the default is <code>false</code>.</p>
<i>cleanlinefeeds</i>	<p>String Optional. Indicates whether the service should retain or remove carriage return characters at the end of each line of text. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to remove carriage returns. This is the default. ■ <code>false</code> to retain carriage returns.
<i>newSession</i>	<p>String Optional. Flag indicating whether a new FTP session will be created for this FTP operation. Set to:</p> <ul style="list-style-type: none"> ■ <code>yes</code> to create a new session for this FTP operation. ■ <code>no</code> to use the current session, if one is available, for this FTP operation. This is the default.
<i>clientTimeout</i>	<p>String Optional. Specifies the idle time-out, measured in seconds, for this FTP session. If <i>clientTimeout</i> is set to 0 (zero), the session will never time out. The default is 600 seconds (10 minutes).</p>
<i>proxyAlias</i>	<p>String Optional. Name of the proxy server alias for the proxy server to which Integration Server routes the FTP request.</p> <p>If you do not specify a <i>proxyAlias</i>, Integration Server routes the FTP request through the proxy server specified in the default FTP proxy alias. If there is no default FTP proxy alias, the action taken by Integration Server depends on the value specified for the <code>watt.net.proxy.useNonDefaultProxies</code> parameter.</p>

- If the `watt.net.proxy.useNonDefaultProxies` parameter is set to `true`, Integration Server routes the FTP request through the proxy server in any configured FTP proxy alias. If the Integration Server does not have any defined FTP proxy aliases, Integration Server sends the FTP request directly to the FTP server or throws an exception depending on the settings specified for the `watt.net.proxy.fallbackToDirectConnection` parameter.
- If the `watt.net.proxy.useNonDefaultProxies` parameter is set to `false`, Integration Server sends the request to the remote server using a direct connection.

For more information about proxy server usage, refer to the section *How Integration Server Uses Proxy Servers* in the *webMethods Integration Server Administrator's Guide*.

Output Parameters

<i>command</i>	String FTP command that was executed (<code>ls</code> , <code>get</code> , or <code>put</code>).
<i>dirlist</i>	String List File names returned by the <code>ls</code> command.
<i>localfile</i>	String Name of the local file used for a <code>get</code> or <code>put</code> operation.
<i>remotefile</i>	String Name of the remote file used for a <code>get</code> or <code>put</code> operation.
<i>content</i>	byte[] If <i>localfile</i> was not specified, this parameter contains the Content object sent to the remote server (if a <code>put</code> command was executed) or received from the remote server (if a <code>get</code> command was executed).
<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log message.

Usage Notes

If you set the *auth* variable in the *secure* parameter to `SSL`, `TLS`, or `TLS-P`, `pub.client.ftp` automatically sends the following sequence of FTP commands prior to sending the `USER` command:

```
AUTH <SSL | TLS | TLS-P> PBSZ 0 PROT <P | C>
```

The client FTP services will not negotiate for less security than you have specified with the *auth* parameter. However, if you set the *auth* variable to `None`, the client FTP services can operate (in a non-secure mode) with any FTP server.

The FTP services will always connect to a secure FTP server using a non-secure (SSL) socket. After getting a valid reply from the `AUTH` command, the FTP services will convert the connected socket to an SSL socket and initiate SSL handshaking.

Prior to Integration Server version 10.15, the `pub.client.ftp` service included the `secure/useJSSE` input parameter which specified whether Integration Server created the outbound connection using the Java Secure Socket Extension (JSSE) library. Beginning with Integration Server version 10.15, Integration Server establishes all secure outbound connections with JSSE. If you migrated to Integration Server 10.15 and a migrated service invokes `pub.client.ftp`, the `secure/useJSSE` parameter still appears in the pipeline. However, Integration Server ignores the value of the `secure/useJSSE` input parameter, proceeding as if `secure/useJSSE` were set to `yes`.

pub.client.ftp:append

WmPublic. Appends data to a remote file.

If the remote file does not exist, the service creates the file.

Input Parameters

<i>sessionkey</i>	String Unique key for the current FTP session. The <i>sessionkey</i> is returned by the <code>pub.client.ftp:login</code> service.
<i>transfermode</i>	String FTP file transfer mode (<code>ascii</code> or <code>binary</code>). The default is <code>ascii</code> .
<i>content</i>	java.io.InputStream, byte[], or String Data to be transferred to the remote file.
<i>localfile</i>	String Optional. Name of the local file to append to the remote file. Used only when <i>content</i> is not specified.
<i>remotefile</i>	String Name of the remote file to which to append the data specified in <i>content</i> or <i>localfile</i> .

Output Parameters

<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.

pub.client.ftp:cd

WmPublic. Changes the working directory on the FTP server. (This service corresponds to the standard FTP command `cd dirpath`.)

Input Parameters

<i>sessionkey</i>	String Unique key for the current FTP session. The <i>sessionkey</i> is returned by the pub.client.ftp:login service.
<i>dirpath</i>	String Directory to which you want to switch on the FTP server. For example: pub

Output Parameters

<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.

pub.client.ftp:cdls

WmPublic. Changes the working directory on the FTP server and retrieves a list of file names. (This service corresponds to the standard FTP commands `cd dirpath` and `ls namePattern`.)

Input Parameters

<i>sessionkey</i>	String Unique key for the current FTP session. The <i>sessionkey</i> is returned by the pub.client.ftp:login service.
<i>dirpath</i>	String Directory to which you want to switch on the FTP server (for example, pub).
<i>filenamepattern</i>	String Optional. Pattern that specifies the file names to list (for example, *.txt).
<i>orderby</i>	String Optional. The order of the returned file list. Set to: <ul style="list-style-type: none">■ none to send an NLST command to the remote FTP server. This is the default.■ timestamp to return the list in order of the timestamp. Sends an NLST -t command to the remote FTP server.

Note:

The -t command is not part of the RFC959 standard. Some FTP servers may not support this command. Servers that support this command may return the results in either ascending or descending order of creation time.

Output Parameters

<i>dirlist</i>	String List List of file names matching <i>filenamepattern</i> .
<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.

pub.client.ftp:delete

WmPublic. Deletes a file in the current working directory on an FTP server. (This service corresponds to the standard FTP command `delete somefile`.)

Input Parameters

<i>sessionkey</i>	String Unique key for the current FTP session. The <i>sessionkey</i> is returned by the pub.client.ftp:login service.
<i>remotefile</i>	String Name of the file to be deleted from the current working directory. For example: <code>text.txt</code> If you specify pattern-matching characters in <i>remotefile</i> , all files matching the pattern will be deleted.

Output Parameters

<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.

pub.client.ftp:dir

WmPublic. Retrieves the file list during an FTP session. (This service corresponds to the standard FTP command `dir namepattern`.)

Input Parameters

<i>sessionkey</i>	String Unique key for the current FTP session. The <i>sessionkey</i> is returned by the pub.client.ftp:login service.
-------------------	--

filenamepattern **String** Optional. Pattern that specifies the names of the files to include in the list (for example, *.txt).

Output Parameters

dirlist **String List** Directory listing of the files matching *filenamepattern* including the file names and timestamps.

returncode **String** Standard FTP protocol return code.

returnmsg **String** Standard FTP protocol return message.

logmsg **String** FTP log messages for the entire user session.

pub.client.ftp:get

WmPublic. Retrieves a file from a remote FTP server. (This service corresponds to the standard FTP command `get`.)

Input Parameters

sessionkey **String** Unique key for the current FTP session. The *sessionkey* is returned by the [pub.client.ftp:login](#) service.

transfermode **String** FTP file transfer mode (`ascii` or `binary`). The default is `ascii`.

localfile **String** Optional. Name of a local file where the retrieved file is to be saved.

remotefile **String** Name of the remote file.

encoding **String** Optional. Character set in which the file is encoded. This variable is required to convert the file to bytes correctly. Specify an IANA-registered character set (for example: `ISO-8859-1`).

If this variable is null, the encoding currently set for the FTP session is used. If encoding was never set for this FTP session, the default JVM encoding is used.

largefilethreshold **String** Optional. Defines the size (in bytes) of a "large" file. For more information, see the Usage Notes.

If you...

Then...

Set to 0

All files will be considered large files. This means:

- The output parameter *islargefile* will always be true.

	<ul style="list-style-type: none"> ■ The file content will be returned in the output parameter <i>contentstream</i> (as a <code>java.io.InputStream</code> object). ■ The output parameter <i>content</i> will be null.
Set to any value greater than 0	<p>Any file larger than the value you specify will be considered large. This means:</p> <ul style="list-style-type: none"> ■ The output parameter <i>islargefile</i> will be <code>true</code>. ■ The file content will be returned in the output parameter <i>contentstream</i> (as a <code>java.io.InputStream</code> object). ■ The output parameter <i>content</i> will be null.
Leave blank	<p>No file is considered large. This means:</p> <ul style="list-style-type: none"> ■ The output parameter <i>islargefile</i> will always be <code>false</code>. ■ The file content will be returned in the output parameter <i>content</i>. ■ The output parameter <i>contentstream</i> will be null.
<i>cleanlinefeeds</i>	<p>String Optional. Indicates whether the service should retain or remove carriage return characters at the end of each line of text. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to remove carriage returns. ■ <code>false</code> to retain carriage returns. This is the default.

Output Parameters

<i>content</i>	byte[] Data retrieved from the remote file.
<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.
<i>islargefile</i>	<p>String Indicates whether the file is considered to be large (as specified by the input parameter <i>largefilethreshold</i>). A value of:</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates that the file is larger than the value of <i>largefilethreshold</i>. ■ <code>false</code> indicates that the file is not larger than the value of <i>largefilethreshold</i> (or <i>largefilethreshold</i> is blank).
<i>contentstream</i>	Object An <code>java.io.InputStream</code> object.

Usage Notes

The *largefilethreshold* parameter improves the ability of `pub.client.ftp:get` to retrieve larger files. If a retrieved file is larger than the size specified in the *largefilethreshold* parameter, and the *localfile* parameter is empty (which means the retrieved file is retrieved to memory, not to a file on disk), the Integration Server streams the large file to a temporary file. While this will improve the scalability of `pub.client.ftp:get`, it will also reduce the throughput of the operation because the retrieved file will be written to a temporary file.

Tip:

Due to the impact to the throughput of `pub.client.ftp:get` when streaming is enabled, you should set the value for *largefilethreshold* to a sufficiently large value so that it causes only minimal degradation to throughput and yet allows the service to retrieve large files without encountering an `OutOfMemory` exception.

See Also

[pub.io:close](#)

pub.client.ftp:getCompletedNotification

`WmPublic`. A publishable document type that represents the document published to notify parties that an FTP get command has completed on Integration Server which is acting as the FTP server.

When a user completes an FTP get command in his or her own user directory (that is, when the RETR command is completed on the server side but the server has not yet acknowledged the client with return code 226), an event is fired to notify interested parties by publishing a document. EDI packages that subscribe to this document will remove the file from the server.

Parameters

<i>username</i>	String The login user name through the FTP Listener.
<i>filename</i>	String The absolute path name of the file.
<i>_env</i>	Document Optional. A document reference to pub.publish:envelope which defines the structure and contents of the envelope of a published document.

Usage Notes

Integration Server publishes an instance document of `pub.client.ftp:getCompletedNotification` when an FTP client has completed an FTP get command on Integration Server through an FTP/S port. Because the retrieved file is located on the Integration Server file system, only subscribers located on the same Integration Server would have access to the file. Consequently the `pub.client.ftp:getCompletedNotification` publishable document type is set to publish locally only and uses the `IS_LOCAL_CONNECTION` messaging connection alias. When Integration Server publishes an instance document for `pub.client.ftp:getCompletedNotification`, only subscribers located on the same

Integration Server receive the document. Software AG does not recommend changing the assigned messaging connection alias.

pub.client.ftp:login

WmPublic. Connects to a remote FTP server and logs in with a specified user name and password.

Input Parameters

<i>serverhost</i>	String Name or IP address of the FTP server (for example, <code>ftp.netscape.com</code>).
<i>serverport</i>	String Port number on which the FTP server listens for requests (for example, 4566). The default is 21.
<i>dataport</i>	String Optional. Listener port number of the data transfer channel (for example, 3345). If you do not specify <i>dataport</i> , the Integration Server will choose the listener port number. This value is used only when the <i>transfertype</i> value is active.
<i>username</i>	String Valid FTP user on the remote FTP server (for example, <code>anonymous</code>).
<i>password</i>	String Optional. Valid password for the FTP user specified in <i>username</i> (for example, <code>someone@somewhere</code>).
<i>account</i>	String Optional. The user name for an account on the FTP server. Specify account if your FTP host requires account information. The account is defined in the FTP protocol to further identify the user that is identified by the <i>username</i> and <i>password</i> input variables.
<i>transfertype</i>	String Type of the FTP data transfer mode (<code>passive</code> or <code>active</code>). The default is <code>active</code> .
<i>encoding</i>	String Optional. Default character set for encoding data transferred during this session. Specify an IANA-registered character set (for example, <code>ISO-8859-1</code>). If you do not set <i>encoding</i> , the default JVM encoding is used.
<i>serverencoding</i>	String Optional. Specifies the encoding this service uses to convert the incoming FTP command string to encoded bytes that are supported by IANA and the FTP server. If the parameter is null, the service uses the 'UTF-8' character set to encode the FTP command String to bytes.
<i>timeout</i>	String Optional. Time (measured in seconds) to wait for a response from the FTP server before timing out and terminating the request. The default is to wait forever.
<i>secure</i>	Document Indicates whether the FTP session is with a secure FTP server.

Note:Integration Server does not support FTPS (FTP over SSL) requests through FTP proxy.

Note:Integration Server does not support implicit FTPS, which is also deprecated.

Key	Description
<i>auth</i>	<p>String The kind of authentication mechanism to use: None, SSL, TLS, or TLS-P.</p> <p>None specifies that the FTP session is with a non-secure FTP server. This is the default. If the value of <i>auth</i> is None, the <i>securedata</i> variable is ignored.</p> <p>TLS-P is a shortcut that is equivalent to the sequence AUTH TLS, PBSZ 0, and PROT P. If the value of <i>auth</i> is TLS-P, the <i>securedata</i> variable is ignored.</p>
<i>securedata</i>	<p>String Use the value <code>false</code> for a client sending PROT C (Data Channel Protection Level Clear).</p> <p>Use the value <code>true</code> for a client sending PROT P (Data Channel Protection Level Private).</p> <p>Note: If you do not set a value, the default is <code>false</code>.</p>
<i>newSession</i>	<p>String Optional. Flag indicating whether a new FTP session will be created for this FTP operation. Set to:</p> <ul style="list-style-type: none"> ■ <code>yes</code> to create a new session for this FTP operation. ■ <code>no</code> to use the current session, if one is available, for this FTP operation. This is the default.
<i>clientTimeout</i>	<p>String Optional. Specifies the idle time-out, measured in seconds, for this FTP session. If <i>clientTimeout</i> is set to 0 (zero), the session will never time out. The default is 600 seconds (10 minutes).</p>
<i>proxyAlias</i>	<p>String Optional. Name of the proxy alias for the proxy server through which Integration Server routes the FTP request.</p> <p>If you do not specify a <i>proxyAlias</i>, Integration Server routes the FTP request through the proxy server specified in the default FTP proxy alias. If there is no default FTP proxy alias, the action taken by Integration Server depends on the value specified for the <code>watt.net.proxy.useNonDefaultProxies</code> parameter.</p> <ul style="list-style-type: none"> ■ If the <code>watt.net.proxy.useNonDefaultProxies</code> parameter is set to <code>true</code>, Integration Server routes the FTP request through the proxy server in any configured FTP proxy alias. If the Integration Server does not have any

defined FTP proxy aliases, Integration Server sends the FTP request directly to the FTP server or throws an exception depending on the settings specified for the `watt.net.proxy.fallbackToDirectConnection` parameter.

- If the `watt.net.proxy.useNonDefaultProxies` parameter is set to `false`, Integration Server sends the request to the remote server using a direct connection.

For more information about proxy server usage, refer to *webMethods Integration Server Administrator's Guide*.

Output Parameters

<i>sessionkey</i>	String Unique key for the current FTP session. This session key must be provided to execute most other services in <code>pub.client.ftp</code> .
<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.

Usage Notes

If you set the `auth` variable in the `secure` parameter to `SSL`, `TLS`, or `TLS-P`, `pub.client.ftp:login` automatically sends the following sequence of FTP commands prior to sending the `USER` command:

```
AUTH <SSL | TLS | TLS-P> PBSZ 0 PROT <P | C>
```

The client FTP services will not negotiate for less security than you have specified with the `auth` parameter. However, if you set the `auth` variable to `None`, the client FTP services can operate (in a non-secure mode) with any FTP server.

The FTP services will always connect to a secure FTP server using a non-secure (SSL) socket. After getting a valid reply from the `AUTH` command, the FTP services will convert the connected socket to an SSL socket and initiate SSL handshaking.

If the `watt.client.ftp.session.logoutOnServiceCompletion` parameter is set to `true`, the FTP session created by the `pub.client.ftp:login` service closes automatically when the invoking service completes execution. If the value is set to `false`, then the `pub.client.ftp:logout` service must be invoked to close the FTP(S) session.

Prior to Integration Server version 10.15, the `pub.client.ftp:login` service included the `secure/useJSSE` input parameter which specified whether Integration Server created the outbound connection using the Java Secure Socket Extension (JSSE) library. Beginning with Integration Server version 10.15, Integration Server establishes all secure outbound connections with JSSE. If you migrated to Integration Server 10.15 and a migrated service invokes `pub.client.ftp:login`, the `secure/useJSSE` parameter still appears in the pipeline. However, Integration Server ignores the value of the `secure/useJSSE` input parameter, proceeding as if `secure/useJSSE` were set to `yes`.

pub.client.ftp:logout

WmPublic. Logs off of the FTP server and ends the current FTP session.

Input Parameters

sessionkey **String** Unique key for the current FTP session. The *sessionkey* is returned by the [pub.client.ftp:login](#) service.

Output Parameters

returncode **String** Standard FTP protocol return code.

returnmsg **String** Standard FTP protocol return message.

logmsg **String** FTP log messages for the entire user session.

pub.client.ftp:ls

WmPublic. Retrieves the file list during an FTP session. (This service corresponds to the standard FTP command `ls namepattern`.)

Input Parameters

sessionkey **String** Unique key for the current FTP session. The *sessionkey* is returned by the [pub.client.ftp:login](#) service.

filenamepattern **String** Optional. Pattern that specifies the names of the files to include in the list (for example, `*.txt`).

orderby **String** Optional. The order of the returned file list.

<u>Value of <i>orderby</i></u>	<u>Description</u>
none	Default. Sends an NLST command to the remote FTP server.
timestamp	Returns the list in order of the timestamp. Sends an NLST <code>-t</code> command to the remote FTP server.

Note:

The `-t` command is not part of the RFC959 standard. Some FTP servers may not support this command. Servers that support this command may return the results in either ascending or descending order of creation time.

Output Parameters

<i>dirlist</i>	String List List of file names matching <i>filenamepattern</i> .
<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.

Usage Note

During an FTP session, this service uses the character set specified in the *encoding* parameter of the [pub.client.ftp:login](#) service. If the file list this service retrieves includes characters from other languages, set the *encoding* parameter appropriately. For example, set *encoding* to SJIS for file names containing Japanese characters. If you do not set *encoding* in [pub.client.ftp:login](#), the default JVM encoding is used.

pub.client.ftp:mdelete

WmPublic. Deletes multiple files in the current working directory on an FTP server. (This service corresponds to the standard FTP command `mdelete pattern`.)

Input Parameters

<i>sessionkey</i>	String Unique key for the current FTP session. The <i>sessionkey</i> is returned by the pub.client.ftp:login service.
<i>filenamepattern</i>	String Pattern that specifies the names of the files to be deleted from the current working directory (for example, <code>*.txt</code>).

Important:

If you do not specify a value for *filenamepattern*, all files in the working directory are deleted.

Output Parameters

<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.

pub.client.ftp:mget

WmPublic. Transfers multiple files from the remote FTP server. (This service corresponds to the standard FTP command `mget`.)

Input Parameters

<i>sessionkey</i>	String Unique key for the current FTP session. The <i>sessionkey</i> is returned by the pub.client.ftp:login service.
<i>transfermode</i>	String FTP file transfer mode (<code>ascii</code> or <code>binary</code>). The default is <code>ascii</code> .
<i>localdir</i>	String Directory in the local file system where the retrieved files are to be saved (for example, <code>c:\temp\ftpfiles</code>).
<i>filenamepattern</i>	String Pattern that specifies the names of the files to be retrieved (for example, <code>*.txt</code>).
<i>encoding</i>	String Optional. Character set in which the files are encoded. This variable is required to convert the files to bytes correctly. Specify an IANA-registered character set (for example, <code>ISO-8859-1</code>). If you do not specify <i>encoding</i> , the encoding assigned to the FTP session is used. If the encoding was not set for the FTP session, the default JVM encoding is used.

Output Parameters

<i>filenames</i>	String List List of files retrieved from the remote FTP server.
<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.

pub.client.ftp:mput

WmPublic. Transfers multiple files to a remote FTP server. (This service corresponds to the standard FTP command `mput`.)

Input Parameters

<i>sessionkey</i>	String Unique key for the current FTP session. The <i>sessionkey</i> is returned by the pub.client.ftp:login service.
<i>transfermode</i>	String FTP file transfer mode (<code>ascii</code> or <code>binary</code>). The default is <code>ascii</code> .

<i>localdir</i>	String Local directory containing the files you want to transfer to the remote FTP server (for example, <code>c:\temp\ftpfiles</code>).
<i>filenamepattern</i>	String Pattern that specifies the names of the files to be transferred (for example, <code>*.txt</code>).
<i>putunique</i>	String Optional. Indicates whether to send a STOR or a STOU (Store as Unique File) command to the remote FTP server. Set to: <ul style="list-style-type: none"> ■ <code>true</code> to send a STOU (Store as Unique File) command. ■ <code>false</code> to send a STOR command. This is the default.

Output Parameters

<i>filenames</i>	String List List of files transferred to the remote FTP server.
<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.

Usage Note

Some FTP servers, such as the Integration Server FTP Listener, do not support "putting" a unique file. When using the `pub.client.ftp:put` or `pub.client.ftp:mput` service to put a unique file to an FTP server that does not support putting a unique file, you will encounter an error like this one:

```
com.wm.app.b2b.server.ServiceException: 500 'STOU': command not understood.
```

pub.client.ftp:put

WmPublic. Transfers a file to a remote FTP server. (This service corresponds to the standard FTP command `put`.)

Input Parameters

<i>sessionkey</i>	String Unique key for the current FTP session. The <i>sessionkey</i> is returned by the <code>pub.client.ftp:login</code> service.
<i>transfermode</i>	String FTP file transfer mode (<code>ascii</code> or <code>binary</code>). The default is <code>ascii</code> .
<i>content</i>	java.io.InputStream, byte[], or String Data to be transferred to the remote file.
<i>localfile</i>	String Optional. Name of the local file to be appended to the remote file. Used only if <i>content</i> is not specified.

<i>remotefile</i>	String The name of the remote file.
<i>putunique</i>	String Optional. Indicates whether to send a STOR or a STOU (Store as Unique File) command to the remote FTP server. Set to: <ul style="list-style-type: none">■ <code>true</code> to send a STOU (Store as Unique File) command.■ <code>false</code> to send a STOR command. This is the default.

Output Parameters

<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.

Usage Notes

- Some FTP servers, such as the Integration Server FTP Listener, do not support "putting" a unique file. When using the `pub.client.ftp.put` or `pub.client.ftp.mput` service to put a unique file to an FTP server that does not support putting a unique file, you will encounter an error like this one:

```
com.wm.app.b2b.server.ServiceException: 500 'STOU': command not understood.
```

- When a client invokes this service to transport a file, the FTP listener determines the content handler to use based on the file's extension. The content handler converts the file content to the input values for the service to invoke. The *Integration Server_directory* \instances\instance_name\lib\mime.types file contains the mappings of file extension to content type.

By default, if this service encounters a file that has no file extension, the default content handler is used. To override this, you can configure any content handler to handle files that have no file extension. To do this, add a line in the *Integration Server_directory* \instances\instance_name\lib\mime.types file that specifies the content type of the files with no extension, and the `ftp_no_extension` key. For example, to allow a content handler to accept text/xml files that have no extension, add this line to your mime.types file:

```
text/xml          ftp_no_extension
```

pub.client.ftp:putCompletedNotification

WmPublic. A publishable document type that represents the document published to notify parties that an FTP put command has completed on Integration Server which is acting as the FTP server.

When a user completes an FTP put command in his or her own user directory (that is, when the STOR command is completed on the server side but the server has not yet acknowledged the client

with return code 226), an event is fired to notify interested parties by publishing a document. EDI packages that subscribe to this document will retrieve the file from the server.

Parameters

<i>username</i>	String The login user name through the FTP Listener.
<i>filename</i>	String The absolute path name of the file.
<i>_env</i>	Document Optional. A document reference to pub.publish:envelope which defines the structure and contents of the envelope of a published document.

Usage Notes

Integration Server publishes an instance document of `pub.client.ftp:putCompletedNotification` when an FTP client has completed an FTP put command on Integration Server through an FTP/S port. Because the put file is located on the Integration Server file system, only subscribers located on the same Integration Server would have access to the file. Consequently the `pub.client.ftp:putCompletedNotification` publishable document type is set to publish locally only and uses the `IS_LOCAL_CONNECTION` messaging connection alias. When Integration Server publishes an instance document for `pub.client.ftp:putCompletedNotification`, only subscribers located on the same Integration Server receive the document. Software AG does not recommend changing the assigned messaging connection alias.

pub.client.ftp:quote

WmPublic. Executes a given FTP command.

You can use this service to execute non-standard FTP commands.

Input Parameters

<i>sessionkey</i>	String Unique key for the current FTP session. The <i>sessionkey</i> is returned by the pub.client.ftp:login service.
<i>string</i>	String The command to be executed on the FTP server. This service submits the command exactly as it is specified in <i>string</i> .

Output Parameters

<i>returncode</i>	String Standard FTP protocol return code.
<i>returnmsg</i>	String Standard FTP protocol return message.
<i>logmsg</i>	String FTP log messages for the entire user session.

pub.client.ftp:rename

WmPublic. Renames a file on a remote FTP server. (This service corresponds to the standard FTP command `rename`.)

Input Parameters

- sessionkey* **String** Unique key for the current FTP session. The *sessionkey* is returned by the [pub.client.ftp:login](#) service.
- oldname* **String** Fully qualified name of the file you want to rename (for example, `temp/oldname.txt`).
- newname* **String** New fully qualified name for the file (for example, `temp/newname.txt`).

Output Parameters

- returncode* **String** Standard FTP protocol return code.
- returnmsg* **String** Standard FTP protocol return message.
- logmsg* **String** FTP log messages for the entire user session.

pub.client.ftp:sessioninfo

WmPublic. Returns session information for all of the FTP servers that users are currently logged into.

Input Parameters

- name* Not used. Reserved for future use.

Output Parameters

- sessioninfo* **Document List** Information about the current FTP sessions. Each document in *sessioninfo* represents a single session and contains the following information:

Key	Description
<i>serverhost</i>	String Name or IP address of the FTP server.
<i>serverport</i>	String Port number on which the FTP server listens for requests.

<i>dataport</i>	String Listener port of the data transfer channel used by this session.
<i>username</i>	String User logged on to FTP server.
<i>password</i>	String Password for the FTP user specified in <i>username</i> .
<i>account</i>	String Conditional. The user name for an account on the FTP server. The account is defined in the FTP protocol to further identify the user that is identified by the <i>username</i> and <i>password</i> input variables.
<i>transfertype</i>	String Data transfer mode (<i>passive</i> or <i>active</i>) used by this session.
<i>encoding</i>	String Conditional. IANA character set used by this session. If <i>encoding</i> is not returned, the encoding was not explicitly set and the default JVM encoding is in effect.

Usage Notes

When you start an FTP session with `pub.client.ftp.login`, you can set the optional *dataport* parameter to specify the port number for data transfers. During the FTP session, `pub.client.ftp.sessionInfo` returns the *dataport* parameter with the port number used for data transfers.

If you do not set the *dataport* parameter in `pub.client.ftp.login`, the server uses a random port number. During the FTP session, `pub.client.ftp.sessionInfo` will return a 0 for the *dataport* parameter to indicate that the port number used for data transfers is random.

pub.client:http

WmPublic. Issues an HTTP request that you specify and returns the HTTP response.

Input Parameters

<i>url</i>	<p>String URL of the resource that you want to access. For example:</p> <pre>http://www.rubicon.com/orders/orders.html</pre> <p>Important: This string <i>must</i> begin with <code>http://</code> or <code>https://</code>.</p>
<i>method</i>	<p>String Specifies the HTTP method you want to use. Valid values are:</p> <ul style="list-style-type: none"> delete get head

options
 patch
 post
 put
 trace

loadAs

String Optional. Form in which you want the `pub.client:http` service to store the returned document. Set to:

- `bytes` to return the body of the response as a `byte[]`. Use this option if the body will be used as input to a service that operates on whole HTML or XML documents (for example, `pub.xml:queryXMLNode`). This is the default.
- `stream` to return the body of the response as a `java.io.InputStream`. Use this option if the document will be used as input to a service that can process documents incrementally (for example, `pub.xml:getXMLNodeIterator`).

data

Document Data that you want the `pub.client:http` service to submit with the HTTP request. Specify data using one or more of the following keys.

Important:

When you use more than one key, *args* is appended first, *table* is appended second, and *string* is appended last.

Key	Description
<i>args</i>	<p>Document Optional. Name/value pairs that you want this service to submit to the resource in <i>url</i>. You can use <i>args</i> to submit data via the POST, PUT, PATCH, GET, DELETE, or HEAD method.</p> <p>To specify data using <i>args</i>, create one String element for each name/value pair that you want to submit, where the element's name represents the name portion of the pair and the element's value represents the value portion of the pair.</p> <p>When you use <i>args</i>, the <code>pub.client:http</code> service will automatically:</p> <ul style="list-style-type: none"> ■ URL-encode name/value pair, so you do not need to URL-encode the values you specify in <i>args</i>. ■ Insert the "&" character between pairs, so you do not need to include it in <i>args</i>. ■ Prefix the entire query string with the "?" character if it submits the data in <i>args</i> via a GET or HEAD. You do not need to include this character in <i>args</i>.

When you submit data using *args*, Integration Server automatically sets the value of the Content-Type header to `application/x-www-form-urlencoded`.

If you want to explicitly specify a different Content-Type value, you must submit the value using the *string* or *bytes* variable.

table

String Table Optional. Data that the `pub.client:http` service will use to construct a query string to submit to the resource specified in *url*. You can use *table* to submit data via the POST, PUT, PATCH, GET, DELETE, or HEAD method.

table is similar to *args*, but it allows you to submit unnamed values in a query string, not just name/value pairs.

To specify data using *table*, create one row for each value that you want to submit, where the contents of column 0 of the String Table represents the name portion of the pair (leave this column null to submit an unnamed value) and the contents of column 1 represents the value portion of the pair.

When you use *table*, the `pub.client:http` service will automatically:

- URL-encode name/value pair, so you do not need to URL-encode the values you specify in *table*.
- Insert the "&" character between the pairs (or unnamed values) that it constructs, so you do not need to include it in *table*.
- Prefix the entire query string with the "?" character if it submits the data in *table* via the GET method. You do not need to include this character in *table*.

When you submit data using *table*, Integration Server automatically sets the value of the Content-Type header to `application/x-www-form-urlencoded`. If you want to explicitly specify a different Content-Type, you must submit your data using the *string* or *bytes* variable.

string

String Optional. Text that you want the `pub.client:http` service to submit to the resource in *url*. You can use *string* to submit data via the POST, PUT, PATCH, GET, or HEAD method.

If you use *string* to submit data, make sure that you specify the string *exactly* as you want it presented in the HTTP request. (If you are using the GET or HEAD method, make sure you URL-encode the contents of *string*.)

Note:

When you use *string*, the `pub.client:http` service will automatically prefix the entire query string with "?" if it submits the data in *string* via a GET or HEAD. You do not need to include this character in *string*.

When performing a POST, PUT, or PATCH, *string* will be submitted to the resource defined by *url* as the body of the request message.

bytes

byte[] Optional. Data that you want this service to submit to the resource in *url*. You can use *bytes* to submit data via the DELETE, POST, PUT, or PATCH methods only.

Important:

When you use *bytes* and another element (*args*, *table*, or *string*) to specify data, the service appends the data from the *args*, *table*, or *string* element to *url*. The service appends *args* to *url* first, *table* second, and *string* last. The service encodes the data from the *bytes* element in the body of the post.

Note:

For POST, PUT, and PATCH, you can specify only *stream*, *bytes*, or *mimeStream*. If you specify more than one, the `pub.client:http` service ends with an exception.

mimeStream **Java.io.InputStream** Optional. MIME or SMIME message that you want this service to submit to the resource in *url*. A *mimeStream* is created by the [pub.mime:getEnvelopeStream](#), [pub.smime:createEncryptedData](#), [pub.smime:createSignedData](#), [pub.smime.keystore:createSignedData](#) or services. It contains both headers and content. The headers in the *mimeStream* are appended to the http headers.

You can use *mimeStream* to submit data via the POST, PUT, or PATCH methods only.

Note:

For POST, PUT, and PATCH, you can specify only *stream*, *bytes*, or *mimeStream*. If you specify more than one, the `pub.client:http` service ends with an exception.

stream

java.io.InputStream Optional. Data that you want the `pub.client:http` service to submit to the resource in *url*. You can use *stream* to submit data via the POST, PUT, or PATCH methods only.

Important:

When you use *stream* and another element (*args*, *table*, *string* or *bytes*) to specify data, the service appends the data from the *args*, *table*, or *string* element to *url*. The service appends *args* to *url* first, *table* second, and *string* last. The service encodes the data from the *stream* element in the body of the post.

Note:

For POST, PUT, and PATCH, you can specify only *stream*, *bytes*, or *mimeStream*. If you specify more than one, the `pub.client:http` service ends with an exception.

encoding **String** Optional. Character set in which the URL *data* parameters are encoded (*args*, *table* and *string*). Encoding is required to correctly convert the String object to bytes when generating the URL for a post. Specify an IANA-registered character set (for example, ISO-8859-1).

If this variable is null, the default JVM encoding is used. Because *string* is used in the body of the post and not used for building the URL, you do not need to specify encoding for the data parameter *string*.

auth

Document Optional. Authorization information that the `pub.client:http` service will submit if the resource specified in *url* is protected.

Key	Description
<i>type</i>	<p>String Type of authentication scheme that you want this service to use when it submits this request. Set to:</p> <ul style="list-style-type: none"> ■ Basic to submit a user name and password. This is the default. ■ Bearer to submit authorization information for an OAuth resource server. ■ Digest to submit a password digest for authentication. ■ NTLM to use NTLM authentication. <p>You do not need to specify a value for <i>type</i> if this request will specify values for <i>kerberos</i> to use Kerberos authentication. If you specify a value for <i>type</i> and provide <i>kerberos</i> values, Integration Server includes the authentication information related to the specified type and the Kerberos ticket in the outbound request.</p>
<i>user</i>	<p>String User name that this service will submit when requesting a protected resource.</p>

Note:

If you have specified NTLM as *type*, you must specify *user* in the following format:

```
domain_name\user_name
```

<i>pass</i>	String Password associated with <i>user</i> .
<i>delegation</i>	String Type of delegation to execute a service on behalf of other user. Set to: <ul style="list-style-type: none"> ■ <i>kerberos</i> to use Kerberos delegation. ■ <i>none</i> to not use delegation. This is the default.
<i>token</i>	String The access token to submit to the OAuth resource server. Required only when <i>type</i> is set to Bearer.
<i>kerberos</i>	Document Optional. Kerberos information that Integration Server uses to acquire a Kerberos ticket to include in the outbound client request. Integration Server includes the ticket in the HTTP Authorization header using the Negotiate authentication scheme. Specify <i>kerberos</i> details only if you need to use Kerberos authentication to access a secured website.

Key	Description
<i>jaasContext</i>	<p>String Optional. The custom JAAS context used for Kerberos authentication. You must specify a JAAS context for the outbound request to use Kerberos authentication.</p> <p>Integration Server includes a JAAS context named <code>IS_KERBEROS_OUTBOUND</code> that can be used with outbound requests.</p> <p>If you specify a value for <i>jaasContext</i>, you must also specify a value for <i>servicePrincipal</i>.</p>
<i>clientPrincipal</i>	<p>String Optional. The name of the client principal to use for Kerberos authentication.</p> <p>You must specify a <i>clientPrincipal</i> value if the specified <i>jaasContext</i> does not include the <code>principal</code> parameter.</p>

If you specify *clientPrincipal* and the specified *jaasContext* includes a `principal` parameter, the `principal` parameter in the *jaasContext* takes precedence.

The `IS_KERBEROS_OUTBOUND` JAAS context does not include a `principal` parameter. You must specify *clientPrincipal* if you specified `IS_KERBEROS_OUTBOUND` as the *jaasContext* value.

clientPassword

String Optional. The password for the specified client principal. You must specify *clientPassword* if the specified *jaasContext* does not specify a keytab file.

servicePrincipal

String Optional. The name of the principal that is used with the service that the Kerberos client wants to access. The service provider provides the Service Principal Name.

Specify the Service Principal Name in the following format:

```
principal-name.instance-name@realm-name
```

You must specify *servicePrincipal* if you supplied a *jaasContext*.

servicePrincipalForm

String Optional. The format in which you want to specify the principal name of the service that is registered with the principal database. Set to:

- `host-based` to represent the principal name using the service name and the hostname, where hostname is the host computer.

This is the default.

- `username` to represent the principal name as a named user in the LDAP or central user directory used for authentication to the key distribution center.

requestDelegatableToken **String** Optional.

Specify if you want to request for a forwardable ticket granting ticket to send to the intermediary. The intermediary can use this forwardable ticket granting ticket for Kerberos delegation. Set to:

- *true* to request for a forwardable ticket granting ticket.
- *false* to request for non-delegable token. This is the default.

headers

Document Optional. Fields that you want to explicitly override in the HTTP request header issued by the `pub.client:http` service.

Specify a key in *headers* for each header field that you want to set, where the key's name represents the name of the header field and the key's value represents the value of that header field.

If you do not set *headers*, the `pub.client:http` service uses the default header values for the Accept and User-Agent headers as determined by the `watt.net.default.accept` and `watt.net.userAgent` respectively.

timeout

String Optional. Time, measured in milliseconds, that Integration Server waits for a response from the remote server before timing out and terminating the request. If you do not specify a value, Integration Server uses the value of the `watt.net.timeout` server configuration parameter.

For information about the `watt.net.timeout` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

maxKeepAliveConnections

String Optional. Number of client keep alive connections that you want Integration Server to retain in the client connection pool it uses for this HTTP connection.

Integration Server establishes a client connection pool for each protocol (i.e., HTTP or HTTPS), host, and port combination. How the service uses this input value differs based on whether a suitable client connection pool already exists for the HTTP connection.

- If a suitable pool already exists, Integration Server uses a connection from the pool for the HTTP request. If the specified *maxKeepAliveConnections* is different from what is currently being used for the pool, Integration Server updates the pool to use the value you specify.
- If a suitable pool does *not* exist, Integration Server establishes one, using the maximum connections defined by this parameter. If you do not specify a value, the service uses the default value defined by

the `watt.net.maxClientKeepAliveConns` server configuration parameter. After establishing the client connection pool, the service uses a connection from the newly established connection pool to the HTTP request.

keepAliveTimeout

String Optional. Number of seconds that you want Integration Server to keep an idle connection in the client connection pool before closing it.

Integration Server establishes a client connection pool for each protocol (i.e., HTTP or HTTPS), host, and port combination. How the service uses this input value differs based on whether a suitable client connection pool already exists for the HTTP connection.

- If a suitable pool already exists, Integration Server uses a connection from the pool for the HTTP request. If the specified *keepAliveTimeout* is different from what is currently being used for the pool, Integration Server updates the pool to use the value you specify.
- If a suitable pool does *not* exist, Integration Server establishes one, using the timeout value defined by this parameter. If you do not specify a value, the service uses the default value defined by the `watt.net.clientKeepAliveTimeout` server configuration parameter. After establishing the client connection pool, the service uses a connection from the newly established connection pool to the HTTP request.

newSession

String Optional. Flag indicating whether a new session will be created for this HTTP request. This parameter overrides the `watt.server.new.http.session.context` server configuration parameter. For information about the `watt.server.new.http.session.context` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

Set to:

- `no` to use the current session, if one is available, for this HTTP request. If one is not available, Integration Server creates one with the name `"(httpclient)"`. This is the default.
- `yes` to create a new session for this HTTP request. Integration Server creates one with the name `"(httpclient)"`.

trustStore

String Optional. Alias for the truststore that contains the list of certificates that Integration Server uses to validate the trust relationship. If you do not specify a truststore alias, the default truststore alias will be used.

proxyAlias

String Optional. Name of the proxy alias for the proxy server to which Integration Server routes the HTTP request.

If you do not specify a *proxyAlias*, Integration Server routes the HTTP request through the proxy server specified in the default HTTP proxy alias. If there is no default HTTP proxy alias, the action taken by Integration Server depends on the value specified for the `watt.net.proxy.useNonDefaultProxies` parameter.

- If the `watt.net.proxy.useNonDefaultProxies` parameter is set to true, Integration Server routes the HTTP request through the proxy server in any configured HTTP proxy alias. If the Integration Server does not have any defined HTTP proxy aliases, Integration Server sends the HTTP request directly to the HTTP server or throws an exception depending on the settings specified for the `watt.net.proxy.fallbackToDirectConnection` parameter.
- If the `watt.net.proxy.useNonDefaultProxies` parameter is set to false, Integration Server sends the request to the remote server using a direct connection.

For more information about proxy server usage, refer to *webMethods Integration Server Administrator's Guide*.

connectTimeout

String Optional. Time, measured in milliseconds, that Integration Server waits to connect to the remote server before timing out and terminating the request. If you do not specify a value for *connectTimeout*, Integration Server uses the value specified for the `watt.net.timeout` server configuration parameter. If no value is specified for the `watt.net.timeout` server configuration parameter, Integration Server waits for the timeout value defined by the operating system before terminating the connection request.

For more information about the `watt.net.timeout` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

followRedirect

String Optional. Whether the outbound request follows a redirect when receiving a response code between 300 and 400. Set to one of the following:

- `yes` if the request follows the redirect.
- `no` if the request does not follow the redirect and instead returns the response code and all the response headers from the original outbound request.
- `<null>` if the value of the `watt.net.http.followRedirect` parameter determines whether or not the request follows a redirect.

Note:

A value of `yes` or `no` overrides the value of the `watt.net.http.followRedirect` parameter.

Output Parameters

encodedURL **String** The URL that was submitted by `pub.client:http`. This will contain any argument set in *args*, *table*, or *string*.

If the remote server redirected `pub.client:http` to a different location, *encodedURL* will contain the URL that `pub.client:http` submitted to the server to which it was redirected.

header **Document** Conditional. HTTP response headers.

Key	Description
<i>lines</i>	Document Fields in the response header, where key names represent field names and values represent field values.
<i>status</i>	String HTTP status code of the response.
<i>statusMessage</i>	String HTTP status message of the response.

body **Document** Body of the HTTP response.

Key	Description
<i>bytes</i>	byte[] Conditional. Body of the HTTP response represented as a <code>byte[]</code> . <i>bytes</i> is returned only when the <i>loadAs</i> input parameter is set to <code>bytes</code> .
<i>stream</i>	java.io.InputStream Conditional. The body of the HTTP response represented as an <code>InputStream</code> . <i>stream</i> is returned only when the <i>loadAs</i> input parameter is set to <code>stream</code> .

Usage Notes

For the GET, HEAD, OPTIONS, and TRACE methods, the `pub.client:http` service sends a URL only. The service does not send a body.

The `pub.client:http` service sends the *data/string* input in the query of the URL when using the GET or HEAD methods, but sends the input as the body of the request when using the POST, PUT or PATCH methods.

If *url* begins with `https:`, you can use [pub.security:setKeyAndChain](#) to specify the certificate chain. If you do not specify a certificate chain, `pub.client:http` uses the default outbound SSL certificate settings to authenticate the resources.

When using `pub.client:http` to create an outbound HTTPS connection, before initiating the SSL handshake with the remote server, Integration Server sets the SSL socket timeout to the value of the `watt.net.ssl.server.clientHandshakeTimeout` value.

If `pub.client:http` does not receive a response within the time-out period specified in the server's `watt.net.timeout` server configuration parameter, it will throw an exception. For information about the `watt.net.timeout` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

For the HTTP request, the `pub.client:http` service uses a client connection from a client connection pool. When you set the `loadAs` input parameter to `stream` so that the service returns the response body as a stream, the connection remains in use and is not returned to the connection pool until you close the stream. To close the stream and return the connection to the pool, you can use the `pub.io:close` service or the `close()` method on the returned stream object.

When the HTTP response contains the 401 status code, the `pub.client:http` service does one of the following depending on the value of the `watt.net.http401.throwException` server configuration parameter.

- When `watt.net.http401.throwException` is set to `true`, if the `pub.client:http` service receives a 401 error, the service throws a `NetException`.
- When `watt.net.http401.throwException` is set to `false`, if the `pub.client:http` service receives a 401 error, the service suppresses the `NetException` and places the HTTP response header and body, if one exists, into the `header` and `body` fields in the service output.

When the HTTP response contains the HTTP 302 redirection status code and the `pub.client:http` service is configured to redirect, the service redirects the request to the URL provided by the remote server. If the remote server redirected `pub.client:http` to a different location, the output parameter `encodedURL` will contain the URL that `pub.client:http` submitted to the server to which the service was redirected.

You can use the `watt.net.http.redirect.performSSRFcheck` server configuration parameter to have Integration Server perform an IP address and protocol check to prevent Server-Side Request Forgery (SSRF) when following a redirection request.

If the server to which `pub.client:http` is redirected returns an HTTP response with a 401 status code and `watt.net.http401.throwException` is set to `false`, the `pub.client:http` services places the header and body of the response in the output pipeline. The service that invokes `pub.client:http` can examine the `header/status` field to determine if the server to which `pub.client:http` was redirected returned a 401. If it did, the service can re-issue the outbound request directly to the URL in `encodedURL` field, making sure to supply credentials with the request.

When the HTTP response contains the status code in the 501 to 599 range, the `pub.client:http` service does one of the following depending on the value of the `watt.net.http501-599.throwException` server configuration parameter:

- When set to `true`, the `pub.client:http` service throws a `ServiceException` when it receives a 501 to 599 level response from a remote HTTP server.
- When set to `false`, the `pub.client:http` service returns the status code, response headers, and response body in the service output when it receives a 501 to 599 level response from a remote HTTP server.

When the `method` input variable is `DELETE`, you can supply a value in the `data/bytes` input variable. The `pub.client:http` service will transmit the value in the body of the request to the remote server

If data is supplied in a format that is not supported with an HTTP method, the `pub.client:http` service ignores the data. For example, use of the `data/stream` and `data/mimeStream` input variables is not supported with DELETE. If the `data/stream` or `data/mimeStream` input variables specify a value when method is set to DELETE, the `pub.client:http` service ignores `data/stream` or `data/mimeStream`.

For POST, PUT and PATCH, if a value is supplied for `data/args` and/or `data/table`, the `pub.client:http` service sets the Content-Type header for the request to is set to `application/x-www-form-urlencoded`. The service ignores a Content-Type value supplied using a name/value pair in `headers`.

You can append query parameters directly to the `url` input parameter value. If you do this, any value supplied for `data/args` and `data/table` will be appended. For the GET method, the `data/string` value would also be appended. For example, these inputs:

- `url = http://example-host:8080/getOrders?cust=116`
- `data/args= {{“since”, “20180201”}, {“greaterThan”, “250.00”}}`

Result in `pub.client:http` sending this URL:

```
http://example-host:8080/getOrders?cust=116&some=20180201&greaterThan=250.00
```

When using NTLM, Integration Server supports authentication for both HTTP and HTTPS. Web server providing NTLM authentication must be configured to return the response header `WWW-Authenticate: NTLM` and optionally the header `WWW-Authenticate: Negotiate`. If the NTLM server returns only `WWW-Authenticate: Negotiate` header, then authentication cannot proceed.

When the `pub.client:http` service submits a password digest for authentication (that is, the `auth/type` field is set to `Digest`) and the HTTP server response includes the header field “Content-Type” but does not contain the charset parameter, Integration Server uses the value of the `watt.server.netEncoding` server configuration parameter as the default character set.

When using Kerberos authentication, principal name and principal password can be specified in the JAAS context file and in the `pub.client:http` service in the `clientPrincipal` and `clientPassword` fields in the `auth\kerberos` document. If the principal name and password are specified in the JAAS context file supplied to `jaasContext` and in the `pub.client:http` service, the values in the JAAS context file take precedence.

By default, for outbound requests that require Kerberos authentication, Integration Server generates a Java Kerberos ticket using the JGSS Kerberos OID. If you need Integration Server to generate a SPNEGO-based Kerberos ticket for outbound requests that use Kerberos authentication, set the `watt.security.kerberos.client.useSPNEGO` server configuration parameter to `true`. This instructs Integration Server to generate a SPNEGO token using SPNEGO OID (Object Identifier) for all outbound requests that require Kerberos authentication.

When Integration Server acts as a client (original requester) and requires a forwardable ticket granting ticket, ensure that you set the `requestDelegatableToken` parameter to `true`.

When Integration Server acts as an intermediary, ensure that you set the `delegation` parameter to `kerberos` to use Kerberos delegation.

If you have a large set of data and want to compress the data before sending it via `pub.client:http`, then you can use `pub.compress:compressData` service to compress the data and then send it. For more information on `pub.compress:compressData`, see [“pub.compress:compressData” on page 220](#).

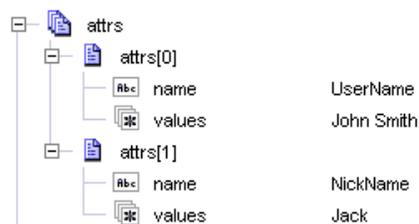
Prior to Integration Server version 10.15, the `pub.client:http` service included the `useJSSE` input parameter which specified whether Integration Server created the outbound connection using the Java Secure Socket Extension (JSSE) library. Beginning with Integration Server version 10.15, Integration Server establishes all secure outbound connections with JSSE. If you migrated to Integration Server 10.15 and a migrated service invokes `pub.client:http`, the `useJSSE` parameter still appears in the pipeline. However, Integration Server ignores the value of the `useJSSE` parameter, proceeding as if `useJSSE` were set to `yes`.

pub.client.ldap:add

WmPublic. Inserts a new entry into the directory.

Input Parameters

<i>url</i>	String Optional. URL of the directory server to connect to. For example <code>ldap://servername:389</code> .
<i>principal</i>	String Optional. The principal for the directory server.
<i>credentials</i>	String Optional. Credentials for the directory server.
<i>timeout</i>	String Optional. Connection timeout in milliseconds. The default value is 30000 milliseconds.
<i>ldapEnv</i>	Record Optional. Key/value parameters to be passed to JNDI to further define the connection environment. See your JNDI provider documentation or the Oracle JNDI documentation for more information about parameters you can pass to JNDI.
<i>close</i>	String Flag that specifies whether to close the connection after the service finishes. Set to: <ul style="list-style-type: none"> ■ <code>yes</code> to close the connection. This is the default. ■ <code>no</code> to leave the connection open and available.
<i>dn</i>	String The distinguished name of the new entry to add to the directory.
<i>attrs</i>	Document List Optional. LDAP attributes and their corresponding values. If an attribute is specified more than once, it will be assigned multiple values. The following example shows how to specify a user name of John Smith and one nickname.



attrsData **Document** Optional. LDAP attributes and their corresponding values. If an attribute is specified more than once, it will be assigned multiple values. The following example shows how to assign a user name of John Smith with two nicknames.



Output Parameters

connectionHandle **Object** Optional. The returned connection object. Returned only if the *close* parameter is set to "no".

Usage Notes

Specify only one of *attrs* or *attrsData*. If you specify both, the service uses *attrs* and ignores *attrsData*.

When *close* is set to yes, Integration Server removes the *connectionHandle* from the pipeline, but does not close the LDAP connection. To close the LDAP connection, set the `watt.server.ldap.cleanContext` server configuration parameter to `true`. For information about the `watt.server.ldap.cleanContext` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

pub.client.ldap:bind

WmPublic. Performs an LDAP bind operation that associates the connection with the specified principal.

Input Parameters

url **String** URL of the LDAP server to connect to.

principal **String** Optional. The principal for the LDAP server.

credentials **String** Optional. Credentials for the LDAP server.

timeout **String** Optional. Connection timeout in milliseconds.
The default value is 30000 milliseconds.

ldapEnv **Record** Optional. Key/value parameters to be passed to JNDI to further define the connection environment. See your JNDI provider documentation or the Oracle JNDI documentation for more information about parameters you can pass to JNDI.

- close* **String** Flag that specifies whether to close the connection after the service finishes. Set to:
- yes to close the connection. This is the default.
 - no to leave the connection open and available.

Output Parameters

- connectionHandle* **Object** Optional. The returned connection object. Returned only if the *close* parameter is set to "no".

Usage Notes

When *close* is set to yes, Integration Server removes the *connectionHandle* from the pipeline, but does not close the LDAP connection. To close the LDAP connection, set the `watt.server.ldap.cleanContext` server configuration parameter to `true`. For information about the `watt.server.ldap.cleanContext` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

pub.client.ldap:cancelNotification

WmPublic. Cancels a previously created notification request.

Input Parameters

- url* **String** Optional. URL of the LDAP server to connect to.
- principal* **String** Optional. The principal for the LDAP server.
- credentials* **String** Optional. Credentials for the LDAP server.
- timeout* **String** Optional. Connection timeout in milliseconds.
The default value is 30000 milliseconds.
- ldapEnv* **Record** Optional. Key/value parameters to be passed to JNDI to further define the connection environment. See your JNDI provider documentation or the Oracle JNDI documentation for more information about parameters you can pass to JNDI.
- close* **String** Flag that specifies whether to close the connection after the service finishes. Set to:
- yes to close the connection. This is the default.
 - no to leave the connection open and available.

<i>dn</i>	String The distinguished name of the entry.
<i>connectionHandle</i>	Object Optional. Connection object returned by a previously invoked LDAP service.
<i>scope</i>	String The scope of the search. Must be "object" (only search the specified directory entry), "onelevel" (only search the immediate children of the specified directory entry), or "subtree" (search the directory, its children, and all of their children).

Output Parameters

<i>connectionHandle</i>	Object Optional. The returned connection object. Returned only if the <i>close</i> parameter is set to "no".
-------------------------	---

Usage Notes

When *close* is set to yes, Integration Server removes the *connectionHandle* from the pipeline, but does not close the LDAP connection. To close the LDAP connection, set the `watt.server.ldap.cleanContext` server configuration parameter to `true`. For information about the `watt.server.ldap.cleanContext` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

pub.client.ldap:compare

WmPublic. Compares the value of an attribute in the LDAP directory with a value specified by the service.

Input Parameters

<i>url</i>	String Optional. URL of the LDAP server to connect to.
<i>principal</i>	String Optional. The principal for the LDAP server.
<i>credentials</i>	String Optional. Credentials for the LDAP server.
<i>timeout</i>	String Optional. Connection timeout in milliseconds. The default value is 30000 milliseconds.
<i>ldapEnv</i>	Record Optional. Key/value parameters to be passed to JNDI to further define the connection environment. See your JNDI provider documentation or the Oracle JNDI documentation for more information about parameters you can pass to JNDI.
<i>close</i>	String Flag that specifies whether to close the connection after the service finishes. Set to:

- yes to close the connection. This is the default.
- no to leave the connection open and available.

<i>dn</i>	String The distinguished name of the entry whose attribute value you want to compare to <i>attrValue</i> .
<i>connectionHandle</i>	Object Optional. Connection object returned by a previously invoked LDAP service.
<i>attrName</i>	String Name of the attribute whose value you want to compare to <i>attrValue</i> .
<i>attrValue</i>	String The string to compare against the value of the attribute identified by <i>attrName</i> .

Output Parameters

<i>connectionHandle</i>	Object Optional. The returned connection object. Returned only if the <i>close</i> parameter is set to "no".
<i>result</i>	String The result of the compare operation. Can be "true" or "false".

Usage Notes

When *close* is set to yes, Integration Server removes the *connectionHandle* from the pipeline, but does not close the LDAP connection. To close the LDAP connection, set the `watt.server.ldap.cleanContext` server configuration parameter to `true`. For information about the `watt.server.ldap.cleanContext` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

pub.client.ldap:delete

WmPublic. Removes an entry from the directory.

Input Parameters

<i>url</i>	String Optional. URL of the LDAP server to connect to.
<i>principal</i>	String Optional. The principal for the LDAP server.
<i>credentials</i>	String Optional. Credentials for the LDAP server.
<i>timeout</i>	String Optional. Connection timeout in milliseconds. The default value is 30000 milliseconds.
<i>ldapEnv</i>	Record Optional. Key/value parameters to be passed to JNDI to further define the connection environment. See your JNDI provider documentation

	or the Oracle JNDI documentation for more information about parameters you can pass to JNDI.
<i>close</i>	String Flag that specifies whether to close the connection after the service finishes. Set to: <ul style="list-style-type: none"> ■ <code>yes</code> to close the connection. This is the default. ■ <code>no</code> to leave the connection open and available.
<i>dn</i>	String The distinguished name of the entry to delete.
<i>connectionHandle</i>	Object Optional. Connection object returned by a previously invoked LDAP service.

Output Parameters

<i>connectionHandle</i>	Object Optional. The returned connection object. Returned only if the <i>close</i> parameter is set to "no".
-------------------------	---

Usage Notes

This service does not flag an error if the entry is not deleted. One way to check is to use [pub.client.ldap:search](#) to search for the entry. If the entry is not found, you know it has been deleted.

When *close* is set to `yes`, Integration Server removes the *connectionHandle* from the pipeline, but does not close the LDAP connection. To close the LDAP connection, set the `watt.server.ldap.cleanContext` server configuration parameter to `true`. For information about the `watt.server.ldap.cleanContext` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

pub.client.ldap:modify

WmPublic. Performs an LDAP modify operation that allows you to specify a list of attributes with corresponding lists of values to add to, replace, or remove from the directory entry.

Input Parameters

<i>url</i>	String Optional. URL of the LDAP server to connect to.
<i>principal</i>	String Optional. The principal for the LDAP server.
<i>credentials</i>	String Optional. Credentials for the LDAP server.
<i>timeout</i>	String Optional. Connection timeout in milliseconds. The default value is 30000 milliseconds.

<i>ldapEnv</i>	Record Optional. Key/value parameters to be passed to JNDI to further define the connection environment. See your JNDI provider documentation or the Oracle JNDI documentation for more information about parameters you can pass to JNDI.
<i>close</i>	String Flag that specifies whether to close the connection after the service finishes. Set to: <ul style="list-style-type: none"> ■ yes to close the connection. This is the default. ■ no to leave the connection open and available.
<i>dn</i>	String The distinguished name of the entry to modify.
<i>connectionHandle</i>	Object Optional. Connection object returned by a previously invoked LDAP service.
<i>attrs</i>	Document List Optional. For each LDAP attribute to change, specifies the attribute name, the values affected, and the action to perform on those values. The following example shows how to specify the removal of John Smith's nickname Johnny.



Output Parameters

<i>connectionHandle</i>	Object Optional. The returned connection object. Returned only if the <i>close</i> parameter is set to "no".
-------------------------	---

Usage Notes

When *close* is set to yes, Integration Server removes the *connectionHandle* from the pipeline, but does not close the LDAP connection. To close the LDAP connection, set the `watt.server.ldap.cleanContext` server configuration parameter to `true`. For information about the `watt.server.ldap.cleanContext` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

pub.client.ldap:registerNotification

`WmPublic`. Creates a notification (or "persistent search") that causes Integration Server to listen for LDAP events. When the notification gets an event, the specified service is called.

Input Parameters

<i>url</i>	String Optional. URL of the LDAP server to connect to.
<i>principal</i>	String Optional. The principal for the LDAP server.
<i>credentials</i>	String Optional. Credentials for the LDAP server.
<i>timeout</i>	String Optional. Connection timeout in milliseconds. The default value is 30000 milliseconds.
<i>ldapEnv</i>	Record Optional. Key/value parameters to be passed to JNDI to further define the connection environment. See your JNDI provider documentation or the Oracle JNDI documentation for more information about parameters you can pass to JNDI.
<i>close</i>	String Flag that specifies whether to close the connection after the service finishes. Set to: <ul style="list-style-type: none"> ■ yes to close the connection. This is the default. ■ no to leave the connection open and available.
<i>dn</i>	String The distinguished name of the entry to be monitored.
<i>connectionHandle</i>	Object Optional. Connection object returned by a previously invoked LDAP service.
<i>scope</i>	String The scope of the search. Must be "object" (only search the specified directory entry, "onelevel" (only search the immediate children of the specified directory entry), or "subtree" (search the directory entry, its children, and all of their children).
<i>service</i>	String The target service to be invoked when the LDAP event is retrieved.
<i>user</i>	String Optional. Integration Server user to run <i>service</i> (the target service to be invoked when the LDAP event is retrieved). If you do not specify a user, the service runs as the Default user. Make sure <i>user</i> has the permissions necessary to run the service. Be careful when assigning the user because no password is required when invoking a service in this manner. It is recommended that you create a special account just for invoking the target service.

Output Parameters

<i>connectionHandle</i>	Object Optional. The returned connection object. Returned only if the <i>close</i> parameter is set to "no".
-------------------------	---

Usage Notes

When the `pub.client.ldap:registerNotification` service creates a notification, Integration Server listens for four different types of events: `objectAdded`, `objectRemoved`, `objectRenamed`, and `objectChanged`. If any one of these events is triggered, `pub.client.ldap:registerNotification` calls the specified target service and passes these inputs to it:

Pipeline Input	Description
<i>type</i>	One of the following depending on which event was triggered - "objectAdded", "objectRemoved", "objectRenamed", "objectChanged".
<i>dn</i>	Distinguished name of the entry that triggered the event.
<i>attributes</i>	Any additional LDAP attributes from the event.
<i>oldDn</i>	Applicable only for <code>objectRenamed</code> event. Distinguished name of the entry before it was renamed.

If an error occurs, `pub.client.ldap:registerNotification` places an input called "exception" in the pipeline. This input includes details on the exception that occurred.

Some LDAP servers do not support persistent searches and therefore do not support notifications.

When `close` is set to `yes`, Integration Server removes the `connectionHandle` from the pipeline, but does not close the LDAP connection. To close the LDAP connection, set the `watt.server.ldap.cleanContext` server configuration parameter to `true`. For information about the `watt.server.ldap.cleanContext` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

pub.client.ldap:rename

WmPublic. Performs an LDAP rename (move) operation allowing you to rename an entry.

Input Parameters

<i>url</i>	String Optional. URL of the LDAP server to connect to.
<i>principal</i>	String Optional. The principal for the LDAP server.
<i>credentials</i>	String Optional. Credentials for the LDAP server.
<i>timeout</i>	String Optional. Connection timeout in milliseconds. The default value is 30000 milliseconds.
<i>ldapEnv</i>	Record Optional. Key/value parameters to be passed to JNDI to further define the connection environment. See your JNDI provider documentation or the Oracle JNDI documentation for more information about parameters you can pass to JNDI.

<i>close</i>	String Flag that specifies whether to close the connection after the service finishes. Set to: <ul style="list-style-type: none"> ■ yes to close the connection. This is the default. ■ no to leave the connection open and available.
<i>connectionHandle</i>	Object Optional. Connection object returned by a previously invoked LDAP service.
<i>newDn</i>	String The new name for the entry.

Output Parameters

<i>connectionHandle</i>	Object Optional. The returned connection object. Returned only if the <i>close</i> parameter is set to "no".
-------------------------	---

Usage Notes

When *close* is set to yes, Integration Server removes the *connectionHandle* from the pipeline, but does not close the LDAP connection. To close the LDAP connection, set the `watt.server.ldap.cleanContext` server configuration parameter to `true`. For information about the `watt.server.ldap.cleanContext` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

pub.client.ldap:search

WmPublic. Performs an LDAP search operation with the specified parameters and returns the results of the search.

Input Parameters

<i>url</i>	String Optional. URL of the LDAP server to connect to.
<i>principal</i>	String Optional. The principal for the LDAP server.
<i>credentials</i>	String Optional. Credentials for the LDAP server.
<i>timeout</i>	String Optional. Connection timeout in milliseconds. The default value is 30000 milliseconds.
<i>ldapEnv</i>	Record Optional. Key/value parameters to be passed to JNDI to further define the connection environment. See your JNDI provider documentation or the Oracle JNDI documentation for more information about parameters you can pass to JNDI.

<i>close</i>	<p>String Flag that specifies whether to close the connection after the service finishes. Set to:</p> <ul style="list-style-type: none">■ yes to close the connection. This is the default. <p>If the <i>close</i> parameter is set to "yes", the <i>connectionHandle</i> parameter must also be mapped.</p> <ul style="list-style-type: none">■ no to leave the connection open and available.
<i>dn</i>	<p>String The distinguished name indicating the root from to begin the search.</p>
<i>connectionHandle</i>	<p>Object Required if the <i>close</i> parameter is set to "yes", otherwise it is optional. Connection object returned by a previously invoked LDAP service.</p>
<i>scope</i>	<p>String The scope of the search. Must be "object" (only search the specified directory entry), "onelevel" (only search the immediate children of the specified directory entry), or "subtree" (search the directory entry, its children, and all their children).</p>
<i>filter</i>	<p>String The filter string that works with RFC 2254.</p>
<i>countLimit</i>	<p>String Optional. The maximum number of results to return (0, the default, indicates no limit).</p>
<i>pageSize</i>	<p>String Optional. The number of entries to return in a page.</p>
<i>timeLimit</i>	<p>String Optional. The number of milliseconds to wait for the search to complete (0, the default, indicates to wait forever).</p>
<i>returnAttributes</i>	<p>Record Optional. A list of attribute names to return (an empty array indicates that no results should be returned. A null array, the default, indicates that all attributes should be returned).</p>
<i>returnObjects</i>	<p>String Optional. Specifies whether or not objects associated with the results should be returned. Can be "yes" or "no". The default is "no".</p>
<i>dereferenceLinks</i>	<p>String Optional. Whether to return the symbolic link to the entry or the entry itself. Can be "yes"/"no". The default is "yes", which returns the entry to which the link points.</p>
<i>isDocumentList</i>	<p>String Optional. Whether to return results as a list. Set to:</p> <ul style="list-style-type: none">■ Yes to return results as a Document List containing Documents (IData). The results are returned in the <i>resultsList</i> output parameter.■ No (the default) to return results as a Document containing Documents. The results are returned in the <i>results</i> output parameter.
<i>ldapCookie</i>	<p>byte[] Optional. Contains the index of the page count for the search.</p>

Output Parameters

<i>connectionHandle</i>	Object Optional. The returned connection object. Returned only if the <i>close</i> parameter is set to No.
<i>ldapCookie</i>	byte[] Optional. Contains the index of the page count for the search.
<i>results</i>	Document Conditional. The returned results of the search. Returned only if <i>isDocumentList</i> is set to No.
<i>resultsList</i>	Document List Conditional. Returned only if <i>isDocumentList</i> is set to Yes.

Usage Notes

To see if no match was found, check for either:

- A *results* parameter that does not contain a key-value pair.
- A *resultsList* parameter with a size of 0.

When *close* is set to yes, Integration Server removes the *connectionHandle* from the pipeline, but does not close the LDAP connection. To close the LDAP connection, set the `watt.server.ldap.cleanContext` server configuration parameter to `true`. For information about the `watt.server.ldap.cleanContext` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

pub.client.oauth:executeRequest

WmPublic. Allows Integration Server to access protected resources on a resource server using an existing Open Authentication (OAuth) access token.

When a client application requires the OAuth protocol to access a user's protected resources on a third-party resource server (for example, Facebook, Google, Twitter, or another Integration Server), the client application must present an access token on behalf of the user in order to gain access. This service presents the access token to the resource server on behalf of the user.

Note:

To use this service, you must have registered the client with the provider's authorization server and received an access token. You will use the information given to you by the provider to configure this service. For information about registering a client and obtaining an access token, refer to the provider's documentation.

Integration Server uses the Scribe API, a simple open source client implementation, to connect to OAuth providers. The Scribe API provides client implementations for many providers such as Facebook, Google, and Twitter. For information about using the Scribe API, see the Usage Notes.

Input Parameters

<i>provider</i>	<p>String Name of the service provider to which the client will connect. Integration Server uses this parameter to determine which OAuth client implementation in the Scribe library to use when issuing requests.</p> <p>Possible values are <code>IntegrationServer</code> and <code>Other</code> (case insensitive).</p> <p>Note: If set to <code>Other</code>, you must specify a value for <i>providerClass</i>.</p>
<i>providerClass</i>	<p>String Name of a class that implements the <code>org.scribe.builder.api.Api</code> interface.</p> <p>This parameter is required only when the <i>provider</i> parameter is set to <code>Other</code>.</p> <p>Note: The <code>org.scribe.builder.api.Api</code> interface is part of the Scribe API. It facilitates the use of the <code>pub.client.oauth.executeRequest</code> service to connect to providers other than <code>IntegrationServer</code>. For more information about <code>org.scribe.builder.api.Api</code> see the Usage Notes.</p>
<i>clientID</i>	<p>String The client identifier assigned to the client by the provider.</p> <p>The <i>clientID</i> is used to authenticate the client to the provider. The value is assigned by the provider at registration time.</p>
<i>clientSecret</i>	<p>String The secret assigned to the client when it registered with the provider.</p> <p>Use this parameter to specify either the client secret or the key to the client secret in the outbound password store. For information about using the outbound password store, see the Usage Notes.</p>
<i>accessToken</i>	<p>String The access token assigned to the client application when it registered with the provider.</p> <p>Note: The process for obtaining the <i>accessToken</i> varies depending on the provider. For information about obtaining the <i>accessToken</i>, refer to your provider's documentation.</p> <p>Use this parameter to specify either the access token or the key to the access token in the outbound password store. For information about using the outbound password store, see the Usage Notes.</p>
<i>accessTokenSecret</i>	<p>String Optional. The access token secret assigned to the client application when it registered with the provider.</p> <p>Note: The process for obtaining the <i>accessTokenSecret</i> varies depending on the provider. For information about obtaining the <i>accessTokenSecret</i>, refer to your provider's documentation.</p>

Use this parameter to specify either the access token secret or the key to the access token secret in the outbound password store. For information about using the outbound password store, see the Usage Notes.

Note:

Not all providers use an access token secret. If the provider issued a secret with the token, you must specify it with the *accessTokenSecret* parameter.

<i>resourceUri</i>	<p>String The URI given to the client application when it registered with the provider.</p> <p>The client application uses this URI when issuing requests to the provider. It points to the resource that the client application wants to access on the provider.</p>
<i>method</i>	<p>String The HTTP method Integration Server will use to issue the request to the provider.</p> <p>Possible values are <i>get</i>, <i>post</i>, <i>put</i>, and <i>delete</i>.</p>
<i>headers</i>	<p>Document List Optional. One or more name/value pairs to add to the header of the request sent to the provider.</p> <p>If the provider requires a request header, you must provide a value.</p>
<i>queryString Parameters</i>	<p>Document List Optional. One or more name/value pairs to add to the URL of the <i>get</i> request sent to the provider.</p>
<i>bodyParameters</i>	<p>Document List Optional. One or more name/value pairs to add to the body of the request sent to the provider.</p>
<i>requestDataType</i>	<p>String Optional. If supplying data with the request to the provider, indicates the data type of the <i>requestData</i> parameter. If set to:</p> <ul style="list-style-type: none"> ■ <i>bytes</i>, <i>requestData</i> must be a <code>byte[]</code>. This is the default. ■ <i>string</i>, <i>requestData</i> must be a <code>java.lang.String</code>.
<i>requestData</i>	<p>Object Optional. Data to include in the body of the request sent to the provider. The value can be a <code>string</code> or a <code>byte[]</code>.</p> <p>Note:</p> <p>The data type of <i>requestData</i> must match what is specified by the <i>requestDataType</i> parameter. <i>requestData</i> is ignored if <i>bodyParameters</i> is specified.</p>
<i>responseDataType</i>	<p>String Optional. Indicates the data type of the <i>responseData</i> output parameter. Set to:</p>

- `stream` to return the `responseData` as a `java.io.InputStream`. This is the default.
- `bytes` to return the `responseData` as a `byte[]`.
- `string` to return the `responseData` as a `java.lang.String`, constructed using the default platform encoding (indicated by the `file.encoding` Java system property, or UTF-8 if `file.encoding` is not set).

Output Parameters

responseData **Object** The response from the provider. If the *responseDataType* is set to:

- `stream`, *responseData* is a `java.io.InputStream`.
- `bytes`, *responseData* is a `byte[]`.
- `string`, *responseData* is a `java.lang.String`, constructed using the default platform encoding (indicated by the `file.encoding` Java system property, or UTF-8 if `file.encoding` is not set).

Usage Notes

- Since the values for the *clientSecret*, *accessToken*, and *accessTokenSecret* parameters contain sensitive data, you might want to consider storing their values in the Integration Server outbound password store. For information about services you can use to store these values in the outbound password store, see the `pub.security.outboundPasswords` in the [About the Security Elements](#) folder.

If you decide to use the outbound password store, the value for each parameter (*clientSecret*, *accessToken*, and *accessTokenSecret*) must match the key you supplied in the `pub.security.outboundPasswords` services. Integration Server uses that key to retrieve the values from the store, then uses the values to send the request to the provider.

If you decide not to use the outbound password store, Integration Server sends the request to the provider using the values you supply with the *clientSecret*, *accessToken*, and *accessTokenSecret* parameters.

- You can use this service to connect to OAuth providers other than Integration Server by setting the *provider* parameter to `other` and the *providerClass* parameter to the name of an `org.scribe.builder.api.Api` implementation. The `org.scribe.builder.api.Api` interface is defined in the Scribe open source API. For this approach, Software AG recommends the following:
 - That you download the Scribe API source code from the GitHub website. You can either browse the code or generate the Javadoc for the Scribe classes using the following command:

```
javadoc -sourcepath your_scribe_install_dir/src/main/java -d your_destination_dir  
org.scribe.builder.api
```

- That you check the Scribe OAuth library to see if an implementation for the provider that you want to use already exists. Scribe provides client implementation for many providers.

Important:

If an implementation already exists but the provider has changed its interface and the implementation in the Scribe library no longer works, you can either modify the implementation yourself or request an update from the author of Scribe.

- If your provider supports OAuth 2.0, then extend `org.scribe.builder.api.DefaultApi20`. If your provider supports OAuth 1.0a, then extend `org.scribe.builder.api.DefaultApi10a`.

pub.client.oauth:getExternalAccessToken

WmPublic. Gets the access and refresh tokens that the OAuth server generates for the Integration Server. This service can be used when Integration Server uses the OAuth authentication mechanism for services such as `pub.client:smtp`.

Input Parameters

<i>grant_type</i>	<p>String. Specify one of the following values:</p> <ul style="list-style-type: none"> ■ <code>authorization_code</code>, to get an access token using the authorization code issued by the OAuth server. ■ <code>refresh_token</code>, to use the refresh token issued by the OAuth server to obtain a new access token, when the current access token expires.
<i>token_endpoint</i>	<p>String. The URL of the endpoint that Integration Server must use to request an access token from the OAuth server.</p>
<i>code</i>	<p>String. Conditional. Get the <code>authorization_code</code> manually from the OAuth server. The procedure to get the <code>authorization_code</code> varies depending on your OAuth server. You must provide a value for this parameter only when the <code>grant_type</code> is <code>authorization_code</code>.</p>
<i>client_id</i>	<p>String. The unique public identifier that the OAuth server generates for Integration Server during registration.</p>
<i>client_secret</i>	<p>String. The unique string that the OAuth server provides to Integration Server during registration. It is only known to Integration Server and the OAuth server.</p>

<i>scope</i>	String. The e-mail server access permissions configured for Integration Server during registration. Multiple scopes can be specified by separating them with a space.
<i>redirect_uri</i>	String. The URL that the OAuth server must use to send authentication responses to Integration Server. <ul style="list-style-type: none">■ If you are accessing Integration Server locally, enter the redirect URLs in one of the applicable formats: <code>http://localhost:{port}/WmRoot/security-oauth-get-authcode.dsp</code> or <code>https://localhost:{port}/WmRoot/security-oauth-get-authcode.dsp</code>■ If you are accessing Integration Server remotely, use <code>https://{ISHostName}:{port}/WmRoot/security-oauth-get-authcode.dsp</code>.
<i>refresh_token</i>	String. Conditional. The refresh token issued by the OAuth server. You can use this token to obtain new access tokens using the <i>refresh_token</i> authorization grant. Note: An OAuth server issues refresh tokens based on certain conditions, which vary across OAuth servers. For example, Microsoft Azure issues refresh tokens only when the <i>scope</i> input parameter contains <code>offline_access</code> .

Output Parameters

<i>token_type</i>	String. The type of access token issued by the authorization server. The value is Bearer.
<i>access_token</i>	String. The access token issued by the authorization server.
<i>expires_in</i>	String. The number of seconds for which the access token is valid.
<i>refresh_token</i>	String. Conditional. The refresh token issued by the authorization server. You can use this token to obtain new access tokens using the same authorization grant. Note: An OAuth server issues refresh tokens based on certain conditions, which vary across OAuth servers. For example, Microsoft Azure

issues refresh tokens only when the scope input parameter contains `offline_access`.

scope

String. Set of scopes requested by Integration Server.

pub.client:restClient

WmPublic. Creates and sends REST API requests over HTTP or HTTPS. Integration Server generates the REST connector services while creating a consumer REST API descriptor and calls this service while executing any REST connector service.

Note:

This service is entirely internal to Integration Server and you must not execute this service manually.

Input Parameters

path

String Relative path of the individual endpoints of the REST API.

httpMethod

String Specifies the HTTP method you want to use. Valid values are:

get

post

put

delete

patch

options

head

body

Document Optional. Body of the REST API request.

scheme

String Transfer protocol that you want to use to send the REST API request. Valid values are:

http

https

produces

String Optional. MIME media type the REST operation can produce and send back to the REST client. Valid values are:

application/xml

application/json

consumes **String** Optional. MIME media type the REST operation can consume or accept from the REST client. Valid values are:

application/xml

application/json

basePath **String** Optional. Base path on which the REST API is served, which is relative to the *host*. If base path is not included, the REST API is served directly under the *host*. The path must begin with a "/" (slash).

auth **Document** Optional. Authorization information that this service submits to the server.

Key	Description
<i>type</i>	<p>String Type of authentication scheme that you want this service to use. Set to:</p> <ul style="list-style-type: none"> ■ BASIC: The basic authentication scheme that is built into the HTTP protocol. You need to submit a user name and password. This is the default. ■ OAUTH: The OAuth authentication scheme according to the OAuth 2.0 Authorization Framework. ■ APIKEY: APIkey-based authentication uses a special token or key that the client needs to provide while accessing the API. The key is usually sent as a request header or a query parameter.
<i>username</i>	<p>String User name that this service will submit when requesting a protected resource. Required only when <i>type</i> is set to <code>Basic</code>.</p>
<i>password</i>	<p>String Password associated with <i>username</i>. Required only when <i>type</i> is set to <code>Basic</code>.</p>
<i>token</i>	<p>String The access token to submit to the OAuth resource server. Required only when <i>type</i> is set to <code>OAUTH</code>.</p>
<i>apiKey</i>	<p>String The alphanumeric key that this service uses to make the API calls.</p>
<i>in</i>	<p>String Specifies whether Integration Server passes the API key in header or in query. For example, <code>in: header</code> or <code>in: query</code>.</p>

	<i>name</i>	String Name of the API key.
	<i>value</i>	String Alphanumeric value of the API key.
<i>secure</i>	Document	Optional. Specifies the truststore information for certificate validation that Integration Server uses when communicating with the HTTPS server port.
	<i>trustStoreAlias</i>	String Alias for the truststore that contains the list of certificates that Integration Server uses to validate the trust relationship. If you do not specify a truststore alias, the default truststore alias is used.
<i>params</i>	Document	Optional. All path parameters must be added under this document as key value pairs.
	Key	Description
	<i>path</i>	Document. Optional. Path parameters of the REST API request.
	<i>query</i>	Document. Optional. Query parameters of the REST API request.
	<i>form</i>	Document. Optional. Form parameters of the REST API request.
	<i>header</i>	Document. Optional. Headers from the REST API request and responses.
<i>host</i>	String	Host serving the REST API.
<i>radName</i>	String	The namespace of the consumer REST API descriptor.

Output Parameters

<i>response</i>	Object	Optional. Body of the REST API response as a document or document list.
<i>code</i>	String	HTTP code of the REST API response.
<i>phrase</i>	String	HTTP message of the REST API response.

pub.client.sftp:cd

WmPublic. Changes the working directory on the remote SFTP server.

Input Parameters

<i>sessionKey</i>	String Unique key for the current SFTP session. The <i>sessionKey</i> is returned by the pub.client.sftp:login service.
<i>path</i>	String Absolute or relative path of the directory that you want as the working directory on the remote SFTP server.

Output Parameters

<i>returnCode</i>	String Standard SFTP protocol return code.
<i>returnMsg</i>	String Text message describing the return code.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:chgrp

WmPublic. Changes the group ownership of one or more remote files.

Input Parameters

<i>sessionKey</i>	String Unique key for the current SFTP session. The <i>sessionKey</i> is returned by the pub.client.sftp:login service.
<i>groupId</i>	String Numeric group identifier of the group to which you want to transfer ownership of the remote files.
<i>path</i>	String Absolute or relative path of the remote files.

Output Parameters

<i>returnCode</i>	String Standard SFTP protocol return code.
<i>returnMsg</i>	String Text message describing the return code.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:chmod

WmPublic. Changes permissions of one or more remote files.

Input Parameters

<i>sessionKey</i>	String Unique key for the current SFTP session. The <i>sessionKey</i> is returned by the pub.client.sftp:login service.
<i>mode</i>	String The permission mode to apply to the remote file (for example, 777).
<i>path</i>	String Absolute or relative path of the remote files.

Output Parameters

<i>returnCode</i>	String Standard SFTP protocol return code.
<i>returnMsg</i>	String Text message describing the return code.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:chown

WmPublic. Changes the owning user of one or more remote files.

Input Parameters

<i>sessionKey</i>	String Unique key for the current SFTP session. The <i>sessionKey</i> is returned by the pub.client.sftp:login service.
<i>uid</i>	String Numeric user ID of the new owning user of the file.
<i>path</i>	String Absolute or relative path of the remote files.

Output Parameters

<i>returnCode</i>	String Standard SFTP protocol return code.
<i>returnMsg</i>	String Text message describing the return code.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:get

WmPublic. Retrieves a file from a remote SFTP server and saves it on the local machine.

Input Parameters

<i>sessionKey</i>	String Unique key for the current SFTP session. The <i>sessionKey</i> is returned by the pub.client.sftp:login service.
<i>remoteFile</i>	String Absolute or relative path of the remote file.
<i>localFile</i>	String Optional. Absolute or relative path of the local file. If <i>localFile</i> is not specified, the <code>pub.client.sftp:get</code> service returns the retrieved file in the output parameter <i>contentStream</i> (as a <code>java.io.InputStream</code> object).
<i>mode</i>	String Optional. Specifies how the retrieved file is to be saved to the local file. Use this parameter only if you have specified a value for <i>localFile</i> . Set to: <ul style="list-style-type: none">■ <code>overwrite</code> to overwrite the contents of the local file with the contents of the remote file. This is the default.■ <code>append</code> to append the entire contents of the remote file to the local file.■ <code>resume</code> to resume writing the contents of the remote file to the local file from the point at which the writing stopped during previous SFTP sessions.

Output Parameters

<i>returnCode</i>	String Standard SFTP protocol return code.
<i>returnMsg</i>	String Text message describing the return code.
<i>contentStream</i>	Object Conditional. A <code>java.io.InputStream</code> object. The <code>pub.client.sftp:get</code> service returns the retrieved file in the output parameter <i>contentStream</i> (as a <code>java.io.InputStream</code> object) if <i>localFile</i> is not specified.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:login

WmPublic. Creates a secure connection to the SFTP server using the specified user alias or configuration parameters.

Important:

The `sessionKey` returned by this service is used by most other `pub.client.sftp` services.

Input Parameters

userAlias

String. Optional. Alias containing the SFTP client configuration for an SFTP user account.

Integration Server creates a new session each time it logs in to the SFTP server and returns the session key to the user.

This parameter is optional. Instead of using this parameter, you can pass the login credentials and the configuration parameters using the fields within the *sftpConfigurationParameters* document.

Note:

It is recommended to use *userAlias* instead of the fields within the *sftpConfigurationParameters* document because it is resilient to changes in configuration, such as removal of algorithms or ciphers in favor of stronger algorithms and ciphers.

If you provide inputs for both *userAlias* and SFTP configuration parameters, then *userAlias* takes precedence.

reuseSession

String. Optional. Flag indicating whether or not Integration Server reuses a session that is already open for the specified user alias. Set to:

- `true`, to reuse the session that is already open for the specified user alias. If a session is not open for this user alias, the `pub.client.sftp:login` service creates a new session and returns the key for this new session.
- `false`, to create a new session for the specified user alias. This is the default.

sftpConfigurationParameters

Document. Optional. The following parameters are part of this document.

sftpClientVersion

String. Indicates the Integration Server SFTP client version, which can be `version1` (existing) or `version2` (new). Set to `version2`, if you want Integration Server to use the newer SFTP client that has new configuration properties,

	additional Key Exchange Algorithms, Machine Access Code (MAC) algorithms, and ciphers.
<i>serverHost</i>	String. The IP address or the host name of the SFTP server.
<i>serverPort</i>	Integer. The SFTP server port number. The port number must be within the range of 0 and 65535 (inclusive).
<i>hostKeyBytes</i>	Object. Optional. An array of bytes (byte[]). The host key of the SFTP server. If this field is empty, then host key verification is not strict: Integration Server ignores the value of the <i>strictHostKeyChecking</i> field and trusts the host key received from the SFTP server while creating a connection. Note: You can get the host key of the SFTP server by using the <code>pub.client.sftp.admin:getHostKey</code> service.
<i>userName</i>	String. The user name for the SFTP user account.
<i>authenticationType</i>	String. Type of authentication that Integration Server uses to authenticate itself on the SFTP server. Set to: <ul style="list-style-type: none">■ <code>password</code>, to use password-based authentication.■ <code>public key</code>, to use public key-based authentication. If the authentication type is <code>password</code>, then the value in the <i>password</i> field is used. If the authentication type is <i>publicKey</i>, then the value provided in the <i>privateKeyBytes</i> field is used.
<i>password</i>	String. Optional. Password of the specified SFTP user account. This is required if <i>authenticationType</i> is <code>password</code> .
<i>privateKeyBytes</i>	Object (an array of bytes (byte[])). Optional. If the authentication type is <i>publicKey</i> , then provide the private key of the specified SFTP user account.

<i>passPhrase</i>	String. Optional. It is required if you select <i>publicKey</i> as the authentication type and the private key that you specified requires a passphrase
<i>minDHKeySize</i>	Integer. Optional. The minimum DH key size. The default value is 1024. This field is not applicable if <i>sftpClientVersion</i> is version1.
<i>maxDHKeySize</i>	Integer. Optional. The maximum DH key size. The default value is 8192. This field is not applicable, if <i>sftpClientVersion</i> is version1.
<i>preferredKeyExchangeAlgorithms</i>	String. Optional. A comma-separated list of preferred key exchange algorithms. If not defined, then the default list of key exchange algorithms (in the default order) is used.
	<p>Note: You can get the list of default key exchange algorithms, MAC algorithms, and ciphers by using the <code>pub.client.sftp.admin:getDefaultAlgorithms</code> service.</p>
<i>preferredCiphersS2C</i>	String. Optional. A comma-separated list of preferred server-to-client ciphers. If no value is provided, then the default list of server-to-client ciphers (in the default order) is used.
<i>preferredCiphersC2S</i>	String. Optional. A comma-separated list of preferred client-to-server ciphers. If a value is not provided, then the default list of client-to-server ciphers (in the default order) is used.
<i>preferredMacC2S</i>	String. Optional. A comma-separated list of preferred client-to-server Message Authentication Code (MAC) algorithms. If a value is not provided, then the default list of client-to-server MAC algorithms (in the default order) is used.
<i>preferredMacS2C</i>	String. Optional. A comma-separated list of preferred server-to-client Message Authentication Code (MAC) algorithms.

	If a value is not provided, then the default list of server-to-client MAC algorithms (in the default order) is used.
<i>proxyAlias</i>	String. Optional. The proxy alias through which the request should be routed. The proxy alias can be HTTP, HTTPS, or SOCKS. If a proxy alias is not specified, Integration Server makes outbound requests using each enabled proxy server alias until the request is sent successfully or all proxy servers are tried.
<i>maximumRetries</i>	Integer. Optional. The maximum number of times Integration Server tries to connect to the SFTP server, if login fails. The default value is 5. This field is applicable, if <i>sftpClientVersion</i> is version1.
<i>connectionTimeout</i>	Integer. Optional. The time (in seconds) that Integration Server waits for a response from the SFTP server before timing out and terminating the request. The default is 0, which indicates that the session never times out.
<i>sessionTimeout</i>	Integer. Optional. The number of minutes that Integration Server waits before terminating an idle session. The default is 30 minutes.
<i>compression</i>	String. Optional. Determines whether data should be compressed or not, to reduce the size of the data in transition. Integration Server supports compression using the <i>zlib</i> compression algorithm. The allowed values for this field are <i>none</i> and <i>zlib</i> .
	Note: Use compression, only if the SFTP server to which you connect supports compression.
<i>compressionLevel</i>	Integer. Optional. The compression level to use, if you select <i>zlib</i> in the compression field. The minimum allowed value is 1 (fast, minimum compression). The maximum allowed value is 6 (slow, maximum compression). The default

	value is 6. This field is not applicable if <i>sftpClientVersion</i> is version2.
<i>strictHostKeyChecking</i>	<p>String. Optional. Enables host key checking. The default value is <i>Yes</i>.</p> <ul style="list-style-type: none"> ■ If set to <i>Yes</i> and the host key does not match the host key provided in the <i>hostKeyBytes</i> field at the time of handshake, then the connection fails. ■ If set to <i>No</i>, then the host key is not checked during the handshake. <p>This field is ignored if the <i>hostKeyBytes</i> field is empty.</p>

Output Parameters

<i>sessionKey</i>	String. On successful login, this field contains the session key.
<i>returnCode</i>	String. The code returned for the login command.
<i>returnMsg</i>	String. The message returned for the login command.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

If the `watt.client.sftp.session.logoutOnServiceCompletion` parameter is set to `true`, the FTP session created by the `pub.client.sftp:login` service closes automatically when the invoking service completes execution. If the value is set to `false`, then the `pub.client.sftp:logout` service must be invoked to close the FTP(S) session.

pub.client.sftp.admin:getDefaultAlgorithms

Gets the default list of algorithms supported by the Integration Server SFTP client. It returns the default values for the following parameters: *keyExchangeAlgorithms*, *ciphersC2S*, *ciphersS2C*, *macC2S*, and *macS2C*. The values are returned as a comma-separated list.

Input Parameters

<i>sftpClientVersion</i>	String. Indicates the Integration Server SFTP client version, which can be <code>version1</code> (existing) or <code>version2</code> (newer). Set to <code>version2</code> , if you want Integration Server to use the newer SFTP client that
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has new configuration properties, additional Key Exchange Algorithms, Machine Access Code (MAC) algorithms, and ciphers.

Output Parameters

<i>keyExchangeAlgorithms</i>	String. A comma-separated list of supported Key Exchange Algorithms.
<i>ciphersC2S</i>	String. A comma-separated list of supported client-to-server ciphers.
<i>ciphersS2C</i>	String. A comma-separated list of supported server-to-client ciphers.
<i>macC2S</i>	String. A comma-separated list of supported client-to-server Message Authentication Code (MAC) algorithms.
<i>macS2C</i>	String. A comma-separated list of supported server-to-client Message Authentication Code (MAC) algorithms.

pub.client.sftp.admin:getHostKey

WmPublic. Gets the host key of the SFTP server.

Input Parameters

<i>sftpClientVersion</i>	String. Indicates the Integration Server SFTP client version, which can be <code>version1(existing)</code> or <code>version2(newer)</code> . Set to <code>version2</code> , if you want Integration Server to use the newer SFTP client that has new configuration properties, additional Key Exchange Algorithms, Machine Access Code (MAC) algorithms, and ciphers.
<i>serverHost</i>	String. The IP address or the host name of the SFTP server.
<i>serverPort</i>	Integer. The SFTP server port number. The port number must be within the range of 0 and 65535 (inclusive).
<i>preferredKeyExchangeAlgorithms</i>	String. Optional. A comma-separated list of preferred key exchange algorithms. If not defined, then the

default list of key exchange algorithms (in the default order) is used.

Note:

You can get the list of default key exchange algorithms, MAC algorithms, and ciphers by using the `pub.client.sftp.admin.getDefaultAlgorithms` service.

preferredCiphersS2C

String. Optional. A comma-separated list of preferred server-to-client ciphers. If no value is provided, then the default list of server-to-client ciphers (in the default order) is used.

preferredCiphersC2S

String. Optional. A comma-separated list of preferred client-to-server ciphers. If a value is not provided, then the default list of client-to-server ciphers (in the default order) is used.

preferredMacC2S

String. Optional. A comma-separated list of preferred client-to-server Message Authentication Code (MAC) algorithms. If a value is not provided, then the default list of client-to-server MAC algorithms (in the default order) is used.

preferredMacS2C

String. Optional. A comma-separated list of preferred server-to-client Message Authentication Code (MAC) algorithms. If a value is not provided, then the default list of server-to-client MAC algorithms (in the default order) is used.

minDHKeySize

Integer. Optional. The minimum DH key size. The default value is 1024. This field is not applicable if *sftpClientVersion* is version1.

maxDHKeySize

Integer. Optional. The maximum DH key size. The default value is 8192. This field is not applicable, if *sftpClientVersion* is version1.

proxyAlias

String. Optional. The proxy alias through which the request should be routed. The proxy alias can be HTTP, HTTPS, or SOCKS. If a proxy alias is not specified, Integration Server makes outbound requests using each enabled proxy server alias until the request is sent successfully or all proxy servers are tried.

Output Parameters

hostKeyBytes

Object. An array of bytes (`byte[]`). The host key in byte array format.

fingerprint

String. Fingerprint of the host key.

pub.client.sftp:logout

WmPublic. Logs off the user from the SFTP server and ends the current SFTP session.

Input Parameters

sessionKey **String** Unique key for the current SFTP session. The *sessionKey* parameter is returned by the [pub.client.sftp:login](#) service.

Output Parameters

returnCode **String** Standard SFTP protocol return code.

returnMsg **String** Text message describing the return code.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:ls

WmPublic. Retrieves the remote directory listing of the specified path. If path is not specified, the [pub.client.sftp:ls](#) service retrieves the file listing of the current remote directory. The [pub.client.sftp:ls](#) service also retrieves additional details such as permissions and ownership information.

Input Parameters

sessionKey **String** Unique key for the current SFTP session. The *sessionKey* parameter is returned by the [pub.client.sftp:login](#) service.

path **String** Optional. Absolute or relative path of the remote directory. If no *path* is specified, the [pub.client.sftp:ls](#) service retrieves the directory listing of the current remote directory.

You can use the wildcard characters asterisk (*) and question mark (?) after the last slash (/) to view all remote directories or files that match the specified path.

Note:

SFTP client version 2 supports only the asterisk (*) wildcard for filtering files. For example, *.xml , *.txt , and so on. However, Java regular expressions are not supported.

Output Parameters

returnCode **String** Standard SFTP protocol return code.

returnMsg **String** Text message describing the return code.

dirList **Document** List of directories matching the pattern specified in the *path* parameter. Following are the parameters in the document:

Key	Description
<i>fileName</i>	String Specifies the name of the remote file.
<i>fileSize</i>	String Specifies the size of the remote file.
<i>permissions</i>	String Specifies the access permission of the file (read, write, or execute).
<i>lastAccessTime</i>	String Specifies the time when the file was last accessed.
<i>lastModifiedTime</i>	String Specifies the time when the file was last modified.
<i>uid</i>	String Specifies the user ID of the file owner.
<i>gid</i>	String Specifies the group id associated with the file.
<i>longName</i>	String Specifies the long name of the <code>ls</code> entry. It contains all the parameters space separated.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

The date format for SFTP client services is determined by the `watt.server.sftp.dateStampFmt` property.

pub.client.sftp:mkdir

WmPublic. Creates a new remote directory.

Input Parameters

sessionKey **String** Unique key for the current SFTP session. The *sessionKey* parameter is returned by the [pub.client.sftp:login](#) service.

path **String** Absolute or relative path of the remote directory where you want to create a new directory.

Output Parameters

<i>returnCode</i>	String Standard SFTP protocol return code.
<i>returnMsg</i>	String Text message describing the return code.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:put

WmPublic. Transfers a file to a remote SFTP server.

Input Parameters

<i>sessionKey</i>	String Unique key for the current SFTP session. The <i>sessionKey</i> is returned by the pub.client.sftp:login service.
<i>contentStream</i>	java.io.InputStream Optional. Data to be transferred to the remote file.
<i>localFile</i>	String Optional. Name of the local file to be appended to the remote file. Use <i>localFile</i> only if <i>contentStream</i> is not specified.
<i>remoteFile</i>	String Optional. Absolute or relative path of the remote file to which the local file is to be appended.
<i>mode</i>	String Optional. Specifies how the local file is to be transferred to the remote SFTP server. Set to: <ul style="list-style-type: none">■ <code>overwrite</code> to overwrite the contents of the remote file with the contents of the local file. This is the default.■ <code>append</code> to append the entire contents of the local file to the remote file.■ <code>resume</code> to resume writing the contents of the local file to the remote file from the point the writing was stopped during previous SFTP sessions.

Output Parameters

<i>returnCode</i>	String Standard SFTP protocol return code.
<i>returnMsg</i>	String Text message describing the return code.

Usage Notes

If you specify *contentStream*, you must specify *remoteFile*. In this case, *localFile* is optional.

If you specify *localFile*, then *remoteFile* and *contentStream* are optional. In this case, the remote file will be given the same name as the local file.

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:pwd

WmPublic. Displays the remote working directory in the SFTP server.

Input Parameters

sessionKey **String** Unique key for the current SFTP session. The *sessionKey* is returned by the [pub.client.sftp:login](#) service.

Output Parameters

returnCode **String** Standard SFTP protocol return code.

returnMsg **String** Text message describing the return code.

path **String** Absolute or relative path of the working directory on the remote SFTP server.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:rename

WmPublic. Renames a file or directory on a remote SFTP server.

Input Parameters

sessionKey **String** Unique key for the current SFTP session. The *sessionKey* is returned by the [pub.client.sftp:login](#) service.

oldPath **String** Fully qualified name of the file you want to rename (for example, temp/oldname.txt).

newPath **String** New fully qualified name for the file (for example, temp/newname.txt).

Output Parameters

returnCode **String** Standard SFTP protocol return code.

returnMsg **String** Text message describing the return code.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:rm

WmPublic. Deletes one or more remote files on the SFTP server.

Input Parameters

sessionKey **String** Unique key for the current SFTP session. The *sessionKey* is returned by the [pub.client.sftp:login](#) service.

path **String** Absolute or relative path of the file you want to delete.

Output Parameters

returnCode **String** Standard SFTP protocol return code.

returnMsg **String** Text message describing the return code.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:rmdir

WmPublic. Deletes one or more remote directories on the SFTP server.

Input Parameters

sessionKey **String** Unique key for the current SFTP session. The *sessionKey* is returned by the [pub.client.sftp:login](#) service.

path **String** Absolute or relative path of the directory you want to delete.

Output Parameters

returnCode **String** Standard SFTP protocol return code.

returnMsg **String** Text message describing the return code.

Usage Notes

The remote directories that you want to delete must be empty.

You cannot execute SFTP commands in parallel using the same session key.

pub.client.sftp:symlink

WmPublic. Creates a symbolic link between the old path and the new path of a file.

Input Parameters

<i>sessionKey</i>	String Unique key for the current SFTP session. The <i>sessionKey</i> is returned by the pub.client.sftp:login service.
<i>oldPath</i>	String Old path of the file for which you want to create a symbolic link.
<i>newPath</i>	String New path of the file to which the symbolic link should point.

Output Parameters

<i>returnCode</i>	String Standard SFTP protocol return code.
<i>returnMsg</i>	String Text message describing the return code.

Usage Notes

You cannot execute SFTP commands in parallel using the same session key.

pub.client:smtp

WmPublic. Sends a MIME-type e-mail message.

You may attach one or more content objects or files to the message.

Input Parameters

<i>to</i>	String Optional. E-mail address of the receiver. If you specify multiple addresses, separate them with commas.
<i>cc</i>	String Optional. E-mail addresses of additional receivers. If you specify multiple addresses, separate them with commas.
<i>bcc</i>	String Optional. E-mail addresses of additional receivers. If you specify multiple addresses, separate them with commas.

<i>subject</i>	String Optional. Subject of the message.
<i>subjectCharset</i>	String Optional. The character set used to encode the MIME message headers (including subject). If <i>subjectCharset</i> is not specified, then <i>charset</i> is used. If <i>charset</i> is not specified, the value in the server configuration parameter <code>watt.server.email.charset</code> is used. If that parameter is not set, the <code>utf-8</code> encoding is used.
<i>charset</i>	String Optional. The character encoding of the body text. If you do not specify the value of <i>charset</i> , the value in the server configuration parameter <code>watt.server.email.charset</code> is used. If that parameter is not set, the <code>utf-8</code> encoding is used.
<i>from</i>	String Optional. E-mail address of the sender. If you do not specify a <i>from</i> value, Integration Server uses the value specified for the <code>mail.smtp.from</code> JVM property. If no value is specified for that property, Integration Server uses the default value, <code>user@servername</code> , where <i>user</i> is the operating system user ID, and <i>servername</i> is the host name of the Integration Server.
<i>mailhost</i>	<p>String SMTP host name for outbound messages. For example: <code>smtp.webMethods.com</code></p> <p>If no value is provided for the <i>mailhost</i> parameter, Integration Server uses the value of the Java system property <code>mail.smtp.host</code> set for Integration Server as the <i>mailhost</i> value. For more information about setting Java system properties for Integration Server, which includes modifying the <code>custom_wrapper.conf</code> file, see the section <i>Changing Settings in the Configuration File <code>custom_wrapper.conf</code></i> in the <i>webMethods Integration Server Administrator's Guide</i>.</p> <p>If no value is supplied for the <i>mailhost</i> parameter and the <code>mail.smtp.host</code> Java system property is not set, the <code>pub.client:smtp</code> service ends with an exception.</p>
<i>mailhostPort</i>	String Optional. The number of the port on which the SMTP host listens. This parameter does not need to be set if the host listens on port 25 (the standard SMTP port).
<i>auth</i>	Document Optional. Authorization information that the SMTP service will submit.

Key	Description
<i>type</i>	<p>String. Specifies how you want to authenticate the user on the specified e-mail server.</p> <ul style="list-style-type: none"> ■ Select Basic to authenticate the user on the specified

e-mail server with only username and password. This is the default authentication type.

- Select **Bearer** to authenticate the user on the specified e-mail server with the access token issued by the OAuth server.

user **String.** The username that this service submits when requesting a protected resource.

pass **String.** Conditional. Password associated with *user*. This parameter is required only when *auth* is `Basic`.

token **String.** Conditional. The access token issued by the OAuth server to Integration Server. This parameter is required only when *auth* is `Bearer`. To get the access token, see “[pub.client.oauth:getExternalAccessToken](#)” on page 169

secure **Document** Optional. Parameters specifying the security protocol and truststore information for certificate validation that Integration Server uses when communicating with the SMTP server port.

Key	Description
<i>transportLayerSecurity</i>	<p>String Type of security protocol Integration Server uses when communicating with the SMTP server port. Set to:</p> <ul style="list-style-type: none"> ■ <code>none</code> to use a non-secure mode when communicating with the port on the SMTP server. This is the default. ■ <code>explicit</code> to use explicit security when communicating with the port on the SMTP server. With explicit security, Integration

Server establishes an un-encrypted connection to the e-mail server and then switches to the secure mode.

- `implicit` to use implicit security when communicating with the port on the SMTP server. With implicit security, Integration Server always establishes an encrypted connection to the e-mail server.

truststoreAlias

String Optional. Alias for the truststore that contains the list of certificates that Integration Server uses to validate the trust relationship. If you do not specify a truststore alias, the default truststore alias will be used.

body

String Optional. The content of the message.

mimeStream

java.io.InputStream Optional. MIME or S/MIME message that you want to send in the e-mail. A *mimeStream* is created by the [pub.mime:getEnvelopeStream](#), [pub.smime:createEncryptedData](#), [pub.smime:createSignedData](#), or [pub.smime.keystore:createSignedData](#) services. It contains both headers and content. If the *mimeStream* already contains the from, to, and subject headers, you do not need to pass them as individual inputs to this service.

attachments

Document List Optional. Attachments to the message. Each attachment defines one message part in a multi-part message.

Key	Description
<i>contenttype</i>	String MIME type of the message. For example: <code>application/x-edifact-message</code>
<i>content</i>	byte[] , String , or java.io.InputStream Content of the message.
<i>filename</i>	String Name to assign to the attachment. If you do not specify <i>attachment/content</i> , the parameter specifies the file name of a local

file to attach to the message. In other words:

- If you specify *attachment/content* and *attachments/filename*, the service uses the value of *attachments/filename* as the name to assign to the attachment specified by *attachment/content*.
- If you specify *attachments/filename*, but not *attachment/content*, the service attaches the local file specified by *attachments/filename*.

encoding

String Optional. Encoding of the message. For example: base64 or 7bit. If *encoding* is not specified, 7bit is used.

charset

String Optional. Character set encoding of the attachment. This value is added to the Content-Type header for the attachment. If *charset* is not specified, the value in the server configuration parameter `watt.server.email.charset` is used. If that parameter is not set, the utf-8 encoding is used.

properties

Document List Optional. SMTP system properties to send to the SMTP server. This parameter overrides the settings on the `watt.config.systemProperties` server configuration parameter. If you omit this *properties* parameter, Integration Server uses the settings specified on the `watt.config.systemProperties` server configuration parameter.

Key	Description
<i>name</i>	Name of the SMTP system property.
<i>value</i>	Value to specify for the SMTP property.

Output Parameters

status **String** Final status of service.

Usage Notes

Any one of the recipient fields, that is the *to*, *cc*, or the *bcc* parameter, must be defined.

If you are using *filename* to attach a file to the message and the file is not a plain text file, you must set the *contenttype* and *encoding*. For example, to attach

IntegrationServer_directory\instances\instance_name\mydir\myfile.doc to a `pub.client:smtp` service, you would invoke the service with the following values in *attachments*:

contenttype:application/msword

filename:instances/instance_name/mydir/myfile.doc

encoding:base64

Prior to Integration Server version 10.15, the `pub.client:smtp` service included the *useJSSE* input parameter which specified whether Integration Server created the outbound connection using the Java Secure Socket Extension (JSSE) library. Beginning with Integration Server version 10.15, Integration Server establishes all secure outbound connections with JSSE. If you migrated to Integration Server 10.15 and a migrated service invokes `pub.client:smtp`, the *useJSSE* parameter still appears in the pipeline. However, Integration Server ignores the value of the *useJSSE* parameter, proceeding as if *useJSSE* were set to *yes*.

pub.client:soapClient

WmPublic. Creates and sends SOAP 1.1 and SOAP 1.2 messages over HTTP, HTTPS, or JMS transports for any style/use combination supported by Integration Server.

Input Parameters

address **String** String specifying the URI of the web service endpoint. If you are submitting the request to an Integration Server, remember to direct it to the default SOAP processor (*ws*) as shown in the following example:

```
http://rubicon:5555/soap/ws/example:calculator
```

request **Document** The input parameters that are to be passed to the web service.

wsdName **String** The name of the consumer web service descriptor that contains the operation you want to invoke.

wsdBinderName **String** The name of a binder that contains information to use to create and send the request. This binder must be in the consumer web service descriptor specified in *wsdName*.

Note:

The consumer web service endpoint alias assigned to a binder indicates which proxy server Integration Server uses to send the request. For more information about proxy server usage and web service endpoint aliases, see the section *Creating an Endpoint Alias for a Provider Web Service Descriptor for Use with HTTP/S* in the *webMethods Integration Server Administrator's Guide*.

wsdOperationName **String** The name of the operation that you want to invoke. This operation must be contained in the binder specified in *wsdBinderName*.

targetInputSignature **String** Fully qualified name of the IS document type to use to validate and encode the contents of *request*.

targetOutputSignature **String** Fully qualified name of the IS document type to use to validate and decode the output value returned by the web service.

soapHeaders **Document** Optional. Header documents included in the SOAP request as SOAP headers.

transportHeaders **Document** Optional. Transport header fields that you want to explicitly set in the request issued by the `pub.client:soapClient` service.

Specify a key in *transportHeaders* for each header field that you want to set, where the key's name represents the name of the header field and the key's value represents the value of that header field.

The names and values supplied to *transportHeaders* must be of type `String`. If a transport header has a name or value that is not of type `String`, the header will not be included in the message.

The headers that you pass in to *transportHeaders* vary depending on the transport used to send the SOAP message. The supplied *wsdBinderName* determines the transport.

For more information about specifying *transportHeaders*, refer to the Usage Notes.

method **Document** Optional. The QName of the requested procedure. The name is defined as follows:

Key	Value
<i>namespaceName</i>	String Namespace portion of the procedure's QName.
<i>localName</i>	String Local portion of the procedure's QName.

Note:

The *method* parameter applies when style is RPC.

auth

Document Optional. Parameters specifying the credentials that are to be submitted to the server specified in *address*.

Integration Server allows two levels of authorization credentials: transport level and message level.

Each element is defined as follows:

Key	Description										
<i>transport</i>	<p>Document Optional. Transport level authorization parameters.</p> <table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>type</i></td> <td> <p>String Optional. Type of authentication that the service will perform. Set to:</p> <ul style="list-style-type: none"> ■ Basic to submit a user name and password. This is the default. ■ Digest to submit a password digest for authentication. ■ NTLM to use NTLM authentication. </td> </tr> <tr> <td><i>user</i></td> <td> <p>String Optional. User name that this service will use if one is requested.</p> <p>Note: If you have specified NTLM as <i>type</i>, you must specify <i>user</i> in the following format:</p> <p><i>domain_name\user_name</i></p> </td> </tr> <tr> <td><i>pass</i></td> <td> <p>String Optional. Password that this service will submit if one is requested.</p> </td> </tr> <tr> <td><i>serverCerts</i></td> <td> <p>Document Optional. The message signer's private key and certificate chain.</p> </td> </tr> </tbody> </table>	Key	Description	<i>type</i>	<p>String Optional. Type of authentication that the service will perform. Set to:</p> <ul style="list-style-type: none"> ■ Basic to submit a user name and password. This is the default. ■ Digest to submit a password digest for authentication. ■ NTLM to use NTLM authentication. 	<i>user</i>	<p>String Optional. User name that this service will use if one is requested.</p> <p>Note: If you have specified NTLM as <i>type</i>, you must specify <i>user</i> in the following format:</p> <p><i>domain_name\user_name</i></p>	<i>pass</i>	<p>String Optional. Password that this service will submit if one is requested.</p>	<i>serverCerts</i>	<p>Document Optional. The message signer's private key and certificate chain.</p>
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<i>pass</i>	<p>String Optional. Password that this service will submit if one is requested.</p>										
<i>serverCerts</i>	<p>Document Optional. The message signer's private key and certificate chain.</p>										

privateKey **Object** The SOAP message signer's private key.

certChain **Object List** A list containing the signer's complete certificate chain, where element 0 in the list contains the signer's certificate and element 1 contains the CA's certificate.

message

Document Optional. Message level authorization parameters.

Key	Description
-----	-------------

<i>user</i>	String Optional. User name that this service will use if one is requested.
-------------	---

<i>pass</i>	String Optional. Password that this service will submit if one is requested.
-------------	---

<i>serverCerts</i>	Document Optional. The message signer's private key and certificate chain.
--------------------	---

privateKey **Object** The SOAP message signer's private key.

certChain **Object List** A list containing the signer's complete certificate chain, where element 0 in the list contains the signer's certificate and element 1 contains the CA's certificate.

<i>partnerCert</i>	Object Optional. The partner's complete certificate chain, where element 0 in the list contains the message signer's certificate and element 1 contains the CA's certificate.
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timeout

String Optional. Time (measured in milliseconds) to wait for a response from the server hosting the web service before timing out and terminating the request.

A value of 0 means Integration Server waits for a response indefinitely. If the connection to the host or JMS provider ends before

Integration Server receives a response, the service ends with an exception and a status code of 408.

If this parameter is not specified, or an invalid (non-numeric) value is specified, Integration Server uses one of the following values:

- For HTTP, Integration Server uses the value of the `watt.server.SOAP.request.timeout` server configuration parameter as the *timeout* value
- For JMS, Integration Server uses the value of the `watt.server.soapjms.request.timeout` server configuration parameter as the *timeout* value.

For more information about `watt.server.SOAP.request.timeout` and `watt.server.soapjms.request.timeout` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

Integration Server ignores timeout if the name/value pair `jms.async=true` is passed in to *transportHeaders*.

soapAction

String Optional. Specifies one of the following:

- If *soapProtocol* is set to `SOAP 1.1 Protocol`, specifies the value to which you want to set the SOAPAction HTTP header.
- If *soapProtocol* is set to `SOAP 1.2 Protocol`, specifies the value to which you want to set the action attribute in the Content-Type header.

Integration Server ignores *soapAction* in either of the following situations:

- The Content-Type header is passed in to *transportHeaders* and *soapProtocol* is set to `SOAP 1.2 Protocol`.
- The *soapAction* header is passed into *transportHeaders* and *soapProtocol* is set to `SOAP 1.1 Protocol`.

soapProtocol

String Optional. Indicates the SOAP protocol the service uses to send messages. Valid values are `SOAP 1.1 Protocol` or `SOAP 1.2 Protocol`.

encoding

String Optional. Specifies the encoding method. Default value is UTF-8.

Integration Server ignores *encoding* if the Content-Type header is passed in to *transportHeaders*.

Output Parameters

soapResponseData **Object** A SOAP object containing the SOAP response message returned by the server specified in *address*.

response **Document** Output parameters returned from the web service.

header **Document** Conditional. Headers from the response and request messages.

header contains the following keys:

Key	Value
-----	-------

<i>requestLines</i>	<p>Document Conditional. Header fields from the request message. Each key in <i>requestLines</i> represents a line (field) in the request header. Key names represent the names of header fields. The keys' values are Strings containing the values of the fields.</p>
---------------------	--

The contents of the *requestLines* document are not identical to *transportHeaders*. The transport can add, remove, or alter specific headers while processing the request.

Whether or not the web service connector returns the *requestLines* parameter depends on the success or failure of the `pub.client:soapClient` service. In the case of failure, the point at which the failure occurs determines the presence of the *requestLines* parameter. For more information, see the usage notes for this service.

For the HTTP or HTTPS transports, the *requestLines* parameter will not contain any HTTP headers that the transport mechanism added or modified when sending the request.

For the JMS transport, each key in *requestLines* represents a JMS message header. Key names represent the names of header fields. Key values are Strings containing the values of the header fields. The JMS provider populates some JMS message header fields after it successfully receives the JMS message. Additionally, the Integration Server specific run-time properties (properties that begin with the "jms." prefix) are not returned in JMS transport, each key in *requestLines*. The JMS provider uses the information in these properties to populate the JMS message header fields that correspond to the properties.

<i>lines</i>	<p>Document Header fields from the response. Each key in <i>lines</i> represents a field (line) of the response header.</p>
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Key names represent the names of header fields. The keys' values are Strings containing the values of the fields.

Whether or not the `pub.client:soapClient` service returns the *lines* parameter depends on the success or failure of the service. In the case of failure, the point at which the failure occurs determines the presence of the *lines* parameter. For more information, see the usage notes for this service.

For the HTTP or HTTPS transports, the *lines* parameter contains any HTTP/HTTPS headers present in the response.

For the JMS transport, the *lines* parameter contains the JMS headers present in the response.

status **String** Status code from the request, returned by the underlying transport. response. For more information about status codes returned by the service, see the usage notes for this service.

statusMessage **String** Status message returned by the transport. For more information about status messages returned by the service, see the usage notes for this service.

soapStatus **String** Flag indicating whether the SOAP request message was processed successfully.

<u>A value of...</u>	<u>Indicates that...</u>
0	The remote server successfully processed the SOAP request and returned a SOAP response message.
1	The remote server returned a SOAP fault, indicating that the SOAP request was received but was not processed successfully.
2	The server returned an error that was not a SOAP fault. This indicates that some type of HTTP error occurred (often, an HTTP 404). You can check the <i>status</i> field in <i>header</i> to determine the type of HTTP error that occurred.

Usage Notes

If the *address* begins with `https:`, you must specify a private key and certificate chain. You can use the *auth/transport/serverCerts* parameters to do so. If you do not specify them using the *auth/transport/serverCerts* parameters, `pub.client:soapClient` uses the web service endpoint alias specified

in the binder. If the endpoint alias does not have an associated private key and certificate chain, then the default outbound SSL certificate settings are used to authenticate the resources.

Note: `pub.client:soapClient` supports NTLM protected web service over HTTP as well as HTTPS.

As part of executing `pub.client:soapClient`, Integration Server executes any service handlers assigned to the consumer web service descriptor specified in `wsdName`.

When a document type contains a String variable that represents a required attribute (meaning that the variable name starts with the "@" symbol and the **Required** property is set to **True** in Designer) and the input document does not contain the required attribute, Integration Server adds an empty attribute during document encoding. For example, if the document type contains a required String variable named `@myAttribute` but `@myAttribute` is missing from the input document, Integration Server adds `myAttribute=""` to the XML document.

Note:

Because empty `xmlns` attributes are invalid, if the document type contains a required String variable named `@xmlns` and the input document does not specify a value for the `@xmlns` attribute, Integration Server *does not* add `xmlns=""` to the XML document.

Keep the following points in mind when specifying `transportHeaders` for HTTP or HTTPS:

- For any header name/value pair supplied in `transportHeaders`, Integration Server simply passes through the supplied headers and does not perform any validation for the headers.
- If you do not set `transportHeaders` or do not specify the following header fields in `transportHeaders`, Integration Server adds and specifies values for the following header fields:
 - Accept
 - Authorization
 - Connection
 - Content-Type
 - Host
 - SOAPAction (Added when `soapProtocol` is SOAP 1.1 only)
 - User-Agent

Important:

Pass in the preceding headers to `transportHeaders` only if you are an experienced web service developer. Incorrect header values can result in failure of the HTTP request.

- If you specify Content-Type in `transportHeaders`, Integration Server ignores the value of the `encoding` input parameter.
- If you specify Content-Type in `transportHeaders` and the `soapProtocol` input parameter is set to SOAP 1.2, Integration Server ignores the value of the `soapAction` input parameter.

- If you specify the `SOAPAction` header in `transportHeaders` and the `soapProtocol` input parameter is set to `SOAP 1.1 Protocol`, Integration Server ignores the value of the `soapAction` input parameter.
- If MTOM processing converts any portion of the SOAP request to an MTOM/XOP attachment, it will overwrite the `Content-Type` value supplied to the `transportHeaders` input.
- Integration Server sets the value of `Content-Length` automatically and overrides any value passed in to `transportHeaders`.
- Integration Server automatically adds the `Cookie` header to the HTTP header and supplies any cookies established between Integration Server and the HTTP server with which it is interacting. If you supply the `Cookie` header to `transportHeaders`, Integration Server prepends the values you supply to the already established `Cookie` header value.
- The following headers are considered to be standard and require the specified capitalization: `Accept`, `Authorization`, `Connection`, `Content-Type`, `Cookie`, `Host`, `SOAPAction`, `User-Agent`.
- Using capitalization other than that which is specified results in undefined behavior.
- Supplying duplicate entries for any standard header results in undefined behavior.

Keep the following points in mind when specifying `transportHeaders` for JMS:

- Specify a key in `transportHeaders` for each header field that you want to set, where the key's name represents the name of the header field and the key's value represents the value of that header field.
- You can specify the following JMS message header fields in `transportHeaders`:
 - `JMSCorrelationID`
 - `JMSType`

Note:

The `JMSCorrelationID` and `JMSType` names are case-sensitive.

- You can specify the following JMS-defined properties in `transportHeaders`:
 - `JMSXGroupID`
 - `JMSXGroupSeq`

If the value of `JMSXGroupSeq` is not an integer, Integration Server ignores the name/value pair and does not place it in the message header.

Note:

The `JMSXGroupID` and `JMSXGroupSeq` names are case-sensitive.

- The "JMSX" prefix is reserved for JMS-defined properties. If a header whose name starts with "JMSX" is passed into `transportHeaders` and it is not named `JMSXGroupID` or `JMSXGroupSeq`, Integration Server generates a fault and returns it to the service.

- You can set any provider-specific property whose name starts with “JMS_” in *transportHeaders*. Integration Server maps a supplied name/value pair whose name starts with “JMS_” directly to a JMS message property. Because the JMS standard reserves the prefix “JMS_<vendor_name>” for provider-specific properties, Integration Server does not validate the name or value of this content.

Note:

The JMS provider determines which provider-specific properties to accept and include in the JMS message properties. For more information about provider-specific message properties how the JMS provider handles them, review the JMS provider documentation.

- You can use *transportHeaders* to specify run-time properties that affect the values of the JMS message and JMS message headers. The following table identifies these properties and indicates the JMS message header fields affected by each property.

Property Name	Description
<code>jms.async</code>	Indicates whether this is a synchronous or asynchronous request/reply. This run-time property does not affect a JMS message header field.

Note:

This property applies when `pub.client:soapClient` calls an operation with an In-Out message exchange pattern only

Value	Description
<code>true</code>	Indicates this is an asynchronous request/reply. Integration Server does not wait for a response message before executing the next step in the flow service. If <code>jms.async</code> is true, Integration Server ignores the <i>timeout</i> input parameter.
<code>false</code>	Default. Indicates this is a synchronous request/reply. Integration Server waits for a response before executing the next step in the flow service.

`jms.deliveryMode` Specifies the message delivery mode for the message. Integration Server uses this value to set the `JMSDeliveryMode` header.

Value	Description
<code>PERSISTENT</code>	Indicates the request message is persistent.
<code>2</code>	Default. Indicates the request message is persistent.

Property Name	Description
	<p>NON_PERSISTENT Indicates the request message is not persistent.</p> <p>1 Indicates the request message is not persistent.</p>
	<p>Note: If the <code>jms.deliveryMode</code> is not one of the above values, Integration Server ignores the name/value pair and uses the default value of 2.</p>
<code>jms.messageType</code>	<p>Message type identifier for the message. Integration Server uses this value to set the JMSType header.</p> <p>Specify one of the following:</p> <ul style="list-style-type: none"> ■ BytesMessage ■ TextMessage
	<p>Note: If the <code>jms.messageType</code> value is not BytesMessage or TextMessage, Integration Server ignores the name/value pair and uses the default value of BytesMessage</p>
<code>jms.timeToLive</code>	<p>Length of time, in milliseconds, that the JMS provider retains the message. A value of 0 means that the message does not expire.</p> <p>The JMS provider uses this value to set the JMSExpiration header in the sent JMS message.</p>
	<p>Note: If the <code>jms.timeToLive</code> value is not a valid Long, Integration Server ignores the property and uses the default value of 0.</p>
<code>jms.priority</code>	<p>Specifies the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.</p> <p>Integration Server uses this value to set the JMSPriority header.</p> <p>If the <code>jms.priority</code> value is not a value between 0 to 9, Integration Server ignores the property and uses the default value of 4.</p>
	<ul style="list-style-type: none"> ■ The lowercase “jms.” prefix is reserved for run-time properties used by Integration Server. If a header starts with “jms.” and is not one of the “jms.” properties defined by Integration Server, Integration Server ignores the property.

The *header* information returned when `pub.client:soapClient` executes an operation in a web service descriptor created on Integration Server version 8.2 or later varies depending on the following:

- The transport used to send the SOAP message which is determined by the *wsdBinderName*
- The success or failure of the *pub.client:soapClient* service and if failure occurs, the point at which that happens
- The message exchange pattern for the operation specified in *wsdOperationName*

Note:

The same conditions that affect the contents of *header* also determine whether the *soapResponseData* contains a SOAP response, a SOAP fault, or an exception.

The following table identifies the basic success and failure scenarios when *pub.client:soapClient* service executes an operation in a web service descriptor created on Integration Server version 8.2 or later and the *header* information that would be returned in each scenario. The table also indicates whether the scenario results in a SOAP response, SOAP fault, or exception being returned in *soapResponseData*.

Note:

JMS status codes as well as the status code 900 are specific to Integration Server and are not derived from any standard.

Use Case

The *pub.client:soapClient* service fails before sending the SOAP request.

Parameter	Description
<i>status</i>	900
<i>statusMessage</i>	Error occurred while preparing SOAP request
<i>requestLines</i> returned?	Yes, if the web service connector created the SOAP request successfully but execution failed before sending the request.
<i>lines</i> returned?	No
<i>soapResponseData</i>	Contains an exception.

Use Case

The *pub.client:soapClient* service fails while sending the SOAP request.

Parameter	Description
<i>status</i>	For HTTP, the status code will be the value returned by the HTTP server. For JMS, the status code will be 400.
<i>statusMessage</i>	For HTTP, the status message will be the message returned by the HTTP server.

	For JMS, the status message will be: Error occurred while sending request to JMS provider.
<i>requestLines</i> returned?	Yes
<i>lines</i> returned?	For HTTP, <i>lines</i> may be returned. For example, when the provider returns a status code in the 300 range or 400 range, it is possible that the provider populated response headers. For JMS, <i>lines</i> will not be returned.
<i>soapResponseData</i>	Contains an exception.

Use Case

The `pub.client:soapClient` service fails while sending the SOAP request because a timeout occurs.

Parameter	Description
<i>status</i>	408
<i>statusMessage</i>	Timeout
<i>requestLines</i> returned?	Yes
<i>lines</i> returned?	No
<i>soapResponseData</i>	Contains an exception.

Use Case

The `pub.client:soapClient` service executes successfully.

Parameter	Description
<i>status</i>	For HTTP, the status code will be the value returned by the HTTP server. The status code will typically be in the 200 range. For JMS and an In-Out or Robust In-Only operation, the status code will be 200. For JMS and an In-Only operation, the status code will be 202.
<i>statusMessage</i>	For HTTP, the status message will be the message returned by the HTTP server. For JMS, the status message will be: OK
<i>requestLines</i> returned?	Yes
<i>lines</i> returned?	Depends on the message exchange pattern (MEP) of the operation. For In-Only and Robust In-Only, <i>lines</i> is not returned.

For In-Out, *lines* is returned.

soapResponseData Contains the SOAP response for In-Out MEP only.

Use Case

The `pub.client:soapClient` service executes successfully but the JMS provider is not available, causing Integration Server to write the JMS message to the client side queue.

Note:

This use case applies to JMS only. It occurs only when the client side queue is enabled for the JMS binder specified in *wsdBinderName*.

Parameter	Description
<i>status</i>	300
<i>statusMessage</i>	Message written to the client side queue.
<i>requestLines</i> returned?	Yes
<i>lines</i> returned?	No.
<i>soapResponseData</i>	Not returned.

Use Case

The `pub.client:soapClient` service sends the SOAP request successfully but receives a SOAP fault from the web service provider.

Parameter	Description
<i>status</i>	For HTTP, the status code will be the value returned by the HTTP server. The status code will typically be in the 500 range. For JMS, the status code will be 500.
<i>statusMessage</i>	For HTTP, the status message will be the message returned by the HTTP server. For JMS, the status message will be: SOAP Fault
<i>requestLines</i> returned?	Yes
<i>lines</i> returned?	No
<i>soapResponseData</i>	Contains an SOAP fault.

Use Case

The `pub.client:soapClient` service fails while processing the SOAP response.

Parameter	Description
<i>status</i>	900

<i>statusMessage</i>	Error occurred while processing SOAP request
<i>requestLines</i> returned?	Yes
<i>lines</i> returned?	Yes
<i>soapResponseData</i>	Contains an exception.

When invoking `pub.client:soapClient` to execute an In-Out operation *asynchronously* using SOAP over JMS, keep the following information in mind:

- For an asynchronous request/reply, you must pass `jms.async= true` into the *transportHeaders* input parameter.
- To instruct Integration Server to write the request message for an asynchronous request/reply to the client side queue when the JMS provider is not available, the JMS binder must be configured to use the client side queue. Specifically, in the consumer web service descriptor, the **Use CSQ** property for the JMS binder must be set to true.
- When `pub.client:soapClient` sends an asynchronous request it executes to completion without populating any response headers for the *lines* output parameter.
- Even though `pub.client:soapClient` does not wait for a SOAP response, it will execute the response handlers assigned to the consumer web service descriptor. However, the `messageContext` that is available to handler services will not contain a response message. Handler services that do not operate on the response message and instead perform activities such as clean up following a request handler invocation might still provide value for an asynchronous request/reply.
- If you want to retrieve the SOAP response from the provider, you need to receive and process the response with a custom solution. This might include using standard JMS trigger or an on-demand message consumer to receive the message and then using the `pub.soap*` services to process the SOAP message.

Note:

Using a JMS trigger or message consumer to receive the response bypasses any response handlers or policies applied to the SOAP response, including any WS-SecurityPolicy. The SOAP response does not undergo any processing provided by the response handlers or policies attached to the consumer web service descriptor. Any response messages that require decryption or authentication will not be usable. Consequently, do not use an asynchronous request/reply to invoke an In-Out operation to which the WS-SecurityPolicy is applied.

When using `pub.client:soapClient` to execute a Robust In-only operation using SOAP over JMS, keep the following information in mind:

- For a consumer web service descriptor, Integration Server provides partial support for Robust In-Only operations with a SOAP over JMS binding. When Integration Server creates a consumer web service descriptor from a WSDL that contains a Robust In-Only operation and that operation is defined as part of a portType with a SOAP over JMS binding, Integration Server populates the reply destination in the JMS message header (the `JMSReplyTo` header field) but otherwise treats the operation as In-Only.

Specifically, `pub.client:soapClient` will not produce or wait for any output besides the `transportInfo` parameter. If an exception occurs while the provider processes the request, the web service connector does not retrieve or process the SOAP response.

- If you want to retrieve a SOAP response (which includes the SOAP fault) that the provider sends when an exception occurs during web service execution, you need to receive and process the response with a custom solution. This might include using a standard JMS trigger or an on-demand message consumer to receive the message and using the `pub.soap*` services to process the SOAP message.

Note:

Using a JMS trigger or message consumer to receive the response bypasses any policies applied to the SOAP response and any response handlers assigned to the consumer web service descriptor. The SOAP response does not undergo any processing provided by the response handlers or policies attached to the consumer web service descriptor. Any response messages that require decryption or authentication will not be usable. Consequently, do not use an asynchronous request/reply to invoke an In-Out operation to which the WS-SecurityPolicy is applied.

If the Docker image for a Microservices Runtime excludes the web services functionality, then the Docker image for the Microservices Runtime running in the Docker container cannot execute the `pub.client:soapClient` service. Attempts to execute `pub.client:soapClient` fail with a `ServiceException`.

Prior to Integration Server version 10.15, the `pub.client:soapClient` service included the `useJSSE` input parameter which specified whether Integration Server created the outbound connection using the Java Secure Socket Extension (JSSE) library. Beginning with Integration Server version 10.15, Integration Server establishes all secure outbound connections with JSSE. If you migrated to Integration Server 10.15 and a migrated service invokes `pub.client:soapClient`, the `useJSSE` parameter still appears in the pipeline. However, Integration Server ignores the value of the `useJSSE` parameter, proceeding as if `useJSSE` were set to `yes`.

See Also

[pub.client:soapHTTP](#)

[pub.client:soapRPC](#)

pub.client:soapHTTP

WmPublic. *Deprecated* - There is no replacement service.

Submits a SOAP message to a server via HTTP or HTTPS.

Input Parameters

soapRequestData

Object SOAP message that is to be sent. This object must be produced with the services in the soap folder. See the Usage Notes for more information.

<i>address</i>	<p>String URL to which you want the SOAP message sent. For example:</p> <pre>https://servername:5555/soap/default</pre>								
<i>auth</i>	<p>Document Optional. Parameters specifying the credentials that are to be submitted to the server specified in <i>address</i>. Each element is defined as follows:</p> <table> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>type</i></td> <td>String Type of authentication that the service will perform. Leave this field blank, as the only option currently available is basic HTTP authentication.</td> </tr> <tr> <td><i>user</i></td> <td>String User name that this service will use if one is requested.</td> </tr> <tr> <td><i>pass</i></td> <td>String Password that this service will submit if one is requested.</td> </tr> </tbody> </table>	Key	Description	<i>type</i>	String Type of authentication that the service will perform. Leave this field blank, as the only option currently available is basic HTTP authentication.	<i>user</i>	String User name that this service will use if one is requested.	<i>pass</i>	String Password that this service will submit if one is requested.
Key	Description								
<i>type</i>	String Type of authentication that the service will perform. Leave this field blank, as the only option currently available is basic HTTP authentication.								
<i>user</i>	String User name that this service will use if one is requested.								
<i>pass</i>	String Password that this service will submit if one is requested.								
<i>validateSOAP</i>	<p>String Optional. Indicates whether or not the response message is to be validated against the SOAP schema. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to validate the response message and throw an exception if the response does not conform to the SOAP schema. ■ <code>false</code> to bypass the validation process. This is the default. 								
<i>SOAPAction</i>	<p>String Optional. Value to which you want to set the SOAPAction HTTP header.</p>								
<i>contentType</i>	<p>String Optional. Specifies the value of Content-Type in the HTTP header. Set to:</p> <ul style="list-style-type: none"> ■ <code>text/xml; charset="utf-8"</code> to specify the content type as XML and the character encoding of the message text as UTF-8. This is the default. ■ <code>text/xml</code> to specify the content type as XML. Since the <code>charset</code> parameter is not specified, the character encoding of the message text defaults to US-ASCII. 								
<i>loadAs</i>	<p>String Optional. Specifies the format of the <code>soapResponseData</code>. Default value is <code>stream</code> for an HTTP service and <code>byteArrayStream</code> for an HTTPS service. Set to:</p> <ul style="list-style-type: none"> ■ <code>stream</code> to return the body of the response as a <code>java.io.InputStream</code>. Use this option when you will invoke an HTTP web service. This is the default for an HTTP service. 								

- `bytes` to return the body of the response as a `byte[]`. Use this option if the body will be used as input to a service that operates on whole HTML or XML documents (for example, `pub.xml:queryXMLNode`).
- `byteArrayStream` to have the response stream fully read and converted to `java.io.ByteArrayStream`. This prevents data loss or a truncated SOAP response if the connection closes prematurely. Use this option when you will invoke an HTTPS web service. This is the default for an HTTPS service.

timeout **String** Optional. Time (measured in milliseconds) to wait for a response from the remote server before timing out and terminating the request. The default value is to wait forever.

encoding **String** Default character set for encoding SOAP message. Specify an IANA-registered character set (for example, ISO-8859-1). The default is UTF-8.

The *encoding* parameter is used to override the encoding determined by the `watt.server.netEncoding` server configuration parameter. For more information about `watt.server.netEncoding`, see *webMethods Integration Server Administrator's Guide*.

Output Parameters

soapResponseData **Object** The SOAP response message returned by the server specified in *address*.

header **Document** Conditional. Headers from the HTTP response. Will contain the following keys:

Key	Description
<i>lines</i>	Document Header fields from the HTTP response. Each key in <i>lines</i> represents a field (line) of the response header. Key names represent the names of header fields. The keys' values are Strings containing the values of the fields.
<i>status</i>	String Status code from the HTTP response.
<i>statusMessage</i>	String Status message from the HTTP response.
<i>soapStatus</i>	String Flag indicating whether the SOAP request message was processed successfully.
A value of...	Indicates that...

- 0 The remote server successfully processed the SOAP request and returned a SOAP response message.
- 1 The remote server returned a SOAP fault, indicating that the SOAP request was received but was not processed successfully.
- 2 The server returned an error that was not a SOAP fault. This indicates that some type of HTTP error occurred (often, an HTTP 404). You can check the *status* element in *header* to determine the type of HTTP error that occurred.

Usage Notes

This `pub.client:soapHTTP` service is deprecated. There is not a replacement service.

If *address* begins with `https:`, you can use [pub.security.keystore:setKeyAndChain](#) to specify the certificate chain. If you do not specify a certificate chain, `pub.client:soapHTTP` uses the default outbound SSL certificate settings to authenticate the resources.

To send a SOAP message with this service, you must first generate an empty SOAP object with the [pub.soap.utils:createSoapData](#) service and then populate it using services such as [pub.soap.utils:addHeaderEntry](#) and [pub.soap.utils:addBodyEntry](#).

If the Docker image for a Microservices Runtime excludes the web services functionality, then the Docker image for the Microservices Runtime running in the Docker container cannot execute the `pub.client:soapHTTP` service. Attempts to execute `pub.client:soapHTTP` result in a `ServiceException`.

See Also

[pub.client:soapRPC](#)

pub.client:soapRPC

WmPublic. *Deprecated* - There is no replacement service.

Submits a SOAP remote procedure call via HTTP or HTTPS.

Input Parameters

address **String** String specifying the numeric address or name of the server on which the remote procedure resides. If you are submitting the request to an Integration Server, remember to direct it to the RPC processor as shown in the following example:

```
http://rubicon:5555/soap/rpc
```

reqParams **Document** The input parameters that are to be passed to the remote procedure. For example, if you wanted to pass three String parameters, *acct*, *amt*, and *org*, containing the values Cash, 150.00, and Sales, *reqParams* would contain the following:

<u>Key</u>	<u>Value</u>
<i>acct</i>	Cash
<i>amt</i>	150.00
<i>org</i>	Sales

method **Document** The QName of the requested procedure where:

<u>Key</u>	<u>Value</u>
<i>namespaceName</i>	String Namespace portion of the procedure's QName.
<i>localName</i>	String Local portion of the procedure's QName.

auth **Document** Optional. User name and password that are to be submitted to the server specified in *address*.

<u>Key</u>	<u>Value</u>
<i>type</i>	String Type of authentication that the service will perform. Leave this field blank, as the only option currently available is basic HTTP authentication.
<i>user</i>	String User name that this service will use if one is requested.
<i>pass</i>	String Password that this service will submit if one is requested.

targetInputSignature **String** Optional. Fully qualified name of the IS document type to use to validate and encode the contents of *reqParams*.

targetOutputSignature **String** Optional. Fully qualified name of the IS document type to use to validate and decode the output value returned by the remote procedure.

SOAPAction **String** Optional. Value to which you want to set the SOAPAction HTTP header.

contentType **String** Optional. Specifies the value of Content-Type in the HTTP header. Set to:

- `text/xml; charset="utf-8"` to specify the content type as XML and the character encoding of the text as UTF-8. This is the default.

- `text/xml` to specify the content type as XML. Since the `charset` parameter is not specified, the character encoding of the text defaults to US-ASCII.
- encoding* **String** Optional. Specifies the encoding method. Default value is UTF-8.
- loadAs* **String** Optional. Specifies the format of the `soapResponseData`. Default value is `stream`. Set to:
- `stream` to return the body of the response as a `java.io.InputStream`. Use this option when you will invoke an HTTP web service. This is the default.
 - `byteArrayStream` to have the response stream fully read and converted to `java.io.ByteArrayStream`. This prevents data loss or a truncated SOAP response if the connection closes prematurely. Use this option when you will invoke an HTTPS web service.
- timeout* **String** Optional. Time (measured in milliseconds) to wait for a response from the server hosting the remote procedure before timing out and terminating the request. The default value is to wait forever.

Output Parameters

soapResponseData **Object** A SOAP object containing the SOAP response message returned by the server specified in *address*.

respParms **Document** Output parameters returned by the remote procedure. For example, if the remote procedure returned two `String` parameters, *status* and *balance*, containing the values `closed` and `-4.95`, *respParms* would contain the following:

Key	Value
<i>status</i>	<code>closed</code>
<i>balance</i>	<code>-4.95</code>

header **Document** Conditional. Headers from the HTTP response. Will contain the following keys:

Key	Value
<i>lines</i>	Document Header fields from the HTTP response. Each key in <i>lines</i> represents a field (line) of the response header. Key names represent the names of header fields. The keys' values are <code>Strings</code> containing the values of the fields.
<i>status</i>	String Status code from the HTTP response.

	<i>statusMessage</i>	String Status message from the HTTP response.
<i>soapStatus</i>		String Flag indicating whether the SOAP request message was processed successfully.
	A value of...	Indicates that...
	0	The remote server successfully processed the SOAP request and returned a SOAP response message.
	1	The remote server returned a SOAP fault, indicating that the SOAP request was received but was not processed successfully.
	2	The server returned an error that was not a SOAP fault. This indicates that some type of HTTP error occurred (often, an HTTP 404). You can check the <i>status</i> field in <i>header</i> to determine the type of HTTP error that occurred.

Usage Notes

The `pub.client:soapRPC` service is deprecated. There is not a replacement service.

To disable output validation for `pub.client:soapRPC`, set the `watt.server.soap.validateResponse` server configuration parameter to `false`. For more information about `watt.server.soap.validateResponse`, see *webMethods Integration Server Administrator's Guide*.

If *address* begins with `https:`, you can use [pub.security.keystore:setKeyAndChain](#) to specify the certificate chain. If you do not specify a certificate chain, `pub.client:soapRPC` uses the default outbound SSL certificate settings to authenticate the resources.

If the Docker image for a Microservices Runtime excludes the web services functionality, then the Docker image for the Microservices Runtime running in the Docker container cannot execute the `pub.client:soapRPC`. Attempts to execute the `pub.client:soapRPC` service end with a `ServiceException`.

See Also

[pub.client:soapHTTP](#)

pub.client:websocket

`WmPublic`. Establishes a WebSocket connection to the URL captured in the identified WebSocket client endpoint.

Input Parameters

nsName **String** Namespace name of the WebSocket client endpoint.

headers

Record Optional. Headers that are part of the HTTP request used to establish the WebSocket connection.

Key	Description
<i>name</i>	The name of the header.
<i>value</i>	The value of the header

auth

String Authentication information that the `pub.client:websocket` service will submit to the URL in WebSocket client endpoint.

Key	Description
<i>type</i>	String Type of authentication scheme that you want this service to use when it submits this request. Set to: basic to submit a username and password.
<i>username</i>	String Username that this service will submit when requesting a protected resource.
<i>password</i>	String Password associated with user.

secure

String Optional. Parameters specifying the truststore information for certificate validation that Integration Server uses when communicating with the WebSocket server port:

Key	Description
<i>truststoreAlias</i>	String Alias for the truststore that contains the list of certificates that Integration Server uses to validate the trust relationship. If you do not specify a truststore alias, the default truststore alias specified in the <code>watt.security.trustStoreAlias</code> property will be used.

connectTimeout

String Optional. Time (measured in milliseconds) the server will wait to connect to the remote server before timing out and terminating the request.

If a value for *connectTimeout* is not specified, Integration Server uses the value specified for the `watt.net.timeout` server configuration parameter. If no value is specified for the `watt.net.timeout` server configuration parameter, the server will wait for the timeout value defined by the operating system before terminating the connection request. For more information about the `watt.net.timeout` server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

<i>cookies</i>	String Optional. The cookies which are to be part of the HTTP request used to establish a WebSocket connection.
<i>extensions</i>	String Optional. The extensions which are to be part of the HTTP request used to establish a WebSocket connection.
<i>subProtocols</i>	String Optional. The subprotocols which are to be part of the HTTP request used to establish a WebSocket connection.

Output Parameters

<i>sessionId</i>	String Session ID to identify the WebSocket session.
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7 Compress Folder

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You can use the elements in the compress folder to compress the data before sending the HTTP request and decompress it after receiving the HTTP response.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.compress:compressData	WmPublic. Performs compression of data.
pub.compress:decompressData	WmPublic. Performs decompression of data.

pub.compress:compressData

WmPublic. Compresses the data before sending the HTTP request using any of the specified compression schemes.

Input Parameters

data **Document.** Data that you want the `pub.compress:compressData` service to compress. Specify data using one of the following keys.

Important:

When you use more than one key, *string* is appended first, *bytes* is appended second, and *stream* is appended last and Integration Server uses the first key that it encounters.

Key	Description
<i>string</i>	String. Optional. Text that you want the <code>pub.compress:compressData</code> service to compress.
<i>bytes</i>	byte[]. Optional. Data that you want the <code>pub.compress:compressData</code> service to compress.
<i>stream</i>	java.io.InputStream. Optional. Data that you want the <code>pub.compress:compressData</code> service to compress.

compressionScheme **String.** The compression method you want the `pub.compress:compressData` service to apply to compress the data. The supported compression schemes are `gzip` and `deflate`.

loadAs **String.** Form in which you want the `pub.compress:compressData` service to store the output data. Set to:

- `bytes` to store the data as a `byte[]`.
- `stream` to store the data as a `java.io.InputStream`.

encoding **String** Optional. Name of a registered, IANA character set that specifies the encoding to use when converting the String to an array of bytes (for example: ISO-8859-1).

Output Parameters

compressedData **Document**. Compressed data after applying the compression scheme.

Key	Description
<i>bytes</i>	byte[] . Conditional. Compressed data represented as a byte[]. <i>bytes</i> is returned only when the <i>loadAs</i> input parameter is set to bytes.
<i>stream</i>	java.io.InputStream . Conditional. Compressed data represented as an InputStream. <i>stream</i> is returned only when the <i>loadAs</i> input parameter is set to stream.

Note:

This service just compresses the data; if you want to send the data as a payload in an HTTP request, you can send the data as input to `pub.client:http` service. For more information, see [“pub.client:http” on page 141](#).

pub.compress:decompressData

WmPublic. Decompresses the data based on the response header of the HTTP response.

Input Parameters

data **Document**. Data that you want the `pub.compress:decompressData` service to decompress. Specify data using one of the following keys.

Key	Description
<i>bytes</i>	byte[] . Optional. Data that you want the <code>pub.compress:decompressData</code> service to decompress.
<i>stream</i>	java.io.InputStream . Optional. Data that you want the <code>pub.compress:decompressData</code> service to decompress.

compressionScheme **String**. The compression scheme you want the `pub.compress:decompressData` service to apply to decompress the data. The supported compression schemes are `gzip` and `deflate`.

loadAs **String**. Form in which you want the `pub.compress:decompressData` service to store the returned document. Set to:

- `bytes` to return the data as a `byte[]`.
- `stream` to return the data as a `java.io.InputStream`.

Output Parameters

decompressedData

Document. Decompressed data after applying the compression algorithm.

<u>Key</u>	<u>Description</u>
<i>bytes</i>	byte[] . Conditional. Decompressed data represented as a <code>byte[]</code> . <i>bytes</i> is returned only when the <i>loadAs</i> input parameter is set to <code>bytes</code> .
<i>stream</i>	java.io.InputStream . Conditional. The decompressed data represented as an <code>InputStream</code> . <i>stream</i> is returned only when the <i>loadAs</i> input parameter is set to <code>stream</code> .

8 Date Folder

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You can use the elements in the date folder to generate and format date values.

Pattern String Symbols

Many of the date services require you to specify pattern strings describing the data's current format and/or the format to which you want it converted. For services that require a pattern string, use the symbols in the following table to describe the format of your data. For example, to describe a date in the January 15, 1999 format, you would use the pattern string `MMMM dd, yyyy`. To describe the format `01/15/99`, you would use the pattern string `MM/dd/yy`. For more information about these pattern string symbols, see the Oracle Java API documentation for the `SimpleDateFormat` class.

Overview on using the symbols to describe the format of your data.

Symbol	Meaning	Presentation	Example
G	era designator	Text	AD
y	year	Number	1996 or 96
M	month in year	Text or Number	July or Jul or 07
d	day in month	Number	10
h	hour in am/pm (1-12)	Number	12
H	hour in day (0-23)	Number	0
m	minute in hour	Number	30
s	second in minute	Number	55
S	millisecond	Number	978
E	day in week	Text	Tuesday or Tue
D	day in year	Number	189
F	day of week in month	Number	2 (2nd Wed in July)
w	week in year	Number	27
W	week in month	Number	2
a	am/pm marker	Text	PM
k	hour in day (1-24)	Number	24
K	hour in am/pm (0-11)	Number	0
z	time zone	Text	Pacific Standard Time or PST or GMT-08:00
Z	RFC 822 time zone (JVM 1.4 or later)	Number	-0800 (offset from GMT/UT)

Symbol	Meaning	Presentation	Example
'	escape for text	Delimiter	
''	single quote	Literal	'

Time Zones

When working with date services, you can specify time zones. The Earth is divided into 24 standard time zones, one for every 15 degrees of longitude. Using the time zone including Greenwich, England (known as Greenwich Mean Time, or GMT) as the starting point, the time is increased by an hour for each time zone east of Greenwich and decreases by an hour for each time zone west of Greenwich. The time difference between a time zone and the time zone including Greenwich, England (GMT) is referred to as the *raw offset*.

The following table identifies the different time zones for the Earth and the raw offset for each zone from Greenwich, England. The effects of daylight savings time are ignored in this table.

Note:

Greenwich Mean Time (GMT) is also known as Universal Time (UT).

ID	Raw Offset	Name
MIT	-11	Midway Islands Time
HST	-10	Hawaii Standard Time
AST	-9	Alaska Standard Time
PST	-8	Pacific Standard Time
PNT	-7	Phoenix Standard Time
MST	-7	Mountain Standard Time
CST	-6	Central Standard Time
EST	-5	Eastern Standard Time
IET	-5	Indiana Eastern Standard Time
PRT	-4	Puerto Rico and U.S. Virgin Islands Time
CNT	-3.5	Canada Newfoundland Time
AGT	-3	Argentina Standard Time
BET	-3	Brazil Eastern Time
GMT	0	Greenwich Mean Time
ECT	+1	European Central Time

ID	Raw Offset	Name
CAT	+2	Central Africa Time
EET	+2	Eastern European Time
ART	+2	(Arabic) Egypt Standard Time
EAT	+3	Eastern African Time
MET	+3.5	Middle East Time
NET	+4	Near East Time
PLT	+5	Pakistan Lahore Time
IST	+5.5	India Standard Time
BST	+6	Bangladesh Standard Time
VST	+7	Vietnam Standard Time
CTT	+8	China Taiwan Time
JST	+9	Japan Standard Time
ACT	+9.5	Australian Central Time
AET	+10	Australian Eastern Time
SST	+11	Solomon Standard Time
NST	+12	New Zealand Standard Time

Examples

You can specify *timezone* input parameters in the following formats:

- As a full name. For example:

Asia/Tokyo America/Los_Angeles

You can use the `java.util.TimeZone.getAvailableIDs()` method to obtain a list of the valid full name time zone IDs that your JVM version supports.

- As a custom time zone ID, in the format `GMT[+ | -]hh[[:]mm]`. For example:

GMT+2:00 All time zones 2 hours east of Greenwich (that is, Central Africa Time, Eastern European Time, and Egypt Standard Time)

GMT-3:00 All time zones 3 hours west of Greenwich (that is, Argentina Standard Time and Brazil Eastern Time)

GMT+9:30 All time zones 9.5 hours east of Greenwich (that is, Australian Central Time)

- As a three-letter abbreviation from the table above. For example:

PST Pacific Standard Time

Note:

Because some three-letter abbreviations can represent multiple time zones (for example, "CST" could represent both U.S. "Central Standard Time" and "China Standard Time"), all abbreviations are deprecated. Use the full name or custom time zone ID formats instead.

Notes on Invalid Dates

The dates you use with a date service must adhere to the `java.text.SimpleDateFormat` class.

If you use an invalid date with a date service, the date service automatically translates the date to a legal date. For example, if you specify `1999/02/30` as input, the date service interprets the date as `1999/03/02` (two days after `2/28/1999`).

If you use `00` for the month or day, the date service interprets `00` as the last month or day in the Gregorian calendar. For example, if you specify `00` for the month, the date service interprets it as 12.

Notes on Date and Time Format

Year Format

If the pattern `yy` is used for the year, the date service uses a 50-year moving window to interpret the value of `yy`. The date service establishes the window by subtracting 49 years from the current year and adding 50 years to the current year. For example, if you are running the webMethods Integration Server in the year 2000, the moving window would be from 1951 to 2050. The date service interprets 2-digit years as falling into this window (for example, 12 would be 2012, 95 would be 1995).

Milliseconds Format

If you need milliseconds in the timestamp, it is recommended to use triple S (`SSS`) in the date pattern.

When you use services that accept date and time as inputs, it is recommended to use three digits for milliseconds. Otherwise, the services might show inconsistent results. If you specify `SSS` for milliseconds in the date pattern (`yyyy-MM-dd'T'H:mm:ss.SSS'Z'`), enter three digits in place of `SSS`. For example, `2021-07-08T1:20:20.001Z`.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.date:calculateDateDifference	WmPublic. Calculates the difference between two dates and returns the result as seconds, minutes, hours, and days.
pub.date:compareDates	WmPublic. Compares two dates and returns the result as an integer.
pub.date:currentNanoTime	WmPublic. Returns the current time returned by the most precise system timer, in nanoseconds.
pub.date:dateBuild	WmPublic. <i>Deprecated</i> - Replaced by pub.datetime:build .
pub.date:dateTimeBuild	WmPublic. <i>Deprecated</i> - Replaced by pub.datetime:build .
pub.date:dateTimeFormat	WmPublic. Converts date/time (represented as a String) string from one format to another.
pub.date:elapsedNanoTime	WmPublic. Calculates the time elapsed between the current time and the given time, in nanoseconds.
pub.date:formatDate	WmPublic. Formats a Date object as a string.
pub.date:getCurrentDate	WmPublic. Returns the current date as a Date object.
pub.date:getCurrentDateString	WmPublic. Returns the current date as a String in a specified format.
pub.date:getWorkingDays	WmPublic. Returns the number of working days between two dates.
pub.date:incrementDate	WmPublic. <i>Deprecated</i> - Replaced by pub.datetime:increment .

pub.date:calculateDateDifference

WmPublic. Calculates the difference between two dates and returns the result as seconds, minutes, hours, and days.

Input Parameters

<i>startDate</i>	String Starting date and time.
<i>endDate</i>	String Ending date and time.
<i>startDatePattern</i>	String Format in which the <i>startDate</i> parameter is to be specified (for example, yyyyMMdd HH:mm:ss.SSS). For pattern-string notation, see “Pattern String Symbols” on page 224 .

endDatePattern **String** Format in which the *endDate* parameter is to be specified (for example, yyyyMMdd HH:mm:ss.SSS). For pattern-string notation, see [“Pattern String Symbols” on page 224](#).

Output Parameters

dateDifferenceSeconds **String** The difference between the *startingDateTime* and *endingDateTime*, truncated to the nearest whole number of seconds.

dateDifferenceMinutes **String** The difference between the *startingDateTime* and *endingDateTime*, truncated to the nearest whole number of minutes.

dateDifferenceHours **String** The difference between the *startingDateTime* and *endingDateTime*, truncated to the nearest whole number of hours.

dateDifferenceDays **String** The difference between the *startingDateTime* and *endingDateTime*, truncated to the nearest whole number of days.

Usage Notes

Each output value represents the same date difference, but in a different scale. Do not add these values together. Make sure your subsequent flow steps use the correct output, depending on the scale required.

pub.date:compareDates

WmPublic. Compares two dates and returns the result as an integer.

Input Parameters

startDate **String** Starting date to compare against *endDate*.

endDate **String** Ending date to compare against *startDate*.

startDatePattern **String** Format in which the *startDate* parameter is specified (for example, yyyyMMdd HH:mm:ss.SSS). For pattern-string notation, see [“Pattern String Symbols” on page 224](#).

endDatePattern **String** Format in which the *endDate* parameter is specified (for example, yyyyMMdd HH:mm:ss.SSS). For pattern-string notation, see [“Pattern String Symbols” on page 224](#).

Output Parameters

result **String** Checks whether *startDate* is before, the same, or after *endDate*.

<u>A value of...</u>	<u>Indicates that...</u>
+1	The <i>startDate</i> is after the <i>endDate</i> .
0	The <i>startDate</i> is the same as the <i>endDate</i> .
-1	The <i>startDate</i> is before the <i>endDate</i> .

Usage Notes

If the formats specified in the *startDatePattern* and *endDatePattern* parameters are different, Integration Server takes the units that are not specified in the *starDate* and *endDate* values as 0.

That is, if the *startDatePattern* is `yyyyMMdd HH:mm` and the *startDate* is `20151030 11:11` and if the *endDatePattern* is `yyyyMMdd HH:mm:ss.SSS` and the *endDate* is `20151030 11:11:55:111`, then the `pub.date:compareDates` service considers start date to be before the end date and will return the result as -1.

To calculate the difference between two dates, use the [pub.date:calculateDateDifference](#) service.

pub.date:currentNanoTime

WmPublic. Returns the current time returned by the most precise system timer, in nanoseconds.

Input Parameters

None.

Output Parameters

nanoTime **java.lang.Long** Current time returned by the most precise system timer, in nanoseconds.

pub.date:dateBuild

WmPublic. *Deprecated* - Replaced by [pub.datetime:build](#).

Builds a date String using the specified pattern and date elements.

Input Parameters

pattern **String** Pattern representing the format in which you want the date returned. For pattern-string notation, see [“Pattern String Symbols” on page 224](#). If you do not specify *pattern*, `dateBuild` returns null. If *pattern* contains a time zone and

	<i>timezone</i> is not specified, the default time zone of webMethods Integration Server is used.
<i>year</i>	String Optional. The year expressed in <i>yyyy</i> or <i>yy</i> format (for example, 01 or 2001). If you do not specify <i>year</i> or you specify an invalid value, <code>dateBuild</code> uses the current year.
<i>month</i>	String Optional. The month expressed as a number (for example, 1 for January, 2 for February). If you do not specify <i>month</i> or you specify an invalid value, <code>dateBuild</code> uses the current month.
<i>dayofmonth</i>	String Optional. The day of the month expressed as a number (for example, 1 for the first day of the month, 2 for the second day of the month). If you do not specify <i>dayofmonth</i> or you specify an invalid value, <code>dateBuild</code> uses the current day.
<i>timezone</i>	String Optional. Time zone in which you want the output date and time expressed. Specify a time zone code as shown in “Time Zones” on page 225 (for example, EST for Eastern Standard Time). If you do not specify <i>timezone</i> , the value of the server's "user timezone" property is used. If this property has not been set, GMT is used.
<i>locale</i>	String Optional. Locale in which the date is to be expressed. For example, if <i>locale</i> is <i>en</i> (for English), the pattern <code>EEE d MMM yyyy</code> will produce <code>Friday 23 August 2002</code> , and the <i>locale</i> of <i>fr</i> (for French) will produce <code>vendredi 23 août 2002</code> . If <i>locale</i> is not specified, Integration Server uses the value of the <code>watt.server.session.locale.ignore</code> server configuration parameter to determine whether the locale is obtained from the session used by the client that invoked the service or if the locale is the locale of Integration Server.

Output Parameters

<i>value</i>	String The date specified by <i>year</i> , <i>month</i> , and <i>dayofmonth</i> , in the format of <i>pattern</i> .
--------------	--

Usage Notes

The `pub.date:dateBuild` service creates a date String by using the supplied *year*, *month*, and *dayofmonth* to first create a local `java.util.Date` object. The local `java.util.Date` object uses the timezone of the machine running Integration Server. The `pub.date:dateBuild` service then applies the offset between the local timezone and the specified *timezone*. Finally, the service uses *pattern* to convert the `java.util.Date` object to the String returned in *value*. Due to the way in which the `pub.date:dateBuild` service works, if you run the `pub.date:dateBuild` service with the same set of inputs on two different machines, each located in a different timezone, you will get different results.

pub.date:dateTimeBuild

WmPublic. *Deprecated* - Replaced by [pub.datetime:build](#).

Builds a date/time string using the specified pattern and date/time elements.

Input Parameters

<i>pattern</i>	String Pattern representing the format in which you want the time returned. For pattern-string notation, see “Pattern String Symbols” on page 224 . If you do not specify <i>pattern</i> , <code>dateTimeBuild</code> returns null. If <i>pattern</i> contains a time zone and the <i>timezone</i> parameter is not set, the time zone of Integration Server is used.
<i>year</i>	String Optional. The year expressed in <i>yyyy</i> or <i>yy</i> format (for example, 01 or 2001). If you do not specify <i>year</i> or you specify an invalid value, <code>dateTimeBuild</code> uses the current year.
<i>month</i>	String Optional. The month expressed as a number (for example, 1 for January, 2 for February). If you do not specify <i>month</i> or you specify an invalid value, <code>dateTimeBuild</code> uses the current month.
<i>dayofmonth</i>	String Optional. The day of the month expressed as a number (for example, 1 for the first day of the month, 2 for the second day of the month). If you do not specify <i>dayofmonth</i> or you specify an invalid value, <code>dateTimeBuild</code> uses the current day.
<i>hour</i>	String Optional. The hour expressed as a number based on a 24-hour clock. For example, specify 0 for midnight, 2 for 2:00 A.M., and 14 for 2:00 P.M. If you do not specify <i>hour</i> or you specify an invalid value, <code>dateTimeBuild</code> uses 0 as the <i>hour</i> value.
<i>minute</i>	String Optional. Minutes expressed as a number. If you do not specify <i>minute</i> or you specify an invalid value, <code>dateTimeBuild</code> uses 0 as the <i>minute</i> value.
<i>second</i>	String Optional. Seconds expressed as a number. If you do not specify <i>second</i> or you specify an invalid value, <code>dateTimeBuild</code> uses 0 as the <i>second</i> value.
<i>millis</i>	String Optional. Milliseconds expressed as a number. If you do not specify <i>millis</i> or you specify an invalid value, <code>dateTimeBuild</code> uses 0 as the <i>millis</i> value.
<i>timezone</i>	String Optional. Time zone in which you want the output date and time expressed. Specify a time zone code as shown in “Time Zones” on page 225 (for example, EST for Eastern Standard Time). If you do not specify <i>timezone</i> , the value of the server's "user timezone" property is used. If this property has not been set, GMT is used.
<i>locale</i>	String Optional. Locale in which the date is to be expressed. For example, if <i>locale</i> is en (for English), the pattern EEE d MMM yyyy will produce Friday 23 August 2002, and the <i>locale</i> of fr (for French) will produce vendredi 23 août 2002.

If *locale* is not specified, Integration Server uses the value of the `watt.server.session.locale.ignore` server configuration parameter to determine whether the locale is obtained from the session used by the client that invoked the service or if the locale is the locale of Integration Server.

Output Parameters

value **String** Date and time in format of *pattern*.

Usage Notes

The `pub.date:dateTimeBuild` service creates a date String by using the supplied *year*, *month*, *dayofmonth*, *hour*, *minute*, *second*, and *millis* to first create a local `java.util.Date` object. The local `java.util.Date` object uses the timezone of the machine running Integration Server. The `pub.date:dateTimeBuild` service then applies the offset between the local timezone and the specified *timezone*. Finally, the service uses *pattern* to convert the `java.util.Date` object to the String returned in *value*. Due to the way in which the `pub.date:dateTimeBuild` service works, if you run the `pub.date:dateTimeBuild` service with the same set of inputs on two different machines, each located in a different timezone, you will get different results.

pub.date:dateTimeFormat

WmPublic. Converts date/time (represented as a String) string from one format to another.

Input Parameters

inString **String** Date/time that you want to convert.

Important:

If *inString* contains a character in the last position, that character is interpreted as 0. This can result in an inaccurate date. For information about invalid dates, see [“Notes on Invalid Dates” on page 227](#).

currentPattern **String** Pattern string that describes the format of *inString*. For pattern-string notation, see [“Pattern String Symbols” on page 224](#).

newPattern **String** Pattern string that describes the format in which you want *inString* returned. For pattern-string syntax, see [“Pattern String Symbols” on page 224](#).

locale **String** Optional. Locale in which the date is to be expressed. For example, if *locale* is `en` (for English), the pattern `EEE d MMM yyyy` will produce `Friday 23 August 2002`, and the *locale* of `fr` (for French) will produce `vendredi 23 août 2002`.

If *locale* is not specified, Integration Server uses the value of the `watt.server.session.locale.ignore` server configuration parameter to determine

whether the locale is obtained from the session used by the client that invoked the service or if the locale is the locale of Integration Server.

lenient

String Optional. A flag indicating whether Integration Server throws an exception if the *inString* value does not adhere to the format specified in *currentPattern* parameter. Set to:

- `true` to perform a lenient check. This is the default.

In a lenient check, if the format of the date specified in the *inString* parameter does not match the format specified in the *currentPattern* parameter, Integration Server interprets and returns the date in the format specified in the *currentPattern* parameter. If the interpretation is incorrect, the service will return an invalid date.

- `false` to perform a strict check.

In a strict check, the Integration Server throws an exception if the format of the date specified in the *inString* parameter does not match the format specified in the *currentPattern* parameter.

Output Parameters

value

String The date/time given by *inString*, in the format of *newPattern*.

Usage Notes

As described in [“Notes on Invalid Dates” on page 227](#), if the pattern *yy* is used for the year, `dateTimeFormat` uses a 50-year moving window to interpret the value of the year. If you need to change this behavior so that the year is interpreted as 80 years before or 20 years after the current date (as described in the Java class `java.text.SimpleDateFormat`), set the server configuration parameter `watt.server.pubDateTimeFormat.javaSlidingWindow` to `true`. For information about setting configuration parameters, see *webMethods Integration Server Administrator’s Guide*.

By default, the Integration Server throws an exception if no input is passed to the service. To suppress the error message and return a null value for the *value* parameter, set the server configuration parameter `watt.server.date.suppressPatternError` to `true`. For information about setting configuration parameters, see *webMethods Integration Server Administrator’s Guide*.

If *currentPattern* does not contain a time zone, the value is assumed to be in the time zone of the `webMethods Integration Server`.

If *newPattern* contains a time zone, the time zone of the `webMethods Integration Server` is used.

pub.date:elapsedNanoTime

`WmPublic`. Calculates the time elapsed between the current time and the given time, in nanoseconds.

Input Parameters

nanoTime **java.lang.Long** Time in nanoseconds. If *nanoTime* is less than zero, then the service treats it as zero.

Output Parameters

elapsedNanoTime **java.lang.Long** The difference between the current time in nanoseconds and *nanoTime*. If *nanoTime* is greater than the current nano time, the service returns zero.

elapsedNanoTimeStr **String** The difference between the current time in nanoseconds and *nanoTime*. The difference is expressed as a String, in this format:
 [years] [days] [hours] [minutes] [seconds] [millisec] [microsec] <nanosec>
 If *nanoTime* is greater than the current nano time, the service returns zero.

pub.date:formatDate

WmPublic. Formats a Date object as a string.

Input Parameters

date **java.util.Date** Optional. Date/time that you want to convert.

pattern **String** Pattern string that describes the format in which you want the date returned. For pattern-string notation, see [“Pattern String Symbols” on page 224](#).

timezone **String** Optional. Time zone in which you want the output date and time expressed. Specify a time zone code as shown in [“Time Zones” on page 225](#) (for example, EST for Eastern Standard Time).

If you do not specify *timezone*, the value of the server's "user timezone" property is used. If this property has not been set, GMT is used.

locale **String** Optional. Locale in which the date is to be expressed. For example, if *locale* is en (for English), the pattern EEE d MMM yyyy will produce Friday 23 August 2002, and the *locale* of fr (for French) will produce vendredi 23 août 2002.

If *locale* is not specified, Integration Server uses the value of the watt.server.session.locale.ignore server configuration parameter to determine whether the locale is obtained from the session used by the client that invoked the service or if the locale is the locale of Integration Server.

Output Parameters

value **String** The date/time given by *date* in the format specified by *pattern*.

pub.date:getCurrentDate

WmPublic. Returns the current date as a Date object.

Input Parameters

None.

Output Parameters

date **java.util.Date** Current date.

pub.date:getCurrentDateString

WmPublic. Returns the current date as a String in a specified format.

Input Parameters

pattern **String** Pattern representing the format in which you want the date returned. For pattern-string notation, see [“Pattern String Symbols” on page 224](#).

timezone **String** Optional. Time zone in which you want the output date and time expressed. Specify a time zone code as shown in [“Time Zones” on page 225](#) (for example, EST for Eastern Standard Time).

If you do not specify *timezone*, the value of the server's "user timezone" property is used. If this property has not been set, GMT is used.

locale **String** Optional. Locale in which the date is to be expressed. For example, if *locale* is en (for English), the pattern EEE d MMM yyyy will produce Friday 23 August 2002, and the *locale* of fr (for French) will produce vendredi 23 août 2002.

If *locale* is not specified, Integration Server uses the value of the `watt.server.session.locale.ignore` server configuration parameter to determine whether the locale is obtained from the session used by the client that invoked the service or if the locale is the locale of Integration Server.

Output Parameters

value **String** Current date in the format specified by *pattern*.

pub.date:getWorkingDays

WmPublic. Returns the number of working days between two dates.

The number of working days returned includes the *startDate*, but excludes the *endDate*.

Input Parameters

startDate **String** Starting date and time.

endDate **String** Ending date and time.

startDatePattern **String** Format in which the *startDate* parameter is to be specified (for example, yyyyMMdd HH:mm:ss.SSS). For pattern-string notation, see [“Pattern String Symbols” on page 224](#).

endDatePattern **String** Format in which the *endDate* parameter is to be specified (for example, yyyyMMdd HH:mm:ss.SSS). For pattern-string notation, see [“Pattern String Symbols” on page 224](#).

Output Parameters

workingDays **String** Number of days between *startDate* and *endDate* excluding weekends and holidays.

Usage Notes

The `pub.date:getWorkingDays` service requires you to configure holidays and weekend days in the `holidays.cnf` configuration file in `Integration Server_directory\instances\instance_name\packages\WmPublic\config` directory. The `pub.date:getWorkingDays` service uses this configuration file to find the number of working days between two dates.

Note:

If you make any changes to the `holidays.cnf`, you must reload the WmPublic package or restart Integration Server for the changes to take effect.

Parameter Settings for holidays.cnf file

The following table gives the parameter settings for the `holidays.cnf` file:

Parameter	Description
holiday.format	The date format in which holidays are to be specified. The default format is MM/dd/yyyy.
holiday.<number>	<p>Holidays in a year. No default values are set for the holiday parameter in the holidays.cnf file.</p> <p>For example, if July 4, 2009 and December 25, 2009 are holidays, then it can be specified as:</p> <pre>holiday.1=07/04/2009 holiday.2=12/25/2009</pre>
weekend.<number>	<p>Weekends days. Valid values are sunday, monday, tuesday, wednesday, thursday, friday, and saturday. No default values are set for the weekend parameter in the holidays.cnf file.</p> <p>If Sunday and Saturday are weekends, then it can be specified as:</p> <pre>weekend.1 weekend.2=saturday</pre>

Note:

If invalid date or weekend is specified in the configuration file, the `pub.date:getWorkingDays` service will throw errors on execution.

pub.date:incrementDate

WmPublic. *Deprecated* - Replaced by [pub.datetime:increment](#).

Increments a date by a specified amount of time.

Input Parameters

<i>startDate</i>	String Starting date and time.
<i>startDatePattern</i>	String Format in which the <i>startDate</i> parameter is specified (for example, yyyyMMdd HH:mm:ss.SSS). For pattern-string notation, see “Pattern String Symbols” on page 224 .
<i>endDatePattern</i>	<p>String Optional. Pattern representing the format in which you want the <i>endDate</i> to be returned. For pattern-string notation, see “Pattern String Symbols” on page 224.</p> <p>If no <i>endDatePattern</i> is specified, the <i>endDate</i> will be returned in the format specified in the <i>startDatePattern</i> parameter.</p>
<i>addYears</i>	String Optional. Number of years to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.

<i>addMonths</i>	String Optional. Number of months to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>addDays</i>	String Optional. Number of days to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>addHours</i>	String Optional. Number of hours to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>addMinutes</i>	String Optional. Number of minutes to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>addSeconds</i>	String Optional. Number of seconds to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>addMilliseconds</i>	String Optional. Number of milliseconds to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>timezone</i>	<p>String Optional. Time zone in which you want the <i>endDate</i> to be expressed. Specify a time zone code as shown in “Time Zones” on page 225 (for example, EST for Eastern Standard Time).</p> <p>If you do not specify <i>timezone</i>, the value of the server's "user timezone" property is used. If this property has not been set, GMT is used.</p>
<i>locale</i>	<p>String Optional. Locale in which the <i>endDate</i> is to be expressed. For example, if <i>locale</i> is en (for English), the pattern EEE d MMM yyyy will produce Friday 23 August 2002, and the <i>locale</i> of fr (for French) will produce vendredi 23 août 2002.</p> <p>If <i>locale</i> is not specified, Integration Server uses the value of the <code>watt.server.session.locale.ignore</code> server configuration parameter to determine whether the locale is obtained from the session used by the client that invoked the service or if the locale is the locale of Integration Server.</p>

Output Parameters

<i>endDate</i>	<p>String The end date and time, calculated by incrementing the <i>startDate</i> with the specified years, months, days, hours, minutes, seconds, and/or milliseconds. The <i>endDate</i> will be in the <i>endDatePattern</i> format, if specified.</p> <p>If no <i>endDatePattern</i> is specified or if blank spaces are specified as the value, the <i>endDate</i> will be returned in the format specified in the <i>startDatePattern</i> parameter.</p>
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Usage Notes

The *addYears*, *addMonths*, *addDays*, *addHours*, *addMinutes*, *addSeconds*, and *addMilliseconds* input parameters can take positive or negative values. For example, If *startDate* is 10/10/2001, *startDatePattern* is MM/dd/yyyy, *addYears* is 1, and *addMonths* is -1, *endDate* will be 09/10/2002.

If you specify only the *startDate*, *startDatePattern*, and *endDatePattern* input parameters and do not specify any of the optional input parameters to increment the period, the `pub.date:incrementDate` service just converts the format of *startDate* from *startDatePattern* to *endDatePattern* and returns it as *endDate*.

Integration Server issues an exception if the format of the date specified in the *startDate* parameter does not match the format specified in the *startDatePattern*. Integration Server issues a similar exception if the format of the date specified in the *endDate* parameter does not match the *endDatePattern* format.

9 Datetime Folder

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You use the services in the `datetime` folder to build or increment a date/time. The services in `datetime` provide more explicit timezone processing than similar services in the `date` folder.

Supplying Time Zones

You can specify *timezone* input parameters to the `pub.datetime` services in the following formats:

- As a full name.

For example: `Asia/Tokyo America/Los_Angeles`

You can use `java.time.ZoneId.getAvailableZoneIds. ()` method to obtain a list of the valid full name time zone IDs that your JVM version supports.

- As UTC.

For example: `UTC - 5h`

- As a custom time zone ID, in the format `GMT[+ | -]hh[[:]mm]`.

For example: `GMT+2:00` Time zones 2 hours east of Greenwich `GMT-3:00` Time zones 3 hours west of Greenwich (that is, Argentina Standard Time and Brazil Eastern Time)

`GMT+9:30` Time zones 9.5 hours east of Greenwich (that is, Australian Central Time)

- As a three-letter abbreviation.

For example: `PST` Pacific Standard Time

Important:

Because some three-letter abbreviations can represent multiple time zones (for example, "CST" could represent both U.S. "Central Standard Time" and "China Standard Time"), all abbreviations are deprecated. Use the full name, UTC, or custom time zone ID GMT formats instead.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
<code>pub.datetime:build</code>	<code>WmPublic</code> . Builds a date/time string using the specified pattern and the supplied date/time elements.
<code>pub.datetime:increment</code>	<code>WmPublic</code> . Increments or decrements a date and time by a specified amount of time.

pub.datetime:build

`WmPublic`. Builds a date/time string using the specified pattern and the supplied date/time elements.

Input Parameters

<i>pattern</i>	String The pattern with which to format the string. For more information about these pattern letters and symbols, see the Oracle Java API documentation for the <code>DateTimeFormatter</code> class.
<i>year</i>	String Optional. The year expressed as a 4-digit Integer. If you do not specify year, the year will be from the current date which is determined by the JVM in which Integration Server runs. If you specify an invalid value for <i>year</i> , the service will end with an error from the JDK.
<i>month</i>	String Optional. The month expressed as an Integer where January is 1. If you do not specify month, the month will be from the current date which is determined by the JVM in which Integration Server runs. If you specify an invalid value for <i>month</i> , the service will end with an error from the JDK.
<i>dayOfMonth</i>	String Optional. The day of the month expressed as an Integer, starting with 1 as the first day of the month. If you do not specify <i>dayOfMonth</i> the day of the month will be from the current date which is determined by the JVM in which Integration Server runs. If you specify an invalid value for <i>day</i> , the service will end with an error from the JDK.
<i>hour</i>	String Optional. The hour of the day expressed as an Integer from 0 through 23. If you do not specify <i>hour</i> , the hour will be from the current time which is determined by the JVM in which Integration Server runs. If you specify an invalid value for <i>hour</i> , the service will end with an error from the JDK.
<i>minute</i>	String Optional. The minute expressed as an Integer from 0 through 59. If you do not specify <i>minute</i> , the minute will be from the current time which is determined by the JVM in which Integration Server runs. If you specify an invalid value for <i>minute</i> , the service will end with an error from the JDK.
<i>second</i>	String Optional. The seconds of the hour expressed as an Integer from 0 through 59. If you do not specify <i>second</i> , the second will be from the current time which is determined by the JVM in which Integration Server runs. If you specify an invalid value for <i>second</i> , the service will end with an error from the JDK.
<i>millis</i>	String Optional. The number of milliseconds expressed as a Long. If you do not specify <i>millis</i> , the millis will be from the current time which is determined by the JVM in which Integration Server runs. If you specify an invalid value for <i>millis</i> , the service will end with an error from the JDK.
<i>timezone</i>	String Optional. The time zone. If you specify a value for <i>timezone</i> , the service ignores the <code>useSystemTimeZone</code> parameter value. Software AG recommends supplying the full name for timezones, such as <code>Asia/Tokyo</code> , or using UTC. If pattern includes a timezone, you must specify <i>timezone</i> input parameter value or set <code>useSystemTimeZone</code> to true.

useSystemTimeZone **String** Optional. Indicates whether the service uses the time zone of the Integration Server JVM if *timezone* was not specified. Set to:

- `true` to use the time zone of Integration Server when *timezone* is not specified.
- `false` if you do not want the service to use the *timezone* of Integration Server if *timezone* was not set. The default is `false`.

If *pattern* includes a *timezone*, you must specify the *timezone* input parameter value or set *useSystemTimeZone* to `true`.

To match the behavior of `pub.date:dateTimeBuild` which produced a date/time that always included a time zone set *useSystemTimeZone* to `true`. This ensures that if *timezone* is not specified, the resulting date/time will include a time zone.

locale **String** Optional. The locale in which to express the date. If *locale* is not specified, Integration Server uses the value of the `watt.server.session.locale.ignore` server configuration parameter to determine whether the locale is obtained from the session used by the client that invoked the service or if the locale is the locale of Integration Server. An invalid locale results in an error from the JDK.

Output Parameters

value **String** The formatted date and time.

Usage Notes

The `pub.datetime:build` service replaces the `pub.date:dateBuild` and `pub.date:dateTimeBuild` services which are deprecated.

If you specify a parameter that does not exist in the supplied *pattern*, the service ignores that parameter.

If you do not specify a *timezone*, *useSystemTimeZone* is set to `false`, and the *pattern* includes a time zone, the service ends with an exception.

If a time zone is provided as input to the service either in the *timezone* parameter or by setting *useSystemTimeZone* to `true`, the `pub.datetime:build` service calculates the date/time starting with a "zoned" date/time. The resulting values can differ when daylight savings time transitions are in effect. If no time zone is provided as input to the service either by not specifying *timezone* or by setting *useSystemTimeZone* to `false`, then the `pub.datetime:build` service calculates the date/time starting with an "unzoned" date/time.

The `pub.datetime:build` service is similar to `pub.date:dateBuild` and `pub.date:dateTimeBuild`, however, the `pub.datetime:build` service allows the building of a date/time that does not include a time zone. Furthermore, the `pub.datetime:build` service assembles a date/time using each of the provided

parameters. Consequently the `pub.datetime:build` service can build a date/time with a value that would be invalid in the current time zone, such as a date/time that would fall into the gap of a daylight saving time transition. This is unlike the `pub.date:dateBuild` and `pub.date:dateTimeBuild` services which build a local `java.util.Date` object that uses the timezone of the machine running Integration Server. The `pub.date:dateBuild` and `pub.date:dateTimeBuild` service then applies the offset between the local timezone and the specified timezone.

pub.datetime:increment

WmPublic. Increments or decrements a date and time by a specified amount of time.

Input Parameters

<i>startDate</i>	String Starting date and time.
<i>startDatePattern</i>	String Pattern in which the <i>startDate</i> value is specified. For more information about these pattern letters and symbols, see the Oracle Java API documentation for the <code>DateTimeFormatter</code> class.
<i>endDatePattern</i>	String Pattern in which to format the resulting date/time. For more information about these pattern letters and symbols, see the Oracle Java API documentation for the <code>DateTimeFormatter</code> class. If no <i>endDatePattern</i> is specified, the <i>endDate</i> will be returned in the format specified in the <i>startDatePattern</i> parameter.
<i>timezone</i>	String Optional. The time zone to use for parsing <i>startDate</i> and formatting <i>endDate</i> . The service uses <i>timezone</i> to parse the <i>startDate</i> String and convert it from the time zone specified in the input, if one was provided. For example, if the <i>timezone</i> input parameter is MST and the <i>startDate</i> is "2019-02-21 11:30:00 EST", then the service converts the <i>startDate</i> time from EST to MST. The service uses <i>timezone</i> when formatting <i>endDate</i> as a String. That is, the <i>timezone</i> determines the time zone in which the service expresses the <i>endDate</i> .
<i>locale</i>	String Optional. Locale in which the <i>endDate</i> is to be expressed. If <i>locale</i> is not specified, Integration Server uses the value of the <code>watt.server.session.locale.ignore</code> server configuration parameter to determine whether the locale is obtained from the session used by the client that invoked the service or if the locale is the locale of Integration Server.
<i>addYears</i>	String Optional. The number of years to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>addMonths</i>	String Optional. The number of months to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.

<i>addDays</i>	String Optional. The number of days to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>addHours</i>	String Optional. The number of hours to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>addMinutes</i>	String Optional. The number of minutes to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>addSeconds</i>	String Optional. The number of seconds to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>addMilliseconds</i>	String Optional. The number of milliseconds to add to <i>startDate</i> . The value must be an integer between -2147483648 and 2147483647.
<i>useSystemTimeZone</i>	<p>String Optional. Whether to use the system time zone to increment the date/time when the <i>startDate</i> value does not have a time zone.</p> <p>Usually, the system time zone is the time zone from which the JVM that contains Integration Server was launched. Note that it possible to modify the JVM time zone after the JVM launches.</p> <p>Set to:</p> <ul style="list-style-type: none">■ <code>false</code> if the <i>startDate</i> does not include a time zone, the <i>timezone</i> parameter was not set, and you want to increment the date/time without being affected by a time zone. This is the default.■ <code>true</code> to use the system time zone when incrementing the <i>startDate</i>. <p>When <i>useSystemTimeZone</i> is <code>false</code> and no <i>timezone</i> is provided, the resulting <i>endDate</i> will not include a timezone. To match the behavior of <code>pub.date:incrementDate</code>, which produced a date/time that always included a time zone, set <i>useSystemTimeZone</i> to <code>true</code>.</p>
<i>useSameInstant</i>	<p>String Optional. Whether to use the same Instant, where Instant represents a moment on the timeline in UTC, or the same unzoned date/time when applying a different time zone. Using the same Instant will usually result in changes to the unzoned date/time when the time zone and its offset are applied. Not using the same Instant will result in the unzoned date/time being unchanged when the time is applied.</p> <p>If <i>useSameInstant</i> is <code>true</code>, the <code>pub.datetime:increment</code> service uses the Instant (the absolute time with no time zones) to determine how the <i>timezone</i> value is used.</p> <p>If <i>useSameInstant</i> is <code>false</code>, the <code>pub.datetime:increment</code> service uses the unzoned date/time and only changes the time zone.</p> <p>The default is <code>true</code>.</p>

Note:

For the purpose of this documentation, the term "unzoned date/time" is synonymous with the term "local date/time".

For example, if *startDate* is a date/time of "2019-02-25 08:25:00 CET" (Central European Time, UTC+1:00) and the specified timezone value is America/New_York (EST, UTC-5:00), the value of *useSameInstant* has the following impact:

- If *useSameInstant* is true, then 2019-02-25 08:25:00 CET becomes 2019-02-25 02:25:00 EST
- If *useSameInstant* is false, then 2019-02-25 08:25:00 CET becomes 2019-02-25 08:25:00 EST

Output Parameters

endDate **String** The incremented date and time.

Usage Notes

The `pub.datetime:increment` service replaces the `pub.date:incrementDate` service which is deprecated.

The `pub.datetime:increment` service can be used to decrement a date and time by specifying negative numbers. The *addYears*, *addMonths*, *addDays*, *addHours*, *addMinutes*, *addSeconds*, and *addMilliseconds* input parameters can take positive or negative values.

The service ends with an exception if the format of the date specified in the *startDate* parameter does not match the format specified in the *startDatePattern*.

If you want to increment the *startDate* value by hours, minutes, seconds, or milliseconds, the *startDate* must include the time; otherwise, the service ends with an `UnsupportedTemporalTypeException`.

If you need milliseconds in the timestamp, it is recommended to use triple S (SSS) in the date pattern and enter 3 digits in place of SSS. For example, in the date pattern (yyyy-MM-dd'T'H:mm:ss.SSS'Z'), enter three digits in place of SSS like: 2021-07-08T1:20:20.001Z. Otherwise, the service might show inconsistent results.

If *endDatePattern* includes a time zone, such as "z", then the input string and *startDatePattern* must also have time zone fields, or *timeZone* must be set, or *useSystemTimeZone* must be true. Otherwise the service ends with an error.

If you specify only the *startDate*, *startDatePattern*, and *endDatePattern* input parameters and do not specify any of the optional input parameters to increment the period, the `pub.datetime:increment` service just converts the format of *startDate* from *startDatePattern* to *endDatePattern* and returns it as *endDate*.

If you specify a value for *timezone*, the service ignores the *useSystemTimeZone* parameter value.

If you specify a value for *timezone* and the *startDate* includes a time zone, then the service uses the supplied *timezone* to convert the *startDate* time zone.

If you do not specify a value for *timezone* and the *startDate* includes a time zone, then the service uses the time zone in the *startDate* and ignores the *useSystemTimeZone* parameter.

If you do not specify a value for *timezone*, the *startDate* does not include a time zone, and *useSystemTimeZone* parameter is true, then the service uses the system time zone.

If *startDate* does not include a time zone, you do not specify a value for *timezone*, and *useSystemTimeZone* is false, the resulting *endDate* will not include a time zone.

The `pub.datetime:increment` service is similar to `pub.date:incrementDate`, however, the `pub.datetime:increment` service provides more specific handling of time zones. To match the behavior of `pub.date:incrementDate`, set *useSameInstant* to true.

10 Db Folder

■ Summary of Elements in this Folder	250
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You use the elements in the db folder to access JDBC-enabled databases.

Note:

The webMethods Adapter for JDBC also provides services that perform operations against JDBC-enabled databases. See the *webMethods Adapter for JDBC Installation and User's Guide* for information.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.db:call	WmDB. Invokes a stored procedure on a target database. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:clearTransaction	WmDB. Clears the transactional state within a database connection. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:close	WmDB. Closes a specified database connection. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:closeAll	WmDB. Closes all database connections that the session has opened. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:commit	WmDB. Commits changes to a database. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:connect	WmDB. Creates a connection to the database using the supplied JDBC URL, user name, and password. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:delete	WmDB. Removes all rows in the specified table that meet the given criteria. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:execSQL	WmDB. Executes the specified SQL statement. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:getProclInfo	WmDB. Retrieves information about one or more stored procedures. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Element	Package and Description
pub.db:getProcs	WmDB. Retrieves the names of stored procedures for the specified database. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:getTableInfo	WmDB. Retrieves information about columns in the specified table. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:getTables	WmDB. Retrieves the names of tables in the specified database and schema. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:insert	WmDB. Inserts one or more rows into the specified table. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:query	WmDB. Retrieves all rows from the specified table that meet the given criteria. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:rollback	WmDB. Discards changes to a database. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:startTransaction	WmDB. Begins a transaction on a database connection. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.
pub.db:update	WmDB. Updates all rows in a table that meet the given criteria. Rows are updated with the supplied new data. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

pub.db:call

WmDB. Invokes a stored procedure on a target database. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Alias of the database on which you want to execute the stored procedure.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user specified in <i>\$dbUser</i> .
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db:connect .
<i>\$dbCatalog</i>	<p>String Optional. Name of the database's system catalog. Include this parameter if your DBMS supports distributed databases and you want to invoke a stored procedure from a database other than the one to which you are connected.</p> <p>If you are not using a distributed database system, you do not need to specify this parameter.</p> <p>If you are running against DB2, use this parameter to specify the stored procedure's location.</p>
<i>\$dbSchemaPattern</i>	<p>String Optional. Name of the schema to which the stored procedure belongs.</p> <p>If your database supports pattern-matching on schemas, you may specify the schema name with a pattern-matching string, where <code>_</code> represents a single character and <code>%</code> represents any string of characters. For example, the value of <code>HR%</code> would represent any schema beginning with characters <code>HR</code>.</p> <p>If you are running against DB2, you use this parameter to specify the stored procedure's AuthID.</p>
<i>\$dbProc</i>	String The name of the stored procedure you want to invoke.
<i>\$dbProcSig</i>	Document List Optional. Set of parameters containing information about the stored procedure you want to invoke.

Key	Description						
<i>name</i>	String Parameter name defined in the stored procedure.						
<i>sqlType</i>	String Type of procedure parameter for <i>name</i> as defined in the database. Set to one of the following values:						
	<table> <tr> <td>BIT</td> <td>TINYINT</td> </tr> <tr> <td>SMALLINT</td> <td>INTEGER</td> </tr> <tr> <td>BIGINT</td> <td>FLOAT</td> </tr> </table>	BIT	TINYINT	SMALLINT	INTEGER	BIGINT	FLOAT
BIT	TINYINT						
SMALLINT	INTEGER						
BIGINT	FLOAT						

REAL	DOUBLE
NUMERIC	DECIMAL
CHAR	VARCHAR
LONGVARCHAR	DATE
TIME	TIMESTAMP
BINARY	VARBINARY
LONGVARBINARY	NULL

direction

String Way in which the parameter is used by the stored procedure. Set to one of the following values:

```
in
out
inout
return value
```

\$dbParamsByOrder

String Optional. Indicates whether the contents of *\$data* should be sent to the database in order. Set to:

- `true` to send the contents of *\$data* to the database in the order they are listed in *\$data*.
- `false` to send the contents of *\$data* to the database in no particular order. This is the default.

\$data

Document Parameter values for the stored procedure. Whether the *\$data* parameter is mandatory or not depends on the `watt.server.jdbc.sp.mandateParams` property. If this property is set to `false`, the *\$data* input parameter is optional. If this property is `true`, you must provide values for the *\$data* parameter. The default value for the `watt.server.jdbc.sp.mandateParams` property is `true`.

Output Parameters

\$dbMessage

String Conditional. Message indicating the success or failure of the operation.

Usage Notes

The output will also contain output parameters and procedure return values (the return value is called `RETURN_VALUE`).

pub.db:clearTransaction

WmDB. Clears the transactional state within a database connection. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL*, *\$dbUser*, *\$dbPass*, *\$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Alias of the database connection on which you want to clear the transactional state. The alias is passed automatically if the database is connected.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db:connect .

Output Parameters

\$dbMessage **String** A message indicating the success or failure of the operation.

Usage Notes

On some databases, exceptional conditions within transactions will automatically abort the entire transaction. When this happens, the standard commit/rollback operations are meaningless because there is no current transaction. If this occurs, use the `clearTransaction` service to clear the transactional state and prepare for a new transaction. You should only use this service if you have begun a transaction and cannot end it with a standard commit or rollback.

The `clearTransaction` service *does not* involve a database operation; it is entirely internal to the webMethods Integration Server.

pub.db:close

WmDB. Closes a specified database connection. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Database alias.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db.connect .
<i>\$closeDbConnection</i>	<p>String Optional. Indicates whether to remove the database connection from the pool or return it to the pool for future use. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to close the connection and remove it from the pool. ■ <code>false</code> to close the connection and return it to the pool for future use. This is the default.

Output Parameters

\$dbMessage **String** Message indicating the success or failure of the operation.

pub.db:closeAll

WmDB. Closes all database connections that the session has opened. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

None.

Output Parameters

\$dbMessage **String** Message indicating the success or failure of the operation.

pub.db:commit

WmDB. Commits changes to a database. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Alias of the database on which you want to commit changes. The alias is passed automatically if the database is connected.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db:connect .

Output Parameters

\$dbMessage **String** Message indicating the success or failure of the operation.

Usage Notes

This service returns an exception if an error occurs when committing changes to the database. The most common reason for this error is that no transaction has been started (see [“pub.db:startTransaction”](#) on page 272).

pub.db:connect

WmDB. Creates a connection to the database using the supplied JDBC URL, user name, and password. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

You can also specify a JDBC driver specific to the database.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbURL, \$dbDriver, \$dbProperties*

<i>\$dbAlias</i>	String Optional. Database alias.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbProperties</i>	Document Optional. Set of connection parameters that are to be used to make the database connection. Within <i>\$dbProperties</i> , key names represent the names of the connection parameters that are to be used to establish the connection, and the value of a key specifies the value of that particular parameter.

In most cases, you will include the keys *user* and *password* in *\$dbProperties* to specify the user name and password parameters that are to be used to connect to the database. You may include additional parameters as needed.

The following example shows how *\$dbProperties* would look if you wanted to set the *weblogic.codeset* parameter to GBK in order to extract Unicode data out of the database:

Key	Value
<i>user</i>	dbu
<i>password</i>	dbu
<i>weblogic.codeset</i>	GBK

Output Parameters

<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Connection object.
<i>\$dbMessage</i>	String Message indicating the success or failure of the operation.

Usage Notes

Database connections opened by [pub.db:connect](#) are associated with the current session.

Multiple attempts to connect to the same database by the same client will result in the same connection being reused. This means that if client A and client B request connections to the same database, they each get their own new connection. If client A makes another call to [pub.db:connect](#), the previous connection is reused. Associating the database connection with the client session prevents remote clients from having to reconnect repeatedly to a target database.

Connections are not pooled or shared across sessions. Unless explicitly closed (by calling [pub.db:close](#) or [pub.db:closeAll](#)), connections associated with a session are closed when the session is flushed from memory. This happens at a regular interval, which can be configured using the Integration Server Administrator. For more information about setting the session time-out limit, see the section *Setting the Session Timeout Limit* in the *webMethods Integration Server Administrator's Guide*.

pub.db:delete

WmDB. Removes all rows in the specified table that meet the given criteria. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Database alias.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db:connect .
<i>\$dbCatalog</i>	String Optional. Name of the database's system catalog. Include this parameter if your DBMS supports distributed databases and you want to delete rows from a table that is not in the database to which you are connected.

If you are not using a distributed database system or if you want to delete rows from the database to which you are connected, you do not need to specify this parameter.

If you are running against DB2, use this parameter to specify the database location.

\$dbSchemaPattern

String Optional. Name of the schema to which the table belongs.

If your database supports pattern-matching on schemas, you may specify the schema name with a pattern-matching string, where `_` represents a single character and `%` represents any string of characters. For example, the value `HR%` would represent any schema beginning with the characters `HR`.

If you are running against DB2, you use this parameter to specify the table's AuthID.

\$dbTable

String Name of the table to remove rows from.

\$data

Document Optional. Criteria that the rows to delete must meet.

Important:

If no criteria are provided, *all rows* are deleted from the table.

Output Parameters

\$updateCount

String Number of rows deleted.

\$dbMessage

String Conditional. Message indicating the success or failure of the operation.

pub.db:execSQL

WmDB. Executes the specified SQL statement. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

The service does not perform any parsing on the SQL statement.

Input Parameters

\$dbAlias

String Optional. Database alias.

\$dbURL

String Optional. JDBC URL that identifies the database resource.

\$dbUser

String Optional. User name to use to log into the database.

<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db.connect .
<i>\$dbCatalog</i>	String Optional. Name of the database's system catalog. Include this parameter if your DBMS supports distributed databases and you want to retrieve information from a database to which you are not currently connected. If you are not using a distributed database system, you do not need to specify this parameter. If you are running against DB2, use this parameter to specify the database location.
<i>\$dbSchemaPattern</i>	String Optional. Name of the schema to which the table belongs. If your database supports pattern-matching on schemas, you may specify the schema name with a pattern-matching string, where <code>_</code> represents a single character and <code>%</code> represents any string of characters. For example, the value <code>HR%</code> would represent any schema beginning with the characters <code>HR</code> . If you are running against DB2, you use this parameter to specify the table's <code>AuthID</code> .
<i>\$dbSQL</i>	String SQL statement to execute.
<i>\$dbProcessEsc</i>	String Optional. Flag that indicates whether JDBC SQL escapes will be processed. These escapes allow database-independent access to database-dependent functionality. For example, different dialects of SQL have different syntax for date literals. Using a JDBC escape, you can encode a date literal in a SQL string that should work on any database. Documentation on JDBC SQL escapes is widely available. Set to: <ul style="list-style-type: none">■ <code>true</code> to process JDBC SQL escapes. This is the default.■ <code>false</code> to skip processing JDBC SQL escapes.

<i>\$dbProcessReporterTokens</i>	<p>String Optional. Flag that indicates whether reporter tags (for example, %value xxx%) will be processed in the SQL. Including these tokens in your SQL allows dynamic construction of complex SQL statements, at the possible expense of some execution speed.</p> <p>Set to:</p> <ul style="list-style-type: none"> ■ true to process tags. ■ false to ignore tags. This is the default.
<i>\$dbParamValues</i>	<p>Object List Optional. If the "?" parameters in the SQL statement are not supplied indirectly (with the <i>\$dbParamNames</i> parameter), they can be supplied directly via this parameter. See “Usage Notes” on page 262 below. Objects in <i>\$dbParamValues</i> can be of any type.</p>
<i>\$dbParamNames</i>	<p>String List Optional. Names of any "?" parameters in the SQL. See “Usage Notes” on page 262 below.</p>
<i>\$dbParamTypes</i>	<p>String List Optional. SQL type names for each parameter. Use type names from the JDBC 1.2 specification ("INTEGER", "VARCHAR", etc.).</p>

Output Parameters

<i>sql</i>	<p>String Conditional. SQL as it was actually passed to the target database. This can be helpful in debugging calls to this service when dynamic SQL is used (that is, you are using either JDBC SQL escapes or webMethods Reporter tokens in your SQL).</p>
<i>paramsAsStrings</i>	<p>String List Conditional. Values used for each of the parameters in the SQL statement. This can be helpful in debugging calls to this service when "?" parameters are being used.</p>
<i>\$rowCount</i>	<p>String Conditional. Number of rows in <i>results</i>.</p>
<i>results</i>	<p>com.wm.util.Table Conditional. Results from the SQL statement. The Integration Server recognizes and treats this parameter as a Document List at run time.</p>
<i>\$updateCount</i>	<p>String Conditional. Number of rows updated.</p>
<i>\$dbMessage</i>	<p>String Conditional. Message indicating the success or failure of the operation.</p>

Usage Notes

This service does not support updates from a web browser or HTML form.

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

SQL supports host variables ("?") in statements to be executed. Because the pipeline is based on named values and individual host variables are not named, *\$dbParamNames* and *\$dbParamTypes* are used to supply an index-to-name mapping for each SQL statement executed. For example, consider the following SQL query:

```
SELECT * FROM royalties WHERE pub_id = ? and roy_amt > ?
```

To execute this SQL query, you could supply the following values to the [pub.db:execSQL](#) service:

Key	Value	Description
<i>\$dbSQL</i>	SELECT * FROM royalties WHERE pub_id = ? and roy_amt > ?	SQL query to execute.
<i>\$dbParamNames</i>	pub_id roy_amt	Pipeline items to use for the host variables.
<i>\$dbParamTypes</i>	varchar integer	SQL types for the host variables.
<i>pub_id</i>	P1053	Values for the host variables.
<i>roy_amt</i>	10	Values for the host variables.
	Note: Even if there is only one host variable in the SQL statement, both <i>\$dbParamNames</i> and <i>\$dbParamTypes</i> are String arrays.	

Example: Consider the following SQL query, which contains an INSERT with three host variables:

```
INSERT INTO books VALUES (?, ?, ?)
```

To execute this SQL query, you could supply the following values to the [pub.db:execSQL](#) service:

Key	Value	Description
<i>\$dbSQL</i>	INSERT INTO books VALUES (?, ?, ?)	SQL query to execute.

Key	Value	Description
<i>\$dbParamNames</i>	book_id pub_id book_title	Pipeline items to use for the host variables.
<i>\$dbParamTypes</i>	varchar varchar varchar	SQL types for the host variables.
<i>book_id</i>	B234	Values for the host variables.
<i>pub_id</i>	P1053	Values for the host variables.
<i>book_title</i>	The Importance of Being Earnest	Values for the host variables.
<p>Note: The SQL type names used in the examples are defined in the <code>java.sql.Types</code> and <code>SQL92</code>. Even if you used an Oracle database, which calls long string types "varchar2," you would call them <code>varchar</code>. The standard names from <code>SQL92</code> will be mapped into database-specific type names.</p>		

pub.db:getProcInfo

WmDB. Retrieves information about one or more stored procedures. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Database alias.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db:connect .

- \$dbCatalog* **String** Optional. Name of the database's system catalog. Include this parameter if your DBMS supports distributed databases and you want to retrieve information about a stored procedure that is not in the database to which you are currently connected.
- If you are not using a distributed database system, you do not need to specify this parameter.
- If you are running against DB2, use this parameter to specify the stored procedure's location.
- \$dbSchemaPattern* **String** Optional. Name of the schema to which the table belongs.
- If your database supports pattern-matching on schemas, you may specify the schema name with a pattern-matching string, where `_` represents a single character and `%` represents any string of characters. For example, the value `HR%` would represent any schema beginning with the characters `HR`.
- If you are running against DB2, you use this parameter to specify the stored procedure's `AuthID`.
- \$dbProc* **String** Name of the procedure about which you want information.

Output Parameters

This service returns one document (IData object) for each item in the stored procedure's signature that matches the specified input criteria. Each document contains information about the signature item. The document's key will be the same as the signature item's name. For a description of what information is supplied by your database, see `java.sql.DatabaseMetaData.getProcedureColumns` in your JDBC documentation.

pub.db:getProcs

WmDB. Retrieves the names of stored procedures for the specified database. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

\$dbAlias **String** Optional. Database alias.

<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db:connect .
<i>\$dbCatalog</i>	<p>String Optional. Name of the database's system catalog. Include this parameter if your DBMS supports distributed databases and you want to retrieve a list of stored procedures from a database other than the one to which you are connected.</p> <p>If you are not using a distributed database system, you do not need to specify this parameter.</p> <p>If you are running against DB2, use this parameter to specify the database location.</p>
<i>\$dbSchemaPattern</i>	<p>String Optional. Name of the schema to which the stored procedures belong.</p> <p>If your database supports pattern-matching on schemas, you may specify the schema name with a pattern-matching string, where <code>_</code> represents a single character and <code>%</code> represents any string of characters. For example, the value <code>HR%</code> would represent any schema beginning with the characters <code>HR</code>.</p> <p>If you are running against DB2, you use this parameter to specify the database's <code>AuthID</code>.</p>
<i>\$dbProcNamePattern</i>	String Optional. Pattern-matching string that specifies the procedures that you want included in the returned list, where <code>_</code> represents a single character and <code>%</code> represents any string of characters. For example, the value <code>DATE%</code> would represent any procedure beginning with the characters <code>DATE</code> .

Output Parameters

This service returns one document (IData object) for each stored procedure that matches the specified input criteria. Each document contains information about a stored procedure. The document's key will be the same as the stored procedure name. For a description of what information is supplied by your database, see `java.sql.DatabaseMetaData.getProcedures` in your JDBC documentation.

pub.db:getTableInfo

WmDB. Retrieves information about columns in the specified table. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Database alias.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db:connect .
<i>\$dbCatalog</i>	String Optional. Name of the database's system catalog. Include this parameter if your DBMS supports distributed databases and you want information about a table that is not in the database to which you are connected. If you are not using a distributed database system or you want information about a table in the database to which you are connected, you do not need to specify this parameter. If you are running against DB2, use this parameter to specify the database location.
<i>\$dbSchemaPattern</i>	String Optional. Name of the schema to which the table belongs. If your database supports pattern-matching on schemas, you may specify a pattern-matching string for the schema name, where <code>_</code> represents a single character and <code>%</code> represents any string of characters. For example, the value <code>HR%</code> would represent any schema beginning with the characters <code>HR</code> . If you are running against DB2, you use this parameter to specify the table's AuthID.
<i>\$dbTable</i>	String Name of table whose column names you want to retrieve.

\$dbColumnNamePattern **String** Optional. Pattern-matching string that specifies the column names that you want to retrieve, where `_` represents a single character and `%` represents any string of characters. For example, the value `ADDR%` would represent any column name beginning with the characters `ADDR`.

Output Parameters

This service returns one document (IData object) for each column that matches the specified input criteria. Each document contains information about a column. The document's key will be the same as the column name.

Usage Notes

This service accepts input from a web browser or HTML form.

pub.db:getTables

WmDB. Retrieves the names of tables in the specified database and schema. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Database alias.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db:connect .
<i>\$dbCatalog</i>	String Optional. Name of the database's system catalog. Include this parameter if your DBMS supports distributed databases and you want information from a database that is not the one to which you are connected.

If you are not using a distributed database system or you want information about the database to which you are connected, you do not need to specify this parameter.

If you are running against DB2, use this parameter to specify the database location.

\$dbSchemaPattern

String Optional. Name of the schema for which you want the names of tables.

If your database supports pattern-matching on schemas, you may specify a pattern-matching string for the schema name, where `_` represents a single character and `%` represents any string of characters. For example, the value `HR%` would represent any schema beginning with the characters `HR`.

If you want the table names from all schemas, set *\$dbSchemaPattern* to null.

If you are running against DB2, you use this parameter to specify the table's AuthID.

\$dbTableNamePattern

String Optional. Pattern string describing the tables whose names you want to retrieve.

If your database supports pattern-matching on schemas, you may specify a pattern-matching string, where `_` represents a single character and `%` represents any string of characters. For example, the value `HR%` would represent any table name beginning with the characters `HR`.

If you want all table names, set *\$dbTableNamePattern* to null.

\$dbTableTypeList

String List Optional. Set of parameters specifying the types of tables whose names you want to retrieve. Common JDBC table types include: `TABLE`, `VIEW`, `SYSTEM TABLE`, `ALIAS`, and `SYNONYM`. Check your driver documentation for others.

Output Parameters

This service returns one document (IData object) for each table that matches the specified input criteria. Each document contains information about a table. The document's key will be the same as the table name.

Usage Notes

This service accepts input from a web browser or HTML form.

pub.db:insert

WmDB. Inserts one or more rows into the specified table. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Database alias.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db:connect .
<i>\$dbCatalog</i>	<p>String Optional. Name of the database's system catalog. Include this parameter if your DBMS supports distributed databases and you want to insert rows into a table that is not in the database to which you are connected.</p> <p>If you are not using a distributed database system or if you want to insert rows into the database to which you are connected, you do not need to specify this parameter.</p> <p>If you are running against DB2, use this parameter to specify the database location.</p>
<i>\$dbSchemaPattern</i>	<p>String Optional. Name of the schema to which the table belongs.</p> <p>If your database supports pattern-matching on schemas, you may specify the schema name with a pattern-matching string, where <code>_</code> represents a single character and <code>%</code> represents any string of characters. For example, the value <code>HR%</code> would represent any schema beginning with the characters <code>HR</code>.</p> <p>If you are running against DB2, you use this parameter to specify the table's AuthID.</p>
<i>\$dbTable</i>	String Name of table in which you want to insert rows.

<i>\$dbRollbackOnFail</i>	String Optional. Flag that determine whether changes are committed if a failure occurs while processing multiple inserts. Set to: <ul style="list-style-type: none">■ <code>true</code> to undo changes on failure.■ <code>false</code> to commit changes on failure. This is the default.
<i>\$data</i>	Document or Document List Optional. Data to insert.

Output Parameters

<i>\$updateCount</i>	String Number of rows the service inserted.
<i>\$failCount</i>	String Number of rows the service failed to insert.
<i>\$errors</i>	Document Conditional. Error messages generated during service execution.
<i>\$dbMessage</i>	String Conditional. Message indicating the success or failure of the operation.

Usage Notes

This service accepts input from a web browser or HTML form.

pub.db:query

WmDB. Retrieves all rows from the specified table that meet the given criteria. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL*, *\$dbUser*, *\$dbPass*, *\$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Database alias.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.

<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db:connect .
<i>\$dbCatalog</i>	<p>String Optional. Name of the database's system catalog. Include this parameter if your DBMS supports distributed databases and you want to query a table that is not in the database to which you are connected.</p> <p>If you are not using a distributed database system or if you want to query a table in the database to which you are connected, you do not need to specify this parameter.</p> <p>If you are running against DB2, use this parameter to specify the database location.</p>
<i>\$dbSchemaPattern</i>	<p>String Optional. Name of the schema to which the table belongs.</p> <p>If your database supports pattern-matching on schemas, you may specify the schema name with a pattern-matching string, where <code>_</code> represents a single character and <code>%</code> represents any string of characters. For example, the value <code>HR%</code> would represent any schema beginning with the characters <code>HR</code>.</p> <p>If you are running against DB2, you use this parameter to specify the table's AuthID.</p>
<i>\$dbTable</i>	String Name of table to query.
<i>\$data</i>	Document Optional. Criteria that the rows to retrieve must meet.

Output Parameters

<i>results</i>	com.wm.util.Table Conditional. Results of the query. The Integration Server recognizes and treats this parameter as a Document List at run time.
<i>\$dbMessage</i>	String Conditional. Message indicating the success or failure of an operation.
<i>\$rowCount</i>	String Conditional. Number of rows for the table that meet the criteria specified in <i>\$data</i> .

Usage Notes

This service accepts input from a web browser or HTML form.

pub.db:rollback

WmDB. Discards changes to a database. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Alias of the database for which you want to discard changes. This information is passed automatically.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db:connect .

Output Parameters

\$dbMessage **String** Message indicating the success or failure of the operation.

Usage Notes

This service throws an exception if an error occurs when discarding changes to the database. The most common reason for this error is that no transaction has been started (see [pub.db:startTransaction](#)).

pub.db:startTransaction

WmDB. Begins a transaction on a database connection. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*
- *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Alias of the database for which you want to start the transaction. This information is passed automatically.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db.connect .

Output Parameters

<i>\$dbMessage</i>	String Message indicating the success or failure of the operation.
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Usage Notes

By default, all database connections are opened in "auto commit" mode, meaning the results of a operation are automatically committed to the database when that operation succeeds. To use a connection in a transactional context, you must first call [pub.db.startTransaction](#) to take that connection out of "auto commit" mode.

This service returns an exception if an error occurs when starting the new transaction. Common reasons for an error when starting a new transaction are:

- A transaction is already in progress (see [pub.db.commit](#), [pub.db.rollback](#), or [pub.db.clearTransaction](#)).
- The target database does not support transactions.

After a transaction has been started, it must be terminated with a call to either [pub.db.commit](#) (to save all changes to the database) or [pub.db.rollback](#) (to discard changes).

pub.db:update

WmDB. Updates all rows in a table that meet the given criteria. Rows are updated with the supplied new data. As an alternative to this service, consider using the services provided with the webMethods Adapter for JDBC.

Input Parameters

You may specify the connection parameters in one of the following ways:

- *\$dbAlias*
- *\$dbURL, \$dbUser, \$dbPass, \$dbDriver*

■ *\$dbConnection*

<i>\$dbAlias</i>	String Optional. Database alias.
<i>\$dbURL</i>	String Optional. JDBC URL that identifies the database resource.
<i>\$dbUser</i>	String Optional. User name to use to log into the database.
<i>\$dbPass</i>	String Optional. Password for the user.
<i>\$dbDriver</i>	String Optional. Name of the JDBC driver to use.
<i>\$dbConnection</i>	com.wm.app.b2b.server.DBConnection Optional. Connection object returned by pub.db.connect .
<i>\$dbCatalog</i>	<p>String Optional. Name of the database's system catalog. Include this parameter if your DBMS supports distributed databases and you want to update rows in a table that is not in the database to which you are connected.</p> <p>If you are not using a distributed database system or if you want to update rows in the database to which you are connected, you do not need to specify this parameter.</p> <p>If you are running against DB2, you use this parameter to specify the database location.</p>
<i>\$dbSchemaPattern</i>	<p>String Optional. Name of the schema to which the table belongs.</p> <p>If your database supports pattern-matching on schemas, you may specify the schema name with a pattern-matching string, where <code>_</code> represents a single character and <code>%</code> represents any string of characters. For example, the value <code>HR%</code> would represent any schema beginning with the characters <code>HR</code>.</p> <p>If you are running against DB2, you use this parameter to specify the table's AuthID.</p>
<i>\$dbTable</i>	String Name of table to update.
<i>\$criteria</i>	Document Criteria that the rows to update must meet.
	Important: If no criteria are provided, <i>all rows</i> are updated.
<i>\$set</i>	Document New data with which to update rows.

Output Parameters

<i>\$updateCount</i>	String Number of rows updated.
<i>\$dbMessage</i>	String Conditional. Message indicating the operation failed.

11 Document Folder

■ Summary of Elements in this Folder	276
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You use the elements in the document folder to perform operations on documents in the pipeline.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.document:bytesToDocument	WmPublic. Converts an array of bytes to a document.
pub.document:deleteDocuments	WmPublic. Deletes the specified documents from a set of documents.
pub.document:documentListToDocument	WmPublic. Constructs a document (an IData object) from a document list (an IData[]) by generating key/value pairs from the values of two elements that you specify in the document list.
pub.document:documentToBytes	WmPublic. Converts a document to an array of bytes.
pub.document:documentToDocumentList	WmPublic. Expands the contents of a document into a list of documents.
pub.document:documentToXMLValues	WmPublic. Converts a document (IData object) to a String by encoding it in the webMethods XMLValues format.
pub.document:groupDocuments	WmPublic. Groups a set of documents based on specified criteria.
pub.document:insertDocument	WmPublic. Inserts a new document in a set of documents at a specified position.
pub.document:searchDocuments	WmPublic. Searches a set of documents for entries matching a set of Criteria.
pub.document:sortDocuments	WmPublic. Sorts a set of input documents based on the specified sortCriteria.
pub.document:XMLValuesToDocument	WmPublic. Decodes a String containing an XMLValues-encoded document and produces a document (IData object).

pub.document:bytesToDocument

WmPublic. Converts an array of bytes to a document. This service can only be used with byte arrays created by executing the [pub.document:documentToBytes](#) service.

Input Parameters

<i>documentBytes</i>	<p>Object An array of bytes (<code>byte[]</code>) to convert to a document.</p> <ul style="list-style-type: none"> ■ If <i>documentBytes</i> is null, the service does not return a document or an error message. ■ If <i>documentBytes</i> is not a byte array, the service throws a service exception. ■ If <i>documentBytes</i> is zero-length, the service produces an empty document.
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Output Parameters

<i>document</i>	Document A document.
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Usage Notes

Use this service with the [pub.document:documentToBytes](#) service, which converts a document into a byte array. You can pass the resulting byte array to the [pub.document:bytesToDocument](#) service to convert it back into the original document.

In order for the document-to-bytes-to-document conversion to work, the entire content of the document must be serializable. Every object in the document must be of a data type known to Integration Server, or it must support the `java.io.Serializable` interface.

Note:

If Integration Server encounters an unknown object in the document that does not support the `java.io.Serializable` interface, that object's value will be lost. It will be replaced with a string containing the object's class name.

pub.document:deleteDocuments

WmPublic. Deletes the specified documents from a set of documents.

Input Parameters

<i>documents</i>	Document List Set of documents that contain the documents you want to delete.
<i>indices</i>	String List Index values of documents to be deleted from the <i>documents</i> parameter document list.

Output Parameters

<i>documents</i>	Document List List of documents whose indices do <i>not</i> match the values in <i>indices</i> parameter.
<i>deletedDocuments</i>	Document List List of deleted documents.

Usage Notes

The `pub.document:deleteDocuments` service returns an error if the *indices* parameter value is less than zero or more than the number of documents in the *documents* input parameter.

pub.document:documentListToDocument

WmPublic. Constructs a document (an IData object) from a document list (an IData[]) by generating key/value pairs from the values of two elements that you specify in the document list.

Input Parameters

<i>documentList</i>	Document List Set of documents (IData[]) that you want to transform into a single document (IData object).
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Note:

If the *documentList* parameter contains a single document instead of a Document List, the `documentListToDocument` service does nothing.

<i>name</i>	String Name of the element in the <i>documentList</i> parameter whose value provides the name of each key in the resulting document.
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Important:

The data type of the element that you specify in the *name* parameter must be String.

<i>value</i>	String Name of the element in the <i>documentList</i> parameter whose values will be assigned to the keys specified in <i>name</i> . This element can be of any data type.
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Output Parameters

<i>document</i>	Document Document (IData object) containing the key/value pairs generated from the <i>documentList</i> parameter.
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Usage Notes

The following example illustrates how the `documentListToDocument` service would convert a document list that contains three documents to a single document containing three key/value pairs. When

you use the `documentListToDocument` service, you specify which two elements from the source list are to be transformed into the keys and values in the output document. In the following example, the values from the `pName` elements in the source list are transformed into key names, and the values from the `pValue` elements are transformed into the values for these keys.

A `documentList` containing these three documents:

Overview on how the `documentListToDocument` service would convert a document list that contains three documents to a single document containing three key/value pairs.

Key	Value
<i>pName</i>	<code>cx_timeout</code>
<i>pValue</i>	<code>1000</code>

Key	Value
<i>pName</i>	<code>cx_max</code>
<i>pValue</i>	<code>2500</code>

Key	Value
<i>pName</i>	<code>cx_min</code>
<i>pValue</i>	<code>10</code>

Would be converted to a document containing these three key:

Key	Value
<i>cx_timeout</i>	<code>1000</code>
<i>cx_max</i>	<code>2500</code>
<i>cx_min</i>	<code>10</code>

pub.document:documentToBytes

WmPublic. Converts a document to an array of bytes.

Input Parameters

<i>document</i>	Document Document (IData object) to convert to bytes. <ul style="list-style-type: none"> ■ If <i>document</i> is null, the service does not return an output or an error message.
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- If *document* is not a document (IData), the service throws a service exception.
- If *document* contains no elements, the service produces a zero-length byte array.

Output Parameters

documentBytes **Object** A serialized representation of the document as an array of bytes (byte[]).

Usage Notes

Use the [pub.document:documentToBytes](#) service with the [pub.document:bytesToDocument](#) service, which converts the byte array created by this service back into the original document.

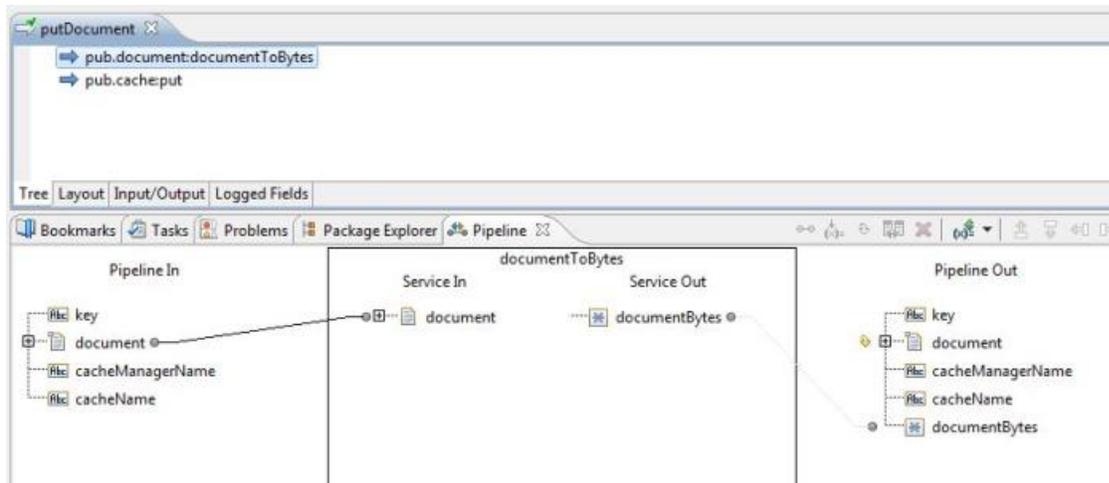
The [pub.document:documentToBytes](#) service is useful when you want to write a document to a file (using the [pub.file:bytesToFile](#) service), an input stream (using the [pub.io:bytesToStream](#) service), or a cache (using the [pub.cache:put](#) service).

In order for the document-to-bytes-to-document conversion to work, the entire content of the document must be serializable. Every object in the document must be of a data type known to Integration Server, or it must support the `java.io.Serializable` interface. If Integration Server encounters an unknown object in the document that does not support the `java.io.Serializable` interface, that object's value will be lost. Integration Server will replace it with a string containing the object's class name.

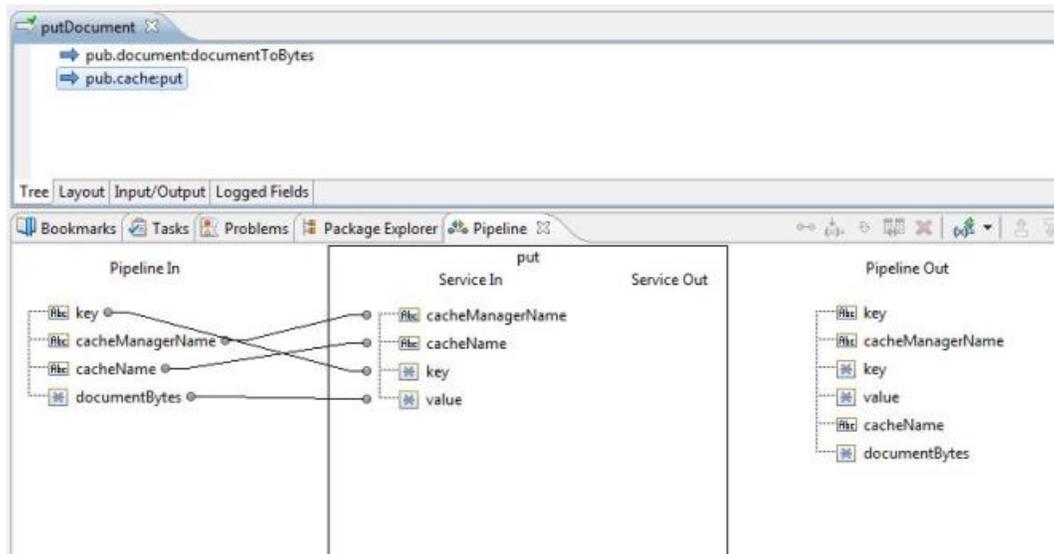
Example

This example describes how to use the [pub.document:documentToBytes](#) and [pub.document:bytesToDocument](#) services to cache a document in the pipeline.

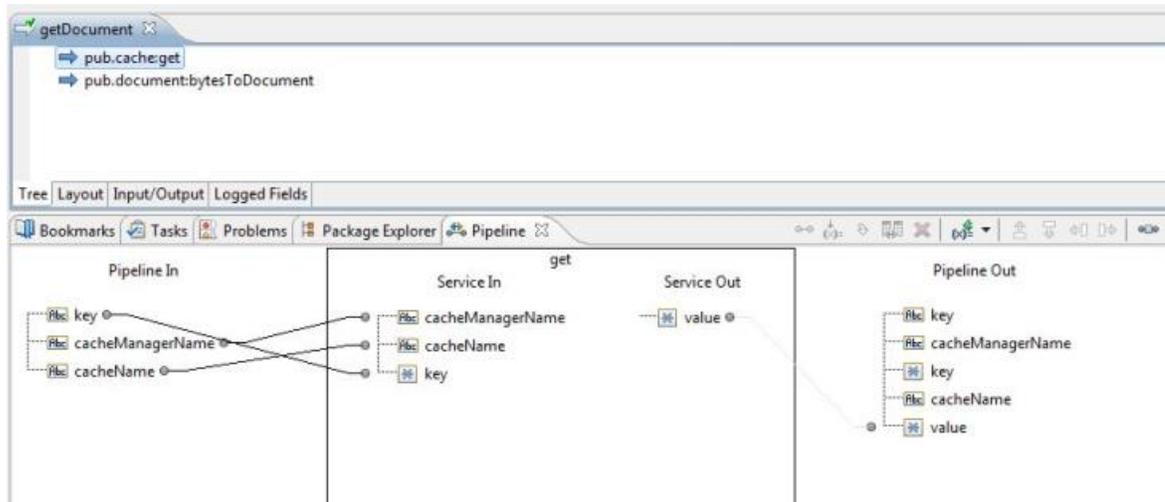
1. A document is not directly serializable, so you must first use the [pub.document:documentToBytes](#) service. Invoke the service and map the document to the *document* input parameter. This will add the output *documentBytes* to the pipeline.



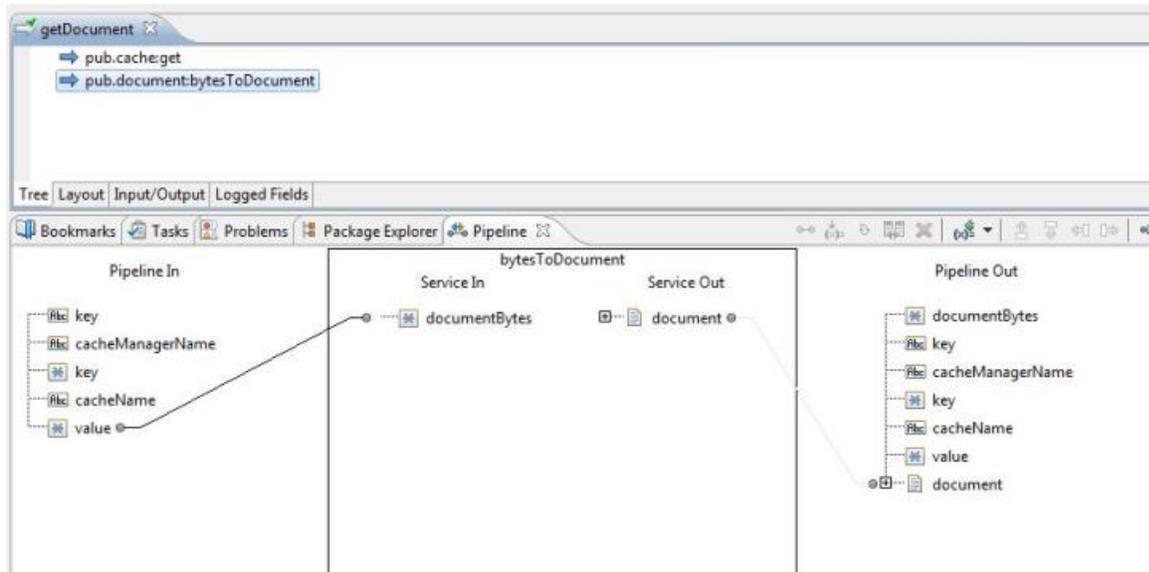
- Invoke `pub.cache:put` and map `documentBytes` to the `value` input parameter for that service. Set the `key` input parameter to a value that is meaningful to your application.



- At another point in your application, you will need to retrieve the document you cached. You can do so by invoking the `pub.cache:get` service and supplying the same `key` input parameter as in step 2. The `value` output parameter that was added as output to the pipeline will contain the byte array from step 1.



- Invoke `pub.document:bytesToDocument` and map the `value` output parameter to the `documentBytes` input parameter. This will add the output `document` to the pipeline, which will match the original document in step 1.



pub.document:documentToDocumentList

WmPublic. Expands the contents of a document into a list of documents.

Each key/value pair in the source document is transformed to a single document containing two keys (whose names you specify). These two keys will contain the key name and value of the original pair.

Input Parameters

<i>document</i>	Document Document (IData object) to transform.
<i>name</i>	String Name to assign to the key that will receive the key name from the original key/value pair. (In the example above, this parameter was set to pName.)
<i>value</i>	String Name to assign to the key that will receive the value from the original key/value pair. (In the example above, this parameter was set to pValue.)

Output Parameters

<i>documentList</i>	Document List List containing a document for each key/value pair in the <i>document</i> parameter. Each document in the list will contain two keys, whose names were specified by the <i>name</i> and <i>value</i> parameters. The values of these two keys will be the name and value (respectively) of the original pair.
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Usage Notes

The following example shows how a document containing three keys would be converted to a document list containing three documents. In this example, the names *pName* and *pValue* are specified as names for the two new keys in the document list.

A document containing these three keys:

Key	Value
<i>cx_timeout</i>	1000
<i>cx_max</i>	2500
<i>cx_min</i>	10

Would be converted to a document list containing these three documents:

Key	Value
<i>pName</i>	<i>cx_timeout</i>
<i>pValue</i>	1000

Key	Value
<i>pName</i>	<i>cx_max</i>
<i>pValue</i>	2500

Key	Value
<i>pName</i>	<i>cx_min</i>
<i>pValue</i>	10

pub.document:documentToXMLValues

WmPublic. Converts a document (IData object) to a String by encoding it in the webMethods XMLValues format.

Input Parameters

document **Document** Document (IData object) to convert. This document can contain any number of other fields, lists, and other documents.

Output Parameters

xmlvalues **String** String representation of the *document* parameter, encoded in the webMethods XMLValues format.

Usage Notes

To convert the encoded String back into an IData object, use the [pub.document:XMLValuesToDocument](#) service.

If the `watt.server.xmlCoder.getUndefinedDataTypeClassName` server configuration parameter is set to true, the *xmlvalues* output includes the class name of an unsupported data type in the XML document.

pub.document:groupDocuments

WmPublic. Groups a set of documents based on specified criteria.

Input Parameters

documents **Document List** Set of documents to be grouped based on the specified criteria.

groupCriteria **Document List** The criteria on which the input documents are to be grouped. Valid values for the *groupCriteria* parameter are:

- *key*. Key in the pipeline. The value for *key* can be a path expression. For example, "Family/Children[0]/BirthDate" retrieves the birthday of the first child from the input Family document list.
- *compareStringsAs*. Optional. Valid values for *compareStringsAs* are `string`, `numeric`, and `datetime`. The default value is `string`.
- *pattern*. Optional. *pattern* will be considered only if the *compareStringsAs* parameter is of type `datetime`. For information about using patterns, see ["Time Zones" on page 225](#).

Note:

If *key* is not found in all the input documents, the documents that do not match the *groupCriteria* are grouped together as a single group.

Output Parameters

documentGroups **Document List** List of documents where each element represents a set of documents grouped based on the criteria specified.

Usage Notes

The following example illustrates how to specify the values for the *groupCriteria* parameter:

key	compareStringsAs	pattern
name	string	
age	numeric	
birthdate	datetime	yyyy-MM-dd

The input documents will be grouped based on name, age, and birth date.

pub.document:insertDocument

WmPublic. Inserts a new document in a set of documents at a specified position.

Input Parameters

<i>documents</i>	Document List Set of documents in which a new document is to be inserted.
<i>insertDocument</i>	Document The new document to be inserted to the set of documents specified in the <i>documents</i> parameter.
<i>index</i>	String Optional. The position in the set which the document is to be inserted. The <i>index</i> parameter is zero-based. If the value for the <i>index</i> parameter is not specified, the document will be inserted at the end of the document list specified in the <i>documents</i> parameter.

Output Parameters

<i>documents</i>	Document List Document list after inserting the new document.
------------------	--

pub.document:searchDocuments

WmPublic. Searches a set of documents for entries matching a set of Criteria.

Input Parameters

<i>documents</i>	Document List Set of documents from which the documents meeting the search criteria are to be returned.
------------------	--

- searchCriteria* **Document** Criteria on which the documents in the *documents* parameter are to be searched.
- Valid values for *searchCriteria* parameters are:
- *key*. Name of the element in *documentList* whose value provides the value for the search text. The value for *key* can be a path expression. For example, "Family/Children[0]/BirthDate" retrieves the birthday of the first child from the input Family document list.
 - *value*. Optional. Any search text. If no value is specified, the service searches for null in the document list.
 - *compareStringsAs*. Optional. Allowed values are *string*, *numeric*, and *datetime*. The default value is *string*.
 - *pattern*. Optional. *pattern* will be considered only if the *compareStringsAs* value is of type *datetime*. For information about using patterns, see ["Time Zones" on page 225](#).
- sorted* **String** Optional. The value of the *sorted* parameter is *true* if the document list is already sorted based on the search criteria and same search key; otherwise *false*.
- If the value for the *sorted* parameter is set to *true*, the required documents are searched faster.

Output Parameters

- resultdocuments* **Document List** List of documents which are matching the search criteria.
- documentListIndices* **String List** Positions of search documents in the document list.
- documents* **Document List** List of documents that were input.

Usage Note

For example, if you want to search a set of documents for documents where *BirthDate* is 10th January 2008, the values for the *searchCriteria* parameter would be:

key	value	compareStringsAs	pattern
Birthdate	2008-01-10	datetime	yyyy-MM-dd

pub.document:sortDocuments

WmPublic. Sorts a set of input documents based on the specified *sortCriteria*.

Input Parameters

<i>documents</i>	Document List Set of documents that are to be sorted.
<i>sortCriteria</i>	Document List Criteria based on which the documents in the <i>documents</i> parameter are to be sorted.

Valid values for *sortCriteria* parameters are:

- *key*. Name of the element in documentList whose value provides the value based on which the documents are to be sorted. The value for *key* can be a path expression. For example, "Family/Children[0]/BirthDate" retrieves the birthday of the first child from the input Family document list.
- *order*. Optional. Allowed values are ascending and descending. The default value is ascending.
- *compareStringsAs*. Optional. Allowed values are string, numeric, and datetime. Default value is string.
- *pattern*. Optional. The value for *pattern* will be considered only if the *compareStringsAs* value is of type datetime. For information about using patterns, see ["Time Zones" on page 225](#).

Note:

If *key* is not found in all the input documents, the sorted list of documents appears at the end or start of the list based on the *order* specified. If the order is ascending, then all the documents that do not match the sort criteria appears at the top of the list, followed by the sorted list. If the order is descending, the sorted list will appear at the top, followed by the documents that do not match the sort criteria.

Output Parameters

<i>documents</i>	Document List The documents sorted based on the sort criteria specified in the <i>sortCriteria</i> parameter.
------------------	--

Usage Notes

For example, if you want to sort a set of documents based on name, age, and then on birth date, the values for *sortCriteria* parameter would be:

key	order	compareStringsAs	pattern
Name	ascending	string	
Age	descending	numeric	

key	order	compareStringsAs	pattern
Birthdate	ascending	datetime	yyyy-MM-dd

pub.document:XMLValuesToDocument

WmPublic. Decodes a String containing an XMLValues-encoded document and produces a document (IData object).

Input Parameters

xmlvalues **String** An XMLValues encoding of a document.

Important:

This String must contain a webMethods XMLValues encoding of a document. No other encoding format is accepted.

Output Parameters

document **Document** Document (IData object) result of the decoding of *xmlvalues*.

Usage Notes

An XMLValues-encoded document is produced using [pub.document:documentToXMLValues](#).

If the `watt.server.xmlCoder.getUndefinedDataTypeClassName` server configuration parameter is set to true, the class name of an unsupported data type appears in the *document* IData object.

12 Event Folder

■ Summary of Elements in this Folder	290
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You use the elements in the event folder to subscribe to events, write event handlers, and work with EDA (Event Driven Architecture) events.

Note: webMethods Event Routing, the `pub.event.routing*` services and document types, and the `pub.event.eda*` services, document types, and schemas are deprecated. Use Digital Event Services.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.event:addSubscriber	WmPublic. Creates a subscription for a specified event.
pub.event:alarm	WmPublic. Specification for alarm event handlers.
pub.event:alarmInfo	WmPublic. Document type for alarm event information.
pub.event:audit	WmPublic. Specification for audit event handlers.
pub.event:auditError	WmPublic. Specification for audit event errors.
pub.event:auditErrorInfo	WmPublic. Document type for audit error event information.
pub.event:auditInfo	WmPublic. Document type for audit event information.
pub.event:callstackItem	WmPublic. Document type for the name of the service in the invocation path when an exception occurred and the index that indicates the step at which the exception occurred.
pub.event:deleteSubscriber	WmPublic. Removes an event handler from the subscription list for a specified event.
pub.event.eda:event	WmPublic. <i>Deprecated</i> - There is no replacement document type. Document type that defines the structure of an event document.
pub.event.eda:eventToDocument	WmPublic. <i>Deprecated</i> - There is no replacement service. Converts an EDA event in the form of an XML string to a document (IData object).
pub.event.eda:schema_event	WmPublic. <i>Deprecated</i> - There is no replacement schema. Schema that defines the structure and data types used for the event header in the <code>pub.event.eda:event</code> document type.
pub.event:error	WmPublic. Specification for error event handlers.
pub.event:errorInfo	WmPublic. Document type for error event information.
pub.event:exception	WmPublic. Specification for exception event handlers.

Element	Package and Description
pub.event:exceptionInfo	WmPublic. Document type for exception information.
pub.event:gdEnd	WmPublic. Specification for gdEnd event handlers.
pub.event:gdEndInfo	WmPublic. Document type for gdEnd event information.
pub.event:gdStart	WmPublic. Specification for gdStart event handlers.
pub.event:gdStartInfo	WmPublic. Document type for gdStart event information.
pub.event:getEventTypes	WmPublic. Returns the list of supported event types on Integration Server.
pub.event:getSubscribers	WmPublic. Returns the list of subscribers for a specified event type.
pub.event:jmsReceiveErrorEvent	WmPublic. Specification for a JMS retrieval failure event handler.
pub.event:jmsSendErrorEvent	WmPublic. Specification for the JMS delivery failure event handler.
pub.event:journal	WmPublic. Specification for journal event handlers.
pub.event:journalInfo	WmPublic. Document type for journal event information
pub.event:modifySubscriber	WmPublic. Modifies the information about a subscription.
pub.event:portStatus	WmPublic. Specification for a port status event.
pub.event:portStatusInfo	WmPublic. Document type for port event information.
pub.event:reloadEventManagerSettings	WmPublic. Reloads the settings from the event manager's configuration file (eventcfg.bin) on the server.
pub.event:replication	WmPublic. Specification for replication event handlers.
pub.event:replicationInfo	WmPublic. Document type for replication event information.
pub.event.routing:send	WmPublic. <i>Deprecated</i> - There is no replacement document type. Sends events to the messaging provider using webMethods Event Routing.
pub.event.routing:eventAcknowledgement	WmPublic. <i>Deprecated</i> - Use Digital Event Services. Defines the input signature for a callback service that processes acknowledgments sent by the Event Routing framework.
pub.event.routing:subscribe	WmPublic. <i>Deprecated</i> - Use Digital Event Services. Subscribes to a particular type of event using webMethods Event Routing.

Element	Package and Description
pub.event.routing:unsubscribe	WmPublic. <i>Deprecated</i> - Use Digital Event Services. Unsubscribes from an event type previously subscribed to using the pub.event.routing:subscribe service.
pub.event:saveEventManagerSettings	WmPublic. Saves the current subscriber information to the event manager's configuration file (eventcfg.bin) on the server.
pub.event:security	WmPublic. Specification for security event handlers.
pub.event:securityInfo	WmPublic. Document type for security event information.
pub.event:sessionEnd	WmPublic. Specification for sessionEnd event handlers.
pub.event:sessionEndInfo	WmPublic. Document type for sessionEnd event information.
pub.event:sessionExpire	WmPublic. Specification for sessionExpire event handlers.
pub.event:sessionExpireInfo	WmPublic. Document type for sessionExpire event information.
pub.event:sessionStart	WmPublic. Specification for sessionStart event handlers.
pub.event:sessionStartInfo	WmPublic. Document type for sessionStart event information.
pub.event:stat	WmPublic. Specification for stat event handlers.
pub.event:statInfo	WmPublic. Document type for stat event information.
pub.event:txEnd	WmPublic. Specification for txEnd event handlers.
pub.event:txEndInfo	WmPublic. Document type for txEnd event information.
pub.event:txStart	WmPublic. Specification for txStart event handlers.
pub.event:txStartInfo	WmPublic. Document type for txStart event information.

pub.event:addSubscriber

WmPublic. Creates a subscription for a specified event.

Important:

Subscriptions that you add using this service take effect immediately; however, they are not made permanent unless you also persist them to disk with the [pub.event:saveEventManagerSettings](#) service. If you do not run [pub.event:saveEventManagerSettings](#) after adding subscribers, your changes will be lost when the server is restarted.

Input Parameters

EventType **String** Type of event to which the event handler is subscribing. Must be one of the following:

Alarm Event
 Audit Event
 Audit Error Event
 Error Event
 Exception Event
 GD End Event
 AGD Start Event
 JMS Delivery Failure Event
 JMS Retrieval Failure Event
 Journal Event
 Port Status Event
 Replication Event
 Security Event
 Session End Event
 Session Expire Event
 Session Start Event
 Stat Event
 Tx End Event
 Tx Start Event

Tip:

To view the current list of event types, you can execute the [pub.event:getEventTypes](#) service.

Filter **String** Selects (filters) the set of events within *EventType* to which the event handler is subscribing. `addSubscriber` uses *Filter* as a pattern string to filter a particular attribute of an event.

The pattern string can be composed of literal characters, which match a character exactly, and/or the "*" character, which matches any sequence of characters. For example:

<u>This pattern string...</u>	<u>Would match...</u>
*	Any string
M*	Any string that starts with an uppercase "M."
M*X	Any string that starts with an uppercase "M" and ends with an uppercase "X."

The following table shows the attribute that is filtered for each event type. Note that some event types cannot be filtered.

<u>EventType</u>	<u>Filtered attribute</u>
Alarm Event	Message generated by the alarm event.
Audit Event	Fully qualified name of the service that generates the audit event.
Audit Error Event	Concatenated values of the <i>destination</i> and <i>errorCode</i> parameters of the audit error event.
Error Event	Error message text for the error that generates the error event.
Exception Event	Fully qualified name of the service that generates the exception event.
GD End Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
GD Start Event	Fully qualified name of the service that generates the GD Start Event.
JMS Delivery Failure Event	Name of the JMS connection alias used to send the message to the JMS provider.
JMS Retrieval Failure Event	Fully qualified name of the JMS trigger that invoked the trigger service for which the error occurred.
Journal Event	The major code and minor code of the message that causes the journal event.
Port Status Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
Replication Event	Name of the package being replicated.
Security Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
Session End Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.

Session Expire Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
Session Start Event	<p>User ID of the user starting the session or the groups to which the user belongs. (The filter is applied to a space-delimited list of groups, composed of group names suffixed with the user's user ID.)</p> <p>The following examples show how you might filter session start events for various groups and/or user IDs:</p> <p>To select session starts for any user in the Administrators group, the filter would be:</p> <pre>*Administrators*</pre> <p>To select session starts for the user ID "LRMalley" in the Administrators group, the filter would be:</p> <pre>*Administrators*LRMalley</pre> <p>To select session starts for the user ID "LRMalley" in any group, the filter would be:</p> <pre>*LRMalley</pre>
Stat Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
Tx End Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
Tx Start Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
<i>Service</i>	String Fully qualified name of the event-handler service (the service that will execute when the event specified by <i>EventType</i> and <i>Filter</i> occurs).
<i>Comment</i>	String Descriptive comment for this subscription. This comment is displayed when subscriptions are viewed with Designer.
<i>Enabled</i>	<p>String Flag specifying the status of the subscription. Must be one of the following values. Set to:</p> <ul style="list-style-type: none"> ■ true to make the subscription active. ■ false to make the subscription inactive. This is the default. <p>Note: Although the default value is false, you will generally want to set <i>Enabled</i> to true to activate the subscription immediately when it is added.</p>

Output Parameters

<i>Result</i>	String Flag indicating whether the subscriber was successfully added. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that the subscriber was added successfully.■ <code>false</code> indicates that the subscriber was not added.
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See Also

[pub.event:deleteSubscriber](#)

[pub.event:modifySubscriber](#)

[pub.event:getSubscribers](#)

[pub.event:saveEventManagerSettings](#)

pub.event:alarm

WmPublic. Specification for alarm event handlers.

Input Parameters

<i>time</i>	String Date and time that the event occurred, in the format <code>yyyy/MM/dd HH:mm:ss.SS</code> .
<i>service</i>	String Fully qualified name of the service that generated the event. A service can generate an alarm event when a client invokes a service that accesses information or a service on a remote server. If the client is not a member of an allowed group for the port on the remote server, the service will generate an alarm event.
<i>sessionID</i>	String Identification number for the session during which the alarm event was generated. Some alarm events are not generated during sessions. In these cases, the <i>sessionID</i> variable will not contain a value.
<i>msg</i>	String Text describing the alarm.

Output Parameters

None.

Usage Notes

Remember to register your handler with the Event Manager.

When you subscribe an event handler to an alarm event, you can create a filter for the *msg* field to specify the services whose alarm events you want to subscribe to. That is, you can specify which services' alarm events invoke the event handler.

pub.event:alarmInfo

WmPublic. Document type for alarm event information.

Parameters

<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>service</i>	String Fully qualified name of the service that generated the event.
<i>sessionID</i>	String Session ID of the service firing the alarm.
<i>msg</i>	String Text describing the alarm.

pub.event:audit

WmPublic. Specification for audit event handlers.

Input Parameters

<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy-MM-dd HH:mm:ss z</i> (for example, "2004-10-28 14:46:39 EDT").
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Note:

You can set the format for the *time* parameter in the `watt.server.dateStampFmt` property.

<i>TID</i>	String Server thread that generated the audit event.
<i>service</i>	String Fully qualified name of the service that generated the event.
<i>sessionID</i>	String Session ID of the service that generated the event.
<i>result</i>	<p>String Description of the audit point. A value of:</p> <ul style="list-style-type: none"> ■ Started indicates that this event marks the beginning of a service. ■ Ended indicates that this event marks the end of a service that executed successfully. ■ Failed indicates that this event marks the end of a service that executed unsuccessfully (that is, threw an exception) and is not configured to retry. A failed event also marks the end of a service that executed unsuccessfully after exhausting all of its retries.

- Retried indicates that this event is created each time a service is retried.

pipeline **Document** Optional. The pipeline that was passed to the service. This parameter is required only if the service is configured to include the pipeline when auditing.

userName **String** User ID that invoked the service that generated the event.

Output Parameters

None.

Usage Notes

Events are created for a service only if auditing for that type of event is enabled for the service. For example, start events will not be created unless auditing for service start is enabled for that service.

Remember to register your handler with the Event Manager. Not all audit handlers that you code will log information.

When writing your own audit handler, be careful to not modify the *pipeline* variable within your handler.

Use the `watt.server.event.audit.async` server parameter to indicate whether event handlers for audit events are invoked synchronously or asynchronously. When this parameter is set to true, Integration Server invokes the event handlers that subscribe to audit events asynchronously. When this parameter is set to false, Integration Server invokes the event handlers that subscribe to audit events synchronously. The default is true (asynchronous).

pub.event:auditError

WmPublic. Specification for audit error event handlers.

Input Parameters

time **String** Date and time at which the audit error occurred. This parameter is in the format `yyyy-MM-dd HH:mm:ss.SSS` (for example, "2004-10-28 14:46:39.505").

destination **String** Specifies the audit log destination to which the audit logging system attempted to write when the error occurred.

<u>Value</u>	<u>Audit logger where the error occurred...</u>
ServiceDBDest	Service audit logger
ErrorDBDest	Error audit logger
SessionDBDest	Session audit logger

	ProcessAuditDBDest	Process audit logger
	CoreAuditDBDest	All other audit loggers
<i>message</i>	String	Error message of the exception.
<i>stackTrace</i>	String	Stack trace for the exception.
<i>errorCode</i>	String	Optional. The SQL error code returned with the exception.

Output Parameters

None.

Usage Notes

Remember to register your event handler using [pub.event:addSubscriber](#). Set the *EventType* input variable to Audit Error Event.

An audit error event is fired in the following situations:

- When a SQLException is encountered while trying to insert an audit record into the audit logging database.
- When Integration Server initializes and cannot connect to the audit logging database.
- When the Service logger is configured to retry failed auditing attempts, the audit error event is fired for the initial failure and each subsequent failure.

When you subscribe to an audit error event, you can supply a filter to limit the events that your event handler receives. The filter applies to the concatenated values of the *destination* and *errorCode* fields. You can use the asterisk (*) as a wildcard character in the filter. The following table shows how you can use filters to limit the events that your event handler will receive:

This filter...	Limits the events that the event handler receives to...
<i>YourSearchTerm</i>	Events that contain <i>only YourSearchTerm</i> .
<i>*YourSearchTerm</i>	Events that contain <i>YourSearchTerm</i> at the end of the audit error event value.
<i>YourSearchTerm*</i>	Events that contain <i>YourSearchTerm</i> at the beginning of the audit error event value.
<i>*YourSearchTerm*</i>	Events that contain <i>YourSearchTerm</i> anywhere within the audit error event value.

Use the `watt.server.event.audit.async` server parameter to indicate whether event handlers for audit error events are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to audit error events asynchronously. When this parameter is set to `false`, Integration Server invokes the event handlers that subscribe to audit error events synchronously. The default is `true` (asynchronous).

pub.event:auditErrorInfo

WmPublic. Document type for audit error event information.

Input Parameters

time **String** Date and time at which the audit error occurred. This parameter is in the format *yyyy-MM-dd HH:mm:ss.SSS* (for example, "2004-10-28 14:46:39.505").

destination **String** Specifies the audit log destination to which the audit logging system attempted to write when the error occurred.

<u>Value</u>	<u>Audit logger where the error occurred...</u>
ServiceDBDest	Service audit logger
ErrorDBDest	Error audit logger
SessionDBDest	Session audit logger
ProcessAuditDBDest	Process audit logger
CoreAuditDBDest	All other audit loggers

message **String** Error message of the exception.

stackTrace **String** Stack trace for the exception.

errorCode **String** Optional. The SQL error code returned with the exception.

Usage Notes

Use the `watt.server.event.audit.async` server parameter to indicate whether event handlers for audit events are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to audit events asynchronously. When this parameter is set to `false`, Integration Server invokes the event handlers that subscribe to audit events synchronously. The default is `true` (asynchronous).

pub.event:auditInfo

WmPublic. Document type for audit event information.

Parameters

time **String** Date and time that the event occurred, in the format *yyyy-MM-dd HH:mm:ss z* (for example, "2004-10-28 14:46:39 EDT").

Note:

You can set the format for the *time* parameter in the `watt.server.dateStampFmt` property.

<i>TID</i>	String Server thread that generated the audit event in hashed format. The TID is generated by calling the <code>Java Thread.currentThread().hashCode()</code> method.
<i>service</i>	String Fully qualified name of the service that generated the event.
<i>sessionID</i>	String Session ID of the service that generated the event.
<i>result</i>	String Description of the audit point. <ul style="list-style-type: none"> ■ Started indicates that this event marks the beginning of a service. ■ Ended indicates that this event marks the end of a service that executed successfully. ■ Failed indicates that this event marks the end of a service that executed unsuccessfully (that is, threw an exception) and is not configured to retry. A failed event also marks the end of a service that executed unsuccessfully after exhausting all of its retries. ■ Retried indicates that this event is created each time a service is retried.
<i>pipeline</i>	Document Optional. The pipeline that was passed to the service. This parameter is required only if the service is configured to include the pipeline when auditing.
<i>userName</i>	String User ID that invoked the service that generated the event.

Usage Notes

Use the `watt.server.event.audit.async` server parameter to indicate whether event handlers for audit events are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to audit events asynchronously. When this parameter is set to `false`, Integration Server invokes the event handlers that subscribe to audit events synchronously. The default is `true` (asynchronous).

pub.event:callstackItem

WmPublic. Document type for the name of the service in the invocation path when an exception occurred and the index that indicates the step at which the exception occurred.

Parameters

<i>service</i>	String Fully qualified name of the last service (that is, most recently called) on the call stack.
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flowStep

String Path representing the last executed flow step in the service where the exception occurred. The path takes the form /n/n/n..., where n represents a sequential index of flow steps and / indicates a level of nesting. The following illustrates an example of flow steps and the *flowStep* value that would be assigned to them if the exception occurred at that step:

Step	<i>flowStep</i> Value
MAP	/0
SEQUENCE	/1
BRANCH	/1/0
INVOKE	/1/0/0
MAP	/2
SEQUENCE	/3
EXIT	/3/0

If the stack contains a Java service, the *flowStep* value for that service will be empty.

pub.event:deleteSubscriber

WmPublic. Removes an event handler from the subscription list for a specified event.

Important:

Deletions made using this service take effect immediately; however, they are not made permanent unless you persist them to disk with the [pub.event:saveEventManagerSettings](#) service. If you do not run [pub.event:saveEventManagerSettings](#) after deleting subscribers, your changes will be lost when the server is restarted.

Input Parameters

EventType

String Type of event from which the event handler is unsubscribing. Must be one of the following values:

- Alarm Event
- Audit Event
- Exception Event
- GD End Event
- GD Start Event
- JMS Delivery Failure Event
- JMS Retrieval Failure Event
- Port Status Event
- Replication Event

Security Event
Session End Event
Session Expire Event
Session Start Event
Stat Event
Tx End Event
Tx Start Event

Tip:

To view the current list of event types, you can execute the [pub.event:getEventTypes](#) service.

gID

String ID of the subscriber that you want to delete. To get a list of subscriber IDs, execute the [pub.event:getSubscribers](#) service.

Output Parameters

Result

String Flag indicating whether the subscriber was successfully deleted. A value of:

- true indicates that the subscriber was deleted successfully.
- false indicates that the subscriber was not deleted (typically an invalid subscriber ID was provided in *gID*).

See Also

[pub.event:addSubscriber](#)

[pub.event:modifySubscriber](#)

[pub.event:getSubscribers](#)

[pub.event:saveEventManagerSettings](#)

pub.event.eda:event

WmPublic. *Deprecated* - There is no replacement document type.

Document type that defines the structure of an EDA event.

Parameters

evt:Header **Document** The event header.

Key	Description
<i>evt:Start</i>	String Start date and time of the event, in the format <i>yyyy-MM-dd'T'HH:mm:ss.SSSZ</i> .
<i>evt:End</i>	String Optional. End date and time of the event, in the format <i>yyyy-MM-dd'T'HH:mm:ss.SSSZ</i> . The absence of an <i>End</i> value in an event is often interpreted as indicating that the event started and ended at the same time. While this is valid in some consumers, other consumers consider it impossible for events to start and end at precisely the same time. When an event does not specify an <i>End</i> value, the consumer may set a default value, such as start time plus one millisecond.
<i>evt:Kind</i>	String Optional. Indicates whether the event is a new event (Event) or a heartbeat event (Heartbeat). A heartbeat event indicates the temporal progress of the stream.
<i>evt:Type</i>	<p>String The unique identifier of the event type. Event Types use qualified names (QNames) as the mechanism for concisely identifying the particular type. The value of <i>evt:type</i> combines the URI and local name as a string. For example,</p> <p><code>http://namespace.softwareag.com/EDA/WebMProcess/IOProcessInstanceChange</code></p> <p>is the event type identifier that reports changes to a process instance.</p>
<i>evt:Version</i>	String Optional. The version of the event type with which the event is compatible. An event should contain a version only if the event type supports versioning. An event should not specify a version if the event type does not support versioning.
<i>evt:CorrelationID</i>	String Optional. Unique identifier used to associate an event with other events.
<i>evt:EventID</i>	String Optional. The unique identifier of the event. This element can be supplied by the user who emitted the event or can be system generated.
<i>evt:Priority</i>	String Optional. The priority of the event to the producer. The value can be <code>Normal</code> or <code>High</code> .

<i>evt:ProducerID</i>	String Optional. The identifier of the event producer. For example, this can be an application identifier or a globally unique identifier for each producer.
<i>evt:UserID</i>	String Optional. The identifier of the user who emitted the event.
<i>evt:CustomHeaders</i>	Document Optional. Custom header elements.
<i>evt:Body</i>	Document Optional. The event body.

Usage Notes

The prefix “*evt*” is associated with the namespace <http://namespaces.softwareag.com/EDA/Event>. All events belong to this asset namespace.

The [pub.event.eda:schema_event](#) schema defines the structure and data types for an EDA event document.

pub.event.eda:eventToDocument

WmPublic. *Deprecated* - There is no replacement service.

Converts an EDA event in the form of an XML string to a document instance in the form of `pub.event.eda:event`.

Note:

The [pub.event.routing:subscribe](#) service, which replaces the removed `pub.event.nerv:subscribe` service, handles the conversion of an EDA event into an IS document (IData). Hence, you no longer have to run the `pub.event.eda:eventToDocument` service to convert an EDA event before it can be processed.

Input Parameters

<i>xmldata</i>	String XML string containing the event to convert to a document (IData object). The XML string must conform to the Event element structure declared in the <code>Envelope.xsd</code> schema.
<i>documentTypeName</i>	<p>String Optional. Fully qualified name of the IS document type that specifies the structure to impose on the body of the event. By specifying a document type, you can identify:</p> <ul style="list-style-type: none"> ■ The order and dimensionality of elements. ■ The prefix associated with each namespace in the instance document. <p>The document type specified in <i>documentTypeName</i> does not need to specify every element that will appear in the resulting document. At a minimum, the document type needs to specify the elements whose</p>

structure you want to explicitly set and the elements that you want to use in pipeline mapping.

If you do not specify *documentTypeName*, the structure of the event body is determined solely by the event document.

Output Parameters

evt:Event **Document** A document reference to the [pub.event.eda:event](#) document type which specifies the structure of an event as a Document (IData object).

Usage Notes

This service transforms each element and attribute in the EDA event to an element in an IData object.

This service always converts XML nodes to String or Document object fields. It does not generate constrained objects (for example, Floats or Integers), even if the fields in the specified document are defined as constrained objects.

The [pub.event.eda:event](#) document type determines the overall structure of the *evt:Event* IData object that this service returns.

The document type specified for *documentTypeName* determines the structure of the event body contained in the *evt:Body* field. If you do not specify *documentTypeName*, the structure of the event body is determined by the event.

The document type in *documentTypeName* identifies the namespace prefixes to use for the conversion. Integration Server determines the namespace prefix information through the association of the prefix in the field name with the URI in the **XML namespace** property of the field. For example, suppose that a field in *documentTypeName* is named `SAG:account` and the XML namespace property of that field is `http://www.softwareag.com`. In the resulting IData object for the event body, Integration Server will use the prefix SAG with any element that belongs to the `http://www.softwareag.com` namespace.

If *documentTypeName* does not specify namespace prefixes or *documentTypeName* is not specified, the prefixes used in conversion depend on the event document.

- If the event contains namespace qualified elements and uses prefixes, the resulting IData object for the event body uses the prefixes from the instance document.
- If the event contains elements qualified with a default namespace and the elements do not use prefixes, the resulting IData object for the event body does not use prefixes. Only the local name appears in the resulting event body.

In a document type that represents a namespace qualified XML document, it is considered good practice for the document type and its contents to account for all of the namespaces in the XML document. That is, the document type should include namespace prefixed fields associated with the namespaces for all of the possible namespace qualified elements in the XML document.

When *documentTypeName* is provided, the server parameter `watt.server.xml.xmlNodeToDocument.keepDuplicates` determines whether or not Integration Server keeps additional occurrences of an element in an XML document. When set to true, the document produced by the `pub.event.eda:eventToDocument` service contains multiple occurrences of the element. When set to false, the document keeps only the last occurrence of the element. The default is true.

pub.event.eda:schema_event

WmPublic. *Deprecated* - There is no replacement schema.

Schema that defines the structure and data types used for the event header in the `pub.event.eda:event` document type.

pub.event:error

WmPublic. Specification for error event handlers.

Input Parameters

<i>stackTrace</i>	String Stack trace for the error.
<i>errorMessage</i>	String The error message, if any, generated by the error that causes the error event.
<i>serviceName</i>	String Fully qualified name of the service in which the error occurred.

Output Parameters

None.

Usage Notes

Remember to register your even handler using Event Manager or `pub.event:addSubscriber`.

The `watt.server.event.exception.async` server parameter indicates whether event handlers for error events are invoked synchronously or asynchronously. When this parameter is set to true, Integration Server invokes the event handlers that subscribe to error events asynchronously. When this parameter is set to false, Integration Server invokes the services that subscribe to the error events synchronously. The default is true (asynchronous).

An error event handler can have a filter for the contents of *errorMessage*. The following filter specifies that any error event with an *errorMessage* whose value contains the word "missing" will invoke the event handler: `*missing*`

pub.event:errorInfo

WmPublic. Document type for error event information.

Parameters

<i>stackTrace</i>	String Stack trace for the error.
<i>errorMessage</i>	String The error message, if any, generated by the error that causes the error event.
<i>serviceName</i>	String Fully qualified name of the service in which the error occurred.

Usage Note

The `watt.server.event.exception.async` server parameter indicates whether event handlers for error events are invoked synchronously or asynchronously. When this parameter is set to true, Integration Server invokes the event handlers that subscribe to error events asynchronously. When this parameter is set to false, Integration Server invokes the services that subscribe to the error events synchronously. The default is true (asynchronous).

An error event handler can have a filter for the contents of *errorMessage*. The following filter specifies that any error event with an *errorMessage* whose value contains the word "missing" will invoke the event handler: `*missing*`

pub.event:exception

WmPublic. Specification for exception event handlers.

Input Parameters

<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
-------------	--

Note:

You can set the format by specifying the `watt.server.dateStampFmt` property.

<i>error</i>	String Optional. Error message of the exception.
<i>localizedError</i>	String Optional. Error message in the language that corresponds to the locale of your webMethods installation.
<i>errorType</i>	String Exception type that was thrown.
<i>errorDump</i>	String More detailed information about the exception.

<i>service</i>	String Optional. Fully qualified name of the service that generated the event.
<i>user</i>	String User that requested the service that generated the event.
<i>callStack</i>	Document List Optional. The call stack information describing where the exception occurred, including the fully qualified name of a service on the stack and an index that identifies the last executed flow step in that service. Each document represents a service on the call stack. The first document in the list represents the service that threw the exception and the last document in the list represents the top-level service. The structure of this document is defined by pub.event:callstackItem .
<i>pipeline</i>	Document Optional. State of the pipeline at the time the exception occurred.
<i>threadID</i>	String Thread ID identifying the thread that invoked the service.
<i>ssnid</i>	String Session ID during which the exception occurred.
<i>errorMsgID</i>	String Optional. The identification number for the error message.
<i>errorDetails</i>	Document Optional. Additional exception information provided by the author of the Java service. For more information about constructing exceptions to return additional information, see the <i>webMethods Integration Server Java API Reference</i> for the <code>com.wm.util.LocalizedException</code> class.
<i>nestedErrorInfo</i>	Document Optional. Nested errors and exceptions, if any. The structure of this document is defined by pub.event:exceptionInfo .

Output Parameters

None.

Usage Notes

Remember to register your handler with the Event Manager.

Not all exception handlers that you code will log information.

Use the `watt.server.event.exception.async` server parameter to indicate whether event handlers for exception events are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to exception events asynchronously. When this parameter is set to `false`, Integration Server invokes the services that subscribe to the exception events synchronously. The default is `true` (asynchronous).

When you subscribe an event handler to an exception event, you can create a filter for the *service* field to specify the services whose exception events you want to subscribe to. That is, you can specify which services' exception events invoke the event handler.

pub.event:exceptionInfo

WmPublic. Document type for exception information.

Parameters

<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>error</i>	String Optional. Error message of the exception.
<i>localizedError</i>	String Optional. Error message in the language that corresponds to the locale of your webMethods installation.
<i>errorType</i>	String Exception type that was thrown.
<i>errorDump</i>	String More detailed information about the exception.
<i>service</i>	String Optional. Fully qualified name of the service that generated the event.
<i>user</i>	String User that requested the service that generated the event.
<i>callStack</i>	Document List Optional. The call stack information describing where the exception occurred, including the fully qualified name of a service on the stack and an index that identifies the last executed flow step in that service. Each document represents a service on the call stack. The first document in the list represents the service that threw the exception and the last document in the list represents the top-level service. The structure of this document is defined by pub.event:callstackItem .
<i>pipeline</i>	Document Optional. State of the pipeline at the time the exception occurred.
<i>threadID</i>	String Thread ID identifying the thread that invoked the service.
<i>ssnid</i>	String Session ID during which the exception occurred.
<i>errorMsgID</i>	String Optional. The identification number for the error message.
<i>errorDetails</i>	Document Optional. Additional exception information provided by the author of the Java service. For more information about constructing exceptions to return additional information, see the <i>webMethods Integration Server Java API Reference</i> for the <code>com.wm.util.LocalizedException</code> class.
<i>nestedErrorInfo</i>	Document Optional. Nested errors and exceptions, if any. The structure of this document is defined by pub.event:exceptionInfo .

Usage Notes

Use the `watt.server.event.exception.async` server parameter to indicate whether event handlers for exception events are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to exception events asynchronously. When this parameter is set to `false`, Integration Server invokes the services that subscribe to the exception events synchronously. The default is `true` (asynchronous).

pub.event:gdEnd

WmPublic. Specification for gdEnd event handlers.

Input Parameters

<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>TID</i>	String Transaction ID of the service that generated the event.
<i>result</i>	String Status of the transaction.

Output Parameters

None.

Usage Notes

Remember to register your handler with the Event Manager.

Use the `watt.server.event.gd.async` server parameter to indicate whether event handlers for all guaranteed delivery events (gdStart and gdEnd) are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to the gdStart and/or gdEnd events asynchronously. When this parameter is set to `false`, Integration Server invokes the event handlers that subscribe to the gdStart and/or gdEnd events synchronously. The default is `true` (asynchronous).

pub.event:gdEndInfo

WmPublic. Document type for gdEnd event information.

Parameters

<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>TID</i>	String Transaction ID of the service that generated the event.

result **String** Status of the transaction.

Usage Notes

Use the `watt.server.event.gd.async` server parameter to indicate whether event handlers for all guaranteed delivery events (`gdStart` and `gdEnd`) are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to the `gdStart` and/or `gdEnd` events asynchronously. When this parameter is set to `false`, Integration Server invokes the event handlers that subscribe to the `gdStart` and/or `gdEnd` events synchronously. The default is `true` (asynchronous).

pub.event:gdStart

WmPublic. Specification for `gdStart` event handlers.

Input Parameters

time **String** Date and time that the event occurred, in the format `yyyy/MM/dd HH:mm:ss.SS`.

TID **String** Transaction ID of the service that generated the event.

svcname **String** Fully qualified name of the service that generated the event.

result **String** Status of the transaction.

Output Parameters

None.

Usage Notes

Remember to register your handler with the Event Manager.

Use the `watt.server.event.gd.async` server parameter to indicate whether event handlers for all guaranteed delivery events (`gdStart` and `gdEnd`) are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to the `gdStart` and/or `gdEnd` events asynchronously. When this parameter is set to `false`, Integration Server invokes the event handlers that subscribe to the `gdStart` and/or `gdEnd` events synchronously. The default is `true` (asynchronous).

When you subscribe an event handler to a `gdStart` event, you can create a filter for the `svcname` field to specify the services in a guaranteed delivery transaction that you want to subscribe to. That is, you can specify the services that when invoked using guaranteed delivery will invoke the event handler.

pub.event:gdStartInfo

WmPublic. Document type for gdStart event information.

Parameters

<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>TID</i>	String Transaction ID of the service that generated the event.
<i>svcname</i>	String Fully qualified name of the service that generated the event.
<i>result</i>	String Status of the transaction.

Usage Notes

Use the `watt.server.event.gd.async` server parameter to indicate whether event handlers for all guaranteed delivery events (`gdStart` and `gdEnd`) are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to the `gdStart` and/or `gdEnd` events asynchronously. When this parameter is set to `false`, Integration Server invokes the event handlers that subscribe to the `gdStart` and/or `gdEnd` events synchronously. The default is `true` (asynchronous).

pub.event:getEventTypes

WmPublic. Returns the list of supported event types on Integration Server.

Input Parameters

None.

Output Parameters

<i>EventTypes</i>	Document The types of events that the server supports:
	Alarm Event
	Audit Event
	Audit Error Event
	Exception Event
	GD End Event
	GD Start Event

JMS Delivery Failure Event
JMS Retrieval Failure Event
Port Status Event
Replication Event
Security Event
Session End Event
Session Expire Event
Session Start Event
Stat Event
Tx End Event
Tx Start Event

Usage Note

The `pub.event:getEventTypes` service returns a list of supported local event types on Integration Server. The service does not return a list of EDA event types in the event store.

pub.event:getSubscribers

WmPublic. Returns the list of subscribers for a specified event type.

Input Parameters

EventType **String** Type of event for which you want the list of subscribers. Must be one of the following values:

Alarm Event
Audit Event
Audit Error Event
Exception Event
GD End Event
GD Start Event
JMS Delivery Failure Event
JMS Retrieval Failure Event

Port Status Event

Replication Event

Security Event

Session End Event

Session Expire Event

Session Start Event

Stat Event

Tx End Event

Tx Start Event

Tip:

To view the current list of event types, you can execute the [pub.event:getEventTypes](#) service.

Output Parameters

Subscribers **Document** The list of subscribers. For each subscriber, *Subscribers* will contain a key that is the subscriber ID. The value of that key is a document containing the following information about the subscriber:

<u>Key</u>	<u>Description</u>
<i>Service</i>	String Fully qualified name of the event-handler service (that is, the service that subscribes to the event in <i>EventType</i>).
<i>Filter</i>	<p>String Filter associated with the subscription. This is a pattern string that selects (filters) an event based on a particular attribute. <i>Filter</i> is composed of literal characters, which match a character exactly, and/or the "*" character, which matches any sequence of characters. For example:</p> <ul style="list-style-type: none"> ■ * would match any string. ■ M* would match any string that starts with an uppercase "M." ■ M*X would match any string that starts with an uppercase "M" and ends with an uppercase "X."

For a list of attributes to which the filter is applied, see [pub.event:addSubscriber](#).

<i>Comment</i>	String Descriptive comment associated with the description. If a comment has not been assigned to the subscription, <i>Comment</i> will be empty.
<i>gID</i>	String Subscriber ID.
<i>Enabled</i>	String Flag indicating the status of the subscription. Will be one of the following values. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that the subscription is active.■ <code>false</code> indicates that the subscription is inactive.

See Also

[pub.event:addSubscriber](#)

[pub.event:modifySubscriber](#)

[pub.event:deleteSubscriber](#)

pub.event:jmsReceiveErrorEvent

WmPublic. Specification for a JMS retrieval failure event handler.

Input Parameters

<i>triggerName</i>	String Specifies the name of the JMS trigger that executed the trigger service for which the JMS retrieval failure event occurred.
<i>triggerDestinationIndex</i>	java.lang.Integer Specifies the index for the destination from which the JMS trigger receives messages. A JMS trigger that specifies a join type can listen for messages from multiple destinations. The first destination listed has an index of 0, the second destination listed has an indices of 1, etc.
<i>deliveryCount</i>	java.lang.Integer Number of times the JMS provider delivered the message to the JMS trigger at the time the event occurred.
<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i>
<i>exceptionClass</i>	String Name of the class that caused the failure. This may be useful to determine programmatically why the error occurred.
<i>exceptionMessage</i>	String Message contained in the exception.
<i>data</i>	Document A document (IData) containing the JMS message being processed when the error occurred.

<u>Key</u>	<u>Description</u>
<i>JMSMessage</i>	A document reference (IData) to the pub.jms:JMSMessage document type.

Output Parameters

None

Usage Notes

A JMS retrieval failure event occurs in the following situations:

- A trigger service executed by a JMS trigger throws a non-transient error and the `watt.server.jms.trigger.raiseEventOnException` property is set to `true` (the default).
- A trigger service associated with a JMS trigger ends because of a transient error, all retry attempts have been made, and the JMS trigger is configured to throw an exception on retry failure. In addition, the `watt.server.jms.trigger.raiseEventOnRetryFailure` property is set to `true` (the default).
- The maximum delivery count from the JMS provider has been met for the message and the `watt.server.jms.trigger.raiseEventOnRetryFailure` property is set to `true` (the default).

The `watt.server.jms.trigger.maxDeliveryCount` property specifies the maximum number of times the JMS provider can deliver a message to Integration Server. The default is 100. In a JMS message, the property `JMSXDeliveryCount` specifies the number of times the JMS provider delivered the message. Most JMS providers set this value.

- While performing exactly-once processing, the connection to the document history database is unavailable, and transient error handling for the JMS trigger is configured to **Throw exception** (non-transacted JMS trigger) or **Recover only** (transacted JMS trigger). In addition, the `watt.server.jms.trigger.raiseEventOnRetryFailure` property is set to `true` (the default).
- While performing exactly-once processing, the document resolver service ends with an `ISRuntimeException`, and transient error handling for the JMS trigger is configured to **Throw exception** (non-transacted JMS trigger) or **Recover only** (transacted JMS trigger). In addition, the `watt.server.jms.trigger.raiseEventOnRetryFailure` property is set to `true` (the default).
- While performing exactly-once processing, the document resolver service ends with an exception other than an `ISRuntimeException`. In addition, the `watt.server.jms.trigger.raiseEventOnRetryFailure` property is set to `true` (the default).

Remember to register your event handler with the Event Manager.

Use the `watt.server.event.jmsRetrievalError.async` server parameter to indicate whether event handlers for JMS retrieval failure events are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to JMS retrieval failure events asynchronously. When this parameter is set to `false`, Integration Server invokes the event handlers that subscribe to the JMS retrieval failure events synchronously. The default is `true` (asynchronous).

See Also

[pub.jms:JMSMessage](#)

pub.event:jmsSendErrorEvent

WmPublic. Specification for the JMS delivery failure event handler.

Input Parameters

<i>aliasName</i>	String Name of the JMS connection alias used to send the message to the JMS provider.
<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>data</i>	Document Contents of the JMS message that could not be sent to the JMS provider.

Output Parameters

None

Usage Notes

Integration Server generates a JMS delivery failure event when a message written to the client side queue cannot be delivered to the JMS provider. When a transient error occurs, several delivery attempts may have been made.

You might want to create an event handler for a JMS delivery failure event to send notification or log information about the undelivered JMS message. You can also create an event handler that attempts to re-send the message to the JMS provider.

Remember to register your event handler with the Event Manager.

Use the `watt.server.event.jmsDeliveryFailureError.async` server parameter to indicate whether event handlers for JMS delivery failure events are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to JMS delivery failure events asynchronously. When this parameter is set to `false`, Integration Server invokes the event handlers that subscribe to the JMS delivery failure events synchronously. The default is `true` (asynchronous).

pub.event:journal

WmPublic. Specification for journal event handlers.

Input Parameters

<i>time</i>	String Date and time that the event occurred, in the format yyyy/mm/dd hh:mm:ss.ss.
<i>productID</i>	String Name of the product that generated the journal log message and the event.
<i>majorCode</i>	String Major code of the message.
<i>minorCode</i>	String Minor code of the message.
<i>severity</i>	String Number indicating the severity of the message. <ul style="list-style-type: none"> ■ 1 Fatal ■ 2 Error ■ 3 Warning ■ 4 Info ■ 5, 6 Debut ■ 7 - 10 Trace
<i>defaultMessage</i>	String Default message associated with the major code and minor code. The actual message may differ from the default message. For example the default message might be "Package WmART is stopping due to {0}", where {0} is a placeholder for a run-time parameter. The actual message generated at run time might be "Package WmART is stopping due to ServiceException".

Output Parameters

None.

Usage Notes

Remember to register your even handler using Event Manager or [pub.event:addSubscriber](#).

A journal event handler can have a filter for the major code and minor code of the generated event. The format of the filter is <majorCode>.<minorCode>. For example, the following filter specifies that any journal event with major code of 28 followed by a minor code of 34 will invoke the event handler: *28.34*

If a journal event is created when synchronously or asynchronously. When this parameter is set to true, Integration Server writes the following log message "[ISS.0028.0034I] Package WmIExtDC is stopping " the journal event handler will be passed the following information in addition to the *time* value:

productID: ISS

majorCode: 28

minorCode: 34

severity: 4

defaultMessage: Package WmISExtDC is stopping

The `watt.server.event.exception.async` server parameter indicates whether event handlers for journal events are invoked synchronously or asynchronously. When this parameter is set to true, Integration Server invokes the event handlers that subscribe to journal events asynchronously. When this parameter is set to false, Integration Server invokes the services that subscribe to the journal events synchronously. The default is true (asynchronous).

pub.event:journalInfo

WmPublic. Document type for journal event information

Parameters

<i>time</i>	String Date and time that the event occurred, in the format yyyy/mm/dd hh:mm:ss.ss.
<i>productID</i>	String Name of the product that generated the journal log message and the event.
<i>majorCode</i>	String Major code of the message.
<i>minorCode</i>	String Minor code of the message.
<i>severity</i>	String Number indicating the severity of the message. <ul style="list-style-type: none">■ 1 Fatal■ 2 Error■ 3 Warning■ 4 Info■ 5, 6 Debut■ 7 - 10 Trace
<i>defaultMessage</i>	String Default message associated with the major code and minor code. The actual message may differ from the default message. For example the default message might be “Package WmART is stopping due to {0}”, where {0} is a placeholder for a run-time parameter. The actual message generated at run time might be “Package WmART is stopping due to ServiceException”.

Usage Notes

If a journal event is created when synchronously or asynchronously. When this parameter is set to true, Integration Server writes the following log message "[ISS.0028.0034I] Package WmISExtDC is stopping " the journal event handler will be passed the following information in addition to the *time* value:

productID: ISS

majorCode: 28

minorCode: 34

severity: 4

defaultMessage: Package WmISExtDC is stopping

The `watt.server.event.exception.async` server parameter indicates whether event handlers for journal events are invoked synchronously or asynchronously. When this parameter is set to true, Integration Server invokes the event handlers that subscribe to journal events asynchronously. When this parameter is set to false, Integration Server invokes the services that subscribe to the journal events synchronously. The default is true (asynchronous).

pub.event:modifySubscriber

WmPublic. Modifies the information about a subscription.

Important:

The changes you make with this service take effect immediately; however, they are not made permanent unless you also persist them to disk with the [pub.event:saveEventManagerSettings](#) service. If you do not run [pub.event:saveEventManagerSettings](#) after modifying subscribers, your changes will be lost when the server is restarted.

Input Parameters

EventType

String Event type that you want the subscription to have:

Alarm Event

Audit Event

Error Event

Exception Event

GD End Event

GD Start Event

JMS Delivery Failure Event

JMS Retrieval Failure Event

Journal Event

Port Status Event

Replication Event

Security Event

Session End Event

Session Expire Event

Session Start Event

Stat Event

Tx End Event

Tx Start Event

Tip:

To view the current list of event types, you can execute the [pub.event:getEventTypes](#) service.

gID

String ID of the subscriber that you want to modify. To get the current list of subscriber IDs, execute the [pub.event:getSubscribers](#) service.

Filter

String Filter that you want subscription to have. *Filter* is a pattern-matching string composed of literal characters, which match a character exactly, and/or the "*" character, which matches any sequence of characters. For example:

This pattern string...	Would match...
*	Any string
M*	Any string that starts with an uppercase "M."
M*X	Any string that starts with an uppercase "M" and ends with an uppercase "X."

The following table shows the attribute that is filtered for each event type. Note that some event types cannot be filtered.

EventType	Filtered attribute
Alarm Event	Message generated by the alarm event.
Audit Event	Fully qualified name of the service that generates the audit event.
Error Event	Error message text for the error that generates the error event

Exception Event	Fully qualified name of the service that generates the exception event.
GD End Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
GD Start Event	Fully qualified name of the service that generates the GD Start Event.
JMS Delivery Failure Event	Name of the JMS connection alias used to send the message to the JMS provider.
JMS Retrieval Failure Event	Fully qualified name of the JMS trigger that called the trigger service for which the error occurred.
Journal Event	The major code and minor code of the message that causes the journal event.
Port Status Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
Replication Event	Name of the package being replicated.
Security Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
Session End Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
Session Expire Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
Session Start Event	<p>User ID of the user starting the session or the groups to which the user belongs. (The filter is applied to a space delimited list of groups, composed of group names suffixed with the user's user ID.)</p> <p>The following examples show how you might filter session-start events for various groups and/or user IDs:</p> <p>To select session starts for any user in the Administrators group, the filter would be:</p> <pre>*Administrators*</pre> <p>To select session starts for the user ID "LRMalley" in the Administrators group, the filter would be:</p> <pre>*Administrators*LRMalley</pre>

To select session starts for the user ID "LRMalley" in any group, the filter would be:

```
*LRMalley
```

Stat Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
Tx End Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.
Tx Start Event	None. This event type cannot be filtered. <i>Filter</i> is ignored for this event type.

Service **String** Fully qualified name of the event-handler service that you want the subscription to specify.

Comment **String** Descriptive comment that you want to assign to the subscription.

Enabled **String** Flag specifying the status of the subscription. Must be one of the following values. Set to:

- true to make the subscription active.
- false to make the subscription inactive. This is the default.

Note:

Although the default value is false, you will generally want to set *Enabled* to true to activate the subscription immediately after it is modified.

Output Parameters

Result **String** Flag indicating whether the subscriber was successfully modified. A value of:

- true indicates that the subscriber was updated successfully.
- false indicates that the subscriber was not updated (typically because an invalid subscriber ID was provided in *gID*).

See Also

[pub.event:addSubscriber](#)

[pub.event:deleteSubscriber](#)

[pub.event:getSubscribers](#)

[pub.event:saveEventManagerSettings](#)

pub.event:portStatus

WmPublic. Specification for a port status event.

Input Parameters

portStatusInfo **Document List** of documents (Data[] objects) containing the following information for each port.

Key	Description
<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>port</i>	String Number for the port.
<i>status</i>	String Status of the port.
<i>protocol</i>	String Type of port (for example, http, https, ftp, or email).
<i>primary</i>	String Primary port. By default, the webMethods Integration Server designates an HTTP port at port 5555 as the primary port.
<i>enabled</i>	String Flag indicating whether or not the port is enabled. Set to: <ul style="list-style-type: none"> ■ true to indicate that the port is enabled. ■ false to indicate that the port is disabled.

Output Parameters

None.

pub.event:portStatusInfo

WmPublic. Document type for port event information.

Parameters

<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>port</i>	String Number for the port.
<i>status</i>	String Status of the port.
<i>protocol</i>	String Type of port (for example, http, https, ftp, or email).

- primary* **String** The primary port. By default, the webMethods Integration Server designates an HTTP port at port 5555 as the primary port.
- enabled* **String** A flag indicating whether or not the port is enabled. A value of:
- `true` indicates that the port is enabled.
 - `false` indicates that the port is disabled.

pub.event:reloadEventManagerSettings

WmPublic. Reloads the settings from the event manager's configuration file (eventcfg.bin) on the server.

Input Parameters

None.

Output Parameters

None.

See Also

[pub.event:saveEventManagerSettings](#)

pub.event:replication

WmPublic. Specification for replication event handlers.

Input Parameters

- time* **String** Date and time that the event occurred, in the format *yyyy/MM/dd HH:mm:ss.SS*.
- action* **String** Description of the event (such as create or push). The value of *action* can be used to maintain separate logs for each action type.
- package* **String** Name of package being replicated.
- service* **String** Fully qualified name of the service that generated the event.

Output Parameters

None.

Usage Notes

Remember to register your handler with the Event Manager. When you subscribe an event handler to a replication event, you can create a filter to specify the package that, when replicated, will invoke the event handler.

Use the `watt.server.event.replication.async` server parameter to indicate whether event handlers for replication events are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to replication events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to replication events synchronously. The default is `true` (asynchronous).

pub.event:replicationInfo

WmPublic. Document type for replication event information.

Parameters

<i>time</i>	String Date and time that the event occurred, in the format <code>yyyy/MM/dd HH:mm:ss.SS</code> .
<i>action</i>	String Description of the event (such as create or push). The value of <i>action</i> can be used to maintain separate logs for each action type.
<i>package</i>	String Name of package being replicated.
<i>service</i>	String Fully qualified name of the service that generated the event.

Usage Notes

Use the `watt.server.event.replication.async` server parameter to indicate whether event handlers for replication events are invoked synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to replication events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to replication events synchronously. The default is `true` (asynchronous).

pub.event.routing:eventAcknowledgement

WmPublic. *Deprecated* - There is no replacement document type.

Document type that defines the input signature for a callback service that processes acknowledgments sent by the Event Routing framework. The Event Routing framework sends acknowledgments to the callback service in response to asynchronously sent events.

Parameters

<i>eventID</i>	String The unique identifier of the sent event. The <i>eventID</i> is the same as the <i>evt:EventID</i> in pub.event.eda:event , either supplied by the user who emitted the event or generated by the Event Routing framework.
<i>processedUsingClientThread</i>	Boolean Optional. Specifies whether or not the Event Routing framework processes the event using the client thread that invoked the send operation, or its own thread. The Event Routing framework uses the first available thread to process the event and sets the parameter to <code>true</code> or <code>false</code> depending on the selected thread. Set to: <ul style="list-style-type: none">■ <code>true</code> if the event is processed using the client thread that invoked the send operation.■ <code>false</code> if the event is processed using a thread in the Event Routing framework.
<i>exception</i>	String Optional. Exception that occurred in the Event Routing framework while processing an event.

See Also

[“pub.event.routing:send” on page 328](#)

pub.event.routing:send

WmPublic. *Deprecated* - Use Digital Event Services.

Sends events to the messaging provider using webMethods Event Routing. Integration Server constructs events using the parameters defined in this service.

Note: Event Routing is a framework that Software AG provides for applications to communicate using events. For more information about using Event Routing, see *Communicating Between Software AG Products Using Event Routing*.

Input Parameters

<i>documentType Name</i>	String Optional. Fully qualified name of the IS document type that specifies the structure to impose on the body of the event. By specifying a document type, you can identify: <ul style="list-style-type: none">■ The order and dimensionality of elements.■ The prefix associated with each namespace in the instance document. When field names in a document type include a prefix and specify a value for the XML namespace property, the <code>pub.event.routing:send</code> service will
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convert a name/value pair in the *event/body* IData with the same prefix and name to an XML element with that prefix and with a local name equivalent to the XML namespace property value.

Note:

You must specify an IS document type for the *documentTypeName* parameter if *createOptions* is set to `VALIDATE_BODY`. The XML structure of the IS document type specified in the *documentTypeName* parameter must match the XML structure passed as the value of *evt:body* in the [pub.event.eda:event](#) document type.

<i>event</i>	Document A document reference (IData) to the pub.event.eda:event document type containing the event that you want to publish, including the event header and payload.
<i>createOptions</i>	<p>String List Optional. Options that Integration Server passes on to the Event Routing framework during the creation of an event.</p> <p>Possible values are none or any one or both of the following:</p> <ul style="list-style-type: none"> ■ <code>EXTRACT_FILTERABLE_PROPS</code> if you want the Event Routing framework to verify that the workspace name and service name that combine to form the value of <i>evt:type</i> in the pub.event.eda:event document type are valid. ■ <code>VALIDATE_BODY</code> if you want the Event Routing framework to verify that the XML structure passed as the value of <i>evt:body</i> in the pub.event.eda:event document type matches the XML structure of the IS document type specified as the <i>documentTypeName</i> parameter. <p>Note: If you select the <code>VALIDATE_BODY</code> option, you must specify an IS document type for the <i>documentTypeName</i> parameter. Integration Server will issue an error if you do not specify any value for <i>documentTypeName</i>.</p>
<i>isAsync</i>	<p>Boolean Optional. Specifies whether or not the event is sent synchronously or asynchronously. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to send the event asynchronously. <p>If set to <code>true</code>, after sending the event, Integration Server executes the next step in the flow service immediately. Integration Server does not wait for an acknowledgment before continuing service execution.</p> <ul style="list-style-type: none"> ■ <code>false</code> to send the event synchronously. <p>If set to <code>false</code>, after sending the event, Integration Server waits for an acknowledgment before executing the next step in the flow service. This is the default.</p>

If the value of *isAsync* is set to `true`, you must specify a callback service in the *serviceName* input parameter.

serviceName

String Optional. The callback service that you want Integration Server to invoke upon receiving an acknowledgment from the Event Routing framework after completing the send operation.

The input signature for the callback service is defined by the document `pub.event.routing:eventAcknowledgement`. The `pub.event.routing:eventAcknowledgement` must be provided as an input document to the callback service.

Note:

You must specify a callback service if the value of *isAsync* parameter is set to `true`.

runAsUser

String Optional. The name of the user account whose credentials Integration Server uses to execute the callback service. This parameter is required only if the event is being sent asynchronously, that is, if the *isAsync* parameter is set to `true`.

You can specify a locally defined user account or a user account defined in a central or external directory. The user account you specify must have the execute ACL associated with the callback service.

If you do not specify any user account for an event that is sent asynchronously, Integration Server uses the name specified in the `watt.server.event.routing.runAsUser` server configuration parameter. If no user is specified in that parameter, Integration Server uses the Administrator user to execute the service. For more information about `watt.server.event.routing.runAsUser`, see *webMethods Integration Server Administrator's Guide*.

Output Parameters

eventID

String The unique identifier of the sent event. The *eventID* is the same as the *evt:EventID* in `pub.event.eda:event`, either supplied by the user who emitted the event or generated by the Event Routing framework.

Usage Notes

This service replaces `pub.event.nerv:send`, which has been removed.

See Also

[pub.event.routing:subscribe](#)

[pub.event.routing:unsubscribe](#)

[pub.event.eda:event](#)

pub.event.routing:subscribe

WmPublic. *Deprecated* - Use Digital Event Services.

Creates a subscription to a particular type of event using webMethods Event Routing. Integration Server identifies a subscription based on a combination of *eventTypeName* and *serviceName* or based on the *subscriberId*, if specified.

When the Event Routing framework receives a matching event, it routes the event to Integration Server. Upon receiving the event, Integration Server executes a specific service to process the event.

Input Parameters

<i>eventTypeName</i>	<p>String Fully qualified name of the event type to which to subscribe. For example,</p> <p>{http://namespacesoftwareag.com/EDA/WebM/Sample/InventoryMgmt/1.0}PartInventoryLow</p> <p>is an event type identifier used for inventory management. Integration Server maintains a list of default event types in the directory <i>Integration Server_directory /common/EventTypeStore</i> on the machine where Software AG Universal Messaging is installed.</p>
<i>serviceName</i>	<p>String Fully qualified name of the service that Integration Server should invoke when the Event Routing framework notifies Integration Server about receiving an event of the type specified in <i>eventTypeName</i>. The signature for this service must reference the document type pub.event.eda:event as its only input.</p> <p>Integration Server verifies that the service specified in <i>serviceName</i> exists and issues an error if the service does not exist or is not valid.</p>
<i>runAsUser</i>	<p>String Optional. Name of the user account whose credentials Integration Server uses to invoke the service specified in <i>serviceName</i>. Integration Server validates the user name when the service specified in <i>serviceName</i> is executed.</p> <p>You can specify a locally defined user account or a user account defined in a central or external directory. The user account you specify must have the execute ACL associated with the service specified in <i>serviceName</i>.</p> <p>If you do not specify any user account for <i>runAsUser</i>, Integration Server uses the name specified in the <code>watt.server.event.routing.runAsUser</code> server configuration parameter. If no user is specified in that parameter, Integration Server uses the Administrator user to execute the service. For more information about <code>watt.server.event.routing.runAsUser</code>, see <i>webMethods Integration Server Administrator's Guide</i>.</p>

isDurable

String Optional. Indicates whether or not the subscription is durable. Set to:

- true if you want the subscription to be a durable subscription.

Note:

You must specify a unique value for the *subscriberID* parameter if you set *isDurable* to true.

In case of durable subscriptions, the messaging provider saves the messages for an inactive subscriber and delivers these saved messages when the subscriber creates a new subscription by specifying the same *subscriberID*. The messaging provider retains the messages for durable subscriptions until they are retrieved by the subscriber or until they expire.

- false if you do not want the subscription to be durable. This is the default.

Non-durable subscriptions allow subscribers to receive messages only if those messages are published while the subscription is active.

subscriberID

String Optional. User-specified unique identifier that designates the subscription as a durable subscription on the messaging provider. If no *subscriberID* is specified, the subscription will be non-durable.

If you remove a durable subscription by using the [pub.event.routing:unsubscribe](#) service with the *removeDurable* parameter set to false and you want to resume the subscription, you can do so by giving the same *subscriberID* in the [pub.event.routing:subscribe](#) service. However, if *removeDurable* is set to true while unsubscribing, you will have to create a new subscription with a new *subscriberID*.

If no *subscriberID* is specified, the subscription that is created is non-durable.

Note:

You must specify a unique value for the *subscriberID* parameter if you set *isDurable* to true.

Output Parameters

None.

Usage Notes

This service replaces `pub.event.nerv:subscribe`, which has been removed.

Integration Server does not persist the subscriptions to event types across server restarts or WmPublic package reloads. Consequently, you need to create subscriptions each time Integration Server starts or you reload the WmPublic package. If you want these subscriptions to be created

each time Integration Server starts or you reload the WmPublic package, you can assign the services that create durable subscriptions for various event types as startup services for the WmPublic package.

See Also

[pub.event.routing:send](#)

[pub.event.routing:unsubscribe](#)

[pub.event.eda:event](#)

pub.event.routing:unsubscribe

WmPublic. *Deprecated* - Use Digital Event Services.

Removes a subscription to an event type previously subscribed to using the [pub.event.routing:subscribe](#) service.

Input Parameters

<i>eventName</i>	<p>String Fully qualified name of the event type from which you want to unsubscribe. For example,</p> <p><code>{http://namespacesoftwareag.com/EDA/WebM/Sample/InventoryMgmt/1.0}PartInventoryLow</code></p> <p>is an event type identifier used for inventory management. Integration Server maintains a list of default event types in the directory <i>Integration Server_directory</i> /common/EventTypeStore on the machine where Software AG Universal Messaging is installed.</p>
<i>serviceName</i>	<p>String Fully qualified name of the service specified in the <i>serviceName</i> parameter of the pub.event.routing:subscribe service. Integration Server uses either a combination of the <i>eventName</i> and <i>serviceName</i> or the <i>subscriberId</i> to determine the correct event type subscription to unsubscribe.</p>
<i>subscriberId</i>	<p>String Optional. User-specified unique identifier specified in the <i>subscriberId</i> parameter of the pub.event.routing:subscribe service.</p> <p>Integration Server uses either the <i>subscriberId</i> or a combination of the <i>eventName</i> and <i>serviceName</i> to determine the correct event type subscription to unsubscribe.</p>
<i>removeDurable</i>	<p>String Optional. Indicates whether or not to remove the durable subscription for the specified <i>subscriberId</i> from the messaging provider while unsubscribing from an event type. Set to:</p> <ul style="list-style-type: none"> ■ true to remove the durable subscription for an event type from the messaging provider.

If set to `true`, the subscription for the specified event type and the corresponding `subscriberID` is removed from the messaging provider. If you want to receive notifications for the event type again, you must create new a subscription using the [pub.event.routing:subscribe](#) service.

Note:

If `removeDurable` is set to `true`, you must specify a `subscriberID`.

- `false` to retain the durable subscription on the messaging provider after unsubscribing from an event type. This is the default.

If set to `false`, you can resume the subscription by giving the same `subscriberID` in the [pub.event.routing:subscribe](#) service.

Output Parameters

None.

Usage Notes

This service replaces `pub.event.nerv:unsubscribe`, which has been removed.

See Also

[pub.event.routing:subscribe](#)

[pub.event.routing:send](#)

[pub.event.eda:event](#)

pub.event:saveEventManagerSettings

WmPublic. Saves the current subscriber information to the event manager's configuration file (`eventcfg.bin`) on the server.

Important:

Always run this service after making any permanent changes to subscriber information (for example, add subscribers, modify subscribers, or delete subscribers). Otherwise, your changes will be lost the next time the server is restarted.

Input Parameters

None.

Output Parameters

None.

See Also

[pub.event:addSubscriber](#)

[pub.event:deleteSubscriber](#)

[pub.event:modifySubscriber](#)

[pub.event:reloadEventManagerSettings](#)

pub.event:security

WmPublic. Specification for security event handlers.

Input Parameters

<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>clientID</i>	String IP address of the host from which the request originated.
<i>serverID</i>	String IP address of the host on which Integration Server is running.
<i>userName</i>	String User ID that initiated or performed the security event. If a value is specified for the <i>clientApplication</i> field, then <i>userName</i> identifies the OAuth resource owner that permitted the OAuth client application to initiate or perform the security event.
<i>securityEventType</i>	String Type of security event. Some examples are: Authentication Authorization Certificates Configuration JDBC Pools Packages Passwords Ports Remote Servers Services

SSL Web Services

<i>clientApplication</i>	<p>User ID of the OAuth client application that initiated or performed the security event.</p> <p>If this field has a value, the <i>userName</i> field identifies the OAuth resource owner that permitted the OAuth client application to initiate or perform the security event.</p>
<i>result</i>	<p>String Flag indicating whether the security action completed successfully. Set to:</p> <ul style="list-style-type: none">■ <code>true</code> to indicate that the security event completed successfully.■ <code>false</code> to indicate that the security event ended because of failure.
<i>message</i>	<p>String Indicates what the security action was, irrespective of whether it was successful or unsuccessful. For example, if a user was successfully added to Integration Server, the message would say so. If the event was unsuccessful, this string would provide a reason or information about the failure, wherever possible.</p>

Output Parameters

None.

Usage Notes

Use the `watt.server.event.security.async` server parameter to indicate whether Integration Server invokes event handlers for security events synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to security events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to security events synchronously. The default is `true` (asynchronous).

pub.event:securityInfo

WmPublic. Document type for security event information.

Input Parameters

<i>time</i>	String Date and time that the event occurred, in the format <code>yyyy/MM/dd HH:mm:ss.SS</code> .
<i>clientID</i>	String IP address of the host from which the request originated.
<i>serverID</i>	String IP address of the host on which Integration Server is running.
<i>userName</i>	String User ID that initiated or performed the security event.

If a value is specified for the *clientApplication* field, then *userName* identifies the OAuth resource owner that permitted the OAuth client application to initiate or perform the security event.

<i>securityEventType</i>	<p>String Type of security event. Some examples are:</p> <ul style="list-style-type: none">AuthenticationAuthorizationCertificatesConfigurationJDBC PoolsPackagesPasswordsPortsRemote ServersServicesSSL Web Services
<i>clientApplication</i>	<p>String User ID of the OAuth client application that initiated or performed the security event.</p> <p>If this field has a value, the <i>userName</i> field identifies the OAuth resource owner that permitted the OAuth client application to initiate or perform the security event.</p>
<i>result</i>	<p>String Flag indicating whether the security action completed successfully.</p> <ul style="list-style-type: none">■ True indicates that the security event completed successfully.■ False indicates that the security event ended because of failure.
<i>message</i>	<p>String Indicates what the security action was, irrespective of whether it was successful or unsuccessful. For example, if a user was successfully added to Integration Server, the message would say so. If the event was unsuccessful, this string would provide a meaningful reason or information about the failure, wherever possible.</p>

Output Parameters

None.

Usage Notes

Use the `watt.server.event.security.async` server parameter to indicate whether Integration Server invokes event handlers for security events synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes the event handlers that subscribe to security events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to security events synchronously. The default is `true` (asynchronous).

pub.event:sessionEnd

WmPublic. Specification for `sessionEnd` event handlers.

Input Parameters

<i>time</i>	String Date and time that the event occurred, in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>sessionID</i>	String Session ID of the service firing the alarm.
<i>rpcs</i>	String Number of service calls the session has performed.
<i>age</i>	String Number of milliseconds the session existed before it ended.

Output Parameters

None.

Usage Notes

Remember to register your handler with the Event Manager.

Use the `watt.server.event.session.async` server parameter to indicate whether Integration Server invokes event handlers for session events (`sessionStart`, `sessionEnd`, and `sessionExpire`) synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the session events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to the session events synchronously. The default is `true` (asynchronous).

pub.event:sessionEndInfo

WmPublic. Document type for `sessionEnd` event information.

Parameters

<i>time</i>	String Date and time that the event occurred. Given in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
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<i>sessionID</i>	String Session ID of the service firing the alarm.
<i>rpcs</i>	String Number of service calls the session has performed.
<i>age</i>	String Number of milliseconds the session existed before it ended.

Usage Notes

Use the `watt.server.event.session.async` server parameter to indicate whether Integration Server invokes event handlers for session events (`sessionStart`, `sessionEnd`, and `sessionExpire`) synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the session events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to the session events synchronously. The default is `true` (asynchronous).

pub.event:sessionExpire

WmPublic. Specification for `sessionExpire` event handlers.

Input Parameters

<i>time</i>	String Date and time that the event occurred. Given in the format <code>yyyy/MM/dd HH:mm:ss.SS</code> .
<i>sessionID</i>	String Session ID of the service firing the alarm.
<i>rpcs</i>	String Number of service calls the session has performed.
<i>age</i>	String Number of milliseconds the session existed before it expired.

Output Parameters

None.

Usage Notes

Remember to register your handler with the Event Manager.

Use the `watt.server.event.session.async` server parameter to indicate whether Integration Server invokes event handlers for session events (`sessionStart`, `sessionEnd`, and `sessionExpire`) synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the session events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to the session events synchronously. The default is `true` (asynchronous).

pub.event:sessionExpireInfo

WmPublic. Document type for sessionExpire event information.

Parameters

<i>time</i>	String Date and time that the event occurred. Given in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>sessionID</i>	String Session ID of the service firing the alarm.
<i>rpcs</i>	String Number of service calls the session has performed.
<i>age</i>	String Number of milliseconds the session existed before it expired.

Usage Notes

Use the `watt.server.event.session.async` server parameter to indicate whether Integration Server invokes event handlers for session events (`sessionStart`, `sessionEnd`, and `sessionExpire`) synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the session events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to the session events synchronously. The default is `true` (asynchronous).

pub.event:sessionStart

WmPublic. Specification for sessionStart event handlers.

Input Parameters

<i>time</i>	String Date and time that the event occurred. Given in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>sessionID</i>	String ID of the new session.
<i>userid</i>	String User ID that the IS client or developer used to log on to the webMethods Integration Server.
<i>sessionName</i>	String Name of the new session.

Output Parameters

None.

Usage Notes

Remember to register your handler with the Event Manager. When you subscribe an event handler to a Session Start event, you can create a filter so that only session start events generated by a specific user or by a member of a specific group invoke the event handler.

Use the `watt.server.event.session.async` server parameter to indicate whether Integration Server invokes event handlers for session events (`sessionStart`, `sessionEnd`, and `sessionExpire`) synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the session events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to the session events synchronously. The default is `true` (asynchronous).

pub.event:sessionStartInfo

WmPublic. Document type for `sessionStart` event information.

Parameters

<i>time</i>	String Date and time that the event occurred. Given in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>sessionID</i>	String ID of the new session.
<i>userid</i>	String User ID that the IS client or developer used to log on to the webMethods Integration Server.
<i>sessionName</i>	String Name of the new session.

Usage Notes

Use the `watt.server.event.session.async` server parameter to indicate whether Integration Server invokes event handlers for session events (`sessionStart`, `sessionEnd`, and `sessionExpire`) synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the session events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to the session events synchronously. The default is `true` (asynchronous).

pub.event:stat

WmPublic. Specification for `stat` event handlers.

Input Parameters

<i>startTime</i>	String Date and time that the event occurred. Given in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
------------------	--

<i>uptime</i>	String Amount of time the server has been up. Given in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>totalMem</i>	String Total amount of used and unused storage available to the JVM, in kilobytes. For example, a value of 65535 represents 64 megabytes of storage.
<i>freeMem</i>	String Amount of unused storage available to the Integration Server, in kilobytes. For example, a value of 65535 represents 64 megabytes of storage.
<i>usedMem</i>	String Amount of storage used by the Integration Server, in kilobytes. For example, a value of 65535 represents 64 megabytes of storage.
<i>freeMemPer</i>	String Percent of total memory unused.
<i>usedMemPer</i>	String Percent of total memory used.
<i>svrT</i>	String Number of services currently running.
<i>svrTMax</i>	String Peak number of servers ever running concurrently.
<i>sysT</i>	String Number of JVM threads running.
<i>sysTMax</i>	String Peak number of threads ever running.
<i>conn</i>	String Number of current sessions.
<i>connMax</i>	String Peak number of concurrent sessions.
<i>reqTotal</i>	String Cumulative total number of services processed.
<i>reqAvg</i>	String Average duration of service.
<i>newReqPM</i>	String New requests per minute.
<i>endReqPM</i>	String End requests per minute.
<i>errSvc</i>	String Number of services completed in error state.
<i>svcRate</i>	String Number of end/start(s) per second.
<i>ssnUsed</i>	String Number of licensed sessions currently active.
<i>ssnPeak</i>	String Number of licensed sessions that have ever run concurrently on the server.
<i>ssnMax</i>	String Maximum number of sessions for which the server is licensed.
<i>errSys</i>	String Number of unknown errors.

Output Parameters

None.

Usage Notes

Remember to register your handler with the Event Manager.

Use the `watt.server.event.stat.async` server parameter to indicate whether Integration Server invokes event handlers for statistics events synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the `stat` event asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to `stat` events synchronously. The default is `true` (asynchronous).

pub.event:statInfo

WmPublic. Document type for `stat` event information.

Parameters

<i>startTime</i>	String Date and time that the event occurred. Given in the format <code>yyyy/MM/dd HH:mm:ss.SS</code> .
<i>uptime</i>	String Amount of time the server has been up. Given in the format <code>yyyy/MM/dd HH:mm:ss.SS</code> .
<i>totalMem</i>	String Total amount of used and unused storage available to the JVM, in kilobytes. For example, a value of 65535 represents 64 megabytes of storage.
<i>freeMem</i>	String Amount of unused storage available to the Integration Server, in kilobytes. For example, a value of 65535 represents 64 megabytes of storage.
<i>usedMem</i>	String Amount of storage used by the Integration Server, in kilobytes. For example, a value of 65535 represents 64 megabytes of storage.
<i>freeMemPer</i>	String Percent of total memory unused.
<i>usedMemPer</i>	String Percent of total memory used.
<i>svrT</i>	String Number of services currently running.
<i>svrTMax</i>	String Peak number of servers ever running concurrently.
<i>sysT</i>	String Number of JVM threads running.
<i>sysTMax</i>	String Peak number of threads ever running.
<i>conn</i>	String Number of current sessions.
<i>connMax</i>	String Peak number of concurrent sessions.
<i>reqTotal</i>	String Cumulative total number of services processed.

<i>reqAvg</i>	String Average duration of service.
<i>newReqPM</i>	String New requests per minute.
<i>endReqPM</i>	String End requests per minute.
<i>errSvc</i>	String Number of services completed in error state.
<i>svcRate</i>	String Number of end/start(s) per second.
<i>ssnUsed</i>	String Number of licensed sessions currently active.
<i>ssnPeak</i>	String Number of licensed sessions that have ever run concurrently on the server.
<i>ssnMax</i>	String Maximum number of sessions for which the server is licensed.
<i>errSys</i>	String Number of unknown errors.

Usage Notes

Use the `watt.server.event.stat.async` server parameter to indicate whether Integration Server invokes event handlers for statistics events synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the `stat` event asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to `stat` events synchronously. The default is `true` (asynchronous).

pub.event:txEnd

WmPublic. Specification for `txEnd` event handlers.

Input Parameters

<i>time</i>	String Date and time that the event occurred. Given in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>TID</i>	String Transaction ID of the service that generated the event.
<i>result</i>	String Status of the transaction.

Output Parameters

None.

Usage Notes

Remember to register your handler with the Event Manager.

Use the `watt.server.event.tx.async` server parameter to indicate whether Integration Server invokes event handlers for transaction events (`txStart` and `txEnd`) synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the `txStart` or `txEnd` events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to the `txStart` or `txEnd` events synchronously. The default is `true` (asynchronous).

pub.event:txEndInfo

WmPublic. Document type for `txEnd` event information.

Parameters

<i>time</i>	String Date and time that the event occurred. Given in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>TID</i>	String Transaction ID of the service that generated the event.
<i>result</i>	String Status of the transaction.

Usage Notes

Use the `watt.server.event.tx.async` server parameter to indicate whether Integration Server invokes event handlers for transaction events (`txStart` and `txEnd`) synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the `txStart` or `txEnd` events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to the `txStart` or `txEnd` events synchronously. The default is `true` (asynchronous).

pub.event:txStart

WmPublic. Specification for `txStart` event handlers.

Input Parameters

<i>time</i>	String Date and time that the event occurred. Given in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>TID</i>	String Transaction ID of the service that generated the event.
<i>result</i>	String Status of the transaction.

Output Parameters

None.

Usage Notes

Remember to register your handler with the Event Manager.

Use the `watt.server.event.tx.async` server parameter to indicate whether Integration Server invokes event handlers for transaction events (`txStart` and `txEnd`) synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the `txStart` or `txEnd` events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to the `txStart` or `txEnd` events synchronously. The default is `true` (asynchronous).

`pub.event:txStartInfo`

WmPublic. Document type for `txStart` event information.

Parameters

<i>time</i>	String Date and time that the event occurred. Given in the format <i>yyyy/MM/dd HH:mm:ss.SS</i> .
<i>TID</i>	String Transaction ID of the service that generated the event.
<i>result</i>	String Status of the transaction.

Usage Notes

Use the `watt.server.event.tx.async` server parameter to indicate whether Integration Server invokes event handlers for transaction events (`txStart` and `txEnd`) synchronously or asynchronously. When this parameter is set to `true`, Integration Server invokes event handlers that subscribe to the `txStart` or `txEnd` events asynchronously. When this parameter is set to `false`, Integration Server invokes event handlers that subscribe to the `txStart` or `txEnd` events synchronously. The default is `true` (asynchronous).

13 File Folder

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You use the elements in the file folder to perform operations on the local file system.

File Access Control Configuration for the pub.file Services

The fileAccessControl.cnf configuration file in *Integration Server_directory* \instances\instance_name\packages\WmPublic\config directory contains parameters that Integration Server uses to provide additional validation checks to make the services in the pub.file folder secure.

Integration Server also uses the fileAccessControl.cnf configuration file with the pub.flow:savePipelineToFile and pub.flow:restorePipelineFromFile services to provide security for those services.

Note:

If you make any changes to fileAccessControl.cnf, you must reload the WmPublic package or restart Integration Server for the changes to take effect.

Parameter Settings

The following table shows the parameter settings for the fileAccessControl.cnf file:

Parameter	Description
allowedReadPaths	<p>List of directories and/or files to which the services in the pub.file folder have read permission.</p> <p>When watt.server.checkPath.restorePipelineFromFile is set to true, which is the default value, the allowedReadPaths is also the list of directories and/or files from which the pub.flow:restorePipelineFromFile service can restore a pipeline. The pub.flow:restorePipelineFromFile can always load files from default pipeline directory which is located here: <i>Integration Server_directory</i> /instances/<i>instance_name</i>/pipeline</p>
allowedWritePaths	<p>List of directories and/or files to which the services in the pub.file folder have write permission.</p> <p>When watt.server.checkPath.restorePipelineFromFile is set to true, which is the default value, the allowedWritePaths is also the list of directories and/or files to which the pub.flow:savePipelineToFile service can save a pipeline. The pub.flow:savePipelineFromFile can always save files to default pipeline directory which is located here: <i>Integration Server_directory</i> /instances/<i>instance_name</i>/pipeline</p>
allowedDeletePaths	<p>List of directories and/or files that the services in the pub.file folder can delete.</p>

When modifying the parameters in the fileAccessControl.cnf file, keep the following points in mind:

- Parameters can be set to file names and/or directories.

- If a file name is listed, access is allowed to that file only.

For example, the following entry will allow the services in `pub.file` folder to write the file `c:/wm8/test.txt`.

```
allowedWritePaths=C:/wm8/test.txt
```

- If a directory name is listed, access is allowed to all files in that directory, but not to the subdirectories.

For example, the following entry will allow the services in `pub.file` folder to write to any file in the `c:/wm8/test` directory.

```
allowedWritePaths=C:/wm8/test
```

- Use a semicolon (;) as the delimiter when listing multiple paths. Do *not* include spaces between paths. For example:

```
allowedWritePaths=C:/wm8/test;C:/wm8/test.txt
```

- If a file or directory name has a semicolon (;), use two backslashes (\ \) before the semicolon when specifying the allowed paths. For example, if the filename is: `c:/temp/ab;c.txt`

Specify it as: `c:/temp/ab\\;c.txt`

Note:

When using a pathname with a semicolon as the value for an input parameter in a `pub.file` service, you do not need to include two backslashes before the semicolon.

- You can use the wildcard character asterisk (*) to match multiple folders, subfolders, and files.
 - A single asterisk (*) wildcard can be used to denote single directory names.

For example, the following entry will allow the services in `pub.file` folder to write to all the `.log` files in the subdirectories whose names starts with 'fatal' in the `c:/home/` directory:

```
allowedWritePaths=C:/home/fatal*/*.log
```

- Double asterisks (**) can be used to denote multiple files and subfolders in a folder.

For example, the following entry will allow the services in `pub.file` folder to write to all files in all the subdirectories of `c:/home` directory:

```
allowedWritePaths=C:/home/**
```

- The asterisk (*) is the only wildcard character that you can use. All other characters are treated as literals.
- You cannot use a wildcard character to match any files in the root directory. Integration Server ignores the entries that use asterisks to match a file in the root directory.

For example, Integration Server will ignore the following entry:

```
allowedWritePaths = **
```

- UNIX-based operating systems are case-sensitive. When specifying paths for the parameters in `fileAccessControl.cnf`, make sure to use the appropriate case in the path names. Any path name supplied to input parameters for the `pub.file` services must match the case specified in the `fileAccessControl.cnf` parameters.
- If the Integration Server runs on a UNIX-based operating system, you must use a forward slash as the directory separator.
- If the Integration Server runs on Windows, you can use either a forward slash (/) or two backslashes (\\) as the directory separator in paths specified in `fileAccessControl.cnf`. When specifying values for input parameters for the `pub.file` services, you can specify a single forward slash, a single backslash, or a double backslash as the directory separator.
- Network paths must be valid Universal Naming Convention (UNC) paths.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.file:bytesToFile	WmPublic. Writes the specified byte array to a file.
pub.file:checkFileExistence	WmPublic. Checks if a specified file exists, and if the file exists, checks whether the file name represents a file or a directory.
pub.file:copyFile	WmPublic. Copies a file from one directory to another.
pub.file:deleteFile	WmPublic. Deletes the specified file.
pub.file:getFile	WmPublic. Retrieves a specified file from the local file system.
pub.file:listFiles	WmPublic. List all the files in a specified directory.
pub.file:moveFile	WmPublic. Moves a file from one directory to another.
pub.file:readerToFile	WmPublic. Reads data from a <code>java.io.Reader</code> object and writes it to a file.
pub.file:streamToFile	WmPublic. Writes the data in the <code>InputStream</code> to a file.
pub.file:stringToFile	WmPublic. Writes text to a file.

pub.file:bytesToFile

WmPublic. Writes the specified byte array to a file.

Input Parameters

fileName **String** The absolute path name of the file to which to write the byte array.

<i>bytes</i>	Byte[] The byte array to write to the file specified in the <i>filename</i> parameter.
<i>append</i>	<p>String Optional. Specifies whether to append or overwrite if the specified file already exists. The default behavior is to create a new file if file does not exist or overwrite an existing file if file already exists.</p> <p>Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to append to the file if the file already exists. ■ <code>false</code> to overwrite the file if the file already exists.

Output Parameters

<i>length</i>	String Number of bytes written to the file.
---------------	--

Usage Notes

For security reasons, the `pub.file:bytesToFile` service checks the input *fileName* parameter against the list of `allowedWritePaths` values specified in the `fileAccessControl.cnf` file. If the input *fileName* is not on the allowed list, Integration Server throws an exception. For information about configuring the `fileAccessControl.cnf` file, refer to [“File Access Control Configuration for the pub.file Services” on page 348](#).

pub.file:checkFileExistence

WmPublic. Checks if a specified file exists, and if the file exists, checks whether the file name represents a file or a directory.

Input Parameters

<i>fileName</i>	String The absolute path name of the file to be checked.
-----------------	---

Output Parameters

<i>exists</i>	<p>String Indicates whether the specified <i>fileName</i> exists or not. A value of:</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates that the specified <i>fileName</i> exists. ■ <code>false</code> indicates that the specified <i>fileName</i> does not exist.
<i>isDirectory</i>	<p>String Indicates whether the specified <i>fileName</i> is a file or a directory.</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates that the specified <i>fileName</i> is a directory. ■ <code>false</code> indicates that the specified <i>fileName</i> is a file.

Usage Notes

For security reasons, the `pub.file:checkFileExistence` service checks the input `fileName` parameter against the list of `allowedReadPaths` values specified in the `fileAccessControl.cnf` file. If the input `fileName` is not on the allowed list, Integration Server throws an exception. For information about configuring the `fileAccessControl.cnf` file, refer to [“File Access Control Configuration for the `pub.file` Services” on page 348](#).

`pub.file:copyFile`

WmPublic. Copies a file from one directory to another.

If a file with the same name as the file being copied exists in the `targetDirectory`, the `pub.file:copyFile` service throws an error on execution.

Input Parameters

<code>fileName</code>	String The absolute path name of the file to be copied.
<code>targetDirectory</code>	String Directory to which the file specified in the <code>fileName</code> parameter will be copied.
<code>appendTimestamp</code>	String Optional. Specifies whether the current timestamp will be appended to the target filename. Set to: <ul style="list-style-type: none">■ <code>true</code> to append a timestamp to the target <code>fileName</code> in the <code>yyyyMMddHHmmss</code> format.■ <code>false</code> to omit a timestamp from the target <code>fileName</code>.

Output Parameters

<code>targetFileName</code>	String The absolute path name of the target file to which the <code>fileName</code> parameter is copied.
-----------------------------	---

Usage Notes

For security reasons, the `pub.file:copyFile` service checks the input `fileName` against the list of `allowedReadPaths` and the input `targetDirectory` against the list of `allowedWritePaths` specified in the `fileAccessControl.cnf` file. If the file name or directory is not specified in the respective allowed lists, or if an invalid file path is specified, Integration Server throws an exception. For information about configuring the `fileAccessControl.cnf` file, refer to [“File Access Control Configuration for the `pub.file` Services” on page 348](#).

pub.file:deleteFile

WmPublic. Deletes the specified file.

Input Parameters

fileName **String** The absolute path name of the file to be deleted.

Output Parameters

status **String** Specifies the status of the delete operation. A value of:

- true indicates that the deletion succeeded.
- false indicates that the deletion failed.

Usage Notes

For security reasons, the `pub.file:deleteFile` service checks the input `fileName` parameter against the list of `allowedDeletePaths` values specified in the `fileAccessControl.cnf` file. If the input `fileName` is not on the allowed list, Integration Server throws an exception. For information about configuring the `fileAccessControl.cnf` file, refer to [“File Access Control Configuration for the pub.file Services” on page 348](#).

pub.file:getFile

WmPublic. Retrieves a specified file from the local file system.

If the file contains an XML document, you can use the services in the [XML Folder](#) to convert it to an XML node.

Input Parameters

filename **String** The absolute path name of the file in the local file system (for example `c:\rubicon\document.xml`).

loadAs **String** Optional. Form in which you want the `getFile` service to make the contents of the file available to subsequent services. Set to:

- bytes to return the file as a byte array. Use this option if the contents of the file will be used as input to a service that operates on whole documents (for example, `pub.xml:queryXMLNode`). This is the default.

- `stream` to return the file as an input stream. Use this option if the contents of the file will be used as input to a service that can process a document incrementally (for example, [pub.xml:getXMLNodeIterator](#)).
- `string` to return the file as a string.
- `reader` to return the file as a reader.

encoding **String** Optional. Character set in which the file is encoded. Specify an IANA-registered character set (for example, ISO-8859-1). This information is required to correctly convert the String object to bytes when performing a get. If no value is specified or if the value is set to `autoDetect`, the service uses the default operating system encoding. If you specify an unsupported encoding, the system throws an exception.

bufferSize **String** Optional. Buffer size (in bytes) to use if you are loading an `InputStream` (that is, `loadAs=stream`). The default is 4096 bytes.

largeFile **String** Optional. Indicates whether the file specified in the input is a large file or not. As large files are loaded as a `stream`, set this parameter to `true` and the `loadAs` parameter to `stream` to get larger files. The default value is `false`.

Note:

Files larger than the system memory are considered as large files.

Output Parameters

body **Document** Document (IData object) containing the file as a `byte[]`, `InputStream`, `string`, or `reader`. The *body* parameter will contain one of the following keys, depending on how the *loadAs* parameter was set:

Key	Description
<i>bytes</i>	byte[] Conditional. Returns file contents in a byte array if the <i>loadAs</i> parameter is set to <code>bytes</code> .
<i>stream</i>	java.io.InputStream Conditional. Returns file contents as an <code>InputStream</code> if the <i>loadAs</i> parameter is set to <code>stream</code> .
<i>reader</i>	java.io.Reader Conditional. Returns file contents as a reader if the <i>loadAs</i> parameter is set to <code>reader</code> .
<i>string</i>	String Conditional. Returns file contents as a string if the <i>loadAs</i> parameter is set to <code>string</code> .

Usage Notes

The `getFile` service *does not* automatically generate an XML node from the contents of the file. To generate an XML node, the output from this service must be passed to the [pub.xml:xmlStringToXMLNode](#) service.

The `pub.file:getFile` service first checks the value of the `watt.security.pub.getFile.checkReadAllowed` server configuration parameter to determine if the service must check the `allowedReadPaths` parameter in the `fileAccessControl.cnf` to retrieve the specified file.

- If `watt.security.pub.getFile.checkReadAllowed` is set to `true`, the `pub.file:getFile` service checks the contents of the `allowedReadPaths` parameter for the specified *filename*. If the *filename* appears in the `allowedReadPaths` list, the `pub.file:getFile` service retrieves the file. If the specified *filename* is not on the `allowedReadPaths` list, the service throws an exception.
- If `watt.security.pub.getFile.checkReadAllowed` is set to `false` the `pub.file:getFile` service retrieves the specified file without checking the `allowedReadPaths` parameter in the `fileAccessControl.cnf`.

For information about configuring the `fileAccessControl.cnf`, refer to [“File Access Control Configuration for the pub.file Services” on page 348](#).

See Also

[pub.io:close](#)

pub.file:listFiles

WmPublic. List all the files in a specified directory.

The `pub.file:listFiles` service does not list subdirectories or recursively list subdirectory contents.

Input Parameters

- directory* **String[]** Name of the directory that is to be queried.
- filter* **String** Optional. Filter string for the file list (for example, `*.java` or `EDI*.tx*`).

Output Parameters

- fileList* **String** Names of the files in the directory specified in the *directory* parameter. Only the file names are returned; not the full path name.
- fileList* does not list subdirectories or recursively list subdirectory content.
- numFiles* **String** Number of files in the specified directory.

Usage Notes

For security reasons, the `pub.file:listFiles` service checks the value of the *directory* parameter against the list of `allowedReadPaths` values specified in the `fileAccessControl.cnf` file. If the specified directory is not on the allowed list, the service throws an exception. For information about configuring the `fileAccessControl.cnf` file, refer to [“File Access Control Configuration for the pub.file Services” on page 348](#).

pub.file:moveFile

WmPublic. Moves a file from one directory to another.

Input Parameters

<i>fileName</i>	String The absolute path name of the file to be moved.
<i>targetDirectory</i>	String Name of the directory to which the file specified in the <i>fileName</i> parameter is to be moved.
<i>appendTimeStamp</i>	String Optional. Specifies whether the current timestamp is to be appended to the file name after the file is moved to the target directory. Set to: <ul style="list-style-type: none">■ <code>false</code> if you do not want to append a timestamp. This is the default.■ <code>true</code> if you want to append a timestamp in the following format: <code>yyyyMMddHHmmss</code>.

Output Parameters

<i>status</i>	String Status of the move. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that the move was successful.■ <code>false</code> indicates that the move failed.
<i>targetFileName</i>	String Fully qualified path of the target file.

Usage Notes

For security reasons, the `pub.file:moveFile` service checks the input *fileName* parameter against the list of `allowedReadPaths` and the input *targetDirectory* against the list of `allowedWritePaths` specified in the `fileAccessControl.cnf` file. If the provided file name or directory is not specified in the respective allowed lists, Integration Server throws an exception. For information about configuring the `fileAccessControl.cnf` file, see [“File Access Control Configuration for the pub.file Services” on page 348](#).

If the service cannot move the file by using the default move operation in Java, the service copies the file from the source directory to the destination directory, and then removes the file from the source directory.

If a file with the same name as the *fileName* parameter exists in the target directory, the `pub.file:moveFile` service throws an error.

pub.file:readerToFile

WmPublic. Reads data from a `java.io.Reader` object and writes it to a file.

Input Parameters

<i>fileName</i>	String Fully qualified name of the file to which the data is to be written.
<i>reader</i>	java.io.Reader The reader object from which the data is read.
<i>append</i>	String Optional. Specifies whether to append to or overwrite the file if it already exists. The default behavior is to create a new file if the file does not exist or overwrite an existing file if the file already exists. Set to: <ul style="list-style-type: none">■ <code>true</code> to append if the file already exists.■ <code>false</code> to overwrite if the file already exists.
<i>encoding</i>	String Optional. Name of a registered, IANA character set (for example, ISO-8859-1). If you specify an unsupported encoding, the system throws an exception. If no value is specified or if the encoding is set to <code>autoDetect</code> , the default operating system encoding is used.

Output Parameters

None.

Usage Notes

For security reasons, the `pub.file:readerToFile` service checks the input `fileName` parameter against the list of `allowedWritePaths` values specified in the `fileAccessControl.cnf` file. If the input `fileName` is not on the allowed list, the service throws an exception. For information about configuring the `fileAccessControl.cnf` file, refer to [“File Access Control Configuration for the pub.file Services” on page 348](#).

The `readerToFile` service *does not* automatically close the reader object. To close the reader, use the `pub.io:close` service.

pub.file:streamToFile

WmPublic. Writes the data in the `InputStream` to a file.

Input Parameters

<i>fileName</i>	String[] Fully qualified name of the file to be written to.
<i>stream</i>	java.io.InputStream The stream from which data is read.
<i>append</i>	String Optional. Specifies whether to append or overwrite if the specified file already exists. The default behavior is to create a new file if the file does not exist or overwrite an existing file if the file already exists.

Set to:

- true to append if the file already exists.
- false to overwrite if the file already exists.

Output Parameters

None.

Usage Notes

For security reasons, the `pub.file:streamToFile` service checks the input `fileName` parameter against the list of `allowedWritePaths` values specified in the `fileAccessControl.cnf` file. If the input `fileName` is not on the allowed list, an exception is thrown. For information about configuring the `fileAccessControl.cnf` file, refer to [“File Access Control Configuration for the pub.file Services” on page 348](#).

The `streamToFile` service *does not* automatically close the stream object. To close the input stream, use the `pub.io:close` service.

pub.file:stringToFile

WmPublic. Writes text to a file.

Input Parameters

<i>fileName</i>	String[] Fully qualified name of the file to be written to.
<i>data</i>	String Text to be written.
<i>append</i>	String Optional. Specifies whether to append or overwrite if the specified file already exists. The default behavior is to create a new file if the file does not exist or overwrite an existing file if the file already exists.

Set to:

- true to append if the file already exists.

- `false` to overwrite if the file already exists.

encoding

String Optional. Name of a registered, IANA character set (for example, ISO-8859-1).

If you specify an unsupported encoding, the system throws an exception. If no value is specified or if the encoding is set to `autoDetect`, the default operating system encoding is used.

Output Parameters

None.

Usage Notes

For security reasons, the `pub.file:stringToFile` service checks the input *fileName* parameter against the list of `allowedWritePaths` values specified in the `fileAccessControl.cnf` file. If the input *fileName* is not on the allowed list, an exception is thrown. For information about configuring the `fileAccessControl.cnf` file, refer to [“File Access Control Configuration for the pub.file Services” on page 348](#).

14 Flow Folder

■ Summary of Elements in this Folder	362
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You use the elements in the flow folder to perform debugging and utility-type tasks in a flow service.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.flow:clearPipeline	WmPublic. Removes all fields from the pipeline. You may optionally specify fields that should not be cleared by this service.
pub.flow:debugLog	WmPublic. Writes a message to the server log.
pub.flow:getCallingService	WmPublic. Retrieves the service name and package name of the parent of the calling child service.
pub.flow:getLastError	WmPublic. Obtains detailed information about the last exception that was trapped within a flow.
pub.flow:getLastFailureCaught	WmPublic. Returns information about the last failure that was caught in a flow service.
pub.flow:getRetryCount	WmPublic. Retrieves the retry count and the maximum retry count for a service.
pub.flow:getSession	WmPublic. Inserts the Session object into the pipeline as a document named <i>\$session</i> .
pub.flow:getTransportInfo	WmPublic. Retrieves information about the protocol from which the current service was invoked.
pub.flow:HTTPRequest	WmPublic. Document type used to represent information about the HTTP request received by Integration Server. This includes HTTP headers, request URL, and the HTTP method.
pub.flow:HTTPResponse	WmPublic. Document type that specifies the HTTP response information to be returned by Integration Server to the client.
pub.flow:invokeService	WmPublic. Dynamically invokes any Integration Server public service and optionally returns the output from the invoked service in the pipeline for pub.flow:invokeService .
pub.flow:iterator	WmPublic. Returns IData arrays as batches with a specified batch size.
pub.flow:restorePipeline	WmPublic. Restores a pipeline previously saved by pub.flow:savePipeline .
pub.flow:restorePipelineFromFile	WmPublic. Restores a pipeline that was previously saved to a file.

Element	Package and Description
pub.flow:savePipeline	WmPublic. Saves a pipeline into memory, for later retrieval with pub.flow:restorePipeline .
pub.flow:savePipelineToFile	WmPublic. Saves the current pipeline to a file on the machine running webMethods Integration Server.
pub.flow:setActivityLog	WmPublic. Logs user-defined messages to the WMSERVICEACTIVITYLOG table or the WMSERVICEACTIVITYLOG_ yyyymmdd_hhmmss.log file.
pub.flow:setAuditLogFields	WmPublic. Sets the service auditing properties for one or more custom services.
pub.flow:setCustomContextID	WmPublic. Associates a custom value with an auditing context. This custom value can be used to search for service audit records in the webMethods Monitor.
pub.flow:setCustomLoggedFields	WmPublic. Selects the fields of one or more custom services for logging.
pub.flow:setResponse	WmPublic. <i>Deprecated</i> - Replaced by pub.flow:setResponse2 .
pub.flow:setResponse2	WmPublic. Forces a specified response to be returned by the webMethods Integration Server to a calling process (such as a browser or application server).
pub.flow:setResponseCode	WmPublic. Specifies the HTTP response code to be returned by Integration Server to a calling process (such as a browser or application server).
pub.flow:setResponseHeader	WmPublic. Sets a header field in the HTTP response to a calling process (such as a browser or application server) or in the JMS message that contains the SOAP response from a web service invocation.
pub.flow:setResponseHeaders	WmPublic. Sets one or more header fields in the HTTP response to a calling process (such as a browser or application server) or in the JMS message that contains the SOAP response from a web service invocation.
pub.flow:throwExceptionForRetry	WmPublic. Throws an <code>ISRuntimeException</code> and instructs the Integration Server to re-execute a service using the original service input.
pub.flow:tracePipeline	WmPublic. Writes the names and values of all fields in the pipeline to the server log.
pub.flow:transportInfo	WmPublic. Document type used to return information about the protocol through which a service was invoked.

pub.flow:clearPipeline

WmPublic. Removes all fields from the pipeline. You may optionally specify fields that should not be cleared by this service.

Input Parameters

preserve **String List.** Optional. Field names that should not be cleared from the pipeline.

Output Parameters

None.

pub.flow:debugLog

WmPublic. Writes a message to the server log.

Each log message contains a timestamp, a message ID, the function name field, and message field. See the following example.

```
                function _____ message
2009-08-16 11:01:23 EDT [ISP.0004C] My function - My message
```

Input Parameters

message **String.** Optional. Text of the message to write to the log.

function **String.** Optional. Function name, typically an abbreviation used to identify the source of the message.

level **String.** Optional. Debug level at which to display this message.

Whether or not Integration Server displays this message depends on the logging level setting for the 0090 pub Flow services facility. For example, if you specify Error for this message, but 0090 pub Flow services facility is configured to display only Fatal errors, this message will not be displayed. However, if the 0090 pub Flow services logging facility logging level is set to Warn, this message will be displayed (the Warn setting displays warning, error, *and* fatal messages).

Specify one of the following values:

<u>Specify...</u>	<u>To display the message with these types of messages...</u>
off	No messages.
Fatal	Fatal messages only. This is the default

Error	Error and fatal messages.
Warn	Warning, error, and fatal messages.
Info	Informational, warning, error, and fatal messages.
Debug	Debug, informational, warning, error, and fatal messages.
Trace	Trace, debug, informational, warning, error, and fatal messages.

Output Parameters

None.

Usage Notes

You can control the logging level for flow messages independent of log messages for other facilities. On the **Logs > Logging configuration > Server Logger > Edit Server Logger > Edit server logger details** page in Integration Server Administrator, go to **0090 pub Flow Services** under Integration Server and specify the level of messages that you want Integration Server to display for services in the `pub.flow` folder.

Prior to Integration Server 7.1, Integration Server used a number-based system to set the level of debug information written to the server log. Integration Server maintains backward compatibility with this system.

`pub.flow:getCallingService`

`WmPublic`. Retrieves the service name and package name of the parent of the calling child service.

Input Parameters

None.

Output Parameters

<i>svcName</i>	String Fully qualified namespace name of the parent service.
<i>pkgName</i>	String Package name of the parent service.

Usage Notes

If `pub.flow:getCallingService` is invoked from a service that does not have a parent service (for example, if the service is a top-level service), Integration Server does not return the output parameters.

pub.flow:getLastError

WmPublic. Obtains detailed information about the last exception that was trapped within a flow.

An exception is trapped in a flow when a service failure occurs inside a SEQUENCE step that executes until DONE, or when a service failure occurs inside a REPEAT step that repeats on FAILURE.

Input Parameters

None.

Output Parameters

lastError **Document** Information about the last error, translated into the language used by the Integration Server. The structure of this document is defined by [pub.event:exceptionInfo](#).

Usage Notes

If this service is not invoked from within a flow service, an exception is thrown.

Each execution of a service (whether the service succeeds or fails) updates the value returned by `getLastError`. Consequently, `getLastError` itself resets the value of *lastError*. Therefore, if the results of `getLastError` will be used as input to subsequent services, map the value of *lastError* to a variable in the pipeline.

If a map has multiple transformers, then a subsequent call to `getLastError` will return the error associated with the last failed transformer in the map, even if it is followed by successful transformers.

The `pub.flow:getLastError` services returns information for failures that originate in a service call made by flow only. The error information is not updated to reflect a failure caused by the EXIT step such as an EXIT step configured to exit \$parent and signal failure.

Invoking `pub.flow:getLastError` repeatedly in a flow service increases the pipeline size as the *pipeline/lastError* document has the *lastError* of all previous `pub.flow:getLastError` executions, which leads to "out of memory" issues in Integration Server when the exceptions are high. In such scenarios, set the `watt.server.getLastError.removeLastError` server configuration parameter to true, which removes the *pipeline/lastError* document from the output of the last invocation of the `pub.flow:getLastError` service.

When you invoke `pub.flow:getLastError` in a flow service and the input to the flow service has non-serializable objects, the `pub.flow:getLastError` service returns the object type as strings instead of the object reference. For example, consider the following flow service.

```

CEExceptionTest.myUtilsreturnInputStream
- SEQUENCE (Try/Catch)
- SEQUENCE (Try)
  - SEQUENCE (getAndCheckInputStream)
    - CEExceptionTestUtil.throwServiceException (Deliberately throw an exception so control flows to catch block)
  - SEQUENCE (Catch)
    - pub.flow.getLastError (First invoke of getLastError to obtain the error and pipeline contents)
    - CEExceptionTest.myUtilsinstanceOfInputStream

```

In the example, the "SEQUENCE (Try)" step returns a reference to non-serializable objects or object lists of class such as `java.io.ByteArrayInputStream`. For such non-serializable objects or object lists in the pipeline, when the error occurs, the `pub.flow:getLastError` service in the "SEQUENCE (Catch)" step returns the object type (`java.io.ByteArrayInputStream`) as strings instead of the object reference. Therefore, you must initialize the objects outside the "SEQUENCE (Try)" step to make them available to the "SEQUENCE (Catch)" step.

pub.flow:getLastFailureCaught

WmPublic. Returns information about the last failure that was caught by a CATCH step.

Input Parameters

None.

Output Parameters

<i>failure</i>	Object The last failure caught by a CATCH step. The <i>failure</i> parameter is null if no failure have been caught.
<i>failureMessage</i>	String . Conditional. The message associated with the failure. The service returns a <i>failureName</i> output parameter only if a failure has been caught.
<i>failureName</i>	String . Conditional. The class name of the exception. The service returns a <i>failureMessage</i> output parameter only if a failure has been caught.

Usage Notes

When a CATCH step can handle multiple failures, use the `pub.flow:getLastFailureCaught` service to determine which failure the step caught.

If you want to rethrow a caught failure, use the `pub.flow:getLastFailureCaught` service to determine which failure the CATCH step caught and then use an EXIT step configured to signal failure to rethrow the failure.

The `pub.flow:getLastFailureCaught` service does not have to be executed within a CATCH step. Invoking the service any time after a failure has been caught returns the caught failure.

pub.flow:getRetryCount

WmPublic. Retrieves the retry count and the maximum retry count for a service.

The retry count indicates the number of times the Integration Server has re-executed a service. For example, a retry count of 1 indicates that the Integration Server tried to execute the service twice (the initial attempt and then one retry). The maximum retry count indicates the maximum number of times the Integration Server can re-execute the service if it continues to fail because of an `ISRuntimeException`.

Input Parameters

None.

Output Parameters

<i>retryCount</i>	String The number of times the Integration Server has re-executed the service.
<i>maxRetryCount</i>	String The maximum number of times the Integration Server can re-execute the service. A value of -1 indicates that the service is being invoked by a trigger configured to retry until success.

Usage Notes

Although the `pub.flow:getRetryCount` service can be invoked at any point in a flow service, the `pub.flow:getRetryCount` service retrieves retry information for the service within which it is invoked. That is, you can use the `pub.flow:getRetryCount` service to retrieve retry information for top-level services or services invoked by a trigger only. The `pub.flow:getRetryCount` service does not retrieve retry information for a nested service (a service that is invoked by another service).

The Integration Server retries a service that is configured to retry if the service uses the `pub.flow:throwISRuntimeException` service to catch a transient error and re-throw it as an `ISRuntimeException`. The Integration Server will also retry a service written in Java if the service throws an exception using `com.wm.app.b2b.server.ISRuntimeException()`. For more information about constructing `com.wm.app.b2b.server.ISRuntimeExceptions` in Java services, see the *webMethods Integration Server Java API Reference* for the `com.wm.app.b2b.server.ISRuntimeException` class.

The maximum number of times the Integration Server retries a service depends on the value of the **Max attempts** property for the service. If the service is invoked by a trigger, the retry behavior is determined by the trigger retry properties.

See Also

[pub.flow:throwExceptionForRetry](#)

pub.flow:getSession

WmPublic. Inserts the Session object into the pipeline as a document named *\$session*.

Session is useful for associating values with particular clients or users. Once *\$session* is added to the pipeline, it can be used like any other document in a flow. This permits more powerful flows that perform work spanning several user requests.

Input Parameters

None.

Output Parameters

\$session **Document** Information for the current user session. Setting, copying, or dropping fields within *\$session* is effectively manipulating the Session object on the server.

pub.flow:getTransportInfo

WmPublic. Retrieves information about the protocol from which the current service was invoked.

Input Parameters

None.

Output Parameters

transport **Document** Information about the protocol that invoked the service. The structure of this document is defined by [pub.flow:transportInfo](#).

Usage Notes

The `pub.flow:getTransportInfo` service can be used to retrieve protocol information for a top-level service only. A top-level service is one that is invoked by a client request or a trigger.

The value of the *protocol* key in *transport* indicates which protocol was used to invoke the top-level service. For example, if the service was invoked through SMTP, *protocol* would be set to `email`. *transport* will also contain a document (whose key is protocol-dependent) that holds protocol-specific details.

To use this service, first check the value of the *transport/protocol* parameter to determine which protocol was used. Then, depending on the value of *protocol*, extract the appropriate protocol information from *transport*. See [pub.flow:transportInfo](#) for the structure of the document that holds the protocol details.

pub.flow:HTTPRequest

WmPublic. Document type used to represent information about the HTTP request received by the Integration Server.

Parameters

<i>headers</i>	Document Contains the header fields from the HTTP request.
<i>requestURL</i>	String URL used by the client to invoke the service.
<i>method</i>	String HTTP method used by the client to request the top-level service. Possible values are GET, PUT, POST, PATCH, and DELETE.

Usage Notes

To get the details of an HTTP request for a service, you can add a document reference variable named *\$HttpRequest* that references the `pub.flow:HttpRequest` document type in the input signature of a service. While invoking a service that includes a *\$HttpRequest* document reference variable, Integration Server populates the *\$HttpRequest* variable with information from the from the HTTP request.

Note:

The variable name *\$HttpRequest* is case sensitive. To achieve the described behavior, you must use the exact combination of letters and symbols, including upper and lower case.

pub.flow:HTTPResponse

WmPublic. Document type that specifies the HTTP response information to be returned by Integration Server to the client.

Parameters

<i>headers</i>	Document. Optional. Contains the header fields to be returned in the HTTP response.
<i>responseCode</i>	String. Optional. HTTP status code to be returned to the client. The response codes and phrases are defined in https://tools.ietf.org/html/rfc7231#section-6 . If you provide a value for <i>responseCode</i> that is not listed in RFC 7321, Section 6, you must also provide a value for <i>reasonPhrase</i> .
<i>reasonPhrase</i>	String. Optional. HTTP reason phrase to be returned to the client. If no reason is provided, the default reason phrase associated with <i>responseCode</i> will be used. You must provide a <i>reasonPhrase</i> for any <i>responseCode</i> that is not listed in RFC 7321, Section 6.
<i>responseString</i>	String. Optional. Response to be returned to the client, specified as a string.
<i>responseBytes</i>	byte[]. Optional. Response to be returned to the client, specified as a byte array.
<i>responseStream</i>	java.io.InputStream. Optional. Response to be returned to the client, specified as an InputStream.

Usage Notes

You can set an HTTP response by adding a document reference to the `pub.flow:HTTPResponse` document type in the pipeline of the service and naming the variable as `$httpResponse`. Using the values set in the `$httpResponse`, Integration Server sends the response back to the client.

The variable name `$httpResponse` is case sensitive. To achieve the described behavior, you must use the exact combination of letters and symbols, including upper and lower case.

If multiple documents named `$httpResponse` exist in a flow service, (multiple nested flow services), Integration Server uses the last `$httpResponse` value set in the flow service the response header.

If a service adds `$httpResponse` to the pipeline and also calls the `pub.flow:setResponse`, `pub.flow:setResponse2`, `pub.flow:setResponseHeader`, or `pub.flow:setResponseHeaders` service, then Integration Server uses the values set in `$httpResponse` pipeline variable.

Note: Integration Server does not support the use of the `pub.flow:HTTPResponse` document type for Enterprise Gateway that is configured to use the custom filter.

pub.flow:invokeService

WmPublic. Dynamically invokes any Integration Server public service and optionally returns the output from the invoked service in the pipeline for `pub.flow:invokeService`.

Input Parameters

<i>ifcname</i>	String The flow interface name of the service to be invoked. For example, <code>pub.math</code> .
<i>svcname</i>	String The name of the service to invoke. For example, <code>addInts</code> .
<i>pipeline</i>	Document. Optional. The name of the pipeline for the <code>pub.flow:invokeService</code> service.

Note:

If *pipeline* is not specified, the invoked service returns the output parameters in its own pipeline.

Output Parameters

If you specify a value for *pipeline*, the `pub.flow:invokeService` service returns the output parameters defined for the service specified by *ifcname* and *svcname*. For example, `pub.flow:invokeService` invokes `pub.math:addInts` as follows:

```
ifcname = "pub.math"
```

```
svcname = "addInts"
```

```
pipeline = "mypipeline"
```

```
mypipeline.num1 = "100"
```

```
mypipeline.num2 = "200"
```

In this case, `pub.flow:invokeService` returns the output parameter as follows:

```
mypipeline.value = "300"
```

If you do not specify a value for *pipeline*, the invoked service returns the output, *not* `pub.flow:invokeService`. For example, if you use `pub.flow:invokeService` to invoke `pub.math.addInts`, the output is returned in the pipeline for `pub.math.addInts`.

Usage Notes

If the parameters specified by the service invoked by `pub.flow:invokeService` are not present or not properly specified, Integration Server issues an exception appropriate for the invoked service.

Integration Server issues a `ServiceException` for `pub.flow:invokeService` if either of the following is not present in the flow service:

- The interface specified by *ifcname*
- The service specified by *svcname*

pub.flow:iterator

WmPublic. Returns IData arrays as batches with a specified batch size.

Input Parameters

<i>\$internal</i>	IData A document that specifies the information required to batch output.										
	<table border="1"> <thead> <tr> <th style="text-align: left;">Key</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr> <td><i>batchContext</i></td> <td>String. Optional. Unique handle for this specific batch request. For the first call, this parameter must be null or empty. On subsequent calls, it will contain a universally unique identifier (UUID) that Integration Server uses as the key to retrieve the current state of the batching request.</td> </tr> <tr> <td><i>batchSize</i></td> <td>Integer. Optional. Number of records (IData) to return in the result set array. The value must be greater than 0. The default is 100.</td> </tr> <tr> <td><i>timeToLive</i></td> <td>Integer Length of time in seconds that the request remains in the cache. The value must be greater than 0. The default is 60.</td> </tr> <tr> <td><i>resultSetKey</i></td> <td>String Pipeline key name of the IData array that should be batched. If not specified, the service creates batches from the first IData array in the pipeline. If no IData array</td> </tr> </tbody> </table>	Key	Description	<i>batchContext</i>	String . Optional. Unique handle for this specific batch request. For the first call, this parameter must be null or empty. On subsequent calls, it will contain a universally unique identifier (UUID) that Integration Server uses as the key to retrieve the current state of the batching request.	<i>batchSize</i>	Integer . Optional. Number of records (IData) to return in the result set array. The value must be greater than 0. The default is 100.	<i>timeToLive</i>	Integer Length of time in seconds that the request remains in the cache. The value must be greater than 0. The default is 60.	<i>resultSetKey</i>	String Pipeline key name of the IData array that should be batched. If not specified, the service creates batches from the first IData array in the pipeline. If no IData array
Key	Description										
<i>batchContext</i>	String . Optional. Unique handle for this specific batch request. For the first call, this parameter must be null or empty. On subsequent calls, it will contain a universally unique identifier (UUID) that Integration Server uses as the key to retrieve the current state of the batching request.										
<i>batchSize</i>	Integer . Optional. Number of records (IData) to return in the result set array. The value must be greater than 0. The default is 100.										
<i>timeToLive</i>	Integer Length of time in seconds that the request remains in the cache. The value must be greater than 0. The default is 60.										
<i>resultSetKey</i>	String Pipeline key name of the IData array that should be batched. If not specified, the service creates batches from the first IData array in the pipeline. If no IData array										

exists in the service signature, the service will not batch results, and Integration Server returns all records at once.

serviceName **String** Fully qualified service name from which `pub.flow.iterator` receives the `IData` array. This parameter is required for the first invocation, and is optional for subsequent calls.

Output Parameters

\$internal **IData** A document that specifies the results of the batch request.

Key	Description
<i>batchContext</i>	String . Conditional. Unique handle for this specific request. Returned only if <i>hasMore</i> is <code>true</code> .
<i>hasMore</i>	Boolean Indicates whether there are still records to process in the result set (<code>true</code>), or if there are no more to process (<code>false</code>).
<i>resultSetKey</i>	String Indicates the pipeline key name of the <code>IData</code> array that was batched. If <i>resultSetKey</i> is specified in the input, Integration Server returns that value. If <i>resultSetKey</i> is not specified in the input, this parameter contains the key of the first <code>IData</code> array that was processed.

Note:

In addition to the output parameters listed above, `pub.flow.iterator` returns any parameters returned in the output signature of the service specified in the *serviceName* input parameter.

Usage Notes

The output service signature of the service specified by the *serviceName* input parameter must contain at least one `IData` array. If there are multiple `IData` arrays in the output signature and the *resultSetKey* input parameter is not specified, `pub.flow.iterator` batches the first `IData` array in the pipeline. If there are no `IData` arrays in the pipeline, `pub.flow.iterator` returns the output all at once instead of in batches.

The `pub.flow.iterator` service sends the rest of the pipeline to the service specified by the *serviceName* parameter in the case that multiple calls are required to get all of the data in the result set.

pub.flow:restorePipeline

WmPublic. Restores a pipeline previously saved by [pub.flow:savePipeline](#).

Input Parameters

- \$name* **String** Name of the saved pipeline. Because multiple pipelines can be saved, this parameter is necessary to identify the pipeline in memory. If this value is left null or the name is unknown, an exception will be thrown.
- \$merge* **String**. Optional. Flag that indicates whether or not to merge the values in the existing pipeline with the values in the saved pipeline. Set to:
- `false` to clear the existing pipeline before restoring the saved pipeline. This is the default.
 - `true` to merge the existing pipeline with the saved pipeline. If a field exists in the saved pipeline and the existing pipeline, the saved field takes precedence.
- \$remove* **String**. Optional. Flag that indicates whether or not the saved pipeline will remain in memory after this service is executed. Set to:
- `false` to retain the saved pipeline in memory so that future calls to `restorePipeline` with the same *\$name* will still return the saved pipeline. This is the default.
 - `true` to remove the saved pipeline from memory after the service executes.

Output Parameters

The output is dynamic, based on the contents of the saved and existing pipelines.

Usage Notes

After a successful invocation of `restorePipeline`, the pipeline will contain all fields that were present immediately before `pub.flow:savePipeline` was invoked. `restorePipeline` clears existing pipeline values unless the optional *\$merge* field is specified.

When using MTOM streaming for SOAP attachments, *messageContext* variables and/or `XOPOject` fields will not be available in the saved pipeline. A *messageContext* variable is used by many `pub.soap` services to hold the SOAP message on which the service acts. `XOPOject` fields are Objects that use the `com.wm.util.XOPOject` Java wrapper type. For more information about MTOM Streaming, see the *Web Services Developer's Guide*.

This service is helpful in the interactive development or debugging of an application.

See Also

[pub.flow:savePipeline](#)

[pub.flow:restorePipelineFromFile](#)

pub.flow:restorePipelineFromFile

WmPublic. Restores a pipeline that was previously saved to a file.

Input Parameters

fileName **String** Relative or absolute path and file name of a file containing a saved pipeline on the Integration Server. If the file is not found at run time, an exception is thrown.

For a filename that does not include an absolute path, Integration Server calculates the relative path from the default pipeline directory which is located here:

Integration Server_directory/instances/instance_name/pipeline

When you specify a path for the *fileName* input parameter and the path is outside of the default pipeline directory, Integration Server verifies whether it is specified in the `allowedReadPaths` parameter of the file access control configuration file (`fileAccessControl.cnf`). If the file path is not specified in the `allowedReadPaths` parameter, Integration Server issues an exception.

merge **String**. Optional. Flag that determines whether or not to merge the saved values into the existing pipeline. Set to:

- `false` to replace the existing pipeline with the saved values. This is the default.
- `true` to merge the saved values into the existing pipeline.

Output Parameters

The output is dynamic, based on the contents of the saved and existing pipelines.

Usage Notes

This service is helpful in the interactive development or debugging of an application. In some cases, however, using the Pipeline debug property for the debugging of an application is more efficient. For more information about the Pipeline debug property, see *webMethods Service Development Help*.

Be aware that variables that exist in the saved pipeline but are not defined in the flow will not appear on the **Pipeline** tab and, therefore, will not be available for explicit mapping.

When using MTOM streaming for SOAP attachments, *messageContext* variables and/or *XOPObj* fields will not be available in the saved pipeline. A *messageContext* variable is used by many `pub.soap` services to hold the SOAP message on which the service acts. *XOPObj* fields are Objects that use the `com.wm.util.XOPObj` Java wrapper type. For more information about MTOM Streaming, see the *Web Services Developer's Guide*.

The `watt.server.checkPath.restorePipelineFromFile` server configuration parameter determines whether Integration Server verifies that the provided *filename* is in the `allowedReadPaths` parameter of the file access control configuration file (`fileAccessControl.cnf`). When this parameter is set to

true, the default, Integration Server verifies that the path or directory specified in *filename* is in the default pipeline directory or is included in the `allowedReadPaths` parameter. If the file is outside of the default pipeline directory and it is not in the allowed list, the service ends with a `ServiceException`. When the `watt.server.checkPath.restorePipelineFromFile` parameter is set to false Integration Server does not verify that the specified *filename* is in the default pipeline directory or the `allowedReadPaths` parameter.

The `pub.flow:restorePipelineFromFile` can always read from files in the default pipeline directory which is located here: *Integration Server_directory /instances/instance_name/pipeline*. You do not need to include the default pipeline directory in the `allowedReadPaths` parameter.

The `fileAccessControl.cnf` file is located in the following directory: *Integration Server_directory /instances/instance_name/packages/WmPublic/config*

See Also

[pub.flow:savePipelineToFile](#)

[pub.flow:restorePipeline](#)

pub.flow:savePipeline

WmPublic. Saves a pipeline into memory, for later retrieval with [pub.flow:restorePipeline](#).

Input Parameters

\$name **String** Name that will identify the pipeline in memory. An exception will be thrown if this value is not specified.

Output Parameters

None.

Usage Notes

After a successful invocation of `savePipeline`, a snapshot of pipeline fields will be saved in memory under the key provided by *\$name*. Note that because the pipeline is saved to memory, it will not be available after a server restart.

When using MTOM streaming for SOAP attachments, *messageContext* variables and/or `XOPObject` fields will not be available in the saved pipeline. A *messageContext* variable is used by many `pub.soap` services to hold the SOAP message on which the service acts. `XOPObject` fields are Objects that use the `com.wm.util.XOPObject` Java wrapper type. For more information about MTOM Streaming, see the *Web Services Developer's Guide*.

This service is helpful in the interactive development or debugging of an application.

See Also

[pub.flow:restorePipeline](#)

[pub.flow:savePipelineToFile](#)

pub.flow:savePipelineToFile

WmPublic. Saves the current pipeline to a file on the machine running Integration Server.

Input Parameters

fileName **String** Relative or absolute path to a file on the server file system in which Integration Server saves the contents of the pipeline. If the file or directory is not found at run time, the service creates it.

For a filename that does not include an absolute path, Integration Server calculates the relative path from the default pipeline directory which is located here:

Integration Server_directory /instances/instance_name/pipeline

When you specify a path for the *fileName* input parameter and the path is outside of the pipeline directory, Integration Server verifies whether it is specified in the allowedWritePaths parameter of the file access control configuration file (fileAccessControl.cnf). If the file path is not specified in the allowedWritePaths parameter, Integration Server issues an exception. Otherwise, Integration Server either creates the file if it does not yet exist or overwrites the existing file if one already exists.

Output Parameters

None.

Usage Notes

This service is helpful in the interactive development or debugging of an application. In some cases, however, using the **Pipeline debug** property for the debugging of an application is more efficient. For more information about the Pipeline debug property, see *webMethods Service Development Help*.

The watt.server.checkPath.savePipelineToFile server configuration parameter determines whether Integration Server verifies that the provided *filename* is in the default pipeline directory or is in the allowedWritePaths parameter of the file access control configuration file (fileAccessControl.cnf). When this parameter is set to true, the default, Integration Server verifies that the path or directory specified in *filename* is in the default pipeline directory or is specified in the allowedWritePaths parameter. If the file is outside of the default pipeline directory and it is not in the allowed list, the service ends with a ServiceException. When the watt.server.checkPath.savePipelineToFile parameter is set to false Integration Server does not verify that the specified *filename* is in the default pipeline directory or in the allowedWritePaths parameter.

The `pub.flow:savePipelineToFile` can always write files to the default pipeline directory which is located here: `Integration Server_directory/instances/instance_name/pipeline`. You do not need to include the default pipeline directory in the `allowedWritePaths` parameter.

The `fileAccessControl.cnf` file is located in the following directory: `Integration Server_directory/instances/instance_name/packages/WmPublic/config`

If `fileName` specifies a filename with an invalid character the `pub.flow:savePipelineToFile` service appears to work but, in fact, does not persist the file to disk. If a subsequent call to `pub.flow:restorePipelineFromFile` that specifies the same invalid filename is made within the same server session, the service restores the pipeline successfully. However, if `pub.flow:restorePipelineFromFile` specifies the invalid filename after Integration Server restarted, the service fails with a `FileNotFoundException`. To avoid this situation, make sure the `fileName` value does not include any invalid characters.

When using MTOM streaming for SOAP attachments, `messageContext` variables and/or `XOPObject` fields will not be available in the saved pipeline. A `messageContext` variable is used by many `pub.soap` services to hold the SOAP message on which the service acts. `XOPObject` fields are Objects that use the `com.wm.util.XOPObject` Java wrapper type. For more information about MTOM Streaming, see the *Web Services Developer's Guide*.

The following table shows the data types and classes that this service can write to the output file if they are included in the pipeline:

For	<code>pub.flow:savePipelineToFile</code> supports
Java data types	<ul style="list-style-type: none"> ■ <code>byte[]</code> ■ <code>Date</code> ■ <code>GregorianCalendar</code> ■ <code>IData</code> ■ <code>IData[]</code> (IData list) ■ <code>String</code> ■ <code>String[]</code> (String list) ■ <code>String[][]</code> (String table) ■ <code>Vector</code>
Java wrapper classes	<ul style="list-style-type: none"> ■ <code>Boolean</code> ■ <code>Byte</code> ■ <code>Character</code> ■ <code>Double</code> ■ <code>Float</code>

For [pub.flow:savePipelineToFile](#) supports

	<ul style="list-style-type: none"> ■ Integer ■ Long ■ Short ■ Single dimension arrays of any of the above
webMethods classes	<ul style="list-style-type: none"> ■ MBoolean ■ MByte ■ MDouble ■ MFloat ■ MInteger ■ MLong ■ MShort ■ Single dimension arrays of any of the above
Object arrays	Any non-array item listed in this table.

See Also

[pub.flow:restorePipelineFromFile](#)

[pub.flow:savePipeline](#)

pub.flow.setActivityLog

WmPublic. Logs user-defined messages to the WMSERVICEACTIVITYLOG table or the WMSERVICEACTIVITYLOG_ yyyymmdd_hhmmss.log file.

Input Parameters

<i>fullMessage</i>	String. Optional. Complete message to record in the WMSERVICEACTIVITYLOG table or the WMSERVICEACTIVITYLOG_ yyyymmdd_hhmmss.log file. The message can be up to 1024 bytes.
<i>briefMessage</i>	String. Optional. Shortened version of the full message. The message can be up to 240 bytes.
<i>entryType</i>	String. Flag indicating the type of message. Set to:

- MESSAGE to indicate that the message is informational and no action is needed.
- WARNING to indicate that the message is a warning message. The parent service can complete successfully even if the circumstance causing the warning is not addressed.
- ERROR to indicate that the message is an error message. The parent service cannot complete successfully until the circumstance causing the error is resolved. This is the default.

Output Parameters

None.

Usage Notes

You can invoke the `pub.flow.setActivityLog` service in a flow service to log messages for debugging or auditing purposes. If `pub.flow.setActivityLog` fails, the flow service execution is not interrupted.

Note:

You do not need to enable service auditing for the service to capture activity logs.

If you do not specify both *fullMessage* and *briefMessage*, the `pub.flow.setActivityLog` service logs an empty string.

pub.flow:setAuditLogFields

WmPublic. Sets the service auditing properties for one or more custom services.

Input Parameters

serviceList

Document List. One or more custom services for which you want to set the service auditing properties. Set the following fields for each custom service.

<u>Key</u>	<u>Description</u>
<i>nsName</i>	String. Specify the fully qualified name of the service for which you want to set the service auditing properties.

Note:

You can use `pub.flow:setAuditLogFields` to set service auditing properties for a custom service only.

enableAuditing

String. Determines when service auditing is performed for the service specified in *nsName*. Set to:

- `topLevelService` to generate audit data only when a client request or a trigger invokes the service. The service does not generate audit data when it is invoked by another service (that is, when it is a nested service).
- `always` to generate audit data every time the service executes. Select this option if the service is a critical service that you want to audit every time it executes.
- `never` to never generate audit data. Select this option if you do not want to audit this service. This is the default.

logOn

String. Specifies when the service logs the audit data. Set to:

- `onError` to log audit data only when the service execution fails.
- `errorAndSuccess` to log audit data when the service execution ends because of success or failure.
- `always` to log audit data when the service execution starts and ends because of success or failure.

includePipeline

String. Specifies when Integration Server should include a copy of the input pipeline in the service log.

- `onError` to log pipeline data only when the service execution fails.
- `always` to log pipeline data when the service execution starts and ends because of success or failure.

Note:

To log pipeline data in the service log always, set *logOn* to `always`.

- never to never log pipeline data. This is the default.

Note:

Configure the service to save a copy of the input pipeline only if you intend to re-invoke the service using the re-submission capabilities of webMethods Monitor.

Output Parameters

serviceList

Document List. The following parameters are displayed for each custom service specified in the input.

Key	Description
<i>nsName</i>	String. The custom service for which you set the audit properties.
<i>status</i>	String. Indicates whether the service auditing properties for the service are successfully updated or not.
<i>message</i>	String. If the <code>pub.flow:setAuditLogFields</code> service execution is successful, the message indicates that the audit properties for the custom service are successfully updated. Otherwise, the message provides the reason for failure.

Usage Notes

In Designer, you can set the audit logging properties for a custom service in the **Properties** panel > **Audit** category. However, you can set the properties only for a single service at a time. The `pub.flow:setAuditLogFields` public service enables you to set the properties for multiple custom services at a time with or without Designer.

Consider the following points to run the `pub.flow:setAuditLogFields` service successfully.

- The custom service must be locked for editing. Otherwise, the `pub.flow:setAuditLogFields` service fails. For more information about locking and unlocking elements, see *webMethods Service Development Help*.
- An invalid or incorrect custom service name in the *nsName* parameter leads to an error. Similarly, if the service name is not fully qualified or is a system service, the `pub.flow:setAuditLogFields` service fails.

pub.flow:setCustomContextID

WmPublic. Associates a custom value with an auditing context. This custom value can be used to search for service audit records in the webMethods Monitor.

Input Parameters

id **String.** Optional. The custom value for the current auditing context. Specify a value that you want to associate with the auditing context.

Output Parameters

None.

Usage Notes

- Each client request creates a new auditing context. The auditing context is the lifetime of the top-level service. Once the custom context identifier is set, Integration Server includes that value in each service audit record it logs in the current context. Calls to this service affect audit logging only for the current request.
- This service is useful when Integration Server is configured to log to a database. When the server logs information about a service to the database, it includes the custom context identifier in the service log. Using the webMethods Monitor, you can use the custom value as search criteria to locate and view all corresponding service audit records.
- If Integration Server is configured to log to a file system, the server writes the custom context identifier with the service audit records to a file. This file is not accessible with the webMethods Monitor. You cannot use the webMethods Monitor to query service records when logging to a file.
- If this service is invoked without a specified value for *id*, Integration Server writes a null value for the custom context identifier field for all subsequent service audit records that it logs in the current context.

pub.flow:setCustomLoggedFields

WmPublic. Selects the fields of one or more custom services for logging.

Input Parameters

serviceList **Document List.** One or more custom services for which you want to select the input and output fields for logging. Set the following parameters for each custom service.

Key	Description
<i>nsName</i>	String. Specify the fully qualified name of the service for which you want to select the fields for logging.

Note:

You can use `pub.flow:setCustomLoggedFields` to select the fields of a custom service only.

Key	Description
<i>inputFields</i>	Document List. Optional. One or more input fields that you want to log for the custom service.

Key	Description
-----	-------------

<i>path</i>	String. Path of the input field that you want to log for the custom service. For example, if the input field is a string (<code>myString</code>) under a document (<code>myDocument</code>), <i>path</i> is <code>myDocument/myString</code> , where <code>myString</code> is the leaf node.
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<i>type</i>	String. The data type of the input field.
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<i>objectWrapperType</i>	String. Optional. The Java wrapper type for a field of type <code>Object</code> or <code>Object List</code> . The default is <code>UNKNOWN</code> .
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<i>alias</i>	String. Optional. A name to easily locate the input field in <code>webMethods Monitor</code> . The default is the leaf node name specified in <i>path</i> .
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<i>outputFields</i>	Document List. Optional. One or more output fields that you want to log for the custom service.
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Key	Description
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<i>path</i>	String. Path of the output field that you want to log for the custom service. For example, if the output field is a string (<code>myString</code>) under a document (<code>myDocument</code>), <i>path</i> is <code>myDocument/myString</code> , where <code>myString</code> is the leaf node.
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<i>type</i>	String. The data type of the output field.
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<i>objectWrapperType</i>	String. Optional. The Java wrapper type for a field of type Object or Object List. The default is UNKNOWN.
<i>alias</i>	String. Optional. A name to easily locate the output field in webMethods Monitor. The default is the leaf node name specified in <i>path</i> .

Output Parameters

serviceList **Document List.** The following parameters are displayed for each custom service in the input.

<u>Key</u>	<u>Description</u>
<i>nsName</i>	String. The fully qualified name of the custom service for which you have specified the fields for logging.
<i>status</i>	String. Indicates whether the specified fields of a custom service are selected for logging or not.
<i>message</i>	String. If the <code>pub.flow:setCustomLoggedFields</code> service execution is successful, the message indicates that the specified fields of a custom service are selected for logging. Otherwise, the message provides the reason for failure.

Usage Notes

In Designer, you can select the custom service fields for logging in the **Logged Fields** tab. However, you can select the fields only for one service at a time. The `pub.flow:setCustomLoggedFields` public service enables you to select the fields of multiple custom services at once for logging, with or without Designer.

Consider the following points to run the `pub.flow:setCustomLoggedFields` service successfully.

- The custom service must be locked for editing. Otherwise, the `pub.flow:setCustomLoggedFields` service fails. For more information about locking and unlocking elements, see *webMethods Service Development Help*.
- An invalid or incorrect custom service name in the *nsName* parameter leads to an error. Similarly, if the service name is not fully qualified or is a system service, the `pub.flow:setCustomLoggedFields` service fails.

- If there are multiple custom services in *serviceList*, and a custom service has invalid *inputFields* or *outputFields*, the `pub.flow:setCustomLoggedFields` service fails to set the fields of that service for logging.
- If one or more *inputFields* or *outputFields* of a custom service have the incorrect *type*, `pub.flow:setCustomLoggedFields` fails to set the fields of that service for logging.
- For a custom service, if you manually select the fields in the **Logged Fields** tab, and then run the `pub.flow:setCustomLoggedFields` service without specifying *inputFields* or *outputFields*, the `pub.flow:setCustomLoggedFields` service clears the fields that are already selected.

If you want audit data for the custom fields in the service log, you must enable service auditing for the custom service.

The service logger destination must be a database to log the values of the selected custom fields.

pub.flow:setResponse

WmPublic. *Deprecated* - Replaced by [pub.flow:setResponse2](#).

Forces a specified response to be returned by the webMethods Integration Server to a calling process (such as a browser or application server).

Formatting of the response is normally handled by templates, which format values from the pipeline. If templates are not appropriate for a particular integration scenario, a response message can be created within the flow and then returned to the caller using this service.

Input Parameters

<i>responseString</i>	String . Optional. Response to be returned to the caller, specified as a string.
<i>responseBytes</i>	byte[] . Optional. Response to be returned to the caller, specified as a byte array.
<i>string</i>	<i>Deprecated</i> - Replaced by <i>responseString</i> . String . Optional. Response to be returned to the caller, specified as a string.
<i>bytes</i>	<i>Deprecated</i> - Replaced by <i>responseBytes</i> . byte[] . Optional. Response to be returned to the caller, specified as a byte array.
<i>response</i>	<i>Deprecated</i> - Replaced by <i>responseString</i> . String . Optional. Response to be returned to the caller, specified as a string.
<i>contentType</i>	String . Optional. MIME type of the response data. By default, the server's response will match the MIME type of the request. This field allows this behavior to be overridden.

Note:

If you explicitly set this value with Designer, you will see two choices: `text/XML` and `text/HTML`. You are not limited to these two values. You may either select one of these or type a new value.

encoding **String**. Optional. Character set in which the response is encoded.

Output Parameters

None.

Usage Notes

Specify *responseString* or *responseBytes*, but not both. If you specify both, the `pub.flow:setResponse` service uses *responseString* and ignores *responseBytes*.

If neither *responseString* or *responseBytes* are specified, Integration Server uses the value of the server configuration parameter `watt.server:setResponse.pre82Mode` to determine the order in which to look for and use the deprecated fields.

- When `watt.server:setResponse.pre82Mode` is set to “true”, Integration Server follows a precedence order similar to what was available in Integration Server 7.1x and 8.0x. Specifically, Integration Server looks for the deprecated parameters in the following order and uses the value of the first parameter that it finds: *response*, *string*, *bytes*
- When `watt.server:setResponse.pre82Mode` is set to “false”, Integration Server follows a precedence order similar to what was available in Integration Server 8.2 and later. Specifically, Integration Server looks for the deprecated parameters in the following order and uses the value of the first parameter that it finds: *string*, *bytes*, *response*

One possible usage of this service is to create an XML response to an XML request. A flow that creates an XML document by calling [pub.xml:documentToXMLString](#) can use `pub.flow:setResponse` to return the XML document to the caller. In your flow, you would map *xmldata* (output of [pub.xml:documentToXMLString](#)) to *responseString* and set *contentType* to `text/xml` (inputs to `pub.flow:setResponse`). Calling `pub.flow:setResponse` will cause the server to return the XML document that you've mapped to *responseString* instead of processing the pipeline through a template.

Your client might be expecting binary data in the response, such as a JPEG image. In this case, map a byte array that represents the image to *responseBytes* and set *contentType* to `image/jpeg`.

Integration Server detects the type of request and sets the Content-Type value to `text/XML` (for requests in XML format) or `text/HTML` (for requests in all other formats). Be aware that if you specify a value for *contentType*, Designer will not be able to decode or display output from flows that include this service. This is because your *contentType* setting will override the Content-Type value that the Integration Server uses to return output to Designer. If you use **Run** to test the flow, Designer will not display any results.

If you specify a *contentType* value that is not supported, Integration Server sets the Content-Type of the response to `text/XML`.

If the *contentType* input parameter and the Content-Type header of the request are not set, Integration Server uses the value of the request Accept header to set the Content-Type header of the response. For more information about how Integration Server handles Accept headers to set Content-Types, see

Keep in mind that when returning the processed XML document to the client that originally submitted it, you may need to modify the encoding. Java String objects are always stored using a Unicode encoding. If your original XML document used an encoding other than UTF-8 or UTF-16, it will still contain an encoding tag that indicates what this encoding was. However, if you did not modify the encoding during document processing, you need to set the encoding parameter when you invoke the `pub.flow:setResponse` service. Specifically, do one of the following:

- Set the *encoding* parameter to match the tag in the file, or
- Set the *encoding* parameter to "autoDetect" to use the encoding specified in the XML string encoding tag.

pub.flow:setResponse2

`WmPublic`. Forces a specified response to be returned by the webMethods Integration Server to a calling process (such as a browser or application server).

Formatting of the response is normally handled by templates, which format values from the pipeline. If templates are not appropriate for a particular integration scenario, a response message can be created within the flow and then returned to the caller using this service.

Input Parameters

<i>responseString</i>	String . Optional. Response to be returned to the caller, specified as a string.
<i>responseBytes</i>	byte[] . Optional. Response to be returned to the caller, specified as a byte array.
<i>responseStream</i>	java.io.InputStream . Optional. Response to be returned to the caller, specified as an <code>InputStream</code> .
<i>responseStream TransferEncoding</i>	String . Optional. When set to <code>chunked</code> , causes Integration Server to use chunked transfer encoding for the response and include the <code>Transfer-Encoding: chunked</code> response header. Using this variable lets you avoid <code>OutOfMemoryExceptions</code> when using large <code>responseStreams</code> . This variable is used by Integration Server only if <i>responseStream</i> is not null. This variable has no default value; to use it, set it to <code>chunked</code> . If <i>responseStream</i> is not null, and this variable is not set or is set to a value other than <code>chunked</code> , Integration Server reads the entire <code>responseStream</code> to calculate the content length.
<i>contentType</i>	String . Optional. MIME type of the response data. By default, the server's response will match the MIME type of the request. This field allows this behavior to be overridden.

Note:

If you explicitly set this value with Designer, you will see two choices: `text/XML` and `text/HTML`. You are not limited to these two values. You may either select one of these or type a new value.

encoding

String. Optional. Character set in which the response is encoded.

Output Parameters

None.

Usage Notes

This service replaces [pub.flow:setResponse](#), which is deprecated.

Specify *responseString*, *responseBytes*, or *responseStream*. If you specify more than one, the `pub.flow:setResponse2` service looks for the parameters in the following order and uses the first one that it finds: *responseString*, *responseBytes*, *responseStream*.

One possible usage of this service is to create an XML response to an XML request. A flow that creates an XML document by calling [pub.xml:documentToXMLString](#) can use `pub.flow:setResponse2` to return the XML document to the caller. In your flow, you would map *xmlData* (output of [pub.xml:documentToXMLString](#)) to *responseString* and set *contentType* to `text/xml` (inputs to `pub.flow:setResponse2`). Calling `pub.flow:setResponse2` will cause the server to return the XML document that you've mapped to *responseString* instead of processing the pipeline through a template.

Your client might be expecting binary data in the response, such as a JPEG image. In this case, map a byte array that represents the image to *responseBytes* and set *contentType* to `image/jpeg`.

Integration Server detects the type of request and sets the Content-Type value to `text/XML` (for requests in XML format) or `text/HTML` (for requests in all other formats). Be aware that if you specify a value for *contentType*, Designer will not be able to decode or display output from flows that include this service. This is because your *contentType* setting will override the Content-Type value that the Integration Server uses to return output to Designer. If you use **Run** to test the flow, Designer will not display any results.

If you specify a *contentType* value that is not supported, Integration Server sets the Content-Type of the response to `text/XML`.

If the *contentType* input parameter and the Content-Type header of the request are not set, Integration Server uses the value of the request Accept header to set the Content-Type header of the response. For more information about how Integration Server handles Accept headers to set Content-Types, see

Keep in mind that when returning the processed XML document to the client that originally submitted it, you may need to modify the encoding. Java String objects are always stored using a Unicode encoding. If your original XML document used an encoding other than UTF-8 or UTF-16, it will still contain an encoding tag that indicates what this encoding was. However, if you did not modify the encoding during document processing, you need to set the encoding parameter when you invoke the `pub.flow:setResponse2` service. Specifically, do one of the following:

- Set the *encoding* parameter to match the tag in the file, or
- Set the *encoding* parameter to "autoDetect" to use the encoding specified in the XML string encoding tag.

pub.flow:setResponseCode

WmPublic. Specifies the HTTP response code to be returned by Integration Server to a calling process (such as a browser or application server).

Input Parameters

<i>responseCode</i>	String HTTP status code to be returned to the caller. The response codes and phrases are defined in RFC 2616, Section 10 . If you provide a value for <i>responseCode</i> that is not listed in RFC 2616, Section 10, you must also provide a value for <i>reasonPhrase</i> .
<i>reasonPhrase</i>	String . Optional. HTTP reason phrase to be returned to the caller. If no reason is provided, the default reason phrase associated with <i>responseCode</i> will be used. You must provide a <i>reasonPhrase</i> for any <i>responseCode</i> that is not listed in RFC 2616, Section 10

Output Parameters

None.

Usage Notes

When you invoke `pub.flow:setResponseCode` from Designer and set the *responseCode* input variable to 204, the Results view in the Service Development perspective will be empty. This is because an HTTP response code of 204 indicates to the client that there is no content in the response. For Designer, this means there is no output pipeline to display when the service completes.

pub.flow:setResponseHeader

WmPublic. Sets a header field in the HTTP response to a calling process (such as a browser or application server) or in the JMS message that contains the SOAP response from a web service invocation.

Input Parameters

<i>fieldName</i>	String Name of the header field to set.
<i>fieldValue</i>	String Value of the header field to set.

Output Parameters

None.

Usage Notes

`pub.flow:setResponseHeader` sets a single field in the response header. To set multiple response header fields, use `pub.flow:setResponseHeaders`.

You can use `pub.flow:setResponse` to set the Content-Type of the HTTP header field. Content-Type specifies the format of the service response. For example, to specify a JSON response, set Content-Type to `application/json`. For more information about content types Integration Server supports, see

Important:

If you set the value of the Set-Cookie header and include the SameSite attribute using this or the `pub.flow:setResponseHeaders` service, then Integration Server ignores the value of the `watt.server.http.header.sameSite` parameter.

The following HTTP header fields cannot be set by calling this service or by Integration Server applications:

- Allow
- Connection
- Content-Length
- WWW-Authenticate
- Transfer-Encoding
- Upgrade

Keep the following points in mind when adding headers for a JMS message that contains a SOAP response:

- You can specify custom headers.
- You can set some JMS message header fields directly and set others using run-time properties specific to Integration Server.
 - You can set `JMSType` directly. This header name is case-sensitive.
 - You can set the following headers indirectly using run-time properties: `JMSDeliveryMode`, `JMSExpiration`, and `JMSPriority`. The following table identifies these properties and indicates the JMS message header fields affected by each property.

Property Name	Description
<code>jms.deliveryMode</code>	Specifies the message delivery mode for the message. Integration Server uses this value to set the <code>JMSDeliveryMode</code> header.

Property Name	Description	
	Value	Description
	PERSISTENT	Indicates the request message is persistent.
	2	Default. Indicates the request message is persistent.
	NON_PERSISTENT	Indicates the request message is not persistent.
	1	Indicates the request message is not persistent.
<p>Note: If the <code>.jms.deliveryMode</code> is not one of the above values, Integration Server ignores the name/value pair and uses the default value of 2.</p>		
<code>.jms.timeToLive</code>	<p>Length of time, in milliseconds, that the JMS provider retains the message. A value of 0 means that the message does not expire.</p> <p>The JMS provider uses this value to set the <code>JMSExpiration</code> header in the sent JMS message.</p>	
<p>Note: If the <code>.jms.timeToLive</code> value is not a valid Long, Integration Server ignores the property and uses the default value of 0.</p>		
<code>.jms.priority</code>	<p>Specifies the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.</p> <p>Integration Server uses this value to set the <code>JMSPriority</code> header.</p> <p>If the <code>.jms.priority</code> value is not a value between 0 to 9, Integration Server ignores the property and uses the default value of 4.</p>	

- You can specify the following JMS-defined properties:

- `JMSXGroupID`
- `JMSXGroupSeq`

If the value of `JMSXGroupSeq` is not an String that contains a number, Integration Server ignores the name/value pair and does not place it in the message header.

Note:
The `JMSXGroupID` and `JMSXGroupSeq` names are case-sensitive.

- You can set any provider-specific property whose name starts with “`JMS_`” in *fieldName*. Because the JMS standard reserves the prefix “`JMS_<vendor_name>`” for provider-specific properties, Integration Server does not validate the name or value of this content.

Note:

The JMS provider determines which provider-specific properties to accept and include in the JMS message properties. For more information about provider-specific message properties how the JMS provider handles them, review the JMS provider documentation.

- The lowercase “jms.” prefix is reserved for run-time properties used by Integration Server. If a header starts with “jms.” and is not one of the “jms.” properties defined by Integration Server, Integration Server ignores the property.
- The “JMSX” prefix is reserved for JMS-defined properties. If a header whose name starts with “JMSX” is passed into *fieldName* and it is not named JMSXGroupID or JMSXGroupSeq, Integration Server throws a ServiceException.
- You cannot set any of the SOAP over JMS message header properties. These header names start with “SOAPJMS”.

pub.flow:setResponseHeaders

WmPublic. Sets one or more header fields in the HTTP response to a calling process (such as a browser or application server) or in the JMS message that contains the SOAP response from a web service invocation.

Input Parameters

<i>headers</i>	Document List Contains the header fields to set. Specify the following for each header that you want to set.
<i>fieldName</i>	String Name of the header field to set.
<i>fieldValue</i>	String Value of the header field to set.

Output Parameters

None.

Usage Notes

pub.flow:setResponseHeaders sets one or more fields in the response header. If any of the fields specified by *fieldName* have already been set, they will be overwritten.

See the Usage Notes for [pub.flow:setResponseHeader](#) for more information.

pub.flow:throwExceptionForRetry

WmPublic. Throws an ISRuntimeException and instructs the Integration Server to re-execute a service using the original service input.

Input Parameters

- wrappedException* **Object.** Optional. Any exception that you want to include as part of this `ISRuntimeException`. This might be the exception that causes the `pub.flow:throwExceptionForRetry` service to execute. For example, if the service attempts to connect to a database and the connection attempt fails, you might map the exception generated by the database connection failure to the *wrappedException* parameter.
- message* **String.** Optional. A message to be logged as part of this exception.

Output Parameters

None.

Usage Notes

Use the `pub.flow:throwExceptionForRetry` service to handle transient errors that might occur during service execution. A transient error is an error that arises from a condition that might be resolved quickly, such as the unavailability of a resource due to network issues or failure to connect to a database. The service might execute successfully if the Integration Server waits and then retries the service. If a transient error occurs, the service can catch this error and invoke `pub.flow:throwExceptionForRetry` to instruct the Integration Server to retry the service.

The `pub.flow:throwExceptionForRetry` service should be used for transient errors only.

Only top-level services or trigger services can be retried. That is, a service can be retried only when it is invoked directly by a client request or by a trigger. The service cannot be retried when it is invoked by another service (that is, when it is a nested service).

You can invoke the [pub.flow:getRetryCount](#) service to retrieve the current retry count and the maximum specified retry attempts for a service.

If the trigger service is written in Java, the service can use `ISRuntimeException()` to throw an exception and retry the service. For more information about constructing `ISRuntimeExceptions` in Java services, see the *webMethods Integration Server Java API Reference* for the `com.wm.app.b2b.server.ISRuntimeException` class.

For information about configuring retry for services or triggers, see *webMethods Service Development Help*.

See Also

[pub.flow:getRetryCount](#)

pub.flow:tracePipeline

WmPublic. Writes the names and values of all fields in the pipeline to the server log.

Input Parameters

level **String**. Optional. Debug level at which to write the pipeline. Defaults to `Fatal`. If the debug level on the webMethods Integration Server is set to a value less than this parameter, the pipeline will not be written to the server log.

Output Parameters

None.

Usage Notes

Prior to Integration Server 7.1, Integration Server used a number-based system to set the level of debug information written to the server log. Integration Server maintains backward compatibility with this system. For more information about logging levels, see the description of the `watt.debug.level` parameter in *webMethods Integration Server Administrator's Guide*.

pub.flow:transportInfo

WmPublic. Document type used to return information about the protocol through which a service was invoked.

Parameters

protocol **String** Name of protocol about which *transportInfo* contains information. Will be one of the following values

A value of...	Indicates that...
email	SMTP was used to invoke the service. Detailed information is contained in the <i>email</i> parameter.
filePolling	File polling protocol was used to invoke this service. Detailed information is contained in the <i>filePolling</i> parameter.
ftp	FTP was used to invoke the service. Detailed information is contained in the <i>ftp</i> parameter.
http	HTTP was used to invoke the service. Detailed information is contained in the <i>http</i> parameter.
jms	JMS was used to invoke the service. When a standard JMS trigger or a SOAP-JMS trigger invokes a service, the protocol is JMS. Detailed information is contained in the <i>jms</i> parameter.

messaging webMethods messaging was used to invoke the service. Specifically, a webMethods messaging trigger invoked the service. Detailed information is contained in the *messaging* parameter.

subprotocol **String.** Conditional. Subprotocol used to invoke the service.

<u>A value of...</u>	<u>Indicates that...</u>
broker	<p>The service was invoked by a webMethods messaging trigger that received a document from the Broker or a locally published document.</p> <p>This subprotocol can only occur if <i>protocol</i> is <i>messaging</i>.</p>
HTTP	<p>The service was invoked through HTTP.</p> <p>This subprotocol can only occur if <i>protocol</i> is <i>http</i>.</p>
HTTPS	<p>The service was invoked through HTTPS.</p> <p>This subprotocol can only occur if <i>protocol</i> is <i>http</i>.</p>
jndi	<p>Integration Server uses JNDI to connect to the JMS provider. The JMS connection alias assigned to the JMS trigger specifies how Integration Server connects to the JMS provider.</p> <p>A value of <i>jndi</i> also indicates that the <i>jms/destinationName</i> value is a lookup name.</p> <p>This subprotocol can only occur if <i>protocol</i> is <i>jms</i>.</p>
native	<p>Integration Server uses the native webMethods API to connect to the webMethods Broker being used as the JMS provider directly. The JMS connection alias assigned to the JMS trigger specifies how Integration Server connects to the JMS provider.</p> <p>A value of <i>native</i> also indicates that the <i>jms/destinationName</i> value is the name of the actual destination.</p> <p>This subprotocol can only occur if <i>protocol</i> is <i>jms</i>.</p>
um	<p>The service was invoked by a webMethods messaging trigger that received a document from the Universal Messaging.</p> <p>This subprotocol can only occur if <i>protocol</i> is <i>messaging</i>.</p>

The *subprotocol* parameter is returned only when the returned *protocol* is `http`, `jms`, or `messaging`.

email

Document. Conditional. Information about the SMTP transport. This parameter is returned only if the service was invoked via SMTP.

Key	Description
<i>to</i>	String List E-mail addresses for the recipients of the e-mail.
<i>from</i>	String List E-mail addresses for the senders of the e-mail.
<i>cc</i>	String List. Conditional. E-mail addresses receiving a copy of the e-mail.
<i>bcc</i>	String List. Conditional. E-mail addresses receiving a blind copy of the e-mail.
<i>replyto</i>	String List. Conditional. E-mail address to which replies of this e-mail should be sent
<i>subject</i>	String Subject of the e-mail.
<i>filename</i>	String. Conditional. Name of the attached file.
<i>contenttype</i>	String. Conditional. Content-Type of the attached file.
<i>content</i>	java.io.InputStream. Conditional. Contents of the attached file.
<i>recvdate</i>	String. Conditional. Date the e-mail was received in String format. <i>recvdate</i> may be passed as parameter for the <code>java.util.Date</code> constructor.
<i>sentdate</i>	String. Conditional. Date the e-mail was sent in String format. <i>sentdate</i> may be passed as parameter for the <code>java.util.Date</code> constructor.

http

Document. Conditional. Information about the http transport. This parameter is returned only if the service was invoked via http.

Key	Description
<i>requestUrl</i>	String URL used by the client to invoke the service.
<i>query</i>	String. Conditional. Query portion of request URL.
<i>method</i>	String HTTP method used by the client to request the top-level service. Possible values are GET, PUT, POST, PATCH, and DELETE.

requestHdrs **Document** Fields in the request header, where key names represent header field names and values represent the header field values.

ipInfo **Document** Information about the http socket connection. Contains the following information:

Key	Description
<i>clientIp</i>	String. Optional. IP address of the client connecting to this socket. If null, <i>clientIP</i> is not included in the output.
<i>clientPort</i>	String. Optional. Port number used by the client connecting to this socket. If null, <i>clientPort</i> is not included in the output.
<i>localIp</i>	String Local IP address for this socket connection to client.
<i>localPort</i>	String Local port number for this socket connection to client.
<i>remoteIp</i>	String Remote IP address for this socket connection to client.
<i>remotePort</i>	String Remote port number for this socket connection to client.

ftp **Document.** Conditional. Information about the ftp transport. This parameter is returned only if the ftp transport invoked the service.

Key	Description
<i>filename</i>	String Name of file that was put into the service directory.
<i>mimetype</i>	String. Conditional. Content type of the file (for example, <i>text/xml</i> , <i>text/plain</i> , or <i>image/jpeg</i>). The server determines content type based on the extension of the file and the extension's corresponding content type defined in <i>Integration Server_directory\instances\instance_name\lib\mime.types</i> .

ipInfo **Document** Information about the FTP socket connection. Contains the following information:

Key	Description
<i>localIp</i>	String Local IP address for this socket connection to client.

<i>localPort</i>	String Local port number for this socket connection to client.
<i>remoteIp</i>	String Remote IP address for this socket connection to client.
<i>remotePort</i>	String Remote port number for this socket connection to client.

filePolling **Document.** Conditional. Information about the file polling transport. Returned only if the file polling transport invoked the service.

Key	Description
<i>filename</i>	String Fully qualified name of the file submitted to the file polling listener.
<i>originalFilename</i>	String Name of the file when it was submitted to the file polling listener.
<i>contentType</i>	String. Conditional. Content type of the file (for example, <code>text/xml</code> , <code>text/plain</code> , or <code>image/jpeg</code>). The server determines content type based on the extension of the file and the extension's corresponding content type defined in <i>Integration Server_directory\instances\instance_name\lib\mime.types</i> .
<i>length</i>	String The original file length in bytes.
<i>lastModified</i>	java.util.Date Java date object indicating when the original file was last modified.

jms **Document.** Conditional. Information about the JMS transport. This parameter is returned only if the JMS transport invoked the service.

Key	Description
<i>connectionAliasName</i>	String Name of the JMS connection alias used by the JMS trigger to retrieve the message.
<i>triggerName</i>	String Fully qualified name of the JMS trigger that retrieved the JMS message that resulted in invocation of the service.
<i>destinationName</i>	String Name or lookup name of the destination from which the message that invoke the service was received. When the <i>subprotocol</i> is <code>jndi</code> , the <i>destinationName</i> value is the lookup name of the destination on the JNDI provider. When the <i>subprotocol</i> is <code>native</code> , the <i>destinationName</i> value is the name of the destination at the webMethods Broker.

<i>destinationType</i>	<p>String Type of destination from which the JMS trigger received the message. The destination type for the JMS trigger specified in <i>triggerName</i> subscribes determines the <i>destinationType</i> value.</p> <p><i>destinationType</i> will be one of the following:</p> <p>QUEUE indicates the destination is a queue.</p> <p>TOPIC indicates the destination is a topic.</p>
<i>requestHdrs</i>	<p>Document Fields in the request header of the JMS message, where key names represent header field names and values represent header field values. The <i>requestHdrs</i> includes all of the JMS message headers and JMS message properties.</p> <p>When a SOAP-JMS trigger receives a message, Integration Server passes the body of the message to the web services stack for processing. The body of the JMS message is the SOAP message. Integration Server does not pass the JMS headers on to the web services stack. If you want to review the contents of the JMS request header, you must use <code>pub.flow:getTransportInfo</code> to obtain the headers.</p> <p>For a standard JMS trigger, Integration Server passes the entire JMS message, including request headers, on to the trigger service for processing.</p>
<i>messaging</i>	<p>Document. Conditional. Information about the messaging transport. This parameter is returned only if the messaging transport invoked the service.</p>
<i>connectionAliasName</i>	<p>String Name of the <code>webMethodsMessaging</code> connection alias used by the <code>webMethodsMessaging</code> trigger to retrieve the document. If the <code>webMethodsMessaging</code> trigger received a locally published document and the publishable document type is not associated with a messaging connection alias, the <i>connectionAliasName</i> field is blank.</p>
<i>triggerName</i>	<p>String Fully qualified name of the <code>webMethodsMessaging</code> trigger that retrieved the document that resulted in invocation of the service.</p>
<i>documentTypeName</i>	<p>String Fully qualified name of the publishable document type for which the received document is an instance.</p> <p>If the trigger services executes because an AND join condition in the <code>webMethodsMessaging</code> trigger was</p>

satisfied, the *documentTypeName* contains the name of the publishable document type that completed the AND join. For example, suppose that an AND join condition specifies *folder.subfolder:documentA* and *folder.subfolder:documentB*. If the trigger receives an instance of *documentB* first and then an instance of *documentA*, the *documentTypeName* parameter contains *folder.subfolder:documentA*.

redeliveryCount

String Number of times the messaging provider has redelivered the document to the trigger.

<u>A value of...</u>	<u>Indicates...</u>
-1	The transport used to send the document does not maintain a document redelivery count. For example, a document received from a webMethods Broker version 6.0.1 has a redelivery count of -1. (webMethods Brokers that are version 6.0.1 or earlier do not maintain document redelivery counts.) Integration Server may or may not have received the document before.
0	The document has been received only once.
> 0	The number of times document has been redelivered.

Usage Notes

A document with this structure is produced by the [pub.flow:getTransportInfo](#) service.

15 GraphQL Folder

■ Summary of Elements in this Folder	404
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You can use the services in the *GraphQL* folder to add data loading capability to the *GraphQL* resolver service in Integration Server.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.graphql:load	WmPublic. Loads data for a single key in Integration Server.
pub.graphql:loadMany	WmPublic. Loads data for multiple keys in Integration Server.

pub.graphql:load

WmPublic. Loads the data for a single key and returns the values.

Input Parameters

\$internal **Document** Contains the fields that are populated and used internally while loading the data.

Important:

This parameter is reserved for internal use by Integration Server. Do not modify or delete the value of this parameter.

key **Document** Contains the field(s) for which you want to fetch the data from the data source. The field(s) in this document must be same as the field(s) in the key document of *Dataloader* service input signature. For more information on *Dataloader* service, see *webMethods Service Development Help*.

loaderName **String** Specifies the name of the *Dataloader*.

Output Parameters

\$internal **Document** Document containing the fields, which are used internally by *Dataloader*.

pub.graphql:loadMany

WmPublic. Loads the data for a multiple keys and returns the list of values.

Input Parameters

\$internal **Document** Contains the fields that are populated and used internally while loading the data.

Important:

This parameter is reserved for internal use by Integration Server. Do not modify or delete the value of this parameter.

keys **Document List** Contains the field(s) for which you want to fetch the data from the data source. The field(s) in this document must be same as the field(s) in the key document of *Dataloader* service input signature. For more information on *Dataloader* service, see *webMethods Service Development Help*

loaderName **String** Specifies the name of the *Dataloader*.

Output Parameters

\$internal **Document** Document containing the fields, which are used internally by *Dataloader*.

Usage Notes

You can only invoke the `pub.graphql:load` and `pub.graphql:loadMany` services from a data resolver service and always as a last step.

From a data resolver service, you can invoke the `pub.graphql:load` and `pub.graphql:loadMany` services only once.

You can either use a *Dataloader* or a resolver service to load data. If you are using a *Dataloader* to load data for a field, then you cannot use the resolver service to load data for the same field. Resolver service should be used only to identify and map the key(s) to `pub.graphql:load` or `pub.graphql:loadMany` service.

16 gRPC Folder

■ Summary of Elements in This Folder	408
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You can use the services in the `grpc` folder in the `WmGRPC` package to send a response or error to the gRPC client. Use these services in the gRPC method flow services generated for a gRPC descriptor.

Summary of Elements in This Folder

The following elements are available in this folder:

Element	Package and Description
pub.grpc.observer:onCompleted	WmGRPC. Notifies the gRPC server of a successful stream completion.
pub.grpc.observer:onError	WmGRPC. Notifies the gRPC client about an unsuccessful gRPC request caused by an error that occurred during the gRPC request processing.
pub.grpc.observer:onNext	WmGRPC. Converts a document (IData) to a gRPC response and returns it to the gRPC client.

pub.grpc.observer:onCompleted

WmGRPC. Notifies the gRPC server of a successful stream completion.

Input Parameters

<i>streamObserver</i>	Object A gRPC object used by the gRPC server to return the response to the gRPC client.
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Output Parameters

None

Usage Notes

For a unary gRPC method, `pub.grpc.observer:onCompleted` is the final service invoked in a successful execution of the generated gRPC method flow service. Upon completion, the gRPC server sends the response to the gRPC client.

An instance of the *streamObserver* is present in the pipeline when any gRPC method flow service is invoked by the gRPC server. It is an opaque object to be used only as input to the `pub.grpc.observer:onNext`, `pub.grpc.observer:onCompleted`, or `pub.grpc.observer:onError` services.

The gRPC method flow service generated for a gRPC descriptor already contains the call to the `pub.grpc.observer:onCompleted` service for unary methods. The generated gRPC method flow service includes preset pipeline mapping into the `pub.grpc.observer:onCompleted` service. You should not need to edit the auto generated `pub.grpc.observer:onCompleted` step of the gRPC method flow service.

If you modify the gRPC method flow service to include an INVOKE step for `pub.grpc.observer:onError` to indicate an error in the processing of the gRPC method flow service, ensure that the `pub.grpc.observer:onCompleted` will not execute after `pub.grpc.observer:onError`.

pub.grpc.observer:onError

WmGRPC. Notifies the gRPC client about an unsuccessful gRPC request caused by an error that occurred during the gRPC request processing performed by the gRPC method flow service.

Input Parameters

streamObserver **Object** A gRPC object used by the gRPC server to return the response to the gRPC client.

status **String** The gRPC error code to be returned. The codes correspond to status codes defined by `gRPC.io` minus the prefix `"GRPC_STATUS_"`. Set *status* to one of the following:

- ABORTED
- ALREADY_EXISTS
- CANCELLED
- DATA_LOSS
- DEADLINE_EXCEEDED
- FAILED_PRECONDITION
- INTERNAL
- INVALID_ARGUMENT
- NOT_FOUND
- OK
- OUT_OF_RANGE
- PERMISSION_DENIED
- RESOURCE_EXHAUSTED
- UNAVAILABLE
- UNAUTHENTICATED
- UNIMPLEMENTED
- UNKNOWN

message **String** Message text to be returned with the gRPC error, including any specific error details you want to return to the gRPC client.

Output Parameters

None.

Usage Notes

An instance of the *streamObserver* is present in the pipeline when any gRPC method flow service is invoked by the gRPC server. It is an opaque object to be used only as input to the `pub.grpc.observer.onNext`, `pub.grpc.observer.onCompleted`, or `pub.grpc.observer.onError` services.

For unary methods, the gRPC method flow service automatically generated for a gRPC descriptor contains the calls to the `pub.grpc.observer.onNext` and `pub.grpc.observer.onCompleted` services. When implementing the logic for the RPC method in the RPC method flow service, you can modify the gRPC method flow service to include logic to return a gRPC error by adding an INVOKE step for the `pub.grpc.observer.onError` service. If you modify the gRPC method flow service to return an error or return a response message, make sure the flow logic ensures that either `pub.grpc.observer.onError` executes *or* `pub.grpc.observer.onNext` and `pub.grpc.observer.onCompleted` execute. This can be accomplished by using a BRANCH step. Further, the flow service logic must terminate immediately after executing `pub.grpc.observer.onError`.

pub.grpc.observer.onNext

WmGRPC. Converts a document (IData) to a gRPC response and returns it to the gRPC client.

Input Parameters

document **Document** A document (IData object) representing the gRPC response message to be returned to the gRPC client. The document must conform to the document type in *documentTypeName*.

documentTypeName **String** Fully qualified name of the gRPC document type  representing the gRPC response.

streamObserver **Object** A gRPC object used by the gRPC framework to return the response to the gRPC client.

streamType **Object** A gRPC object used by the gRPC framework to identify the gRPC message type of the expected response.

Output Parameters

None.

Usage Notes

An instance of the *streamObserver* is present in the pipeline when any gRPC method flow service is invoked by the gRPC server. It is an opaque object to be used only as input to the `pub.grpc.observer.onNext`, `pub.grpc.observer.onCompleted`, or `pub.grpc.observer.onError` services.

An instance of the *streamType* is present in the pipeline when any gRPC method flow service is invoked by the gRPC server. It is an opaque object to be used only as input to the `pub.grpc.observer.onNext` service when returning a gRPC response.

17 Hashtable Folder

■ Summary of Elements in this Folder	414
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This folder contains services that you can use to create, update, and obtain information about the hashtable.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.hashtable:containsKey	WmPublic. Checks for the existence of a hashtable element.
pub.hashtable:createHashtable	WmPublic. Creates a hashtable object.
pub.hashtable:get	WmPublic. Gets the value for a specified key in the hashtable.
pub.hashtable:listKeys	WmPublic. Lists all the keys stored in the hashtable.
pub.hashtable:put	WmPublic. Adds a key/value pair in the hashtable.
pub.hashtable:remove	WmPublic. Removes a key/value pair from the hashtable.
pub.hashtable:size	WmPublic. Gets the number of elements in the hashtable.

pub.hashtable:containsKey

WmPublic. Checks for the existence of a hashtable element.

Input Parameters

<i>hashtable</i>	java.util.Hashtable Hashtable in which to check for the existence of a hashtable element.
<i>key</i>	String Hashtable element to be checked for.

Output Parameters

<i>containsKey</i>	String Indicates whether the specified hashtable element exists. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that the element exists.■ <code>false</code> indicates that the element does not exist.
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pub.hashtable:createHashtable

WmPublic. Creates a hashtable object.

Input Parameters

None.

Output Parameters

hashtable **java.util.Hashtable** The new hashtable object.

pub.hashtable:get

WmPublic. Gets the value for a specified key in the hashtable.

Input Parameters

hashtable **java.util.Hashtable** Hashtable from which to retrieve the specified value.

key **String** Key of the hashtable element whose value is to be retrieved.

Output Parameters

value **Object** Value of the input hashtable element.

pub.hashtable:listKeys

WmPublic. Lists all the keys stored in the hashtable.

Input Parameters

hashtable **java.util.Hashtable** Hashtable from which the keys are to be listed.

Output Parameters

keys **String[]** List of keys stored in the input hashtable.

pub.hashtable:put

WmPublic. Adds a key/value pair in the hashtable.

Input Parameters

<i>hashtable</i>	java.util.Hashtable Hashtable to which the key/value pair is to be added.
<i>key</i>	String Key of the element to be added to the hashtable.
<i>value</i>	Object Value of the element to be inserted into the hashtable.

Output Parameters

<i>hashtable</i>	java.util.Hashtable Hashtable object after the insertion of the key/value pair.
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pub.hashtable:remove

WmPublic. Removes a key/value pair from the hashtable.

Input Parameters

<i>hashtable</i>	java.util.Hashtable Hashtable from which to remove the key/value pair.
<i>key</i>	String Key of the hashtable element to be removed.
<i>value</i>	Object Value of the hashtable element to be removed.

Output Parameters

<i>hashtable</i>	java.util.Hashtable Hashtable object after the key/value pair is removed.
<i>value</i>	Object Value of the hashtable element that was removed. Returns <code>null</code> if the input <i>key</i> is not found in the hashtable.

pub.hashtable:size

WmPublic. Gets the number of elements in the hashtable.

Input Parameters

<i>hashtable</i>	java.util.Hashtable Hashtable from which the number of elements stored in it is to be retrieved.
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Output Parameters

size **String** Number of elements in the hashtable.

18 IO Folder

■ Summary of Elements in this Folder	420
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You use the elements in the `io` folder to convert data between `byte[]`, characters, and `InputStream` representations. The `io` folder contains services for reading and writing bytes, characters, and streamed data to the file system.

These services behave like the corresponding methods in the `java.io.InputStream` class. For more information about `InputStreams`, see the Java documentation.

Summary of Elements in this Folder

Note:

The services in this folder may only be invoked by other services on Integration Server. Streams cannot be passed between clients and Integration Server, so these services will not execute if they are invoked from a client.

The following elements are available in this folder:

Element	Package and Description
pub.io:bytesToStream	WmPublic. Converts a <code>byte[]</code> to <code>java.io.ByteArrayInputStream</code> .
pub.io:close	WmPublic. Closes an <code>InputStream</code> or a reader object and releases the resources.
pub.io:createByteArray	WmPublic. Creates a byte array of the specified length.
pub.io:mark	WmPublic. Marks the current position in the <code>InputStream</code> or reader object.
pub.io:markSupported	WmPublic. Enables you to test whether your <code>InputStream</code> or reader object supports the mark and reset operations.
pub.io:read	WmPublic. Reads a specified number of bytes from the <code>InputStream</code> and stores them into a buffer.
pub.io:readAsString	WmPublic. Reads the data from a reader object and returns the contents as a string.
pub.io:readerToString	WmPublic. Reads the data from a reader object and converts it to a string.
pub.io:reset	WmPublic. Repositions the <code>InputStream</code> or the reader object to the position at the time the <code>pub.io:mark</code> service was last invoked on the stream.
pub.io:skip	WmPublic. Skips over and discards the specified number of bytes or characters from the input stream or a reader object.
pub.io:streamToBytes	WmPublic. Creates a <code>byte[]</code> from data that is read from an <code>InputStream</code> .
pub.io:streamToReader	WmPublic. Converts a <code>java.io.InputStream</code> to a <code>java.io.Reader</code> object.

Element	Package and Description
pub.io:streamToString	WmPublic. Creates a string from data that is read from an <code>InputStream</code> .
pub.io:stringToReader	WmPublic. Converts a string object to a <code>java.io.StringReader</code> object.
pub.io:stringToStream	WmPublic. Converts a string to a byte stream.

pub.io:bytesToStream

WmPublic. Converts a `byte[]` to `java.io.ByteArrayInputStream`.

Input Parameters

<i>bytes</i>	byte[] The byte array to convert.
<i>length</i>	String Optional. The maximum number of bytes to read and convert. If <i>length</i> is not specified, the default value for this parameter is the length of the input byte array.
<i>offset</i>	String Optional. The offset into the input byte array from which to start converting. If no value specified, the default value is zero.

Output Parameters

<i>stream</i>	java.io.ByteArrayInputStream An open <code>InputStream</code> created from the contents of the input <i>bytes</i> parameter.
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Usage Notes

This service constructs *stream* from the byte array using the constructor `ByteArrayInputStream(byte[])`. This constructor does not make a copy of the byte array, so any changes to *bytes* will be reflected in the data read from the stream.

pub.io:close

WmPublic. Closes an `InputStream` or a reader object and releases the resources.

Input Parameters

<i>inputStream</i>	java.io.InputStream Optional. An open <code>InputStream</code> .
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Note:

You can use either *InputStream* or *Reader* to specify the input object. If both the input parameters are provided, then both the objects will be closed.

reader

java.io.Reader Optional. An open reader object.

Output Parameters

None.

Usage Notes

If the *InputStream* is already closed, invoking this service has no effect. However, leaving an *InputStream* open may cause errors that are not recoverable until Integration Server is shut down. Use the `pub.io:close` service to explicitly close the input stream when a service leaves it open. For example, `pub.file:getFile` and `pub.client.ftp:get` leave the input stream open in the pipeline.

pub.io:createByteArray

WmPublic. Creates a byte array of the specified length.

Input Parameters

length

String The length of the byte array to be created.

Output Parameters

bytes

Object The new byte array.

Usage Notes

The `pub.io:read` service reads data from an *InputStream* into a byte array. You can use this service to create the byte array. Invoking this service is the equivalent of the Java code `new byte[length]`.

pub.io:mark

WmPublic. Marks the current position in the *InputStream* or *Reader* object.

A subsequent call to `pub.io:reset` repositions this stream at the last marked position. Marking and repositioning the input stream allows subsequent service calls to re-read the same bytes.

Input Parameters

stream **java.io.InputStream** Optional. The InputStream.

Note:

You can use either *stream* or *reader* to specify the input object. If both *stream* and *reader* input parameters are provided, then both the objects will be marked.

reader **java.io.Reader** Optional. The reader object.

limit **String** The maximum number of bytes that can be read before the mark position becomes invalid. If more than this number of bytes are read from the stream after the `pub.io:mark` service is invoked, the `pub.io:reset` service will have no effect.

Output Parameters

stream **java.io.InputStream**. Conditional. The InputStream. Returned only if the input parameter is *stream*.

reader **java.io.Reader**. Conditional. The reader object. Returned only if the input parameter is *reader*.

Usage Notes

If the InputStream does not support the mark operation, invoking this service has no effect.

Either of the optional input parameters, *stream* or *reader*, is required.

pub.io:markSupported

WmPublic. Enables you to test whether your InputStream or reader object supports the mark and reset operations.

Input Parameters

stream **java.io.InputStream** Optional. The InputStream.

Note:

You can use either *stream* or *reader* to specify the input object. If both *stream* and *reader* input parameters are provided, then the *stream* input parameter is ignored.

reader **java.io.Reader** Optional. The reader object.

Output Parameters

<i>stream</i>	java.io.InputStream. Conditional. The InputStream. Returned only if the input parameter is <i>stream</i> .
<i>supported</i>	String Indicates whether the stream supports the mark and reset operations. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that the InputStream supports the mark and reset operations.■ <code>false</code> indicates that the InputStream does not support the mark and reset operations.
<i>reader</i>	java.io.Reader. Conditional. The reader object. Returned only if the input parameter is <i>reader</i> .

Usage Notes

Either of the input parameters, *stream* or *reader*, is required.

pub.io:read

WmPublic. Reads a specified number of bytes from the InputStream and stores them into a buffer.

Input Parameters

<i>stream</i>	Object The InputStream. Object from which the service is to read bytes.
<i>offset</i>	String Optional The offset into the byte array in the buffer to which the data is written. If no value is supplied, this defaults to 0.
<i>length</i>	String Optional. The maximum number of bytes to read from the InputStream. If no value is supplied, the default is the length of <i>buffer</i> . If the value supplied for <i>length</i> is greater than the length of <i>buffer</i> , an exception will be thrown.
<i>buffer</i>	Object The buffer into which data is written. This is a byte array, which can be created from a Flow service by invoking <code>pub.io:createByteArray</code> .

Output Parameters

<i>stream</i>	Object The InputStream. If any bytes were read from the stream, the stream is repositioned after the last byte read.
<i>buffer</i>	Object The buffer into which data was written.

bytesRead **String** The number of bytes read from the `InputStream` and copied to *buffer*. If there is no more data because the end of the stream has been reached, *bytesRead* will be -1.

Usage Notes

The `pub.io:read` service does not close the input stream. To close the input stream, use the `pub.io:close` service.

pub.io:readAsString

WmPublic. Reads the data from a reader object and returns the contents as a string.

Input Parameters

reader **java.io.Reader** The reader object.

length **String** The maximum number of characters to read from the input reader object.

Output Parameters

reader **java.io.Reader** The reader object.

lengthRead **String** The number of characters read from the input reader object. If there is no more data because the end of the stream has been reached, *lengthRead* will be -1.

value **String** The data read from the reader object, or null if end of stream has been reached.

Usage Notes

The `readAsString` service *does not* automatically close the reader object. To close the reader, use the `pub.io:close` service.

pub.io:readerToString

WmPublic. Reads the data from a reader object and converts it to a string.

Input Parameters

reader **java.io.Reader** The reader object.

Output Parameters

string **String** Data read from the reader object.

Usage Notes

The readerToString service *does not* automatically close the reader object. To close the reader, use the pub.io:close service.

pub.io:reset

WmPublic. Repositions the InputStream or the reader object to the position at the time the pub.io:mark service was last invoked on the stream.

Input Parameters

stream **java.io.InputStream** Optional. The InputStream.

Note:

You can use either *stream* or *reader* to specify the input object. If both *stream* and *reader* input parameters are provided, then both the objects will be reset.

reader **java.io.Reader** Optional. The reader object.

Output Parameters

stream **java.io.InputStream**. Conditional. The InputStream. Returned only if the input parameter is *stream*.

reader **java.io.Reader**. Conditional. The reader object. Returned only if the input parameter is *reader*.

Usage Notes

If the InputStream does not support the reset operation, invoking this service has no effect.

Either of the input parameters, *stream* or *reader*, is required.

pub.io:skip

WmPublic. Skips over and discards the specified number of bytes or characters from the input stream or a reader object.

Input Parameters

stream **java.io.InputStream** Optional. The InputStream.

Note:

You can use either *stream* or *reader* to specify the input object. If both *stream* and *reader* input parameters are provided, then the stream and reader object data will be skipped.

reader **java.io.Reader** Optional. The reader object.

length **String** The number of bytes or characters to skip.

Output Parameters

stream **java.io.InputStream**. Conditional. The InputStream. Returned only if the input parameter is *stream*.

reader **java.io.Reader**. Conditional. The reader object. Returned only if the input parameter is *reader*.

bytesSkipped **String**. Conditional. The actual number of bytes that were skipped. Returned only if the input parameter is *stream*.

charactersSkipped **String**. Conditional. The number of characters that were skipped. Returned only if the input parameter is *reader*.

Usage Notes

The `pub.io:skip` service uses the Java method `InputStream.skip`, which might skip some smaller number of bytes, possibly zero (0). This happens due to conditions such as reaching the end of file before *n* bytes have been skipped. For more information about the `InputStream.skip` method, see the Java documentation on the `InputStream` class.

Either of the optional input parameters, *stream* or *reader*, is required.

If both *stream* and *reader* input parameters are specified and if an exception occurs during the stream object usage, then the operations are not performed on the reader object also.

pub.io:streamToBytes

WmPublic. Creates a `byte[]` from data that is read from an `InputStream`.

Input Parameters

stream **java.io.InputStream** The `InputStream` that you want to convert.

Output Parameters

bytes **byte[]** The bytes read from *stream*.

Usage Notes

The `pub.io:streamToBytes` service reads all of the bytes in the input stream, and then closes the input stream.

pub.io:streamToReader

WmPublic. Converts a `java.io.InputStream` to a `java.io.Reader` object.

Input Parameters

inputStream **java.io.InputStream** The `InputStream` to convert to a reader object.

encoding **String**. Optional. Name of a registered, IANA character set (for example, ISO-8859-1). If you specify an unsupported encoding, the system throws an exception. If no value is specified or if the encoding is set to `autoDetect`, the default operating system encoding is used.

Output Parameters

reader **java.io.Reader** The reader object read from *inputStream*.

pub.io:streamToString

WmPublic. Creates a string from data that is read from an `InputStream`.

Input Parameters

inputStream **java.io.InputStream** The `InputStream` to convert to a string.

encoding **String**. Optional. Name of a registered, IANA character set (for example, ISO-8859-1). If you specify an unsupported encoding, the system throws an exception. If no value is specified or if the encoding is set to `autoDetect`, the default operating system encoding is used.

Output Parameters

string **String** Data read from *inputStream* and converted to a string.

Usage Notes

The `pub.io:streamToString` service reads all of the bytes in the input stream but does not close the input stream. You must invoke `pub.io:close` to close the input stream.

`pub.io:stringToReader`

WmPublic. Converts a string object to a `java.io.StringReader` object.

Input Parameters

string **String** The string to convert to a `StringReader` object.

Output Parameters

reader **java.io.StringReader** The `StringReader` object.

`pub.io:stringToStream`

WmPublic. Converts a string to a byte stream.

Input Parameters

string **String** The string object to be converted.

encoding **String**. Optional. Name of a registered, IANA character set (for example, ISO-8859-1). If you specify an unsupported encoding, the system throws an exception. If no value is specified or if the encoding is set to `autoDetect`, the default operating system encoding is used.

Output Parameters

inputStream **java.io.ByteArrayInputStream** An open `InputStream` created from the contents of *string*.

19 JDBC Folder

■ Summary of Elements in this Folder	432
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You use the elements in the JDBC folder to obtain information about Integration Server JDBC pools.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.jdbc:getPoolInfo	WmPublic. Returns run-time information about the JDBC pool associated with a specified functional alias.

pub.jdbc:getPoolInfo

WmPublic. Returns run-time information about the JDBC pool associated with a specified functional alias.

Input Parameters

<i>functionalAlias</i>	String Name of the Integration Server functional alias for which you want to obtain JDBC information.
<i>getConnectionWait</i>	String Optional. Number of milliseconds the service will wait to obtain a connection to a JDBC connection pool. The default is 10 seconds (10000 milliseconds). If a connection is not obtained within this time, the service ends with a status of fail.

Output Parameters

<i>minConnections</i>	String The minimum number of connections the pool can have.
<i>maxConnections</i>	String The maximum number of connections the pool can have.
<i>totalConnections</i>	String The total number of connections currently in the pool. This number includes connections that are already in use and connections that are available for use.
<i>availableConnections</i>	String The number of connections that are available for use.
<i>status</i>	String A status indicating whether the service was able to connect to the pool. A value of: <ul style="list-style-type: none">■ <code>Active</code> indicates that the service was able to connect to the JDBC pool.■ <code>Inactive</code> indicates that the service was not able to connect to the JDBC pool or an invalid functional alias was specified. If the attempt to connect to the JDBC pool failed with a <code>SQLException</code>, the service

might throw an exception. If the service does not throw an exception, it will return a message in the *message* variable.

message

String. Conditional. Returned only if the service was not able to connect to the JDBC pool. Contains one of the following explanations:

```
Invalid functional alias.
```

An invalid or non-existent functional alias was specified with the *functionalAlias* input parameter.

```
No pool is associated with this function or the pool  
may have failed during initialization.
```

A valid functional alias was specified, but no pool is associated with the functional alias, or the pool did not properly initialize.

20 JMS Folder

■ Summary of Elements in This Folder	436
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You can use the services in the JMS folder to send and receive JMS messages.

Summary of Elements in This Folder

The following elements are available in this folder:

Element	Package and Description
pub.jms:acknowledge	WmPublic. Sends an acknowledgment for a message to the JMS provider.
pub.jms:batchTriggerSpec	WmPublic. Specification for the signature of a JMS trigger that processes a batch of messages at one time.
pub.jms:createConsumer	WmPublic. Creates a message consumer to receive messages from destinations on the JMS provider.
pub.jms:documentResolverSpec	WmPublic. Specification for the signature of a document resolver service that determines whether a JMS message has a status of New, Duplicate, or In Doubt.
pub.jms:JMSMessage	WmPublic. Document type that represents the structure and content of a JMS message received by a JMS trigger, received by the service pub.jms:documentResolverSpec , or as the output of pub.jms:send or pub.jms:sendAndWait .
pub.jms:receive	WmPublic. Receives a message from a queue or topic on the JMS provider.
pub.jms:reply	WmPublic. Sends a reply message to a requesting client.
pub.jms:send	WmPublic. Sends a JMS message to the JMS provider.
pub.jms:sendAndWait	WmPublic. Sends a request in the form of a JMS message to the JMS provider and optionally, waits for a reply.
pub.jms:sendBatch	WmPublic. Sends multiple JMS messages to the same destination on the JMS provider.
pub.jms:triggerSpec	WmPublic. Specification for the input signature of a JMS trigger that processes one message at a time.
pub.jms:waitForReply	WmPublic. Retrieves the reply message for an asynchronous request.
pub.jms.wmjms:receiveStream	WmPublic. <i>Deprecated</i> - There is no replacement service. Receives a large message stream from a queue or topic on the webMethods Broker.
pub.jms.wmjms:sendStream	WmPublic. <i>Deprecated</i> - There is no replacement service. Sends a large message stream to the webMethods Broker.

pub.jms:acknowledge

WmPublic. Sends an acknowledgment for a message to the JMS provider.

Input Parameters

message **Object** A javax.jms.Message object that identifies the message for which you want Integration Server to send an acknowledgment to the JMS provider.

Output Parameters

None.

Usage Notes

Use this service to acknowledge a message retrieved from the JMS provider if:

- The message was received using the [pub.jms:receive](#) service, and
- The message consumer used to retrieve the message has an *acknowledgmentMode* set to CLIENT_ACKNOWLEDGE or DUPS_OK_ACKNOWLEDGE. For more information about creating a message consumer, see [pub.jms:createConsumer](#).

A message is not considered to be successfully consumed until it is acknowledged.

Note:

Acknowledging a message automatically acknowledges the receipt of all messages received in the same session. That is, all messages received by the same consumer will be acknowledged when just one of the received messages is acknowledged.

See Also

[pub.jms:createConsumer](#)

[pub.jms:receive](#)

pub.jms:batchTriggerSpec

WmPublic. Specification for the signature of a JMS trigger that processes a batch of messages at one time.

Input Parameters

JMSMessage **Document List** A document list where each document references the [pub.jms:JMSMessage](#) document type.

Output Parameters

None.

Usage Notes

Use this specification as the signature for JMS trigger services that will retrieve and process a batch of messages.

If you want to use a JMS trigger to retrieve and process one message at a time, use [pub.jms:triggerSpec](#) to declare the signature of the JMS trigger service.

See Also

[pub.jms:triggerSpec](#)

[pub.jms:JMSMessage](#)

pub.jms:createConsumer

WmPublic. Creates a message consumer to receive messages from destinations on the JMS provider.

Input Parameters

<i>connectionAliasName</i>	<p>String Name of the JMS connection alias that you want the message consumer to receive messages.</p> <p>The JMS connection alias indicates how Integration Server connects to the JMS provider. A JMS connection alias can specify that Integration Server use a JNDI provider to look up administered objects (connection factories and destinations) and then use the connection factory to create a connection. Alternatively, a JMS connection alias can specify that Integration Server uses the native webMethods API to create the connection directly on the webMethods Broker.</p>
<i>destinationName</i>	<p>String Name or lookup name of the Destination from which you want the message consumer to receive messages. Specify the lookup name of the Destination object when the JMS connection alias uses JNDI to retrieve administered objects. Specify the provider-specific name of the Destination when the JMS connection alias uses the native webMethods API to connect directly to the webMethods Broker.</p>
<i>destinationType</i>	<p>String. Optional. Type of destination from which the message consumer receives messages. Specify one of the following:</p> <ul style="list-style-type: none">■ QUEUE to receive messages sent to a particular queue. This is the default.

- TOPIC to receive messages sent to a particular topic.

Note:

You need to specify a *destinationType* only if you specified a *connectionAliasName* that uses the native webMethods API.

acknowledgmentMode

String. Optional. Specifies the acknowledgment mode. Specify one of the following:

- AUTO_ACKNOWLEDGE to automatically acknowledge the message when it is received by the message consumer. The message consumer will acknowledge the message before the message processing completes. The JMS provider cannot redeliver the message if Integration Server becomes unavailable before message processing completes. This is the default.
- CLIENT_ACKNOWLEDGE to acknowledge the receipt of a message when the JMS client (Integration Server) invokes [pub.jms:acknowledge](#) service.
- DUPS_OK_ACKNOWLEDGE to automatically, lazily acknowledge the receipt of messages, which reduces system overhead but may result in duplicate messages being sent.

messageSelector

String. Optional Specifies a filter used to receive a subset of messages from the specified destination. A *message selector* allows a client to filter the messages it wants to receive by use of a SQL92 string expression in the message header. That expression is applied to properties in the message header (not to the message body content) containing the value to be filtered.

If the SQL expression evaluates to true, the JMS provider sends the message to the message consumer; if the SQL expression evaluates to false, the JMS provider does not send the message.

durableSubscriberName

String. Optional. Name of the durable subscriber that you want this service to create on the JMS provider. A durable subscriber creates a durable subscription on the JMS provider. If a durable subscriber of this name already exists on the JMS provider, this service resumes the previously established subscription.

Note:

This parameter only applies when the *destinationType* is set to TOPIC. If you select TOPIC, but do not specify a *durableSubscriberName*, this service creates a nondurable subscriber. If *destinationType* is set to QUEUE, this parameter is ignored.

noLocal

java.lang.Boolean. Optional. Flag indicating whether the message consumer can receive locally published messages. Integration Server considers a message to be local if the message was:

- Sent by the same Integration Server, and
- Sent using the same JMS connection alias.

Specify one of the following values:

- `True` to indicate that the consumer will not receive locally published messages.
- `False` to indicate that the consumer can receive locally published messages. This is the default.

Note:

This parameter only applies when the *destinationType* is set to `TOPIC`.

Output Parameters

consumer

Object An on demand message consumer object used to receive messages for the specified destination.

Usage Notes

A *message consumer* is a `webMethods` object that encapsulates the actual `javax.jms.MessageConsumer` and `javax.jms.Session`.

Any message consumers created during the execution of a service will be closed automatically when the top-level service completes. If the consumer closes without acknowledging messages, messages are implicitly recovered back to the JMS provider.

The use of [pub.jms:createConsumer](#) in conjunction with [pub.jms:receive](#) is an alternative to using JMS triggers. Use the [pub.jms:createConsumer](#) service to create a message consumer. Use the [pub.jms:receive](#) to actively receive messages from a destination on the JMS provider.

To create a durable subscriber, set the *destinationType* to `TOPIC` and specify a *durableSubscriberName*. If you select `TOPIC`, but do not specify a *durableSubscriberName*, Integration Server creates a nondurable subscriber.

A durable subscription allows subscribers to receive all the messages published on a topic, including those published while the subscriber is inactive.

If a durable subscription already exists for the specified durable subscriber on the JMS provider, this service resumes the subscription.

A non-durable subscription allows subscribers to receive messages on their chosen topic, only if the messages are published while the subscriber is active. A non-durable subscription lasts the lifetime of its message consumer.

If the *acknowledgment Mode* field is set to `CLIENT_ACKNOWLEDGE`, you must acknowledge messages received by this consumer to the JMS provider using the [pub.jms:acknowledge](#) service.

If the message consumer created by this service will be used to receive large message streams from the webMethods Broker, make sure to specify an *acknowledgmentMode* of `AUTO_ACKNOWLEDGE` or `CLIENT_ACKNOWLEDGE`. If the *acknowledgmentMode* is `DUPS_OK_ACKNOWLEDGE`, the message consumer cannot be used to receive large message streams.

If you specify a destination that does not exist in the JNDI namespace and the JMS connection alias specified for the *connectionAliasName* input parameter is configured to create administered objects on demand, Integration Server creates the destination when the service executes. The ability to create administered objects on demand applies only when is the JMS provider. For more information about creating administered objects on demand, see the section *Creating Administered Objects* in the *webMethods Integration Server Administrator's Guide*.

See Also

[pub.jms:acknowledge](#)

[pub.jms:receive](#)

[pub.jms:reply](#)

[pub.jms:send](#)

[pub.jms:sendAndWait](#)

pub.jms:documentResolverSpec

WmPublic. Specification for the signature of a document resolver service that determines whether a JMS message has a status of *New*, *Duplicate*, or *In Doubt*.

Input Parameters

<i>uuid</i>	String Universally unique identifier for the message. If the sending client assigned a value to the <i>uuid</i> field in the message, Integration Server uses the <i>uuid</i> value to identify the message. If the <i>uuid</i> field is empty, Integration Server uses the value of the <i>JMSMessageID</i> field in the message header as the UUID.
<i>triggerName</i>	String The name of the JMS trigger that received the message whose status needs to be resolved.
<i>JMSMessage</i>	Document The message whose status needs to be resolved. This is a document reference (IData) to the pub.jms:JMSMessage document type, which defines the structure of a JMS message.

Output Parameters

<i>status</i>	String Indicates the status of the message. The value of this field determines whether the Integration Server processes or rejects the message. The <i>status</i> field will have one of the following values:
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- **NEW** indicates that the message is new and has not been processed by the JMS trigger. Integration Server instructs the JMS trigger to process the message.
- **DUPLICATE** indicates that the message is a duplicate of one already processed by the JMS trigger. Integration Server acknowledges the message, but does not execute the trigger service.
- **IN_DOUBT** indicates that the status of the message is still in doubt. The document resolver service could not conclusively determine whether the JMS trigger already processed the message. Integration Server acknowledges the message, but does not execute the trigger service.

message

String. Conditional. A user-specified string that indicates why the message status is **DUPLICATE** or **IN_DOUBT**. Integration Server writes this message to the journal log when the message has a status of **DUPLICATE** or **IN_DOUBT**.

Usage Notes

The [pub.jms:documentResolverSpec](#) must be used as the signature for a document resolver service used to determine the processing status of a JMS message received by a JMS trigger. For information about building a document resolver service and enabling exactly once processing for a JMS message, see *Using webMethods Integration Server to Build a Client for JMS*.

Use [pub.publish:documentResolverSpec](#) as the signature for a document resolver service used to determine the status of document received a webMethods messaging trigger.

See Also

[pub.jms:JMSMessage](#)

[pub.publish:documentResolverSpec](#)

pub.jms:JMSMessage

WmPublic. Document type that represents the structure and content of a JMS message received by a JMS trigger, received by the service [pub.jms:receive](#), or as the output of [pub.jms:send](#) or [pub.jms:sendAndWait](#).

Parameters

header

Document. Optional. Document (IData object) containing the header of the JMS message.

Key	Description
<i>JMSCorrelationID</i>	String. Optional. A unique identifier used to link multiple messages together. Often, a

	<p><i>JMSCorrelationID</i> is used to link a reply message with its requesting message.</p>
<i>JMSDeliveryMode</i>	<p>java.lang.Integer. Optional. Delivery mode specified at the time the message was sent. Delivery mode can be one of the following:</p> <ul style="list-style-type: none">■ PERSISTENT to indicate that the JMS provider places the message in a persistent message store, allowing the message to be recovered in the event of a resource failure. This is the default.■ NON-PERSISTENT to indicate that the JMS provider does not place the message in a persistent store. The message has no guarantee of being delivered if the JMS provider fails. <p>Note: When sending a message, this value is obtained from the <i>JMSMessage/header/deliveryMode</i> input parameter.</p>
<i>JMSDestination</i>	<p>Object. Optional. Destination (queue or topic) to which the message was sent.</p>
<i>JMSExpiration</i>	<p>java.lang.Long Optional. Time at which this message expires. If the message producer did not specify a time-to-live, the <i>JMSExpiration</i> value is zero, indicating the message does not expire.</p> <p>Note: When sending a message, this value is obtained from the <i>JMSMessage/header/timeToLive</i> input parameter.</p>
<i>JMSMessageID</i>	<p>String. Optional. Unique identifier assigned to this message by the JMS provider.</p>
<i>JMSPriority</i>	<p>java.lang.Integer. Optional. Defines the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.</p> <p>Note: When sending a message, this value is obtained from the <i>JMSMessage/header/priority</i> input parameter.</p>

<i>JMSRedelivered</i>	<p>java.lang.Boolean. Optional. Flag indicating the JMS provider delivered this message to the JMS client previously. A value of:</p> <ul style="list-style-type: none"> ■ True indicates that the message may have been delivered in the past. ■ False indicates that the JMS provider has not delivered this message previously.
<i>JMSReplyTo</i>	Object. Optional. Destination to which a reply to this message should be sent.
<i>JMSTimestamp</i>	java.lang.Long. Optional. Time at which the message was given to the JMS provider.
<i>JMSType</i>	String. Optional. Message type identifier specified by the client when sending the message.

properties

Document.. Optional. A document containing optional fields added to the message header. Integration Server may add the following properties to JMS messages it sends or receives.

Key	Description
<i>JMSXDeliveryCount</i>	java.lang.Integer. Optional. Specifies the number of times the JMS provider delivered the message. Most JMS providers set this value.
<i>JMS_WMClusterNodes</i>	String. Optional. Contains the name of the Broker in a Broker cluster that will receive the message or the name of the Broker or Brokers in the Broker cluster that received the JMS message.
<i>activation</i>	String. Optional. A unique identifier assigned by the sender. An <i>activation</i> is used to group together messages that will be received by a JMS trigger with a join. A JMS trigger can join together messages with the same <i>activation</i> .
<i>uuid</i>	String. Optional. A universally unique identifier for the message assigned by the sender. Integration Server can use the <i>uuid</i> for exactly-once processing or for request/reply.

body

Document. Optional A Document (IData) contenting the JMS message body. Integration Server supports the following formats for the JMS message body:

Key	Description
<i>string</i>	String. Optional. Message body in the form of a String.

<i>bytes</i>	primitive type. Optional Message body in the form of a one-dimensional byte array.
<i>object</i>	Object. Optional. Message body in the form of a Serializable Java object.
<i>data</i>	Document. Optional. Message body in the form of a document (IData object).

Note:

This message format can only be used when sending a JMS message from one Integration Server to another. When the JMS message is sent, the sending Integration Server encodes the IData into a byte array. When the receiving Integration Server receives the message, it decodes the byte array into IData.

<i>message</i>	Object. Optional. Message body in the form of an actual javax.jms.Message.
----------------	---

Note:

When a JMS message is received using the [pub.jms:receive](#) service this field will always be populated because javax.jms.Message is required for acknowledging the message.

Note:

When receiving a javax.jms.MapMessage or javax.jms.StreamMessage this field will be populated. The data can then be processed using a Java service. A flow service cannot process the message in its current state.

Output Parameters

None.

See Also

[pub.jms:receive](#)

[pub.jms:send](#)

[pub.jms:sendAndWait](#)

pub.jms:receive

WmPublic. Receives a message from a queue or topic on the JMS provider.

Input Parameters

consumer

Object A message consumer object that the session uses to receive messages sent to the specified destination.

timeout

java.lang.Long Specifies the time to wait, in milliseconds, for a message to be received from the JMS provider.

If you specify 0 (zero), the service will not wait.

The default is 0 (zero).

Output Parameters

JMSMessage

Document A document (IData) containing the JMS message received by the consumer.

Key

Description

header

Document. Conditional. A Document containing the header fields for the received message.

Key

Description

JMSCorrelationID

String. Conditional. A unique identifier used to link multiple messages together. Often, a *JMSCorrelationID* is used to link a reply message with its requesting message.

JMSDeliveryMode

java.lang.Integer. Conditional. Delivery mode specified at the time the message was sent.

PERSISTENT indicates the JMS provider places the message in a persistent message store, allowing the message to be recovered in the event of a resource failure.

NON-PERSISTENT indicates the JMS provider does not place the message in a persistent store. The message has no guarantee of being delivered if the JMS provider fails.

JMSDestination

Object. Conditional. Destination (queue or topic) to which the message was sent.

JMSExpiration

java.lang.Long Conditional. Time at which this message expires. If the message producer did not specify a time-to-live, the

		<i>JMSExpiration</i> value is zero, indicating the message does not expire.
	<i>JMSMessageID</i>	String. Conditional. Unique identifier assigned to this message by the JMS provider.
	<i>JMSPriority</i>	java.lang.Integer. Conditional. Defines the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.
	<i>JMSRedelivered</i>	java.lang.Boolean. Conditional. Flag indicating the JMS provider delivered this message to the JMS client previously. True indicates the message may have been delivered in the past. False indicates the JMS provider has not delivered this message previously.
	<i>JMSReplyTo</i>	Object. Conditional. Destination to which a reply to this message should be sent.
	<i>JMSTimestamp</i>	java.lang.Long. Conditional. Time at which the message was given to the JMS provider.
	<i>JMSType</i>	String. Conditional. Message type identifier specified by the client when sending the message.
<i>properties</i>		Document. Conditional. A Document containing optional fields added to the message header. Integration Server may add the following properties to JMS messages it receives.
	Key	Description
	<i>JMSXDeliveryCount</i>	java.lang.Integer. Conditional. Specifies the number of times the JMS provider delivered the message. Most JMS providers set this value.
	<i>JMS_WMClusterNodes</i>	String. Conditional. Name of the Broker or Brokers in the Broker cluster that received the JMS message. The Broker Server acting as the JMS provider populates the <i>JMS_WMClusterNodes</i> parameter after it distributes the JMS message to the Broker or Brokers in the Broker cluster.

The *JMS_WMClusterNodes* value will be null when:

- The JMS provider is not the Broker Server.
- The JMS connection alias used to send the JMS message does not use a cluster connection factory to obtain the connection to the Broker Server.
- The cluster connection factory does not permit a policy to be overridden.

activation

String. Conditional. A unique identifier assigned by the sending service. A JMS trigger uses the *activation* value to determine if a message satisfies a join.

uuid

String. Conditional. A universally unique identifier for the message assigned by the sender. Integration Server can use the *uuid* for exactly-once processing or for request/reply.

body

Document. Conditional. A Document (IData) contenting the JMS message body. Integration Server supports the following formats for the JMS message body:

Key	Description
<i>string</i>	String. Conditional. Message body in the form of a String.
<i>bytes</i>	primitive type. Conditional. Message body in the form of a one-dimensional byte array.
<i>object</i>	Object. Conditional. Message body in the form of a Serializable Java object.
<i>data</i>	Document. Conditional. Message body in the form of a document (IData object).

Note:

This message format can only be used when sending a JMS message from one Integration Server to another. When the JMS message is sent, the sending Integration Server encodes the IData into a byte array. When the receiving

message

Integration Server receives the message, it decodes the byte array into IData.

Object. Conditional. Message body in the form of an actual `javax.jms.Message`.

Note:

When the JMS message is received using the [pub.jms:receive](#) service this field will always be populated because `javax.jms.Message` is required for acknowledging the message.

Note:

When receiving a `javax.jms:MapMessage` or `javax.jms:StreamMessage` this field will be populated. The data can then be processed using a Java service. A flow service cannot process the message in its current state.

Usage Notes

Use this service to receive a message from the JMS provider on demand. Receiving a message on demand provides more control over when and how Integration Server receives a message; however, it may not be as efficient or practical as using a JMS trigger to listen for and then receive the message.

To listen for messages and receive them when they are available, create a JMS trigger that listens to the destination. For more information about creating a JMS trigger, see the *webMethods Service Development Help*.

If the *timeout* period elapses before a message is received, the value of *JMSMessage* is null.

The message consumer that you use to receive the message determines the destination from which this services receives messages and the JMS connection alias used to receive the messages. You can create a message consumer object using the [pub.jms:createConsumer](#) service.

After you receive a message, you need to invoke a service that processes the message.

If the acknowledgment mode of the consumer is set to `CLIENT_ACKNOWLEDGE`, use the [pub.jms:acknowledge](#) service to acknowledge the message to the JMS provider.

See Also

[pub.jms:acknowledge](#)

[pub.jms:createConsumer](#)

pub.jms:reply

WmPublic. Sends a reply message to a requesting client.

Input Parameters

JMSReplyMessage **Document** A document representing the JMS message reply.

<u>Key</u>	<u>Description</u>										
<i>header</i>	Document. Optional. A document containing the header of the replying JMS message.										
	<table border="1"> <thead> <tr> <th><u>Key</u></th> <th><u>Description</u></th> </tr> </thead> <tbody> <tr> <td><i>deliveryMode</i></td> <td> String. Optional. Specifies the message delivery mode for the reply message. Specify one of the following: <p>PERSISTENT Default. Provide once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.</p> <p>NON_PERSISTENT Provide at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.</p> </td> </tr> <tr> <td><i>priority</i></td> <td> java.lang.Integer. Optional. Specifies the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest. The default is 4. </td> </tr> <tr> <td><i>timeToLive</i></td> <td> java.lang.Long. Optional. Length of time, in milliseconds, that the JMS provider system retains the reply message. The default is 0, meaning that the message does not expire. </td> </tr> <tr> <td><i>JMSType</i></td> <td> String. Optional. Message type identifier for the message. </td> </tr> </tbody> </table>	<u>Key</u>	<u>Description</u>	<i>deliveryMode</i>	String. Optional. Specifies the message delivery mode for the reply message. Specify one of the following: <p>PERSISTENT Default. Provide once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.</p> <p>NON_PERSISTENT Provide at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.</p>	<i>priority</i>	java.lang.Integer. Optional. Specifies the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest. The default is 4.	<i>timeToLive</i>	java.lang.Long. Optional. Length of time, in milliseconds, that the JMS provider system retains the reply message. The default is 0, meaning that the message does not expire.	<i>JMSType</i>	String. Optional. Message type identifier for the message.
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<i>JMSType</i>	String. Optional. Message type identifier for the message.										
<i>properties</i>	Document. Optional. A Document containing optional fields added to the message header.										
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<u>Key</u>	<u>Description</u>										

<i>activation</i>	String. Optional. A unique identifier that you want to assign to the message. JMS triggers use the <i>activation</i> value to determine if a message satisfies a join.										
<i>uuid</i>	String. Optional. A universally unique identifier for the message. Integration Server can use the <i>uuid</i> for exactly-once processing or for request/reply.										
<i>body</i>	Document. Optional. A Document containing the JMS message body. Integration Server supports the following formats for the JMS message body:										
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<i>data</i>	Document. Optional. Message body in the form of a document (IData object).										
	<p>Note: This message format can only be used when sending a JMS message from one Integration Server to another. When the JMS message is sent, the sending Integration Server encodes the IData into a byte array. When the receiving Integration Server receives the message, it decodes the byte array into IData.</p>										
<i>message</i>	Object. Optional. Message body in the form of a <code>javax.jms.Message</code> .										
<i>consumer</i>	<p>Object. Optional. The message consumer object used to receive the request message from the JMS provider. Integration Server uses information from the <i>consumer</i> to create a message producer that will send the reply message.</p> <p>You only need to specify a <i>consumer</i> when replying to a message received using pub.jms.receive.</p>										
<i>message</i>	Object. Optional. A <code>javax.jms.Message</code> object that contains the request message. You can map the <i>JMSMessage/body/message</i> field in the request										

message to the `pub.jms:reply` *message* input parameter. The `pub.jms:replyservice` uses the request message to determine the *replyTo* destination.

You only need to specify a *message* when replying to a message received using [pub.jms:receive](#).

Output Parameters

JMSReplyMessage

Document. A Document containing the reply message the JMS provider sent to the client. After it sends a message, the JMS provider populates some fields in the JMS reply message.

Key	Description
<i>header</i>	<p>Document. Conditional. A Document containing the header fields for the reply message.</p>
<i>JMSCorrelation ID</i>	<p>String. Conditional. A unique identifier used to link the reply message with the initial request message.</p> <p>The replying Integration Server automatically sets this value when it executes the pub.jms:reply service.</p>
<i>JMSDelivery Mode</i>	<p>java.lang.Integer Delivery mode used to send the message.</p> <p>PERSISTENT indicates that the JMS provider provides once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.</p> <p>NON_PERSISTENT indicates that the JMS provider provides at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: When sending a reply message, this value is obtained from the <code>JMSMessage/header/deliveryMode</code> input parameter.</p> </div>
<i>JMSDestination</i>	<p>Object. Conditional. Destination (queue or topic) to which the message</p>

	was sent. The <i>JMSReplyTo</i> value of the request message determines the destination of the reply message.
<i>JMSExpiration</i>	<p>java.lang.Long Conditional. Time at which this message expires. If the message producer did not specify a time-to-live, the <i>JMSExpiration</i> value is zero, indicating the message does not expire.</p> <p>Note: When sending a message, this value is obtained from the <i>JMSReplyMessage/header/timeToLive</i> input parameter.</p>
<i>JMSMessageID</i>	<p>String. Conditional. Unique identifier assigned to this message by the JMS provider.</p>
<i>JMSPriority</i>	<p>java.lang.Integer. Conditional. Defines the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.</p> <p>Note: When sending a reply message, this value is obtained from the <i>JMSMessage/header/priority</i> input parameter.</p>
<i>JMSReplyTo</i>	<p>Object. Conditional. Specifies the destination to which a response to this message should be sent.</p>
<i>JMSTimestamp</i>	<p>java.lang.Long Time at which the message was given to the JMS provider.</p>
<i>JMSType</i>	<p>String. Conditional. Message type identifier specified by the client when sending the message.</p>
<i>properties</i>	<p>Document. Conditional. A Document containing optional fields added to the message header. Integration Server may add the following properties to JMS messages it receives.</p>

Key	Description
<i>activation</i>	String. Conditional. A unique identifier assigned by the sending service. A JMS trigger can join together messages with the same <i>activation</i> .
<i>uuid</i>	String. Conditional. A universally unique identifier for the message assigned by the sender. Integration Server can use the <i>uuid</i> for exactly-once processing or for request/reply.
<i>body</i>	Document. Conditional. A Document containing the JMS message body. Integration Server supports the following formats for the JMS message body:
Key	Description
<i>string</i>	String. Conditional. Message body in the form of a String.
<i>bytes</i>	primitive type. Conditional Message body in the form of a one-dimensional byte array.
<i>object</i>	Object. Conditional. Message body in the form of a Serializable Java object.
<i>data</i>	Document. Conditional. Message body in the form of a document (IData object).
	Note: This message format can only be used when sending a JMS message from one Integration Server to another. When the JMS message is sent, the sending Integration Server encodes the IData into a byte array. When the receiving Integration Server receives the message, it decodes the byte array into IData.
<i>message</i>	Object. Conditional. Message body in the form of an actual <code>javax.jms.Message</code> .

Usage Notes

The `pub.jms:reply` service creates a JMS message (`javax.jms.Message`) based on input provided to the service or takes an existing JMS message and sends it to the JMS provider as a reply to a requesting client.

The `pub.jms:reply` service sends the reply message using the same connection that was used to retrieve the message.

The `JMSReplyTo` field in the request message is set by the sending client and indicates the destination to which the reply will be sent. The replying Integration Server automatically sets this value when it executes the `pub.jms:reply` service.

When executing the `pub.jms:replyservice`, Integration Server automatically sets the value of the `JMSCorrelationID` field in the `JMSReplyMessage`. Integration Server uses the value of the `wm_tag` field, `uuid` field, or the `JMSMessageID` field in the requesting JMS message to correlate the request and the response. If the `wm_tag` field is populated in the request message, Integration Server uses the `wm_tag` value as the `JMSCorrelationID`. If the request message does not specify a `wm_tag` value and you specify the `uuid` when sending the request, the replying Integration Server will use the `uuid` as the `JMSCorrelationID` of the reply message. If the request message does not specify a `wm_tag` value and you do not specify a `uuid`, the replying Integration Server uses the `JMSMessageID` of the request message as the `JMSCorrelationID` of the reply message.

When replying to a message received using `pub.jms:receive`, you need to specify the input parameters `consumer` and `message`.

If a transaction has not yet been started, the transaction manager starts a transaction context for an implicit transaction when Integration Server executes a `pub.jms:reply` service that uses a transacted JMS connection alias. A JMS connection alias is considered to be transacted when it has a transaction type of XA TRANSACTION or LOCAL TRANSACTION.

If you want more control over the actual `javax.jms.Message` that Integration Server sends to the JMS provider, you can create a Java service that calls the `com.wm.app.b2b.server.jms.producer.ProducerFacade` class, which will create a `javax.jms.Message`. See:

- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createBytesMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createMapMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createObjectMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createStreamMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createTextMessage(String)`

The Java service calling this API must return an Object of type `javax.jms.Message`, which can then be mapped to the `JMSMessage/body/message` input parameter of the `pub.jms:reply` service.

When creating the `javax.jms.Message` with the `com.wm.app.b2b.server.jms.producer.ProducerFacade`, you can use the `javax.jms.Message` setter methods to set the values of the message headers and properties directly. You can also set the

value of message headers and properties using the input parameters of the `pub.jms:replyservice` that you use to send the message. If you set the message headers and properties both ways, the values provided to the `pub.jms:replyservice` take precedence.

Software AG recommends that you use a `pub.jms:reply` service to create and send the JMS message. This may provide better performance on average. However, if you want to send a `StreamMessage` or a `MapMessage`, you need to use the appropriate `com.wm.app.b2b.server.jms.producer.ProducerFacade` API.

When using Universal Messaging as the JMS provider, the JMS client can use synchronous or asynchronous publishing. To ensure delivery of a persistent JMS message (*deliveryMode* is set to `PERSISTENT`), Integration Server always uses synchronous publishing to send a persistent JMS message to Universal Messaging.

Message priority is not supported when Universal Messaging is the JMS provider. Any value specified in the *priority* field will be ignored.

See Also

[pub.jms:createConsumer](#)

[pub.jms:receive](#)

pub.jms:send

WmPublic. Sends a JMS message to the JMS provider.

Input Parameters

<i>connectionAliasName</i>	String Name of the JMS connection alias that you want to use to send the message. The JMS connection alias indicates how Integration Server connects to the JMS provider. A JMS connection alias can specify that Integration Server use a JNDI provider to look up administered objects (connection factories and destinations) and then use the connection factory to create a connection. Alternatively, a JMS connection alias can specify that Integration Server uses the native webMethods API to create the connection directly on the webMethods Broker.
<i>destinationName</i>	String Name or lookup name of the Destination to which you want to send the message. Specify the lookup name of the Destination object when the JMS connection alias uses JNDI to retrieve administered objects. Specify the provider-specific name of the Destination when the JMS connection alias uses the native webMethods API to connect directly to the webMethods Broker.
<i>destinationType</i>	String . Optional. Type of destination to which you want to send the message. Specify one of the following:

- QUEUE to send the message to a particular queue. This is the default.
- TOPIC to send the message to a topic.

Note:

You need to specify *destinationType* only if you specified a *connectionAliasName* that uses the native webMethods API.

JMSMessage

Document A document representing the JMS message you want to send.

<u>Key</u>	<u>Description</u>
<i>header</i>	Document. Optional. A document containing the header of the JMS message.
<u>Key</u>	<u>Description</u>
<i>deliveryMode</i>	<p>String. Optional. Specifies the message delivery mode for the message. Specify one of the following:</p> <p>PERSISTENT Default. Provide once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.</p> <p>NON_PERSISTENT Provide at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.</p>
<i>priority</i>	<p>java.lang.Integer. Optional. Specifies the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.</p> <p>The default is 4.</p>
<i>replyTo</i>	<p>String. Optional. Name or lookup name of the destination to which you want a reply message sent.</p> <p>If the JMS connection alias used by the <code>pub.jms:send</code> service connects to the JMS provider using JNDI, set <i>replyTo</i> to be the lookup name of the destination lookup object name.</p>

If the JMS connection alias used by the `pub.jms:send` service connects to the JMS provider using a native Broker connection, set `replyTo` to the Broker queue name. That is, if the JMS connection alias specifies the Broker as the JMS provider and uses the native `webMethods` API to connect directly to the `webMethods` Broker, specify the name of the queue on the Broker that should receive replies to the message.

Note:

When using the native `webMethods` API to connect to the Broker, the `replyTo` destination must be a queue. Topics are not supported

timeToLive

java.lang.Long. Optional. Length of time, in milliseconds, that the JMS provider retains the message. The default is 0, meaning that the message does not expire.

JMSType

Optional. Message type identifier for the message.

properties

Document. Optional. A Document containing optional fields added to the message header. Integration Server adds the following properties to JMS messages it sends.

Key	Description
<i>JMS_WMClusterNodes</i>	String. Optional. Name of the Broker in a Broker cluster that you want to receive the message. The specified Broker effectively overrides the policy applied to the cluster connection factory used by the JMS connection alias. If the applied policy is <code>multisend guaranteed</code> or <code>multisend best effort</code> , the <i>JMS_WMClusterNodes</i> value should contain multiple Brokers.

Important: Software AG requires that you specify the value for

JMS_WMClusterNodes by mapping the contents of the service output parameter *JMS_WMClusterNodes* produced by a previous invocation of `pub.jms:send` or `pub.jms:sendAndWait`.

Use this field to override a Broker cluster policy when all of the following are true:

- The Broker Server is the JMS provider.
- The JMS connection alias used to send the message (*connectionAliasName*) uses a connection from a cluster connection factory.
- The cluster connection factory permits the applied policy to be overridden.

Leave this field blank if the above conditions are not met or if you want the JMS message to be distributed according to the policy applied to the cluster connection factory.

activation

String. Optional. A unique identifier used to group together messages that will be received by a JMS trigger with a join. A JMS trigger can join together messages with the same *activation*.

uuid

String. Optional. A universally unique identifier for the message. Integration Server can use the *uuid* for exactly-once processing or for request/reply.

body

Document. Optional. A Document containing the JMS message body. Integration Server supports the following formats for the JMS message body:

Key	Description
<i>string</i>	String. Optional. Message body in the form of a String.

	<i>bytes</i>	primitive type. Optional Message body in the form of a one-dimensional byte array.
	<i>object</i>	Object. Optional. Message body in the form of a Serializable Java object.
	<i>data</i>	Document. Optional. Message body in the form of a document (IData object).
		<p>Note: This message format can only be used when sending a JMS message from one Integration Server to another. When the JMS message is sent, the sending Integration Server encodes the IData into a byte array. When the receiving Integration Server receives the message, it decodes the byte array into IData.</p>
	<i>message</i>	Object. Optional. Message body in the form of an actual javax.jms.Message.
<i>useCSQ</i>		<p>java.lang.Boolean. Optional. Flag indicating whether Integration Server places sent messages in the client side queue if the JMS provider is not available at the time the messages are sent. Set to:</p> <ul style="list-style-type: none"> ■ True to write messages to the client side queue if the JMS provider is not available at the time this service executes. When the JMS provider becomes available, Integration Server sends messages from the client side queue to the JMS provider. <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: If you want to use the client side queue with the pub.jms:send service, the JMS connection alias specified for <i>connectionAliasName</i> must be configured to have a client side queue. A JMS connection alias has a client side queue if the Maximum CSQ Size property for the alias is set to a value other than 0 (zero).</p> </div> <ul style="list-style-type: none"> ■ False to throw an ISRuntimeException if the JMS provider is not available at the time this service executes. This is the default. <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: If the specified <i>connectionAliasName</i> uses a cluster connection factory to which the multisend guaranteed policy is applied, set <i>useCSQ</i> to False.</p> </div>

Output Parameters

JMSMessage **Document.** A Document containing the message sent to the JMS provider.

Key	Description
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<i>header</i>	Document. Conditional. A Document containing the header fields for the sent message. The JMS provider populates these fields after it has successfully received the message from Integration Server.
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Key	Description
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<i>JMSCorrelationID</i>	String. Conditional. A unique identifier used to link messages together.
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<i>JMSDeliveryMode</i>	java.lang.Integer Delivery mode used to send the message.
------------------------	--

PERSISTENT indicates that the JMS provider provides once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.

NON_PERSISTENT indicates that the JMS provider provides at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.

Note:

When sending a message, this value is obtained from the *JMSMessage/header/deliveryMode* input parameter.

<i>JMSDestination</i>	Object. Conditional. Destination (queue or topic) to which the message was sent.
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<i>JMSExpiration</i>	java.lang.Long Conditional. Time at which this message expires. If the message producer did not specify a time-to-live, the <i>JMSExpiration</i> value is zero, indicating the message does not expire.
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Note:

When sending a message, this value is obtained from the

JMSMessage/header/timeToLive input parameter.

JMSMessageID **String.** Conditional. Unique identifier assigned to this message by the JMS provider.

JMSPriority **java.lang.Integer.** Conditional. Defines the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.

Note:

When sending a message, this value is obtained from the *JMSMessage/header/priority* input parameter.

JMSReplyTo **Object.** Conditional. Specifies the destination to which a response to this message should be sent.

JMSTimestamp **java.lang.Long** Time at which the message was given to the JMS provider.

JMSType **String.** Conditional. Message type identifier specified by the client when sending the message.

properties **Document.** Conditional. A Document containing optional fields added to the message header. Integration Server adds the following properties to JMS messages it sends.

Key	Description
-----	-------------

<i>JMS_WMClusterNodes</i>	String. Conditional. Name of the Broker or Brokers in the Broker cluster that received the JMS message.
---------------------------	--

The Broker Server acting as the JMS provider populates the *JMS_WMClusterNodes* parameter after it distributes the JMS message to the Broker or Brokers in the Broker cluster.

The *JMS_WMClusterNodes* value will be null when:

- The JMS provider is not the Broker Server.

- The JMS connection alias used to send the JMS message does not use a cluster connection factory to obtain the connection to the Broker Server.
- The cluster connection factory does not permit a policy to be overridden.

activation **String.** Conditional. A unique identifier assigned by the sender. A JMS trigger can join together messages with the same *activation*.

uuid **String.** Conditional. A universally unique identifier for the message assigned by the sender. Integration Server can use the *uuid* for exactly-once processing or for request/reply.

body **Document.** Conditional. A Document containing the JMS message body. Integration Server supports the following formats for the JMS message body:

Key	Description
<i>string</i>	String. Conditional. Message body in the form of a String.
<i>bytes</i>	primitive type. Conditional Message body in the form of a one-dimensional byte array.
<i>object</i>	Object. Conditional. Message body in the form of a Serializable Java object.
<i>data</i>	Document. Conditional. Message body in the form of a document (IData object).

Note:

This message format can only be used when sending a JMS message from one Integration Server to another. When the JMS message is sent, the sending Integration Server encodes the IData into a byte array. When the receiving Integration Server receives the message, it decodes the byte array into IData.

message

Object. Conditional. Message body in the form of an actual `javax.jms.Message`.

Usage Notes

The `pub.jms:send` service creates a JMS message (`javax.jms.Message`) based on input provided to the service or takes an existing JMS message and sends it to the JMS provider.

If a transaction has not yet been started, the transaction manager starts a transaction context for an implicit transaction when Integration Server executes a `pub.jms:send` service that uses a transacted JMS connection alias. A JMS connection alias is considered to be transacted when it has a transaction type of XA TRANSACTION or LOCAL TRANSACTION.

You can add properties to a JMS message when building a flow service that invokes this service. In Designer, use the Pipeline view to add a new variable to *JMSMessage/properties* document.

If the JMS connection alias specified for *connectionAliasName* uses the native `webMethods` API, you need to specify *destinationName* and *destinationType* to indicate where the `webMethods` Broker should send the message.

If you specify a destination that does not exist in the JNDI namespace and the JMS connection alias specified for the *connectionAliasName* input parameter is configured to create administered objects on demand, Integration Server creates the destination when the service executes. The ability to create administered objects on demand applies only when is the JMS provider. For more information about creating administered objects on demand, see the section *Creating Administered Objects* in the *webMethods Integration Server Administrator's Guide*.

Integration Server creates the output parameter *JMSMessage* because some of the *header* fields in a JMS message are populated by the JMS provider after the message is sent. For example, the *header* field *JMSMessageID* is not in the JMS message sent by Integration Server, but *JMSMessageID* is in the *header* after the JMS provider receives the message.

When sending a JMS message to , Integration Server sets the *JMSMessageID*.

Each JMS connection alias can be configured to have its own client side queue. A JMS connection alias has a client side queue if the **Maximum CSQ Size** property for the alias is set to a value other than 0 (zero). If you want to use the client side queue with the `pub.jms:send` service, the JMS connection alias specified for *connectionAliasName* must be configured to have a client side queue. If the JMS connection alias is configured to use a client side queue and *useCSQ* is set to true, Integration Server places messages in the client side queue if the JMS provider is not available at the time the `pub.jms:send` service executes. When the JMS provider becomes available, Integration Server sends messages from the client side queue to the JMS provider.

The JMS provider populates the header fields in the *JMSMessage* output parameter after it successfully receives the sent message from Integration Server. If the JMS provider is not available at the time `pub.jms:send` executes and *useCSQ* is set to true, the *header* fields in the output *JMSMessage* will not be populated. Instead these fields will be blank or be set to 0 (zero).

If the client side queue is not in use (*useCSQ* is set to false and/or the JMS connection alias is not configured to use a client side queue, Integration Server throws an *ISRuntimeException* if the JMS provider is not available when this service executes. Make sure to code your service to handle this situation.

A JMS connection alias can be configured so that Integration Server retries the `pub.jms:send` service automatically when the service fails because of a transient error. For more information about configuring a JMS connection alias for automatic retry, see the section *Working with JMS Connection Aliases* in the *webMethods Integration Server Administrator's Guide*.

When sending a message as part of a transaction the client side queue cannot be used. That is, the *useCSQ* field should be set to false. If *useCSQ* is set to true, Integration Server throws a *JMSSubsystemException* when the `pub.jms:send` service executes. A JMS message is sent as part of a transaction if the JMS connection alias specified in *connectionAliasName*:

- Uses a transaction type of `LOCAL_TRANSACTION` or `XA_TRANSACTION`.
- Connects to the webMethods Broker using a cluster connection factory to which the multisend guaranteed policy is applied. Integration Server uses an XA transaction to perform a two-phase commit when sending JMS messages.

If you want more control over the actual `javax.jms.Message` that Integration Server sends to the JMS provider, you can create a Java service that calls the `com.wm.app.b2b.server.jms.producer.ProducerFacade` class, which will create a `javax.jms.Message`. See:

- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createBytesMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createMapMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createObjectMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createStreamMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createTextMessage(String)`

The Java service calling this API must return an Object of type `javax.jms.Message`, which can then be mapped to the *JMSMessage/body/message* input parameter of the `pub.jms:send` service.

When creating the `javax.jms.Message` with the `com.wm.app.b2b.server.jms.producer.ProducerFacade`, you can use the `javax.jms.Message` setter methods to set the values of the message headers and properties directly. You can also set the value of message headers and properties using the input parameters of the `pub.jms:send` service that you use to send the message. If you set the message headers and properties both ways, the values provided to the `pub.jms:send` service take precedence.

Software AG recommends that you use a `pub.jms:send` service to create and send the JMS message. This may provide better performance on average. However, if you want to send a `StreamMessage` or a `MapMessage`, you need to use the appropriate `com.wm.app.b2b.server.jms.producer.ProducerFacade` API.

To send a `StreamMessage`, create a Java service that calls `com.wm.app.b2b.server.jms.producer.ProducerFacade.createStreamMessage(String)`. The Java service calling

this API must return an Object of type `javax.jms.Message`. Map the `javax.jms.Message` object to the `JMSMessage/body/message` input parameter of the `pub.jms:send` service.

To send a `MapMessage`, create a Java service that calls `com.wm.app.b2b.server.jms.producer.ProducerFacade.createMapMessage(String)`. The Java service calling this API must return an Object of type `javax.jms.Message`. Map the `javax.jms.Message` object to the `JMSMessage/body/message` input parameter of the `pub.jms:send` service.

If you use the input parameter `JMS_WMClusterNodes` to override the policy applied to the cluster connection factory, make sure to code the invoking service to handle any exception that the Broker Server throws when policy requirements are not or cannot be met. For more information about policy override scenarios that might result in an exception from Broker Server, see *Using webMethods Integration Server to Build a Client for JMS*.

You can use the `pub.jms:send` service to specify a destination for response messages when you do not need to wait for the response. The act of waiting for a response message comes with extra overhead for Integration Server which is unnecessary if you merely want to specify a `JMSReplyTo` destination but do not want the sending service to wait for a reply.

When executing the `pub.jms:send` service with a valid value for the `JMSMessage/header/replyTo` parameter, Integration Server creates the `javax.jms.Destination` and maps it to the `JMSReplyTo` field within the message header. Integration Server sends the message and returns immediately. The service does not wait for the response message. If `JMSMessage/header/replyTo` is empty, then Integration Server does not set the `JMSReplyTo` header for the JMS message. If `JMSMessage/header/replyTo` is invalid, then Integration Server throws a `ServiceException`.

When the body of the message is supplied as an `IData` in the `JMSMessage/body/data` input parameter, the `pub.jms:send` service sends a message that is twice the size of the original `IData`. This occurs because Integration Server encodes the `IData` as a byte array using `IDataBinCoder` which encodes data as two-byte instead of single-byte when sending the message. This causes a dramatic increase in message size. When is the JMS provider, this can result in the default 20 MB max buffer size being exceeded when the `IData` for the message body is just 10 MB. To resolve this issue, Integration Server includes a custom property to indicate that the message should be encoded as XML and decoded from XML instead of as a byte array. When creating a service that invokes the `pub.jms:send` add the following custom property of type `String` and value to the `JMSMessage/properties` document in the pipeline: `$coderType = idata_xml_bytes`. The presence of the custom property `$coderType` and the value `idata_xml_bytes` instructs the sending Integration Server to encode the `IData` message as XML using `IDataXMLCoder`. The same property and value also instructs the receiving Integration Server to decode the JMS message as XML to `IData`.

pub.jms:sendAndWait

`WmPublic`. Sends a request in the form of a JMS message to the JMS provider and optionally, waits for a reply.

Input Parameters

<code>connectionAliasName</code>	String Name of the JMS connection alias that you want to use to send the message.
----------------------------------	--

The JMS connection alias indicates how Integration Server connects to the JMS provider. A JMS connection alias can specify that Integration Server use a JNDI provider to look up administered objects (connection factories and destinations) and then use the connection factory to create a connection. Alternatively, a JMS connection alias can specify that Integration Server uses the native webMethods API to create the connection directly on the webMethods Broker.

destinationName **String** Name or lookup name of the Destination to which you want to send the message. Specify the lookup name of the Destination object when the JMS connection alias uses JNDI to retrieve administered objects. Specify the provider-specific name of the Destination when the JMS connection alias uses the native webMethods API to connect directly to the webMethods Broker.

destinationType **String** Optional. Type of destination to which you want to send the message. Specify one of the following:

- QUEUE to send the message to a particular queue. This is the default.
- TOPIC to send the message to a topic.

Note:

You need to specify a *destinationType* only if you specified a *connectionAliasName* that uses the native webMethods API.

destinationName ReplyTo **String**. Optional. Name or lookup name of the Destination to which you want the reply message sent. Specify the lookup name of the Destination object when the JMS connection alias uses JNDI to retrieve administered objects. Specify the provider-specific name of the Destination when the JMS connection alias uses the native webMethods API to connect directly to the webMethods Broker.

If you do not specify a destination for reply messages, Integration Server uses a temporaryQueue to receive the reply. A *temporaryQueue* is a queue object created for the duration of a particular connection. It can only be consumed by the connection from which it was created.

If you want to use a dedicated listener (MessageConsumer) to retrieve replies to all requests sent using a particular JMS connection alias, do not specify a value for *destinationNameReplyTo*. A dedicated MessageConsumer can retrieve replies for a synchronous request/reply only.

If you want to use the client side queue with an asynchronous request-reply, you must specify a queue that is not temporary as the *destinationNameReplyTo* value.

destinationType ReplyTo **String**. Optional. Type of destination to which you want the reply to be sent. Specify one of the following:

- **QUEUE** to send the reply message to a particular queue. This is the default.
- **TOPIC** to send the reply message to a specific topic.

timeout

java.lang.Long. Optional. Time to wait (in milliseconds) for the response to arrive. If no value is specified, the service does not wait for a reply and returns a null document. You must specify a value greater than zero.

The *timeout* value only applies for a synchronous request/reply. If *async* is set to true, Integration Server ignores the *timeout* value.

JMSMessage

Document A document representing the JMS message you want to send.

Key	Description								
<i>header</i>	Document. Optional. A document containing the header of the JMS message.								
	<table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>deliveryMode</i></td> <td> <p>String. Optional. Specifies the message delivery mode for the message. Specify one of the following:</p> <p>PERSISTENT Default. Provide once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.</p> <p>NON_PERSISTENT Provide at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.</p> </td> </tr> <tr> <td><i>priority</i></td> <td> <p>java.lang.Integer. Optional. Specifies the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.</p> <p>The default is 4.</p> </td> </tr> <tr> <td><i>timeToLive</i></td> <td> <p>java.lang.Long. Optional. Length of time, in milliseconds, that the JMS provider retains the message. The default is 0, meaning that the message does not expire.</p> </td> </tr> </tbody> </table>	Key	Description	<i>deliveryMode</i>	<p>String. Optional. Specifies the message delivery mode for the message. Specify one of the following:</p> <p>PERSISTENT Default. Provide once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.</p> <p>NON_PERSISTENT Provide at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.</p>	<i>priority</i>	<p>java.lang.Integer. Optional. Specifies the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.</p> <p>The default is 4.</p>	<i>timeToLive</i>	<p>java.lang.Long. Optional. Length of time, in milliseconds, that the JMS provider retains the message. The default is 0, meaning that the message does not expire.</p>
Key	Description								
<i>deliveryMode</i>	<p>String. Optional. Specifies the message delivery mode for the message. Specify one of the following:</p> <p>PERSISTENT Default. Provide once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.</p> <p>NON_PERSISTENT Provide at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.</p>								
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<i>timeToLive</i>	<p>java.lang.Long. Optional. Length of time, in milliseconds, that the JMS provider retains the message. The default is 0, meaning that the message does not expire.</p>								

*JMS*Type **String**. Optional. Message type identifier for the message. Integration Server expects the reply message to be of this type.

properties

Document. Optional. A Document containing optional fields added to the message header.

You can add a custom property to a JMS. Click  on the Pipeline view. Select a data type for the property and assign it a name. Assign a value to any custom properties that you add.

Note:Integration Server reserves use of a message property named *wm_tag* for internal purposes. Do not add a property named *wm_tag* to the JMS message. Integration Server may overwrite a supplied value for *wm_tag*.

Integration Server adds the following properties to JMS messages it sends.

Key	Description
<i>JMS_WMClusterNodes</i>	String . Optional. Name of the Broker in a Broker cluster that you want to receive the message. The specified Broker effectively overrides the policy applied to the cluster connection factory used by the JMS connection alias. If the applied policy is multisend guaranteed or multisend best effort, the <i>JMS_WMClusterNodes</i> value should contain multiple Brokers.

Important:Software AG requires that you specify the value for *JMS_WMClusterNodes* by mapping the contents of the service output parameter *JMS_WMClusterNodes* produced by a previous invocation of `pub.jms:send` or `pub.jms:sendAndWait`.

Use this field to override a Broker cluster policy when all of the following are true:

- The Broker Server is the JMS provider.

- The JMS connection alias used to send the message (*connectionAliasName*) uses a connection from a cluster connection factory.
- The cluster connection factory permits the applied policy to be overridden.

Leave this field blank if the above conditions are not met or if you want the JMS message to be distributed according to the policy applied to the cluster connection factory.

activation **String.** Optional. A unique identifier used to group together messages that will be received by a JMS trigger with a join. A JMS trigger can join together messages with the same *activation*.

uuid **String.** Optional. A universally unique identifier for the message. Integration Server can use the *uuid* for exactly-once processing or for request/reply.

body **Document.** Optional. A Document containing the JMS message body. Integration Server supports the following formats for the JMS message body:

Key	Description
<i>string</i>	String. Optional. Message body in the form of a String.
<i>bytes</i>	primitive type. Optional. Message body in the form of a one-dimensional byte array.
<i>object</i>	Object. Optional. Message body in the form of a Serializable Java object.
<i>data</i>	Document. Optional. Message body in the form of a document (IData object).

Note:

This message format can only be used when sending a JMS message

from one Integration Server to another. When the JMS message is sent, the sending Integration Server encodes the IData into a byte array. When the receiving Integration Server receives the message, it decodes the byte array into IData.

message

Object. Optional. Message body in the form of an actual `javax.jms.Message`.

async

java.lang.Boolean. Optional. Flag specifying whether this is an asynchronous or synchronous request/reply. Set to:

- `True` to indicate that this is an asynchronous request/reply. After sending the message, Integration Server executes the next step in the flow service immediately. The Integration Server does not wait for a reply before continuing service execution.

Note:

To retrieve the reply to an asynchronous send, invoke the [pub.jms:waitForReply](#) service.

- `False` to indicate that this is a synchronous request/reply. After sending the message, the Integration Server waits for a reply before executing the next step in the flow service. This is the default.

useCSQ

java.lang.Boolean. Optional. Flag indicating whether Integration Server places sent messages in the client side queue if the JMS provider is not available at the time the messages are sent. Set to:

- `True` to write messages to the client side queue if the JMS provider is not available at the time this service executes. When the JMS provider becomes available, Integration Server sends messages from the client side queue to the JMS provider.

Note:

If you want to use the client side queue, the JMS connection alias specified for *connectionAliasName* must be configured to have a client side queue. A JMS connection alias has a client side queue if the **Maximum CSQ Size** property for the alias is set to a value other than 0 (zero).

- `False` to throw an `ISRuntimeException` if the JMS provider is not available at the time this service executes. This is the default.

Note: Integration Server can write messages to the client side queue only for messages sent as part of an asynchronous request/reply. That

is, if *async* is set to true (the default) and the JMS provider is not available at the time this service executes, Integration Server places the message in the client side queue.

Note:

The client side queue cannot be used if the reply destination is a temporary queue. Set *useCSQ* to `False` if *destinationNameReplyTo* is not specified or is a temporary queue.

Note:

If the specified *connectionAliasName* uses a cluster connection factory to which the multiseed guaranteed policy is applied, set *useCSQ* to `False`.

Output Parameters

JMSMessage

Document. A Document containing the message sent to the JMS provider.

Key	Description
<i>header</i>	Document. Conditional. A Document containing the header fields for the sent message. The JMS provider populates these fields after it has successfully received the message from Integration Server.

Key	Description
<i>JMSCorrelationID</i>	String Conditional. A unique identifier used to link messages together.
<i>JMSDeliveryMode</i>	<p>java.lang.Integer Delivery mode used to send the message.</p> <p>PERSISTENT indicates that the JMS provider provides once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.</p> <p>NON_PERSISTENT indicates that the JMS provider provides at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.</p>

Note:

	When sending a message, this value is obtained from the <i>JMSMessage/header/deliveryMode</i> input parameter.
<i>JMSDestination</i>	Object. Conditional. Destination (queue or topic) to which the message was sent.
<i>JMSExpiration</i>	java.lang.Long Optional. Time at which this message expires. If the message producer did not specify a time-to-live, the <i>JMSExpiration</i> value is zero, indicating the message does not expire.
	Note: When sending a message, this value is obtained from the <i>JMSMessage/header/timeToLive</i> input parameter.
<i>JMSMessageID</i>	String. Conditional. Unique identifier assigned to this message by the JMS provider.
<i>JMSPriority</i>	java.lang.Integer. Optional. Defines the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.
	Note: When sending a message, this value is obtained from the <i>JMSMessage/header/priority</i> input parameter.
<i>JMSReplyTo</i>	Object. Conditional. Specifies the destination to which a reply to this message should be sent. The <i>destinationNameReplyTo</i> value determines the value of <i>JMSReplyTo</i> .
<i>JMSTimestamp</i>	java.lang.Long Time at which the message was given to the JMS provider.

*JMS*Type **String**. Conditional. Message type identifier specified by the client when sending the message.

properties **Document**. Conditional. A Document containing optional fields added to the message header. Integration Server adds the following properties to JMS messages it sends.

<u>Key</u>	<u>Description</u>
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<i>JMS_WMClusterNodes</i>	String . Conditional. Name of the Broker or Brokers in the Broker cluster that received the JMS message.
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The Broker Server acting as the JMS provider populates the *JMS_WMClusterNodes* parameter after it distributes the JMS message to the Broker or Brokers in the Broker cluster.

The *JMS_WMClusterNodes* value will be null when:

- The JMS provider is not the Broker Server.
- The JMS connection alias used to send the JMS message does not use a cluster connection factory to obtain the connection to the Broker Server.
- The cluster connection factory does not permit a policy to be overridden.

activation **String**. Conditional. A unique identifier assigned by the sender. A JMS trigger can join together messages with the same *activation*.

uuid **String**. Conditional. A universally unique identifier for the message assigned by the sender. Integration Server can use the *uuid* for exactly-once processing or for request/reply.

Note: Integration Server adds a *wm_tag* property to a synchronous request message sent using a JMS connection alias that uses a dedicated MessageConsumer to retrieve replies. Integration Server reserves the use of a JMS message property named *wm_tag* for internal purposes. Integration Server may overwrite any user-supplied value for *wm_tag*.

body

Document. Conditional. A Document containing the JMS message body. Integration Server supports the following formats for the JMS message body:

Key	Description
<i>string</i>	String. Conditional. Message body in the form of a String.
<i>bytes</i>	primitive type. Conditional Message body in the form of a one-dimensional byte array.
<i>object</i>	Object. Conditional. Message body in the form of a Serializable Java object.
<i>data</i>	Document. Conditional. Message body in the form of a document (IData object).

Note:

This message format can only be used when sending a JMS message from one Integration Server to another. When the JMS message is sent, the sending Integration Server encodes the IData into a byte array. When the receiving Integration Server receives the message, it decodes the byte array into IData.

message **Object.** Conditional. Message body in the form of an actual `javax.jms.Message`.

JMSReplyMessage

Document. Conditional. Document containing the JMS message received as a reply.

If this is a synchronous request/reply and Integration Server does not receive a a reply before the specified *timeout* value

elapses or if *timeout* was not set, the *JMSReplyMessage* is null.

If this is an asynchronous reply, the *JMSReplyMessage* is null.

Key	Description										
<i>header</i>	Document. Conditional. A Document containing the header fields for the reply message.										
	<table border="1"> <thead> <tr> <th style="text-align: left;">Key</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"><i>JMSCorrelationID</i></td> <td> <p>String. Conditional. A unique identifier used to link the reply message with the initial request message.</p> <p>The replying Integration Server automatically sets this value when it executes the pub.jms:reply service.</p> </td> </tr> <tr> <td style="vertical-align: top;"><i>JMSDeliveryMode</i></td> <td> <p>java.lang.Integer. Conditional. Delivery mode used to send the message.</p> <p>PERSISTENT indicates that the JMS provider provides once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.</p> <p>NON_PERSISTENT indicates that the JMS provider provides at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.</p> </td> </tr> <tr> <td style="vertical-align: top;"><i>JMSDestination</i></td> <td>Object. Conditional. Destination (queue or topic) to which the message was sent.</td> </tr> <tr> <td style="vertical-align: top;"><i>JMSExpiration</i></td> <td>java.lang.Long Conditional. Time at which this message expires. If the message producer did not specify a time-to-live, the <i>JMSExpiration</i> value is zero, indicating the message does not expire.</td> </tr> </tbody> </table>	Key	Description	<i>JMSCorrelationID</i>	<p>String. Conditional. A unique identifier used to link the reply message with the initial request message.</p> <p>The replying Integration Server automatically sets this value when it executes the pub.jms:reply service.</p>	<i>JMSDeliveryMode</i>	<p>java.lang.Integer. Conditional. Delivery mode used to send the message.</p> <p>PERSISTENT indicates that the JMS provider provides once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.</p> <p>NON_PERSISTENT indicates that the JMS provider provides at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.</p>	<i>JMSDestination</i>	Object. Conditional. Destination (queue or topic) to which the message was sent.	<i>JMSExpiration</i>	java.lang.Long Conditional. Time at which this message expires. If the message producer did not specify a time-to-live, the <i>JMSExpiration</i> value is zero, indicating the message does not expire.
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The Broker Server acting as the JMS provider populates the *JMS_WMClusterNodes* parameter after it distributes the JMS message to the Broker or Brokers in the Broker cluster.

The *JMS_WMClusterNodes* value will be null when:

- The JMS provider is not the Broker Server.
- The JMS connection alias used to send the JMS message does not use a cluster connection factory to obtain the connection to the Broker Server.
- The cluster connection factory does not permit a policy to be overridden.

activation

String. Conditional. A unique identifier assigned by the sender. A JMS trigger uses the *activation* value to determine whether a message satisfies a join.

uuid

String. Conditional. A universally unique identifier for the message assigned by the sender. Integration Server can use the *uuid* for exactly-once processing or for request/reply.

body

Document. Conditional. A Document containing the JMS message body. Integration Server supports the following formats for the JMS message body:

Key	Description
<i>string</i>	String. Conditional. Message body in the form of a String.
<i>bytes</i>	primitive type. Conditional Message body in the form of a one-dimensional byte array.

<i>object</i>	Object. Conditional. Message body in the form of a Serializable Java object.
<i>data</i>	Document. Conditional. Message body in the form of a document (IData object).
	<p>Note: This message format can only be used when sending a JMS message from one Integration Server to another. When the JMS message is sent, the sending Integration Server encodes the IData into a byte array. When the receiving Integration Server receives the message, it decodes the byte array into IData.</p>
<i>message</i>	Object. Conditional. Message body in the form of an actual javax.jms.Message.

Usage Notes

The `pub.jms:sendAndWait` service creates a JMS message (`javax.jms.Message`) based on input provided to the service or takes an existing JMS message, sends it to the JMS provider and optionally, waits for a reply.

If a transaction has not been started, the transaction manager starts a transaction context for an implicit transaction when Integration Server executes a `pub.jms:sendAndWait` service that uses a transacted JMS connection alias. A JMS connection alias is considered to be transacted when it has a transaction type of `XA TRANSACTION` or `LOCAL TRANSACTION`.

You can add properties to a JMS message when building a flow service that invokes this service. In Designer, use the Pipeline view to add a new variable to *JMSMessage/properties* document.

If the JMS connection alias specified for *connectionAliasName* uses the native webMethods API, you need to specify *destinationName* and *destinationType* to indicate where the webMethods Broker should send the message.

If you specify a destination that does not exist in the JNDI namespace and the JMS connection alias specified for the *connectionAliasName* input parameter is configured to create administered objects on demand, Integration Server creates the destination when the service executes. The ability to create administered objects on demand applies only when is the JMS provider. For more information about creating administered objects on demand, see the section *Creating Administered Objects* in the *webMethods Integration Server Administrator's Guide*.

Integration Server creates the output parameter *JMSMessage* because some of the *header* fields in a JMS message are populated by the JMS provider after the message is sent. For example, the *header* field *JMSMessageID* is not in the JMS message sent by Integration Server, but *JMSMessageID* is in the *header* after the JMS provider receives the message.

When sending a JMS message to , Integration Server sets the *JMSMessageID*.

You can use the `pub.jms:sendAndWait` service to initiate a request/reply. The sending client sends a request for information to either a topic or queue. Clients that subscribe to the destination compose and send a reply document that contains the information requested by the sender.

A single request might receive many reply messages. Integration Server that sent the request uses only the first reply document it receives from the JMS provider. Integration Server discards all other replies. First is arbitrarily defined. There is no guarantee provided for the order in which the JMS provider processes incoming replies.

The `pub.jms:sendAndWait` service can be useful in situations where multiple sources contain the response data. For example, suppose that an enterprise uses one application for managing customer data, another for storing master customer records, and a mainframe system for saving customer lists. Each of these applications could answer a request for customer data. The requesting service will use the first reply message it receives.

The `pub.jms:sendAndWait` service can issue a request/reply in a synchronous or asynchronous manner.

- In a synchronous request/reply, the service that sends the request stops executing while it waits for a reply. When the service receives a reply message, the service resumes execution. If the *timeout* elapses before the service receives a reply, Integration Server ends the request, and the service returns a null message that indicates that the request timed out. Integration Server then executes the next step in the flow service.
- In an asynchronous request/reply, the service that sends the request continues executing the steps in the service after sending the message. To retrieve the reply, the requesting flow service must invoke the `pub.jms:waitForReply` service. If the *timeout* value specified in `pub.jms:waitForReply` elapses before the `pub.jms:waitForReply` service receives a reply, the `pub.jms:waitForReply` service returns a null document indicating that the request timed out.

When using `pub.jms:sendAndWait` to issue a request/reply, you must specify a queue as the value of the *destinationNameReplyTo* parameter. In a request/reply scenario, it is possible that the message consumer created to receive the reply might be created after the reply message is sent. (In a synchronous request/reply, the `pub.jms:sendAndWait` service creates the message consumer. In an asynchronous request/reply, the `pub.jms:waitForReply` service or a custom solution, such as a JMS trigger, creates the message consumer.) If the reply destination is a queue, a message consumer can receive messages published to the queue regardless of whether the message consumer was active at the time the message was published. If the destination is a topic, a message consumer can receive only messages published when the message consumer was active. If the reply is sent to a topic before the message consumer is created, the message consumer will not receive the reply. Consequently, when creating a request/reply, the *destinationNameReplyTo* parameter should specify the name or lookup name of a queue.

Note:

If you are using a dedicated listener (`MessageConsumer`) to retrieve replies to all of the requests sent using a particular JMS connection alias, do not specify a value for `destinationNameReplyTo`.

A service that contains multiple asynchronous send and wait invocations allows the service to send all the requests before collecting the replies. This approach can be more efficient than sending a request, waiting for a reply, and then sending the next request.

The replying Integration Server uses the value of the `wm_tag`, `uuid` or `JMSMessageID` in the requesting JMS message to correlate the request and the response. For more information, see [pub.jms:reply](#).

If you create a service that contains multiple asynchronous requests, make sure to link the `JMSMessage` field (`uuid` or `JMSMessageID`) whose value will be used as the reply message's `JMSCorrelationID` to another field in the pipeline. Each asynchronous request produces a `JMSMessage` document in the pipeline. If you do not link the `uuid` or `JMSMessageID` field from the `JMSMessage` document to another field, the next asynchronous request (that is, the next execution of the `pub.jms:sendAndWait` service), will overwrite the previous `JMSMessage` document. When you invoke the `pub.jms:waitForReply` service, the pipeline will contain only the input needed to retrieve the reply to the last request. The pipeline will not contain the information needed to retrieve replies to the previous requests. (That is, there will be nothing to map to the `correlationID` input parameter of the `pub.jms:waitForReply` service.)

Each JMS connection alias can be configured to have its own client side queue. A JMS connection alias has a client side queue if the **Maximum CSQ Size** property for the alias is set to a value other than 0 (zero). If you want to use the client side queue with the `pub.jms:sendAndWait` service, the JMS connection alias specified for `connectionAliasName` must be configured to have a client side queue. If the JMS connection alias is configured to use a client side queue and `useCSQ` is set to true, Integration Server places messages in the client side queue if the JMS provider is not available at the time the `pub.jms:sendAndWait` service executes. When the JMS provider becomes available, Integration Server sends messages from the client side queue to the JMS provider.

If the client side queue is not used (`useCSQ` is set to false or the JMS connection alias is not configured to have a client side queue), Integration Server throws an `ISRuntimeException` if the JMS provider is not available when this service executes. Make sure to code your service to handle this situation.

Integration Server can write messages to the client side queue only for messages sent as part of an asynchronous request/reply. That is, if `async` is set to true (the default) and the JMS provider is not available at the time this service executes, Integration Server places the message in the client side queue. The client side queue cannot be used for a synchronous request/reply.

The client side queue cannot be used if the reply destination is a temporary queue. Consequently, if `useCSQ` is set to true, values must be specified for the `destinationNameReplyTo` and `destinationTypeReplyTo` input parameters. If these parameters are not specified, Integration Server throws the following `ServiceException` when it executes the `pub.jms:sendAndWait` service: [ISS.0134.9082] The client side queue cannot be used with a send and wait request if the reply destination is a temporary queue.

The JMS provider populates the header fields in the `JMSMessage` output parameter after it successfully receives the sent message from Integration Server. If the JMS provider is not available at the time the `pub.jms:sendAndWait` executes and `useCSQ` is set to true, the `header` fields in the output `JMSMessage` will not be populated. Instead these fields will be blank or be set to 0 (zero).

The `pub.jms:waitForReply` service cannot be used to retrieve response to requests that were routed through the client side queue. To retrieve the response, create a JMS trigger that subscribes to the reply to queue.

If the `pub.jms:sendAndWait` service executes and the message is sent directly to the JMS provider (i.e., it is not sent to the client side queue), the `JMSMessage\header\JMSMessageID` contains a unique identifier assigned by the JMS provider. If the `JMSMessageID` field is null after the service executes, the JMS provider was not available at the time the service executed. Integration Server wrote the message to the client side queue.

When sending a message as part of a transaction client side queuing cannot be used. That is, the `useCSQ` field should be set to false. If `useCSQ` is set to true, Integration Server throws a `JMSException` when the `pub.jms:sendAndWait` service executes. A JMS message is sent as part of a transaction if the JMS connection alias specified in `connectionAliasName`:

- Uses a transaction type of `LOCAL_TRANSACTION` or `XA_TRANSACTION`.
- Connects to the webMethods Broker using a cluster connection factory to which the multisend guaranteed policy is applied. Integration Server uses an XA transaction to perform a two-phase commit when sending JMS messages.

If you do not specify a destination for reply messages, Integration Server uses a `temporaryQueue` to receive the reply. A *temporaryQueue* is a queue object created for the duration of a particular connection. It can only be consumed by the connection from which it was created.

To use a dedicated listener (`MessageConsumer`) to retrieve replies for a request, the `pub.jms:sendAndWait` invocation must specify the following:

- The `connectionAliasName` input parameter must specify a JMS connection alias that is configured to use a dedicated message consumer. Specifically, the **Create Temporary Queue** and **Enable Request-Reply Listener for Temporary Queue** check boxes must be selected for the alias.
- The request must be asynchronous. The `async` input parameter must be set to false.
- There must not be a value specified for the `destinationNameReplyTo` input parameter.

If you want more control over the actual `javax.jms.Message` that Integration Server sends to the JMS provider, you can create a Java service that calls the `com.wm.app.b2b.server.jms.producer.ProducerFacade` class, which will create a `javax.jms.Message`. See:

- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createBytesMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createMapMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createObjectMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createStreamMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createTextMessage(String)`

The Java service calling this API must return an Object of type `javax.jms.Message`, which can then be mapped to the `JMSMessage/body/message` input parameter of the `pub.jms:sendAndWait` service.

When creating the `javax.jms.Message` with the `com.wm.app.b2b.server.jms.producer.ProducerFacade`, you can use the `javax.jms.Message` setter methods to set the values of the message headers and properties directly. You can also set the value of message headers and properties using the input parameters of the `pub.jms:sendAndWait` service that you use to send the message. If you set the message headers and properties both ways, the values provided to the `pub.jms:sendAndWait` service take precedence.

Software AG recommends that you use a `pub.jms:sendAndWait` service to create and send the JMS message. This method may provide better performance on average. However, if you want to send a `StreamMessage` or a `MapMessage`, you need to use the appropriate `com.wm.app.b2b.server.jms.producer.ProducerFacade` API.

To send a `StreamMessage`, create a Java service that calls `com.wm.app.b2b.server.jms.producer.ProducerFacade.createStreamMessage(String)`. The Java service calling this API must return an Object of type `javax.jms.Message`. Map the `javax.jms.Message` object to the `JMSMessage/body/message` input parameter of the `pub.jms:sendAndWait` service.

To send a `MapMessage`, create a Java service that calls `com.wm.app.b2b.server.jms.producer.ProducerFacade.createMapMessage(String)`. The Java service calling this API must return an Object of type `javax.jms.Message`. Map the `javax.jms.Message` object to the `JMSMessage/body/message` input parameter of the `pub.jms:sendAndWait` service.

If you use the input parameter `JMS_WMClusterNodes` to override the policy applied to the cluster connection factory, make sure to code the invoking service to handle any exception that the Broker Server throws when policy requirements are not or cannot be met. For more information about policy override scenarios that might result in an exception from Broker Server, see *Using webMethods Integration Server to Build a Client for JMS*.

When using Universal Messaging as the JMS provider, the JMS client can use synchronous or asynchronous publishing. To ensure delivery of a persistent JMS message (`deliveryMode` is set to `PERSISTENT`), Integration Server always uses synchronous publishing to send a persistent JMS message to Universal Messaging.

You can use the `pub.jms:send` service to specify a destination for response messages when you do not need to wait for the response. The act of waiting for a response message comes with extra overhead for Integration Server which is unnecessary if you merely want to specify a `JMSReplyTo` destination but do not want the sending service to wait for a reply. For more information, see the `JMSMessage/header/replyTo` input parameter description and Usage Notes in [pub.jms:JMSMessage](#).

See Also

[pub.jms:reply](#)

[pub.jms:waitForReply](#)

pub.jms:sendBatch

`WmPublic`. Sends a group of JMS messages to the same destination on the webMethods Broker.

Input Parameters

<i>connectionAliasName</i>	<p>String Name of the JMS connection alias that you want to use to send the messages.</p> <p>The JMS connection alias indicates how Integration Server connects to the webMethods Broker or Universal Messaging. A JMS connection alias can specify that Integration Server use a JNDI provider to look up administered objects (connection factories and destinations) and then use the connection factory to create a connection. Alternatively, a JMS connection alias can specify that Integration Server uses the native webMethods API to create the connection directly on the webMethods Broker.</p> <p>Note: <i>connectionAliasName</i> must specify a JMS connection alias that uses the webMethods Broker or Universal Messaging as the JMS provider.</p>
<i>destinationName</i>	<p>String Name or lookup name of the Destination to which you want to send the messages. Specify the lookup name of the Destination object when the JMS connection alias uses JNDI to retrieve administered objects. Specify the provider-specific name of the Destination when the JMS connection alias uses the native webMethods API to connect directly to the webMethods Broker.</p> <p>Note: When using the <code>pub.jms:batchSend</code> service, Integration Server sends all messages to the same destination.</p>
<i>destinationType</i>	<p>String. Optional. Type of destination to which you want to send the message. Specify one of the following:</p> <ul style="list-style-type: none">■ <code>QUEUE</code> to send the message to a particular queue. This is the default.■ <code>TOPIC</code> to send the message to a topic. <p>Note: You need to specify <i>destinationType</i> only if you specified a <i>connectionAliasName</i> that uses the native webMethods API.</p>
<i>deliveryMode</i>	<p>String. Optional. Specifies the message delivery mode for the messages. Specify one of the following:</p> <ul style="list-style-type: none">■ <code>PERSISTENT</code> Default. Provide once-and-only-once delivery for the messages. The messages will not be lost if a JMS provider failure occurs.

- **NON_PERSISTENT** Provide at-most-once delivery for the messages. The messages have no guarantee of being saved if a JMS provider failure occurs.

Note:

The specified delivery mode applies to all of the messages sent by the service.

priority

java.lang.Integer. Optional. Specifies the message priority for all of the messages. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.

The default is 4.

Note:

The specified priority applies to all of the messages sent by the service.

timeToLive

java.lang.Long. Optional. Length of time, in milliseconds, that the JMS provider retains each message. The default is 0, meaning that the messages do not expire.

Note:

The specified time to live applies to all of the messages sent by the service.

JMSMessages

Document List A document list representing the JMS messages to send to the destination. Specify the following for each JMS message that you want to send:

<u>Key</u>	<u>Description</u>				
<i>header</i>	Document. Optional. A document containing the header of the JMS message.				
	<table border="1"> <thead> <tr> <th><u>Key</u></th> <th><u>Description</u></th> </tr> </thead> <tbody> <tr> <td><i>JMSType</i></td> <td>String. Optional. Message type identifier for the message.</td> </tr> </tbody> </table>	<u>Key</u>	<u>Description</u>	<i>JMSType</i>	String. Optional. Message type identifier for the message.
<u>Key</u>	<u>Description</u>				
<i>JMSType</i>	String. Optional. Message type identifier for the message.				
<i>properties</i>	Document. Optional. A Document containing optional fields added to the message header. Integration Server adds the following properties to JMS messages it sends.				
	<table border="1"> <thead> <tr> <th><u>Key</u></th> <th><u>Description</u></th> </tr> </thead> <tbody> <tr> <td><i>activation</i></td> <td>String. Optional. A unique identifier used to group together messages that will be received by a JMS trigger with a join. A</td> </tr> </tbody> </table>	<u>Key</u>	<u>Description</u>	<i>activation</i>	String. Optional. A unique identifier used to group together messages that will be received by a JMS trigger with a join. A
<u>Key</u>	<u>Description</u>				
<i>activation</i>	String. Optional. A unique identifier used to group together messages that will be received by a JMS trigger with a join. A				

JMS trigger can join together messages with the same *activation*.

uuid **String**. Optional. A universally unique identifier for the message. Integration Server can use the *uuid* for exactly-once processing or for request/reply.

body **Document**. Optional. A Document containing the JMS message body. Integration Server supports the following formats for the JMS message body:

Key	Description
<i>string</i>	String . Optional. Message body in the form of a String.
<i>bytes</i>	primitive type . Optional. Message body in the form of a one-dimensional byte array.
<i>object</i>	Object . Optional. Message body in the form of a Serializable Java object.
<i>data</i>	Document . Optional. Message body in the form of a document (IData object).

Note:

This message format can only be used when sending a JMS message from one Integration Server to another. When the JMS message is sent, the sending Integration Server encodes the IData into a byte array. When the receiving Integration Server receives the message, it decodes the byte array into IData.

message **Object**. Optional. Message body in the form of an actual `javax.jms.Message`.

Note:

When you send a batch of messages, you can specify a different format for each JMS message body.

useCSQ

java.lang.Boolean. Optional. Flag indicating whether Integration Server places sent messages in the client side queue if the JMS provider is not available at the time the messages are sent. Set to:

- True to write messages to the client side queue if the JMS provider is not available at the time this service executes. When the JMS provider becomes available, Integration Server sends messages from the client side queue to the JMS provider.

Note:

If you want to use the client side queue, the JMS connection alias specified for *connectionAliasName* must be configured to have a client side queue. A JMS connection alias has a client side queue if the **Maximum CSQ Size** property for the alias is set to a value other than 0 (zero).

- False to throw an `ISRuntimeException` if the JMS provider is not available at the time this service executes. This is the default.

Output Parameters

JMSMessages

Document List A Document list containing the messages sent to the JMS provider. Each document contains the following information:

<u>Key</u>	<u>Description</u>
<i>header</i>	Document. Conditional. A Document containing the header fields for the sent message. The JMS provider populates these fields after it has successfully received the message from Integration Server.
<u>Key</u>	<u>Description</u>
<i>JMSCorrelationID</i>	String. Conditional. A unique identifier used to link messages together.
<i>JMSDeliveryMode</i>	java.lang.Integer Delivery mode used to send the message. PERSISTENT indicates that the JMS provider provides once-and-only-once

delivery for the message. The message will not be lost if a JMS provider failure occurs.

NON_PERSISTENT indicates that the JMS provider provides at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.

Note:

When sending a message, this value is obtained from the *JMSMessage/header/deliveryMode* input parameter.

JMSDestination

Object. Conditional. Destination (queue or topic) to which the message was sent.

JMSExpiration

java.lang.Long Conditional. Time at which this message expires. If the message producer did not specify a time-to-live, the *JMSExpiration* value is zero, indicating the message does not expire.

Note:

When sending a message, this value is obtained from the *JMSMessage/header/timeToLive* input parameter.

JMSMessageID

String. Conditional. Unique identifier assigned to this message by the JMS provider.

JMSPriority

java.lang.Integer. Conditional. Defines the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.

Note:

When sending a message, this value is obtained from the *JMSMessage/header/priority* input parameter.

	<i>JMSReplyTo</i>	Object. Conditional. Specifies the destination to which a response to this message should be sent.
	<i>JMSTimestamp</i>	java.lang.Long Time at which the message was given to the JMS provider.
	<i>JMSType</i>	String. Conditional. Message type identifier specified by the client when sending the message.
<i>properties</i>		Document. Conditional. A Document containing optional fields added to the message header. Integration Server adds the following properties to JMS messages it sends.

<u>Key</u>	<u>Description</u>
------------	--------------------

<i>activation</i>	String. Conditional. A unique identifier assigned by the sender. A JMS trigger can join together messages with the same <i>activation</i> .
-------------------	--

<i>uuid</i>	String. Conditional. A universally unique identifier for the message assigned by the sender. Integration Server can use the <i>uuid</i> for exactly-once processing or for request/reply.
-------------	--

body **Document.** Conditional. A Document containing the JMS message body. Integration Server supports the following formats for the JMS message body:

<u>Key</u>	<u>Description</u>
------------	--------------------

<i>string</i>	String. Conditional. Message body in the form of a String.
---------------	---

<i>bytes</i>	primitive type. Conditional Message body in the form of a one-dimensional byte array.
--------------	--

<i>object</i>	Object. Conditional. Message body in the form of a Serializable Java object.
---------------	---

<i>data</i>	Document. Conditional. Message body in the form of a document (IData object).
-------------	--

Note:

This message format can only be used when sending a JMS message from one Integration Server to another. When the JMS message is sent, the

sending Integration Server encodes the IData into a byte array. When the receiving Integration Server receives the message, it decodes the byte array into IData.

message

Object. Conditional. Message body in the form of an actual `javax.jms.Message`.

Usage Notes

The `pub.jms:sendBatch` service can be used with webMethods Broker or Universal Messaging only. If you set the `connectionAliasName` parameter to a JMS connection alias that uses a different JMS provider, the `pub.jms:sendBatch` service ends with an exception.

The `pub.jms:sendBatch` service creates multiple JMS messages (`javax.jms.Message`) based on input provided to the service or takes existing JMS messages and sends them to the JMS provider.

Sending a batch of messages using the `pub.jms:sendBatch` service is an all or nothing operation. If Integration Server or the JMS provider determines that one of the messages is not valid during a pre-processing check, none of the messages will be sent. Make sure to code your service to handle this possibility.

When Integration Server executes a `pub.jms:sendBatch` service that uses a transacted JMS connection alias, Integration Server sends the messages as part of a transaction. If a transaction has not yet been started, the transaction manager starts a transaction context for an implicit transaction. A JMS connection alias is considered to be transacted when it has a transaction type of XA TRANSACTION or LOCAL TRANSACTION.

You can add properties to a JMS message when building a flow service that invokes this service. To add a new property, use the Pipeline to add a new variable to `JMSMessages/properties` document.

If the JMS connection alias specified for `connectionAliasName` uses the native webMethods API, you need to specify `destinationName` and `destinationType` to indicate where the webMethods Broker should send the message.

If you specify a destination that does not exist in the JNDI namespace and the JMS connection alias specified for the `connectionAliasName` input parameter is configured to create administered objects on demand, Integration Server creates the destination when the service executes. The ability to create administered objects on demand applies only when is the JMS provider. For more information about creating administered objects on demand, see the section *Creating Administered Objects* in the *webMethods Integration Server Administrator's Guide*.

Integration Server creates the output parameter `JMSMessages` because some of the *header* fields in a JMS message are populated by the JMS provider after the message is sent. For example, the *header* field `JMSMessageID` is not in the JMS message sent by Integration Server, but `JMSMessageID` is in the *header* after the JMS provider receives the message.

When sending a JMS message to , Integration Server sets the `JMSMessageID`.

Each JMS connection alias can be configured to have its own client side queue. A JMS connection alias has a client side queue if the **Maximum CSQ Size** property for the alias is set to a value other than 0 (zero). If you want to use the client side queue with the `pub.jms:sendBatch` service, the JMS connection alias specified for `connectionAliasName` must be configured to have a client side queue. If the JMS connection alias is configured to use a client side queue and `useCSQ` is set to true, Integration Server places messages in the client side queue if the JMS provider is not available at the time the `pub.jms:sendBatch` service executes. When the JMS provider becomes available, Integration Server sends messages from the client side queue to the JMS provider.

If the client side queue is not used (`useCSQ` is set to false or the JMS connection alias is not configured to have a client side queue), Integration Server throws an `ISRuntimeException` if the JMS provider is not available when this service executes. Make sure to code your service to handle this situation.

When sending a message as part of a transaction, the client side queue cannot be used. The `useCSQ` field should be set to false. If `useCSQ` is set to true, Integration Server throws a `JMSSubsystemException` when the `pub.jms:send` service executes. A JMS message is sent as part of a transaction if the JMS connection alias specified in `connectionAliasName` uses a transaction type of `LOCAL_TRANSACTION` or `XA_TRANSACTION`.

The JMS provider populates the header fields in the `JMSMessages` output parameter after it successfully receives the sent message from Integration Server. If the JMS provider is not available at the time `pub.jms:sendBatch` executes and `useCSQ` is set to true, the `header` fields in the output `JMSMessages` will not be populated. Instead these fields will be blank or be set to 0 (zero).

If you want more control over the actual `javax.jms.Message` that Integration Server sends to the JMS provider, you can create a Java service that calls the `com.wm.app.b2b.server.jms.producer.ProducerFacade` class, which will create a `javax.jms.Message`. See:

- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createBytesMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createMapMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createObjectMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createStreamMessage(String)`
- `com.wm.app.b2b.server.jms.producer.ProducerFacade.createTextMessage(String)`

The Java service calling this API must return an Object of type `javax.jms.Message`, which can then be mapped to the `JMSMessage/body/message` input parameter of the `pub.jms:send` service.

When creating the `javax.jms.Message` with the `com.wm.app.b2b.server.jms.producer.ProducerFacade`, you can use the `javax.jms.Message` setter methods to set the values of the message headers and properties directly. You can also set the value of message headers and properties using the input parameters of the `pub.jms:send` service that you use to send the message. If you set the message headers and properties both ways, the values provided to the `pub.jms:send` service take precedence.

Software AG recommends that you use a `pub.jms:sendBatch` service to create and send the JMS message. This may provide better performance on average. However, if you want to send a

StreamMessage or a MapMessage, you need to use the appropriate `com.wm.app.b2b.server.jms.producer.ProducerFacade` API.

To send a StreamMessage, create a Java service that calls `com.wm.app.b2b.server.jms.producer.ProducerFacade.createStreamMessage(String)`. The Java service calling this API must return an Object of type `javax.jms.Message`. Map the `javax.jms.Message` object to the `JMSMessage/body/message` input parameter of the `pub.jms:send` service.

To send a MapMessage, create a Java service that calls `com.wm.app.b2b.server.jms.producer.ProducerFacade.createMapMessage(String)`. The Java service calling this API must return an Object of type `javax.jms.Message`. Map the `javax.jms.Message` object to the `JMSMessage/body/message` input parameter of the `pub.jms:send` service.

When using Universal Messaging as the JMS provider, the JMS client can use synchronous or asynchronous publishing. To ensure delivery of a persistent JMS message (`deliveryMode` is set to PERSISTENT), Integration Server always uses synchronous publishing to send a persistent JMS message to Universal Messaging.

pub.jms:triggerSpec

WmPublic. Specification for the input signature of a JMS trigger that processes one message at a time.

Input Parameters

JMSMessage **Document** A document reference (IData) to the [pub.jms:JMSMessage](#) document type, which defines the structure of a JMS message.

Output Parameters

None.

Usage Notes

If you want to use a JMS trigger to retrieve and process multiple messages in one batch, use [pub.jms:batchTriggerSpec](#) to declare the inputs and outputs of the JMS trigger service.

See Also

[pub.jms:batchTriggerSpec](#)

[pub.jms:JMSMessage](#)

pub.jms:waitForReply

WmPublic. Retrieves the reply message for an asynchronous request.

Input Parameters

<i>correlationID</i>	String Unique identifier used to associate the reply message with the initial request.
<i>timeout</i>	<p>java.lang.Long. Optional. Time to wait (in milliseconds) for the reply to arrive.</p> <p>If <i>timeout</i> is greater than 0 (zero) and a reply is not available at the time the <code>pub.jms:waitForReply</code> service executes, the service continues to wait for the document until the time specified in the <i>timeout</i> parameter elapses. If the service does not receive a reply by the time the timeout interval elapses, the <code>pub.jms:waitForReply</code> service returns a null document.</p> <p>If <i>timeout</i> is set to 0 (zero), the <code>pub.jms:waitForReply</code> service waits indefinitely for a response. Software AG does not recommend setting <i>timeout</i> to 0 (zero).</p> <p>If <i>timeout</i> is not set, the <code>pub.jms:waitForReply</code> service does not wait for a reply. The <code>pub.jms:waitForReply</code> service always returns a null document. The service returns a null document even if the reply queue contains a response for the request.</p>

Output Parameters

<i>JMSReplyMessage</i>	<p>Document. Conditional. Document containing the JMS message received as a reply.</p> <p>If the <code>pub.jms:waitForReply</code> service does not receive a a reply before the specified <i>timeout</i> value elapses of the <i>timeout</i> value was not specified, the <i>JMSReplyMessage</i> is null.</p>
------------------------	---

Key	Description
<i>header</i>	Document. Conditional. A Document containing the header fields for the reply message.
Key	Description
<i>JMSCorrelationID</i>	String. Conditional. A unique identifier used to link the reply message with the initial request message.
<i>JMSDeliveryMode</i>	java.lang.Integer. Conditional. Delivery mode used to send the message.

	<p>PERSISTENT indicates that the JMS provider provides once-and-only-once delivery for the message. The message will not be lost if a JMS provider failure occurs.</p> <p>NON_PERSISTENT indicates that the JMS provider provides at-most-once delivery for the message. The message has no guarantee of being saved if a JMS provider failure occurs.</p>
<i>JMSDestination</i>	Object. Conditional. Destination (queue or topic) to which the message was sent.
<i>JMSExpiration</i>	java.lang.Long Conditional. Time at which this message expires. If the message producer did not specify a time-to-live, the <i>JMSExpiration</i> value is zero, indicating the message does not expire.
<i>JMSMessageID</i>	String. Conditional. Unique identifier assigned to this message by the JMS provider.
<i>JMSPriority</i>	java.lang.Integer. Conditional. Defines the message priority. The JMS standard defines priority levels from 0 to 9, with 0 as the lowest priority and 9 as the highest.
<i>JMSRedelivered</i>	java.lang.Boolean. Conditional. Flag indicating the JMS provider delivered this message to the JMS client previously. True indicates the message may have been delivered in the past. False indicates the JMS provider has not delivered this message previously.
<i>JMSReplyTo</i>	Object. Conditional. Specifies the destination to which a response to this message should be sent.

JMSTimestamp **java.lang.Long.** Conditional. Time at which the message was given to the JMS provider.

JMSType **String.** Conditional. Message type identifier specified by the client when sending the message.

properties **Document.** Conditional. A document containing optional fields added to the message header. Integration Server may add the following properties to JMS messages it sends or receives.

Key	Description
-----	-------------

<i>JMSXDeliveryCount</i>	java.lang.Integer. Conditional. Specifies the number of times the JMS provider delivered the message to the requesting client. Most JMS providers set this value.
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<i>JMS_WMCluster Nodes</i>	String. Conditional. Name of the Broker or Brokers in the Broker cluster that received the JMS message.
----------------------------	--

The Broker Server acting as the JMS provider populates the *JMS_WMClusterNodes* parameter after it distributes the JMS message to the Broker or Brokers in the Broker cluster.

The *JMS_WMClusterNodes* value will be null when:

- The JMS provider is not the Broker Server.
- The JMS connection alias used to send the JMS message does not use a cluster connection factory to obtain the connection to the Broker Server.
- The cluster connection factory does not permit a policy to be overridden.

activation **String.** Conditional. A unique identifier assigned by the sending

service. A JMS trigger uses the *activation* to determine whether a message is part of a join.

uuid

String. Conditional. A universally unique identifier for the message assigned by the sender. Integration Server can use the *uuid* for exactly-once processing or for request/reply.

body

Document. Conditional. A Document containing the JMS message body. Integration Server supports the following formats for the JMS message body:

Key	Description
<i>string</i>	String. Conditional. Message body in the form of a String.
<i>bytes</i>	primitive type. Conditional Message body in the form of a one-dimensional byte array.
<i>object</i>	Object. Conditional. Message body in the form of a Serializable Java object.
<i>data</i>	Document. Optional. Message body in the form of a document (IData object).

Note:

This message format can only be used when sending a JMS message from one Integration Server to another. When the JMS message is sent, the sending Integration Server encodes the IData into a byte array. When the receiving Integration Server receives the message, it decodes the byte array into IData.

message

Object. Optional. Message body in the form of an actual `javax.jms.Message`.

Usage Notes

Integration Server uses the value of the *uuid* or *JMSMessageID* fields in the requesting JMS message to correlate the response to the request. If you specify the *uuid* when sending the request, the replying Integration Server will use the *uuid* as the *JMSCorrelationID* of the reply message (*JMSReplyMessage*). If you do not specify a *uuid*, the replying Integration Server uses the *JMSMessageID* set by the JMS provider as the *JMSCorrelationID* of the reply message (*JMSReplyMessage*).

If you set the *uuid* in the JMS message request, you can link the value of the *uuid* field from the *JMSMessage* produced by the [pub.jms:sendAndWait](#) service to the *correlationID* input field of the [pub.jms:waitForReply](#) service. If you did not specify a *uuid*, you can link the *JMSMessageID* field from the *JMSMessage* produced by the [pub.jms:sendAndWait](#) to the *correlationID* input field.

The *timeout* value of the sending service specifies how long Integration Server will keep the request open while waiting for a reply. If a reply is not available at the time Integration Server executes the [pub.jms:waitForReply](#) service, Integration Server continues to wait for the document until the time specified in the *timeout* parameter elapses. If the service does not receive a reply by the time the *timeout* interval elapses, the service returns a null document.

The [pub.jms:waitForReply](#) service cannot be used to retrieve response to requests that were routed through the client side queue. To retrieve the response, create a JMS trigger that subscribes to the reply queue.

If the [pub.jms:sendAndWait](#) service executes and the message is sent directly to the JMS provider (i.e., it is not sent to the client side queue), the *JMSMessage\header\JMSMessageID* contains a unique identifier assigned by the JMS provider. If the *JMSMessageID* field is null after the service executes, the JMS provider was not available at the time the service executed. Integration Server wrote the message to the client side queue.

See Also

[pub.jms:sendAndWait](#)

pub.jms.wmjms:receiveStream

WmPublic. *Deprecated* - There is no replacement service.

Receives a large message stream from a queue or topic on the webMethods Broker.

Input Parameters

consumer

Object A message consumer object that the service uses to receive the large message stream. Create the message consumer object using the [pub.jms:createConsumer](#) service.

timeout **java.lang.Long.** Optional. Time to wait (in milliseconds) for the first part of the message stream. If you do not specify a *timeout* value, the consumer does not wait.

Output Parameters

stream **Object** A `com.webmethods.jms.impl.WmJMSInputStream` received by the consumer.

If the *timeout* value elapses before a message is received, *stream* will be null.

Usage Notes

webMethods Broker is deprecated, resulting in the deprecation of the `pub.jms.wmjms:receiveStream` service. There is no replacement service.

When using webMethods Broker as the JMS provider, the webMethods message streaming feature allows you to stream large amounts of data or a large file from a message producer to a message consumer.

Important:

You can only send and receive large messages from Integration Server when working with the webMethods Broker. For more information about how the webMethods message streaming feature works on the webMethods Broker, see the *webMethods Broker Messaging Programmer's Guide*.

Large message streams cannot be sent or received as part of a transaction. If the JMS connection alias used by the consumer has a transaction type of `LOCAL_TRANSACTION` or `XA_TRANSACTION`, Integration Server throws an exception, specifically `com.wm.app.b2b.server.jms.JMSSubsystemException`, when it executes the `pub.jms.wmjms:receiveStream` service.

The *consumer* that you use to receive the message determines the destination from which this services receives messages and the JMS connection alias used to receive the messages. You can create a message consumer object using the `pub.jms:createConsumer` service.

The *timeout* value specifies how long the message consumer waits for the initial part of the message stream. If a message is not returned when the time out period elapses, the `pub.jms.wmjms:receiveStream` returns a null value.

The *read timeout* is the maximum length of time the consumer waits between receiving subsequent pieces of the message stream. After the read timeout elapses, the consumer calls `InputStream.read()` to read the next byte of the stream. If the next byte of the stream is not available, Integration Server throws a `WmReadTimeoutException`. The read timeout only applies after the consumer receives the first part of the message stream. The `watt.server.jms.wmjms.lms.readTimeout` property determines the read timeout value. The default is 30000 milliseconds.

Make sure to code your service to handle a `WmReadTimeoutException`. When an `WmReadTimeoutException` occurs, it suggests that Integration Server did not receive the entire message stream. When this occurs, you need to close the stream, which will acknowledge it to the webMethods Broker. You can close the stream from a Java service by calling `InputStream.close`. You can also close the stream using the [pub.io:close](#) service.

If the connection between the Integration Server and webMethods Broker fails during execution of the [pub.jms.wmjms:receiveStream](#) service, Integration Server throws a `WmConnectionException`. When this occurs, Integration Server rolls the message back to the webMethods Broker automatically. The message can be received when the connection to the webMethods Broker is re-established.

You can code your service to implement recoverability logic. This means that the next time the message stream is received, the service re-processes the message stream from the point at which processing stopped. To resume processing from the correct point, the service needs to keep track of the message ID and byte position. For more details, see `com.webmethods.jms.impl.WmJMSInputStream`.

After the [pub.jms.wmjms:receiveStream](#) receives and processes the last part of the message stream, you need to close the stream. `InputStream.read()` returns "-1" when the end of the stream is reached. You can close the stream from a Java service by calling `InputStream.close`. You can also close the stream using the [pub.io:close](#) service. Closing the stream explicitly acknowledges the message to the provider.

The *consumer* used to receive large message streams from the webMethods Broker can specify an *acknowledgmentMode* of `AUTO_ACKNOWLEDGE` or `CLIENT_ACKNOWLEDGE`. webMethods Broker does not permit the use of the *acknowledgmentMode* `DUPS_OK_ACKNOWLEDGE` for the webMethods message streaming feature.

You might want to use the scheduler capabilities within Integration Server to schedule a service that receives and then process large messages from webMethods Broker. For more information about scheduling services, see the section *Scheduling a User Task* in the *webMethods Integration Server Administrator's Guide*.

pub.jms.wmjms:sendStream

WmPublic. *Deprecated* - There is no replacement service.

Sends a large message stream to the webMethods Broker.

Input Parameters

<i>connectionAliasName</i>	String Name of the JMS connection alias that you want to use to send the message.
<i>destinationName</i>	String Name or lookup name of the Destination to which you want to send the message. Specify the lookup name of the Destination object when the JMS connection alias uses JNDI to retrieve administered objects. Specify the provider-specific name of the Destination when

the JMS connection alias uses the native webMethods API to connect directly to the webMethods Broker.

destinationType

String. Optional. Type of destination to which you want to send the message. Specify one of the following:

- QUEUE to send the message to a particular receiver/queue. This is the default.
- TOPIC to send the message to a topic.

Note:

You need to specify a *destinationType* only if you specified a *connectionAliasName* that uses the native webMethods API.

stream

Object A stream for the message you want to send to the webMethods Broker.

Output Parameters

None.

Usage Notes

webMethods Broker is deprecated, resulting in the deprecation of the `pub.jms.wmjms:sendStream` service. There is no replacement service.

When using the webMethods Broker as the JMS provider, the webMethods message streaming feature allows you to stream large amounts of data or a large file from a message producer to a message consumer. You can only send and receive large messages from Integration Server when working with the webMethods Broker. For more information about how the webMethods message streaming feature works on the webMethods Broker, see the *webMethods Broker Messaging Programmer's Guide*.

Large message streams cannot be sent or received as part of a transaction. If *connectionAliasName* specifies a JMS connection alias with a transaction type of LOCAL_TRANSACTION or XA_TRANSACTION, Integration Server throws the exception `com.wm.app.b2b.server.jms.JMSSubsystemException` when it executes the `pub.jms.wmjms:sendStream` service.

If the connection between Integration Server and the webMethods Broker fails before the `pub.jms.wmjms:sendStream` sends the entire message stream, you need to re-send the entire stream when the connection is re-established.

21 JSON Folder

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You use the elements in the JSON folder for the following:

- Converting JSON content into a document (IData object)
- Converting a document (IData object) into JSON content
- Validating JSON content against a JSON schema

Data Type Mapping

The following table shows how JSON data types and JSON document types map to Integration Server data types during data conversion.

JSON	Integration Server
object	Document
string	String
number (integer)	Integer or Long Java wrapper. For more information about converting JSON integers, see the <i>decodeIntegerAsLong</i> input parameters in pub.json:jsonStreamToDocument and pub.json:jsonStringToDocument .
number (real)	Float or Double Java wrapper. For more information about converting real numbers, see the <i>decodeRealAsDouble</i> input parameter in pub.json:jsonStreamToDocument and pub.json:jsonStringToDocument . In JSON document type which is created from a JSON schema, if the data type is number, the JSON text will be converted to BigDecimal.
true/false	Boolean Java wrapper
Array of JSON type	Array of Integration Server type <ul style="list-style-type: none"> ■ If the JSON object contains a string array, Integration Server sets the corresponding field in the IS document type to String List. ■ If the JSON object contains a two-dimensional string array, Integration Server sets the corresponding field in the IS document type to String Table. ■ If the JSON object contains a array having different types of objects (for example, integer, string, etc.), Integration Server sets the corresponding field in the IS document type to Object List with Java wrapper type as UNKNOWN.
<p>Note: The Flow type system in Integration Server does not support the following multi-dimensional arrays in JSON objects:</p> <ul style="list-style-type: none"> ■ Two-dimensional arrays of data types other than string 	

JSON

Integration Server

- Multi-dimensional arrays of three or more dimensions (three-dimensional, four-dimensional, etc.)

The JSON coder in Integration Server can create pipelines with arbitrarily deep arrays or various types and you can write Java services to access those arrays. The limitations above apply to Flow services and viewing the document in Designer.

For `pub.json:jsonStringToDocument` and `pub.json:sonStreamToDocument`, these kinds of arrays become an Object List of UNKOWN type. For IS document types created from a JSON object using Integration Server, these kinds of arrays become an Object with a Java wrapper type of UNKNOWN.

Array of null

Object List

null

null

All others

String

Note:

If an object has a `toString()` implementation, Integration Server uses that implementation.

If the object does not provide a `toString()` implementation, Integration Server uses `Object.toString()`. `Object.toString()` returns the class name and hexadecimal representation of the hash code of the object, such as `"javax.naming.InitialContext@3ae6f00b"`.

Additional notes on data conversion:

- If JSON text begins with an array at the root and the array is unnamed, when parsing the JSON text, Integration Server uses a fixed name of `$rootArray` for the array value. The `$rootArray` field appears in the output pipeline of the service converting the JSON text to a Document (IData). When creating a JSON response, if the pipeline contains `$rootArray` with an array as its value, Integration Server discards the `$rootArray` name and transforms the array value into a JSON array. The resulting JSON text will contain only an unnamed array.
- If JSON text contains only a primitive type (string, number, boolean, or null) at root level, Integration Server uses a fixed name of `$rootValue` for the primitive value while converting it to IData.

The following table identifies how JSON text with a primitive type is converted to an IData in Integration Server:

JSON text

Generated IData

"just a simple string"

```
{
  $rootValue="just a simple string"
}
```

JSON text	Generated IData
3.14159	<pre>{ \$rootValue=3.14159 }</pre>
true	<pre>{\$rootValue=true}</pre>
null	<pre>{\$rootValue=null}</pre>
null	<pre>{}</pre>
	Empty IData (if <i>decodeNullRootAsEmpty</i> input parameter is set to true)

- With regards to using Integration Server data types with JSON, Integration Server supports only those types that can be mapped to a JSON value as defined in <https://tools.ietf.org/html/rfc7159#section-3>. Integration Server can take any valid arbitrary JSON text and convert it to an IData. Integration Server must be able to convert the resulting IData to JSON text that is identical to the original text. If Integration Server cannot do that for an Integration Server data type, then Integration Server does not support the use of that data type with JSON. For example, `com.wm.util.Table` is not supported for JSON even though it is supported for XML. Integration Server embeds additional type information in XML when converting IData to XML. However, Integration Server cannot embed the additional type information in JSON because the additional type information is treated as JSON text. The resulting JSON text would not match the original JSON text.
- An exception to the guideline that Integration Server must be able to convert the resulting IData to JSON text that is identical to the original text involves primitive JSON type `null`. If the JSON text is `null` and *decodeNullRootAsEmpty* is set to `true` in the service performing the conversion, JSON text of `null` will get converted to empty IData and an empty IData will get converted to `{}` JSON text.

Summary of Elements in This Folder

The following elements are available in this folder:

Element	Package and Description
pub.json:closeArrayIterator	WmPublic. Closes the iteration. The iterator object used in an iteration cannot be reused after this service runs.
pub.json:documentToJSONString	WmPublic. Converts a document (IData object) to a JSON string.
pub.json:getArrayIterator	WmPublic. Returns an <code>iterator</code> object to iterate over arrays in the input JSON stream.
pub.json:getNextBatch	WmPublic. Gets the next batch of array elements by parsing arrays in the iterator object returned by the <code>pub.json:getArrayIterator</code> service.

Element	Package and Description
pub.json:jsonStreamToDocument	WmPublic. Converts content from the JSON content stream to a document (an IData object).
pub.json:jsonStringToDocument	WmPublic. Converts a JSON string to a document (an IData object).
pub.json:jsonToDocument	WmPublic. Converts a JSON string or the content from a JSON content stream to a document (an IData object).
pub.json.schema:validate	WmPublic. Validates JSON content against a JSON document type.

pub.json:closeArrayIterator

WmPublic. Closes the iteration. The iterator object used in an iteration cannot be reused after this service runs.

Input Parameters

iterator **Object.** The iterator object returned by the `pub.json:getNextBatch` service.

Output Parameters

None.

pub.json:documentToJSONString

WmPublic. Converts a document (IData object) to a JSON string.

Input Parameters

document **Document.** The document (IData object) to be converted to a JSON string.

encodeDateAs **String.** Optional. Specifies how `java.util.Date` instances in the document are encoded in the returned JSON. Set to one of the following:

- `long` to encode `java.util.Date` instances as timestamps, specifically the number of milliseconds since Jan 1, 1970 00:00:00. The dates are encoded as JSON numbers.

- ISO8601 to encode `java.util.Date` instances as strings in a standard ISO format of: `YYYY-MM-DD'T'HH:mm:ss.sssZ`. The dates are encoded as JSON Strings.
- ISO_LOCAL_DATE to encode `java.util.Date` instances as strings in a standard ISO format without an offset. For example, `'2011-12-03'`. The dates are encoded as JSON Strings.
- ISO_DATE to encode `java.util.Date` instances as strings in a standard ISO format with the offset if available. For example, `'2011-12-03'` or `'2011-12-03+01:00'`. The dates are encoded as JSON Strings.
- ISO_ZONED_DATE_TIME to encode `java.util.Date` instances as strings in a standard ISO format with the offset and zone if available. For example, `'2011-12-03T10:15:30'`, `'2011-12-03T10:15:30+01:00'` or `'2011-12-03T10:15:30+01:00[Europe/Paris]'`. The dates are encoded as JSON Strings.
- ISO_INSTANT to encode `java.util.Date` instances as strings in a standard ISO format in UTC. For example, `'2011-12-03T10:15:30Z'`. The dates are encoded as JSON Strings.
- BASIC_ISO_DATE to encode `java.util.Date` instances as strings in a standard ISO format without an offset. For example, `'20111203'`. The dates are encoded as JSON Strings.
- RFC_1123_DATE_TIME to encode `java.util.Date` instances as strings in a standard ISO format. For example, `'Tue, 3 Jun 2008 11:05:30 GMT'`. The dates are encoded as JSON Strings.
- Custom format in which dates are encoded as strings in the supplied pattern. The pattern must adhere to the date and time patterns as described in the `java.text.SimpleDateFormat` class in the Oracle Java API documentation. The dates are encoded as JSON strings.
- `null` to use the `dateEncoding` setting already in effect for the HTTP client making the request, as follows:
 - If the HTTP client request includes `jsonDataEncoding=long` in the URL, then `java.util.Date` instances as timestamps, specifically the number of milliseconds since Jan 1, 1970 00:00:00. The dates are JSON numbers.

- If the HTTP client request includes `jsonDataEncoding=ISO8601` in the URL, the `java.util.Date` instances are encoded as strings in a standard ISO format of: `YYYY-MM-DD'T'HH:mm:ss.sssZ`. The dates are JSON Strings.
- If the HTTP client request includes `jsonDataEncoding=format` in the URL, the `java.util.Date` instances are encoded as strings in the supplied pattern. The pattern must adhere to the date and time patterns as described in the `java.text.SimpleDateFormat` class in the Oracle Java API documentation.
- If the HTTP client request does not include the `jsonDataEncoding` query parameter in the URL, the service uses the value of the `watt.server.json.encodeDateAs` parameter. For more information about `watt.server.json.encodeDataAs`, see *webMethods Integration Server Administrator's Guide*

encodeStringAsBoolean

Boolean. Optional. Valid values are true and false. The default value is false. Set to:

- `true`, to convert all the boolean values in the string format to Boolean by removing the quotes.
- `false`, to retain all the boolean values without converting.

encodeStringAsNumber

Boolean. Optional. Valid values are true and false. The default value is false. Set to:

- `true`, to convert all the numbers in the string format to numbers by removing the quotes.
- `false`, to retain all the numbers without converting.

jsonDocumentTypeName

String. Optional. If specified, the transformation from Document (IData) to JSON string is based on the JSON document type. Any deviations from the provided JSON document might cause transformation errors.

When this parameter is provided, Integration Server ignores the *encodeDateAs* parameter and the `watt.server.json.encodeDateAs` server configuration parameter.

This parameter must have the fully qualified name of a JSON document type on Integration Server against which the JSON content is validated. This parameter must be in the format: `<Folder Name>:<JSON Document Type Name>`

For example: `data:employeeData`

prettyPrint

String. Optional. Formats the *jsonString* output parameter for human readability by adding carriage returns and indentation to the JSON content. Set to:

- `true` to format *jsonString* output variable for human readability.
- `false` to leave the *jsonString* output variable in its unformatted state. The service will not add any additional carriage returns or indentation to the JSON content.
- `null` to use the `prettyPrint` setting already in effect for the HTTP client making the request, as follows:
 - If the HTTP client request includes `jsonPrettyPrint=true` in the URI, JSON pretty printing is in effect.
 - If the HTTP client request includes `jsonPrettyPrint=false` in the URI, JSON pretty printing is not in effect.
 - If the HTTP client request does not include the `jsonPrettyPrint` parameter, the service uses the value of the `watt.server.json.prettyPrint` configuration parameter. For more information about `watt.server.json.prettyPrint`, see *webMethods Integration Server Administrator's Guide*.

strict

String. Optional. Valid values are `true` and `false`. The default value is `false`.

The values of *strict* and *jsonDocumentTypeName* parameters together determine how Integration Server parses and converts Document (IData) to JSON string in the following manner:

- When *strict* is `false` and *jsonDocumentTypeName* is not specified, there is no change in the behavior.
- When *strict* is `false` and *jsonDocumentTypeName* is specified, the transformation from Document (IData) to JSON string is loosely based on the JSON document type. For conversion rules, see [Table 2: Conversion of IData to JSON String](#).
- When *strict* is `true` and *jsonDocumentTypeName* is not specified, the service returns an exception.
- When *strict* is `true` and *jsonDocumentTypeName* is specified, the transformation from Document (IData) to JSON string is strictly based on the JSON document type. The

validation is performed first before the transformation, and any deviations lead to transformation errors. The *encodeDateAs* parameter and the `watt.server.json.encodeDateAs` server configuration parameter, if specified, are ignored.

encodeListsAndSetsAsArrays

String. Optional. Specifies how the `pub.json:documentToJSONString` service encodes instances of `java.util.List` or `java.util.Set`. Set to:

- `true` to encode instances of `java.util.List` or `java.util.Set` as arrays.
- `false` to encode instances of `java.util.List` and `java.util.Set` as one String value.
- `<null>` to use the value of `watt.server.json.encodeListsAndSetsAsArrays` to determine the encoding.

There is no default value for this parameter.

Note:

The *encodeListsAndSetsAsArrays* input parameter is available after applying a fix that includes PIE-81364 (IS_10.15_Core_Fix9 and higher).

Output Parameters

jsonString

String. JSON string resulting from the conversion of *document*.

Usage Notes

To turn a document in a pipeline into a JSON response to send over HTTP, the application's service can:

1. Use `pub.json:documentToJSONString` to turn a document (IData object) in the pipeline into a string of JSON content.
2. Call `pub.client:http` to send the JSON string as an HTTP request.
3. Set the Content-Type header field to `application/json`.

When creating a JSON text with `pub.json:documentToJSONString`, if the *document* input parameter contains a *\$rootArray* key with an array as its value, Integration Server discards the *\$rootArray* name and transforms the array value into a JSON array. The resulting JSON text will contain only an unnamed array. *\$rootArray* and key/value pairs cannot both appear in the input *document*. *\$rootArray* indicates that the generated JSON text should consist only of an unnamed array. Combining this with additional key/value pairs leads to unpredictable results.

The JSON standard requires that field names be enclosed in double quotes. However, you may need the service to produce unquoted field names if the generated JSON text will be processed by an older JavaScript interpreter. The `watt.server.json.quoteFieldNames` server configuration parameter determines whether the `pub.json:documentToJSONString` service encloses all generated JSON field names in double quotes. Set this parameter to `true` instruct the `pub.json:documentToJSONString` service to enclose field names in quotes in the output JSON text. Set this parameter to `false` to instruct the service to omit the double quotes around field names in the generated JSON text. The default is `true`.

Note:

Use caution when setting `watt.server.json.quoteFieldNames` to `false` as this causes the `pub.json:documentToJSONString` service to generate non-standard JSON text. This can cause interoperability issues if the JSON text is sent to other organizations.

When `strict=true`, the validation of a JSON document against the JSON document type happens before transformation, and the validation exception, if any, contains the first error message, which is the result of the `pub.json.schema.validate` service execution. The validation errors from the `pub.json.schema.validate` service, if any, can be one or more in the service output. However, only the first error message is displayed in the `pub.json:documentToJSONString` service exception.

When you validate a JSON document against the JSON document type, the `format` property in the JSON document type is ignored during transformation. Therefore, the value passed is retained in the same format even after the successful transformation.

pub.json:getArrayIterator

WmPublic. Returns a batch `iterator` object.

Input Parameters

jsonStream **Object.** JSON content to be converted to a document (an `IData` object).

arrayPaths **String List.** The paths of the arrays to be parsed in the JSON input stream. Only the array elements from the paths mentioned in this parameter are considered even though the JSON stream might have more data. For example, to retrieve `toppingA1` from the following JSON content, provide the array path as `/topping/0/toppingA/0/toppingA1`.

```
"topping": [{
  "toppingA": [{
    "toppingA1": ["None71", "Glazed82"]
    ...
  }]}]
```

Note:

This parameter must have only array paths. You must not enter individual array elements or other fields.

Array paths must follow the JSON pointer syntax.

decodeRealAsDouble

String. Optional. Converts real numbers from *jsonStream* to either a Float or Double Java wrapper type. Set to:

- `true` to convert real numbers to Double Java wrapper type. This is the default.
- `false` to convert real numbers to Float Java wrapper type.

Note:

The *decodeRealAsDouble* parameter overrides the value specified by the `watt.server.json.decodeRealAsDouble` server configuration parameter. If no value is supplied for *decodeRealAsDouble*, Integration Server uses the value set for `watt.server.json.decodeRealAsDouble`. For more information about `watt.server.json.decodeRealAsDouble`, see *webMethods Integration Server Administrator's Guide*.

decodeIntegerAsLong

String. Optional. Converts integers from *jsonStream* to either a Long or Integer Java wrapper type. Set to:

- `true` to convert integers to Long Java wrapper types. This is the default.
- `false` to convert integers to Integer Java wrapper types.

Note:

The *decodeIntegerAsLong* parameter overrides the value specified by the `watt.server.json.decodeIntegerAsLong` server configuration parameter. If no value is supplied for *decodeIntegerAsLong*, Integration Server uses the value specified in the `watt.server.json.decodeIntegerAsLong` property. For more information about `watt.server.json.decodeIntegerAsLong`, see *webMethods Integration Server Administrator's Guide*.

decodeRealAsString

String. Optional. Converts real numbers in the *jsonStream* to String. Set to:

- `true` to convert real numbers to String.
- `false` to not convert real numbers to String. The real numbers are then converted to either Float or Double Java wrapper type depending on the value specified in *decodeRealAsDouble*. This is the default value.

Note:

The *decodeRealAsString* parameter overrides the value specified by the `watt.server.json.decodeRealAsString` server configuration parameter. If no value is supplied for *decodeRealAsString*, Integration Server uses the value set in

`watt.server.json.decodeRealAsString`. For more information about `watt.server.json.decodeRealAsString`, see *webMethods Integration Server Administrator's Guide*.

unescapeSpecialChars

String. Optional. Controls whether Integration Server unescapes the special characters `'\n'`, `'\r'`, `'\t'`, `'\b'`, `'\f'`, `'\'`, `'\"'` while parsing JSON documents. Set to:

- `true` to unescape these special characters (that is, `'\n'` will be replaced with new line, similarly other characters will also be replaced) in the output document. This is the default.
- `false` to keep these characters as is in the output document.

Note:

The *unescapeSpecialChars* parameter overrides the value specified by the `watt.server.json.decode.unescapeSpecialChars` server configuration parameter. If no value is supplied for *unescapeSpecialChars*, Integration Server uses the value specified in the `watt.server.json.decode.unescapeSpecialChars` parameter. For more information about `watt.server.json.decode.unescapeSpecialChars`, see *webMethods Integration Server Administrator's Guide*.

Output Parameters

iterator

Object. A batch *iterator* object that has the list of arrays to be parsed in the JSON input stream. This object is passed as input to the `pub.json:getNextBatch` service.

Usage Notes

None.

pub.json:getNextBatch

WmPublic. Gets the next batch of array elements by parsing the array paths in the *iterator* object returned by the `pub.json:getArrayIterator` service. This service returns the array elements in batches based on the batch size provided in the input. The batch size can vary across invocations of this service. A batch is a set of elements that can be retrieved from an array path at once, based on the batch size. To retrieve the remaining elements in the array path or elements from the next array path in the *iterator*, invoke the service in a loop until there are no more array paths to iterate.

Input Parameters

<i>iterator</i>	Object. The iterator object returned by the <code>pub.json:getArrayIterator</code> service.
<i>batchSize</i>	Object. Number of array elements that the service should retrieve in one batch.

Note:

This value must be lesser or equal to the value of the `watt.server.json.iterator.maxBatchSize` server configuration property. Similarly, it must be greater or equal to the value of the `watt.server.json.iterator.minBatchSize` server configuration property. Otherwise, the service throws an error.

Output Parameters

batch **Document.** IData object that contains the following keys.

<u>Key</u>	<u>Description</u>
<i>arrayPath</i>	String. The path of the array elements retrieved in a batch. Since the service can iterate over multiple arrays, each batch contains the array path parsed in current iteration to help you identify the array to which the elements in the batch belong.
<i>documents</i>	Document List. If array elements in the batch are JSON objects, they are returned as documents.
<i>values</i>	Object List. If array elements in the batch are not JSON objects, they are returned as values.

iterationStatus **Document.** IData object that contains the following keys.

<i>hasNext</i>	String. Indicates whether there are more array elements in the iterator beyond this batch, which the service can retrieve. The value can be <code>true</code> or <code>false</code> .
<i>iteration</i>	String. Indicates the current iteration. It starts from 1. If the service runs N times to get all the array elements, then this value is N.
<i>numberOfElementsInBatch</i>	String. Indicates the number of elements in the current batch. This value is same as <code>batchSize</code> .

However, this value can be less than the batch size for the last batch. For example, if there are 7 elements in an array and the batch size is 5, then the last batch will have only 2 elements.

totalElementsParsed

String. Indicates the number of array elements parsed until the current iteration. For example, if the number of elements parsed in the first iteration is 10, second iteration is 20, and third iteration is 7, then in the third iteration, the value of this parameter is 37.

Usage Notes

The `pub.json:getNextBatch` service completes the retrieval of elements from one array in the iterator and starts retrieving from the next array that matches in the subsequent iteration. This is explained in the following example:

Suppose you want the service to parse a JSON file with 2 arrays, for example, A and B with 6 and 2 elements each. Set the `batchSize` input parameter to 5 and invoke the service in a loop until the service returns the `hasNext` parameter as `false`. In the first batch of the output, the first 5 elements of the array A are returned and in the next batch, only the last element of the array A is returned, even though the batch size is 5. At this point, the `hasNext` parameter is `true` because array B is not parsed yet. In the next batch, the service returns both the elements of array B. Since there are no more elements left either in the array A or B, the `hasNext` parameter becomes `false`.

Guidelines

- If two array paths overlap, the path that the service finds first in the input JSON stream is parsed and the other path is ignored. If you provide `arrayPath[0]` as `/a/b` and `arrayPath[1]` as `/a/b/0/c` to parse the following array, `arrayPath[1]` is ignored as the paths overlap and the first path retrieves all elements.

```
{
  "a": {
    "b": [{
      "f1": "v1",
      "c": [1, 2, 3]
    }]
  }
}
```

- If an invalid array path is provided in the input, the `pub.json:getNextBatch` service does not return any result on parsing the array.
- If the `arrayPaths` input parameter is not set, then the `pub.json:getNextBatch` service parses the input considering that the input stream has a single anonymous array at the root level.
- If the `arrayPaths` input parameter is set, then it cannot contain null or empty elements.

- If one or more array paths are invalid, then the `pub.json:getArrayIterator` service still creates an iterator object containing these paths. However, the `pub.json:getNextBatch` service ignores the invalid paths.

If all the paths are invalid, the `pub.json:getNextBatch` service returns the `documents` and `values` parameters as `null`, the `hasNext` parameter as `false`, and all other output parameters as `0`.

pub.json:jsonStreamToDocument

`WmPublic`. Converts content from the JSON content stream to a document (an `IData` object). This service loads the whole JSON data into memory and then converts to an `IData` object.

Input Parameters

jsonStream **Object**. JSON content in an input stream to convert to a document (an `IData` object).

decodeRealAsDouble **String**. Optional. Converts real numbers from *jsonStream* to either a `Float` or `Double` Java wrapper type. Set to:

- `true` to convert real numbers to `Double` Java wrapper types. This is the default.
- `false` to convert real numbers to `Float` Java wrapper types.

Note:

The *decodeRealAsDouble* parameter overrides the value specified by the `watt.server.json.decodeRealAsDouble` server configuration parameter. If no value is supplied for *decodeRealAsDouble*, Integration Server uses the value set in `watt.server.json.decodeRealAsDouble`. For more information about `watt.server.json.decodeRealAsDouble`, see *webMethods Integration Server Administrator's Guide*.

decodeRealAsString **String**. Optional. Converts real numbers in the *jsonStream* to `String`. Set to:

- `true` to convert real numbers to `String`.
- `false` to not convert real numbers to `String`. The real numbers are then converted to either `Float` or `Double` Java wrapper type depending on the value specified in *decodeRealAsDouble*. This is the default.

Note:

The *decodeRealAsString* parameter overrides the value specified by the `watt.server.json.decodeRealAsString` server configuration parameter. If no value is supplied for *decodeRealAsString*, Integration Server uses the value set in `watt.server.json.decodeRealAsString`. For

more information about `watt.server.json.decodeRealAsString`, see *webMethods Integration Server Administrator's Guide*.

decodeIntegerAsLong

String. Optional. Converts integers from *jsonStream* to either a Long or Integer Java wrapper type. Set to:

- `true` to convert integers to Long Java wrapper types. This is the default.
- `false` to convert integers to Integer Java wrapper types.

Note:

The *decodeIntegerAsLong* parameter overrides the value specified by the `watt.server.json.decodeIntegerAsLong` server configuration parameter. If no value is supplied for *decodeIntegerAsLong*, Integration Server uses the value specified in the `watt.server.json.decodeIntegerAsLong` property. For more information about `watt.server.json.decodeIntegerAsLong`, see *webMethods Integration Server Administrator's Guide*.

decodeNullRootAsEmpty

String. Optional. Converts a null value that Integration Server retrieves from JSON content to either IData or empty IData. Set to:

- `true` to convert the null value to empty IData. The subsequent encoding of empty IData creates a JSON text of "{}". This JSON content is different from the original JSON content (null) as the original null value gets converted to JSON text of "{}".
- `false` to convert the null value to IData. This is the default.

jsonDocumentTypeName

String. Optional. If specified, the transformation from the JSON stream to Document (IData) is based on the JSON document type. Any deviations from the provided JSON document might cause transformation errors.

When this parameter is provided, Integration Server ignores the following parameters:

- *decodeRealAsDouble*
- *decodeIntegerAsLong*
- *decodeRealAsString*

and the following server configuration parameters:

- `watt.server.json.decodeIntegerAsLong`
- `watt.server.json.decodeRealAsDouble`
- `watt.server.json.decodeRealAsString`

This parameter must have the fully qualified name of a JSON document type on Integration Server against which the JSON content is validated. This parameter must be in the format: <Folder Name>:<JSON Document Type Name>

For example: data:employeeData

strict

String. Optional. Valid values are `true` and `false`. The default value is `false`.

The values of *strict* and *jsonDocumentTypeName* parameters together determine how Integration Server parses and converts JSON stream to Document (IData) in the following manner:

- When *strict* is `false` and *jsonDocumentTypeName* is not specified, there is no change in the behavior.
- When *strict* is `false` and *jsonDocumentTypeName* is specified, the transformation from JSON stream to Document (IData) is loosely based on the JSON document type. For conversion rules, see [Table 1: Conversion of JSON Payload to IData](#).
- When *strict* is `true` and *jsonDocumentTypeName* is not specified, the service returns an exception.
- When *strict* is `true` and *jsonDocumentTypeName* is specified, the transformation from JSON stream to Document (IData) is strictly based on the JSON document type. The validation is performed first before the transformation, and any deviations lead to transformation errors. The *decodeRealAsDouble*, *decodeIntegerAsLong*, and *decodeRealAsString* parameters and the server configuration parameters, if specified, are ignored.

unescapeSpecialChars

String. Optional. Controls whether Integration Server unescapes the special characters `'\n'`, `'\r'`, `'\t'`, `'\b'`, `'\f'`, `'\'`, `'\"'` while parsing JSON documents. Set to:

- `true` to unescape these special characters (that is, `'\n'` will be replaced with new line, similarly other characters will also be replaced) in the output document. This is the default.
- `false` to keep these characters as is in the output document.

Note:

The *unescapeSpecialChars* parameter overrides the value specified by the `watt.server.json.decode.unescapeSpecialChars` server configuration parameter. If no value is supplied for *unescapeSpecialChars*, Integration Server uses the value specified in the `watt.server.json.decode.unescapeSpecialChars` parameter. For more information about

watt.server.json.decode.unescapeSpecialChars, see *webMethods Integration Server Administrator's Guide*.

Output Parameters

document

Document. Document (IData object) resulting from the conversion of *jsonStream*.

Usage Notes

Software AG recommends that you use the `pub.json:jsonToDocument` service to convert JSON to a document (IData) instead of the `pub.json:jsonStringToDocument` or `pub.json:jsonStreamToDocument` services. The `pub.json:jsonToDocument` service simplifies conversion in favor of strings (by default) or as directed by a document type.

If `watt.server.http.jsonFormat` is set to `stream`, Integration Server places a *jsonStream* variable in the pipeline when it receives an HTTP request containing JSON content. You can then use `pub.json:jsonStreamToDocument` to parse *jsonStream* into pipeline variables. If `watt.server.http.jsonFormat` is set to `parsed`, which is the default, the JSON content handler parses the JSON content in the HTTP request automatically. In this case, the `pub.json:jsonStreamToDocument` does not need to be invoked. For more information about `watt.server.http.jsonFormat`, see *webMethods Integration Server Administrator's Guide*.

A JSON text may contain only an unnamed array. When parsing such a JSON text with `pub.json:jsonStreamToDocument`, Integration Server uses a fixed name of `$rootArray` for the array value. The `$rootArray` field appears in the *document* output parameter.

The JSON standard requires that field names be enclosed in double quotes. However, when parsing legacy JavaScript as JSON text it may be helpful to allow unquoted field names as JavaScript does not require field names to be enclosed in double quotes. The server configuration parameter `watt.server.json.allowUnquotedFieldNames` specifies whether or not unquoted field names are allowed in JSON text passed to the `pub.json:jsonStringToDocument` and `pub.json:jsonStreamToDocument` services. If this parameter is set to `true`, the `pub.json:jsonStringToDocument` and `pub.json:jsonStreamToDocument` services allow unquoted field names in any supplied JSON text. If this parameter is set to `false`, the services throw a `ServiceException` when encountering unquoted field names. The default is `false`.

If `decodeRealAsString` is set to `true` and `decodeRealAsDouble` is either set to `true` or left blank, an error message is displayed.

Set `decodeRealAsString` to `true` to prevent the conversion of real numbers to scientific notation.

When the *jsonString* input parameter containing duplicate keys is validated against the *jsonDocumentTypeName* with `strict` set to `true` in the `pub.json:jsonStringToDocument` service, the transformation might fail even when the `pub.json.schema:validate` service successfully validates the same *jsonString*.

When `strict=true`, the validation of a JSON document against the JSON document type happens before transformation, and the validation exception, if any, contains the first error message, which is the result of the `pub.json.schema.validate` service execution. The validation errors from the `pub.json.schema.validate` service, if any, can be one or more in the service output. However, only the first error message is displayed in the `pub.json.jsonStreamToDocument` service exception.

When you validate a JSON document against the JSON document type, the `format` property in the JSON document type is ignored during transformation. Therefore, the value passed is retained in the same format even after the successful transformation.

Important:

Since this service loads the whole JSON data into memory and then converts it to an `IData` object, it is not meant to process large JSON files (for example, 50GB or more). Large JSON files can be processed in fixed-size logical chunks using the `pub.json:getArrayIterator`, `pub.json:getNextBatch` and the `pub.json:closeArrayIterator` public services together.

pub.json:jsonStringToDocument

`WmPublic`. Converts a JSON string to a document (an `IData` object).

Input Parameters

jsonString **String**. JSON content in a string to convert to a document (`IData` object).

decodeRealAsDouble **String**. Optional. Converts real numbers from *jsonString* to either a `Float` or `Double` Java wrapper type. Set to:

- `true` to convert real numbers to `Double` Java wrapper types. This is the default.
- `false` to convert real numbers to `Float` Java wrapper types.

Note:

The *decodeRealAsDouble* parameter overrides the value specified by the `watt.server.json.decodeRealAsDouble` server configuration parameter. If no value is supplied for *decodeRealAsDouble*, Integration Server uses the value set in `watt.server.json.decodeRealAsDouble`. For more information about `watt.server.json.decodeRealAsDouble`, see *webMethods Integration Server Administrator's Guide*.

decodeRealAsString **String**. Optional. Converts real numbers in the *jsonStream* to `String`. Set to:

- `true` to convert real numbers to `String`.
- `false` to not convert real numbers to `String`. The real numbers are then converted to either `Float` or `Double` Java wrapper type depending on the values specified in *decodeRealAsDouble*. This is the default.

Note:

The *decodeRealAsString* parameter overrides the value specified by the `watt.server.json.decodeRealAsString` server configuration parameter. If no value is supplied for *decodeRealAsString*, Integration Server uses the value set in `watt.server.json.decodeRealAsString`. For more information about `watt.server.json.decodeRealAsString`, see *webMethods Integration Server Administrator's Guide*.

decodeIntegerAsLong

String. Optional. Converts integers from *jsonString* to either a Long or Integer Java wrapper type. Set to:

- `true` to convert integers to Long Java wrapper types. This is the default.
- `false` to convert integers to Integer Java wrapper types.

Note:

The *decodeRealAsDouble* parameter overrides the value specified by the `watt.server.json.decodeIntegerAsLong` server configuration parameter. If no value is supplied for *decodeIntegerAsLong*, Integration Server uses the value specified in the `watt.server.json.decodeIntegerAsLong` property. For more information about `watt.server.json.decodeIntegerAsLong`, see *webMethods Integration Server Administrator's Guide*.

decodeNullRootAsEmpty

String. Optional. Converts a null value that Integration Server retrieves from JSON content to either IData or empty IData. Set to:

- `true` to convert the null value to empty IData. The subsequent encoding of empty IData creates a JSON text of "{}". This JSON content is different from the original JSON content (null) as the original null value gets converted to JSON text of "{}".
- `false` to convert the null value to IData. This is the default.

jsonDocumentTypeName

String. Optional. If specified, the transformation from JSON string to Document (IData) is based on the JSON document type. Any deviations from the provided JSON document might cause transformation errors.

When this parameter is provided, Integration Server ignores the following parameters:

- *decodeRealAsDouble*
- *decodeIntegerAsLong*
- *decodeRealAsString*

and the following server configuration parameters:

- `watt.server.json.decodeIntegerAsLong`

- `watt.server.json.decodeRealAsDouble`
- `watt.server.json.decodeRealAsString`

This parameter must have the fully qualified name of a JSON document type on Integration Server against which the JSON content is validated. This parameter must be in the format: <Folder Name>:<JSON Document Type Name>

For example: `data:employeeData`

strict

String. Optional. Valid values are `true` and `false`. The default value is `false`.

The values of *strict* and *jsonDocumentTypeName* parameters together determine how Integration Server parses and converts JSON string to Document (IData) in the following manner:

- When *strict* is `false` and *jsonDocumentTypeName* is not specified, there is no change in the behavior.
- When *strict* is `false` and *jsonDocumentTypeName* is specified, the transformation from JSON string to Document (IData) is loosely based on the JSON document type. For conversion rules, see: [Table 1: Conversion of JSON Payload to IData](#).
- When *strict* is `true` and *jsonDocumentTypeName* is not specified, the service returns an exception.
- When *strict* is `true` and *jsonDocumentTypeName* is specified, the transformation from JSON string to Document (IData) is strictly based on the JSON document type. The validation is performed first before the transformation, and any deviations lead to transformation errors. The *decodeRealAsDouble*, *decodeIntegerAsLong*, and *decodeRealAsString* parameters and the server configuration parameters, if specified, are ignored.

unescapeSpecialChars

String. Optional. Controls whether Integration Server unescapes the special characters `'\n'`, `'\r'`, `'\t'`, `'\b'`, `'\f'`, `'\'`, `'\"'` while parsing JSON documents. Set to:

- `true` to unescape these special characters (that is, `'\n'` will be replaced with new line, similarly other characters will also be replaced) in the output document. This is the default.
- `false` to keep these characters as is in the output document.

Note:

The *unescapeSpecialChars* parameter overrides the value specified by the `watt.server.json.decode.unescapeSpecialChars` server configuration parameter. If no value is supplied for *unescapeSpecialChars*, Integration Server uses the value specified in

the `watt.server.json.decode.unescapeSpecialChars` parameter. For more information about `watt.server.json.decode.unescapeSpecialChars`, see *webMethods Integration Server Administrator's Guide*.

Output Parameters

document

Document. Document (IData object) resulting from the conversion of *jsonString*.

Usage Notes

Software AG recommends that you use the `pub.json:jsonToDocument` service to convert JSON to a document (IData) instead of the `pub.json:jsonStringToDocument` or `pub.json:jsonStreamToDocument` services. The `pub.json:jsonToDocument` service simplifies conversion in favor of strings (by default) or as directed by a document type.

A JSON text may contain only an unnamed array. When parsing such a JSON text with `pub.json:jsonStringToDocument`, Integration Server uses a fixed name of `$rootArray` for the array value. The `$rootArray` field appears in the *document* output parameter.

The JSON standard requires that field names be enclosed in double quotes. However, when parsing legacy JavaScript as JSON text it may be helpful to allow unquoted field names as JavaScript does not require field names to be enclosed in double quotes. The server configuration parameter `watt.server.json.allowUnquotedFieldNames` specifies whether or not unquoted field names are allowed in JSON text passed to the `pub.json:jsonStringToDocument` and `pub.json:jsonStreamToDocument` services. If this parameter is set to `true`, the `pub.json:jsonStringToDocument` and `pub.json:jsonStreamToDocument` services allow unquoted field names in any supplied JSON text. If this parameter is set to `false`, the services throw a `ServiceException` when encountering unquoted field names. The default is `false`.

If `decodeRealAsString` is set to `true` and `decodeRealAsDouble` is either set to `true` or left blank, an error message is displayed.

Set `decodeRealAsString` to `true` to prevent the conversion of real numbers to scientific notation.

When the *jsonString* input parameter containing duplicate keys is validated against the *jsonDocumentTypeName* with `strict` set to `true` in the `pub.json:jsonStringToDocument` service, the transformation might fail even when the `pub.json.schema:validate` service successfully validates the same *jsonString*.

When `strict=true`, the validation of a JSON document against the JSON document type happens before transformation, and the validation exception, if any, contains the first error message, which is the result of the `pub.json.schema:validate` service execution. The validation errors from the `pub.json.schema:validate` service, if any, can be one or more in the service output. However, only the first error message is displayed in the `pub.json:jsonStringToDocument` service exception.

When you validate a JSON document against the JSON document type, the `format` property in the JSON document type is ignored during transformation. Therefore, the value passed is retained in the same format even after the successful transformation.

pub.json:jsonToDocument

WmPublic. Converts a JSON string or the content from a JSON content stream to a document (an IData object). The service gives an option to select the data type to which you want to convert an integer, a decimal, or a boolean value in the JSON data.

Input Parameters

<i>jsonData</i>	Object. JSON content in a string or an input stream to convert to a document (IData object).
<i>documentTypeName</i>	String. Optional. If specified, the transformation from the JSON data to Document (IData) is based on the document type. Any deviations from the provided document result in errors. <i>documentTypeName</i> accepts all kinds of document types.

When this parameter is provided, Integration Server ignores the following parameters:

- *decodeIntegerAs*
- *decodeDecimalAs*
- *decodeBooleanAs*

This parameter must have the fully qualified name of the document type against which the JSON content is validated.

For example: `data:employeeData`

<i>decodeIntegerAs</i>	String. Optional. Converts all the integer values in <i>jsonData</i> to either String, Integer, Long, or BigInteger Java wrapper type. Depending on the data type to which you want to convert the integer values in <i>jsonData</i> , set to:
------------------------	---

- String to convert all the integer values to String. This is the default.
- Integer to convert all the integer values to Integer.
- Long to convert all the integer values to Long.
- BigInteger to convert all the integer values to BigInteger.
- Auto to check the Java wrapper type range in which the input value fits and convert the value to the appropriate wrapper type.

If there is no user selection and *documentTypeName* is not specified, then by default, converts the value to String.

Note:

If you select the datatype as Integer and the JSON data contains a value outside the range of Integer, the service fails with an error.

*decodeDecimalAs***String.** Optional.

Converts all the decimal values in *jsonData* to either String, Float, Double, or BigDecimal Java wrapper type.

Depending on the data type to which you want to convert the decimal values in *jsonData*, set to:

- `String` to convert all the decimal values to String. This is the default.
- `Float` to convert all the decimal values to Float.
- `Double` to convert all the decimal values to Double.
- `BigDecimal` to convert all the decimal values to BigDecimal.
- `Auto` to check the Java wrapper type range in which the input value fits and convert the value to the appropriate wrapper type.

If there is no user selection and *documentTypeName* is not specified, then by default, converts the value to String.

Note:

If you select the datatype as Float and the JSON data contains a value outside the range of Float, the service fails with an error.

*decodeBooleanAs***String** Optional.

Converts all the boolean values in *jsonData* to String or Boolean.

Depending on the value of the variable in *jsonData*, set to:

- `String` to convert all the boolean values to String. This is the default.
- `Boolean` to convert all the boolean values to Boolean.

If there is no user selection and *documentTypeName* is not specified, then by default converts the value to String.

decodeNullRootAsEmpty

String. Optional. Converts a null value at the root that Integration Server retrieves from JSON content to IData. Depending on the data type to which you want to convert the null values in *jsonData*, set to:

- `true` to convert the null value in the JSON data to an empty IData.
- `false` to convert the null value in the JSON data to an IData with `$rootValue`. This is the default.

unescapeSpecialChars **String**. Optional. Controls whether Integration Server unescapes the special characters '\n', '\r', '\t', '\b', '\f', '\\', '\"' while parsing JSON documents. Set to:

- `true` to unescape these special characters (for example, '\n' is replaced with new line; similarly, other characters are also replaced) in the output document. This is the default.
- `false` to keep these characters as is in the output document.

The behavior applies to both values and keys.

Note:

The *unescapeSpecialChars* parameter overrides the value specified by the `watt.server.json.decode.unescapeSpecialChars` server configuration parameter. If no value is supplied for *unescapeSpecialChars*, Integration Server uses the value specified in the `watt.server.json.decode.unescapeSpecialChars` parameter. For more information about `watt.server.json.decode.unescapeSpecialChars`, see *webMethods Integration Server Administrator's Guide*.

Output Parameters

document **Document**. Document (IData object) resulting from the conversion of *jsonData*.

Usage Notes

Software AG recommends that you use the `pub.json:jsonToDocument` service to convert JSON to a document (IData) instead of the `pub.json:jsonStringToDocument` or `pub.json:jsonStreamToDocument` services. The `pub.json:jsonToDocument` service simplifies conversion in favor of strings (by default) or as directed by a document type.

This service ignores the following server configuration parameters set for the JSON data:

- `watt.server.json.decodeRealAsDouble`
- `watt.server.json.decodeRealAsString`
- `watt.server.json.decodeIntegerAsLong`

Consider the following points while using this service:

- If the input includes characters from other languages, set the encoding parameter appropriately before adding it as the JSON data. For example, use `pub.string:bytesToString` to decode the byte to the correct string format. Then, add the decoded data in the JSON data.
- The transformation from the JSON data to Document (IData) is strictly based on the document type. Hence, deviations result in an error. For example, if *documentTypeName* has a string variable and the JSON data contains an integer value, the service throws an exception.

- If the JSON data contains an exponential value and *documentTypeName* is not specified, the service considers the value as a decimal value.

If the JSON data contains an exponential value and *documentTypeName* is specified, the service maps the value to either Integer, Long, BigInteger, Float, Double, or BigDecimal Java wrapper type based on the user selection.

- If you pass JSON data with an array at the root and *documentTypeName* is specified, the service throws an exception.
- If you assign a bigger number with more than 10 digits to a BigDecimal value in the document, the service automatically converts the number to the exponential form.
- Following are the supported date format examples:
 - 2010-10-10T10:00:00
 - 2002-10-09T04:00:00Z
 - 2018-01-01T00:00:00.000000Z
 - PT13H20M0S
 - 2021-02-16T01:47:44.000-05:00
 - 2020-07-01T00:00:00-06:00
 - 2014-08-14T05:41:49.1686804+00:00
- If *documentTypeName* is specified, and it has multiple variables with same name, the service selects the first suitable match in the document. If there are no matches, the service ignores the duplicate variables. See the following table for examples:

Input	DocumentTypeName	Output
{"age" : "12345"}	<ul style="list-style-type: none"> ■ age: Integer ■ age: Long ■ age: BigInteger 	Empty document (As there are no matches, the service ignores the input variable and generates an empty document.)
{"updatedDate" : "22/01/01" }	<ul style="list-style-type: none"> ■ updatedDate: String ■ updatedDate: Date 	String (Selects the first suitable match.)
{"number": [12 , 22 ,23]}	<ul style="list-style-type: none"> ■ number: Integer array ■ number: String array ■ number: Object array 	Integer array

- If the JSON data contains duplicate variables and *documentTypeName* is specified, the service throws an exception.

- If the document type contains the following variables, the service ignores the values for such variables:
 - `byte []`
 - `com.wm.util.XOPObject`
 - `java.lang.Byte`
- If the JSON data contains a multi-dimensional array with a data type other than `String`, then the service converts the input into an object array. You can create a Java service to decode the object array.

If the JSON data contains a multi-dimensional array with the data type as `String`, the service converts the input into `String table`.
- For a document variable, if you set the "Allow unspecified fields" property to `true`, the service considers the unspecified keys in the JSON data and transforms the input value based on `decodeIntegerAs`, `decodeDecimalAs`, or `decodeBooleanAs`. If set to `false`, the service ignores the unspecified key in the JSON data.
- Following are the minimum and maximum values for different data types:
 - Short: -32768 to 32767
 - Integer: -2147483648 to 2147483647
 - Long: -9223372036854775808 to 9223372036854775807
 - Float: -3.402823466 E + 38 to 3.402823466 E + 38
 - Double: -1.7976931348623158 E + 308 to 1.7976931348623158 E + 308

pub.json.schema:validate

WmPublic. Validates JSON content against a JSON document type.

Input Parameters

<i>jsonString</i>	String. Optional. JSON content for validation in a <code>String</code> . If you specify the value of this parameter, you need not specify <i>jsonStream</i> or <i>jsonDocument</i> .
<i>jsonStream</i>	java.io.InputStream. Optional. JSON content for validation in an input stream. If you specify the value of this parameter, you need not specify <i>jsonString</i> or <i>jsonDocument</i> .
<i>jsonDocument</i>	Document. Optional. JSON content for validation in a document (<code>IData</code> object). If you specify the value of this parameter, you need not specify <i>jsonString</i> or <i>jsonStream</i> .

<i>streamEncoding</i>	String. Optional. Character encoding that applies to <i>jsonStream</i> . The default is UTF-8.
<i>conformsTo</i>	String Fully qualified name of a JSON document type on Integration Server against which the JSON content will be validated.

Output Parameters

<i>isValid</i>	String. Flag that indicates whether or not validation was successful. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that validation was successful.■ <code>false</code> indicates that validation was unsuccessful.
<i>errors</i>	Document List. Conditional. Returned only when errors are encountered during validation.

Each document contains the following information:

Key	Description
<i>code</i>	String Error code (for example, JSV-001).
<i>message</i>	String Error message (for example, JSON schema validation failed).
<i>path</i>	String Location of the error.

Usage Notes

The JSON standard requires that field names be enclosed in double quotes. The `pub.json.schema.validate` service accepts input JSON content according to the JSON standard and treats field names not enclosed in double quotes (including unquoted field names) as invalid.

If the provided JSON input is invalid, then `pub.json.schema.validate` throws a `ServiceException`.

Specify only one of *jsonString*, *jsonStream*, or *jsonDocument*. If you specify more than one of these parameters, then `pub.json.schema.validate` considers only the first of the specified values for validation in the following order: *jsonString*, *jsonStream*, *jsonDocument*.

If you do not specify any JSON content for validation or the JSON schema file, then `pub.json.schema.validate` throws a `ServiceException`.

Table1: Conversion of JSON Payload to IData

JSON Payload	JSON Doctype								
	Object	Array(Objects)	String	Array(String)	Array(BigDecimal)/ Array(Integer)	java.math.BigDecimal	java.lang.Integer	java.lang.Boolean	Null
Object	✓	✗	✗	✗	✗	✗	✗	✗	✗
Array(Objects)	✗	✓	✗	✗	✗	✗	✗	✗	✗
String	✗	✗	✓	✗	✗	✓i	✓i	✓	✓
Array(String)	✗	✗	✗	✓	✗	✗	✗	✗	✗
Array(BigDecimal)/ Array(Integer)	✗	✗	✗	✗	✓	✗	✗	✗	✗
Number	✗	✗	✓i	✗	✗	✓	✓i	✓	✓
Integer	✗	✗	✓i	✗	✗	✓i	✓	✓	✓
Boolean	✗	✗	✓i	✗	✗	✗	✗	✓	✓
Null	✗	✗	✗	✗	✗	✗	✗	✓	✓

where ✓ = Valid, ✗ = Invalid, ✓i = Valid subject to - no runtime exceptions and loss of precision in case of math based conversions.

Table 2: Conversion of IData to JSON Payload

IData	JSON Doctype								
	Object	Array(Objects)	String	Array(String)	java.math.BigDecimal	java.lang.Integer	java.lang.Boolean	Null	
Document	✓	✗	✗	✗	✗	✗	✗	✗	✓
Document[]	✗	✓	✗	✗	✗	✗	✗	✗	✗
String	✗	✗	✓	✗	✗	✗	✓i	✓	
String[]	✗	✗	✗	✓	✗	✗	✗	✗	✗
Object[]	✗	✓	✗	✗	✗	✗	✗	✗	✗
Object(UNKNOWN)	✓	✗	✗	✗	✗	✗	✗	✗	✓
Object(java.lang.Short)	✗	✗	✓i	✗	✓	✓	✗	✓	
Object(java.lang.Long)	✗	✗	✓i	✗	✓	✓i	✗	✓	
Object(java.lang.Double)	✗	✗	✓i	✗	✓	✓i	✗	✓	
Object(java.lang.Integer)	✗	✗	✓i	✗	✓	✓	✗	✓	
Object(java.lang.Float)	✗	✗	✓i	✗	✓	✓i	✗	✓	
Object(java.lang.Boolean)	✗	✗	✓i	✗	✗	✗	✓	✓	
Object(java.math.BigInteger)	✗	✗	✓i	✗	✓	✓	✗	✓	
Object(java.math.BigDecimal)	✗	✗	✓i	✗	✓	✓i	✗	✓	

where ✓ = Valid, ✗ = Invalid, ✓i = Valid subject to - no runtime exceptions and loss of precision in case of math based conversions.

22 JWT Folder

■ Summary of Elements in This Folder	532
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JSON Web Token (JWT) is an open standard (RFC 7519) that defines a compact and self-contained way for securely exchanging information as a JSON object between parties.

Summary of Elements in This Folder

The following elements are available in this folder:

Element	Package and Description
pub.jwt:extractClaimsFromJWT	WmPublic. Returns specific claim details that you want to extract from a JWT.
pub.jwt:generateSignedJWT	WmPublic. Generates a signed JWT.
pub.jwt:verifyJWT	WmPublic. Verifies the signature in a JWT, the token expiration time, and the not-before time.

pub.jwt:extractClaimsFromJWT

WmPublic. This service returns specific claim details that you want to extract from a JWT. You can request a specific claim using the input parameter *claims*.

Input Parameters

<i>jwt</i>	String . The token from which you want to extract claims.
<i>truststoreAlias</i>	String . Optional. Alias of the truststore that contains the list of certificates, which Integration Server uses to verify the JWT before extracting the claims.
<i>certAlias</i>	String . Optional. Alias that identifies a trusted certificate within a truststore.
<i>claims</i>	String[] . List of claims to be extracted.

Output Parameters

<i>message</i>	String . Indicates whether the claims are successfully extracted or not. A success message or an error message followed by the details of claims extracted are displayed.
<i>claimsDetails</i>	Document List . The service returns an array or a list of name and value pairs for each claim.

Usage Notes

If you specify the *truststoreAlias* and *certAlias* input parameters, then the JWT verification is based on these inputs. Therefore, the issuer-certificate mapping in Integration Server Administrator, if any, is ignored.

If you do not specify the *truststoreAlias* and *certAlias* input parameters, then the JWT verification is based on the public key that you can get from the existing issuer-certificate mapping in Integration Server Administrator.

If you do not specify the *truststoreAlias* and *certAlias* input parameters, and an issuer-certificate mapping is not available in Integration Server Administrator, then the service returns an exception.

When the service parses a JWT that contains a number, the output of this service can be any of the subtypes of a number that best fits the value. For example: If the number fits an integer, then integer is returned.

If the token has numbers with values greater than 1e308, then the results are unpredictable.

pub:jwt:generateSignedJWT

WmPublic. Generates a signed JWT from Integration Server.

Input Parameters

<i>algorithm</i>	String. The cryptographic algorithm used to sign a JWT. Supported algorithms are: <ul style="list-style-type: none"> ■ RS512 ■ RS384 ■ RS256
<i>keyStoreAlias</i>	String. Alias of the keystore containing private key required to sign a JWT.
<i>keyAlias</i>	String. Alias of the private key used to sign a JWT.
<i>allowWeakKey</i>	Boolean. Indicates whether an RSA key shorter than 2048 bits in a cryptographic algorithm is allowed or not. A value of: <ul style="list-style-type: none"> ■ <code>true</code> allows an RSA key shorter than 2048 bits in a cryptographic algorithm. ■ <code>false</code> does not allow an RSA key shorter than 2048 bits in a cryptographic algorithm. This is the default.
<i>subject</i>	String. Optional. Identifies the principal, which is the subject of the JWT.
<i>issuer</i>	String. Optional. Specifies the name of the JWT token issuer.

<i>audience</i>	String[] . Optional. Specifies the intended recipients of the token.
<i>expirationTime</i>	String . Optional. Identifies the time on or after which the JWT must not be accepted for processing. The expiration date or time must be equal to or later than the current date or time. The required date format is "dd/MM/yyyy HH:mm:ss".
<i>notBeforeTime</i>	String . Optional. Identifies the time before which the JWT must not be accepted for processing. The not-before date or time must be equal to or earlier than the current date or time. The required date format is "dd/MM/yyyy HH:mm:ss".
<i>addIssuedAtTimeClaim</i>	Boolean . Indicates whether issuedAtTime (iat) claim is added to the generated signed JWT or not. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that the issuedAtTime (iat) claim is added to the generated signed JWT.■ <code>false</code> indicates that the issuedAtTime (iat) claim is not added to the generated signed JWT. This is the default.
<i>jwtId</i>	String . Optional. A unique identifier for the JWT. The value is a case-sensitive string.
<i>customClaims</i>	Document List . Optional. A list of custom claims. Each claim has 3 parts: "name", "value", and "type".

Key	Description
<i>name</i>	String . Name of the claim.
<i>value</i>	String[] . The array to provide one or more values for a custom claim.
<i>type</i>	String . Any valid JSON data type except <code>null</code> . Supported valid JSON data types are: <ul style="list-style-type: none">■ String■ Boolean■ Number■ JSONArray■ JSONObject

Output Parameters

jwt **String**. Signed JWT.

Usage Notes

The *customClaims* parameter in this service accepts only valid JSON data types such as String, Boolean, Number, JSONArray, and JSONObject except `null`.

If you provide duplicate claim names to the *customClaims* parameter, then the values corresponding to the latest duplicate claim name are used to generate the JWT.

If you want to specify *jwtId* manually, you can use the `pub.utils:generateUUID` public service to generate a random Universally Unique Identifier (UUID) and map it to *jwtId*.

If the token has numbers with values greater than $1e308$, then the results are unpredictable.

If you specify a custom claim with empty or a `null` value, then such claims will be absent in the generated JWT.

You can provide one or more inputs to the "value" field in *customClaims*. The output is displayed as an array. For example, custom claim "Address" can have multiple values, then the output for this claim is displayed as an array. For example:

<ul style="list-style-type: none"> ▼ <input type="checkbox"/> customClaims ▼ <input type="checkbox"/> customClaims[0] <ul style="list-style-type: none"> <input type="checkbox"/> name EmployeeName ▼ <input type="checkbox"/> value <ul style="list-style-type: none"> <input type="checkbox"/> value[0] Deepti <input type="checkbox"/> type String ▼ <input type="checkbox"/> customClaims[1] <ul style="list-style-type: none"> <input type="checkbox"/> name EmployeeNumber ▼ <input type="checkbox"/> value <ul style="list-style-type: none"> <input type="checkbox"/> value[0] 1234 <input type="checkbox"/> type Number ▼ <input type="checkbox"/> customClaims[2] <ul style="list-style-type: none"> <input type="checkbox"/> name Address ▼ <input type="checkbox"/> value <ul style="list-style-type: none"> <input type="checkbox"/> value[0] Bangalore <input type="checkbox"/> value[1] Mangalore <input type="checkbox"/> type String ▼ <input type="checkbox"/> customClaims[3] <ul style="list-style-type: none"> <input type="checkbox"/> name JSONArrayExample ▼ <input type="checkbox"/> value <ul style="list-style-type: none"> <input type="checkbox"/> value[0] ["London","Switzerland",1234,true] <input type="checkbox"/> type JSONArray ▼ <input type="checkbox"/> customClaims[4] <ul style="list-style-type: none"> <input type="checkbox"/> name JSONObjectExample ▼ <input type="checkbox"/> value <ul style="list-style-type: none"> <input type="checkbox"/> value[0] {"name": "Admin","age": 36,"rights": ["admin", "editor", "contributor"]} <input type="checkbox"/> type JSONObject 	
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pub:jwt:verifyJWT

WmPublic. Verifies the signature in a JWT, the token expiration time, and the not-before time.

The *expirationTime* identifies the time, on or after which the JWT is not accepted for processing. The expiration date or time must be equal or later than to the current date or time.

The *notBeforeTime* identifies the time before which the JWT is not accepted for processing. The not-before date or time must be equal to or earlier than the current date or time.

Input Parameters

<i>jwt</i>	String. The token to be verified.
<i>truststoreAlias</i>	String. Optional. Alias of the truststore that contains the list of certificates, which Integration Server uses to verify the JWT.
<i>certAlias</i>	String. Optional. Alias that identifies a particular trusted certificate within a truststore.

Output Parameters

isJWTverified **Boolean.** Indicates whether the JWT is verified or not. A value of:

- `true` indicates that the JWT is verified.
- `false` indicates that the JWT is not verified.

message **String.** Success message if verified or a failed message with reason.

Usage Notes

If you specify the *truststoreAlias* and *certAlias* input parameters, the JWT verification is based on these inputs. Therefore, the issuer-certificate mapping in Integration Server Administrator, if any, is ignored.

If you do not specify the *truststoreAlias* and *certAlias* input parameters, the JWT verification is then based on the public key that you can get from the existing issuer-certificate mapping in Integration Server Administrator.

If you do not specify the *truststoreAlias* and *certAlias* input parameters, and an issuer-certificate mapping is not available in Integration Server Administrator, then the service returns an exception.

23 List Folder

■ Summary of Elements in this Folder	538
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You use the elements in the list folder to retrieve, replace, or add elements in an Object List, Document List, String List, or Vector. You also use list services to convert String Lists to Document Lists or a Vector to an Array.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.list:addItemToVector	WmPublic. Adds an item or a list of items to a java.util.Vector object.
pub.list:appendToDocumentList	WmPublic. Adds documents to a document list.
pub.list:appendToStringList	WmPublic. Adds Strings to a String list.
pub.list:sizeOfList	WmPublic. Returns the number of elements in a list.
pub.list:stringListToDocumentList	WmPublic. Converts a String list to a document list.
pub.list:vectorToArray	WmPublic. Converts a java.util.Vector object to an array.

pub.list:addItemToVector

WmPublic. Adds an item or a list of items to a java.util.Vector object.

Input Parameters

vector **java.util.Vector** Optional. The vector object to which you want to add an item or list of items. If no value is specified, the service creates a new java.util.Vector object to which the item(s) will be added.

item **Object** Optional. Item to be added to the vector object.

Note:

You can use either *item* or *itemList* to specify the input object. If both *item* and *itemList* input parameters are specified, the item as well as the list of items will be added to the vector object.

itemList **Object[]** Optional. List of items to be added to the vector object.

addNulls **String** Optional. Specifies whether a null item can be added to the vector object. Set to:

- `false` to prevent null values from being added to the vector object. This is the default.
- `true` to allow null values to be added to the vector object.

Output Parameters

vector **java.util.Vector** Updated vector object with the list of items added or an empty vector in case no items are added.

Usage Notes

Either of the optional input parameters, *item* or *itemList*, is required.

pub.list:appendToDocumentList

WmPublic. Adds documents to a document list.

Input Parameters

toList **Document List** Optional. List to which you want to append documents. If you do not specify *toList*, the service creates a new list.

fromList **Document List** Optional. Documents you want to append to the end of *toList*.

fromItem **Document** Optional. Document you want to append to the end of *toList*. If you specify both *fromList* and *fromItem*, the service adds the document specified in *fromItem* after the documents in *fromList*.

Output Parameters

toList **Document List** The *toList* document list with the documents in *fromList* and *fromItem* appended to it.

Usage Notes

The documents contained in *fromList* and *fromItem* are not actually appended as entries to *toList*. Instead, references to the documents in *fromList* and *fromItem* are appended as entries to *toList*. Consequently, any changes made to the documents in *fromList* and *fromItem* also affect the resulting *toList*.

pub.list:appendToStringList

WmPublic. Adds Strings to a String list.

Input Parameters

<i>toList</i>	String List Optional. List to which you want to append Strings. If the value of <i>toList</i> is null, a null pointer exception error is thrown. If you do not specify <i>toList</i> , the service creates a new list.
<i>fromList</i>	String List Optional. List of Strings to add to <i>toList</i> . Strings are added after the entries of <i>toList</i> .
<i>fromItem</i>	String Optional. String you want to append to the end of <i>toList</i> . If you specify both <i>fromList</i> and <i>fromItem</i> , the service adds the String specified in <i>fromItem</i> after the Strings specified in <i>fromList</i> .

Output Parameters

<i>toList</i>	String List The <i>toList</i> String list with the Strings from <i>fromList</i> and <i>fromItem</i> appended to it.
---------------	--

Usage Notes

The Strings contained in *fromList* and *fromItem* are not actually appended as entries to *toList*. Instead, references to the Strings in *fromList* and *fromItem* are appended as entries to *toList*. Consequently, any changes made to the Strings in *fromList* and *fromItem* also affect the resulting *toList*.

pub.list:sizeofList

WmPublic. Returns the number of elements in a list.

Input Parameters

<i>fromList</i>	Document List, String List, or Object List Optional. List whose size you want to discover. If <i>fromList</i> is not specified, the service returns a <i>size</i> of 0.
-----------------	--

Output Parameters

<i>size</i>	String Number of entries in <i>fromList</i> .
<i>fromList</i>	Document List, String List, or Object List Original list.

Usage Notes

For example, if *fromList* consists of:

```
fromList[0] = "a"
```

```
fromList[1] = "b"
```

```
fromList[2] = "c"
```

The result would be:

```
size="3"
```

pub.list:stringListToDocumentList

WmPublic. Converts a String list to a document list.

Input Parameters

fromList **String List** Optional. List of Strings (a String[]) that you want to convert to a list of documents (an IData[]). If *fromList* is not specified, the service returns a zero length array for *toList*.

key **String** Optional. Key name to use in the generated document list.

Output Parameters

toList **Document List** Resulting document list.

Usage Notes

Creates a document list containing one document for each element in the *fromList*. Each document will contain a single String element named *key*.

For example, if *fromList* consists of:

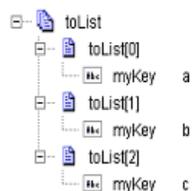
```
fromList[0] = "a"
```

```
fromList[1] = "b"
```

```
fromList[2] = "c"
```

```
key = "myKey"
```

The result would be:



pub.list:vectorToArray

WmPublic. Converts a java.util.Vector object to an array.

Input Parameters

vector

java.util.Vector The object to be converted to an array.

stronglyType

String Optional. If this option is specified, the service expects all items in the vector to have the same Java type as the first non-null item in the vector. If the service detects an item of a different type, an error is thrown.

Set to:

- `false` to convert the vector to an object array. This is the default.
- `true` to convert the vector to a strongly typed array holding the same type of objects.

Output Parameters

array

Object[] Converted object array.

24 Math Folder

■ Summary of Elements in this Folder	544
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You use the elements in the math folder to perform mathematical operations on string-based numeric values.

Note:

Services that operate on integer values use Java's long data type (64-bit, two's complement). Services that operate on float values use Java's double data type (64-bit IEEE 754). If extremely precise calculations are critical to your application, you should write your own Java services to perform math functions.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.math:absoluteValue	WmPublic. Returns the absolute value of the input number.
pub.math:addFloatList	WmPublic. Adds a list of floating point numbers (represented in a string list) and returns the sum.
pub.math:addFloats	WmPublic. Adds one floating point number (represented as a String) to another and returns the sum.
pub.math:addIntList	WmPublic. Adds a list of integers (represented in a String list) and returns the sum.
pub.math:addInts	WmPublic. Adds one integer (represented as a String) to another and returns the sum.
pub.math:addObjects	WmPublic. Adds one java.lang.Number object to another and returns the sum.
pub.math:divideFloats	WmPublic. Divides one floating point number (represented as a String) by another (<i>num1/num2</i>) and returns the quotient.
pub.math:divideInts	WmPublic. Divides one integer (represented as a String) by another (<i>num1/num2</i>) and returns the quotient.
pub.math:divideObjects	WmPublic. Divides one java.lang.Number object by another (<i>num1/num2</i>) and returns the quotient.
pub.math:max	WmPublic. Returns the largest number from a list of numbers.
pub.math:min	WmPublic. Returns smallest number from a list of numbers.
pub.math:multiplyFloatList	WmPublic. Multiplies a list of floating point numbers (represented in a String list) and returns the product.
pub.math:multiplyFloats	WmPublic. Multiplies one floating point number (represented as String) by another and returns the product.

Element	Package and Description
pub.math:multiplyIntList	WmPublic. Multiplies a list of integers (represented in a String list) and returns the product.
pub.math:multiplyInts	WmPublic. Multiplies one integer (represented as a String) by another and returns the product.
pub.math:multiplyObjects	WmPublic. Multiplies one java.lang.Number object by another and returns the product.
pub.math:randomDouble	WmPublic. Returns the next pseudorandom, uniformly distributed double between 0.0 and 1.0.
pub.math:roundNumber	WmPublic. Returns a rounded number.
pub.math:subtractFloats	WmPublic. Subtracts one floating point number (represented as a String) from another and returns the difference.
pub.math:subtractInts	WmPublic. Subtracts one integer (represented as a String) from another and returns the difference.
pub.math:subtractObjects	WmPublic. Subtracts one java.lang.Number object from another and returns the difference.
pub.math:toNumber	WmPublic. Converts a string to numeric data type.

pub.math:absoluteValue

WmPublic. Returns the absolute value of the input number.

Input Parameters

num **String** Number whose absolute value is to be returned.

Output Parameters

positiveNumber **String** Absolute value of the input number.

pub.math:addFloatList

WmPublic. Adds a list of floating point numbers (represented in a string list) and returns the sum.

Input Parameters

numList **String List** Numbers (floating point numbers represented in a string list) to add.

Output Parameters

value **String** Sum of the numbers in *numList*. If a sum cannot be produced, *value* contains one of the following:

Value	Description
Infinity	The computation produces a positive value that overflows the representable range of a float type.
-Infinity	The computation produces a negative value that overflows the representable range of a float type.
0.0	The computation produces a value that underflows the representable range of a float type (for example, adding a number to infinity).
NaN	The computation produces a value that cannot be represented as a number (for example, any operation that uses NaN as input, such as $10.0 + \text{NaN} = \text{NaN}$).

Usage Notes

Make sure the strings that are passed to the service in *numList* are in a locale-neutral format (that is, using the pattern `-####.##`). Passing locally formatted strings may result in unexpected results. For example, calling [pub.math:addFloats](#) in a German locale with the arguments 1,23 and 2,34 will result in the value 357, not 3.57 or 3,57.

pub.math:addFloats

WmPublic. Adds one floating point number (represented as a String) to another and returns the sum.

Input Parameters

num1 **String** Number to add.

num2 **String** Number to add.

precision **String** Optional. Number of decimal places to which the sum will be rounded. The default value is null.

The *precision* parameter, if specified, will override the behavior set by the `watt.server.math.floatOperation.mode` property. For information about the `watt.server.math.floatOperation.mode` property, see the *webMethods Integration Server Administrator's Guide*.

Output Parameters

value **String** Sum of the numbers in *num1* and *num2*. If a sum cannot be produced, *value* contains one of the following:

Value	Description
Infinity	The computation produces a positive value that overflows the representable range of a float type.
-Infinity	The computation produces a negative value that overflows the representable range of a float type.
0.0	The computation produces a value that underflows the representable range of a float type (for example, adding a number to infinity).
NaN	The computation produces a value that cannot be represented as a number (for example, any operation that uses NaN as input, such as $10.0 + \text{NaN} = \text{NaN}$).

Usage Notes

Make sure the strings that are passed to the service in *num1* and *num2* are in a locale-neutral format (that is, using the pattern `-####.##`). Passing locally formatted strings may result in unexpected results. For example, calling `pub.math:addFloats` in a German locale with the arguments 1,23 and 2,34 will result in the value 357, not 3.57 or 3,57.

Use the `watt.server.math.floatOperation.mode` property to specify whether the `pub.math:addFloats` service return the exact result of an operation involving two floating point numbers, the result as calculated by the JVM, or the result based on a fixed number of decimal places. For information about the `watt.server.math.floatOperation.mode` property, see the *webMethods Integration Server Administrator's Guide*.

pub.math:addIntList

WmPublic. Adds a list of integers (represented in a String list) and returns the sum.

Input Parameters

numList **String List** Numbers (integers represented as Strings) to add.

Output Parameters

value **String** Sum of the numbers in *numList*.

Usage Notes

Make sure the strings that are passed to the service in *numList* are in a locale-neutral format (that is, using the pattern -####.##). Passing locally formatted strings may result in unexpected results. For example, calling [pub.math:addFloats](#) in a German locale with the arguments 1,23 and 2,34 will result in the value 357, not 3.57 or 3,57.

pub.math:addInts

WmPublic. Adds one integer (represented as a String) to another and returns the sum.

Input Parameters

num1 **String** Number (integer represented as a String) to add.

num2 **String** Number (integer represented as a String) to add.

Output Parameters

value **String** Sum of *num1* and *num2*.

Usage Notes

Make sure the result of your calculation is less than 64 bits in width (the maximum width for the long data type). If the result exceeds this limit, it will generate a data overflow.

Make sure the strings that are passed to the service in *num1* and *num2* are in a locale-neutral format (that is, using the pattern -####.##). Passing locally formatted strings may result in unexpected results. For example, calling [pub.math:addFloats](#) in a German locale with the arguments 1,23 and 2,34 will result in the value 357, not 3.57 or 3,57.

pub.math:addObjects

WmPublic. Adds one java.lang.Number object to another and returns the sum.

Input Parameters

num1 **java.lang.Number** Number to add. See the Usage Notes for supported sub-classes.

num2 **java.lang.Number** Number to add. See the Usage Notes for supported sub-classes.

Output Parameters

value **java.lang.Number** Sum of the numeric values of *num1* and *num2*.

Usage Notes

This service accepts the following sub-classes of `java.lang.Number`: `java.lang.Byte`, `java.lang.Double`, `java.lang.Float`, `java.lang.Integer`, `java.lang.Long`, `java.lang.Short`.

This service applies the following rules for binary numeric promotion to the operands in order:

- If either operand is of type `Double`, the other is converted to `Double`.
- Otherwise, if either operand is of type `Float`, the other is converted to `Float`.
- Otherwise, if either operand is of type `Long`, the other is converted to `Long`.
- Otherwise, both operands are converted to type `Integer`.

These promotion rules mirror the Java rules for numeric promotion of numeric types.

pub.math:divideFloats

`WmPublic`. Divides one floating point number (represented as a `String`) by another (*num1/num2*) and returns the quotient.

Input Parameters

num1 **String** Number (floating point number represented as a `String`) that is the dividend.

num2 **String** Number (floating point number represented as a `String`) that is the divisor.

precision **String** Optional. Number of decimal places to which the quotient will be rounded. The default value is null.

The *precision* parameter, if specified, will override the behavior set by the `watt.server.math.floatOperation.mode` property. For information about the `watt.server.math.floatOperation.mode` property, see the *webMethods Integration Server Administrator's Guide*.

Output Parameters

value **String** The quotient of *num1* / *num2*. If a quotient cannot be produced, *value* contains one of the following:

Value	Description
-------	-------------

Infinity	The computation produces a positive value that overflows the representable range of a float type.
-Infinity	The computation produces a negative value that overflows the representable range of a float type.
0.0	The computation produces a value that underflows the representable range of a float type (for example, dividing a number by infinity).
NaN	The computation produces a value that cannot be represented as a number (for example, the result of an illegal operation such as dividing zero by zero or any operation that uses NaN as input, such as $10.0 + \text{NaN} = \text{NaN}$).

Usage Notes

Make sure the strings that are passed to the service in *num1* and *num2* are in a locale-neutral format (that is, using the pattern `-####.##`). Passing locally formatted strings may result in unexpected results. For example, calling `pub.math.addFloats` in a German locale with the arguments `1,23` and `2,34` will result in the value `357`, not `3.57` or `3,57`.

Use the `watt.server.math.floatOperation.mode` property to specify whether the `pub.math.divideFloats` service return the exact result of an operation involving two floating point numbers, the result as calculated by the JVM, or the result based on a fixed number of decimal places. For information about the `watt.server.math.floatOperation.mode` property, see the *webMethods Integration Server Administrator's Guide*.

pub.math:divideInts

WmPublic. Divides one integer (represented as a String) by another (*num1/num2*) and returns the quotient.

Input Parameters

<i>num1</i>	String Number (integer represented as a String) that is the dividend.
<i>num2</i>	String Number (integer represented as a String) that is the divisor.

Output Parameters

<i>value</i>	String The quotient of <i>num1</i> / <i>num2</i> .
--------------	---

Usage Notes

Make sure the strings that are passed to the service in *num1* and *num2* are in a locale-neutral format (that is, using the pattern `-####.##`). Passing locally formatted strings may result in unexpected

results. For example, calling `pub.math:addFloats` in a German locale with the arguments 1,23 and 2,34 will result in the value 357, not 3.57 or 3,57.

pub.math:divideObjects

WmPublic. Divides one `java.lang.Number` object by another ($num1/num2$) and returns the quotient.

Input Parameters

- num1* **java.lang.Number** Number that is the dividend. See the Usage Notes for supported sub-classes.
- num2* **java.lang.Number** Number that is the divisor. See the Usage Notes for supported sub-classes.

Output Parameters

- value* **java.lang.Number** Quotient of $num1 / num2$.

Usage Notes

This service accepts the following sub-classes of `java.lang.Number`: `java.lang.Byte`, `java.lang.Double`, `java.lang.Float`, `java.lang.Integer`, `java.lang.Long`, `java.lang.Short`.

This service applies the following rules for binary numeric promotion to the operands in order:

- If either operand is of type `Double`, the other is converted to `Double`.
- Otherwise, if either operand is of type `Float`, the other is converted to `Float`.
- Otherwise, if either operand is of type `Long`, the other is converted to `Long`.
- Otherwise, both operands are converted to type `Integer`.

These promotion rules mirror the Java rules for numeric promotion of numeric types.

pub.math:max

WmPublic. Returns the largest number from a list of numbers.

Input Parameters

- numList* **String List** List of numbers from which the largest number is to be returned.

Output Parameters

maxValue **String** Largest number from the list of numbers.

pub.math:min

WmPublic. Returns smallest number from a list of numbers.

Input Parameters

numList **String List** List of numbers from which the smallest number is to be returned.

Output Parameters

minValue **String** Smallest number from the list of numbers.

pub.math:multiplyFloatList

WmPublic. Multiplies a list of floating point numbers (represented in a String list) and returns the product.

Input Parameters

numList **String List** Numbers (floating point numbers represented as Strings) to multiply.

Output Parameters

value **String** Product of the numbers in *numlist*. If a product cannot be produced, *value* contains one of the following:

Value	Description
Infinity	The computation produces a positive value that overflows the representable range of a float type.
-Infinity	The computation produces a negative value that overflows the representable range of a float type.
0.0	The computation produces a value that underflows the representable range of a float type (for example, multiplying a number by infinity).
NaN	The computation produces a value that cannot be represented as a number (for example, the result of an illegal operation such as

multiplying zero by zero or any operation that uses NaN as input, such as $10.0 + \text{NaN} = \text{NaN}$).

Usage Notes

Make sure the strings that are passed to the service in *numList* are in a locale-neutral format (that is, using the pattern `-####.##`). Passing locally formatted strings may result in unexpected results. For example, calling `pub.math:addFloats` in a German locale with the arguments 1,23 and 2,34 will result in the value 357, not 3.57 or 3,57.

pub.math:multiplyFloats

WmPublic. Multiplies one floating point number (represented as String) by another and returns the product.

Input Parameters

<i>num1</i>	String Number (floating point number represented as a String) to multiply.
<i>num2</i>	String Number (floating point number represented as a String) to multiply.
<i>precision</i>	String Optional. Number of decimal places to which the product will be rounded. The default value is null.

The *precision* parameter, if specified, will override the behavior set by the `watt.server.math.floatOperation.mode` property. For information about the `watt.server.math.floatOperation.mode` property, see the *webMethods Integration Server Administrator's Guide*.

Output Parameters

<i>value</i>	String Product of the numeric values of <i>num1</i> and <i>num2</i> . If a product cannot be produced, <i>value</i> contains one of the following:
--------------	---

Value	Description
Infinity	The computation produces a positive value that overflows the representable range of a float type.
-Infinity	The computation produces a negative value that overflows the representable range of a float type.
0.0	The computation produces a value that underflows the representable range of a float type (for example, multiplying a number by infinity).
NaN	The computation produces a value that cannot be represented as a number (for example, the result of an illegal operation such as

multiplying zero by zero or any operation that uses NaN as input, such as $10.0 + \text{NaN} = \text{NaN}$).

Usage Notes

Make sure the strings that are passed to the service in *num1* and *num2* are in a locale-neutral format (that is, using the pattern `-####.##`). Passing locally formatted strings may result in unexpected results. For example, calling `pub.math:addFloats` in a German locale with the arguments `1,23` and `2,34` will result in the value `357`, not `3.57` or `3,57`.

Use the `watt.server.math.floatOperation.mode` property to specify whether the `pub.math:multiplyFloats` service return the exact result of an operation involving two floating point numbers, the result as calculated by the JVM, or the result based on a fixed number of decimal places. See *webMethods Integration Server Administrator's Guide* for more information about the `watt.server.math.floatOperation.mode` property.

pub.math:multiplyIntList

WmPublic. Multiplies a list of integers (represented in a String list) and returns the product.

Input Parameters

numList **String List** Numbers (floating point numbers represented as Strings) to multiply.

Output Parameters

value **String** Product of the numbers in *numList*.

Usage Notes

Make sure the result of your calculation is less than 64 bits in width (the maximum width for the long data type). If the result exceeds this limit, it will generate a data overflow.

Make sure the strings that are passed to the service in *numList* are in a locale-neutral format (that is, using the pattern `-####.##`). Passing locally formatted strings may result in unexpected results. For example, calling `pub.math:addFloats` in a German locale with the arguments `1,23` and `2,34` will result in the value `357`, not `3.57` or `3,57`.

pub.math:multiplyInts

WmPublic. Multiplies one integer (represented as a String) by another and returns the product.

Input Parameters

num1 **String** Number (integer represented as a String) to multiply.

num2 **String** Number (integer represented as a String) to multiply.

Output Parameters

value **String** Product of *num1* and *num2*.

Usage Notes

Make sure the result of your calculation is less than 64 bits in width (the maximum width for the long data type). If the result exceeds this limit, it will generate a data overflow.

Make sure the strings that are passed to the service in *num1* and *num2* are in a locale-neutral format (that is, using the pattern -####.##). Passing locally formatted strings may result in unexpected results. For example, calling [pub.math:addFloats](#) in a German locale with the arguments 1,23 and 2,34 will result in the value 357, not 3.57 or 3,57.

pub.math:multiplyObjects

WmPublic. Multiplies one java.lang.Number object by another and returns the product.

Input Parameters

num1 **java.lang.Number** Number to multiply. See the Usage Notes for supported sub-classes.

num2 **java.lang.Number** Number to multiply. See the Usage Notes for supported sub-classes.

Output Parameters

value **java.lang.Number** Product of *num1* and *num2*.

Usage Notes

This service accepts the following sub-classes of java.lang.Number: java.lang.Byte, java.lang.Double, java.lang.Float, java.lang.Integer, java.lang.Long, java.lang.Short.

This service applies the following rules for binary numeric promotion to the operands in order:

- If either operand is of type Double, the other is converted to Double.

- Otherwise, if either operand is of type Float, the other is converted to Float.
- Otherwise, if either operand is of type Long, the other is converted to Long.
- Otherwise, both operands are converted to type Integer.

These promotion rules mirror the Java rules for numeric promotion of numeric types.

pub.math:randomDouble

WmPublic. Returns the next pseudorandom, uniformly distributed double between 0.0 and 1.0.

Random number generators are often referred to as pseudorandom number generators because the numbers produced tend to repeat themselves over time.

Input Parameters

None.

Output Parameters

number **String** Generated random number.

pub.math:roundNumber

WmPublic. Returns a rounded number.

Input Parameters

num **String** Number to be rounded.

numberOfDigits **String** Specifies the number of digits to which you want to round the number.

roundingMode **String** Optional. Specifies the rounding method.

Valid values for the *roundingMode* parameter are RoundHalfUp, RoundUp, RoundDown, RoundCeiling, RoundFloor, RoundHalfDown, and RoundHalfEven. The default value is RoundHalfUp.

Output Parameters

roundedNumber **String** The rounded number.

pub.math:subtractFloats

WmPublic. Subtracts one floating point number (represented as a String) from another and returns the difference.

Input Parameters

<i>num1</i>	String Number (floating point number represented as a String).
<i>num2</i>	String Number (floating point number represented as a String) to subtract from <i>num1</i> .
<i>precision</i>	String Optional. Number of decimal places to which the difference will be rounded. The default value is null. The <i>precision</i> parameter, if specified, will override the behavior set by the <code>watt.server.math.floatOperation.mode</code> property. For information about the <code>watt.server.math.floatOperation.mode</code> property, see the <i>webMethods Integration Server Administrator's Guide</i> .

Output Parameters

value **String** Difference of *num1* - *num2*. If a difference cannot be produced, *value* contains one of the following:

Value	Description
Infinity	The computation produces a positive value that overflows the representable range of a float type.
-Infinity	The computation produces a negative value that overflows the representable range of a float type.
0.0	The computation produces a value that underflows the representable range of a float type (for example, subtracting a number from infinity).
NaN	The computation produces a value that cannot be represented as a number (for example, the result of an illegal operation such as multiplying zero by zero or any operation that uses NaN as input, such as $10.0 - \text{NaN} = \text{NaN}$).

Usage Notes

Make sure the strings that are passed to the service in *num1* and *num2* are in a locale-neutral format (that is, using the pattern `-###.##`). Passing locally formatted strings may result in unexpected results. For example, calling `pub.math:addFloats` in a German locale with the arguments 1,23 and 2,34 will result in the value 357, not 3.57 or 3,57.

Use the `watt.server.math.floatOperation.mode` property to specify whether the `pub.math:subtractFloats` service return the exact result of an operation involving two floating point numbers, the result as calculated by the JVM, or the result based on a fixed number of decimal places. For more information about the `watt.server.math.floatOperation.mode` property, see *webMethods Integration Server Administrator's Guide*

pub.math:subtractInts

WmPublic. Subtracts one integer (represented as a String) from another and returns the difference.

Input Parameters

num1 **String** Number (integer represented as a String).

num2 **String** Number (integer represented as a String) to subtract from *num1*.

Output Parameters

value **String** Difference of *num1* - *num2*.

Usage Notes

Make sure the result of your calculation is less than 64 bits in width (the maximum width for the long data type). If the result exceeds this limit, it will generate a data overflow.

Make sure the strings that are passed to the service in *num1* and *num2* are in a locale-neutral format (that is, using the pattern `-####.##`). Passing locally formatted strings may result in unexpected results. For example, calling `pub.math:addFloats` in a German locale with the arguments 1,23 and 2,34 will result in the value 357, not 3.57 or 3,57.

pub.math:subtractObjects

WmPublic. Subtracts one `java.lang.Number` object from another and returns the difference.

Input Parameters

num1 **java.lang.Number** Number. See the Usage Notes for supported sub-classes.

num2 **java.lang.Number** Number to subtract from *num1*. See Usage Notes for supported sub-classes.

Output Parameters

value **java.lang.Number** Difference of *num1* - *num2*.

Usage Notes

This service accepts the following sub-classes of `java.lang.Number`: `java.lang.Byte`, `java.lang.Double`, `java.lang.Float`, `java.lang.Integer`, `java.lang.Long`, `java.lang.Short`.

This service applies the following rules for binary numeric promotion to the operands. The following rules are applied in order:

- If either operand is of type `Double`, the other is converted to `Double`.
- Otherwise, if either operand is of type `Float`, the other is converted to `Float`.
- Otherwise, if either operand is of type `Long`, the other is converted to `Long`.
- Otherwise, both operands are converted to type `Integer`.

These promotion rules mirror the Java rules for numeric promotion of numeric types.

pub.math:toNumber

WmPublic. Converts a string to numeric data type.

Input Parameters

<i>num</i>	String Number (represented as a string) to be converted to numeric format.
<i>convertAs</i>	String Optional. Specifies the Java numeric data type to which the <i>num</i> parameter is to be converted. Valid values for the <i>convertAs</i> parameter are <code>java.lang.Double</code> , <code>java.lang.Float</code> , <code>java.lang.Integer</code> , <code>java.math.BigDecimal</code> , <code>java.math.BigInteger</code> , <code>java.lang.Long</code> . The default value is <code>java.lang.Double</code> .

Output Parameters

<i>num</i>	java.lang.Number Converted numeric object.
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25 MIME Folder

■ Summary of Elements in this Folder	562
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Use the elements in the mime folder to create MIME messages and extract information from MIME messages.

Summary of Elements in this Folder

The following elements are available in this folder:

Service	Function
pub.mime:addBodyPart	WmPublic. Adds a body part (header fields and content) to a specified MIME object.
pub.mime:addMimeHeader	WmPublic. Adds one or more header fields to a specified MIME object.
pub.mime:createMimeData	WmPublic. Creates a MIME object.
pub.mime:getBodyPartContent	WmPublic. Retrieves the content (payload) from the specified MIME object.
pub.mime:getBodyPartHeader	WmPublic. Returns the list of header fields for the specified body part.
pub.mime:getContentType	WmPublic. Returns the value of the Content-Type message header from the specified MIME object.
pub.mime:getEnvelopeStream	WmPublic. Generates an InputStream or MimeMessage representation of a MIME message from a specified MIME object.
pub.mime:getMimeHeader	WmPublic. Returns the list of message headers from a specified MIME object.
pub.mime:getNumParts	WmPublic. Returns the number of body parts in the specified MIME object.
pub.mime:getPrimaryContentType	WmPublic. Returns the top-level portion of a MIME object's Content-Type value.
pub.mime:getSubContentType	WmPublic. Returns the sub-type portion of a MIME object's Content-Type value.
pub.mime:mergeHeaderAndBody	WmPublic. Concatenates the contents of the header and body returned by the pub.client:http service.
pub.mime:releaseBodyPartReferenceInTSpace	WmPublic. Release a body part from the Tspace.

pub.mime:addBodyPart

WmPublic. Adds a body part (header fields and content) to a specified MIME object.

Input Parameters

mimeData **Document** MIME object to which you want to add a body part. (This IData object is produced by [pub.mime:createMimeData](#).)

content **java.io.InputStream or Object** Content that you want to add to the MIME object. *content* can be an InputStream or another MIME object. Use an InputStream to add an ordinary payload. Use a MIME object to add a payload that is itself a MIME message.

isEnvStream **String** Flag that specifies whether *content* is to be treated as a MIME entity.

Important:

This parameter is only used if *content* is an InputStream.

Set this parameter to one of the following values:

- **yes** to treat *content* as a MIME entity. `addBodyPart` will strip out the header fields from the top of *content* and add them to *mimeData* as part headers. The remaining data will be treated as the payload.

Note: `addBodyPart` assumes that all data up to the first blank line represents the entity's header fields.

- **no** to treat *content* as an ordinary payload.

mimeHeader **Document** Specifies the part headers that you want to add with this body part. Key names represent the names of the header fields. The values of the keys represent the values of the header fields.

For example, if you wanted to add the following header fields:

```
X-Doctype: RFQ
X-Severity: 10
```

You would set *mimeHeader* as follows:

Key	Value
<i>X-Doctype</i>	RFQ
<i>X-Severity</i>	10

Be aware that the following MIME headers are automatically inserted by [pub.mime:getEnvelopeStream](#) when it generates the MIME message:

```
Message-ID
MIME-Version
```

Additionally, you use the *content*, *encoding*, and *description* parameters to set the following fields:

```
Content-Type
```

Content-Transfer-Encoding
Content-Description

If you set these header fields in *mimeHeader* and you create a single-part message, the values in *contenttype*, *encoding*, and *description*, if specified, will override those in *mimeHeader*. See usage notes.

contenttype

String. Optional. The value of the Content-Type header for this body part. For single-part messages, this value overrides the Content-Type value in *mimeHeader*, if one is present. Defaults to text/plain.

See usage notes.

encoding

String. Optional. Specifies how the body part is to be encoded for transport and sets the value of the Content-Transfer-Encoding header. For single-part messages, this value overrides the Content-Transfer-Encoding value in *mimeHeader*, if one is present. Defaults to 7bit.

See usage notes.

Note:

This parameter determines how the payload is to be encoded for transport. When you add a payload to *mimeData*, it should be in its original format. The [pub.mime:getEnvelopeStream](#) service will perform the encoding (as specified by *encoding*) when it generates the final MIME message.

Set to:

- `7bit` to specify that *content* is 7-bit, line-oriented text that needs no encoding. This is the default.
- `8bit` to specify that *content* is 8-bit, line-oriented text that needs no encoding.

Note:

This encoding value is not recommended for messages that will be transported via SMTP over the Internet, because the data can be altered by intervening mail servers that can't accommodate 8-bit text. To safely transport 8-bit text, use quoted-printable encoding instead.

- `binary` to specify that *content* contains binary information that needs no encoding.

Note:

This encoding value is not recommended for messages that will be transported via SMTP over the Internet, because the data can be altered by intervening mail servers that can't accommodate binary data. To safely transport binary data, use `base64` encoding instead.

- `quoted-printable` to specify that *content* contains 7 or 8-bit, line-oriented text that you want to encode using the quoted-printable encoding scheme.
- `base64` to specify that *content* contains an arbitrary sequence of octets that you want to encode using the base64 encoding scheme.
- `uuencode` to specify that *content* contains an arbitrary sequence of octets that you want to encode using the uuencode encoding scheme.

description

String. Optional. Specifies the value of the `Content-Description` header for this body part.

multipart

String. Optional. Flag that determines how `addBodyPart` behaves if *mimeData* already contains one or more body parts.

By default, `addBodyPart` simply appends a new body part to *mimeData* if it already contains a payload. (This allows you to construct multi-part messages.) However, you can override this behavior if you want to either replace the existing payload with the new body part or throw an exception under these circumstances (see *replace* parameter, below).

Set to:

- `yes` to append a new body part to *mimeData*. This is the default.
- `no` to replace the existing payload with the new body part. (Depending on the value of *replace*, this setting may cause `addBodyPart` to throw an exception.)

replace

String. Optional. Flag that specifies whether `addBodyPart` replaces the existing payload or throws an exception when it receives a *mimeData* that already contains a payload. This parameter is only used when *multipart* is set to `no`.

Set to:

- `yes` to replace the existing payload with the new body part. This is the default.
- `no` to throw an exception.

Output Parameters

mimeData

Document MIME object to which the body part was added.

Usage Notes

This service operates on the MIME object (*mimeData*) produced by [pub.mime:createMimeData](#).

The way in which the *contenttype* and *encoding* parameters are applied depends on whether the finished message is single-part or multipart.

For single-part messages:

- *contentType* specifies the Content-Type for the entire MIME message. It overrides any value assigned to the Content-Type header in *mimeHeader*. If Content-Type is not specified in *contentType* or *mimeHeader*, the value of the Content-Type header defaults to `text/plain`.
- *encoding* specifies the Content-Transfer-Encoding for the entire MIME message. It overrides any value assigned to the Content-Transfer-Encoding header in *mimeHeader*. If Content-Transfer-Encoding is not specified in *encoding* or *mimeHeader*, the value of the Content-Transfer-Encoding header defaults to `7bit`.

For multipart messages:

- *contentType* specifies the Content-Type for an individual body part. The Content-Type for the entire MIME message is automatically set to `multipart/mixed`, or to `multipart/subType` if a subtype was specified when the MIME object was created. See [pub.mime:createMimeData](#).
- *encoding* specifies the Content-Transfer-Encoding for an individual body part. The Content-Transfer-Encoding header in *mimeHeader*, if present, specifies the encoding for the entire MIME message. If Content-Transfer-Encoding is not specified in *mimeHeader*, or if the specified value is not valid for a multipart message, the value of the Content-Transfer-Encoding header defaults to `7bit`. (`7bit`, `8bit`, and `binary` are the only encoding values valid for multipart messages.)

Note:

This service utilizes a temporary location on the disk (Tspace) instead of the memory (RAM) if data is larger than the `watt.server.mime.largeDataThreshold` property. For more information on this server configuration property, see *webMethods Integration Server Administrator's Guide*.

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.mime:createMimeData](#)

[pub.mime:getBodyPartContent](#)

[pub.mime:addMimeHeader](#)

pub.mime:addMimeHeader

WmPublic. Adds one or more header fields to a specified MIME object.

Input Parameters

mimeData

Document MIME object to which you want the header fields added.
(This IData object is produced by [pub.mime:createMimeData](#).)

mimeHeader

Document Header fields that you want to add to the MIME object. Key names represent the names of the header fields. The values of the keys represent the values of the header fields. For example, to add the following header fields:

```
X-Doctype: RFQ
X-Severity: 10
```

You would set *mimeHeader* as follows:

Key	Description
<i>X-Doctype</i>	RFQ
<i>X-Severity</i>	10

Be aware that the following MIME headers are automatically inserted by [pub.mime:getEnvelopeStream](#) when it generates the MIME message:

```
Message-ID
MIME-Version
```

If you set these values in *mimeHeader*, [pub.mime:getEnvelopeStream](#) will overwrite them at run time.

Output Parameters

mimeData

Document MIME object to which the header fields were added.

Usage Notes

This service operates on the MIME object (*mimeData*) produced by [pub.mime:createMimeData](#).

If you add MIME headers before you add multiple body parts, the header fields will be added to each of the body parts. If you do not want this behavior, either drop *mimeHeader* from the pipeline immediately after you execute [addMimeHeader](#), or invoke [addMimeHeader](#) after you've added all body parts to the MIME object.

Be aware that the *contenttype* and *encoding* parameters used by the [pub.mime:addBodyPart](#) service will override any Content-Type or Content-Transfer-Encoding settings in *mimeData*. Moreover, in certain cases, the [pub.mime:getEnvelopeStream](#) will override these settings when it generates a multipart message. For information about how the Content-Type or Content-Transfer-Encoding headers are derived at run time, see the Usage Notes under [pub.mime:addBodyPart](#).

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.mime:createMimeData](#)

[pub.mime:getMimeHeader](#)[pub.mime:addBodyPart](#)

pub.mime:createMimeData

WmPublic. Creates a MIME object.

If no *input* parameter is passed to this service, the service creates an empty MIME object. Otherwise, the service creates a MIME object containing the elements (header fields and content) from the MIME message in *input*.

- If you are building a MIME message, you use this service to create an empty MIME object. You populate the empty MIME object with header fields and content, and then pass it to [pub.mime:getEnvelopeStream](#), which produces the finished MIME message.
- If you are extracting data from a MIME message, you use this service to parse the original MIME message into a MIME object so that you can extract its header fields and content using other webMethods services.

Input Parameters

input **java.io.InputStream** or **javax.mail.internet.MimeMessage**. Optional. MIME entity you want to parse. If *input* is not provided, `createMimeData` creates an empty MIME object.

mimeHeader **Document**. Optional. Specifies header fields that you want to add to the MIME object. Key names represent the names of the header fields. The values of the keys represent the values of the header fields.

Note:

This parameter is ignored when *input* is passed to this service.

For example, if you wanted to add the following header fields:

```
X-Doctype: RFQ
X-Severity: 10
```

You would set *mimeHeader* as follows:

Key	Value
<i>X-Doctype</i>	RFQ
<i>X-Severity</i>	10

Be aware that the following MIME headers are automatically inserted by [pub.mime:getEnvelopeStream](#) when it generates the MIME message:

```
Message-ID
MIME-Version
```

If you set these values in *mimeHeader*, [pub.mime:getEnvelopeStream](#) will overwrite them at run time.

subType **String.** Optional. String that specifies the subtype portion of the Content Type header, when the message is a multipart message and you want something other than the default value of `mixed`. For example, if you want the Content Type header to be `multipart/related` in the resulting message, set *subType* to `related`.

subType is ignored if the resulting message is not a multipart message.

decodeHeaders **String.** Optional. Specifies how the MIME header is to be decoded.

Set to:

- "" (empty String) to decode headers based on the value of the global `watt` property `watt.server.mime.decodeHeaders`. This is the default.
- `NONE` to specify that the MIME header or body part headers do not need decoding.
- `ONLY_MIME_HEADER` to decode the MIME header only.
- `ONLY_BODY_PART_HEADERS` to decode the body part headers only.
- `BOTH` to decode the MIME header and the body part headers.

Output Parameters

mimeData **Document** MIME object. If *input* was passed to `createMimeData`, *mimeData* will contain the parsed MIME message. If *input* was not passed to `createMimeData`, *mimeData* will be empty.

encrypted **String.** Conditional. Indicates whether input was an encrypted message. This parameter is not present when the service creates a new, empty MIME object. A value of:

- `true` indicates that the message is encrypted (the original message stream is in *stream*).
- `false` indicates that the message is not encrypted.

signed **String.** Conditional. Flag whose value indicates whether *input* was a signed message. This parameter is not present when the service creates a new, empty MIME object. A value of:

- `true` indicates that the message is signed (the original message stream is in *stream*).
- `false` indicates that the message is not signed.

- certsOnly* **String.** Conditional. Flag whose value indicates whether *input* contained only digital certificates. (This type of message can be produced by the [pub.smime:createCertsOnlyData](#) service and allows digital certificates to be transported via the network as a MIME message.) This parameter is not present when the service creates a new, empty MIME object. A value of:
- `true` indicates that the message contains only certificates.
 - `false` indicates that the message contains a regular payload.
- stream* **java.io.InputStream.** Conditional. InputStream containing the original MIME message from *input*. This parameter is present only when *input* is an S/MIME message.

Usage Notes

All of the other MIME services operate on the *mimeData* IData object produced by this service. They do not operate directly on MIME message streams.

Important:

You can examine the contents of *mimeData* during testing and debugging. However, because the internal structure of *mimeData* is subject to change without notice, **do not** explicitly set or map data to/from these elements in your service. To manipulate or access the contents of *mimeData*, use **only** the MIME services that Integration Server provides.

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.mime:addMimeHeader](#)

[pub.mime:addBodyPart](#)

[pub.mime:getMimeHeader](#)

[pub.mime:getBodyPartContent](#)

[pub.mime:getEnvelopeStream](#)

pub.mime:getBodyPartContent

WmPublic. Retrieves the content (payload) from the specified MIME object.

You use this service for both single-part and multi-part messages.

To retrieve content from a multi-part message, you set the *index* (to select the part by index number) or *contentID* (to select the part by *contentID* value) parameter to specify the body part whose content you want to retrieve. To get the content from a single-part message, you omit the *index* and *contentID* parameters or set *index* to 0.

Input Parameters

<i>mimeData</i>	Document MIME object whose content you want to retrieve. (This IData object is produced by pub.mime:createMimeData .)
<i>index</i>	String . Optional. Index number of the body part whose content you want to retrieve (if you want to retrieve the content from a specific body part). The first body part is index number zero.
	Note: If <i>contentID</i> is specified, <i>index</i> is ignored.
<i>contentID</i>	String . Optional. Value of the Content-ID header field of the body part whose content you want to retrieve (if you want to retrieve the payload from a specific body part).

Output Parameters

<i>content</i>	IData The payload of the specified body part.
<i>encrypted</i>	String Flag whose value indicates whether <i>content</i> is an encrypted MIME message. A value of: <ul style="list-style-type: none"> ■ <code>true</code> indicates that <i>content</i> is an encrypted message. ■ <code>false</code> indicates that <i>content</i> is not an encrypted message.
<i>signed</i>	String Flag indicating whether <i>content</i> is a signed MIME message. A value of: <ul style="list-style-type: none"> ■ <code>true</code> indicates that <i>content</i> is a signed MIME message. ■ <code>false</code> indicates that <i>content</i> is not a signed MIME message.
<i>certsOnly</i>	String Flag whose value indicates whether <i>content</i> is a certs-only MIME message. A value of: <ul style="list-style-type: none"> ■ <code>true</code> indicates that <i>content</i> is a certs-only message. ■ <code>false</code> indicates that <i>content</i> is not a certs-only message.

Usage Notes

This service operates on the MIME object (*mimeData*) produced by [pub.mime:createMimeData](#).

If you omit *index* or *contentID* when retrieving content from a multi-part message, `getBodyPartContent` returns the payload from the first body part. If you use *index* or *contentID* to select a body part that does not exist in *mimeData*, *content* will be null.

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.mime:createMimeData](#)

[pub.mime:addBodyPart](#)

[pub.mime:getBodyPartHeader](#)

pub.mime:getBodyPartHeader

WmPublic. Returns the list of header fields for the specified body part.

Input Parameters

<i>mimeData</i>	Document MIME object whose message headers you want to retrieve. (This IData object is produced by pub.mime:createMimeData)
<i>index</i>	String . Optional. Index number of the body part whose header fields you want to retrieve. The first body part is index zero. Note: If <i>contentID</i> is specified, <i>index</i> is ignored.
<i>contentID</i>	String . Optional. Value of the Content-ID header field of the body part whose header fields you want to retrieve.
<i>decodeHeaders</i>	String . Conditional. Flag whose value indicates whether to decode encoded headers in the MIME object. Set to: <ul style="list-style-type: none">■ <code>true</code> to indicate that the headers should be decoded.■ <code>false</code> to indicate that the headers should not be decoded. This is the default.

Output Parameters

mimeHeader **Document** IData object containing the message headers. Key names represent the names of the header fields. The value of a key represents the value of that header field.

For example, if the original message contained the following message header fields:

```
Content-Type: text/xml
X-Doctype: RFQ
X-Severity: 0
```

get Body Part Header would return the following IData object:

Key	Value
<i>Content-Type</i>	text/xml
<i>X-Doctype</i>	RFQ
<i>X-Severity</i>	0

Usage Notes

This service operates on the MIME object (*mimeData*) produced by [pub.mime:createMimeData](#).

If you omit *index* or *contentID*, `getBodyPartHeader` returns the message headers from the first body part. If you use *index* or *contentID* to select a body part that does not exist in *mimeData*, *content* will be null.

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.mime:createMimeData](#)

[pub.mime:addBodyPart](#)

[pub.mime:getMimeHeader](#)

pub.mime:getContentType

WmPublic. Returns the value of the Content-Type message header from the specified MIME object.

Input Parameters

mimeData **Document** MIME object whose Content-Type you want to discover. (This IData object is produced by [pub.mime:createMimeData](#).)

Output Parameters

contentType **String** Value of the MIME object's Content-Type header field. Note that this service returns only the media type and subtype portion of this header field's value. It does not return any parameters the value may include. For example, if the message's Content-Type header were:

```
Content-Type: text/plain;charset=UTF8
```

contentType would contain:

```
text/plain
```

Usage Notes

This service operates on the MIME object (*mimeData*) produced by [pub.mime:createMimeData](#).

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.mime:createMimeData](#)

[pub.mime:getSubContentType](#)

[pub.mime:getPrimaryContentType](#)

[pub.mime:getMimeHeader](#)

[pub.mime:getBodyPartHeader](#)

pub.mime:getEnvelopeStream

WmPublic. Generates an `InputStream` or a `MimeMessage` representation of a MIME message from a specified MIME object.

Input Parameters

<i>mimeData</i>	Document MIME object from which you want to generate the MIME message. (This <code>IData</code> object is produced by pub.mime:createMimeData .)
<i>index</i>	String . Optional. Index number of the body part for which you want to generate the MIME message (if you want to generate the message from a specific body part). The first body part is index number zero.
<i>contentID</i>	String . Optional. Value of the <code>Content-ID</code> header field of the body part from which you want to generate the MIME message (if you want to generate the message from a specific body part).
	Note: If <i>index</i> is specified, <i>contentID</i> is ignored.
<i>suppressHeaders</i>	String List . Optional. Names of header fields that are to be omitted from message. You can use this option to exclude header fields that <code>getEnvelopeStream</code> generates by default, such as <code>Content-Type</code> and <code>content-encoding</code> .

createMultipart **String**. Optional. Specifies whether a multipart message is to be created, even if *mimeData* contains only one body part. Set to:

- yes to create a multipart message (Content-Type message header is set to "multipart/mixed").
- no to create a message based on the number of body parts in *mimeData*. This is the default.
 - If the message contains only one body part, Content-Type is set according to the *contenttype* setting specified when that body part was added to *mimeData*.
 - If the message contains multiple body parts, Content-Type is automatically set to "multipart/mixed."

returnMimeMessage **String** Optional. Specifies whether the MIME message is returned as a `javax.mail.internet.MimeMessage` object when any of the body parts in the message exceed the large data threshold set by the `watt.server.mime.largeDataThreshold`. Set to:

- yes to return the MIME message in the *mimeMessage* output parameter as a `MimeMessage` when the `watt.server.mime.largeDataThreshold` is exceeded. This is the default.
- no to return the MIME message as an `InputStream` in the *envStream* output parameter when the `watt.server.mime.largeDataThreshold` is exceeded.

Note:

The *returnMimeMessage* input parameter is available after applying a fix that includes PIE-84972 (IS_10.15_Core_Fix8 and higher),

Output Parameters

envStream **java.io.InputStream**. Conditional. The MIME message as an `InputStream`.

mimeMessage **javax.mail.internet.MimeMessage**. Conditional. This service returns a *mimeMessage* instead of an *envStream* if any of the body parts have data greater than the threshold specified by the `watt.server.mime.largeDataThreshold` parameter (default 25MB) and *returnMimeMessage* is set to yes.

Usage Notes

This service operates on the MIME object (*mimeData*) produced by [pub.mime:createMimeData](#).

If you omit *index* or *contentID*, `getEnvelopeStream` generates the MIME message from the entire contents of the *mimeData*. If you use *index* or *contentID* to select a body part that does not exist in *mimeData*, *content* will be null.

`getEnvelopeStream` automatically inserts the `MIME-Version` and `Message-ID` message headers into the MIME message it puts into *envStream*.

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.mime:createMimeData](#)

[pub.mime:addBodyPart](#)

[pub.mime:addMimeHeader](#)

pub.mime:getMimeHeader

WmPublic. Returns the list of message headers from a specified MIME object.

Input Parameters

mimeData **Document** MIME object whose message headers you want to retrieve. (This IData object is produced by [pub.mime:createMimeData](#).)

Output Parameters

mimeHeader **Document**. Conditional. An IData object containing the message headers. Key names represent the names of the header fields. The value of a key represents the value of the header fields.

For example, if the original message contained the following message header fields:

```
Message-ID: <002e01c0f150$6f33010a@sgx.com>
From: "Purch01@GSX.com" <Purch01@GSX.com>To:
<EXPEst@exprint.com>
MIME-Version: 1.0
Content-Type: text/xml
X-Doctype: RFQ
X-Severity: 0
```

`getMimeHeader` would return the following:

Key	Value
Message-ID	<002e01c0f150\$6f33010a@sgx.com>

From	"Purch01@GSX.com" <Purch01@GSX.com>
To	<EXPEst@exprint.com>
MIME-Version	1.0
Content-Type	text/xml
X-Doctype	RFQ
X-Severity	0

Usage Notes

This service operates on the MIME object (*mimeData*) produced by [pub.mime:createMimeData](#).

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.mime:createMimeData](#)

[pub.mime:addMimeHeader](#)

[pub.mime:getBodyPartHeader](#)

pub.mime:getNumParts

WmPublic. Returns the number of body parts in the specified MIME object.

Input Parameters

<i>mimeData</i>	Document MIME object whose parts you want to count. (This IData object is produced by pub.mime:createMimeData .)
-----------------	---

Output Parameters

<i>numParts</i>	String The number of body parts in the MIME object.
-----------------	--

Usage Notes

This service operates on the MIME object (*mimeData*) produced by [createMimeData](#).

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.mime:createMimeData](#)

[pub.mime:getBodyPartContent](#)

[pub.mime:addBodyPart](#)

pub.mime:getPrimaryContentType

WmPublic. Returns the top-level portion of a MIME object's Content-Type value.

Input Parameters

mimeData **Document** MIME object whose Content-Type you want to discover. (This IData object is produced by [pub.mime:createMimeData](#).)

Output Parameters

primContentType **String** Message's top-level Content-Type. For example, if the message's Content-Type header were:

```
Content-Type: multipart/mixed
```

primContentType would contain:

```
multipart
```

Usage Notes

This service operates on the MIME object (*mimeData*) produced by [pub.mime:createMimeData](#).

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.mime:createMimeData](#)

[pub.mime:getContentType](#)

[pub.mime:addMimeHeader](#)

[pub.mime:getBodyPartHeader](#)

pub.mime:getSubContentType

WmPublic. Returns the sub-type portion of a MIME object's Content-Type value.

Input Parameters

mimeData **Document** MIME object whose sub-type you want to discover. (This IData object is produced by [pub.mime:createMimeData](#).)

Output Parameters

subContentType **String** Message's sub-type. For example, if the message's Content-Type header were:

```
Content-Type: multipart/mixed
```

subContentType would contain:

```
mixed
```

Usage Notes

This service operates on the MIME object (*mimeData*) produced by [pub.mime:createMimeData](#).

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.mime:createMimeData](#)

[pub.mime:getContentType](#)

[pub.mime:addMimeHeader](#)

[pub.mime:getBodyPartHeader](#)

pub.mime:mergeHeaderAndBody

WmPublic. Concatenates the contents of the header and body returned by the [pub.client:http](#) service.

You can use this service to reassemble the message into its original form so that it can be used as input to the [pub.mime:createMimeData](#) service (or any other service that requires the entire http response as an InputStream).

Input Parameters

- headerLines* **Document** IData object containing the message headers returned by [pub.client:http](#). (The message headers are returned in the *lines* document inside the *header* output parameter that is produced by [pub.client:http](#).)
- body* **Document** IData object containing the body of the message returned by [pub.client:http](#). This document must contain the body of the message in one of the following keys:

<u>Key</u>	<u>Description</u>
<i>bytes</i>	byte[] . Optional. Body of the message (if pub.client:http returned the body as a byte[]).
<i>stream</i>	java.io.InputStream . Optional. The body of the message (if pub.client:http returned the body as an InputStream).

Output Parameters

- stream* **java.io.InputStream** InputStream containing the reassembled tap message.

Usage Notes

Use this service to merge the results produced by [pub.client:http](#) to get the original MIME message.

See Also

- [pub.client:http](#)
- [pub.mime:createMimeData](#)

pub.mime:releaseBodyPartReferenceInTSpace

WmPublic. This service enables you to free up space in the Tspace by releasing body parts stored in it by the [pub.mime:addBodyPart](#) service. You need to provide a reference to the body part to be released.

Input Parameters

- mimeData* **Document**. MIME object whose reference you want to release from the Tspace. (This IData object is produced by [pub.mime:createMimeData](#).)
- index* **String**. Optional. Index number of the body part whose content you want to release (if you want to release the content from a specific body part). The first body part is index number zero.

Note:

If *contentID* is specified, *index* is ignored.

contentID

String. Optional. Value of the Content-ID header field of the body part that you want to release (if you want to release the payload from a specific body part).

Output Parameters

releasedReferenceInTSpace **Boolean.** Returns `true` if the reference was released and `false` if not.

Usage Notes

Before invoking this service, ensure that the body part has a reference in the Tspace.

26 MQTT Folder

■ Summary of Elements in this Folder	584
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You use the elements in the `mqtt` folder to publish messages to an MQTT server and define the input of MQTT trigger services.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.mqtt:publish	WmPublic. Publishes an MQTT message to an MQTT server.
pub.mqtt:triggerSpec	WmPublic. Specification for the signature of an MQTT trigger service.

pub.mqtt:publish

WmPublic. Publishes an MQTT message to an MQTT server.

Input Parameters

connectionAliasName **String** Name of the MQTT connection alias to use to send the MQTT message.

topicName **String** Name of the topic to which to publish the message.

MqttMessage **Document** Document (IData object) A document representing the MQTT message to publish to the MQTT server.

Key	Description						
<i>payload</i>	Document Optional. A document containing the MQTT message payload. Integration Server supports the following formats for the message payload. If you do not specify a payload, the service sends an empty byte[].						
	<table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>string</i></td> <td>String Optional. Message body in the form of a String.</td> </tr> <tr> <td><i>bytes</i></td> <td>byte [] Optional. Message body in the form of a one-dimensional byte array.</td> </tr> </tbody> </table>	Key	Description	<i>string</i>	String Optional. Message body in the form of a String.	<i>bytes</i>	byte [] Optional. Message body in the form of a one-dimensional byte array.
Key	Description						
<i>string</i>	String Optional. Message body in the form of a String.						
<i>bytes</i>	byte [] Optional. Message body in the form of a one-dimensional byte array.						
<i>qos</i>	String Optional. The quality of service (QoS) for publishing the message to the MQTT server. Specify one of the following: <ul style="list-style-type: none"> 0 At most once. Integration Server publishes the message to the MQTT server once or not at all. 						

- 1 At least once. Integration Server publishes the message to the MQTT server one or more times. This is the default.
- 2 Exactly once. Integration Server publishes the message to the MQTT server once and only once.

The QoS for publishing messages to the MQTT server is separate from the QoS for receiving messages. As a result, it is possible for a message to be published to the MQTT server with a higher QoS than which the message is received from the MQTT server.

isRetained **String** Optional. Flag indicating whether the MQTT server retains the published message as the last known message for the topic.

Set to:

- `true` to indicate the message is to be retained by the MQTT server as the last known message for the topic.
- `false` to indicate the MQTT server will not retain this message as the last known message for the topic. This is the default.

Output Parameters

None.

Usage Notes

Integration Server relies on Paho to determine the max inflight property value. The max inflight property determines the maximum number of messages that can be published to the MQTT server at one time using the same MQTT connection alias. Paho uses a default of 10. However you can use the `watt.server.mqtt.producer.maxInflight` server configuration parameter to set the max inflight property value.

pub.mqtt:triggerSpec

WmPublic. Specification for the signature of an MQTT trigger service.

Input Parameters

<i>topicName</i>	String Name of the topic from which the message was received. An MQTT trigger can use wildcards to subscribe to multiple topics.
<i>MqttMessage</i>	Document Document (IData object) A document representing the MQTT message received by the MQTT trigger.

Key	Description						
<i>payload</i>	<p>Document Optional. A document containing the MQTT message payload. The Decoding Type value for the MQTT trigger determines the format for the message payload passed to the trigger service.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>bytes</i></td> <td>byte [] Optional. MQTT message body in the form of a one-dimensional byte array.</td> </tr> <tr> <td><i>string</i></td> <td>String Optional. The MQTT message body as a String.</td> </tr> </tbody> </table>	Value	Description	<i>bytes</i>	byte [] Optional. MQTT message body in the form of a one-dimensional byte array.	<i>string</i>	String Optional. The MQTT message body as a String.
Value	Description						
<i>bytes</i>	byte [] Optional. MQTT message body in the form of a one-dimensional byte array.						
<i>string</i>	String Optional. The MQTT message body as a String.						
<i>id</i>	String Optional. The message ID for the MQTT message which is set only if <i>qos</i> is 1 or 2.						
<i>qos</i>	<p>String Optional. The Quality of Service (QoS) level used for delivery of the message to the MQTT trigger.</p> <p>The QoS for a message can be different than the QoS value set for the MQTT trigger. The QoS for publishing messages to the MQTT server is separate from the QoS for receiving messages. When sending the message to the MQTT trigger, the MQTT server uses the lower QoS regardless of whether it was set by the message publisher or by the MQTT trigger.</p> <p>MQTT version 3.1.1 does not require MQTT servers to support QoS 2. An MQTT server may downgrade a QoS of 2 to 1.</p>						
<i>isRetained</i>	<p>String Optional. Flag indicating whether the MQTT message was saved by the MQTT server as the last known good message for the topic. Whether or not a message is retained is determined by the retain flag in the message which is set by the publisher.</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates the MQTT message was retained by the MQTT server as the last known good message. ■ <code>false</code> indicates the MQTT message was not retained by the MQTT server as the last known good message. 						
<i>isDuplicate</i>	<p>String Optional. Flag indicating whether the MQTT message is a duplicate of one previously retrieved by the MQTT trigger. The MQTT server resends messages when the MQTT server does not receive an acknowledgment for the message from the MQTT trigger. <i>isDuplicate</i> applies only when the <i>qos</i> is greater than 0.</p>						

Output Parameters

None.

27 OAuth Folder

■ Summary of Elements in this Folder	590
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Use the elements in the `oauth` folder to authorize a client application to access data on Integration Server or to revoke access using the OAuth 2.0 Authorization Framework, RFC6749.

Client applications use these services to interact with Integration Server when Integration Server is configured to act as the OAuth authorization server. In this chapter, *authorization server* refers to the Integration Server that acts as the authorization server. For information about configuring Integration Server as the OAuth authorization server, see the section *Configuring Integration Server for OAuth* in the *webMethods Integration Server Administrator's Guide*.

Note:

Before using these services, you must have already registered the client with the authorization server and received a client identifier. You will use this information to invoke the services in this folder. For information about registering a client, see .

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.oauth:authorize	WmPublic. Initiates an authorization request from a client application to the authorization server.
pub.oauth:getAccessToken	WmPublic. <i>Deprecated</i> - Replaced by pub.oauth:getToken .
pub.oauth:getToken	WmPublic. Requests an access token from the authorization server.
pub.oauth:introspectToken	WmPublic. Checks whether an access token or refresh token generated by an Integration Server used as an authorization server is active.
pub.oauth:refreshAccessToken	WmPublic. <i>Deprecated</i> - Replaced by pub.oauth:getToken .
pub.oauth:removeExpiredAccessTokens	WmPublic. Removes expired OAuth access tokens from the database.
pub.oauth:revokeToken	WmPublic. Revokes a token issued by Integration Server acting as an authorization server.

pub.oauth:authorize

WmPublic. Initiates an authorization request from a client application to the Integration Server authorization server.

Input Parameters

response_type **String** The grant type preferred by the client. This parameter informs the authorization server how to respond to the client. Set to:

- `code` for the authorization code grant. When set to `code`, the response from authorization server must include an OAuth authentication code the client can exchange for an access token.
- `token` for an implicit grant type. When set to `token`, the response from authorization server includes an OAuth access token for the client.

For more information about grant types, see [“Usage Notes” on page 592](#).

<i>client_id</i>	String The client identifier generated by the authorization server when the client application is registered. The <i>client_id</i> is used to authenticate the client to the authorization server.
<i>redirect_uri</i>	<p>String. Optional. The URI that the authorization server will use to redirect the client when the client is authorized.</p> <p>This parameter is required if the client is registered with more than one redirect URI. The value for <i>redirect_uri</i> must match one of the client's registered redirect URIs.</p>
<i>scope</i>	<p>String Optional. The name of the scope associated with the client. The scope defines the level of access requested by the client.</p> <p>Specify the name of one or more scopes. Use a space to separate the name of the scopes. For example:</p> <pre>scope1 scope2 scope3</pre> <p>The scopes you specify must already exist on the authorization server. For information about creating a scope, see the section <i>Defining Scopes</i> in the <i>webMethods Integration Server Administrator's Guide</i>.</p>
<i>code_challenge</i>	<p>String Optional. The transformed version of the <code>code_verifier</code> created by the client application.</p> <p>When Integration Server requires PKCE for public clients using the authorization code grant type, the <i>code_challenge</i> input parameter is required. Integration Server requires PKCE for a public client when the Require PKCE option on the Security > OAuth page is set to yes.</p>
<i>code_challenge_method</i>	<p>String Optional. The method used to transform the <code>code_verifier</code> created by the client application. Set to:</p> <ul style="list-style-type: none"> ■ <code>plain</code>. This is the default. ■ <code>S256</code> <p>When <i>code_challenge_method</i> is <code>plain</code>, the <i>code_challenge</i> value is the same as the <code>code_verifier</code>.</p>

state **String.** Optional. A unique string used to maintain the state between the request and callback. When the authorization server redirects the user to the *redirect_uri*, the value for *state* will be included in the response. Software AG recommends using this parameter to protect against cross-site request forgery (CSRF) attacks.

Output Parameters

None.

Usage Notes

The `pub.oauth:authorize` service is the authorization endpoint for the Integration Server acting as the authorization server. The authorization endpoint URL is:

`https://host:port/invoke/pub.oauth/authorize`

This service must be invoked using HTTPS unless the **Require HTTPS** setting on the **Security > OAuth > Edit OAuth Global Settings** page is disabled.

When you register a client, you must consider the grant type the client should use to obtain an access token. Integration Server supports the following grant types with the `pub.oauth:authorize` service:

- **Authorization code.** Requires the client to authenticate to the authorization server before obtaining an access token. The authentication code supplied by the authorization server is included in the redirection URI. The client can refresh an expired token. To implement an authorization code grant, set the *response_type* to `code`.
- **Implicit.** Less secure than the authorization code grant. It does not require the client to authenticate to the authorization server. The authentication server includes the access token in the redirection URI. The client cannot refresh an expired token. To implement an implicit grant, set the *response_type* to `token`.

If the client calls the `pub.oauth:authorize` service with a *response_type* of `password` or `client_credentials`, the service rejects the request with an `invalid_request` OAuth error.

Authentication code is not persisted in the cache. If Integration Server is restarted after the authorization code is issued but before the access token is requested, Integration Server will reject the request for the access token.

The *code_challenge* input parameter is required for a public client when the **Require PKCE** option on the **Security > OAuth** page is set to **yes** and the client identifies authorization code grant type as the preferred grant type (i.e., *response_type* is set to `code`).

Integration Server provides the `com.softwareag.util.PKCE.createCodeVerifier` method for creating a *code_verifier* value and the `com.softwareag.util.PKCE.createCodeChallenge` method for transforming a *code_verifier* value into a base64-encoded, SHA-256 hash to use as the value for *code_challenge*. For more information, see the *webMethods Integration Server Java API Reference*.

pub.oauth:getAccessToken

WmPublic. *Deprecated* - Replaced by [pub.oauth:getToken](#).

Requests an access token from the Integration Server acting as the authorization server.

The authorization server validates the request and generates an access token and a refresh token (if the grant type supports it and the client is configured to get refresh tokens). The tokens, along with the client identifier, token expiration interval, and scope are stored in the authorization server's cache.

Input Parameters

<i>grant_type</i>	<p>String Specifies the type of grant flow required by the client.</p> <p>Specify one of the following:</p> <ul style="list-style-type: none"> ■ authorization_code ■ client_credentials ■ password
<i>client_id</i>	<p>String. Optional. The client identifier generated by the authorization server when the client application is registered. The <i>client_id</i> is used to authenticate the client to the authorization server.</p> <p>Public clients must provide a value for <i>client_id</i>. Confidential clients do not need to provide a value for this parameter because they are required to use HTTP authentication to identify themselves.</p> <p>The service ignores the <i>client_id</i> value when the <i>grant_type</i> is <code>client_credentials</code>.</p>
<i>code</i>	<p>String. Optional. The OAuth authorization code received from the authorization server. A <i>code</i> value is required when the <i>grant_type</i> is <code>authorization_code</code>. Integration Server ignores <i>code</i> for all other grant types.</p>
<i>redirect_uri</i>	<p>String. Optional. The URI the authorization server will use to redirect the client when the client is authorized.</p> <p>A <i>redirect_uri</i> value is required when the <i>grant_type</i> is <code>authorization_code</code> and the client registration specifies more than one redirect URI. The <i>redirect_uri</i> value must match the redirect URI supplied to the <code>pub.oauth:authorize</code> service.</p> <p>The service ignores <i>redirect_uri</i> for all other grant types.</p>
<i>scope</i>	<p>String. Optional. Specify the name of one or more scopes required by the client. Use a space to separate multiple scopes.</p>

The *scope* value is used when *grant_type* is `client_credentials` or `password`. The *scope* value is ignored for other *grant_type* values.

username **String.** Optional. The user name of the resource owner. A *username* is required when the *grant_type* is `password`. The service ignores *username* for all other grant types.

password **String.** Optional. The password of the resource owner. A *username* is required when the *grant_type* is `password`. The service ignores *password* for all other grant types.

Output Parameters

access_token **String** The access token issued by the authorization server.

token_type **String** The type of access token issued by the authorization server. The value is `Bearer`.

expires_in **String** The number of seconds for which the access token is valid.

refresh_token **String.** Optional. The refresh token issued by the authorization server. You can use this token to obtain new access tokens using the same authorization grant.

If the client is registered with a refresh limit of 0, no refresh token is issued.

Usage Notes

The `pub.oauth:getAccessToken` service is deprecated. Use the [pub.oauth:getToken](#) service instead.

The `pub.oauth:getAccessToken` service can be used with authorization code, resource owner password credentials, and client credentials grant flows.

The `pub.oauth:getAccessToken` service is the token endpoint for the Integration Server acting as the authorization server. The token endpoint URL is:

`https://host:port/invoke/pub.oauth/getAccessToken`

The `pub.oauth:getAccessToken` service must be invoked using HTTPS unless the **Require HTTPS** setting on the **Security > OAuth > Edit OAuth Global Settings** page is disabled.

Clients must invoke the `pub.oauth:getAccessToken` service via an HTTP POST request unless the `watt.server.oauth.requirePost` server configuration parameter is set to false. When this parameter is set to false, clients can invoke this service using HTTP GET.

Confidential clients must authenticate requests by supplying their credentials in the HTTP Authorization header.

Authentication code is not persisted in the database. If Integration Server is restarted after the authorization code is issued but before the access token is requested, Integration Server will reject the request for the access token.

The *token_type* output parameter is always `Bearer`. The authorization server retains the information about the bearer tokens it issues, including the user information. When the client presents a bearer token to the resource server, the resource server checks with the authorization server to see whether the user is allowed to access the requested folders and services.

The tokens, authorization codes, and client information are stored in the authorization server's caches. By default, these caches maintain up to 1000 elements in memory and 20000 elements on disk. If the cache size is exceeded, OAuth performance can be affected on Integration Server and can lead to errors if the disk runs out of space. If you anticipate that your authorization server's cache will exceed the default size, you should increase the **Maximum Elements In Memory**, **Maximum Elements On Disk**, or **Maximum Off-Heap** settings for Integration Server. For information about changing these settings, see the section *Working with Caches* in the *webMethods Integration Server Administrator's Guide*. If the cache is distributed, see the BigMemory Max product documentation for 4.1 at www.terracotta.org/documentation for additional considerations when sizing distributed caches.

pub.oauth:getToken

WmPublic. Requests an access token from the Integration Server acting as the authorization server.

The authorization server validates the request and generates an access token and, optionally, a refresh token. The tokens, along with the client identifier, token expiration interval, and scope are stored in the authorization server's cache.

Input Parameters

<i>grant_type</i>	<p>String Specifies the type of grant flow required by the client.</p> <p>Specify one of the following:</p> <ul style="list-style-type: none"> ■ <code>authorization_code</code> for authorization code grant flows ■ <code>client_credentials</code> for client credentials grant flows. ■ <code>password</code> for resource owner password credentials grant flows. ■ <code>refresh_token</code> for refresh token grant flows.
<i>code</i>	<p>String. Optional. The OAuth authorization code received from the authorization server. You must specify <i>code</i> when <i>grant_type</i> is <code>authorization_code</code>. The service ignores the <i>code</i> value for all other grant types.</p>
<i>client_id</i>	<p>String. Optional. The client identifier generated by the authorization server when the client application is registered. The <i>client_id</i> is used to authenticate the client to the authorization server.</p>

Public clients must provide a value for *client_id* when *grant_type* is *authorization_code* or *password*. Confidential clients do not need to provide a value for this parameter because they are required to use HTTP authentication to identify themselves.

The service ignores the *client_id* value if the *grant_type* is *client_credentials*.

redirect_uri

String. Optional. The URI the authorization server used to redirect the client when the client request for authorization is approved.

redirect_uri is required when *grant_type* is *authorization_code* and the call to `pub.oauth:authorize` that initiated the authorization code grant included a *redirect_uri* value. The *redirect_uri* supplied for `pub.oauth:getToken` must exactly match the *redirect_uri* value supplied to the call to `pub.oauth:authorize`. If a *redirect_uri* value was not supplied to `pub.oauth:authorize`, then no *redirect_uri* value may be passed to the `pub.oauth:getToken` service. Doing so will result in an HTTP 400 status code being returned.

The service ignores *redirect_uri* for all other grant types.

refresh_token

String. Optional. Refresh token issued to the client by the authentication server.

scope

String. Optional. Specify the name of one or more scopes required by the client. Use a space to separate multiple scopes.

The *scope* variable is used when *grant_type* is *refresh_token*, *password*, or *client_credentials*. The service ignores the *scope* value when *grant_type* is *authorization_code*.

When using the `pub.oauth:getToken` service with the *refresh_token* grant type, the value for *scope* must match or be a subset of the value you provided for the `pub.oauth:authorize` and `pub.oauth:getAccessToken` services. That is, the scope of the refresh token can be smaller than the original request. It cannot contain any scopes that were not approved by the resource owner.

username

String. Optional. The user name of the resource owner. A *username* is required when the *grant_type* is *password*. The service ignores *username* for all other grant types.

password

String. Optional. The password of the resource owner. A *username* is required when the *grant_type* is *password*. The service ignores *password* for all other grant types.

code_verifier

String Optional. The *code_verifier* generated by the client application. The *code_verifier* input parameter is required for public clients when a *code_challenge* has been sent to the authorization endpoint and the *grant_type* is *authorization_code*. Integration Server

applies the *code_challenge_method* provided in `pub.oauth:authorize` to transform the supplied *code_verifier* value. If the transformed value matches the *code_challenge* sent to the authorization endpoint, the token endpoint returns an access token.

Output Parameters

<i>access_token</i>	String The access token issued by the authorization server.
<i>token_type</i>	String The type of access token issued by the authorization server. The value is Bearer.
<i>expires_in</i>	String The number of seconds for which the access token is valid.
<i>refresh_token</i>	String . Conditional. The refresh token issued by the authorization server. You can use this token to obtain new access tokens using the same authorization grant. If the client is registered with a refresh limit of 0, no refresh token is issued.
<i>scope</i>	String . Conditional. Set of scopes requested by the client.

Usage Notes

The `pub.oauth:getToken` service can be used for four different purposes:

- To create an access token as part of the authorization code grant. In this scenario, the client's redirection endpoint invokes the `pub.oauth:getToken` service. If the client is configured to receive refresh tokens, the service will also return a refresh token. To use the service in this scenario:
 - *grant_type* must be set to `authorization_code`
 - *code* is required
 - *client_id* is required for Public clients
 - *redirect_uri* is optional. If specified, *redirect_uri* must match the *redirect_uri* used with the call to `pub.oauth:authorize`.
 - *code_verifier* is required for public clients if the client supplied a *code_challenge* in the call to `pub.oauth:authorize`.
- To create an access token as part of the resource owner password credentials grant. In this scenario, the confidential or public client invokes the `pub.oauth:getToken` service directly. To use the service in this scenario:
 - The Authorization header in the request contains the credentials for the confidential client.
 - *client_id* is required for Public clients.

- *grant_type* must be set to `password`
- *scope* is required.
- *username* is required.
- *password* is required.
- To create an access token as part of the client credentials grant. In this scenario, the confidential client invokes the `pub.oauth:getToken` service directly. To use the service in this scenario:
 - The Authorization header in the request contains the credentials for the confidential client.
 - *grant_type* must be set to `client_credentials`
 - *scope* is required.
- If your access token has expired or is about to expire, and you have a refresh token, you can use `pub.oauth:getToken` to get a new access token. To use the service in this scenario:
 - *grant_type* must be set to `refresh_token`
 - *refresh_token* is required
 - *scope* is optional

The `pub.oauth:getToken` service is the token endpoint for the Integration Server acting as the authorization server. The token endpoint URL is:

`https://host:port/invoke/pub.oauth/getToken`

The `pub.oauth:getToken` service must be invoked using HTTPS unless the **Require HTTPS** setting on the **Security > OAuth > Edit OAuth Global Settings** page is disabled.

Clients must invoke the `pub.oauth:getToken` service via an HTTP POST request unless the `watt.server.oauth.requirePost` server configuration parameter is set to false. When this parameter is set to false, clients can invoke this service using HTTP GET.

Confidential clients must authenticate requests by supplying their credentials in the HTTP Authorization header.

Authentication code is not persisted in the database. If Integration Server is restarted after the authorization code is issued but before the access token is requested, Integration Server will reject the request for the access token.

The *token_type* output parameter is always `Bearer`. The authorization server retains the information about the bearer tokens it issues, including the user information. When the client presents a bearer token to the resource server, the resource server checks with the authorization server to see whether the user is allowed to access the requested folders and services.

The tokens, authorization codes, and client information are stored in the authorization server's caches. By default, these caches maintain up to 1000 elements in memory and 20000 elements on disk. If the cache size is exceeded, OAuth performance can be affected on Integration Server and can lead to errors if the disk runs out of space. If you anticipate that your authorization server's cache will exceed the default size, you should increase the **Maximum Elements In Memory**,

Maximum Elements On Disk, or **Maximum Off-Heap** settings for Integration Server. For information about changing these settings, see the section *Working with Caches* in the *webMethods Integration Server Administrator's Guide*. If the cache is distributed, see the BigMemory Max product documentation for 4.1 at www.terracotta.org/documentation for additional considerations when sizing distributed caches.

Integration Server provides the `com.softwareag.util.PKCE.pkceMatch` method for determining if the `code_verifier` value matches the `code_challenge` value. For more information, see the *webMethods Integration Server Java API Reference*.

pub.oauth:introspectToken

WmPublic. Checks whether an access token or refresh token generated by an Integration Server used as an authorization server is active.

Input Parameters

<i>token</i>	String The access token or refresh token issued by the authorization server.
<i>token_type_hint</i>	String . Optional. A hint for the token type. Specify: <ul style="list-style-type: none"> ■ <code>access_token</code> if the provided token is an access token. ■ <code>refresh_token</code> if the provided token is refresh token.

Output Parameters

<i>active</i>	String Indicates whether or not the token is active. <ul style="list-style-type: none"> ■ <code>true</code> indicates the token was issued by this authorization server, has not expired, and has not been revoked. ■ <code>false</code> indicates the token is not active.
<i>token_type</i>	String . Conditional. The type of access token issued by the authorization server. The value is <code>Bearer</code> . <i>token_type</i> is returned only if <i>active</i> is <code>true</code> and <i>token_type</i> is <code>access_token</code> .
<i>scope</i>	String . Conditional. A space-delimited list of the scope names for which the authorization server issued the token. <i>scope</i> is returned only if <i>active</i> is <code>true</code> and <i>token_type</i> is <code>access_token</code> .
<i>client_id</i>	String . Conditional. The client identifier for which the authorization server generated the access token. The <i>client_id</i> corresponds to a user account in Integration Server. <i>client_id</i> is returned only if <i>active</i> is <code>true</code> , <i>token_type</i> is <code>access_token</code> , and the authorization server has a value for <i>client_id</i> .

The authorization server always has a *client_id* value for confidential clients because a confidential client must supply their *client_id* and *client_secret* when requesting a token. The authorization server will have a *client_id* value for public clients only if the public client has a user account on Integration Server and the client was already logged in at the time it requested an access token.

owner_id **String**. Conditional. User ID of the resource owner that approved the client access.

owner_id is returned only if *active* is `true` and *token_type* is `access_token`.

iat **String**. Conditional. Time at which the authorization server issued the token. Per RFC 7662, this is a timestamp, measured in the number of seconds since January 1 1970 UTC.

iat is returned only if *active* is `true`.

exp **String**. Conditional. Time at which the token expires. Per RFC 7662, this is a timestamp, measured in the number of seconds since January 1 1970 UTC.

exp is returned only if *active* is `true`, *token_type* is `access_token`, and the token expires. If the token does not expire, *exp* does not appear in the output.

Usage Notes

The `pub.oauth:introspectToken` service is the introspection endpoint for the Integration Server authorization server. The URL for the introspection endpoint is:

`https://host:port/invoke/pub.oauth/introspectToken`

The `pub.oauth:introspectToken` service supports RFC 7662, OAuth 2.0 Token Introspection.

Supplying *token_type_hint* may help the Integration Server authorization server look up the token more quickly. If Integration Server does not find the token of the type specified in the provided hint, Integration Server looks for a token of the other type.

This service must be invoked using HTTPS unless the **Require HTTPS** setting on the **Security > OAuth > Edit OAuth Global Settings** page is disabled.

Clients must invoke this service via an HTTP POST request unless the `watt.server.oauth.requirePost` server configuration parameter is set to `false`. When this parameter is set to `false`, clients can invoke this service using HTTP GET.

Integration Server includes a server configuration parameter to control whether or not the OAuth introspection endpoint, the `pub.oauth:introspectToken` service, considers whether a client account is disabled or enabled when determining if an access token is active. When `watt.server.oauth.disableClient.disableTokens` is set to `true`, the `pub.oauth:introspectToken` service considers the token to be inactive if the client account to which the token was issued is disabled. The service returns a value of `false` for the *active* output parameter. The OAuth resource server, whether it's an Integration Server or another vendor, will not allow access to the requested resource.

When `watt.server.oauth.disableClient.disableTokens` is set to `false`, the `pub.oauth:introspectToken` service does not consider the enabled/disabled state of the client account to which the access token was issued when evaluating an access token. The default value `watt.server.oauth.disableClient.disableTokens` is `true`.

pub.oauth:refreshAccessToken

`WmPublic`. *Deprecated* - Replaced by [pub.oauth:getToken](#).

Requests a new access token from the authorization server by using a refresh token. If the authorization server issued a refresh token to the client with the initial request, the client can use this service to request a new access token when the initial access token expires.

Input Parameters

<i>grant_type</i>	String Specify the type of grant flow required by the client. For refresh tokens, you must specify <code>refresh_token</code> .
<i>refresh_token</i>	String Refresh token issued to the client by the authentication server.
<i>scope</i>	String . Optional. Specify the name of one or more scopes required by the client. Use a space to separate multiple scopes. The value for <i>scope</i> must match or be a subset of the value you provided for the <code>pub.oauth:authorize</code> and <code>pub.oauth:getAccessToken</code> services. The scope of the refresh token can be smaller than the original request. It cannot contain any scope tokens that were not in the original request.

Output Parameters

<i>access_token</i>	String The access token issued by the authorization server.
<i>token_type</i>	String The type of access token issued by the authorization server. The value is <code>Bearer</code> .
<i>expires_in</i>	String The number of seconds for which the access token is valid.
<i>refresh_token</i>	String The refresh token issued by the authorization server. You can use this token to obtain new access tokens using the same authorization grant.
<i>scope</i>	String . Conditional. The name of the scopes requested by the client.

Usage Notes

The `pub.oauth:refreshAccessToken` service is deprecated. Use [pub.oauth:getToken](#) instead.

The `pub.oauth:refreshAccessToken` service is used with authorization grant flows only.

The `pub.oauth:refreshAccessToken` service must be invoked using HTTPS unless the **Require HTTPS** setting on the **Security > OAuth > Edit OAuth Global Settings** page is disabled.

Clients must invoke this service via an HTTP POST request unless the `watt.server.oauth.requirePost` server configuration parameter is set to false. When this parameter is set to false, clients can invoke this service using HTTP GET.

Confidential clients must authenticate requests by supplying their credentials in the HTTP Authorization header.

The `token_type` output parameter is always `Bearer`. The authorization server retains the information about the bearer tokens it issues, including the user information. When the client presents a bearer token to the resource server, the resource server checks with the authorization server to see whether the user is allowed to access the requested folders and services.

pub.oauth:removeExpiredAccessTokens

WmPublic. Removes expired OAuth access tokens from the database.

Input Parameters

maxRows **String.** Optional. Maximum number of rows containing expired tokens to be deleted from the database, where each row contains a single expired access token. If you specify 0 or do not specify a value, the service removes all of the rows containing expired tokens from the database.

The *maxRows* parameter applies to Oracle or DB2 databases only. The *maxRows* parameter is ignored for all other database types, such as MySQL, SQL Server, or Derby. Instead, the service deletes all of the rows containing expired tokens.

Output Parameters

removedTokensCount **String** Number of expired tokens removed by the service. If the service did not remove any expired tokens to be removed, the value of *removedTokensCount* is 0.

Usage Notes

To improve the performance of the `pub.oauth:removeExpiredAccessTokens` service, create the following two database indexes:

- Create index `idx_oauth_tmp_idx` on `IS_OAUTH_ACCESSTOKEN(TOKEN_ID)` ;
- Create index `idx_oauth_tmp_idx2` on `IS_OAUTH_REFRESH_TOKEN(TOKEN_ID)` ;

pub.oauth:revokeToken

WmPublic. Revokes a token issued by the Integration Server.

Input Parameters

<i>token</i>	String The access token or refresh token to revoke
<i>token_type_hint</i>	String . Optional. A hint for the token type. Specify: <ul style="list-style-type: none">■ <code>access_token</code> if the provided token is an access token.■ <code>refresh_token</code> if the provided token is a refresh token.

Output Parameters

None.

Usage Notes

The `pub.oauth:revokeToken` service is the revocation endpoint for an Integration Server authorization server. The URL for the revocation endpoint is:

`https://host:port/invoke/pub.oauth/revokeToken`

Integration Server provides this functionality to support RFC 7009, OAuth 2.0 Token Revocation.

Use the `pub.oauth:revokeToken` service to revoke a token on Integration Server only. The service cannot be used to revoke a token on an external authorization server.

Integration Server revokes all of the tokens related to the supplied *token*. If the supplied *token* is an access token, Integration Server revokes the associated refresh token as well. If the supplied *token* is a refresh token, Integration Server revokes the associated access token as well.

When Integration Server revokes a token, Integration Server removes the token from the database and from cache.

If the supplied *token* does not exist, the `pub.oauth:revokeToken` service is a no-op. Integration Server does not need to return an error because the token is unusable.

Only administrators who are members of the Administrators ACL and confidential clients can revoke tokens. Administrators can revoke any token. Confidential clients can revoke tokens that have been issued to them only. Public clients cannot revoke tokens.

Supplying *token_type_hint* may help the Integration Server authorization server look up the token more quickly. If Integration Server does not find the token of the type specified in the provided hint, Integration Server looks for a token of the other type.

If the *token_type_hint* is incorrect, invalid, or missing, Integration Server still revokes the token

This service must be invoked using HTTPS unless the **Require HTTPS** setting on the **Security > OAuth > Edit OAuth Global Settings** page is disabled.

Clients must invoke this service via an HTTP POST request unless the `watt.server.oauth.requirePost` server configuration parameter is set to false. When this parameter is set to false, clients can invoke this service using HTTP GET.

28 Packages Folder

■ Summary of Elements in this Folder	606
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You use the elements in the packages folder to install, load, and/or alter the status of a package on the Integration Server.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.packages:activatePackage	WmPublic. Activates (makes available to clients) an inactive package.
pub.packages:backupPackage	WmPublic. Creates a backup copy of a specified package.
pub.packages:disablePackage	WmPublic. Disables a package, thus prohibiting access to the services in the package.
pub.packages:enablePackage	WmPublic. Enables a package that has been disabled.
pub.packages.hotdeployment:cancel	WmPublic. Cancels a hot deployment operation.
pub.packages:installPackage	WmPublic. Installs a package that has been published to this server.
pub.packages:recoverPackage	WmPublic. Recovers a package that exists in the server's salvage directory.
pub.packages:reloadPackage	WmPublic. Loads a new copy of the package into memory from disk.
pub.packages:updateHomePage	WmPublic. Updates the home page of a custom package.

pub.packages:activatePackage

WmPublic. Activates (makes available to clients) an inactive package.

You use this service to activate a package that was not activated when it was initially installed or recovered.

Note:

This service activates packages from an *inactive* state (that is, packages that are installed on the server but are not registered in the active-package list). To enable a package that is in a *disabled* state, you use [pub.packages:enablePackage](#).

Input Parameters

package **String** Name of the package that you want to activate. Package names are case sensitive.

Output Parameters

message **String** Message from server. (This is the same message that you receive when you activate a package with the Integration Server Administrator.)

Usage Notes

This service will throw an exception if the package specified in *package* does not exist or cannot otherwise be activated.

When a package is activated, it is loaded into memory in an enabled state (that is, `activatePackage` automatically activates *and* enables the package.) You do not need to explicitly enable it with [pub.packages:enablePackage](#).

See Also

[pub.packages:enablePackage](#)

[pub.packages:installPackage](#)

[pub.packages:recoverPackage](#)

pub.packages:backupPackage

WmPublic. Creates a backup copy of a specified package.

Input Parameters

packageName **String** Name of the package to back up.

Output Parameters

None.

Usage Notes

The service creates the backup in a file named *packageName.zip*, where *packageName* is the name of the original package installed in Integration Server. The *packageName.zip* is placed in the following directory:

Integration Server_directory \instances*instance_name*\replicate\inbound

If a package with the same name as the file produced by this service already exists in the *Integration Server_directory* \instances*instance_name*\replicate\inbound directory, the service overwrites the existing .zip file with the backup copy that the service creates.

The backed up package is an exact copy of the specified package. Package metadata, such as creation timestamp, will be the same in the backup as in the original package. This is unlike package replication or package archiving in which the creation timestamp reflects the time the package was replicated or archived.

pub.packages:disablePackage

WmPublic. Disables a package, thus prohibiting access to the services in the package.

Input Parameters

package **String** Name of the package that you want to disable. Package names are case sensitive.

Output Parameters

message **String** Message from server. (This is the same message that you receive when you disable a package with the Integration Server Administrator.)

Usage Notes

When a package is disabled, the services in the package are no longer available to the clients. To re-enable a package that has been disabled, use [pub.packages:enablePackage](#).

Important:

Never disable the WmRoot package. Doing so would disable the server.

Be aware that if you disable a package while services in the package are being executed, those services will most likely fail. `disablePackage` does not wait for in-progress services to finish before disabling a package.

This service will throw an exception if the package specified in *package* does not exist or cannot otherwise be disabled.

See Also

[pub.packages:enablePackage](#)

pub.packages:enablePackage

WmPublic. Enables a package that has been disabled.

Note:

This service enables a package that is in a *disabled* state (that is, a package that has been disabled through the Integration Server Administrator or the [pub.packages:disablePackage](#) service). To activate a package that is in an *inactive* state, you use `enablePackage`.

Input Parameters

package **String** Name of the package that you want to enable. Package names are case sensitive.

Output Parameters

message **String** Message from server. (This is the same message that you receive when you enable a package with the Integration Server Administrator.)

Usage Notes

When you enable a package, the package is reloaded into memory from disk.

This service will throw an exception if the package specified in *package* does not exist, has not been activated, or cannot otherwise be enabled.

See Also

[pub.packages:disablePackage](#)

[pub.packages:activatePackage](#)

[pub.packages:reloadPackage](#)

pub.packages.hotdeployment:cancel

WmPublic. Cancels a hot deployment operation.

You use the hot deployment feature in Integration Server to upgrade custom packages in Integration Server while ensuring that the Integration Server assets are available for processing without any noticeable downtime. You can use the `pub.packages.hotdeployment:cancel` service to cancel a hot deployment operation if Integration Server is unable to start installing the package because of delay in the completion of in-flight tasks. For more information about hot deployment of packages, see the section *Hot Deployment of Packages* in the *webMethods Integration Server Administrator's Guide*.

Input Parameters

package **String** Name of the package that is being upgraded using hot deployment operation that you want to cancel. Package names are case sensitive.

Output Parameters

message **String** Message from server indicating the status of the cancellation of the hot deployment operation.

pub.packages:installPackage

WmPublic. Installs a package that has been published to this server.

Input Parameters

packageFile **String** Name of the distribution file that contains the package that you want to install. This file must reside in the server's inbound directory (*Integration Server_directory* \instances*instance_name*\replicate\inbound).

When specifying *packageFile*,

- **Do** include the .zip extension in the file name.
- **Do not** include the directory path.

For example: myPackageFileAug2001.zip

activateOnInstall **String** Flag that specifies whether you want Integration Server to automatically activate the package after it is installed. Set to:

- yes to activate the package after installation and make it immediately available to clients. This is the default.
- no to install the package without activating it afterwards. If you install a package in this mode, it will not be accessible until it is explicitly activated through the Integration Server Administrator or the [pub.packages:activatePackage](#) service.

archiveOnInstall **String** Optional. Flag that specifies whether you want Integration Server to archive the package automatically after it is installed. Set to:

- yes to archive the package after installation. If you choose to archive the package automatically, Integration Server moves the package from the *Integration Server_directory* \instances*instance_name*\replicate\inbound directory to the *Integration Server_directory* \instances*instance_name*\replicate\archive directory. This is the default.
- no to install the package without archiving it.

Output Parameters

message **String** Message from server. (This is the same message that is displayed when you install a package with the Integration Server Administrator.)

Usage Notes

If the installed package replaces an existing package on the server, `pub.packages:installPackage` will automatically put a backup copy of the existing package in `Integration Server_directory \instances\instance_name\replicate\salvage` before it installs the new package.

This service will throw an exception if the file named in `packageFile` does not exist or cannot otherwise be installed correctly.

If hot deployment of packages is enabled, Integration Server installs the package using the hot deployment process.

The Integration Server must run in a version of the JVM whose major version is greater than or equal to the JVM version required by the package. For example, if the specified JVM version for a package release is `1.8.0_32`, the installing Integration Server must be running in a JVM that is 1.8 or higher. If the major version of the Integration Server JVM is less than the JVM version required by the package, Integration Server installs but does not activate the package.

See Also

[pub.packages:activatePackage](#)

[pub.packages:recoverPackage](#)

pub.packages:recoverPackage

WmPublic. Recovers a package that exists in the server's salvage directory.

The salvage directory (`Integration Server_directory \instances\instance_name\replicate\salvage`) is where the server keeps packages that are deleted with the "safe delete" option or replaced with newer installed versions.

Input Parameters

package **String** Name of the package that you want to recover. Package names are case sensitive.

activateOnRecover **String** Flag that specifies whether you want the server to automatically activate the package after it is recovered. Set to:

- `yes` to activate the package after it is recovered and make it immediately available to clients.

- no to recover the package without activating it afterwards. If you recover a package in this mode, it will not be accessible until it is explicitly activated through the Integration Server Administrator or the [pub.packages:activatePackage](#) service.

Output Parameters

message **String** Message from server. (This is the same message that is displayed when you recover a package with the Integration Server Administrator.)

Usage Notes

You can only recover packages that exist in the server's salvage directory.

If you recover a package that is currently installed on the server, the package from the salvage directory *replaces* the version that is currently installed. (Be aware that the server *does not* retain a copy of the version that it replaces.)

This service will throw an exception if the file named in *package* does not exist in the server's salvage directory or cannot otherwise be recovered.

See Also

[pub.packages:activatePackage](#)

pub.packages:reloadPackage

WmPublic. Loads a new copy of the package into memory from disk.

If you make changes to the service in a package while the server is running, you must use `reloadPackage` to put those changes into effect.

Input Parameters

package **String** Name of the package that you want to reload. Package names are case sensitive.

Output Parameters

message **String** Message from server. (This is the same message that is displayed when you reload a package with the Integration Server Administrator.)

Usage Notes

Be aware that if you reload a package while services in the package are being executed, those services will most likely fail. `reloadPackage` does not wait for in-progress services to finish before reloading a package.

This service will throw an exception if the file named in *package* does not exist or cannot otherwise be reloaded.

pub.packages:updateHomePage

WmPublic. Updates the home page of a custom package. This service does not apply to the system packages.

The package home page is at *Integration Server_directory* \instances*instance_name*\packages*<package Name>*\pub\index.html

Input Parameters

<i>packageName</i>	String Name of the package for which you want to update the home page. Package names are case sensitive.
<i>replaceHTML</i>	Boolean Flag that specifies whether to overwrite the existing index.html file. Set to: <ul style="list-style-type: none"> ■ <code>true</code> to replace index.html with a predefined home page template for custom package documentation and all the required resources. ■ <code>false</code> to modify only the resources and not the index.html file.

Note:

If any of the input parameters contain leading or trailing spaces, Integration Server considers the input parameter as an invalid input and throws an error.

Output Parameters

<i>success</i>	Boolean Flag that specifies whether the home page is updated successfully.
<i>message</i>	String Conditional. Message from Integration Server that specifies whether the home page is updated successfully. The message changes based on the <i>replaceHTML</i> value.

Usage Notes

After creating a custom package, you must run the `pub.packages:updateHomePage` service with *replaceHTML* set to `true` to see the updated package documentation. When the *replaceHTML* value

is `true`, the service overrides the existing content in the `index.html` file. If the `replaceHTML` value is `false`, the `index.html` file retains the existing content.

To see the subsequent changes to the package, run the service again from Integration Server Administrator by regenerating the home page. This invokes the `pub.packages:updateHomePage` service with `replaceHTML` as `false`. If you need to update the changes in the `index.html` file, run the service with `replaceHTML` set to `true`.

You can access the package home page even when Integration Server Administrator session expires. For more information on viewing package information and generating package documentation, see the *webMethods Integration Server Administrator's Guide* and *webMethods Service Development Help*.

29 Parquet Folder

■ Summary of Elements in this Folder	616
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Use the elements in the Parquet folder to read and write Apache Parquet files on the Integration Server to and from IData.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.parquet:closeBatchIterator	WmParquet. Closes the Parquet iterator.
pub.parquet:documentTypeToSchema	WmParquet. Converts an Integration Server document type to the Parquet schema format.
pub.parquet:getBatchIterator	WmParquet. Reads a Parquet file and returns a batch iterator object that can be used to iterate over the records of the Parquet file.
pub.parquet:getNextBatch	WmParquet. Gets the next batch of Parquet records from the iterator object returned by the pub.parquet:getBatchIterator service.
pub.parquet:read	WmParquet. Reads a Parquet file and converts it to an IData array (Document list).
pub.parquet:write	WmParquet. Writes a document list (an array of IData objects) to a Parquet file.

pub.parquet:closeBatchIterator

WmParquet. Closes the Parquet iterator. The Parquet iterator object, which is obtained from the [pub.parquet:getBatchIterator](#) service, cannot be used after running this service.

Input Parameters

iterator **Object** The iterator object returned by the [pub.parquet:getBatchIterator](#) service.

Output Parameters

None.

pub.parquet:documentTypeToSchema

WmParquet. Converts an Integration Server document type to the Parquet schema format. This service enables you to create a Parquet schema that can be passed to the [pub.parquet:write](#) service.

Input Parameters

docTypeName **String** The fully qualified name of an IS document type.

Output Parameters

schema **String** A Parquet schema for the given IS document type.

pub.parquet:getBatchIterator

WmParquet. Reads a Parquet file and returns a batch iterator object that can be used to iterate over the records in the Parquet file.

Input Parameters

fileName **String** Name of the Parquet file to be read.

Output Parameters

iterator **Object** An iterator object that can be used to iterate over the records in the Parquet file.

Usage Notes

None.

pub.parquet:getNextBatch

WmParquet. Gets the next batch of Parquet records from the iterator object returned by the `pub.parquet:getBatchIterator` service. This service returns records based on the batch size (`batchSize`) provided as input. The batch size can vary across invocations of the service.

To retrieve all records from a Parquet file, invoke this service in a loop till all the records are retrieved (till the `hasNext` output parameter of this service is not `false`).

Input Parameters

iterator **Object** The `iterator` object from which the records have to be retrieved. This object is obtained from the `pub.parquet:getBatchIterator` service.

batchSize **String**. Number of records to be fetched in the current iteration.

Output Parameters

<i>records</i>	Document List A batch of Parquet records converted to an IData array. The number of records returned is less than or equal to the <i>batchSize</i> parameter.								
<i>iterationStatus</i>	Document Details about the iteration are provided in the following fields: <table><tr><td><i>hasNext</i></td><td>String. Returns true if the iterator has more records to read after this iteration.</td></tr><tr><td><i>iteration</i></td><td>String The current iteration count, with the first iteration being 1.</td></tr><tr><td><i>noOfElementsInBatch</i></td><td>String The number of records retrieved in the current iteration.</td></tr><tr><td><i>totalElementsProccesed</i></td><td>String Total number of records retrieved till the current iteration (including the current <i>noOfElementsInBatch</i>).</td></tr></table>	<i>hasNext</i>	String. Returns true if the iterator has more records to read after this iteration.	<i>iteration</i>	String The current iteration count, with the first iteration being 1.	<i>noOfElementsInBatch</i>	String The number of records retrieved in the current iteration.	<i>totalElementsProccesed</i>	String Total number of records retrieved till the current iteration (including the current <i>noOfElementsInBatch</i>).
<i>hasNext</i>	String. Returns true if the iterator has more records to read after this iteration.								
<i>iteration</i>	String The current iteration count, with the first iteration being 1.								
<i>noOfElementsInBatch</i>	String The number of records retrieved in the current iteration.								
<i>totalElementsProccesed</i>	String Total number of records retrieved till the current iteration (including the current <i>noOfElementsInBatch</i>).								

Usage Notes

The getNextBatch service may run into a memory limitation when reading a batch with a large number of records. Consider using a smaller batch size or allocating more memory to the Integration Server instance.

pub.parquet:read

WmParquet. Reads a Parquet file and converts it to an IData array (Document list).

Input Parameters

fileName **String** Name of the Parquet file to be read.

Output Parameters

records **Document List** An array of IData objects containing Parquet records. The tables [“Mapping of Parquet basic types to Integration Server data types” on page 619](#) and [“Mapping of Parquet logical types to Integration Server data types” on page 619](#) list how Parquet data types map to Integration Server data types.

Usage Notes

The following tables list how Parquet data types are converted to Integration Server data types.

Mapping of Parquet basic types to Integration Server data types for read operations

Parquet Basic Type	Integration Server Type
BOOLEAN	java.lang.Boolean
INT32	java.lang.Integer
INT64	java.lang.Long
INT96	byte[]
FLOAT	java.lang.Float
DOUBLE	java.lang.Double
BYTE_ARRAY or BINARY	byte[]
Group	Document
Repeated Group	Document List

Mapping of Parquet logical types to Integration Server data types for read operations

Parquet Logical Type	Parquet Basic Type	Integration Server Type	Remarks
Signed Integers	INT32(INT)	java.lang.Integer	
	INT64(INT)	java.lang.Long	
Unsigned Integers	INT32(INT)	java.lang.Integer	IS types are signed values, therefore conversion of input Parquet values that exceed the maximum or minimum values of the IS types may not be accurate and require further processing and/or reconversion to larger type to get the correct values.
	INT64(INT)	java.lang.Long	
TIMESTAMP	INT64(TIMESTAMP)	java.lang.Long	The conversion of TIMESTAMP values captures only the integer value but not the <code>isAdjustedToUTC</code> and <code>precision</code> parameters.
INTERVAL	fixed_len_byte_array (INTERVAL)	byte[]	The converted byte array has the same structure as the Parquet INTERVAL byte array.
STRING	Binary (UTF8) or Binary (STRING)	String	
ENUM	Binary(ENUM)	String	

Parquet Logical Type	Parquet Basic Type	Integration Server Type	Remarks
JSON	Binary(JSON)	String	
BSON	Binary(BSON)	byte[]	The conversion of the BSON Parquet type is not supported currently. The generated IS document may not have the expected data.
UUID	Binary	byte[]	The converted byte array has the same structure as the Parquet UUID byte array.
DECIMAL	INT32(DECIMAL) INT64(DECIMAL) fixed_len_byte_array (DECIMAL)	java.lang.Integer java.lang.Long byte[]	The conversion of Decimal values captures only the numerical value but not the precision and scale parameters.
DATE	INT32(DATE)	java.lang.Integer	DATE is converted to an integer value that represents the number of days from the base date, 1 January 1970, which corresponds to 0.
TIME	INT32(TIME) INT64(TIME)	java.lang.Integer java.lang.Long	The conversion of TIME values captures only the integer value but not the UTC adjustment and precision parameters.
LIST	GROUP(LIST)	Document (IData)	LIST is converted to a Document List that has Documents that contain the list values.
MAP	GROUP(MAP)	Document (IData)	MAP is converted to a Document List that has Documents that contain the key-values.

Note:

The read operation may run into a memory limitation when reading a Parquet file that has a large number of records: Consider using the [pub.parquet:getBatchIterator](#) and [pub.parquet:getNextBatch](#) services instead.

Note:

The `pub.parquet:read` service does not support network paths that use a universal naming convention (UNC) path, such as `\\Server\Volume\File` or `/<internet resource name>[\Directory name]`.

pub.parquet:write

WmParquet. Writes a document list (an array of IData objects) to a Parquet file.

Input Parameters

<i>fileName</i>	String Name of the Parquet file to which the records will be written.
<i>schema</i>	<p>String Optional. A Parquet schema against which the documents will be matched before the records are written to the file. If a schema is not provided, an IS document type must be provided using the <i>docTypeName</i> parameter.</p> <p>If any of provided documents do not conform to the given schema exactly, an exception is thrown.</p>
<i>docTypeName</i>	<p>String Optional. The fully qualified name of an IS document type. A document type can be provided instead of the <i>schema</i> parameter. The document type is converted to a Parquet schema internally and used for converting and writing the Parquet file.</p> <p>The tables “Table ” on page 622 and “Mapping of Integration Server data types to Parquet Logical types” on page 622 list how Integration Server data types map to Parquet schema types.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: Either a <i>schema</i> or a <i>docTypeName</i> must be provided to validate the data before it is written to the Parquet file.</p> </div>
<i>records</i>	Document List Array of IData objects to be written to the Parquet file.
<i>options</i>	<p>Document. Optional. Options such as compression methods can be passed to this service.</p> <p><i>compressionCodec</i></p> <p>String Optional. The following compression methods are supported:</p> <ul style="list-style-type: none"> ■ gzip ■ snappy ■ uncompressed

Note:
If a *compressionCodec* is not provided then data is not compressed.

Output Parameters

None.

Usage Notes

The following tables list how Integration Server data types map to Parquet types.

Mapping of Integration Server data types to Parquet basic types for write operations

Integration Server Type	Parquet Basic Type
String	STRING
String List	Repeated STRING
String Table	BINARY
Document	Group
Document List	Repeated Group
Document Reference	Group (flatten)
Document Reference List	Repeated Group (flatten)
java.lang.Boolean	BOOLEAN
java.lang.Integer	INT32
java.lang.Long	INT64
java.lang.Float	FLOAT
java.lang.Double	DOUBLE
java.util.Date	BINARY
java.lang.Byte	BINARY
java.lang.Short	BINARY
byte[]	BINARY
Object (unidentified)	BINARY
Object List (unidentified)	Repeated BINARY

Note:

Arrays of objects, such as java.lang.Boolean and java.lang.Long, are converted to arrays of the corresponding basic types.

Mapping of Integration Server data types to Parquet Logical types for write operations

Integration Server Type	Parquet Logical Type	Parquet Basic Type
String	ENUM	Binary(ENUM)
String	JSON	Binary(JSON)

Note:

The `pub.parquet:write` service silently overwrites the file if it already exists: No exception is thrown. Currently, there is no option to append to an existing file.

Important:

Null values are not written to a Parquet file.

Note:

Ensure that the schema does not have field names with characters such as '{', '}', '(', ',', ')', ';', '=', or ' ' (empty space) that are not supported by the Parquet specification.

30 Publish Folder

■ Summary of Elements in this Folder	626
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You use the elements in the publish folder to publish messages to Software AG Universal Messaging or webMethods Broker. Other Integration Servers subscribe to and receive these messages using webMethods messaging triggers.

Note:

webMethods Broker is deprecated.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.publish:deliver	WmPublic. Delivers a document to a specific destination.
pub.publish:deliverAndWait	WmPublic. Requests a reply document from a specific client. The service waits for the reply or indicates that the pub.publish:waitForReply service should retrieve the reply later.
pub.publish:documentResolverSpec	WmPublic. Specification for the signature of a service that determines whether a document's status is New, Duplicate, or In Doubt.
pub.publish:envelope	WmPublic. Document type that defines the content and structure of the envelope that accompanies a published document.
pub.publish:getRedeliveryCount	WmPublic. Retrieves the redelivery count for a document.
pub.publish:publish	WmPublic. Publishes a document locally or to the messaging provider.
pub.publish:publishAndWait	WmPublic. Broadcasts a request for a document from any client subscribed to a specific document type. The service waits for the reply or indicates that the pub.publish:waitForReply service should retrieve the reply later.
pub.publish:reply	WmPublic. Delivers a reply document to the requesting client.
pub.publish:syncToBroker	WmPublic. <i>Deprecated</i> - Replaced by pub.publish:syncToProvider .
pub.publish:syncToProvider	Synchronizes one or more publishable document types with their associated definition on the messaging provider.
pub.publish:waitForReply	WmPublic. Retrieves the reply for an asynchronous request. If a reply is not available, the Integration Server continues to wait for the document until the time specified in the <i>waitTime</i> parameter of the pub.publish:deliverAndWait or pub.publish:publishAndWait service elapses.

Element	Package and Description
pub.publish.notification:error	WmPublic. Publishable document type that defines the document that Integration Server generates and delivers when a trigger encounters an error or exception condition during processing.

pub.publish:deliver

WmPublic. Delivers a document to a specific destination.

Input Parameters

<i>documentTypeName</i>	<p>String Fully qualified name of the publishable document type being delivered.</p> <p>The publishable document type must be in sync with the associated provider definition. The provider definition is a representation of the publishable document type and its properties on the provider. In the case of Universal Messaging, this is a channel. For Broker, it is a Broker document type. If the document type and provider definition are not synchronized, publication might fail.</p> <p>A publishable document type that uses the <code>IS_LOCAL_CONNECTION</code> alias cannot be delivered because delivery can only occur with a messaging provider (Broker or Universal Messaging).</p>
<i>document</i>	<p>Document Document (IData object) conforming to the publishable document type in <i>documentTypeName</i>.</p>
<i>destId</i>	<p>String The destination to which the document will be delivered. You can specify the ID for an individual trigger or the default client of an Integration Server as the destination. When you deliver a document to the default client of Integration Server, Integration Server routes the delivered document to any subscribers on that Integration Server.</p> <p>When working with Universal Messaging, the destination ID is a subject. When working with Broker, the destination ID is the client ID. For details about the destination IDs, see the Usage Notes for this service.</p> <p>If you specify an invalid client ID, the Integration Server delivers the document to the messaging provider, but the messaging provider never delivers the document to the intended recipient and no error is produced.</p>

delayUntilServiceSuccess

String Optional. Flag indicating whether the Integration Server should publish the document when the `pub.publish:deliver` service executes or after the top-level service successfully completes. If the top-level service fails, the Integration Server will not publish the document.

Set to:

- `true` to delay publishing until after the top-level service executes successfully.
- `false` to publish the document when the `pub.publish:deliver` service executes. This is the default.

Output Parameters

None.

Usage Notes

You can use the `pub.publish:deliver` service to deliver a document to a destination where the destination can be a `webMethods` messaging trigger or the default client of an Integration Server.

- The destination ID for a trigger that receives documents from Broker uses the following naming convention:

clientPrefix_folderName_subfolderName_triggerName

Where *clientPrefix* is the client prefix for the messaging connection alias used by the trigger, *folderName* is the folder in which the trigger is located, *subfolderName* is the subfolder in which the trigger is located, and *triggerName* is the local name of the trigger.

For example, for a trigger with the fully qualified name `myFolder.mySubFolder.myTrigger` that uses a messaging connection alias with the client prefix “`myAlias`”, the destination ID of the trigger is: `myAlias_myFolder_mySubFolder_myTrigger`.

- The destination ID for a trigger that receives documents from Universal Messaging uses the following naming convention:

clientPrefix##triggerName

Where *clientPrefix* is the Universal Messaging connection alias used by the trigger and *triggerName* is the fully qualified name of the trigger where periods and colons are replaced by double underscores.

For example, a trigger that uses a Universal Messaging connection alias with a client prefix of `myPrefix` and a trigger name of `myFolder.mySubfolder:myTrigger` the trigger client ID, and therefore the destination ID, would be: `myPrefix##myFolder__mySubFolder__myTrigger`

- The destination ID for the default client of an Integration Server uses the following naming convention:

clientPrefix_DefaultClient

Where *clientPrefix* is the client prefix for the messaging connection alias used by subscribers to the publishable document type on the Integration Server.

As of version 10.3, Universal Messaging has implemented subscriber name filtering for its durable subscriptions which is what Integration Server uses to ensure that delivered documents were routed by Universal Messaging to the intended destination. In subscriber name filtering, when a publisher designates a message for a specific subscriber, Universal Messaging routes the message to a consumer whose durable subscription name matches the designated subscriber name in the message. For Integration Server, the subscription name filtering requires some modifications, specifically:

- Enable the subscription name filtering feature on Universal Messaging. To enable the feature through Universal Messaging Enterprise Manager, navigate to the realm and select the Config tab. In the realm server configuration panel, click Show Advanced Config. Expand Advanced Configuration - Durable Config, and set Durable Name Filtering to true.
- Change the *destID* input parameter value in invocations of `pub.publish:deliver` and `pub.publish:deliverAndWait`, if necessary. This may only be necessary when the trigger to which the message is to be delivered contains an underscore in its name. For more information about client IDs for triggers and how this change may impact existing services that invoke `pub.publish:deliver*`, see *Publish-Subscribe Developer's Guide*.

To view the subjects for a trigger used with Universal Messaging, use Integration Server Administrator to open the **Messaging > webMethods triggers** page. In the **Individual webMethods Messaging Trigger Controls** list, click the name of the trigger for which you want to view the client ID. On the **Messaging > webMethods triggers > Trigger name** page, under **Destination ID for Deliver**, the **Trigger Client ID** field displays the client ID for the trigger. The **Default Client ID** field displays the client of the Integration Server.

To view a list of client IDs on the Broker, use the Broker user interface within My webMethods or use Designer to test the publishable document type that you want to deliver.

For a Universal Messaging connection alias the **Publish Wait Time While Reconnecting** value specifies the number of milliseconds that a publishing service using alias will wait for a connection to the Universal Messaging server to be re-established after the connection fails. If Integration Server re-establishes the connection before the **Publish Wait Time While Reconnecting** elapses, the publishing service continues executing. If the specified time elapses before a connection is re-established, the publishing service ends with an `ISRuntimeException`. Make sure to code your service to handle this situation.

If outbound client-side queuing is disabled (the `watt.server.publish.useCSQ` property is set to "never"), Integration Server throws a `ServiceException` if the Broker is not available when this service executes. Make sure to code your service to handle this situation.

If the `pub.publish:deliver` services publishes a document to Universal Messaging and use of the client side queue is disabled for the Universal Messaging connection alias, Integration Server throws an `ISRuntimeException` if the Universal Messaging server is not available when the service executes. Make sure to code your service to handle this situation.

For more information about how the Integration Server, Universal Messaging, and Broker deliver documents and for information about building a service that delivers a document, see the *Publish-Subscribe Developer's Guide*.

See Also

[pub.publish:publish](#)

[pub.publish:deliverAndWait](#)

[pub.publish:envelope](#)

pub.publish:deliverAndWait

WmPublic. Requests a reply document from a specific client. The service waits for the reply or indicates that the [pub.publish:waitForReply](#) service should retrieve the reply later.

Input Parameters

<i>documentTypeName</i>	String Fully qualified name of the publishable document type being delivered. The publishable document type must be in sync with the associated provider definition. The provider definition is a representation of the publishable document type and its properties on the provider. In the case of Universal Messaging, this is a channel. For Broker, it is a Broker document type. If the document type and provider definition are not synchronized, publication might fail. A publishable document type that uses the IS_LOCAL_CONNECTION alias cannot be delivered because delivery can only occur with a messaging provider (Broker or Universal Messaging).
<i>document</i>	Document Document (IData object) conforming to the publishable document type in <i>documentTypeName</i> .
<i>receiveDocumentType Name</i>	String Optional. Fully qualified name of the publishable document type expected as a reply. If no value is specified, the service uses the first reply document of any type it receives, as long as the value of <i>tag</i> in the envelope of the reply document matches the <i>tag</i> in the envelope of the published document. All other reply documents are discarded.
<i>destId</i>	String The destination to which the document will be delivered. You can specify the ID for an individual trigger or the default client of an Integration Server as the destination. When you deliver a document to the default client of Integration Server, Integration Server routes the delivered document to any subscribers on that Integration Server.

When working with Universal Messaging, the destination ID is a subject. When working with Broker, the destination ID is the client ID. For details about the destination ID, see the Usage Notes for this service.

If you specify an invalid client ID, the Integration Server delivers the document to the messaging provider, but the messaging provider never delivers the document to the intended recipient and no error is produced.

waitTime

String Optional. Specifies the time to wait (in milliseconds) for the response to arrive. If no value is specified, the service waits indefinitely until it receives a reply.

async

String Optional. Flag specifying whether this is an asynchronous or synchronous request/reply. Set to:

- `true` to indicate that this is an asynchronous request/reply. After publishing the document, the Integration Server executes the next step in the flow service immediately. Integration Server does not wait for a reply before continuing service execution.

Note:

To retrieve the reply to an asynchronous request, invoke the [pub.publish:waitForReply](#) service.

- `false` to indicate that this is a synchronous request/reply. After publishing the document, Integration Server waits for a reply before executing the next step in the flow service. This is the default.

Output Parameters

receivedDocument

Document A Document (IData object) received as reply.

Important: Integration Server treats all reply documents as volatile documents. If the Integration Server shuts down before processing the reply document, the reply document is lost.

tag

String Conditional. A unique identifier for a deliver request. The Integration Server uses the *tag* value to match the requesting document with its corresponding reply document.

The service produces a *tag* output value only when the *async* field is set to `true`. The *tag* value is required input when using the [pub.publish:waitForReply](#) service to retrieve the reply.

Note:

The *tag* output value is the same value that the Integration Server places in the *tag* field of the request document's envelope.

Usage Notes

You can use the `pub.publish:deliverAndWait` service to deliver a document to a destination where the destination can be a `webMethods` messaging trigger or the default client of an Integration Server.

- The destination ID for a trigger that receives documents from Broker uses the following naming convention:

clientPrefix_folderName_subfolderName_triggerName

Where *clientPrefix* is the client prefix for the messaging connection alias used by the trigger, *folderName* is the folder in which the trigger is located, *subfolderName* is the subfolder in which the trigger is located, and *triggerName* is the local name of the trigger.

For example, for a trigger with the fully qualified name `myFolder.mySubFolder:myTrigger` that uses a messaging connection alias with the client prefix “`myAlias`”, the destination ID of the trigger is: `myAlias_myFolder_mySubFolder_myTrigger`.

- The destination ID for a trigger that receives documents from Universal Messaging uses the following naming convention:

clientPrefix##triggerName

Where *clientPrefix* is the Universal Messaging connection alias used by the trigger and *triggerName* is the fully qualified name of the trigger where periods and colons are replaced by double underscores.

For example, a trigger that uses a Universal Messaging connection alias with a client prefix of `myPrefix` and a trigger name of `myFolder.mySubFolder:myTrigger` the trigger client ID, and therefore the destination ID, would be: `myPrefix##myFolder_mySubFolder_myTrigger`

- The destination ID for the default client of an Integration Server uses the following naming convention:

clientPrefix_DefaultClient

Where *clientPrefix* is the client prefix for the messaging connection alias used by subscribers to the publishable document type on the Integration Server.

As of version 10.3, Universal Messaging has implemented subscriber name filtering for its durable subscriptions which is what Integration Server uses to ensure that delivered documents were routed by Universal Messaging to the intended destination. In subscriber name filtering, when a publisher designates a message for a specific subscriber, Universal Messaging routes the message to a consumer whose durable subscription name matches the designated subscriber name in the message. For Integration Server, the subscription name filtering requires some modifications, specifically:

- Enable the subscription name filtering feature on Universal Messaging. To enable the feature through Universal Messaging Enterprise Manager, navigate to the realm and select the Config tab. In the realm server configuration panel, click Show Advanced Config. Expand Advanced Configuration - Durable Config, and set Durable Name Filtering to true.

- Change the *destID* input parameter value in invocations of `pub.publish:deliver` and `pub.publish:deliverAndWait`, if necessary. This may only be necessary when the trigger to which the message is to be delivered contains an underscore in its name. For more information about client IDs for triggers and how this change may impact existing services that invoke `pub.publish:deliver*`, see *Publish-Subscribe Developer's Guide*.

To view the subjects for a trigger used with Universal Messaging, use Integration Server Administrator to open the **Messaging > webMethods triggers** page. In the **Individual webMethods Messaging Trigger** list, click the name of the trigger for which you want to view the client ID. On the **Messaging > webMethods triggers > Trigger name** page, under **Destination ID for Deliver**, the **Trigger Client ID** field displays the client ID for the trigger. The **Default Client ID** field displays the client of the Integration Server.

To view a list of client IDs on the Broker, use the Broker user interface within My webMethods or use Designer to test the publishable document type that you want to deliver.

For a Universal Messaging connection alias the **Publish Wait Time While Reconnecting** value specifies the number of milliseconds that a publishing service using alias will wait for a connection to the Universal Messaging server to be re-established after the connection fails. If Integration Server re-establishes the connection before the **Publish Wait Time While Reconnecting** elapses, the publishing service continues executing. If the specified time elapses before a connection is re-established, the publishing service ends with an `ISRuntimeException`. Make sure to code your service to handle this situation.

You can use the `pub.publish:deliverAndWait` service to initiate and continue a private conversation between two clients. This is a variation of the request/reply model. One client executes a service that delivers a document to a specific client. This document requests information from the receiving client.

- In a synchronous request/reply, the delivering service stops executing while it waits for a response. When the service receives a reply document from the specified client, the servers resumes executing. If the *waitTime* elapses before the service receives a reply, Integration Server ends the request, and the service returns a null document indicating that the request timed out. Integration Server then executes the next step in the flow service. If a reply document arrives after the flow service resumes execution, Integration Server rejects the document and creates a journal log message stating that the document was rejected because there is no service thread waiting for the document.
- In an asynchronous request/reply, the delivering service continues executing the steps in the service after publishing the document. To retrieve the reply, the delivering service must invoke the `pub.publish:waitForReply` service. If the wait time elapses before the `pub.publish:waitForReply` service receives a document, the `pub.publish:waitForReply` service returns a null document indicating that the request timed out.

A service that contains multiple asynchronous deliver requests allows the service to deliver all the requests before collecting the replies. This approach can be more efficient than delivering a request, waiting for a reply, and then delivering the next request.

If you create a service that contains multiple asynchronous requests, make sure to link the *tag* output to another field in the pipeline. Each asynchronous delivery produces a *tag* field in the

pipeline. If the *tag* field is not linked to another field, the next asynchronous delivery request (that is, the next execution of the `pub.publish:deliverAndWait` service) will overwrite the first *tag* value.

Use `pub.publish:deliverAndWait` if you need to know that a specific client successfully received and processed the request document.

If the publishable document type in *documentTypeName* is associated with a Universal Messaging connection alias, the **Enable Request/Reply Channel and Listener** check box must be selected for the alias. When this check box is selected, Integration Server ensures that a request/reply channel exists for the Universal Messaging connection alias on the Universal Messaging server and that Integration Server has a listener that subscribes to the alias-specific request/reply channel. If the check box is cleared, there will be no channel in which Universal Messaging can collect replies and no listener with which Integration Server can retrieve replies. The `pub.publish:deliverAndWait` service will end with a `ServiceException` if the **Enable Request/Reply Channel and Listener** check box is not selected for the Universal Messaging connection alias.

If outbound client-side queuing is disabled (the `watt.server.publish.useCSQ` property is set to "never"), Integration Server throws a `ServiceException` if the webMethods Broker is not available when this service executes. Make sure to code your service to handle this situation.

If the `pub.publish:deliverAndWait` services publishes a document to Universal Messaging and use of the client side queue is disabled for the Universal Messaging connection alias, Integration Server throws an `ISRuntimeException` if the Universal Messaging server is not available when the service executes. Make sure to code your service to handle this situation.

For more information about how to build a services that initiate synchronous or asynchronous request/reply scenarios, see the *Publish-Subscribe Developer's Guide*.

See Also

[pub.publish:waitForReply](#)

[pub.publish:publishAndWait](#)

[pub.publish:reply](#)

[pub.publish:envelope](#)

pub.publish:documentResolverSpec

`WmPublic`. Specification for the signature of a service that determines whether a document's status is New, Duplicate, or In Doubt.

Input Parameters

<i>documentTypeName</i>	String Fully qualified name of the document whose status is In Doubt.
<i>redeliveryCount</i>	String Number of times the document has been redelivered to the trigger queue on the Integration Server.

<i>uuid</i>	String Universally unique identifier for the document. The publishing application assigns the <i>uuid</i> to a document.
<i>document</i>	Document The document (IData object) whose status needs to be resolved. This document must conform to the publishable document type specified in <i>documentTypeName</i> .
<i>transport</i>	String The transport (such as LOCAL, BROKER, or UM) used to send the document to the Integration Server.
<i>triggerName</i>	String The name of the webMethods messaging trigger that received the document whose status needs to be resolved.

Output Parameters

<i>status</i>	<p>String Indicates the status of the document. The value of this field determines whether the Integration Server processes the document, discards the document, or sends the document to the audit log. The <i>status</i> field must have one of the following values.</p> <ul style="list-style-type: none"> ■ NEW indicates that the document is new and has not been processed by the trigger. Integration Server instructs the trigger to process the document. ■ DUPLICATE indicates that the document is a duplicate of one already processed by the trigger. Integration Server discards the document and generates a journal log message. ■ IN_DOUBT indicates that the status of the document is still in doubt. The document resolver service could not conclusively determine whether the trigger already processed the document. If the audit log is a database, the audit subsystem logs the document and the Integration Server generates a journal log message.
<i>message</i>	String Conditional. A user-specified string that indicates why the document status is DUPLICATE or IN_DOUBT. Integration Server writes the message to the journal log when the server discards the document or routes it to the audit log.

Usage Notes

The `pub.publish:documentResolverSpec` must be used as the signature for any service used to resolve the processing status of a document. For information about building a document resolver service and enabling exactly once processing for a webMethods messaging trigger, see the *Publish-Subscribe Developer's Guide*.

Use the `pub.jms:documentResolverSpec` as the signature for a document resolver service used to determine the status of a JMS message received by a JMS trigger.

See Also

[pub.jms:documentResolverSpec](#)

pub.publish:envelope

WmPublic. Document type that defines the content and structure of the envelope that accompanies a published document.

The envelope records information such as the sender's address, the time the document was sent, password and certificate information, and other useful information for routing and control. Every publishable document type contains a document reference to this document type.

Read/Write Parameters

You can set the following parameters within your service. Broker supports all of the read/write parameters. However, Software AG Universal Messaging supports only *activation*, *businessContext*, *priority*, *replyTo*, *tag*, and *uuid*. Universal Messaging ignores the values of any other read/write parameters set in the document envelope and passes them through to subscribers.

activation **String** Optional. A unique identifier that any messaging client (including the Integration Server) assigns to all documents published as a result of the one-time execution of the integration solution. If a document does not have an activation ID, the Integration Server assigns one when the document is published.

If you are using a trigger to join documents published by different services, you must explicitly set the activation ID of the documents. The services that publish the documents must assign the same activation ID to the documents.

appLastSeqn **java.lang.Integer** Optional. This field is provided for backward compatibility.

appPassword **String** Optional. The password of the user specified in *appUserName*. If the resource that processes the document requires authentication before it begins processing, specify the password in this field.

appSeqn **java.lang.Integer** Optional. This field is provided for backward compatibility.

appUserName **String** Optional. The user name for logging into the application that processes the document. Use the *appPassword* field to specify the password for this user name.

businessContext **String** Optional. Used by the Integration Server to track business process context and audit context across multiple Integration Servers.

Important:

The *businessContext* field is reserved for internal use by the Integration Server. Do not set or overwrite the value of the *businessContext* field.

<i>controlLabel</i>	java.lang.Short[] Optional. This field is provided for backward compatibility.
<i>errorsTo</i>	String Optional. The client ID to which the Integration Server sends an error notification document if errors occur during document processing by subscribers. If this parameter is not set, error notifications will be sent to the document publisher. The errors document is an instance of pub.publish.notification:error .
<i>errorRequestsTo</i>	String Optional. This field is provided for backward compatibility.
<i>locale</i>	String Optional. Locale of the publishing client expressed as a URN (Uniform Resource Name). Trigger services examine the <i>locale</i> value to determine the locale to use when processing the document. If the <i>locale</i> field is empty, the locale of the current Integration Server is used instead.
<i>maxResults</i>	java.lang.Integer Optional. This field is provided for backward compatibility.
<i>priority</i>	java.lang.Integer Optional. Indicates how quickly the document should be published and processed. A value of 0 is the lowest processing priority; a value of 9 indicates expedited processing. Set a message priority in the document envelope when publishing the document. The default priority is 4.
<i>replyTo</i>	String Optional. The client ID to which the replies to the published document should be sent. If this parameter is not set, replies will be sent to the document publisher as specified in <i>pubId</i> .
<i>runLevel</i>	java.lang.Integer Optional. This field is provided for backward compatibility.
<i>signature</i>	byte[] Optional. A byte sequence that holds a digital signature. Specify a digital signature if clients receiving this document requires one.
<i>signatureType</i>	String Optional. The type of digital signature being used.
<i>startResult</i>	java.lang.Integer Optional. This field is provided for backward compatibility.
<i>tag</i>	java.lang.Integer Optional. Used with pub.publish:publishAndWait and pub.publish:deliverAndWait to match a request document with its corresponding reply document.

Important:

The *tag* field is reserved for internal use by the Integration Server. Do not set or overwrite the value of the *tag* field in the envelope.

<i>trackId</i>	String Optional. A unique identifier assigned to a published document by the publishing client application. If no value is specified, Integration Server populates this field with the value of the <i>uuid</i> field.
<i>transactionId</i>	String Optional. This field is provided for backwards compatibility.
<i>transformState</i>	String Optional. An indication of a document's current state, set by a publishing client application that transforms data. For example, a client could publish a document with a <i>transformState</i> value of "USEnglish" and a receiving client could translate the document into French and publish it with a <i>transformState</i> value of "French."
<i>uuid</i>	String Optional. Universally unique identifier for the document. Integration Server assigns the UUID when it publishes the document. The receiving Integration Server uses the UUID to detect duplicate documents.

If a service uses the `pub.publish:publish` service to publish a document to Universal Messaging, you can specify a value for `uuid`. The `uuid` value that you assign must meet the following criteria:

- Must be a minimum of 1 character in length.
- Must be a maximum of 96 characters in length.
- Must begin with the sequence "wm:" in any case combination. The "wm:" prefix is reserved for UUIDs generated by Integration Server.

Integration Server accepts a user-defined UUID only for invocations of `pub.publish:publish` that publish a document to Universal Messaging. That is, the document being published must be an instance of a publishable document type to which a Universal Messaging connection alias is assigned. For any other publishing service in `pub.publish` or invocations of `pub.publish:publish` that publish a document locally or to webMethods Broker, Integration Server ignores any assigned *uuid* value.

For documents published to Digital Event Services, Integration Server relies on Digital Event Services and on the field used as the `EventId` annotation to provide a unique ID for the document.

Read-only Parameters

Software AG Universal Messaging, webMethods Broker, or Integration Server set the following parameters. You cannot set these parameters within your service, but you can retrieve their values from published documents.

Note:

Of the read-only parameters listed below, Software AG Universal Messaging supports the *destID*, and *pubID* parameters only.

<i>age</i>	java.lang.Integer Optional. The cumulative time, in seconds, that the document spends on all webMethods Brokers. The webMethods Broker starts tracking the document age when it receives the document from the publishing client. The webMethods Broker stops tracking the document age when the subscribing client removes the document from the client queue. If the document is routed to successive webMethods Brokers, <i>age</i> also includes the length of time the document spends on the other webMethods Brokers.
<i>connectionIntegrity</i>	String Optional. An indication of whether the received document passed over a link that is not secure. This field can have one of the following values: <ul style="list-style-type: none">■ <i><empty></i> indicates that at some point, the document passed through a connection that was not encrypted.■ <i>U.S Export</i> indicates that all the connections used to transport the event had an encryption strength of <code>ENCRYPT_LEVEL_US_EXPORT</code> or greater.■ <i>U.S. Domestic</i> indicates that the event traveled exclusively over connections with an encryption strength of <code>ENCRYPT_LEVEL_US_DOMESTIC</code>.
<i>destId</i>	String Optional. The ID of the destination to which the document is being delivered. The publisher sets the <i>destID</i> when it publishes the document. For example, the Integration Server uses the <i>destID</i> value specified in the pub.publish:deliver service or the pub.publish:deliverAndWait service to populate the <i>destID</i> value in the document envelope.
<i>enqueueTime</i>	java.util.Date Optional. The date and time that the webMethods Broker placed the document into the client queue.
<i>logBroker</i>	String Optional. The name of the webMethods Broker that contains the document in its document log. The webMethods Broker sets this parameter when webMethods Broker-based document logging and the logging utility are enabled.
<i>logHost</i>	String Optional. The host name and port number of the webMethods Broker that contains the document in its document log. The webMethods Broker sets this parameter when webMethods Broker-based document logging and the logging utility are enabled.
<i>pubDistinguishedName</i>	String Optional. The distinguished name of the publisher's SSL certificate. The webMethods Broker sets this parameter when the publisher has an SSL connection to the webMethods Broker and clears this parameter when the publisher has a non-SSL connection.
<i>pubId</i>	String Optional. An identifier for the document publisher assigned by the messaging provider.

<i>pubNetAddr</i>	byte[] Optional. The IP address and port number of the document's publisher.
<i>pubSeqn</i>	java.lang.Long Optional. This field is provided for backwards compatibility.
<i>pubLabel</i>	java.lang.Short[] Optional. This field is provided for backwards compatibility.
<i>recvTime</i>	java.util.Date Optional. The date and time the document was received by the messaging provider.
<i>route</i>	Document List Optional. Information about the webMethods Brokers through which a document passed. When a webMethods Broker receives a document, the webMethods Broker sets the <i>broker</i> and <i>recvTime</i> keys. When the webMethods Broker places the document in the queue for the next webMethods Broker, the first webMethods Broker sets <i>enqueueTime</i> . The webMethods Broker only sets these fields when document is forwarded from one webMethods Broker to another. The webMethods Broker does not set these fields when the publishing and receiving clients are connected to the same webMethods Broker.

Key	Description
<i>broker</i>	String Optional. The name of the webMethods Broker.
<i>recvTime</i>	java.util.Date Optional. The time the webMethods Broker received the document from the publishing client or another webMethods Broker.
<i>enqueueTime</i>	java.util.Date Optional. The time the webMethods Broker placed the document in the queue for the next webMethods Broker.

Output Parameters

None.

Usage Notes

For more information about setting and using a document's envelope parameters, see *webMethods Broker Java Client API Reference*, *webMethods Broker Client C API Programmer's Guide*, and *Publish-Subscribe Developer's Guide*.

See Also

[pub.publish:deliver](#)

`pub.publish:deliverAndWait``pub.publish:publish``pub.publish:publishAndWait``pub.publish:publishAndWait``pub.publish.notification:error`

pub.publish:getRedeliveryCount

WmPublic. Retrieves the redelivery count for a document.

The redelivery count indicates the number of times the document has been redelivered to the trigger queue on the Integration Server. A document is redelivered to a trigger queue if the Integration Server shuts down before processing and acknowledging the document.

Input Parameters

None.

Output Parameters

redeliveryCount

String Specifies the number of times the trigger on Integration Server has received the document. The redelivery count can be one of the following:

<u>A value of...</u>	<u>Indicates...</u>
----------------------	---------------------

-1	The transport used to send the document does not maintain a document redelivery count. For example, a document received from a webMethods Broker version 6.0.1 has a redelivery count of -1. (webMethods Brokers that are version 6.0.1 or earlier do not maintain document redelivery counts.) Integration Server may or may not have received the document before.
0	The document has been received only once.
> 0	The number of times document has been redelivered.

Usage Notes

If you do not want to use the exactly once processing capabilities, you can invoke the `pub.publish:getRedeliveryCount` service within your trigger service. The redelivery count for a document can provide an initial indication of whether the trigger has already processed the document.

Integration Server retrieves the redelivery count for the document currently maintained in the invoke state. That is, Integration Server retrieves the redelivery count for the document that caused the trigger service to execute.

When a trigger service satisfied by an All (AND) join condition invokes `pub.publish:getRedeliveryCount`, the `pub.publish:getRedeliveryCount` service returns the redelivery count for the last document received by the join. For example, suppose that documents A and B satisfied an All (AND) join condition. If the Integration Server receives document A first and document B second, when `pub.publish:getRedeliveryCount` executes, it retrieves the redelivery count for document B.

pub.publish:publish

WmPublic. Publishes a document locally or to the messaging provider.

This service broadcasts the document (that is, distributes the document to all clients that subscribe to it).

Input Parameters

<i>documentTypeName</i>	String Fully qualified name of the publishable document type of which you are publishing an instance. If you intend to publish the document to a messaging provider (Broker or Universal Messaging), the publishable document type must be in sync with the associated provider definition. The provider definition is a representation of the publishable document type and its properties on the provider. In the case of Universal Messaging, this is a channel. For Broker, it is a Broker document type. If the document type and provider definition are not synchronized, publication might fail.
<i>document</i>	Document Document (IData object) conforming to the document type in <i>documentTypeName</i> .
<i>local</i>	String Optional. Flag specifying whether the document is to be published locally or to the messaging provider. Set to: <ul style="list-style-type: none">■ <code>true</code> to publish locally (to this Integration Server only).■ <code>false</code> to publish to the messaging provider using the messaging connection alias specified in the document type of which you are publishing an instance. This is the default. The <i>local</i> parameter is applicable only when the publishable document type uses Broker as the messaging provider. If the publishable document type specifies the <code>IS_LOCAL_CONNECTION</code> alias, the document can be published locally only. Integration Server ignores the value of <i>local</i> .

A publishable document type that specifies Universal Messaging as the messaging provider cannot be published locally. If the document type in *documentTypeName* is associated with a Universal Messaging connection alias, Integration Server ignores the value of *local*.

delayUntilServiceSuccess

String Optional. Flag indicating whether the publish should happen when the `pub.publish:publish` service executes or after the top-level service successfully completes. If the top-level service fails, Integration Server will not publish the document. Set to:

- `true` to delay publishing until after the top-level service executes successfully.

Note: Integration Server does not return the *status* output parameter when *delayUntilServiceSuccess* is set to `true`.

- `false` to publish the document when the publish service executes. This is the default.

Output Parameters

status

String Status indicating whether the service was successful. Integration Server reports status only for locally published documents. A value of:

- `success` indicates that the service executed successfully.

Note:

If at least one subscribing trigger has room in its queue, the status is set to `success`.

- `noSubscriber` indicates that Integration Server does not contain any triggers that subscribe to the document.
- `capacityExceeded` indicates that the document could not be placed in the queue of the subscribing trigger because the trigger queue is currently at its maximum capacity.

Note: Integration Server reports this status only when the `watt.server.publish.local.rejectOOS` property is set to `true`.

Usage Notes

You can use `pub.publish:publish` to publish documents to Universal Messaging, Broker, or locally within Integration Server.

The messaging connection alias assigned to a publishable document type determines the message provider to which the Integration Server publishes the document. Only subscribers to the document type on that messaging provider will receive the published document. The **Connection alias**

name property for the document type specifies the message provider. If there is no specified message provider alias, Integration Server publishes the document to the provider in the default messaging connection alias.

If the messaging connection alias specified for the document type does in *documentTypeName* does not exist when the `pub.publish:publish` service executes, Integration Server issues a `ServiceException`. Make sure to code your service to handle this situation.

Integration Server writes a message to the journal log whenever it rejects or discards a document.

For a Universal Messaging connection alias the **Publish Wait Time While Reconnecting** value specifies the number of milliseconds that a publishing service using alias will wait for a connection to the Universal Messaging server to be re-established after the connection fails. If Integration Server re-establishes the connection before the **Publish Wait Time While Reconnecting** elapses, the publishing service continues executing. If the specified time elapses before a connection is re-established, the publishing service ends with an `ISRuntimeException`. Make sure to code your service to handle this situation.

If the `pub.publish:publish` services publishes a document to Broker and outbound client-side queuing is disabled (the `watt.server.publish.useCSQ` property is set to "never"), Integration Server issues a `ServiceException` if the Broker is not available when the service executes. Make sure to code your service to handle this situation.

If the `pub.publish:publish` services publishes a document to Universal Messaging and use of the client side queue is disabled for the Universal Messaging connection alias, Integration Server throws an `ISRuntimeException` if the Universal Messaging server is not available when the service executes. Make sure to code your service to handle this situation.

Integration Server issues a `ServiceException` when the dispatcher is shut down during the execution of this service. In this situation, Integration Server does not save the data in the outbound document store (client side queue), and the document will not appear in the outbound document store. Make sure to code your service to handle this situation.

For more information about building a service that publishes a document locally or to a messaging provider, see the *Publish-Subscribe Developer's Guide*.

See Also

[pub.publish:deliver](#)

[pub.publish:publishAndWait](#)

[pub.publish:envelope](#)

pub.publish:publishAndWait

`WmPublic`. Broadcasts a request for a document from any client subscribed to a specific document type. The service waits for the reply or indicates that the `pub.publish:waitForReply` service should retrieve the reply later.

Input Parameters

<i>documentTypeName</i>	<p>String Fully qualified name of the publishable document type being published.</p> <p>If you intend to publish the document to a messaging provider (Broker or Universal Messaging), the publishable document type must be in sync with the associated provider definition. The provider definition is a representation of the publishable document type and its properties on the provider. In the case of Universal Messaging, this is a channel. For Broker, it is a Broker document type. If the document type and provider definition are not synchronized, publication might fail.</p>
<i>document</i>	<p>Document Document (IData object) conforming to the document type in <i>documentTypeName</i>.</p>
<i>receiveDocumentTypeName</i>	<p>String Optional. Fully qualified name of the document type expected as a reply. If no value is specified, the service uses the first reply document of any type it receives, as long as the value of <i>tag</i> in the reply document envelope matches the <i>tag</i> in the envelope of the published document. All other reply documents are discarded.</p>
<i>local</i>	<p>String Optional. Flag specifying whether the document is to be published locally or to the webMethods Broker. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to publish locally (to this Integration Server only). ■ <code>false</code> to publish to the webMethods Broker. This is the default. <p>The <i>local</i> parameter is applicable only when the publishable document type uses Broker as the messaging provider.</p> <p>The <i>local</i> parameter is applicable only when the publishable document type uses Broker as the messaging provider.</p> <p>If the publishable document type specifies the <code>IS_LOCAL_CONNECTION</code> alias, the document can be published locally only. Integration Server ignores the value of <i>local</i>.</p> <p>A publishable document type that specifies Universal Messaging as the messaging provider cannot be published locally. If the document type in <i>documentTypeName</i> is associated with a Universal Messaging connection alias, Integration Server ignores the value of <i>local</i>.</p>
<i>waitTime</i>	<p>String Optional. Time to wait (in milliseconds) for the response to arrive. If no value is specified, the service waits indefinitely for a reply.</p>
<i>async</i>	<p>String Optional. Flag specifying whether this is an asynchronous or synchronous publish. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to indicate that this is an asynchronous request/reply. After publishing the document, the Integration Server executes the next

step in the flow service immediately. The Integration Server does not wait for a reply before continuing service execution.

Note:

To retrieve the reply to an asynchronous publish, invoke the [pub.publish:waitForReply](#) service.

- `false` to indicate that this is a synchronous request/reply. After publishing the document, the Integration Server waits for a reply before executing the next step in the flow service. This is the default.

Output Parameters

receivedDocument

Document Document (IData object) received as response. If no matching document is received within the wait time, this will be null.

Important: Integration Server treats all reply documents as volatile documents. If Integration Server shuts down before processing the reply document, the reply document is lost.

tag

String Conditional. A unique identifier for a publish request. Integration Server uses the *tag* value to match the request document with its corresponding reply document.

The service produces a *tag* output value only when the *async* field is set to `true`. The *tag* value is required input when using the [pub.publish:waitForReply](#) service to retrieve the reply.

Note:

The *tag* output value is the same value that Integration Server places in the *tag* field of the request document's envelope.

status

String Conditional. Status indicating whether the service was successful. Integration Server reports status only for locally published documents. A value of:

- `success` indicates that the service executed successfully.

Note:

If at least one subscribing trigger has room in its queue, the status is set to `success`.

- `requestTimedOut` indicates that the service timed out (that is, the *waitTime* specified in the service elapsed before Integration Server received a reply).
- `noSubscriber` indicates that Integration Server does not contain any triggers that subscribe to the document.

- `capacityExceeded` indicates that the document could not be placed in the queue of the subscribing trigger because the trigger queue is currently at its maximum capacity.

Note: Integration Server reports the `capacityExceeded` status only when the `watt.server.publish.local.rejectOOS` property is set to `true`.

Usage Notes

You can use the `pub.publish:publishAndWait` service to publish a document to Universal Messaging, Broker, or locally within Integration Server.

Integration Server writes a message to the journal log whenever it rejects or discards a document.

You can use the `pub.publish:publishAndWait` service to initiate a request/reply. The publishing client broadcasts a request for information. Subscribers to the broadcast document compose and send a reply document that contains the information the publisher requested.

A single publish and wait request might receive many response documents. The Integration Server that made the publish and wait request uses only the first reply document it receives from the webMethods Broker. The Integration Server discards all other replies. *First* is arbitrarily defined. There is no guarantee provided for the order in which the messaging provider processes incoming replies. If you need a reply document from a specific client, use the `pub.publish:deliverAndWait` service instead.

The `pub.publish:publishAndWait` service can be useful in situations where multiple sources contain the response data. For example, suppose that an enterprise uses one application for managing customer data, another for storing master customer records, and a mainframe system for saving customer lists. Each of these applications could answer a published request for customer data. The publishing service will use the first reply document it receives.

A service can issue a publish and wait request in a synchronous or asynchronous manner.

- In a synchronous request/reply, the publishing flow service stops executing while it waits for a response. One of the following occurs:
 - If the service receives a reply before the `waitTime` elapses, the service resumes execution.
 - If the `waitTime` elapses before the service receives a reply, Integration Server ends the request, and the service returns a null document that indicates that the request timed out. Integration Server then executes the next step in the flow service.

If a reply document arrives after the flow service resumes execution, Integration Server rejects the document and creates a journal log message stating that the document was rejected because there was no thread waiting for the document.

- In an asynchronous request/reply, the publishing flow service continues executing the steps in the service after publishing the document. To retrieve the reply, the publishing flow service must invoke the `pub.publish:waitForReply` service. If the wait time elapses before the

`pub.publish:waitForReply` service receives a document, the `pub.publish:waitForReply` service returns a null document indicating that the request timed out.

If a service contains multiple asynchronous publish and wait invocations, you can build the service such that the service publishes all the requests before collecting the replies. This approach can be more efficient than publishing a request, waiting for a reply, and then publishing the next request.

If you create a service that contains multiple asynchronous requests, make sure to link the `tag` output to another field in the pipeline. Each asynchronously published request produces a `tag` field in the pipeline. If the `tag` field is not linked to another field, the next asynchronously published request (that is, the next execution of the `pub.publish:publishAndWait` service) will overwrite the first `tag` value.

If the client side queue is disabled for the messaging connection alias and the document type has a storage type of guaranteed, the `pub.publish:waitForReply` service ends with a `ServiceException` if the messaging provider is not available. Make sure to code your publishing service to handle this situation.

The messaging connection alias assigned to a publishable document type determines the message provider to which the Integration Server publishes the document. Only subscribers to the document type on that messaging provider will receive the published document. The **Connection alias name** property for the document type specifies the message provider. If there is no specified message provider alias, Integration Server publishes the document to the provider in the default messaging connection alias.

If the publishable document type in `documentTypeName` is associated with a Universal Messaging connection alias, the **Enable Request/Reply Channel and Listener** check box must be selected for the alias. When this check box is selected, Integration Server ensures that a request/reply channel exists for the Universal Messaging connection alias on the Universal Messaging server and that Integration Server has a listener that subscribes to the alias-specific request/reply channel. If the check box is cleared, there will be no channel in which Universal Messaging can collect replies and no listener with which Integration Server can retrieve replies. The `pub.publish:publishAndWait` service will end with a `ServiceException` if the **Enable Request/Reply Channel and Listener** check box is not selected for the Universal Messaging connection alias.

For more information about building a service that follows the request/reply model, see the *Publish-Subscribe Developer's Guide*.

See Also

[pub.publish:waitForReply](#)

[pub.publish:reply](#)

[pub.publish:envelope](#)

pub.publish:reply

WmPublic. Delivers a reply document to the requesting client.

Input Parameters

<i>receivedDocumentEnvelope</i>	Document Optional. The envelope of the document to which you are replying. By default <i>receivedDocumentEnvelope</i> specifies the envelope of the document that triggered this service. In case of a join, <i>receivedDocumentEnvelope</i> will specify the last document that satisfied the join condition. However, you may specify the envelope of any published document to which you want to reply.
<i>documentTypeName</i>	String Fully qualified name of the publishable document type for the document that you are sending as a reply. Keep in mind that the publisher of the requesting document might be expecting a reply document that conforms to specific publishable document type.
<i>document</i>	Document The reply IData object. This document must conform to the publishable document type specified in <i>documentTypeName</i> .
<i>delayUntilServiceSuccess</i>	<p>String Optional. Flag indicating whether Integration Server should publish the document when the <code>pub.publish:reply</code> service executes or after the top-level service successfully completes. If the top-level service fails, Integration Server will not publish the document.</p> <p>Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to delay publishing until after the top-level service executes successfully. ■ <code>false</code> to publish the document when the publish service executes. This is the default.

Output Parameters

None.

Usage Notes

You can use the `pub.publish:reply` service to publish a document to Universal Messaging, Broker, or locally within Integration Server.

All reply documents are volatile documents. If the requesting Integration Server shuts down before processing the reply document, the reply document is lost.

Integration Server always encodes reply messages as IData.

If the *replyTo* envelope parameter is set in the request document, the reply document is delivered to that destination; otherwise, the reply document is sent to the publisher specified in the *pubId* parameter in the envelope of the request document.

This service correctly maps the required fields from the request document to the reply document.

A reply document can be a simple acknowledgment, or it can contain information asked for by the publisher of the request document.

Integration Server sends the reply document using the same connection that the trigger used to retrieve the request document. Integration Server ignores the messaging connection alias assigned to the publishable document type in *documentTypeName*.

Because Integration Server sends the reply document using the same connection that the trigger used to retrieve the request document, when Universal Messaging is the messaging provider, the publishable document types to which the trigger subscribes must be associated with a Universal Messaging connection alias for which the **Enable Request/Reply Channel and Listener** check box is selected.

If you are building a service to reply to documents that meet join conditions, keep the following in mind:

- **All (AND) join conditions.** If the replying service executes because two or more documents satisfied an All (AND) join condition, Integration Server uses the envelope of the last document that satisfied the join condition to determine where to send the reply document. If you want Integration Server to use the envelope of a different document, link the envelope of that document to *receivedDocumentEnvelope*. If you want to reply to all documents received as part of an All (AND) join, invoke `pub.publish:reply` once for each document received and map the envelope from the received document to *receivedDocumentEnvelope* for each call.
- **Any (OR) or Only one (XOR) join conditions.** If the replying service executes because a document satisfied an Any (OR) or Only one (XOR) join condition, do not map or assign a value to *receivedDocumentEnvelope*. It is impossible to know which document in the Any (OR) or Only one (XOR) join will be received first. For example, suppose that an Only one (XOR) join condition specified document types A and B. Integration Server uses the envelope of the document it received first as the *receivedDocumentEnvelope* value. If you map the envelope of document A to *receivedDocumentEnvelope*, but Integration Server receives document B first, your replying service will fail.

Services that publish or deliver a document and wait for a reply can specify a publishable document type to which reply documents must conform. If the reply document is not of the type specified in the *receiveDocumentTypeName* parameter of the `pub.publish:publishAndWait` or `pub.publish:deliverAndWait` service, the publishing service will wait forever for a reply. Work closely with the developer of the publishing service to make sure that your reply document is an instance of the correct publishable document type.

For more information about building a reply service, see the *Publish-Subscribe Developer's Guide*.

See Also

[pub.publish:deliverAndWait](#)

[pub.publish:publishAndWait](#)

[pub.publish:envelope](#)

pub.publish:syncToBroker

WmPublic. *Deprecated* - Replaced by [pub.publish:syncToProvider](#).

Synchronizes one or more publishable document types with the corresponding Broker document types by pushing the publishable document types to webMethods Broker.

Note:

This service can be used to synchronize publishable document types for which the **Connection alias name** property is a Broker connection alias only.

Input Parameters

documentTypes **String List** Fully qualified names of the publishable document types to synchronize with their associated provider definition.

Output Parameters

successfulPDTs **String List** Conditional. Fully qualified names of the publishable document types that Integration Server updated successfully on the provider. The service only produces this output parameter if one or more publishable document types updated successfully.

unsuccessfulPDTs **String List** Conditional. Fully qualified names of the publishable document types that Integration Server did not update successfully on the provider. The service only produces this output parameter if one or more publishable document types did not update successfully.

errors **Document List** Conditional. Lists any errors that occurred during document type synchronization.

warnings **Document List** Conditional. Lists any warnings that occurred during document type synchronization.

Usage Notes

You can use `pub.publish:syncToBroker` as a start up service for a package to avoid using Software AG Designer to synchronize document types.

You can use the `pub.publish:syncToBroker` service with Broker only. The use of `pub.publish:syncToBroker` with Universal Messaging is not supported. Use [pub.publish:syncToProvider](#) or Designer to synchronize publishable document types with corresponding provider definitions (channels) on Universal Messaging.

The **Connection alias name** property for a document type specifies the messaging connection alias assigned to the document type which indicates the provider to which a document type will be pushed.

If the *documentTypes* parameter contains document types that are not publishable or do not exist, Integration Server lists the errors in the *errors* parameter.

pub.publish:syncToProvider

WmPublic. Synchronizes one or more publishable document types with their associated provider definition by pushing the publishable document types to the associated message provider.

Input Parameters

documentTypes **String List** Fully qualified names of the publishable document types to synchronize with their associated provider definition.

Output Parameters

successfulPDTs **String List** Conditional. Fully qualified names of the publishable document types that Integration Server updated successfully on the provider. The service only produces this output parameter if one or more publishable document types updated successfully.

unsuccessfulPDTs **String List** Conditional. Fully qualified names of the publishable document types that Integration Server did not update successfully on the provider. The service only produces this output parameter if one or more publishable document types did not update successfully.

errors **Document List** Conditional. Lists any errors that occurred during document type synchronization.

warnings **Document List** Conditional. Lists any warnings that occurred during document type synchronization.

Usage Notes

You can use `pub.publish:syncToProvider` as a start up service for a package to avoid using Software AG Designer to synchronize document types.

The **Connection alias name** property for a document type specifies the messaging connection alias assigned to the document type which indicates the provider to which a document type will be pushed.

If the *documentTypes* parameter contains document types that are not publishable or do not exist, Integration Server lists the errors in the *errors* parameter.

The `pub.publish:syncToProvider` service replaces `pub.publish:syncToBroker`, which has been deprecated.

For a publishable document type that uses protocol buffers as the encoding type, the `pub.publish:syncToProvider` synchronizes the existing protocol buffer descriptor with Universal Messaging. If you want Integration Server to create an updated protocol buffer definition for the

document type, compile the updated definition into an updated protocol buffer descriptor, and synchronize the updated descriptor with Universal Messaging, use the “[pub.utils.messaging:syncDocTypesToUM](#)” on page 1028 service.

pub.publish:waitForReply

WmPublic. Retrieves the reply for an asynchronous request. If a reply is not available, Integration Server continues to wait for the document until the time specified in the *waitTime* parameter of the [pub.publish:deliverAndWait](#) service or [pub.publish:publishAndWait](#) service elapses.

Input Parameters

tag **String** A unique identifier for the publish request for which you are retrieving a reply. Integration Server uses the *tag* value to match the request document with its corresponding reply document.

Output Parameters

receivedDocument **Document** Document (IData object) received as the reply to the request. If the request expires (that is, the *waitTime* elapses) before Integration Server receives the reply document, the *receivedDocument* field contains a null document.

Important: Integration Server treats all reply documents as volatile documents. If Integration Server shuts down before processing the reply document, the reply document is lost.

Usage Notes

The *waitTime* value of the publishing service specifies how long Integration Server will keep the request open while waiting for a reply. When building an asynchronous request/reply service, keep the following information about the *waitTime* in mind:

- The waiting interval for the reply document starts when Integration Server executes the request service ([pub.publish:deliverAndWait](#) or [pub.publish:publishAndWait](#)). The execution of the [pub.publish:waitForReply](#) service does not affect the *waitTime* interval.
- If the *waitTime* interval elapses before the [pub.publish:waitForReply](#) service executes, the service immediately returns a null document which indicates that the wait time has expired.
- If Integration Server has not received the reply when the [pub.publish:waitForReply](#) service executes, the service waits the remainder of the *waitTime* interval. If Integration Server does not receive a reply by the time the *waitTime* interval elapses, the request completes. The service returns a null document which indicates that the wait time has expired.
- If the reply document arrives after the *waitTime* interval elapses, Integration Server rejects the document because the request is closed.

A single publish and wait request might receive many response documents. The Integration Server that made the publish and wait request uses only the first reply document it receives. Integration Server discards all other replies. *First* is arbitrarily defined. There is no guarantee provided for the order in which the messaging provider processes incoming replies. If you need a reply document from a specific recipient, use the [pub.publish:deliverAndWait](#) service instead.

For more information about building an asynchronous request/reply service, see the *Publish-Subscribe Developer's Guide*.

See Also

[pub.publish:deliverAndWait](#)

[pub.publish:publishAndWait](#)

pub.publish.notification:error

WmPublic. Publishable document type that defines the document that Integration Server generates and delivers when a trigger encounters an error or exception condition during processing.

Note:Integration Server does not generate and return an error message when the trigger received a document from Universal Messaging.

Integration Server generates an error document if the trigger service cannot successfully process a document for one of the following reasons:

- The trigger service encounters an exception condition (that is not an `ISRuntimeException`) during execution.
- Integration Server makes the maximum number of attempts to re-execute the trigger service and the service still fails because of a transient error condition.
- Some other system exception occurred.

Note:Integration Server does not generate an error document if the subscribing trigger is part of a disabled process model version because the trigger service associated with a disabled process model version never executes.

Integration Server delivers the error document to the client ID specified in the *errorsTo* field contained in the received document's envelope. If the *errorsTo* field is empty, the Integration Server delivers the error document to the original document's publisher (as specified in the *pubId* envelope field). The error document notifies the publisher or other designated recipient that the subscriber cannot process the document successfully.

Note:

If a trigger service cannot process a locally published document successfully, Integration Server produces and delivers an error document only if the Integration Server is connected to a webMethods Broker.

Parameters

<i>adapterType</i>	String Optional. The resource producing the error. Integration Server sets the value of this field to <code>Integration Server</code> .
<i>errorCategory</i>	String Optional. Type of exception. Integration Server sets the value of this field to <code>Application</code> .
<i>errorText</i>	String Optional. Exception text message. At Dispatcher debug level 9, a stack trace of the exception will also be returned.
<i>eventID</i>	java.lang.Long Optional. The event ID of the document that caused this exception. If the trigger service executed because a document satisfied a join condition, then the <i>eventID</i> is the event ID of the last document that satisfied the condition.
<i>_env</i>	Document Optional. A document reference to the pub.publish:envelope document type.

Usage Notes

The client to which Integration Server delivers the error document needs to subscribe to the `pub.publish.notification:error` document type. If the client does not have a trigger that subscribes to this document type, the client will never receive or process the error document. If the client receiving the error document is an Integration Server, it generates the message `[ISS.0098.0024V2] No trigger available for incoming Document pub.publish.notification:error`.

The `watt.server.messaging.deliverNotificationErrors` server configuration parameter specifies whether Integration Server generates and delivers `pub.publish.notification:error` messages. When set to `true`, Integration Server generates and delivers `pub.publish.notification:error` messages when an error or exception condition during `webMethods` messaging triggerprocessing. The generation and delivery of notification error messages may result in the generation of `Adapter:Error` events. When set to `false`, Integration Server does not generate or deliver `pub.publish.notification:error` messages. The notification error messages are suppressed.

See Also

[pub.publish:envelope](#)

31 Remote Folder

■ Summary of Elements in this Folder	658
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You use the elements in the remote folder to invoke services on other webMethods Integration Server.

You can also use remote services for guaranteed delivery transactions. For more information about guaranteed delivery transactions, see the *Guaranteed Delivery Developer's Guide* and *webMethods Integration Server Administrator's Guide*.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.remote:invoke	WmPublic. Invokes a service on a remote webMethods Integration Server.
pub.remote.gd:end	WmPublic. Ends a guaranteed delivery transaction.
pub.remote.gd:getStatus	WmPublic. Returns the status of the guaranteed delivery transaction.
pub.remote.gd:invoke	WmPublic. Invokes the service for a guaranteed delivery transaction by making a synchronous call to a remote webMethods Integration Server.
pub.remote.gd:restart	WmPublic. Restarts an expired guaranteed delivery transaction.
pub.remote.gd:retrieve	WmPublic. Retrieves the results of a guaranteed delivery transaction submitted asynchronously or synchronously to a remote webMethods Integration Server.
pub.remote.gd:send	WmPublic. Makes a guaranteed one-way call (fire-and-forget) to the webMethods Integration Server to invoke a service for which no output is needed or expected.
pub.remote.gd:start	WmPublic. Starts a guaranteed delivery transaction.
pub.remote.gd:submit	WmPublic. Invokes a service for a guaranteed delivery transaction by making an asynchronous call to a remote webMethods Integration Server.

pub.remote:invoke

WmPublic. Invokes a service on a remote webMethods Integration Server.

The remote server is identified by an alias, which is configured on the **Remote Servers** tab in the Integration Server Administrator. Connection and authentication to the remote server is managed transparently to the caller of this service.

All current pipeline inputs are passed to the remote service. To improve performance and minimize the amount of data sent over the wire, scope the pipeline to a separate document or drop unneeded

fields before invoking this service. The same advice applies to the output values of the remote service because all values returned from the service are sent over the wire in response to the caller.

Input Parameters

\$alias **String** Name of the target server on which to invoke the specified service. This name and its associated connection attributes are defined on the **Create Remote Server Alias** page in the Integration Server Administrator.

Note:

If you protect the alias using an Access Control List, the user invoking `invoke` must be a member of this list or the invocation will fail.

\$service **String** Fully qualified name of the service to invoke on the remote server, in the format `folderName.folderName:serviceName` (for example: `wm.server:ping`).

\$scope **String** Flag that specifies how the session to the remote server should be managed. Set to:

- `SESSION` to store the remote session in the current user session. This is the default.

Further calls by the same user to `pub.remote:invoke` for the same server alias reuse the existing remote session with the server.

Stateful interactions with the remote server are maintained and protected inside the current user's session.

When the current user disconnects, the remote session expires, or the local server is shut down, the remote session is automatically disconnected.

- `GLOBAL` to store the remote session in a shared pool of sessions. If another user invokes a service on the same remote server with `GLOBAL` scope, the session will be reused.

Stateful interactions with the remote server could be destroyed by other users' invocations.

When the remote session expires due to inactivity or the local server is shut down, the remote session is automatically disconnected.

\$close **String** Optional. Flag to indicate whether Integration Server closes the connection to the remote server after the service invocation or keeps the connection open until it times out. Set to:

- `true` to close the connection to the remote server immediately after the service invocation.

- `false` to keep the connection open until it times out. This is the default.

Note:

If the `watt.server.trigger.reuseSession` server configuration parameter is set to `true`, Integration Server expects trigger sessions to be reused and the connection to the remote server to remain open. Hence, if `watt.server.trigger.reuseSession` parameter is set to `true`, Integration Server will ignore the value of the `$close` parameter when a trigger service for a `webMethods` messaging trigger executes the `pub.remote:invoke` service.

\$clusterRetry

String Optional. Flag to indicate whether Integration Servers should retry a failed connection request on other Integration Servers in the cluster. Set to:

- `true` to retry a request automatically on other Integration Servers in the cluster if the initial attempt to connect to a remote Integration Server fails. Integration Server will attempt to connect to each Integration Servers in the cluster until the connection is made or all Integration Servers have been tried with no success. If the service cannot connect to another Integration Server in the cluster, the service tries to connect to the retry server specified in the alias definition for the remote server.
- `false` to issue an error if the attempt to connect to the remote Integration Server fails. If the alias definition for the remote server specifies a retry server, the service tries to connect to that server.

Note:

Once a connection to a remote server has been established, that connection is cached and reused. The *\$clusterRetry* setting is established when the connection is first created and used. Subsequent invokes to the same remote server will not change the *\$clusterRetry* setting, even if a different value is passed in the pipeline. Client applications must determine whether or not they want cluster retries before establishing the connection.

Output Parameters

Returns the output of the invoked service. The output signature matches the output signature of the invoked service.

When the `pub.remote:invoke` service executes, Integration Server creates a Pinger thread that sends a `wm.server.ping` request to the remote Integration Server every *n* seconds while the connection to the remote Integration Server is active. The time interval, *n*, is either one third of the wait time set in the **Keep Alive Timeout** field for the remote server alias, or, if that is not specified, the value of the server configuration parameter `watt.server.ping`.

- UNKNOWN indicates that the transaction identification number in *tid* is not recognized.

Usage Notes

Use the [pub.remote.gd:restart](#) service to restart a FAILED (expired) guaranteed delivery transaction.

pub.remote.gd:invoke

WmPublic. Invokes the service for a guaranteed delivery transaction by making a synchronous call to a remote webMethods Integration Server.

Input Parameters

<i>service</i>	String Name of the service to be run on the remote webMethods Integration Server.
<i>tid</i>	String Transaction identification number for the service.
<i>inputs</i>	Document Optional. Document (IData object) containing the inputs for the service.

Output Parameters

<i>results</i>	Document Conditional. Document (IData object) containing the pipeline as it exists after the service is invoked.
----------------	---

Usage Notes

To use an asynchronous call to the server to invoke a service for a guaranteed delivery transaction, use the [pub.remote.gd:submit](#) service.

If the remote server does not respond within the timeout limit specified in this server's `watt.net.timeout` setting, the Integration Server treats it as a failed attempt and retries the request.

pub.remote.gd:restart

WmPublic. Restarts an expired guaranteed delivery transaction.

Input Parameters

<i>tid</i>	String Transaction identification number for the guaranteed delivery transaction you want to restart.
------------	--

Output Parameters

None.

Usage Notes

If a guaranteed delivery transaction failed because of server or network failure, use this service to restart the transaction without resubmitting it.

pub.remote.gd:retrieve

WmPublic. Retrieves the results of a guaranteed delivery transaction submitted asynchronously or synchronously to a remote webMethods Integration Server.

Input Parameters

<i>tid</i>	String Transaction identification number.
<i>block</i>	String Optional. Flag that specifies whether to block or poll for the results of the transaction. Set to: <ul style="list-style-type: none">■ <code>true</code> to wait until the invoked service completes before retrieving results. This is also known as blocking mode. This is the default.■ <code>false</code> to retrieve the results immediately, whether or not the invoked service is completed. This is also known as polling mode.

Output Parameters

<i>results</i>	Document Conditional. Document (IData object) containing the results of the service in the guaranteed delivery transaction.
----------------	--

Usage Notes

If *block* is `false`, and the results of the transaction are still pending when this service executes, the results are returned as null.

pub.remote.gd:send

WmPublic. Makes a guaranteed one-way call (fire-and-forget) to the webMethods Integration Server to invoke a service for which no output is needed or expected.

Input Parameters

<i>service</i>	String Service to be run on the remote Integration Server.
<i>tid</i>	String Transaction identification number for the service.
<i>inputs</i>	Document Optional. Document (IData object) containing the inputs for the service.

Output Parameters

None.

Usage Notes

The results of the service specified in *service* cannot be retrieved. However, errors that occur will be logged when the guaranteed delivery transaction ends.

Use the `pub.remote.gd:send` service to invoke a service remotely only if you want to run a guaranteed delivery transaction and are not concerned about the results of the invoked service. After `pub.remote.gd:send` completes the call, the service ends the transaction; therefore, you do not need to use the `pub.remote.gd:end` service to end the transaction.

pub.remote.gd:start

WmPublic. Starts a guaranteed delivery transaction.

Input Parameters

<i>alias</i>	String Name of the webMethods Integration Server on which you want to invoke a guaranteed delivery transaction. This name and its associated connection attributes are defined on the Remote Servers tab of the Integration Server Administrator.
<i>tvl</i>	String Optional. Transaction time-to-live measured in minutes. The transaction expires when <i>tvl</i> is exceeded. Default is the value set in the <code>watt.tx.defaultTTLmins</code> property or, if the property is not set, 30 minutes.
<i>retries</i>	String Optional. Maximum number of times to retry the transaction. Default is 0 (no retry limit).
<i>followtid</i>	String Optional. Identification number of the transaction you want this guaranteed delivery transaction to follow. The current transaction executes only after the transaction indicated by <i>followtid</i> completes.

Output Parameters

tid **String** Transaction identification number.

pub.remote.gd:submit

WmPublic. Invokes a service for a guaranteed delivery transaction by making an asynchronous call to a remote webMethods Integration Server.

Input Parameters

service **String** Service to be run on the remote webMethods Integration Server.

tid **String** Transaction identification number for the service.

inputs **Document** Optional. Document (IData object) containing the inputs for the service.

Output Parameters

None.

Usage Notes

To remove the transaction from the remote webMethods Integration Server, use the [pub.remote.gd:end](#) service.

To use a synchronous call to invoke the service, use the [pub.remote.gd:invoke](#) service.

32 Replicator Folder

■ Summary of Elements in this Folder	668
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You use the elements in the replicator folder to replicate packages across webMethods Integration Servers. This folder contains services that you can use to push packages from your webMethods Integration Servers to a subscriber's server. It also contains services that you can use to pull packages from a publisher's server to your webMethods Integration Server.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.replicator:addReleaseRegistryEntry	WmPublic. Adds an entry to the webMethods Integration Server's Package Release Registry.
pub.replicator:deleteReleaseRegistryEntry	WmPublic. Deletes an entry from the webMethods Integration Server's Package Release Registry.
pub.replicator:distributeViaFTP	WmPublic. Allows a publisher to send a package to a subscriber via FTP or allows a subscriber to retrieve a package from a publisher via FTP.
pub.replicator:distributeViaSvcPull	WmPublic. Pulls a specified package release from a publisher's server.
pub.replicator:distributeViaSvcPush	WmPublic. Pushes a package from your server to a list of subscribers (other webMethods Integration Servers).
pub.replicator:generateReplicationEvent	WmPublic. Generates a replication event.
pub.replicator:getLocalReleasedList	WmPublic. Returns all entries in your webMethods Integration Server's Package Release Registry.
pub.replicator:getRemoteReleasedList	WmPublic. Queries the publisher for released packages.
pub.replicator:notifyPackageRelease	WmPublic. Sends an e-mail message to subscribers who have said that they want to be notified when a new release becomes available.
pub.replicator:packageCreation	WmPublic. Creates a distribution file (a zip file) for the package.

pub.replicator:addReleaseRegistryEntry

WmPublic. Adds an entry to the webMethods Integration Server's Package Release Registry.

Input Parameters

<i>package</i>	String Name of the package. The service confirms that this package exists on the server before adding an entry to the Package Release Registry.
<i>name</i>	String Name of the release. This name could be different from the name of the package.
<i>version</i>	String Version number of the release, in the format <i>##</i> or <i>###</i> (for example, 1.2 or 1.2.1).
<i>build</i>	String Build number of the release (for example, 12, 530).
<i>patchNums</i>	String One or more comma-separated patch numbers included in this release.
<i>JVMVersion</i>	String Minimum JVM version number that this release requires.
<i>description</i>	String Brief description of this release. You may want to use this parameter to summarize the nature and purpose of the release.

Output Parameters

<i>packages</i>	Document List Entries in the server's Package Release Registry.																		
	<table> <thead> <tr> <th><u>Key</u></th> <th><u>Description</u></th> </tr> </thead> <tbody> <tr> <td><i>name</i></td> <td>String Name of the release.</td> </tr> <tr> <td><i>version</i></td> <td>String Version number of the release, in the format <i>##</i> or <i>###</i> (for example, 1.2 or 1.2.1).</td> </tr> <tr> <td><i>build</i></td> <td>String Conditional. Build number of the release (for example, 12, 530).</td> </tr> <tr> <td><i>patch_nums</i></td> <td>String Conditional. Comma-separated list of patch numbers included in this release.</td> </tr> <tr> <td><i>time</i></td> <td>String Time when the package was released.</td> </tr> <tr> <td><i>jvm_version</i></td> <td>String Minimum JVM version number that the release requires.</td> </tr> <tr> <td><i>description</i></td> <td>String Conditional. Brief description of this release.</td> </tr> <tr> <td><i>source_server_version</i></td> <td>String Version number of Integration Server that released the package.</td> </tr> </tbody> </table>	<u>Key</u>	<u>Description</u>	<i>name</i>	String Name of the release.	<i>version</i>	String Version number of the release, in the format <i>##</i> or <i>###</i> (for example, 1.2 or 1.2.1).	<i>build</i>	String Conditional. Build number of the release (for example, 12, 530).	<i>patch_nums</i>	String Conditional. Comma-separated list of patch numbers included in this release.	<i>time</i>	String Time when the package was released.	<i>jvm_version</i>	String Minimum JVM version number that the release requires.	<i>description</i>	String Conditional. Brief description of this release.	<i>source_server_version</i>	String Version number of Integration Server that released the package.
<u>Key</u>	<u>Description</u>																		
<i>name</i>	String Name of the release.																		
<i>version</i>	String Version number of the release, in the format <i>##</i> or <i>###</i> (for example, 1.2 or 1.2.1).																		
<i>build</i>	String Conditional. Build number of the release (for example, 12, 530).																		
<i>patch_nums</i>	String Conditional. Comma-separated list of patch numbers included in this release.																		
<i>time</i>	String Time when the package was released.																		
<i>jvm_version</i>	String Minimum JVM version number that the release requires.																		
<i>description</i>	String Conditional. Brief description of this release.																		
<i>source_server_version</i>	String Version number of Integration Server that released the package.																		

Usage Notes

Before using this service, use [pub.replicator:packageCreation](#) to create a package zip file in the server's outbound directory. When you use `addReleaseRegistryEntry` to add an entry to the Package Release Registry, the package name you specify in *package* should match the package name you specified in [pub.replicator:packageCreation](#).

pub.replicator:deleteReleaseRegistryEntry

WmPublic. Deletes an entry from the webMethods Integration Server's Package Release Registry.

Input Parameters

packageName **String** Name of the release that you want to delete.

Output Parameters

packages **Document List** Entries that remain in the server's Package Release Registry.

<u>Key</u>	<u>Description</u>
<i>name</i>	String Name of the release.
<i>version</i>	String Version number of the release, in the format <code>##</code> or <code>##.##</code> (for example, 1.2 or 1.2.1).
<i>build</i>	String Conditional. Build number of the release (for example, 12, 530).
<i>patch_nums</i>	String Conditional. Comma-separated list of patch numbers included in this release.
<i>time</i>	String Time when the package was released.
<i>jvm_version</i>	String Minimum JVM version number that the release requires.
<i>description</i>	String Conditional. Brief description of the release.
<i>source_server_version</i>	String Version number of Integration Server that released the package.

pub.replicator:distributeViaFTP

WmPublic. Allows a publisher to send a package to a subscriber via FTP or allows a subscriber to retrieve a package from a publisher via FTP.

Input Parameters

<i>packageName</i>	String Name of the released package.
<i>action</i>	String Flag that specifies whether you want to send (put) a package to another Integration Server or whether you want to retrieve (get) a package from another Integration Server. Set to: <ul style="list-style-type: none">■ get to retrieve a package from the publisher's server. This is the default.■ put to send a package to a subscriber's server.
<i>serverhost</i>	String Host name or IP address of the remote Integration Server.
<i>serverport</i>	String Number of the FTP port on the remote Integration Server.
<i>username</i>	String User name that your server will use to log on to the remote Integration Server.
<i>password</i>	String Password that your server will use to log on to the remote Integration Server.

Output Parameters

None.

pub.replicator:distributeViaSvcPull

WmPublic. Pulls a specified package release from a publisher's server.

Input Parameters

<i>packageName</i>	String Name of the release.
<i>publisher</i>	String Alias of the publisher's server.

Output Parameters

None.

pub.replicator:distributeViaSvcPush

WmPublic. Pushes a package from your server to a list of subscribers (other webMethods Integration Servers).

Input Parameters

<i>packageName</i>	String The name of the release.
<i>subscriber</i>	String List List of the subscriber's host names or IP addresses.

Output Parameters

None.

pub.replicator:generateReplicationEvent

WmPublic. Generates a replication event.

You might invoke this service in conjunction with other services to make the package replication process generate an event. The replication event handler would listen for this event and perform some prescribed action that you have specified.

Input Parameters

<i>packageName</i>	String Name of the package.
<i>action</i>	String User-defined string that describes the replication event, such as "pulled" or "pushed."

Output Parameters

None.

pub.replicator:getLocalReleasedList

WmPublic. Returns all entries in your webMethods Integration Server's Package Release Registry.

Input Parameters

None.

Output Parameters

packages **Document List** Entries in the server's Package Release Registry.

<u>Key</u>	<u>Description</u>
<i>name</i>	String Name of the release.

<i>version</i>	String Version number of the release, in the format <code>##</code> or <code>###</code> (for example, 1.2 or 1.2.1).
<i>build</i>	String Conditional. Build number of the release (for example, 12, 530).
<i>patch_nums</i>	String Conditional. Comma-separated list of the patch numbers included in this release.
<i>time</i>	String Time when the package was released.
<i>jvm_version</i>	String Minimum JVM version number that the release requires.
<i>description</i>	String Conditional. Brief description of the release.
<i>source_server_version</i>	String Version number of webMethods Integration Server that released the package.

pub.replicator:getRemoteReleasedList

WmPublic. Queries the publisher for released packages.

This service gets a list of released packages to which your server subscribes. You can use the list to find out if any new packages, or newer versions of existing packages, have been released.

Input Parameters

publisher **String** Alias of the publishing server.

Output Parameters

packages **Document List** List of released packages on the publishing server to which you subscribe.

<u>Key</u>	<u>Description</u>
<i>name</i>	String Name of the release.
<i>version</i>	String Version number of the release, in the format <code>##</code> or <code>###</code> (for example, 1.2 or 1.2.1).
<i>build</i>	String Conditional. Build number of the release (for example, 12, 530).
<i>patch_nums</i>	String Conditional. Comma-separated list of the patch numbers included in this release.

<i>time</i>	String Time when the package was released.
<i>jvm_version</i>	String Minimum JVM version number that the release requires.
<i>description</i>	String Conditional. Brief description of the release.
<i>source_server_version</i>	String Version number of webMethods Integration Server that released the package.

pub.replicator:notifyPackageRelease

WmPublic. Sends an e-mail message to subscribers who have said that they want to be notified when a new release becomes available.

Input Parameters

packageName **String** Name of the release.

Output Parameters

None.

pub.replicator:packageCreation

WmPublic. Creates a distribution file (a zip file) for the package.

Input Parameters

<i>package</i>	String Name of the package.
<i>name</i>	String Name of the release.
<i>version</i>	String Version number of the release, in the format <i>##</i> or <i>##.##</i> (for example, 1.2 or 1.2.1).
<i>build</i>	String Build number of the release (for example, 12, 530).
<i>patchNums</i>	String Comma-separated list of patch numbers included in the release.
<i>targetPkgVersion</i>	String Version number of the target package. To prevent the installation program from overwriting an existing (higher) version of the package, this field is checked when the subscriber installs this package over an existing package.

<i>targetServerVersion</i>	String Version number of the webMethods Integration Server that this release requires.
<i>JVMVersion</i>	String Minimum JVM version number that this release requires.
<i>description</i>	String Brief description of this release. You might use this parameter to summarize the nature and purpose of the release.
<i>type</i>	<p>String Flag indicating the type of release. Set to:</p> <ul style="list-style-type: none"> ■ <code>full</code> to indicate a full package. This is the default. ■ <code>partial</code> to indicate a patch or an update for the package.
<i>filter</i>	<p>String Flag that specifies whether all files are to be included in the distribution file or only selected files.</p> <p>If only selected files are to be included, use this parameter in conjunction with <i>fileList</i> to specify which files to include.</p> <p>Set to:</p> <ul style="list-style-type: none"> ■ <code>includeall</code> to include all the files in the distribution file. This is the default. ■ <code>include</code> to include selected files in the distribution file. ■ <code>exclude</code> to include all except selected files in the distribution file.
<i>fileList</i>	String List Names of files to include or exclude from the distribution file, depending on the value of <i>filter</i> .
<i>fileNamePattern</i>	String Pattern string that specifies the names of files to be included in the distribution file. The asterisk (*) is the only wildcard character allowed in a pattern string. All other characters are treated literally (for example, <code>*.java</code> , <code>*.dsp</code>).
<i>filesToDeleteList</i>	String List Optional. The names of files that will be deleted from the target package when the subscribing server installs the package created by this service.

Output Parameters

<i>\$result</i>	String Conditional. If the distribution file is created successfully, this parameter contains the value <code>OK</code> . If the distribution file was not created successfully, this parameter is not present in the output signature and the service throws an exception.
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Usage Notes

After you use `packageCreation` to create the package, use `pub.replicator:addReleaseRegistryEntry` to add an entry to the Package Release Registry. The package name you specify in `packageCreation` should match the package name you specify in `pub.replicator:addReleaseRegistryEntry`.

33 Report Folder

■ Summary of Elements in this Folder	678
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You use the elements in the report folder to apply an output template to an IData object. The services can be used in order to generate any type of dynamic XML, EDI, or HTML document.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.report:runFileTemplate	WmPublic. Applies a template file to a document (IData object).
pub.report:runFileTemplateOnPipe	WmPublic. Applies a template to the pipeline.
pub.report:runStringTemplate	WmPublic. Applies an output template to a specified document (IData object).
pub.report:runStringTemplateOnPipe	WmPublic. Applies a template to the pipeline.
pub.report:runTemplate	WmPublic. Applies a template in a file to a specified document (IData object).
pub.report:runTemplateOnPipe	WmPublic. Applies a template in a file to the pipeline.

pub.report:runFileTemplate

WmPublic. Applies a template file to a document (IData object).

Input Parameters

<i>\$template</i>	java.io.File Template file.
<i>\$values</i>	Document Document (IData object) to bind against <i>\$template</i> .
<i>fileEncoding</i>	String Optional. The encoding of the template file. If <i>fileEncoding</i> is not specified, the default file encoding specified in the <code>watt.server.netEncoding</code> server parameter or the system file encoding will be used. Examples: SJIS, ASCII, ISO8859_1.

Output Parameters

<i>\$txt</i>	String Results from applying <i>\$template</i> to <i>\$values</i> .
--------------	--

Usage Notes

If a template is not available in a templates directory of any of the packages on the server, you can use this service by passing in a File object representing the template.

Integration Server executes any services in the template file using the credentials of the user who invoked the `pub.report:runFileTemplate` service.

pub.report:runFileTemplateOnPipe

WmPublic. Applies a template to the pipeline.

Input Parameters

<i>\$template</i>	java.io.File Template file.
<i>fileEncoding</i>	String Optional. The encoding of the template file. If <i>fileEncoding</i> is not specified, the default file encoding specified in the <code>watt.server.netEncoding</code> server parameter or the system file encoding will be used. Examples: SJIS, ASCII, ISO8859_1.

Output Parameters

<i>\$txt</i>	String Results from applying <i>\$template</i> to the pipeline.
--------------	--

Usage Notes

If a template is not available in a templates directory of any of the packages on the server, you can use this service to pass a File object representing the template file.

Integration Server executes any services in the template file using the credentials of the user who invoked the `pub.report:runFileTemplateOnPipe` service.

pub.report:runStringTemplate

WmPublic. Applies an output template to a specified document (IData object).

Input Parameters

<i>\$template</i>	String Template to apply.
<i>\$values</i>	Document Document (IData object) to bind against <i>\$template</i> .

Output Parameters

<i>\$txt</i>	String Results from applying <i>\$template</i> to <i>\$values</i> .
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Usage Notes

This service is typically invoked from other services that already have a template in a `String` object and an `IData` object that will be used to bind against the template.

Integration Server executes any services in the template file using the credentials of the user who invoked the `pub.report:runStringTemplate` service.

pub.report:runStringTemplateOnPipe

WmPublic. Applies a template to the pipeline.

Input Parameters

\$template **String** Template to apply to pipeline.

Output Parameters

\$txt **String** Result from applying *\$template* to the pipeline.

Usage Notes

This service is typically invoked from other services that already have a template in a `String` object and need the template to bind against the pipeline.

Integration Server executes any services in the template file using the credentials of the user who invoked the `pub.report:runStringTemplateOnPipe` service.

pub.report:runTemplate

WmPublic. Applies a template in a file to a specified document (`IData` object).

Input Parameters

\$template **String** Name of the template file (for example, `mytemp.html` or `mytemp.xml`).

\$package **String** Name of the package where the template resides (for example, `Default`).

\$values **Document** Document (`IData` object) to bind against *\$template*.

fileEncoding **String** Optional. The encoding of the template file. If *fileEncoding* is not specified, the default file encoding specified in the `watt.server.netEncoding` server parameter or the system file encoding will be used. Examples: `SJIS`, `ASCII`, `ISO8859_1`.

Output Parameters

\$txt **String** Result from applying the template to *\$values*.

Usage Notes

The `pub.report:runTemplate` service uses template files that reside in the `pub` and `templates` directories of the package. The service locates the output template by its file name and the name of the package in which it resides. For example, to apply a template that resides in `IntegrationServer_directory\packages\Default\templates\mytemp.xml`, invoke the service with the following values.

\$template: mytemp.xml

\$package: Default

Integration Server executes any services in the template file using the credentials of the user who invoked the `pub.report:runTemplate` service.

pub.report:runTemplateOnPipe

WmPublic. Applies a template in a file to the pipeline.

Input Parameters

\$template **String** Name of template file (for example, `mytemp.html` or `mytemp.xml`).

\$package **String** Name of the package in which the template resides (for example, `Default`).

fileEncoding **String** Optional. The encoding of the template file. If *fileEncoding* is not specified, the default file encoding specified in the `watt.server.netEncoding` server parameter or the system file encoding will be used. Examples: `SJIS`, `ASCII`, `ISO8859_1`.

Output Parameters

\$txt **String** Results from applying the template file to the pipeline.

Usage Notes

The `pub.report:runTemplateOnPipe` service uses template files that reside in the `pub` and `templates` directories of the package. The service locates the output template by its file name and the name of the package in which it resides. For example, to apply a template that resides in `IntegrationServer_directory\packages\Default\templates\mytemp.xml`, invoke the service with the following values.

\$template: mytemp.xml

\$package: Default

Integration Server executes any services in the template file using the credentials of the user who invoked the `pub.report:runTemplateOnPipe` service.

34 Scheduler Folder

■ Summary of Elements in this Folder	684
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You use the elements in the scheduler folder to execute services at the times you specify. Services that you schedule are referred to as *user tasks* or just *tasks*. The Scheduler feature on the webMethods Integration Server handles execution of the tasks.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.scheduler:addComplexTask	WmPublic. Adds a complex task to the Scheduler.
pub.scheduler:addOneTimeTask	WmPublic. Adds a task that runs only once to the Scheduler.
pub.scheduler:addRepeatingTask	WmPublic. Adds a recurring task to the Scheduler.
pub.scheduler:cancelTask	WmPublic. Removes a task from the Scheduler.
pub.scheduler:getTaskIDs	WmPublic. Retrieves a list of identification numbers for tasks currently in the Scheduler.
pub.scheduler:getTaskInfo	WmPublic. Retrieves information about a task on the Scheduler.
pub.scheduler:getUserTaskList	WmPublic. Returns a list of scheduled user tasks.
pub.scheduler:migrateTasksToJDBC	WmPublic. Migrates scheduled user tasks from the Integration Server embedded database to an external database.
pub.scheduler:resumeTask	WmPublic. Resumes a suspended task.
pub.scheduler:suspendTask	WmPublic. Suspends a task on the Scheduler.
pub.scheduler:updateComplexTask	WmPublic. Updates a complex task on the Scheduler.
pub.scheduler:updateOneTimeTask	WmPublic. Updates a one-time task on the Scheduler.
pub.scheduler:updateRepeatingTask	WmPublic. Updates a repeating task to the Scheduler.

pub.scheduler:addComplexTask

WmPublic. Adds a complex task to the Scheduler.

The webMethods Integration Server runs the service for a complex task on the day(s) and time(s) that you specify either during a specified date range or indefinitely.

Input Parameters

<i>service</i>	<p>String Name of the service you want to schedule for execution on the server.</p>
<i>description</i>	<p>String Text string describing this task.</p>
<i>target</i>	<p>String Server or servers on which the task is to run. (Clustered environments only). Set to:</p> <ul style="list-style-type: none"> ■ <code>any</code> to run the task on any server in the cluster. The task will run on only <i>one</i> of the servers. <p>For example, suppose that all the servers in your cluster share a single database for a parts inventory application, and that a particular function needs to run against that database once a day. Any of the servers can perform this task, therefore you can specify the <code>all</code> option to schedule a task to run on any of the servers.</p> <div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <p>Note: There is no predetermined order in which servers in the cluster are selected to run tasks. Rather, the first server to detect that a task is ready to be executed runs it.</p> </div> <p>For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services <i>webMethods Integration Server Administrator's Guide</i>.</p> <ul style="list-style-type: none"> ■ <code>all</code> to run the task on all servers in the cluster. <p>For example, suppose you run an application on each server in the cluster, and each server maintains its own database for that application. If you need to run a cleanup task against all the databases every day, you can schedule a task to run every day on all the servers in the cluster.</p> <p>For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services <i>webMethods Integration Server Administrator's Guide</i>.</p> <ul style="list-style-type: none"> ■ <code>hostname</code> to run the task on a specific server in the cluster.
<i>lateness</i>	<p>String The number of minutes (after the scheduled execution time) after which the server is to take a special action for a late task. You specify the action to be taken in the <i>latenessAction</i> parameter, described below. The server checks scheduled tasks at startup, and again periodically. If the server finds a task that is overdue and has exceeded the lateness period, the server performs the requested lateness action. If the server finds a task that is overdue but has <i>not</i> yet exceeded the lateness period, the server starts the task immediately.</p>

<i>latenessAction</i>	<p>String Action to take if a task has missed its scheduled start time by a number of minutes you specified with the <i>lateness</i> parameter. Possible actions are:</p> <ul style="list-style-type: none"> ■ run immediately or 0 - Runs the task immediately ■ skip and run at next scheduled interval or 1 - Skips this execution of the task and runs it again at the next scheduled run time. ■ suspend or 2 - Places the task in a suspended state until an administrator resumes or cancels the task.
<i>runAsUser</i>	<p>String Optional. User ID under which the service is to be executed. If you do not specify a user name, the “Default” access rights are used.</p>
<i>inputs</i>	<p>Document Optional. Document (IData object) containing the input to the scheduled service.</p> <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p>Note: You can also assign values to input parameters of services using the Assign Inputs option while scheduling a task in Integration Server Administrator.</p> </div>
<i>startTime</i>	<p>String Optional. Time at which the task is scheduled to start, in the format <i>HH:mm:ss</i>. If you do not specify a <i>startTime</i>, the current time is used.</p>
<i>startDate</i>	<p>String Optional. Date on which the task is scheduled to start, in the format <i>yyyy/MM/dd</i>. If you do not specify a <i>startDate</i>, the current date is used.</p>
<i>endTime</i>	<p>String Optional. Time at which the task expires, in the format <i>HH:mm:ss</i>. If you do not specify an <i>endTime</i>, the server uses the current time. If you do not specify <i>endDate</i> or <i>endTime</i>, the server executes this task for an indefinite period of time or until the task is canceled.</p>
<i>endDate</i>	<p>String Optional. Date on which the task expires, in the format <i>yyyy/MM/dd</i>. If you do not specify an <i>endDate</i>, the server uses the current date. If you do not specify <i>endDate</i> or <i>endTime</i>, the server executes this task for an indefinite period of time or until the task is canceled.</p>
<i>months</i>	<p>String List Optional. Months during which the task is scheduled to run. Months are represented by integers between 1 and 12, where “1” indicates January and “12” indicates December. If you do not specify <i>months</i>, the task will run every month.</p>
<i>hours</i>	<p>String List Optional. Hours at which the task is scheduled to run. Hours are represented by integers between 0 and 23. If you do not specify <i>hours</i>, the task runs every hour.</p>
<i>minutes</i>	<p>String List Optional. Minutes at which the task is scheduled to run. Minutes are represented by integers between 0 and 59. If you do not specify <i>minutes</i>, the task runs every minute.</p>

<i>daysOfMonth</i>	String List Optional. Days of the month on which the task is scheduled to run. Days are represented by integers between 1 and 31. If you do not specify <i>daysOfMonth</i> , the task runs every day of the month.
<i>daysOfWeek</i>	String List Optional. Days of the week on which the task is scheduled to run. Days are represented by integers between 1 and 7, where “1” indicates Sunday and “7” indicates Saturday. If you do not specify <i>daysOfWeek</i> , the task runs every day of the week.

Output Parameters

<i>taskID</i>	String Identification number of the task added to the scheduler.
<i>type</i>	String Code indicating the type of task added. For this type of task, the value of <i>type</i> will be <code>complex</code> .
<i>taskAdded</i>	String Indicates whether the task was successfully added to the Scheduler. If the task was successfully added to the Scheduler, <i>taskAdded</i> contains <code>true</code> . If the task was not successfully added, the server throws an exception and terminates the service.

pub.scheduler:addOneTimeTask

WmPublic. Adds a task that runs only once to the Scheduler.

The Integration Server executes the service a single time on the date and time you specify.

Input Parameters

<i>service</i>	String Name of the service you want to schedule for execution.
<i>description</i>	String Text string describing this task.
<i>target</i>	<p>String Server or servers on which the task is to run.(Clustered environments only). Set to:</p> <ul style="list-style-type: none"> ■ any to run the task on any server in the cluster. The task will run on only <i>one</i> of the servers. <p>For example, suppose that all the servers in your cluster share a single database for a parts inventory application, and that a particular function needs to run against that database once a day. Any of the servers can perform this task, therefore you can specify the <code>all</code> option to schedule a task to run on any of the servers.</p>

Note:

There is no predetermined order in which servers in the cluster are selected to run tasks. Rather, the first server to detect that a task is ready to be executed runs it.

For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services *webMethods Integration Server Administrator's Guide*.

- `all` to run the task on all servers in the cluster.

For example, suppose you run an application on each server in the cluster, and each server maintains its own database for that application. If you need to run a cleanup task against all the databases every day, you can schedule a task to run every day on all the servers in the cluster.

For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services *webMethods Integration Server Administrator's Guide*.

- `hostname` to run the task on a specific server in the cluster.

lateness

String The number of minutes (after the scheduled execution time) after which the server is to take a special action for a late task. You specify the action to be taken in the *latenessAction* parameter, described below. The server checks scheduled tasks at startup, and again periodically. If the server finds a task that is overdue and has exceeded the lateness period, the server performs the requested lateness action. If the server finds a task that is overdue but has *not* yet exceeded the lateness period, the server starts the task immediately.

latenessAction

String Action to take if a task has missed its scheduled start time by a number of minutes you specified with the *lateness* parameter. Possible actions are:

- **run immediately or 0** - Runs the task immediately
- **skip and run at next scheduled interval or 1** - Skips this execution of the task and runs it again at the next scheduled run time.
- **suspend or 2** - Places the task in a suspended state until an administrator resumes or cancels the task.

runAsUser

String Optional. User ID under which the service is to be executed. If you do not specify a user name, the "Default" access rights are used.

inputs

Document Optional. Document (IData object) containing input to the scheduled service.

Note:

You can also assign values to input parameters of services using the **Assign Inputs** option while scheduling a task in Integration Server Administrator

date **String** Date on which to run the service, in the format *yyyy/MM/dd*.

time **String** Time at which to run the service, in the format *HH:mm:ss*.

Output Parameters

taskID **String** Identification number of the task added to the scheduler.

type **String** Code indicating the type of task added. For this type of task, the value of *type* will be *once*.

taskAdded **String** Indicates whether the task was successfully added to the Scheduler. If the task was successfully added to the Scheduler, *taskAdded* contains *true*. If the task was not successfully added, the server throws an exception and terminates the service.

pub.scheduler:addRepeatingTask

WmPublic. Adds a recurring task to the Scheduler.

The webMethods Integration Server continually executes a repeating task at the interval you specify.

Input Parameters

service **String** Name of the service you want to schedule for execution on the server.

description **String** Text string describing this task.

target **String** Server or servers on which the task is to run. (Clustered environments only). Set to:

- any to run the task on any server in the cluster. The task will run on only *one* of the servers.

For example, suppose that all the servers in your cluster share a single database for a parts inventory application, and that a particular function needs to run against that database once a day. Any of the servers can perform this task, therefore you can specify the `all` option to schedule a task to run on any of the servers.

Note:

There is no predetermined order in which servers in the cluster are selected to run tasks. Rather, the first server to detect that a task is ready to be executed runs it.

For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

- `all` to run the task on all servers in the cluster.

For example, suppose you run an application on each server in the cluster, and each server maintains its own database for that application. If you need to run a cleanup task against all the databases every day, you can schedule a task to run every day on all the servers in the cluster.

For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

- `hostname` to run the task on a specific server in the cluster.

lateness

String The number of minutes (after the scheduled execution time) after which the server is to take a special action for a late task. You specify the action to be taken in the *latenessAction* parameter, described below. The server checks scheduled tasks at startup, and again periodically. If the server finds a task that is overdue and has exceeded the lateness period, the server performs the requested lateness action. If the server finds a task that is overdue but has *not* yet exceeded the lateness period, the server starts the task immediately.

latenessAction

String Action to take if a task has missed its scheduled start time by a number of minutes you specified with the *lateness* parameter. Possible actions are:

- **run immediately or 0** - Runs the task immediately
- **skip and run at next scheduled interval or 1** - Skips this execution of the task and runs it again at the next scheduled run time.
- **suspend or 2** - Places the task in a suspended state until an administrator resumes or cancels the task.

runAsUser

String Optional. User ID under which the service is to be executed. If you do not specify a user name, the "Default" access rights are used.

inputs

Document Optional. Document (IData object) containing input to the scheduled service.

Note:

You can also assign values to input parameters of services using the **Assign Inputs** option while scheduling a task in Integration Server Administrator.

<i>startTime</i>	String Optional. Time at which the task is scheduled to start, in <i>HH:mm:ss</i> format. If you do not specify a <i>startTime</i> , the current time is used.
<i>startDate</i>	String Optional. Date on which the task is scheduled to start, in <i>yyyy/MM/dd</i> format. If you do not specify <i>date</i> , the current date is used.
<i>endTime</i>	String Optional. Time at which the task expires, in <i>HH:mm:ss</i> format. If you do not specify an <i>endTime</i> , the server uses the current time. If you do not specify <i>endDate</i> or <i>endTime</i> , the server executes this task for an indefinite period of time or until the task is canceled.
<i>endDate</i>	String Optional. Date on which the task expires, in <i>yyyy/MM/dd</i> format. If you do not specify an <i>endDate</i> , the server uses the current date. If you do not specify <i>endDate</i> or <i>endTime</i> , the server executes this task for an indefinite period of time or until the task is canceled.
<i>interval</i>	String Time interval (measured in seconds) between executions of the task.
<i>doNotOverlap</i>	<p>String Optional. Flag that indicates whether you want executions of this task to overlap. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to prevent executions of the scheduled task from overlapping. After a scheduled task finishes executing, the Scheduler waits the number of seconds specified in <i>interval</i> before running the task again. ■ <code>false</code> to allow executions of the scheduled task to overlap. The Scheduler runs the task every time the value of <i>interval</i> elapses. This is the default.

Output Parameters

<i>taskID</i>	String Identification number of the task added to the Scheduler.
<i>type</i>	String Code indicating the type of task added. For this type of task, the value of <i>type</i> will be repeat.
<i>taskAdded</i>	String Indicates whether the task was successfully added to the Scheduler. If the task was successfully added to the Scheduler, <i>taskAdded</i> contains <code>true</code> . If the task was not successfully added, the server throws an exception and terminates the service.

pub.scheduler:cancelTask

WmPublic. Removes a task from the Scheduler.

Input Parameters

taskID **String** Identification number of the task to remove from the Scheduler.

If your server runs as part of a cluster of servers, and you have scheduled a task to run on all servers in the cluster, note the following before canceling a task:

- If you cancel a parent task, the task will be canceled on all servers in the cluster.
- If you cancel a child task, the task will be canceled only on the server on which the child task was scheduled to run.

For more information about parent and child tasks, see [pub.scheduler:getTaskInfo](#) or the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

Output Parameters

taskCancelled **String** Indicates whether the task was successfully removed from the Scheduler. If the task was successfully removed from the Scheduler, *taskCancelled* contains `true`. If the task was not successfully removed, the server throws an exception and terminates the service.

Usage Notes

For information about the tasks on the Scheduler, run the [pub.scheduler:getTaskIDs](#) and [pub.scheduler:getTaskInfo](#) services.

pub.scheduler:getTaskIDs

WmPublic. Retrieves a list of identification numbers for tasks currently in the Scheduler.

Input Parameters

running **String** Specifies whether the service returns task IDs for all tasks or just tasks that are running. If you specify "false" (the default), the service returns task IDs for all tasks. If you specify "true," the service returns task IDs for just those tasks with the status "running."

Output Parameters

taskIDs **String List** Identification numbers for the tasks on the Scheduler.

pub.scheduler:getTaskInfo

WmPublic. Retrieves information about a task on the Scheduler.

Input Parameters

taskID **String** Task identification number.

Output Parameters

type **String** Code indicating the task's type. Will be one of the following:

```
complex
once
repeat
```

runAsUser **String** The user ID whose access rights are used to execute the service.

target **String** Server or servers on which the task is to run. (Clustered environments only). A value of:

- `$any` indicates that the task will run on any, but only one, server in the cluster.

For more information about scheduled tasks in a clustered environment, see the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

- `$all` indicates that the task will run on all servers in a cluster.

When you schedule a task to run on all servers in the cluster, the server divides the task into a main or *parent* task, and a *child* task for each server in the cluster. You can perform some actions (activate, suspend, delete) individually on the child tasks, but if you want to change the characteristics of a task, you must do so through the parent task.

For a parent task, this service returns `$all` in the Target parameter.

For each child task, this service returns the hostname:port on which the task is to run.

For more information about scheduled tasks in a clustered environment, see the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

- hostname indicates that the task will run on this particular server. This service returns hostname:port if:
 - Your server is running in a cluster, a task was scheduled to run on all servers in the cluster, and this is one of the child tasks. (See the description of \$all above.)
 - Your server is running in a cluster and you requested a specific server.
 - Your server is not running in a cluster.

For more information about scheduled tasks in a clustered environment, see the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

<i>description</i>	String Text string describing this task.
<i>lateness</i>	String The number of minutes (after the scheduled execution time) after which the server is to take a special action for a late task. You specify the action to be taken in the <i>latenessAction</i> parameter, described below. The server checks scheduled tasks at startup, and again periodically. If the server finds a task that is overdue and has exceeded the lateness period, the server performs the requested lateness action. If the server finds a task that is overdue but has <i>not</i> yet exceeded the lateness period, the server starts the task immediately.
<i>latenessAction</i>	String Action to take if a task has missed its scheduled start time by a number of minutes you specify in the <i>lateness</i> parameter. Possible actions are: <ul style="list-style-type: none"> ■ run immediately or 0 - Runs the task immediately ■ skip and run at next scheduled interval or 1 - Skips this execution of the task and runs it again at the next scheduled run time. ■ suspend or 2 - Places the task in a suspended state until an administrator resumes or cancels the task.
<i>service</i>	String Name of the service associated with the task.
<i>nextRun</i>	String Next date and time that the task is scheduled to run. The date and time is expressed as the number of milliseconds from January 1, 1970, 00:00:00 GMT.
<i>execState</i>	String Current state of the task. Tasks can be in one of the following states:

A value of...	Indicates that...
0	The task is currently active.
1	The task is currently running.
2	The task has been suspended or has expired.

For tasks that are scheduled to run on all servers in the cluster, you might see different statuses among the parent and child tasks. For example, the parent's status might be Active, while one child's status is Active, and another child's status is Suspended.

In general, the status of the parent task will be Active if at least one child task is active or running, Suspended if all child tasks are suspended, or Expired, if all child tasks are expired.

inputs **Document** Conditional. Document (IData object) containing the inputs, if any, to the scheduled service.

oneTimeTaskInfo **Document** Conditional. Information about the complex task represented by *taskID*. This parameter is present only if *type* is once.

Key	Description
<i>date</i>	String Conditional. Date on which to run the task, in <i>yyyy/MM/dd</i> format.
<i>time</i>	String Conditional. Time at which to run the task, in <i>HH:mm:ss</i> format.

repeatingTaskInfo **Document** Conditional. Information about the task represented by *taskID*. This parameter is present only if *type* is repeat.

Key	Description
<i>interval</i>	String Conditional. Time interval (measured in seconds) between repetitions of the task.
<i>doNotOverlap</i>	String Conditional. Indicates whether recurrences of this task will overlap.

complexTaskInfo **Document** Conditional. Information about the task. This parameter is present only if *type* is complex.

Key	Description
<i>startDate</i>	String Conditional. Date on which the task is scheduled to start, in <i>yyyy/MM/dd</i> format.
<i>startTime</i>	String Conditional. Time at which the task is scheduled to start, in <i>HH:mm:ss</i> format.

<i>endDate</i>	String Conditional. Date on which the task expires, in <i>yyyy/MM/dd</i> format.
<i>endTime</i>	String Conditional. Time at which the task expires, in <i>HH:mm:ss</i> format.
<i>minutes</i>	String List Conditional. Minutes at which the task is scheduled to run. Minutes are represented by integers between 0 and 59.
<i>hours</i>	String List Conditional. Hours when the task is scheduled to run. Hours are represented by integers between 0 and 23.
<i>months</i>	String List Conditional. Months during which the task is scheduled to run. Months are represented by integers between 1 and 12, where "1" indicates January and "12" indicates December.
<i>daysOfWeek</i>	String List Conditional. Days of the week on which the task is scheduled to run. Days are represented by integers between 1 and 7, where "1" indicates Sunday and "7" indicates Saturday.
<i>daysOfMonth</i>	String List Conditional. Days of the month on which the task is scheduled to run. Days are represented by integers between 1 and 31.

pub.scheduler:getUserTaskList

WmPublic. Returns a list of scheduled user tasks.

Input Parameters

None.

Output Parameters

<i>tasks</i>	Document List List of one-time and simple repeating tasks.
<i>extTasks</i>	Document List List of complex repeating tasks.

pub.scheduler:migrateTasksToJDBC

WmPublic. Migrates scheduled user tasks from the Integration Server embedded database to an external database.

Integration Server stores information about certificate maps and scheduled jobs in a database that is associated with the **ISInternal** functional alias. When you install Integration Server, you can select whether this database will exist as an embedded database that is shipped with Integration Server, or an external RDBMS that you set up. If you chose to use the embedded database at install time, but later want to use an external RDBMS instead, you can use the `pub.scheduler:migrateTasksToJDBC` service to copy or move information about user scheduled tasks from the embedded database to the external RDBMS.

Input Parameters

move **Boolean** Specifies whether the tasks are to be deleted from the embedded database after the migration successfully completes. If set to false, the default, the tasks remain in the embedded database. If set to true, the tasks are removed from the embedded database.

Output Parameters

numberOfTaskMigrated **String** The number of user scheduled tasks that were migrated.

successful **String** Indicates whether or not the migration was successful. The service returns "true" if all tasks were successfully migrated, otherwise "false."

Usage Notes

This service copies scheduled user tasks only; it does not copy or move information about certificate maps.

Before running this service you must install the external IS Internal database component and define a database connection for it. For instructions, refer to *Installing Software AG Products*.

When you run the service, it looks in the embedded database for scheduled user tasks and writes any tasks it finds to the database identified by the **ISInternal** functional alias, which is defined on the **Settings > JDBC pools** page of the Integration Server Administrator.

pub.scheduler:resumeTask

WmPublic. Resumes a suspended task.

Input Parameters

taskID **String** Identification number of the task to resume.

If your server runs as part of a cluster of servers, and you have scheduled a task to run on all servers in the cluster, note the following before resuming a task:

- If you resume a parent task, the task will be resumed on all servers in the cluster.
- If you resume a child task, the task will be resumed only on the server on which the child task was scheduled to run.

For more information about parent and child tasks, see [pub.scheduler:getTaskInfo](#) or the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

Output Parameters

taskResumed

String Indicates whether the task was successfully resumed. If the task was successfully resumed, *taskResumed* contains `true`. If the task was not successfully resumed, the server throws an exception and terminates the service.

pub.scheduler:suspendTask

WmPublic. Suspends a task on the Scheduler.

Input Parameters

taskID

String Identification number of the task to suspend.

If your server runs as part of a cluster of servers, and you have scheduled a task to run on all servers in the cluster, note the following before canceling a task:

- If you suspend a parent task, the task will be suspended on all servers in the cluster.
- If you suspend a child task, the task will be suspended only on the server on which the child task was scheduled to run.

For more information about parent and child tasks, see [pub.scheduler:getTaskInfo](#) or the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

Output Parameters

taskSuspended

String Indicates whether the task was successfully suspended. If the task was successfully suspended, *taskSuspended* contains `true`. If the task was not successfully suspended, the server throws an exception and terminates the service.

Usage Notes

If you want to cancel a task or remove a task from the scheduler, use the [pub.scheduler:cancelTask](#) service.

pub.scheduler:updateComplexTask

WmPublic. Updates a complex task on the Scheduler.

The webMethods Integration Server runs the service for a complex task on the day(s) and time(s) that you specify either during a specified date range or indefinitely.

Input Parameters

<i>taskID</i>	String Identification number of the task to be updated.
<i>service</i>	String Optional. Name of the service you want to schedule for execution on the server.
<i>description</i>	String Optional. Text string describing this task.
<i>target</i>	String Optional. Server or servers on which the task is to run. (Clustered environments only). Set to:

- any to run the task on any server in the cluster. The task will run on only *one* of the servers.

For example, suppose that all the servers in your cluster share a single database for a parts inventory application, and that a particular function needs to run against that database once a day. Any of the servers can perform this task, therefore you can specify the `all` option to schedule a task to run on any of the servers.

Note:

There is no predetermined order in which servers in the cluster are selected to run tasks. Rather, the first server to detect that a task is ready to be executed runs it.

For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

- all to run the task on all servers in the cluster. For clustered environments only.

For example, suppose you run an application on each server in the cluster, and each server maintains its own database for that application. If you need to run a cleanup task against all the databases

every day, you can schedule a task to run every day on all the servers in the cluster.

For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

- `hostname` to run the task on a specific server in the cluster.

lateness

String Optional. The number of minutes (after the scheduled execution time) after which the server is to take a special action for a late task. You specify the action to be taken in the *latenessAction* parameter, described below. The server checks scheduled tasks at startup, and again periodically. If the server finds a task that is overdue and has exceeded the lateness period, the server performs the requested lateness action. If the server finds a task that is overdue but has *not* yet exceeded the lateness period, the server starts the task immediately.

latenessAction

String Optional. Action to take if a task has missed its scheduled start time by a number of minutes you specified with the *lateness* parameter. Possible actions are:

- **run immediately or 0** - Runs the task immediately
- **skip and run at next scheduled interval or 1** - Skips this execution of the task and runs it again at the next scheduled run time.
- **suspend or 2** - Places the task in a suspended state until an administrator resumes or cancels the task.

doNotOverlap

String Optional. Flag that indicates whether you want executions of this task to overlap. Set to:

- `true` to prevent executions of the scheduled task from overlapping. After a scheduled task finishes executing, the Scheduler waits the number of seconds specified in *interval* before running the task again.
- `false` to allow executions of the scheduled task to overlap. The Scheduler runs the task every time the value of *interval* elapses. This is the default.

runAsUser

String Optional. User ID under which the service is to be executed. If you do not specify a user name, the "Default" access rights are used.

inputs

Document Optional. Document (IData object) containing input to the scheduled service.

startTime

String Optional. Time at which the task is scheduled to start, in *HH:mm:ss* format. If you do not specify a *startTime*, the current time is used.

<i>startDate</i>	String Optional. Date on which the task is scheduled to start, in <i>yyyy/MM/dd</i> format. If you do not specify <i>startDate</i> , the current date is used.
<i>endTime</i>	String Optional. Time at which the task expires, in <i>HH:mm:ss</i> format. If you do not specify an <i>endTime</i> , the server uses the current time. If you do not specify <i>endDate</i> or <i>endTime</i> , the server executes this task for an indefinite period of time or until the task is canceled.
<i>endDate</i>	String Optional. Date on which the task expires, in <i>yyyy/MM/dd</i> format. If you do not specify an <i>endDate</i> , the server uses the current date. If you do not specify <i>endDate</i> or <i>endTime</i> , the server executes this task for an indefinite period of time or until the task is canceled.
<i>months</i>	String List Optional. Months during which the task is scheduled to run. Months are represented by integers between 1 and 12, where "1" indicates January and "12" indicates December.
<i>hours</i>	String List Optional. Hours at which the task is scheduled to run. Hours are represented by integers between 0 and 23.
<i>minutes</i>	String List Optional. Minutes at which the task is scheduled to run. Minutes are represented by integers between 0 and 59.
<i>daysOfMonth</i>	String List Optional. Days of the month on which the task is scheduled to run. Days are represented by integers between 1 and 31.
<i>daysOfWeek</i>	String List Optional. Days of the week on which the task is scheduled to run. Days are represented by integers between 1 and 7, where "1" indicates Sunday and "7" indicates Saturday.

Output Parameters

<i>type</i>	String Code indicating the type of task that was updated. For this type of task, the value of <i>type</i> will be <code>complex</code> .
<i>taskUpdated</i>	String Indicates whether the task was successfully updated. If the task was successfully updated, <i>taskUpdated</i> contains <code>true</code> . If the task was not successfully updated, the server throws an exception and terminates the service.

Usage Notes

You can use [pub.scheduler:getTaskIDs](#) and [pub.scheduler:getTaskInfo](#) services to get information about the task you want to update.

This service updates only the fields for which you provide input parameters. If you want to clear the information in an optional field, specify blanks in the parameter for that field.

You can also assign values to input parameters of services using the **Assign Inputs** option while scheduling a task in Integration Server Administrator.

pub.scheduler:updateOneTimeTask

WmPublic. Updates a one-time task on the Scheduler.

Input Parameters

<i>taskID</i>	String Identification number of the task to be updated.
<i>service</i>	String Optional. Name of the service to be scheduled.
<i>description</i>	String Optional. Text string describing this task.
<i>target</i>	String Optional. Server or servers on which the task is to run. (Clustered environments only). Set to:

- any to run the task on any server in the cluster. The task will run on only *one* of the servers.

For example, suppose that all the servers in your cluster share a single database for a parts inventory application, and that a particular function needs to run against that database once a day. Any of the servers can perform this task, therefore you can specify the `all` option to schedule a task to run on any of the servers.

Note:

There is no predetermined order in which servers in the cluster are selected to run tasks. Rather, the first server to detect that a task is ready to be executed runs it.

For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

- `all` to run the task on all servers in the cluster.

For example, suppose you run an application on each server in the cluster, and each server maintains its own database for that application. If you need to run a cleanup task against all the databases every day, you can schedule a task to run every day on all the servers in the cluster.

For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services in *webMethods Integration Server Administrator's Guide*.

	<ul style="list-style-type: none"> ■ hostname to run the task on a specific server in the cluster.
<i>lateness</i>	String Optional. The number of minutes (after the scheduled execution time) after which the server is to take a special action for a late task. You specify the action to be taken in the <i>latenessAction</i> parameter, described below. The server checks scheduled tasks at startup, and again periodically. If the server finds a task that is overdue and has exceeded the lateness period, the server performs the requested lateness action. If the server finds a task that is overdue but has <i>not</i> yet exceeded the lateness period, the server starts the task immediately.
<i>latenessAction</i>	String Optional. Action to take if a task has missed its scheduled start time by a number of minutes you specified with the <i>lateness</i> parameter. Possible actions are: <ul style="list-style-type: none"> ■ run immediately or 0 - Runs the task immediately ■ skip and run at next scheduled interval or 1 - Skips this execution of the task and runs it again at the next scheduled run time. ■ suspend or 2 - Places the task in a suspended state until an administrator resumes or cancels the task.
<i>runAsUser</i>	String Optional. User ID under which the service is to be executed.
<i>inputs</i>	Document Optional. Document (IData object) containing inputs to the scheduled service.
<i>date</i>	String Optional. Date on which to run the task, in <i>yyyy/MM/dd</i> format.
<i>time</i>	String Optional. Time at which to run the service, in <i>HH:mm:ss</i> format.

Output Parameters

<i>type</i>	String Code indicating the type of task that was updated. For this type of task, the value of <i>type</i> will be <i>once</i> .
<i>taskUpdated</i>	String Indicates whether the task was successfully updated. If the task was successfully updated, <i>taskUpdated</i> contains <i>true</i> . If the task was not successfully updated, the server throws an exception and terminates the service.

Usage Notes

This service updates only the fields for which you provide input parameters. If you want to clear the information in an optional field, specify blanks in the parameter for that field.

You can also assign values to input parameters of services using the **Assign Inputs** option while scheduling a task in Integration Server Administrator.

pub.scheduler:updateRepeatingTask

WmPublic. Updates a repeating task to the Scheduler.

Input Parameters

- | | |
|--------------------|--|
| <i>taskID</i> | String Identification number of the task to be updated. |
| <i>service</i> | String Optional. Name of the service run by the task. |
| <i>description</i> | String Optional. Text string describing this task. |
| <i>target</i> | String Optional. Server or servers in the cluster on which the task is to run. (Clustered environments only). Set to: <ul style="list-style-type: none">■ <code>any</code> to run the task on any server in the cluster. The task will run on only <i>one</i> of the servers.<p>For example, suppose that all the servers in your cluster share a single database for a parts inventory application, and that a particular function needs to run against that database once a day. Any of the servers can perform this task, therefore you can specify the <code>all</code> option to schedule a task to run on any of the servers.</p><div data-bbox="503 997 1364 1165" style="background-color: #f0f0f0; padding: 5px;"><p>Note:
There is no predetermined order in which servers in the cluster are selected to run tasks. Rather, the first server to detect that a task is ready to be executed runs it.</p></div><p>For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services in <i>webMethods Integration Server Administrator's Guide</i>.</p>■ <code>all</code> to run the task on all servers in the cluster.<p>For example, suppose you run an application on each server in the cluster, and each server maintains its own database for that application. If you need to run a cleanup task against all the databases every day, you can schedule a task to run every day on all the servers in the cluster.</p><p>For more information about how Integration Server handles the scheduling of tasks in a clustered environment, see the chapter about managing services in <i>webMethods Integration Server Administrator's Guide</i>.</p>■ <code>hostname</code> to run the task on a specific server in the cluster. |

<i>lateness</i>	String Optional. The number of minutes (after the scheduled execution time) after which the server is to take a special action for a late task. You specify the action to be taken in the <i>latenessAction</i> parameter, described below. The server checks scheduled tasks at startup, and again periodically. If the server finds a task that is overdue and has exceeded the lateness period, the server performs the requested lateness action. If the server finds a task that is overdue but has <i>not</i> yet exceeded the lateness period, the server starts the task immediately.
<i>latenessAction</i>	String Optional. Action to take if a task has missed its scheduled start time by a number of minutes you specified with the <i>lateness</i> parameter. Possible actions are: <ul style="list-style-type: none">■ run immediately or 0 - Runs the task immediately■ skip and run at next scheduled interval or 1 - Skips this execution of the task and runs it again at the next scheduled run time.■ suspend or 2 - Places the task in a suspended state until an administrator resumes or cancels the task.
<i>runAsUser</i>	String Optional. User ID under which the service is to be executed. If you do not specify a user name, the "Default" access rights are used.
<i>startTime</i>	String Optional. Time at which the task is scheduled to start, in <i>HH:mm:ss</i> format. If you do not specify a <i>startTime</i> , the current time is used.
<i>startDate</i>	String Optional. Date on which the task is scheduled to start, in <i>yyyy/MM/dd</i> format. If you do not specify <i>date</i> , the current date is used.
<i>endTime</i>	String Optional. Time at which the task expires, in <i>HH:mm:ss</i> format. If you do not specify an <i>endTime</i> , the server uses the current time. If you do not specify <i>endTime</i> or <i>endDate</i> , the server executes the scheduled service for an indefinite period of time or until you cancel the scheduled user task.
<i>endDate</i>	String Optional. Date on which the task expires, in <i>yyyy/MM/dd</i> format. If you do not specify an <i>endDate</i> , the server uses the current date. If you do not specify <i>endDate</i> or <i>endTime</i> , the server executes the scheduled service for an indefinite period of time or until you cancel the scheduled user task.
<i>inputs</i>	Document Optional. Document (IData object) containing inputs to the scheduled service.
<i>interval</i>	String Optional. Time interval (measured in seconds) between repetitions of the task.
<i>doNotOverlap</i>	String Optional. Flag indicating whether or not you want the executions of this task to overlap. Set to:

- `true` to prevent executions of the scheduled task from overlapping. After a scheduled task finishes executing, the Scheduler waits the number of seconds specified in *interval* before running the task again.
- `false` to allow executions of the scheduled task to overlap. The Scheduler runs the task every time the value of *interval* elapses. This is the default.

Output Parameters

<i>type</i>	String Code indicating the type of task updated. For this type of task, the value of <i>type</i> will be repeat.
<i>taskUpdated</i>	String Indicates whether the task was successfully updated. If the task was successfully updated, <i>taskUpdated</i> contains <code>true</code> . If the task was not successfully updated, the server throws an exception and terminates the service.

Usage Notes

This service updates only the fields for which you provide input parameters. If you want to clear the information in an optional field, specify blanks in the parameter for that field.

You can also assign values to input parameters of services using the **Assign Inputs** option while scheduling a task in Integration Server Administrator.

35 Schema Folder

■ Summary of Elements in this Folder	708
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You use the elements in the schema folder to validate objects and to validate the pipeline.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.schema:createXSD	WmPublic. Creates an XML Schema definition from a document type, from the input and output parameters of a service, or from a specification.
pub.schema:validate	WmPublic. Validates an object using an IS document type or a schema.
pub.schema:validatePipeline	WmPublic. Validates the pipeline against a document type.
pub.schema.w3c	WmPublic. This folder contains definitions for XML Schemas as defined in the W3C specification <i>XML Schema Part 2: Datatypes</i> .
pub.schema.w3c:datatypes	WmPublic. A schema containing the simple type names for built-in schemas.
pub.schema.w3c:structures	WmPublic. A schema containing the structural components for XML schema definitions.
pub.schema.w3c:xml	WmPublic. A schema containing the XML namespace components, such as <code>xml:lang</code> and <code>xml:space</code> , as defined in the W3C specifications <i>Namespaces in XML and Extensible Markup Language (XML) 1.0</i> .
pub.schema.w3c:xsi	WmPublic. A schema containing the XML Schema instance components, such as <code>xsi:nil</code> , <code>xsi:noNamespaceSchemaLocation</code> , <code>xsi:schemaLocation</code> , and <code>xsi:type</code> , as defined in the W3C XML Schema recommendation <i>Part 1: Structures</i> .

pub.schema:createXSD

WmPublic. Creates an XML Schema definition from a document type, from the input and output parameters of a service, or from a specification.

Input Parameters

name **String** Fully qualified name of a document type, service, or specification on the Integration Server.

Output Parameters

isSuccessful

String Flag indicating whether the schema definition was created successfully. A value of:

- `true` indicates that the schema definition was created successfully.
- `false` indicates that the schema definition was not created successfully. See *errors* for detailed information.

xsd

Document Conditional. The schema definition *xsd* has the following keys:

Key	Description
<i>url</i>	String Conditional. Relative url of the generated schema.
<i>source</i>	String Conditional. Schema definition.

errors

Document List Conditional. List of fatal errors, if any, that occurred when generating the XSD. Each document in the list has the following structure:

Key	Description
<i>error Message</i>	String Text of the error message.

When fatal errors occur, the service does not generate an XSD file.

warnings

Document List Conditional. List of non-fatal errors, if any, that were encountered while generating the XSD. Each document in the list has the following structure:

Key	Description
<i>warningMessage</i>	String Text of the warning message.

When non-fatal errors occur, the service generates the XSD file but also returns *warnings* to indicate that it encountered unusual or unexpected conditions during the process.

Usage Notes

If the document type, service signature, or specification you are providing as input to `createXSD` contains fields that belong to multiple XML namespaces, `createXSD` generates multiple XML Schema definitions (one for each XML namespace) and imports them into the XML Schema contained in the *source* field. These imported XML Schema definitions appear as children of *xsd* in the pipeline.

When using `createXSD` to create an XML Schema definition, keep the following points in mind:

- Top-level strings are not allowed.
- String tables beneath the top-level are not allowed.

- Field names must conform to QName lexical rules (that is, the prefix and local name must conform to NCName rules specified in <http://www.w3.org/TR/REC-xml-names/#NT-NCName>).
- Field names cannot contain a prefix without an associated XML namespace.
- Fields of type other than scalar string cannot have names that begin with the character @ or be named *body.
- Fields at the same level (that is, beneath the same parent field in the input or output of the same signature) can have the same name but different types or properties. However, only one field's type and properties is used for all fields with that name at that level. Because the method used to select the field is not defined, Software AG recommends avoiding this case.
- Only one field named *body can occur at the same level.
- Duplicate field names that begin with the character @ cannot repeat at the same level.
- Fields at different levels can have the same name with duplicate XML namespace values, even if the fields have different types or properties. However, only one field's type and properties are used for all fields with that name at that level. Because the method used to select the field is not defined, Software AG recommends avoiding this case.
- Object constraints are allowed. However, the Integration Server does not represent them in the XSD.
- Strings constrained by older schema types (types defined before the W3C XML 2001 Schema recommendations) are allowed. However, the Integration Server translates them into 2001 XML Schema types.
- If a document variable is considered to be open (the Allow unspecified fields property is set to true), Integration Server adds an xsd:any element to the complex type definition that corresponds to the document variable. However, when the watt.core.schema.createSchema.omitXSDAny server configuration parameter is set to true, Integration Server omits the xsd:any element even when the document is considered to be open. For more information about this server configuration parameter, see *webMethods Integration Server Administrator's Guide*.

If you use `createXSD` to create multiple XML Schema definitions that refer to each other, place the XSD files in the same folder or base path. To ensure that the references resolve correctly, make sure the relative URLs specified in the XSD files reflect the names of the XSD files within this folder or base path.

pub.schema:validate

WmPublic. Validates an object using an IS document type, XML document type, or an IS schema.

Input Parameters

object **Document** Where Document is an IData or an XMLData-formatted document, **com.wm.lang.xml.Document** or **com.wm.lang.xml.Node** Document or object to be validated.

conformsTo **String** Document type or schema to validate *object* against.

- If *object* is a Document (IData object), *conformsTo* must specify the fully qualified name of an IS document type on the Integration Server.
- If *object* is a XMLData-formatted document, *conformsTo* must specify the fully qualified name of an XML document type on Integration Server.

Note:

One or more XML document types and XML fields are created from a single XML schema definition. To validate an XMLData-formatted Document using the XML document types created from an XML Schema definition, you need specify only one of the XML document types or XML fields created from the schema. Integration Server locates the related XML document types, using the complete collection of XML document types and XML fields created from the XML schema definition during validation.

- If *object* is a **com.wm.lang.xml.Document** or **com.wm.lang.xml.Node** object, *conformsTo* must specify the fully qualified name of an IS schema on the Integration Server.

The specified IS schema is needed only for validating nodes with "Names" that are not from XML namespaces (that is, qualified nodes whose XML Namespace Name properties are absent). Integration Server can only locate the IS schema if its fully qualified name is provided.

If the XML document (**com.wm.lang.xml.Document** or **com.wm.lang.xml.Node**) contains namespace-qualified tags, *conformsTo* is ignored. Instead, Integration Server uses the XML namespaces declared in the instance document to locate the IS schemas that contain definitions and declarations for that XML namespace.

Note:

When validating a document type created from an XML schema definition, if you want to use the OR operator for pattern-matching, use the | operator after the pattern string. If the | operator is used at the start of the regular expression, Integration Server treats it as an empty string.

maxErrors **String** Optional. Number of errors to be collected. Default value is 1. When the number of errors found is equal to *maxErrors*, the validation

processor stops validation and returns the result. If *maxErrors* is set to -1, the validation processor returns all errors.

ignoreContent **String** Optional. Flag that specifies whether the validation processor will validate content keys of the type String, String List, or String Table.

Set to:

- `true` to ignore content (that is, do not validate keys of these types).
- `false` to validate content. This is the default.

failIfInvalid **String** Optional. Flag that indicates whether the service should fail and throw an exception if the object is invalid. Set to:

- `true` to indicate that the service should fail if the object is invalid.
- `false` to indicate that service should signal success and return errors to the pipeline if object is invalid. This is the default.

schemaDomain **String** Optional. Schema domain in which the schema specified by the XML namespaces resides. If *schemaDomain* is not specified, Integration Server uses the default schema domain.

Note:

This parameter only applies if *object* is a `com.wm.lang.xml.Document` or `com.wm.lang.xml.Node`

Output Parameters

isValid **String** Flag that indicates whether or not the validation was successful. A value of:

- `true` indicates that the validation was successful.
- `false` indicates that the validation was unsuccessful.

errors **Document List** Errors encountered during validation. Each document will contain the following information:

Key	Description
<i>pathName</i>	String Location of the error in XQL.
<i>errorCode</i>	String Error code (for example, VV-001).
<i>errorMessage</i>	String Error message (for example, Missing Object).

Usage Notes

Integration Server uses the Java regular expression compiler to validate the supplied XML against an IS document type, XML document type, or IS schema.

When validating against an IS document type, if the **Allow null** property is set to false for a field in the document type and the corresponding element in the instance document carries the attribute `xsi:nil`, Integration Server throws the following error

```
[ISC.0082.9026] Undefined Object found.
```

When validating against an IS document type, if the **Allow null** property is set to false for a field in the document type and the corresponding element in the instance document contains content or contains child elements, Integration Server throws the following error:

```
[ISC.0082.9024] fieldName cannot have content or child elements since
xsi:nil is true.
```

When validating a `com.wm.lang.xml.Document` or `com.wm.lang.xml.Node` *object*, Integration Server searches the named schema domain for the specified schema. If the schema cannot be found in the specified domain, Integration Server searches the default schema domain. Note that Integration Server searches the schema domain for a schema, not an individual component (element, attribute, complex type, etc) within the schema.

When validating XML, Integration Server uses the W3C recommendation *XML Schema Part 2: Datatypes*. If you want to validate XML for illegal values, set `ignoreContent` to `false` and the `watt.core.validation.w3cConformant` configuration parameter to `true`. For information about setting this configuration parameter, see *webMethods Integration Server Administrator's Guide*.

The `pub.schema.validate` service cannot be used to validate a node produced by the enhanced XML parser.

pub.schema:validatePipeline

WmPublic. Validates the pipeline against a document type.

Input Parameters

<i>conformsTo</i>	String Fully qualified name of the document type that you want to validate the pipeline against.
<i>maxErrors</i>	String Optional. Number of errors to be collected. Default value is 1. When the number of errors found is equal to <i>maxErrors</i> , the validation processor stops validation and returns the result. If <i>maxErrors</i> is set to -1, the validation processor returns all errors.
<i>ignoreContent</i>	String Optional. Flag that specifies whether the validation processor will validate content keys of the type String, String List, or String Table. Set to:

- `true` to ignore content (that is, do not validate keys of these types).
- `false` to validate content. This is the default.

failIfInvalid

String Optional. Flag that indicates whether the service should fail and throw an exception if the object is invalid. Set to:

- `true` to indicate that service should fail if object is invalid.
- `false` to indicate that service should simply signal success and return errors to the pipeline if object is invalid. This is the default.

Output Parameters

isValid

String Flag that indicates whether or not the validation was successful. A value of:

- `true` indicates that the validation was successful.
- `false` indicates that the validation was unsuccessful.

errors

Document List Errors encountered during validation. Each document will contain the following information:

Key	Description
<i>pathName</i>	String Location of the error in XQL.
<i>errorCode</i>	String Error code (for example, VV-001).
<i>errorMessage</i>	String Error message (for example, Missing Object).

pub.schema.w3c

WmPublic. This folder contains definitions for XML Schemas as defined in the W3C specification *XML Schema Part 2: Datatypes* .

For more information about schemas and datatypes, see *webMethods Service Development Help*.

pub.schema.w3c:datatypes

WmPublic. A schema containing the simple type names for built-in schemas.

pub.schema.w3c:structures

WmPublic. A schema containing the structural components for XML schema definitions.

pub.schema.w3c:xml

WmPublic. A schema containing the XML namespace components, such as `xml:lang` and `xml:space`, as defined in the W3C specifications *Namespaces in XML and Extensible Markup Language (XML) 1.0*.

pub.schema.w3c:xsi

WmPublic. A schema containing the XML Schema instance components, such as `xsi:nil`, `xsi:noNamespaceSchemaLocation`, `xsi:schemaLocation`, and `xsi:type`, as defined in the W3C XML Schema recommendation *Part 1: Structures*.

36 Security Folder

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You use the elements in the security folder to control which client certificates are sent to other services and digitally sign data and process digital signatures. You can also use the elements to store and retrieve outbound passwords to access secure resources.

About the Security Elements

Use the elements in the security folder to:

- Control which client certificates are sent to other services.
- Digitally sign data.
- Process digital signatures.
- Store and retrieve outbound passwords to access secure resources.
- Manage Integration Server keystores and truststores.
- Secure XML documents.

The services `pub.security.keystore:setKeyAndChain`, `pub.security:setKeyAndChainFromBytes`, and `pub.security:clearKeyAndChain` are used to control which client certificate the webMethods Integration Server presents to remote servers. You need to use these services to switch between certificates and certificate chains if you are not using aliases for remote servers. For more information about aliases for remote servers, see the section *Setting Up a Remote Server Alias* in the *webMethods Integration Server Administrator's Guide*.

The `pub.security.outboundPasswords` services support the use of encrypted outbound passwords to access secure resources. You may wish to have a flow service access a secure resource such as a remote Integration Server, proxy server, or database. The service would need to provide a valid password to access the resource. The `pub.security.outboundPasswords` services allow a flow service to store passwords in and retrieve passwords from the Integration Server's outbound password store. The outbound password store is an encrypted store of passwords managed by the Integration Server. For more information about the outbound password store, see the section *Working with Outbound Password Settings* in the *webMethods Integration Server Administrator's Guide*.

The `pub.security.keystore` services allow you to configure Integration Server SSL through access to its keys and associated certificates. These keys and certificates are now stored securely in industry-standard keystore and truststore files. For more information about Integration Server keystores and truststores, see the section *Keystores and Truststores* in the *webMethods Integration Server Administrator's Guide*.

The `pub.security.xml` services are based on the Apache Security APIs. These services support encryption and digital signing of outbound XML documents from Integration Server, and decryption and signature verification of inbound XML from partner applications. The services provide the most commonly-used XML security options, including:

- Signing/encrypting the entire XML document or the content of specific nodes
- Selection of the signing and encryption algorithms
- Use of enveloping and enveloped signatures

Important: Software AG recommends that you drop variables containing sensitive data from the pipeline once the data is no longer needed by the flow service. Sensitive data includes, but is not limited to, passwords, private keys, and pass phrases. The pipeline stores data in clear text. Because the entire output pipeline is returned to the calling client, avoid leaving variables containing sensitive data in the pipeline. This prevents the service from returning sensitive data to the calling client.

The `pub.security` services provide PGP-based encryption, decryption, signing, and verification.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.security:clearAuthenticationCache	WmPublic. Clears the authentication cache in Integration Server.
pub.security:clearKeyAndChain	WmPublic. Clears the set key and certificate chain and reverts back to the default key and certificate chain for the subsequent set of invoked services.
pub.security:decrypt	WmPublic. Decrypts the encrypted data and returns plain data as a stream object or a byte array.
pub.security:decryptAndVerify	WmPublic. Decrypts the encrypted data and verifies the associated digital signature.
pub.security:encrypt	WmPublic. Converts plain data to encrypted data.
pub.security:generateHashValue	WmPublic. Returns the hashed value for a string input.
pub.security:generateSalt	WmPublic. Creates a salt value.
pub.security.ports:hostNamesSpec	WmPublic. Specification for a service that returns a list of IP addresses or hostnames in the CSV format.
pub.security:setKeyAndChain	WmPublic. <i>Deprecated</i> - Replaced by pub.security.keystore:setKeyAndChain .
pub.security:setKeyAndChainFromBytes	WmPublic. Associates a key and certificate chain with the subsequent set of invoked services. Use this service to associate a key and certificate chain that is different from the default settings, and if your key and certificate

Element	Package and Description
	information is located in byte arrays (rather than files).
pub.security:sign	WmPublic. Adds a digital signature to data.
pub.security:signAndEncrypt	WmPublic. Adds a digital signature to data and then encrypts the data.
pub.security:userInfoSpec	WmPublic. Specification for the signature of a UserInfo service that performs custom processing based on the personally identifiable information in the OpenID Connect UserInfo token returned from the OpenID Provider
pub.security:verify	WmPublic. Verifies the digital signature associated with the data.
pub.security.enterpriseGateway:alertSpec	WmPublic. Specification for flow services used to send alerts about violations of webMethods Enterprise Gateway rules.
pub.security.enterpriseGateway:customFilterSpec	WmPublic. Specification for services that can be invoked by the custom filter in Enterprise Gateway rules.
pub.security.keystore.pkcs7:sign	WmPublic. Creates a PKCS7 signed Data object.
pub.security.keystore:getCertificate	WmPublic. Returns the trusted certificate, stored in a truststore, that corresponds to the certificate's alias.
pub.security.keystore:getKeyAndChain	WmPublic. Returns a private key and its associated certificate chain from a designated keystore.
pub.security.keystore:getTrustedCertificates	WmPublic. Returns the trusted certificates located in a specified truststore.
pub.security.keystore:setKeyAndChain	WmPublic. Associates a key and certificate chain with the subsequent set of invoked services. Use this service to associate a key and certificate chain that is different from the default settings, and if your key and certificate information is stored in a keystore file.
pub.security.outboundPasswords:getPassword	WmPublic. Retrieves a password from the password store for a given key.
pub.security.outboundPasswords:listKeys	WmPublic. Lists the keys in the password store.

Element	Package and Description
pub.security.outboundPasswords:removePassword	WmPublic. Removes a password from the password store for a given key.
pub.security.outboundPasswords:setPassword	WmPublic. Stores a key and password in the password store.
pub.security.outboundPasswords:updatePassword	WmPublic. Changes the password value for a key already in the password store.
pub.security.pkcs7:sign	WmPublic. Creates a PKCS7 SignedData object.
pub.security.pkcs7:verify	WmPublic. Processes a digital signature to guarantee that the data associated with the signature has not been modified.
pub.security.util:convertSecureString	WmPublic. Returns a WmSecureString in Java String, byte array, or character array format.
pub.security.util:createMessageDigest	WmPublic. Generates a message digest for a given message.
pub.security.util:createSecureString	WmPublic. Creates a WmSecureString object from either a Java String, byte array, or character array.
pub.security.util:destroySecureString	WmPublic. Destroys a WmSecureString such that it no longer resides in memory and is removed from the pipeline.
pub.security.util:getCertificateInfo	WmPublic. Retrieves information such as serial number, issuer, and expiration date from a digital certificate.
pub.security.util:loadPKCS7CertChain	WmPublic. Converts a certificate chain that is in PKCS #7 format to a list of byte arrays.
pub.security.xml:decryptXML	WmPublic. Decrypts the encrypted XML, and returns the XML as either a string or stream object.
pub.security.xml:encryptXML	WmPublic. Encrypt an XML document or node in an XML document.
pub.security.xml:signXML	WmPublic. Digitally sign an outgoing XML node or document.
pub.security.xml:verifyXML	WmPublic. Verifies a signed XML document, or node in an XML document, and returns information about the success or failure of the verification.

pub.security:clearAuthenticationCache

WmPublic. Clears the authentication cache in Integration Server.

Input Parameters

None.

Output Parameters

message Specifies whether the authentication cache is cleared or not.

Usage Notes

Integration Server caches your login credentials (username and password) for better performance. The credentials are stored until the cache expires. If a user's credential is updated and a situation demands that the authentication cache be cleared immediately, then use this service.

pub.security:clearKeyAndChain

WmPublic. Clears the set key and certificate chain and reverts back to the default key and certificate chain for the subsequent set of invoked services.

Input Parameters

None.

Output Parameters

None.

Usage Notes

The following scenario describes a situation in which you would use the [pub.security.keystore:setKeyAndChain](#) and [pub.security:clearKeyAndChain](#) services.

Company A has a webMethods Integration Server with one certificate chain. Company A wants to start trading with two new companies: Company B and Company C. Due to explicit business decisions, both Company B and Company C require that secure requests to their servers use certificates issued by their company's certificate authority. Company A now has three certificate sets that it must manage: one for connections to B, one for connections to C, and one for all other requests. Below is a high-level process flow of what Company A would do if documents needed to be forwarded to companies B, C, and D (some arbitrary partner without the stringent security).

Assume all network communication is done using HTTPS. Documents are sent to the companies in the following order: Company D, Company B, Company C, Company D. All data transfers make use of the [pub.client:http](#) service.

1. Invoke [pub.client:http](#) to send data to Company D.
2. Invoke [pub.security.keystore:setKeyAndChain](#) using the key and certificate chain for Company B.
3. Invoke [pub.client:http](#) to send data to Company B.
4. Invoke [pub.security.keystore:setKeyAndChain](#) using the key and certificate chain for Company C.
5. Invoke [pub.client:http](#) to send data to Company C.
6. Invoke [pub.security.clearKeyAndChain](#) to revert back to the default key and certificate chain for Company A's server.
7. Invoke [pub.client:http](#) to send data to Company D.

See Also

[pub.security.keystore:setKeyAndChain](#)

pub.security:decrypt

WmPublic. Decrypts the encrypted data and returns plain data as a stream object or byte array or string.

Input Parameters

data **Document.** The data that you want to decrypt must be in one of the following formats. If multiple input parameters are supplied for *data*, the service throws an exception stating that only one parameter must be passed.

Key	Description
<i>string</i>	String. Optional. The string that you want to decrypt.
<i>stream</i>	java.io.InputStream. Optional. The stream data that you want to decrypt.
<i>bytes</i>	byte[]. Optional. The byte array that you want to decrypt.
<i>file</i>	String. Optional. The absolute or relative path of the file that you want to decrypt. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.

The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working

directory. The `watt.server.homeDir` server configuration parameter also specifies the working directory.

<i>loadAs</i>	<p>String. Optional. The format in which the service returns the output. Set to:</p> <ul style="list-style-type: none"> ■ <code>bytes</code> to return the output as a byte array. This is the default. ■ <code>stream</code> to return the output as a stream object. ■ <code>string</code> to return the output as a string. 												
<i>secretKey</i>	<p>Document. The secret key to extract the private key required to decrypt the data. Provide <i>secretKeyBytes</i>, <i>secretKeyString</i>, or <i>secretKeyRingFile</i>. If you provide <i>secretKeyRingFile</i>, you must also provide <i>secretKeyAlias</i>. Otherwise, the service throws an exception.</p> <table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>secretKeyBytes</i></td> <td> <p>byte[]. Optional. The secret key file in bytes.</p> <p>Note: Secret key files have a <code>.asc</code> extension.</p> </td> </tr> <tr> <td><i>secretKeyString</i></td> <td> <p>String. Optional. The secret key as a string.</p> </td> </tr> <tr> <td><i>secretKeyRingFile</i></td> <td> <p>String. Optional. The absolute or relative path of the secret keyring file. The secret keyring file is a collection of secret keys with a unique key ID. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.</p> <p>The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The <code>watt.server.homeDir</code> server configuration parameter also specifies the working directory.</p> <p>Note: Secret keyring files have a <code>.skr</code> extension.</p> </td> </tr> <tr> <td><i>secretKeyAlias</i></td> <td> <p>String. Optional. The 64 bit (16 characters) key identifier of the secret key.</p> <p>Note: This parameter is required only when you use <i>secretKeyRingFile</i>.</p> </td> </tr> <tr> <td><i>secretKeyPassphrase</i></td> <td> <p>String. Password required to extract the private key from the secret key. This is the password provided while generating the secret key.</p> </td> </tr> </tbody> </table>	Key	Description	<i>secretKeyBytes</i>	<p>byte[]. Optional. The secret key file in bytes.</p> <p>Note: Secret key files have a <code>.asc</code> extension.</p>	<i>secretKeyString</i>	<p>String. Optional. The secret key as a string.</p>	<i>secretKeyRingFile</i>	<p>String. Optional. The absolute or relative path of the secret keyring file. The secret keyring file is a collection of secret keys with a unique key ID. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.</p> <p>The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The <code>watt.server.homeDir</code> server configuration parameter also specifies the working directory.</p> <p>Note: Secret keyring files have a <code>.skr</code> extension.</p>	<i>secretKeyAlias</i>	<p>String. Optional. The 64 bit (16 characters) key identifier of the secret key.</p> <p>Note: This parameter is required only when you use <i>secretKeyRingFile</i>.</p>	<i>secretKeyPassphrase</i>	<p>String. Password required to extract the private key from the secret key. This is the password provided while generating the secret key.</p>
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<i>secretKeyPassphrase</i>	<p>String. Password required to extract the private key from the secret key. This is the password provided while generating the secret key.</p>												

Output Parameters

- stream* **java.io.OutputStream**. Conditional. Decrypted data as an output stream. Returned when the *loadAs* input parameter is set to *stream*.
- bytes* **byte[]**. Conditional. Decrypted data as bytes. Returned when the *loadAs* input parameter is set to *bytes*.
- string* **String**. Conditional. Decrypted data as a string. Returned when the *loadAs* input parameter is set to *string*.
- status* **String**. Indicates whether the data is successfully decrypted or not. If successful, *status* is *success*. Otherwise, *status* contains *failure* along with an error message.

Usage Notes

Prerequisites to use the `pub.security:decrypt` service:

- Generate a public-secret key pair for Integration Server.
- Make sure that the external system that sends the encrypted data has access to Integration Server's public key to encrypt the data.

Decryption works as follows:

1. The external system sends the data encrypted with Integration Server's public key.
2. Integration Server receives the data and passes it to the `pub.security:decrypt` service.
3. The `pub.security:decrypt` service uses the private key to decrypt the data.
4. The service returns the decrypted data.

The service supports a data file of size up to 2 GB when the memory allocated to Integration Server is 10 GB or more.

Authentication keys used in this service must be in the PGP format and generated using the RSA encryption algorithm.

Note:

Authentication keys in the `.ecc` format are not supported.

`pub.security:decryptAndVerify`

`WmPublic`. Decrypts the encrypted data and verifies the associated digital signature.

Input Parameters

data **Document.** The data that you want to decrypt and verify must be in one of the following formats. If multiple input parameters are supplied for *data*, the service throws an exception stating that only one parameter must be passed.

Key	Description
<i>string</i>	String. Optional. The string that you want to decrypt and verify.
<i>stream</i>	java.io.InputStream. Optional. The stream data that you want to decrypt and verify.
<i>bytes</i>	byte[]. Optional. The byte array that you want to decrypt and verify.
<i>file</i>	<p>String. Optional. The absolute or relative path of the file that you want to decrypt and verify. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.</p> <p>The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The <code>watt.server.homeDir</code> server configuration parameter also specifies the working directory.</p>

loadAs **String.** Optional. The format in which the service returns the output. Set to:

- `bytes` to return the output as a byte array. This is the default.
- `stream` to return the output as a stream object.
- `string` to return the output as a string.

secretKey **Document.** The secret key to extract the private key required to decrypt the data.

Provide *secretKeyBytes*, *secretKeyString*, or *secretKeyRingFile*. If you provide *secretKeyRingFile*, you must also provide *secretKeyAlias*. Otherwise, the service throws an exception.

Key	Description
<i>secretKeyBytes</i>	<p>byte[]. Optional. The secret key file in bytes.</p> <div style="background-color: #f0f0f0; padding: 5px; margin-top: 5px;"> <p>Note: Secret key files have a <code>.asc</code> extension.</p> </div>
<i>secretKeyString</i>	String. Optional. The secret key as a string.
<i>secretKeyRingFile</i>	String. Optional. The absolute or relative path of the secret keyring file. The secret keyring file is a collection of secret keys with a

unique key ID. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.

The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The `watt.server.homeDir` server configuration parameter also specifies the working directory.

Note:

Secret keyring files have a `.skr` extension.

secretKeyAlias **String**. Optional. The 64 bit (16 characters) key identifier of the secret key.

Note:

This parameter is required only when you use *secretKeyRingFile*.

secretKeyPassphrase **String**. Password required to extract the private key from the secret key. This is the password provided while generating the secret key.

publicKey **Document**. The public key required to verify the digital signature associated with the data.

Provide *publicKeyBytes*, *publicKeyString*, or *publicKeyRingFile*. If you provide *publicKeyRingFile*, you must also provide *publicKeyAlias*. Otherwise, the service throws an exception.

Key	Description
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<i>publicKeyBytes</i>	Object List . Optional. One or more public key files as byte arrays.
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Note:

Public key files have a `.asc` extension.

<i>publicKeyString</i>	String List . Optional. One or more public keys as strings.
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<i>publicKeyRingFile</i>	String . Optional. The absolute or relative path of the public keyring file. The public keyring file is a collection of public keys with a unique key ID. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.
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The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The `watt.server.homeDir` server configuration parameter also specifies the working directory.

Note:

Public keyring files have a `.pkr` extension.

publicKeyAlias **String List**. Optional. One or more public key aliases as strings. A public key alias is the 64-bit (16 characters) key identifier of a public key.

Note:

This parameter is required only when you use *publicKeyRingFile*.

Output Parameters

stream **java.io.OutputStream**. Conditional. Decrypted and verified data as an output stream. Returned when the *loadAs* input parameter is set to *stream*.

bytes **byte[]**. Conditional. Decrypted and verified data as bytes. Returned when the *loadAs* input parameter is set to *bytes*.

string **String**. Conditional. Decrypted and verified data as a string. Returned when the *loadAs* input parameter is set to *string*.

verified **Boolean**. Indicates whether the signature associated with the data is verified or not. A value of:

- `true` indicates that the signed data is verified.
- `false` indicates that the signed data is not verified.

status **String**. Indicates whether the data is successfully decrypted and verified. If successful, *status* is `success`. Otherwise, *status* contains `failure` along with an error message.

Usage Notes

Use the `pub.security:decryptAndVerify` service when an external system connected to Integration Server requires decrypted data with verified signature.

Prerequisites to use the `pub.security:decryptAndVerify` service:

- Generate a public-secret key pair for Integration Server.
- Make sure that the external system has access to Integration Server's public key.
- Make sure that Integration Server has access to external's system's public key.

Decryption and verification works as follows:

1. The external system sends the data encrypted with Integration Server's public key and signed with its secret key.

2. Integration Server receives the data and passes it to the `pub.security:decryptAndVerify` service.
3. The service uses the private key extracted from the secret key to decrypt the data.
4. The service then uses the external system's public key to verify the signature of the decrypted data.
5. The service returns the decrypted and verified data.

To decrypt and verify the data signed and encrypted for multiple users, you must provide your secret key and the users' public keys to the service. You can provide the public keys to the service as a list of byte arrays, strings, or a keyring file. If you provide a keyring file, you must also provide the public key aliases.

Integration Server is in FIPS mode, if the `watt.security.fips.mode` server configuration parameter is set to `true`.

Authentication keys used in this service must be in the PGP format and generated using the RSA encryption algorithm.

Note:

Authentication keys in the `.ecc` format are not supported.

pub.security:encrypt

WmPublic. Converts plain data to encrypted data.

Input Parameters

data **Document.** Data that you want to encrypt. The data must be in one of the following formats. If multiple input parameters are supplied for *data*, the service throws an exception stating that only one parameter must be passed.

Key	Description
<i>string</i>	String. Optional. The string that you want to encrypt.
<i>stream</i>	java.io.InputStream. Optional. The stream data that you want to encrypt.
<i>bytes</i>	byte[]. Optional. The byte array that you want to encrypt.
<i>file</i>	String. Optional. The absolute or relative path of the file that you want to encrypt. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.

The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working

directory. The `watt.server.homeDir` server configuration parameter also specifies the working directory.

<i>loadAs</i>	<p>String. Optional. The format in which the service returns the output. Set to:</p> <ul style="list-style-type: none"> ■ bytes to return the output as a byte array. This is the default. ■ stream to return the output as a stream object. ■ string to return the output as a string. 										
<i>publicKey</i>	<p>Document. The public key required to encrypt the data.</p> <p>Provide <i>publicKeyBytes</i>, <i>publicKeyString</i>, or <i>publicKeyRingFile</i>. If you provide <i>publicKeyRingFile</i>, you must also provide <i>publicKeyAlias</i>. Otherwise, the service throws an exception.</p> <table border="1"> <thead> <tr> <th style="text-align: left;">Key</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;"><i>publicKeyBytes</i></td> <td> <p>Object List. Optional. One or more public key files as byte arrays.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: Public key files have a <code>.asc</code> extension.</p> </div> </td> </tr> <tr> <td style="vertical-align: top;"><i>publicKeyString</i></td> <td> <p>String List. Optional. One or more public keys as strings.</p> </td> </tr> <tr> <td style="vertical-align: top;"><i>publicKeyRingFile</i></td> <td> <p>String. Optional. The absolute or relative path of the public keyring file. The public keyring file is a collection of public keys with a unique key ID. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.</p> <p>The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The <code>watt.server.homeDir</code> server configuration parameter also specifies the working directory.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: Public keyring files have a <code>.pkr</code> extension.</p> </div> </td> </tr> <tr> <td style="vertical-align: top;"><i>publicKeyAlias</i></td> <td> <p>String List. Optional. One or more public key aliases as strings. A public key alias is the 64-bit (16 characters) key identifier of a public key.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: This parameter is required only when you use <i>publicKeyRingFile</i>.</p> </div> </td> </tr> </tbody> </table>	Key	Description	<i>publicKeyBytes</i>	<p>Object List. Optional. One or more public key files as byte arrays.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: Public key files have a <code>.asc</code> extension.</p> </div>	<i>publicKeyString</i>	<p>String List. Optional. One or more public keys as strings.</p>	<i>publicKeyRingFile</i>	<p>String. Optional. The absolute or relative path of the public keyring file. The public keyring file is a collection of public keys with a unique key ID. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.</p> <p>The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The <code>watt.server.homeDir</code> server configuration parameter also specifies the working directory.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: Public keyring files have a <code>.pkr</code> extension.</p> </div>	<i>publicKeyAlias</i>	<p>String List. Optional. One or more public key aliases as strings. A public key alias is the 64-bit (16 characters) key identifier of a public key.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: This parameter is required only when you use <i>publicKeyRingFile</i>.</p> </div>
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<i>encryptionAlgorithm</i>	<p>String. The symmetric key encryption algorithm to use. Select one of the following:</p> <ul style="list-style-type: none"> ■ AES_192 ■ AES_256 										

- BLOWFISH
- IDEA
- TRIPLE_DES
- TWOFISH

The default value is AES_256.

Output Parameters

stream **java.io.OutputStream**. Conditional. Encrypted data as an output stream. Returned when the *loadAs* input parameter is set to *stream*.

bytes **byte[]**. Conditional. Encrypted data as bytes. Returned when the *loadAs* input parameter is set to *bytes*.

string **String**. Conditional. Encrypted data as a string in the ASCII-armored format. Returned when the *loadAs* input parameter is set to *string*.

status **String**. Indicates whether the data is successfully encrypted or not. If successful, *status* is *success*. Otherwise, *status* contains *failure* along with an error message.

Usage Notes

Before encrypted data is exchanged between Integration Server and an external system, the external system must share its public key. The service accepts multiple public keys to encrypt the same data for many users.

The public key is passed to the *pub.security:encrypt* service, which returns the encrypted data to Integration Server.

To encrypt the data for multiple users, provide the users' public keys to the service as a list of byte arrays, strings, or a keyring file. If you provide a keyring file, you must also provide the public key aliases.

The service supports a data file of size up to 2 GB when the memory allocated to Integration Server is 10 GB or more.

Authentication keys used in this service must be in the PGP format and generated using the RSA encryption algorithm.

Note:

Authentication keys in the .ecc format are not supported.

pub.security:generateHashValue

WmPublic. Returns the hashed value for a string input.

Input Parameters

<i>inputString</i>	String. The string that you want to convert to a hash value.
<i>hashAlgorithm</i>	String. Optional. The algorithm to generate the hash value. Select one of the following: <ul style="list-style-type: none">■ MD5■ SHA256■ SHA384■ SHA512 The default value is SHA256.
<i>saltValue</i>	byte[]. Optional. A random value that you can prefix to the input string before hashing.

Note:

To use a salt value in this service, run the `pub.security:generateSalt` service and map the generated salt value to this parameter.

Output Parameters

<i>hashedValue</i>	String. Hashed value of the input string.
<i>status</i>	String. Indicates whether the <i>inputString</i> is successfully hashed or not. If successful, <i>status</i> is <code>success</code> . Otherwise, <i>status</i> contains <code>failure</code> along with an error message.

Usage Notes

Use the `pub.security:generateHashValue` service to generate a hash value for any input string. For example, you can create a secure *hashedValue* for a user's password. Additionally, you can run the `pub.security:generateSalt` service to generate a salt value, which can be passed to the `pub.security:generateHashValue` service to generate a unique and stronger *hashedValue*, each time you run the `pub.security:generateHashValue` service.

pub.security:generateSalt

WmPublic. Creates a salt value.

Input Parameters

None.

Output Parameters

<i>saltValue</i>	byte[] . Salt value to be used for hashing purposes.
<i>status</i>	String . Indicates whether a salt value is generated or not. If successful, <i>status</i> is <i>success</i> . Otherwise, <i>status</i> contains <i>failure</i> along with an error message.

Usage Notes

Use the *saltValue* output of this service as input to the `pub.security:generateHashValue` service.

pub.security.ports:hostNamesSpec

WmPublic. Specification for a service that returns a list of IP addresses or hostnames in the CSV format.

Input Parameters

None.

Output Parameters

<i>hostNames</i>	String . Returns a list of IP addresses or hostnames in the CSV format, which can be allowed or denied IP access.
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Usage Notes

The service that returns a list of IP addresses or hostnames must use the specification as the service signature. For more information, see *webMethods Service Development Help*. Alternatively, you can manually replicate the specification in the service signature.

pub.security:setKeyAndChain

WmPublic. *Deprecated* - Replaced by [pub.security.keystore:setKeyAndChain](#).

Associates a key and certificate chain with the subsequent set of invoked services. Use this service to associate a key and certificate chain that is different from the default settings, and if your key and certificate information is located in files (rather than byte arrays).

Input Parameters

<i>privKeyFile</i>	String Absolute (for example, D:\certs\cert1.der) or relative path of the file containing the private key. A relative path is the path relative to the directory from which the Integration Server has been started (for example, <i>Integration Server_directory</i> \instances\ <i>instance_name</i> \config\certs\cert1.der).
<i>certFiles</i>	String List of file names containing the certificates that comprise the certificate chain. The list should start with the user's certificate followed by (in order) intermediate certificates and the root CA certificate. Absolute or relative paths of the files can be specified.

Output Parameters

None.

pub.security:setKeyAndChainFromBytes

WmPublic. Associates a key and certificate chain with the subsequent set of invoked services. Use this service to associate a key and certificate chain that is different from the default settings, and if your key and certificate information is located in byte arrays (rather than files).

Input Parameters

<i>privKey</i>	Object A byte array containing the client's private key.
<i>certs</i>	Object List List of byte arrays containing the client's certificate chain. The list should start with the user's certificate followed by (in sequence) intermediate certificates and the root CA certificate.

Output Parameters

None.

Usage Notes

To enable this service to work properly if you use the FTPS protocol, you must set the *secure* parameter to `True` in the [pub.client:http](#) and [pub.client:ftp:login](#) services.

You can use [pub.security:clearKeyAndChain](#) with [pub.security:setKeyAndChainFromBytes](#). See the Usage Notes for [pub.security:clearKeyAndChain](#) for more information about using the [pub.security:setKeyAndChainFromBytes](#) service.

pub.security:sign

WmPublic. Adds a digital signature to data.

Input Parameters

data **Document.** Data that you want to sign. The data must be in one of the following formats. If multiple input parameters are supplied for *data*, the service throws an exception stating that only one parameter must be passed.

Key	Description
<i>string</i>	String. Optional. The string that you want to sign.
<i>stream</i>	java.io.InputStream. Optional. The stream data that you want to sign.
<i>bytes</i>	byte[]. Optional. The byte array that you want to sign.
<i>file</i>	<p>String. Optional. The absolute or relative path of the file that you want to sign. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.</p> <p>The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The <code>watt.server.homeDir</code> server configuration parameter also specifies the working directory.</p>

loadAs **String.** Optional. The format in which the service returns the output. Set to:

- `bytes` to return the output as a byte array. This is the default.
- `stream` to return the output as a stream object.
- `string` to return the output as a string.

secretKey **Document.** The secret key required to sign the data.

Provide *secretKeyBytes*, *secretKeyString*, or *secretKeyRingFile*. If you provide *secretKeyRingFile*, you must also provide *secretKeyAlias*. Otherwise, the service throws an exception.

Key	Description
<i>secretKeyBytes</i>	<p>byte[]. Optional. The secret key file in bytes.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: Secret key files have a <code>.asc</code> extension.</p> </div>
<i>secretKeyString</i>	String. Optional. The secret key as a string.

secretKeyRingFile **String**. Optional. The absolute or relative path of the secret keyring file. The secret keyring file is a collection of secret keys with a unique key ID. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.

The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The `watt.server.homeDir` server configuration parameter also specifies the working directory.

Note:

Secret keyring files have a `.skr` extension.

secretKeyAlias **String**. Optional. The 64 bit (16 characters) key identifier of the secret key.

Note:

This parameter is required only when you use *secretKeyRingFile*.

secretKeyPassphrase **String**. Password required to extract the private key from the secret key. This is the password provided while generating the secret key.

signingAlgorithm **String**. The signing algorithm to use. Select one of the following:

- MD5
- SHA256
- SHA384
- SHA512

The default value is SHA256.

Note:

If the FIPS (Federal Information Processing Standards) mode is enabled, this service does not support the MD5 signing algorithm. FIPS mode can be enabled or disabled using the `watt.security.fips.mode` parameter.

Note:

If the secret key for signing the data is of the DSA (Digital Signature Algorithm) key type, this service does not support the MD5 signing algorithm.

Output Parameters

- stream* **java.io.OutputStream**. Conditional. Signed data as an output stream. Returned when the *loadAs* input parameter is set to *stream*.
- bytes* **byte[]**. Conditional. Signed data as bytes. Returned when the *loadAs* input parameter is set to *bytes*.
- string* **String**. Conditional. Signed data as a string in the ASCII-armored format. Returned when the *loadAs* input parameter is set to *string*.
- status* **String**. Indicates whether the data is successfully signed or not. If successful, *status* is *success*. Otherwise, *status* contains *failure* along with an error message.

Usage Notes

The `pub.security:sign` service does not support a detached signature.

If Integration Server runs in the FIPS mode, a secret key of the DSA (Digital Signature Algorithm) key type used for signing the data is not supported. Integration Server is in the FIPS mode, if the `watt.security.fips.mode` server configuration parameter is set to `true`.

Authentication keys used in this service must be in the PGP format and generated using the RSA encryption algorithm.

Note:

Authentication keys in the `.ecc` format are not supported.

pub.security:signAndEncrypt

WmPublic. Adds a digital signature to data and then encrypts the data.

Input Parameters

data **Document**. Data that you want to sign and encrypt. The data must be in one of the following formats. If multiple input parameters are supplied for *data*, the service throws an exception stating that only one parameter must be passed.

Key	Description
<i>string</i>	String . Optional. The string that you want to sign and encrypt.
<i>stream</i>	java.io.InputStream . Optional. The stream data that you want to sign and encrypt.
<i>bytes</i>	byte[] . Optional. The byte array that you want to sign and encrypt.

file **String.** Optional. The absolute or relative path of the file that you want to sign and encrypt. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.

The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The `watt.server.homeDir` server configuration parameter also specifies the working directory.

loadAs **String.** Optional. The format in which the service returns the output. Set to:

- bytes to return the output as a byte array. This is the default.
- stream to return the output as a stream object.
- string to return the output as a string.

publicKey **Document.** The public key required to encrypt the data.

Provide *publicKeyBytes*, *publicKeyString*, or *publicKeyRingFile*. If you provide *publicKeyRingFile*, you must also provide *publicKeyAlias*. Otherwise, the service throws an exception.

Key	Description
<i>publicKeyBytes</i>	<p>Object List. Optional. One or more public key files as byte arrays.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: Public key files have a <code>.asc</code> extension.</p> </div>
<i>publicKeyString</i>	<p>String List. Optional. One or more public keys as strings.</p>
<i>publicKeyRingFile</i>	<p>String. Optional. The absolute or relative path of the public keyring file. The public keyring file is a collection of public keys with a unique key ID. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.</p> <p>The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The <code>watt.server.homeDir</code> server configuration parameter also specifies the working directory.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: Public keyring files have a <code>.pkr</code> extension.</p> </div>

publicKeyAlias **String List.** Optional. One or more public key aliases as strings. A public key alias is the 64-bit (16 characters) key identifier of a public key.

Note:

This parameter is required only when you use *publicKeyRingFile*.

encryptionAlgorithm **String.** The symmetric key encryption algorithm to use. Select one of the following:

- AES_192
- AES_256
- BLOWFISH
- IDEA
- TWOFISH
- TRIPLE_DES

The default value is AES_256.

secretKey **Document.** The secret key required to sign the data.

Provide *secretKeyBytes*, *secretKeyString*, or *secretKeyRingFile*. If you provide *secretKeyRingFile*, you must also provide *secretKeyAlias*. Otherwise, the service throws an exception.

Key	Description
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<i>secretKeyBytes</i>	byte[] . Optional. The secret key file in bytes.
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Note:

Secret key files have a .asc extension.

<i>secretKeyString</i>	String. Optional. The secret key as a string.
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<i>secretKeyRingFile</i>	String. Optional. The absolute or relative path of the secret keyring file. The secret keyring file is a collection of secret keys with a unique key ID. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.
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The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The `watt.server.homeDir` server configuration parameter also specifies the working directory.

Note:

Secret keyring files have a `.skr` extension.

secretKeyAlias **String**. Optional. The 64 bit (16 characters) key identifier of the secret key.

Note:

This parameter is required only when you use *secretKeyRing File*.

secretKey Password **String**. Password required to extract the private key from the secret key. This is the password provided while generating the secret key.

signingAlgorithm **String**. The signing algorithm to use. Select one of the following:

- SHA256
- SHA384
- SHA512
- MD5

The default value is SHA256.

Note:

If the FIPS (Federal Information Processing Standards) mode is enabled, this service does not support the MD5 signing algorithm. FIPS mode can be enabled or disabled using the `watt.security.fips.mode` parameter.

Note:

If the secret key for signing the data is of the Digital Signature Algorithm (DSA) Key Type, this service does not support the MD5 signing algorithm.

Output Parameters

stream **java.io.OutputStream**. Conditional. Signed and encrypted data as an output stream. Returned when the *loadAs* input parameter is set to *stream*.

bytes **byte[]**. Conditional. Signed and encrypted data as bytes. Returned when the *loadAs* input parameter is set to *bytes*.

string **String**. Conditional. Signed and encrypted data as a string in the ASCII-armored format. Returned when the *loadAs* input parameter is set to *string*.

status **String**. Indicates whether the data is successfully signed and encrypted or not. If successful, *status* is `success`. Otherwise, *status* contains `failure` along with an error message.

Usage Notes

Use the `pub.security:signAndEncrypt` service when an external system connected to Integration Server requires signed and encrypted data. The service accepts multiple public keys to encrypt the same data for many users.

Prerequisites to use the `pub.security:signAndEncrypt` service:

- Make sure that Integration Server has access to the external system's public key to encrypt data.
- Generate a secret key for Integration Server to sign the data.

Signing and encryption works as follows:

1. The service uses the secret key to sign the data.
2. The service then uses the external system's public key to encrypt the data.
3. The service returns the signed and encrypted data.

Integration Server is in FIPS mode, if the `watt.security.fips.mode` server configuration parameter is set to `true`.

To sign and encrypt the data for multiple users, provide your secret key and the users' public keys to the service. You can provide the public keys to the service as a list of byte arrays, strings, or a keyring file. If you provide a keyring file, you must also provide the public key aliases.

Authentication keys used in this service must be in the PGP format and generated using the RSA encryption algorithm.

Note:

Authentication keys in the `.ecc` format are not supported.

`pub.security:userInfoSpec`

`WmPublic`. Specification for the signature of a `UserInfo` service that performs custom processing based on the personally identifiable information in the OpenID Connect `UserInfo` token returned from the OpenID Provider.

Input Parameters

userInfoClaims

Document Optional. A document (`IData`) containing the claims from the `UserInfo` token returned by the OpenID Provider's `UserInfo` Endpoint.

userInfoError

Document Optional. A document (`IData`) containing the error when the OpenID Provider returns an unsuccessful response.

Integration Server redirects the User Agent to the OpenID Provider's Authorization Endpoint to authenticate the End User. If the OpenID Provider responds to that redirection with an error, Integration Server will populate *error* with the error information.

<u>Key</u>	<u>Description</u>
<i>statusCode</i>	String Optional. The HTTP status code returned by the OpenID Provider's UserInfo Endpoint.
<i>errorType</i>	String The type of error returned by the OpenID Provider's UserInfo Endpoint. The possible values are defined in section 4.1.2.1 of the OAuth 2.0 specification.
<i>errorDescription</i>	String Optional. A description of the error returned by the OpenID Provider's UserInfo Endpoint.

Output Parameters

userInfoResponse

Document A document (IData) for the result of the UserInfo service.

<u>Key</u>	<u>Description</u>
<i>rejectRequest</i>	java.lang.Boolean Whether or not to reject the request. <ul style="list-style-type: none">■ If Integration Server runs in the FIPS mode, ensure to use FIPS-compliant keys.■ True instructs Integration Server to reject the request.<p>Integration Server does not access the requested resource in the original request from the User Agent. Processing of the request stops and a response is sent to the User Agent. Integration Server uses the contents of <i>rejectRequest</i>, <i>statusCode</i>, <i>statusCode</i> and <i>responseEntity</i> in the response.</p>■ False instructs Integration Server to accept the request.<p>Integration Server continues processing of the request by selecting an OpenID Provider User and setting the user for the</p>

current session. Integration Server sends the User Agent an HTTP 302 response with a session cookie, redirecting the User Agent back to the originally requested resource.

statusCode

java.lang.Integer Conditional. HTTP status code to be returned in the response sent to the User Agent.

statusCode is required when *rejectRequest* is set to false.

If *rejectRequest* is true, *statusCode* is not returned to the User Agent.

reasonPhrase

String Conditional. HTTP reason phrase to be included in the response sent to the User Agent.

reasonPhrase is optional when *rejectRequest* is set to false.

If *rejectRequest* is true, *reasonPhrase* is not returned to the User Agent.

responseHeaders

Document List Conditional. A document list (IData []) containing the header fields to set in the response sent to the User Agent.

responseHeaders is optional when *rejectRequest* is set to false.

If *rejectRequest* is true, *responseHeaders* is not returned to the User Agent.

<u>Key</u>	<u>Description</u>
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<i>fieldName</i>	String Name of the header field to set.
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<i>fieldValue</i>	String Value of the header field to set.
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responseEntity

String Conditional. Body of the response to be sent to the User Agent.

responseEntity is optional when *rejectRequest* is set to false.

If *rejectRequest* is true, *responseEntity* is not returned to the User Agent.

Usage Notes

A UserInfo service performs custom processing based on the personally identifiable information in the OpenID Connect UserInfo token returned from the OpenID Provider. The logic of the UserInfo service must determine whether to accept or reject the original resource request made by the User Agent.

The `pub.security:userInfoSpec` must be used as the signature for any service used as a UserInfo service. If the UserInfo service does not use the `pub.security:userInfoSpec` specification as the service signature, Integration Server ignores the results of the UserInfo service and continues to process the request as if the UserInfo service had not been invoked.

Integration Server can only reject a request using a UserInfo service if the UserInfo service is invoked synchronously. When registering the UserInfo service with the OpenID Provider, make sure to register the service as synchronous if you want to be able to reject a User Agent request based on the output of the UserInfo service.

Integration Server populates *userInfoClaims* or *error* depending on the response from the OpenID Provider's UserInfo Endpoint.

pub.security:verify

WmPublic. Verifies signed data.

Input Parameters

data **Document.** Signed data that you want to verify. The data must be in one of the following formats. If multiple input parameters are supplied for *data*, the service throws an exception stating that only one parameter must be passed.

Key	Description
<i>string</i>	String. Optional. The signed string that you want to verify.
<i>stream</i>	java.io.InputStream. Optional. The signed stream data that you want to verify.
<i>bytes</i>	byte[]. Optional. The signed byte array that you want to verify.
<i>file</i>	String. Optional. The absolute or relative path of the signed file that you want to verify. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.

The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The `watt.server.homeDir` server configuration parameter also specifies the working directory.

loadAs **String**. Optional. The format in which the service returns the output. Set to:

- bytes to return the output as a byte array. This is the default.
- stream to return the output as a stream object.
- string to return the output as a string.

publicKey **Document**. The signer's public key required to verify the signed data.

Provide *publicKeyBytes*, *publicKeyString*, or *publicKeyRingFile*. If you provide *publicKeyRingFile*, you must also provide *publicKeyAlias*. Otherwise, the service throws an exception.

Key	Description
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<i>publicKeyBytes</i>	Object List . Optional. One or more public key files as byte arrays.
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Note:
Public key files have a .asc extension.

<i>publicKeyString</i>	String List . Optional. One or more public keys as strings.
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<i>publicKeyRingFile</i>	String . Optional. The absolute or relative path of the public keyring file. The public keyring file is a collection of public keys with a unique key ID. If the file is outside the Integration Server or Microservices Runtime installation directory, provide the absolute path. Otherwise, place the file in your Integration Server or Microservices Runtime working directory.
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The About page in Integration Server Administrator and Microservices Runtime Administrator displays the working directory. The `watt.server.homeDir` server configuration parameter also specifies the working directory.

Note:
Public keyring files have a .pkr extension.

<i>publicKeyAlias</i>	String List . Optional. One or more public key aliases as strings. A public key alias is the 64-bit (16 characters) key identifier of a public key.
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Note:
This parameter is required only when you use *publicKeyRingFile*.

Output Parameters

stream **java.io.OutputStream**. Conditional. Verified data as an output stream. Returned when the *loadAs* input parameter is set to *stream*.

bytes **byte[]**. Conditional. Verified data in bytes. Returned when the *loadAs* input parameter is set to *bytes*.

string **String**. Conditional. Verified data as a string. Returned when the *loadAs* input parameter is set to *string*.

verified **Boolean**. Indicates whether the signature associated with the data is valid or not. A value of:

- `true` indicates that the signed data is verified.
- `false` indicates that the signed data is not verified.

status **String**. Indicates whether the data is successfully verified or not. If successful, *status* is `success`. Otherwise, *status* contains `failure` along with an error message.

Usage Notes

To verify signed data, Integration Server must have access to the signer's public key.

To verify the data for multiple users, provide the users' public keys to the service as a list of byte arrays, strings, or a keyring file. If you provide a keyring file, you must also provide the public key aliases.

The `pub.security.verify` service cannot verify a detached signature.

Authentication keys used in this service must be in the PGP format and generated using the RSA encryption algorithm.

Note:

Authentication keys in the `.ecc` format are not supported.

pub.security.enterpriseGateway:alertSpec

WmPublic. Specification for flow services used to send alerts about violations of webMethods Enterprise Gateway rules.

Use this specification as the signature of the flow service that Integration Server invokes when a request violates an Enterprise Gateway rule. For more information about webMethods Enterprise Gateway, see *webMethods Integration Server Administrator's Guide*.

Input Parameters

ruleName **String** The Enterprise Gateway rule that the request violates.

alertInfo **Document List** Information for Enterprise Gateway alert notification.

<u>Key</u>	<u>Description</u>
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<i>alertAction</i>	<p>String The action that the Integration Server functioning as the Enterprise Gateway Server takes when a request violates an Enterprise Gateway rule. The action will have one of these values:</p> <ul style="list-style-type: none"> ■ DENY if the server denies the request and issues alerts as configured. ■ ALERT if the server allows the request and issues alerts as configured.
<i>requestType</i>	<p>String The specific request type to which the server applies the Enterprise Gateway rule. The values are:</p> <ul style="list-style-type: none"> ■ ALL if the rule applies to all requests. ■ SOAP if the rule applies to SOAP requests only. ■ REST if the rule applies to REST requests only. ■ INVOKE if the rule applies to INVOKE requests only.
<i>filterName</i>	<p>String The filter that the request satisfies. The values are:</p> <ul style="list-style-type: none"> ■ <code>DoSFilter</code> if the request satisfies the Denial of Service settings specified for Enterprise Gateway rules. ■ <code>MsgSizeLimitFilter</code> if the request satisfies the Message Size Limit filter in the rule. ■ <code>OAuthFilter</code> if the request satisfies the OAuth filter in the rule. ■ <code>mobileAppProtectionFilter</code> if the request satisfies the Mobile Application Protection filter in the rule. ■ None if the request violates a rule that has no filters.
<i>message</i>	<p>String The details about the filter condition that the request satisfies.</p>
<i>requestUser</i>	<p>String The user ID that sent the request that violates the Enterprise Gateway rule. This field is empty if authentication is disabled on</p>

	Enterprise Gateway Server. For more information about authentication on Enterprise Gateway Server, see <i>webMethods Integration Server Administrator's Guide</i> .
<i>requestHost</i>	String The host name or IP address of the client that sent the request.
<i>requestTime</i>	String Date and time at which the request reached Enterprise Gateway Server. This parameter is in the format yyyy-MM-dd HH:mm:ss z, where z indicates the time zone.
<i>resourcePath</i>	String The path of the resource to be accessed by the request.
<i>serverHost</i>	String The host name or IP address of the Enterprise Gateway Server that received the client request.
<i>serverPort</i>	String The number of the Enterprise Gateway Server port that received the client request.

Output Parameters

None.

pub.security.enterpriseGateway:customFilterSpec

WmPublic. Specification for services that can be invoked by the custom filter in Enterprise Gateway rules.

Using the service that has the `pub.security.enterpriseGateway:customFilterSpec` specification as its signature, you can extract the HTTP headers and payload from a request and act on it as per your business requirements. Upon processing the headers, you can choose to forward the request to the Internal Server or deny the request and return an error message to the user. For more information about webMethods Enterprise Gateway, see *webMethods Integration Server Administrator's Guide*.

Input Parameters

<i>requestHeaders</i>	Document IData object containing the standard HTTP headers in the request along with any custom headers that are present in the request. The following are the standard headers that will be extracted from the request: User-Agent, Accept, Host, Authorization, Cookie, Content-Type, Accept-Language, and Content-Length.
<i>payload</i>	Object Object containing the payload in the request.

Output Parameters

forwardRequest

java.lang.Boolean Flag indicating whether Enterprise Gateway Server forwards the request to the Internal Server. A value of:

- True indicates that the request will be forwarded to the Internal Server.
- False indicates that the request will be denied and an error message is returned to the user.

pub.security.keystore.pkcs7:sign

WmPublic. Creates a PKCS7 signed Data object.

Input Parameters

signerInfo

Document List Information about a single signer of the signed data object. Each *signerInfo* requires either a certificate chain and a private key or a key alias that references them.

Key	Description
<i>keyStoreAlias</i>	String Name of the keystore alias.
<i>keyAlias</i>	String Alias of the private key.
<i>hashAlgorithm</i>	<p>String The algorithm to use when computing the digest of the provided data. Specify:</p> <ul style="list-style-type: none"> ■ MD5 (the default) ■ SHA-1 ■ SHA-256 ■ SHA-384 ■ SHA-512

data

byte[] Optional. Data in the form of a byte array to be digitally signed.

Note:

If both *data* and *dataAsStream* are provided, *dataAsStream* takes precedence.

dataAsStream

java.io.InputStream Optional. Data in the form of an input stream to be digitally signed.

Note:

If both *data* and *dataAsStream* are provided, *dataAsStream* takes precedence.

detachedSignature

String Flag specifying whether to generate a detached signature. A detached signature does not include the data that was signed. Set to:

- `true` to generate a detached signature.
- `false` to generate an implicit signature (one that includes the signed data). This is the default.

Output Parameters

signature

byte[] Conditional. Signature generated in the form of a byte array from the supplied data. This is a DER-encoded representation of the SignedData object as specified in PKCS#7. *signature* is returned when the input parameter *data* is provided.

signatureAsStream

`java.io.OutputStream` Conditional. Signature generated in the form of an output stream from the supplied data. *signatureAsStream* is returned when the input parameter *dataAsStream* is provided.

Usage Notes

This service supersedes [pub.security.pkcs7:sign](#), which is deprecated.

For information about using aliases for keystores, truststores, and private keys, see the section *Keystores and Truststores* in the [webMethods Integration Server Administrator's Guide](#).

pub.security.keystore:getCertificate

WmPublic. Returns the trusted certificate, stored in a truststore, that corresponds to the certificate's alias.

Input Parameters

trustStoreAlias

String Alias for the truststore containing the certificate.

certAlias

String Alias identifying a particular trusted certificate within a truststore.

Output Parameters

certificate

byte[] A byte array containing the trusted certificate.

Usage Notes

For information about using aliases for keystores, truststores, and private keys, see the section *Keystores and Truststores* in the *webMethods Integration Server Administrator's Guide* .

pub.security.keystore:getKeyAndChain

WmPublic. Returns a private key and its associated certificate chain from a designated keystore.

Input Parameters

<i>keyStoreAlias</i>	String Alias for the keystore that contains the private key of interest and its certificate.
<i>keyAlias</i>	String Alias for the private key stored in the specified keystore.

Output Parameters

<i>privateKey</i>	java.security.PrivateKey Object representing the private key.
<i>certChain</i>	byte[][] List of byte arrays representing the certificate chain associated with the private key.

Usage Notes

For information about using aliases for keystores, truststores, and private keys, see the section *Keystores and Truststores* in the *webMethods Integration Server Administrator's Guide* .

pub.security.keystore:getTrustedCertificates

WmPublic. Returns the trusted certificates located in a specified truststore.

Input Parameters

<i>trustStoreAlias</i>	String Name of the truststore alias.
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Output Parameters

<i>certificates</i>	byte[][] Trusted certificates, as a list of byte arrays.
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Usage Notes

For information about using aliases for keystores, truststores, and private keys, see the section *Keystores and Truststores* in the *webMethods Integration Server Administrator's Guide* .

pub.security.keystore:setKeyAndChain

WmPublic. Associates a key and certificate chain with the subsequent set of invoked services. Use this service to associate a key and certificate chain that is different from the default settings, and if your key and certificate information is stored in a keystore file.

Input Parameters

<i>keyStoreAlias</i>	String Name of the keystore alias.
<i>keyAlias</i>	String Alias of the private key located in the keystore.

Output Parameters

None.

Usage Notes

This service replaces [pub.security:setKeyAndChain](#), which is deprecated.

For information about using aliases for keystores, truststores, and private keys, see the section *Keystores and Truststores* in the *webMethods Integration Server Administrator's Guide* .

See Also

[pub.security:clearKeyAndChain](#)

pub.security.outboundPasswords:getPassword

WmPublic. Retrieves a password from the password store for a given key.

Input Parameters

<i>key</i>	String Key of the password entry to be retrieved.
<i>isInternal</i>	String "true" if this is an internal password; "false" if it is public. By default, this is "false". If you specify incorrectly whether the password is internal or public, the retrieve operation will fail. (For more information about internal and public passwords, see “Internal and Public Passwords” on page 754.)

Output Parameters

<i>value</i>	WmSecureString Value of the retrieved password.
<i>result</i>	String "true" if the password value was successfully retrieved; "false" otherwise.
<i>message</i>	String "successful" or reason for failure.

Usage Notes

This is the basic process a flow service should follow to retrieve an outbound password:

1. Call [pub.security.outboundPasswords:getPassword](#) with the key to the password to be retrieved.

If the key is unknown, you can call [pub.security.outboundPasswords:listKeys](#) to retrieve a list of keys currently in the outbound password store.

The [pub.security.outboundPasswords:getPassword](#) service returns a `WmSecureString` object containing the retrieved password.

2. Call [pub.security.util:convertSecureString](#) to convert the password to a usable format.

The password can then be passed to the authenticating mechanism of the secure resource.

3. When done accessing the secure resource, call [pub.security.util:destroySecureString](#) to remove the password from memory.

pub.security.outboundPasswords:listKeys

WmPublic. Lists the keys in the password store.

Input Parameters

<i>isInternal</i>	String "true" if you want keys for internal passwords; "false" if you want keys for public passwords. By default this is "false". (For more information about internal and public passwords, see “Internal and Public Passwords” on page 754.)
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Output Parameters

<i>key</i>	IData List of keys in the password store.
<i>result</i>	String "true" if the list of keys was successfully retrieved; "false" otherwise.

pub.security.outboundPasswords:setPassword

WmPublic. Stores a key and password in the password store.

Input Parameters

<i>key</i>	String Key to be associated with the password entry.
<i>value</i>	WmSecureString Password to be stored.
<i>isInternal</i>	String "true" if this should be saved as an internal password; "false" if it should be saved as a public password. Default is "false". (See “Internal and Public Passwords” on page 754 for more information.)

Output Parameters

<i>result</i>	String "true" if password was successfully stored; "false" otherwise.
<i>message</i>	String "successful" or reason for failure.

Usage Notes

This is the basic process a flow service should follow to store an outbound password:

1. Call [pub.security.util:createSecureString](#) to create a WmSecureString object containing the password to be stored.

For security reasons, the flow service should be run manually requiring an authorized person to type the password to be stored. This will eliminate the need to save the password on disk in an unencrypted format.

2. Call [pub.security.outboundPasswords:setPassword](#) to save the password in encrypted form in the outbound password store.

The [pub.security.outboundPasswords:setPassword](#) service requires a key to be supplied which is basically a key to the password. This key must be saved in some way; any flow service wishing to use the password to access a secure resource will need to supply the key to retrieve the password from the outbound password store.

3. Once the password is successfully stored, call [pub.security.util:destroySecureString](#) to remove the password from memory.

Internal and Public Passwords

Internal passwords are passwords for use by the Integration Server itself to access secure resources (e.g., remote Integration Servers, JDBC connection pools, LDAP servers, etc.). Internal passwords are managed using the Integration Server Administrator and are stored in the outbound password store. Flow services are also allowed to store passwords in the outbound password store. However,

by default, passwords stored by a flow service are considered "public," as opposed to internal. This distinction allows flow services to use the outbound password store as a secure mechanism for storing and retrieving passwords, but protects the Integration Server's internal passwords.

When calling any of the `pub.security.outboundPasswords` services (i.e. `setPassword`, `getPassword`, `listKeys`, `removePassword`, and `updatePassword`) the `isInternal` input parameter indicates whether the service is working with internal or public passwords. Note that even if this parameter is set to "true", you cannot access internal passwords if the Integration Server is configured to deny access to internal passwords. Access to internal passwords is controlled by the `watt.security.ope.AllowInternalPasswordAccess` configuration parameter on the Integration Server; for more information see *webMethods Integration Server Administrator's Guide*.

pub.security.outboundPasswords:removePassword

WmPublic. Removes a password from the password store for a given key.

Input Parameters

<i>key</i>	String Key of the password to be removed.
<i>isInternal</i>	String "true" if this is an internal password; "false" if it is public. By default, this is "false". If you specify incorrectly whether the password is internal or public, the remove operation will fail. (For more information about internal and public passwords, see "Internal and Public Passwords" on page 754.)

Output Parameters

<i>result</i>	String "true" if the password was successfully removed; "false" otherwise.
<i>message</i>	String "successful" or reason for failure.

pub.security.outboundPasswords:updatePassword

WmPublic. Changes the password value for a key already in the password store.

Input Parameters

<i>key</i>	String Key of the password to be updated.
<i>newPassword</i>	WmSecureString New password value for the key.
<i>isInternal</i>	String "true" if this is an internal password; "false" if it is public. By default, this is "false". If you specify incorrectly whether the password is internal or public, the update operation will fail. (For more information

about internal and public passwords, see “[Internal and Public Passwords](#)” on page 754.)

Output Parameters

<i>result</i>	String "true" if the password value was successfully changed; "false" otherwise.
<i>message</i>	String "successful" or reason for failure.

pub.security.pkcs7:sign

WmPublic. *Deprecated* - Replaced by [pub.security.keystore.pkcs7:sign](#).

Creates a PKCS7 SignedData object.

This service enables multiple entities to sign the specified data. Each *signerInfo* block contained in the resulting signature contains two authenticated attributes: the content type and a timestamp.

Input Parameters

signerInfo **Document List** Information about a single signer of the signed data object. Each *signerInfo* requires either a certificate chain and a private key or a key alias that references them.

<u>Key</u>	<u>Description</u>
<i>certChain</i>	java.security.cert.X509Certificate[] or byte[][] Certificate chain of the signer. The subject that is performing the signature should be the first certificate in this chain, while the root Certifying Authority should be the last. The key provided should correspond to the public key contained in the first certificate of the chain.
<i>key</i>	java.security.PrivateKey or byte[] Private key that will be used to digitally sign the data. The private key can be any asymmetric encryption key that is supported by the webMethods Integration Server (for example, DSA or RSA).
<i>keyAlias</i>	String Alias of the certificate chain and private key in the key store. This key is not currently used.

<i>hashAlgorithm</i>	String The algorithm to use when computing the digest of the provided data (SHA-1 or MD5). The default value is MD5.
<i>data</i>	byte[] Data to be digitally signed.
<i>detachedSignature</i>	<p>String Flag specifying whether to generate a detached signature. A detached signature does not include the data that was signed. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to generate a detached signature. ■ <code>false</code> to generate an implicit signature (one that includes the signed data). This is the default.

Output Parameters

<i>signature</i>	byte[] Signature generated from the supplied data. This is a DER-encoded representation of the SignedData object as specified in PKCS#7.
------------------	---

Usage Notes

This service is superseded by [pub.security.keystore.pkcs7:sign](#).

pub.security.pkcs7:verify

WmPublic. Processes a digital signature to guarantee that the data associated with the signature has not been modified.

Input Parameters

<i>signature</i>	<p>byte[] Optional. Signature to use to determine whether the signed data is intact (a DER-encoded representation of the SignedData object as specified in PKCS#7) where the signature is in the form of a byte array. If you are processing a detached signature, pass the signature in <i>signature</i>. If you are processing an implicit signature, pass the entire signed message in <i>signature</i>.</p>
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Note:

If both *signature* and *signatureAsStream* are provided, *signatureAsStream* takes precedence.

<i>signatureAsStream</i>	<p>java.io.InputStream Optional. Signature to use to determine whether the signed data is intact where the signature is in the form of an input stream.</p>
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Note:

If both *signature* and *signatureAsStream* are provided, *signatureAsStream* takes precedence.

data

byte[] Optional. Data in the form of a byte array that was signed. If you are processing a detached signature, you must supply *data*. If you are only processing an implicitly signed data as a byte array, you do not need to supply *data* because both the data and the signature reside in *signature*. If you are processing a detached signature and an implicitly signed data as a byte array, you must supply *data*.

Note:

If both *data* and *dataAsStream* are provided, *dataAsStream* takes precedence.

dataAsStream

java.io.InputStream Optional. Data in the form of an input stream that was signed. If you are processing a detached signature, you must supply *dataAsStream*. If you are only processing an implicitly signed data as an input stream, you do not need to supply *dataAsStream* because both the data and the signature reside in *signatureAsStream*. If you are processing a detached signature and an implicitly signed data as an input stream, you must supply *dataAsStream*.

Note:

If both *data* and *dataAsStream* are provided, *dataAsStream* takes precedence.

detachedSignature

String Optional. Flag indicating whether the message has a detached signature. Set to:

- `true` when the message has a detached signature.
- `false` when the message has an implicit signature. This is the default.

Note:

- If *detachedSignature* is `true` and *signature* is provided, then *data* should be provided.
- If *detachedSignature* is `true` and *signatureAsStream* is provided, then *dataAsStream* should be provided.

signerCertChain

byte[][] Optional. Certificate chains of the parties that signed the message.

Note:

If the signers included the certificate chain with the digital signature, you do not need to supply *signerCertChain*.

Output Parameters

content **byte[]** Conditional. The data (for example, the document that was originally signed) extracted in the form of a byte array from an implicit signature. If you are verifying a detached signature, *content* is not returned.

Note:

The extracted data is returned in *content* even if signature verification fails.

content is returned when the input parameter *data* is provided.

contentAsStream **java.io.OutputStream** Conditional. The data extracted in the form of an output stream from an implicit signature. *contentAsStream* is returned when the input parameter *dataAsStream* is provided.

signerInfo **Document List** Information about the signers. Each document in the list provides the following information about a single signer:

Key	Description
<i>certChain</i>	java.security.cert.X509Certificate[] Certificate chain of the signer. The chain will appear in hierarchical order, starting with the signer's X.509 certificate in element 0.
<i>timeStamp</i>	java.util.Date Time at which the signer signed the data.
<i>trusted</i>	String Flag indicating whether the certificate chain presented by the signer is trusted. A value of: <ul style="list-style-type: none"> ■ true indicates that the chain is trusted. ■ false indicates that the chain is not trusted.
<i>status</i>	String Flag indicating whether the signatures were successfully verified. If successful, <i>status</i> contains <code>verified</code> . If the signatures were not successfully verified, <i>status</i> contains an error message.

pub.security.util:convertSecureString

WmPublic. Returns a WmSecureString in Java String, byte array, or character array format.

Input Parameters

<i>secureString</i>	WmSecureString WmSecureString to be converted.
<i>returnAs</i>	String Format into which the WmSecureString is to be converted. Valid options are byte[], char[], and Java String. If a value for this parameter is not specified, the default is to convert the WmSecureString to a String.

Output Parameters

<i>string</i>	String The WmSecureString converted to a Java String.
<i>bytes</i>	byte[] The WmSecureString converted to a native Java byte array.
<i>chars</i>	char[] The WmSecureString converted to a native Java character array.

pub.security.util:createMessageDigest

WmPublic. Generates a message digest for a given message.

Input Parameters

<i>algorithm</i>	String Name of the algorithm that you want to use to compute the message digest. Must be one of the following: MD5, SHA-1, SHA-256, SHA-384, or SHA-512.
<i>input</i>	byte[] Optional. Message for which you want the digest generated where the message is in the form of a byte array.

Note:

If both *input* and *inputAsStream* are provided, *inputAsStream* takes precedence.

<i>inputAsStream</i>	java.io.InputStream Optional. Message for which you want to generate a message digest where the message is in the form of an input stream.
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Note:

If both *input* and *inputAsStream* are provided, *inputAsStream* takes precedence.

Output Parameters

<i>output</i>	byte[] Conditional. Computed digest in the form of a byte array. <i>output</i> is returned when the input parameter <i>input</i> is provided.
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outputAsStream **OutputStream Conditional.** Computed digest in the form of an output stream. *outputAsStream* is returned when the input parameter *inputAsStream* is provided.

pub.security.util:createSecureString

WmPublic. Creates a WmSecureString object from either a Java String, byte array, or character array.

WmSecureString is a mutable alternative to Java String. It allows the characters in the string to be explicitly removed from memory. Any password you wish to store in the Integration Server's outbound password store must be converted to a WmSecureString.

Input Parameters

string **String** Java String to be made into a WmSecureString.

bytes **byte[]** Byte array to be made into a WmSecureString.

chars **char[]** Character array to be made into a WmSecureString.

encoding **String** If a byte array is supplied as an input parameter, *encoding* specifies the Java encoding of the byte array. This may be any encoding supported by Java String. By default, if no encoding is specified, then the default JVM encoding is used.

Output Parameters

secureString **WmSecureString** WmSecureString created from the supplied input parameters.

Usage Notes

Only one of the input parameters (i.e. *string*, *bytes*, or *chars*) may be specified. If more than one is specified, an exception will be thrown. An exception is also thrown if none of these is specified.

pub.security.util:destroySecureString

WmPublic. Destroys a WmSecureString such that it no longer resides in memory and is removed from the pipeline.

Input Parameters

secureString **WmSecureString** WmSecureString to be destroyed.

Output Parameters

None.

pub.security.util:getCertificateInfo

WmPublic. Retrieves information such as serial number, issuer, and expiration date from a digital certificate.

Input Parameters

certificate **byte[] java.security.cert.X509Certificate** The certificate whose information you want to retrieve.

dateFormat **String** Optional. The date format to use for the date returned by the *notBefore* and *notAfter* fields in the *validity* output parameter. The value of *dateFormat* must be a pattern used by `java.text.SimpleDateFormat`, for example: `MM/dd/yyyy`

By default, the `pub.security.util:getCertificateInfo` service uses a preset date format that returns only the last two digits of the certificate expiration year. This can lead to ambiguity as a certificate that expires in 2109 returns an expiration year of 09, which some systems might treat as 2009.

Output Parameters

info **Document** Information from the certificate.

<u>Key</u>	<u>Description</u>
<i>version</i>	java.lang.Number X509 certificate version number.
<i>serialNumber</i>	String Serial number of the certificate.
<i>signature</i>	String Signature algorithm used by the issuer to sign this certificate.
<i>issuer</i>	Document Detailed information about the CA that signed the certificate, such as name, location, and e-mail address.
<i>validity</i>	Document The time period over which the certificate is valid.
<u>Key</u>	<u>Description</u>

	<i>notBefore</i>	String First date on which this certificate is valid (for example, 3/15/00 3:36PM).
	<i>notAfter</i>	String Last date on which this certificate is valid (for example, 3/15/00 3:36PM).
	<i>subject</i>	Document Detailed information about the owner of the certificate, such as name, location, and mail address.
	<i>subjectPublicKey Algorithm</i>	String Encryption algorithm with which the certificate's key is designed to be used (for example, RSA or DSA).

pub.security.util:loadPKCS7CertChain

WmPublic. Converts a certificate chain that is in PKCS #7 format to a list of byte arrays.

Input Parameters

certificateChain **byte[]** The certificate chain in PKCS #7 format.

Output Parameters

certificates **byte[][]** List of byte arrays in which each **byte[]** in the list contains a certificate from *certificateChain*.

pub.security.xml:decryptXML

WmPublic. Decrypts the encrypted XML, and returns the XML as either a string or stream object.

Input Parameters

xmldata **String** Optional. Encrypted XML that needs to be decrypted as plain text.

xmlStream **InputStream** Optional. Encrypted XML in the form of an input stream.

Note:

If both *xmlData* and *xmlStream* are provided, *xmlStream* takes precedence; Integration Server uses the *xmlStream* value and returns only *decryptedXMLStream*.

<i>keyStoreAlias</i>	String Optional. Alias of the keystore that contains the private key used for decryption.
<i>keyAlias</i>	String Optional. Alias of the private key, contained in the keystore specified by the <i>keyStoreAlias</i> parameter, that is used for decryption.
<i>encoding</i>	String Optional. Specifies the encoding to use if the encoding cannot be extracted from the XML. If encoding is not specified in the XML document or in the <i>encoding</i> parameter, Integration Server uses UTF-8. The <i>encoding</i> value must be a valid IANA encoding.

Output Parameters

<i>decryptedXMLData</i>	String Conditional. Decrypted XML data. <i>decryptedXMLData</i> is returned when the input parameter <i>xmlData</i> is provided.
<i>decryptedXMLStream</i>	Object Conditional. A decrypted XML OutputStream object. <i>decryptedXMLStream</i> is returned when the input parameter <i>xmlStream</i> is provided.

Usage Notes

There are several prerequisites to using `pub.security.xml:decryptXML`:

- Certificates must be configured for Integration Server and the client with which it is exchanging secure XML.
- The sending, encrypting client must have access to Integration Server's public key before the document exchange can occur.
- Integration Server stores its certificates in keystores and truststores. You must configure a keystore and truststore for Integration Server before using the XML encryption services.

You access the public and private keys for Integration Server through aliases. For information about Integration Server keystores and truststores, refer to *webMethods Integration Server Administrator's Guide*.

The `pub.security.xml:decryptXML` service works as follows:

1. The external system sends the XML document encrypted with the Integration Server's public key.
2. Integration Server receives the document and passes it to the XML service.
3. Integration Server uses the private key member of the key pair to decrypt the XML.

4. The decrypted XML is returned from the service.

If both *xmlData* and *xmlStream* are provided, *xmlStream* takes precedence; Integration Server uses the *xmlStream* value and returns only *decryptedXMLStream*.

keyAlias and *keyStoreAlias* should either both be provided or both be absent from the input. If no value is provided for these parameters, Integration Server uses the private key/certificate specified for the Decryption Key. If no value is specified for Decryption Key, Integration Server uses the SSL Key.

For information about configuring the Decryption Key and SSL Key keystore aliases, refer to *webMethods Integration Server Administrator's Guide*.

pub.security.xml:encryptXML

WmPublic. Encrypt an XML document or node in an XML document.

Input Parameters

<i>xmlData</i>	String Optional. The XML to be encrypted.
<i>xmlStream</i>	InputStream Optional. Input stream to the XML that needs to be encrypted.
	Note: If both <i>xmlData</i> and <i>xmlStream</i> are provided, <i>xmlStream</i> takes precedence.
<i>nodeSelectors</i>	String List XPath(s) to the node to be encrypted. If the value for this parameter is left empty, no XML will be encrypted.
<i>nsDecls</i>	Document Optional. Mapping of the namespace prefixes to the namespace URIs. The first column contains the prefixes and the second column contains the corresponding URIs.
<i>recipientID</i>	String Optional. Name of the client to which the XML will be sent. The user name and certificate must be configured with Integration Server certificate mapping. The client name entry is mapped to a valid X.509 certificate, and both are stored in Integration Server. For information about Integration Server certificate mapping, see <i>webMethods Integration Server Administrator's Guide</i> .
<i>recipientCert</i>	Byte[] Optional. The certificate containing the public key that will be used to encrypt the XML. If the input parameters <i>recipientCert</i> and <i>recipientID</i> are both provided, <i>recipientCert</i> is used.
<i>contentOnly</i>	Boolean Optional. Indicates whether the XML tags surrounding the content will be encrypted along with the content. Set to: <ul style="list-style-type: none"> ■ <code>true</code> to encrypt only the content.

<i>algorithm</i>	<ul style="list-style-type: none"> ■ <code>false</code> to encrypt both the tags and the content. This is the default. <p>String Optional. The symmetric key algorithm to use for encryption. Set to:</p> <ul style="list-style-type: none"> ■ <code>tripledes-cbc</code> for the algorithm at http://www.w3.org/2001/04/xmlenc#tripledes-cbc This is the default. ■ <code>aes256-cbc</code> for the algorithm at http://www.w3.org/2001/04/xmlenc#aes256-cbc ■ <code>aes192-cbc</code> for the algorithm at http://www.w3.org/2001/04/xmlenc#aes192-cbc ■ <code>aes128-cbc</code> for the algorithm at http://www.w3.org/2001/04/xmlenc#aes128-cbc <div style="background-color: #f0f0f0; padding: 5px; margin-top: 10px;"> <p>Note: If you are using <code>aes256-cbc</code> or <code>aes192-cbc</code> with JVM 1.6, make sure the unlimited policy jar files have been installed.</p> </div>
<i>encryptedKeyAlgorithm</i>	<p>String Optional. The symmetric key that is randomly generated, and then encrypted with the receiver's public key. This encryption uses an asymmetric algorithm if public/private key pairs are being used. Set to:</p> <ul style="list-style-type: none"> ■ <code>rsa-1_5</code> for the algorithm at http://www.w3.org/2001/04/xmlenc#rsa-1_5 This is the default. ■ <code>rsa-oaep-mgf1p</code> for the algorithm at http://www.w3.org/2001/04/xmlenc#rsa-oaep-mgf1p
<i>encoding</i>	<p>String Optional. Specifies the encoding to use if the encoding cannot be extracted from the XML. If encoding is not specified in the XML document or in the <i>encoding</i> parameter, Integration Server uses UTF-8.</p> <p>The <i>encoding</i> value must be a valid IANA encoding.</p>

Output Parameters

<i>encryptedXMLData</i>	String Conditional. Encrypted XML data. <i>encryptedXMLData</i> is returned when the input parameter <i>xmlData</i> is provided.
<i>encryptedXMLStream</i>	OutputStream Conditional. Encrypted XML in the form of an OutputStream. <i>encryptedXMLStream</i> is returned when the input parameter <i>xmlStream</i> is provided.

Usage Notes

If both *xmlData* and *xmlStream* are provided, *xmlStream* takes precedence.

There are several prerequisites to using the `pub.security.xml:encryptXML` service:

- Certificates must be configured for Integration Server and the client with which it is exchanging encrypted XML.
- Before an encrypted XML document can be exchanged between Integration Server and an external system, the external system must share its public key.
- Prior to use of `pub.security.xml:encryptXML`, Integration Server must have access to the partner's public key. Such access is possible through:
 - An Integration Server certificate mapping (for information, refer to *webMethods Integration Server Administrator's Guide*).
 - A copy of the partner's X.509 certificate that is available to Integration Server.

In `pub.security.xml:encryptXML`, the certificate/public key is specified through one of the following input parameters: the client's name (through *recipientID*), or the public key of the partner application (through *recipientCert*).

Because encryption is a processing-intensive activity, it is recommended to only encrypt the XML nodes requiring protection.

Signing and Encrypting the Same XML Document

You can use both encryption and signing in the same XML document.

- If you sign and encrypt *different* XML elements in a document, you can run either `pub.security.xml:signXML` or `pub.security.xml:encryptXML` first.
- Typically, if you sign and encrypt the *same* XML elements in a document, you should sign the elements before encrypting them. That is, invoke `pub.security.xml:signXML` before invoking `pub.security.xml:encryptXML`.

pub.security.xml:signXML

WmPublic. Digitally sign an outgoing XML node or document.

Input Parameters

xmlData

String Optional. XML that needs to be signed.

xmlStream

InputStream Optional. Input stream containing the XML that needs to be signed.

Note:

If both *xmlData* and *xmlStream* are provided, *xmlStream* takes precedence.

uri

String Optional. URI to the element to be signed.

In combination with the *nodeSelectors* parameter, the *uri* identifies the nodes to be signed.

noNamespace SchemaLocation

String Optional. A URI that identifies the location of the XML schema definition that contains the ID attribute specified in *uri*.

Provide a *noNamespaceSchemaLocation* when specifying an ID attribute for *uri* and the ID attribute resides in an XML schema with no namespaces.

schemaLocations

Document Optional. Document (IData) containing name-value pairs for the XML namespace and the location of the XML schema definition that contains element declarations, attribute declarations, and type definitions for that namespace.

Provide a *schemaLocation* when specifying an ID attribute for *uri* and the ID attribute resides in an XML schema for a particular namespace.

For example,

- XML namespace = `http://www.w3schools.com`
- XML schema definition location = `file:C:/note.xsd`

nodeSelectors

String List XPath notation that identifies the nodes to be signed. The locations of the XPaths are not absolute, but relative, and work within the context of the node (an XPath Axes).

Important:

Do *not* use absolute location XPaths here.

nsDecls

Document Optional. Mapping of the namespace prefixes to the namespace URIs. The first column contains the prefixes and the second column contains the corresponding URIs.

isEnveloped

String Optional. Indicates whether the signature is enveloped or enveloping. Set to:

- `True` to indicate that the generated signature will be enveloped. This is the default.
- `False` to indicate that the generated signature will be enveloping, provided the *isDetached* parameter is set to `False`.

<i>isDetached</i>	<p>Unlike the detached signature, which is kept apart from the original document, enveloping and enveloped signatures are tightly coupled with the original document.</p> <p>String Optional. Indicates whether the signature is detached or not.</p> <p>Integration Server uses <detached-signature> as the container for signature and the XML to be signed.</p> <p>Set to:</p> <ul style="list-style-type: none"> ■ True to indicate that the generated signature will be detached. ■ False to indicate that the generated signature will be enveloping or enveloped, based on the <i>isEnveloped</i> parameter setting. This is the default.
<i>signatureNodeSelector</i>	<p>String Optional. XPath to the node where the signature is entered. Applicable only for enveloped signatures. If no value is provided, the signature is placed as a first child of the root node.</p>
<i>signatureAlgorithm</i>	<p>String Optional. Signature algorithm to use when signing the XML node or document. Specify one of the following or use the default value (first algorithm):</p> <ul style="list-style-type: none"> ■ SHA1 (default) ■ SHA256 ■ SHA384 ■ SHA512
<i>digestAlgorithm</i>	<p>String Optional. Digest algorithm to use when signing the XML node or document. Specify one of the following or use the default value (first algorithm):</p> <ul style="list-style-type: none"> ■ SHA1 (default) ■ SHA256 ■ SHA384

Note:

- Setting *isDetached* to True and *isEnveloped* to False, indicates that the signature will be detached.
- Setting *isDetached* to False and *isEnveloped* to True, indicates that the signature will be enveloped.
- Setting *isDetached* to False and *isEnveloped* to False, indicates that the signature will be enveloping.
- Setting *isDetached* to True and *isEnveloped* to True, results in error.

<i>canonicalizationAlgorithm</i>	<ul style="list-style-type: none">■ SHA512 <p>String Optional. Canonical algorithm used with the XML. Specify one of the following or use the default value (first algorithm):</p> <ul style="list-style-type: none">■ http://www.w3.org/TR/2001/rec-xml-c14n-20010315 (default)■ http://www.w3.org/TR/2001/rec-xml-c14n-20010315#WithComments■ http://www.w3.org/2001/10/xml-exc-c14n#■ http://www.w3.org/2001/10/xml-exc-c14n#WithComments
<i>signatureId</i>	<p>String Optional. ID attribute for the signature node.</p>
<i>keyStoreAlias</i>	<p>String Optional. Name (alias) of the keystore that contains the private key/certificate.</p>
<i>keyAlias</i>	<p>String Optional. Name (alias) of the private key, contained in the keystore specified by the <i>keyStoreAlias</i> parameter, that is used for signing.</p>
<i>keyName</i>	<p>String Optional. Name that is used by the signer to communicate a key identifier to the recipient.</p>
<i>includeKeyValue</i>	<p>String Optional. Indicates whether to include the key value (RSAKeyValue or DSAKeyValue), based on the certificate used for signing. The KeyValue element contains a single public key that can be used in validating the signature.</p> <p>Set to:</p> <ul style="list-style-type: none">■ True to include the key value (RSAKeyValue or DSAKeyValue) based on the certificate used for signing.■ False to exclude the key value from the signature.
<i>includeCertChain</i>	<p>String Optional. Indicates whether the certificate chain should be included in the signature. Set to:</p> <ul style="list-style-type: none">■ True to include the certificate chain in the signature.■ False to leave the certificate chain out of the signature. This is the default.
<i>certData</i>	<p>String List Optional. Select the X509 certificate data to be entered into the signature's key information.</p> <ul style="list-style-type: none">■ X509_CERTIFICATE (default)■ X509_SUBJECT_NAME■ X509_ISSUER_SERIAL■ X509_SKI

	<ul style="list-style-type: none"> ■ X509_CRL <p>Note that the initials "SKI" and "CRL" in denote "Subject Key Identifier" and Certificate Revocation List".</p>
<i>idXmlObject</i>	<p>String Optional. Specifies the ID for the node that holds the original XML that is signed. Applicable only for enveloping signatures.</p>
<i>encoding</i>	<p>String Optional. Specifies the encoding to use if the encoding cannot be extracted from the XML. If encoding is not specified in the XML document or in the <i>encoding</i> parameter, Integration Server uses UTF-8.</p> <p>The <i>encoding</i> value must be a valid IANA encoding.</p>
<i>addSignatureAsLastElement</i>	<p>Boolean Optional. When <i>isEnveloped</i> is set to <code>True</code>, this parameter indicates the position at which Integration Server should add the signature element child to the root.</p> <p>Set to:</p> <ul style="list-style-type: none"> ■ <code>True</code> to add the signature element as the last child of the root. ■ <code>False</code> to add the signature element as the first child of the root. This is the default.
<i>addDSPrefixToSignature</i>	<p>Boolean. Optional. Set to <code>False</code> to create a <i>Signature</i> element in the signed XML without any prefixes. By default, this input variable is set to <code>True</code> and the "ds:" prefix is added.</p>

Output Parameters

<i>signedXMLData</i>	<p>String Conditional. Signed XML data. <i>signedXMLData</i> is returned when <i>xmlData</i> is provided.</p>
<i>signedXMLStream</i>	<p>OutputStream Conditional. Signed XML in the form of an <code>OutputStream</code>. <i>signedXMLStream</i> is returned when <i>xmlStream</i> is provided.</p>

Usage Notes

Before the signing/signature verification of XML can occur between Integration Server and an external system, the Integration Server *must* share the public key that corresponds to the private key with which the document is signed. Integration Server must share the public key with the external system that will be performing verification.

keyAlias and *keyStoreAlias* should either both be provided or both be absent from the input. If no value is provided for these parameters, Integration Server uses the private key/certificate specified for the Signing Key. If the Signing Key is not specified, Integration Server uses the SSL Key.

For information about configuring the Signing Key and SSL Key keystore aliases using the **Security > Certificates** page in Integration Server Administrator, refer to *webMethods Integration Server Administrator's Guide*.

If both *xmlData* and *xmlStream* are provided, *xmlStream* takes precedence.

The *uri* and *nodeSelectors* parameters identify the nodes to be signed.

If *uri* is specified and *nodeSelectors* is not specified, Integration Server signs the entire node identified by *uri*.

If *uri* and *nodeSelectors* are specified, Integration Server determines which nodes to sign by locating the node specified by the *uri* and then applying the filter from *nodeSelectors*.

If *uri* is not specified and *nodeSelectors* is specified, Integration Server determines which nodes to sign by applying the filter in *nodeSelectors* to the entire XML.

If neither *uri* nor *nodeSelectors* are specified, Integration Server signs the entire XML.

You can use the value of an ID attribute as the *uri*.

For example, `#sampleID`

Where `sampleID` is an ID attribute that functions as a unique identifier for an element in an XML schema definition. In this example, Integration Server will locate the node with the ID attribute "sampleID" and then apply the filter specified by *nodeSelectors* to determine which nodes to sign.

Signature Types

As opposed to a detached signature, which is kept apart from the original document, enveloping and enveloped signatures are tightly coupled with the original document.

An *enveloping* signature must be a parent node of the data being signed:

```
<!-- Example of Enveloping Signature --> <Signature>  
<my_document>. . . </my_document> </Signature>
```

The following input parameters and values are applicable only to enveloping signatures:

- *isEnveloped*. Specify a value of "false" for enveloping. If *isEnveloped* is set to false, then:
 - If both *uri* and *idXmlObject* are null, Integration Server creates a dynamic unique value for both *uri* and *idXmlObject* and signs the XML.
 - If *idXmlObject* is provided and *uri* is null, Integration Server creates a *uri* with a value of `#idXmlObject_value` and signs the XML.
 - If both *uri* and *idXmlObject* are provided and match the XML contract (for example, `uri='#idXmlObject'`), Integration Server signs the XML. If the *uri* and *idXmlObject* parameters do not match the contract, Integration Server issues an exception.
- *idXmlObject*. Specifies the ID for the node that holds the original, signed XML.

An *enveloped* signature must be a child node of the data being signed:

```
<!-- Example of Enveloped Signature --> <my_document>
<Signature> . . . </Signature> </my_document>
```

The following parameters and values are applicable only to enveloped signatures:

- *isEnveloped*. The default value of "true" specifies that the signature is enveloped.
- *signatureNodeSelector*. XPath to the node where the signature is entered. If no value is provided, the signature is placed as a first child of the root node.

Signing and Encrypting the Same XML Document

You can use both encryption and signing in the same XML document.

- If you sign and encrypt *different* XML elements in a document, you can run either `pub.security.xml:signXML` or `pub.security.xml:encryptXML` first.
- Typically, if you sign and encrypt the *same* XML elements in a document, you should sign the elements before encrypting them. That is, invoke `pub.security.xml:signXML` before invoking `pub.security.xml:encryptXML`.

pub.security.xml:verifyXML

`WmPublic`. Verifies a signed XML document, or node in an XML document, and returns information about the success or failure of the verification.

Input Parameters

<i>xmldata</i>	String Optional. Signed XML that needs to be verified.
<i>xmlStream</i>	InputStream Optional. Signed XML as an input stream that needs to be verified.
	Note: If both <i>xmldata</i> and <i>xmlStream</i> are provided, <i>xmlStream</i> takes precedence.
<i>signatureSelectors</i>	String Array XPaths that are used to identify the signature; can be any valid XPath. Following is an example: <code>//*[@ID="Sign001"]</code>
<i>nsDecls</i>	Document Optional. Mapping of the namespace prefixes to the namespace URIs. The first column contains the prefixes and the second column contains the corresponding URIs.
<i>noNamespace SchemaLocation</i>	String Optional. Schema location for elements with no namespace. This parameter is used to locate the schema that defines elements without a namespace prefix.
<i>schemaLocations</i>	Document Optional. Holds the schema locations against the namespaces.

encoding **String** Optional. Specifies the encoding to use if the encoding cannot be extracted from the XML. If encoding is not specified in the XML document or in the *encoding* parameter, Integration Server uses UTF-8.

The *encoding* value must be a valid IANA encoding.

Output Parameters

verificationResult **Boolean** Indicates whether the signed XML is authentic (true) or cannot be verified or shows signs of tampering (false).

failedSignatureSelector **String** Conditional. In case of a verification failure (the digests do not equate), indicates which signature selector failed.

failureReason **String** Conditional. This output parameter is populated only in the case of a verification failure. Its value indicates whether (1) the signature caused the failure, or (2) the signature is from an untrusted certificate. Possible values are:

- SIGNATURE FAILED
- CERTIFICATE NOT TRUSTED

certMap **Document List** Conditional. For each XPath in *signatureSelector*, *certMap* contains a document that identifies the XPath and the corresponding signing certificate found at that XPath.

certMap is only returned if certificates were resolved for at least one the XPaths specified in *signatureSelector*.

If Integration Server encounters a signature failure, Integration Server does not resolve any subsequent XPaths. *certMap* contains all of the XPaths and corresponding certificates that Integration Server could resolve up to the point of failure.

Usage Notes

If both *xmlData* and *xmlStream* are provided, *xmlStream* takes precedence.

Before `pub.security.xml:verifyXML` can verify a signature, the partner application's public key must have been made available to Integration Server, either through:

- Integration Server certificate mapping.
- The partner application having sent a copy of its certificate to Integration Server.

For information on Integration Server certificate mapping, refer to *webMethods Integration Server Administrator's Guide*.

The `pub.security.xml:verifyXML` service works as follows:

1. Integration Server receives the signed XML document.
2. Integration Server extracts the public key from the partner application's certificate.
3. Integration Server uses the public key to verify the authenticity of the XML document.

37 SMIME Folder

- Summary of Elements in this Folder 778

You use the elements in the smime folder to create digitally signed and/or encrypted MIME messages. You also use the services in this folder to process signed and encrypted MIME messages that are passed into the pipeline.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.smime:createCertsOnlyData	WmPublic. Generates a PKCS #7 certs-only S/MIME entity from an array of certificates.
pub.smime:createEncryptedData	WmPublic. Encrypts a MIME message.
pub.smime:createSignedAndEncryptedData	WmPublic. <i>Deprecated</i> - Replaced by pub.smime.keystore:createSignedAndEncryptedData . Digitally signs a MIME message and then encrypts it.
pub.smime:createSignedData	WmPublic. <i>Deprecated</i> - Replaced by pub.smime.keystore:createSignedData . Digitally signs a MIME message.
pub.smime:processCertsOnlyData	WmPublic. Extracts the certificates from a PKCS #7 certs-only S/MIME entity.
pub.smime:processEncryptedData	WmPublic. <i>Deprecated</i> - Replaced by pub.smime.keystore:processEncryptedData .
pub.smime:processSignedData	WmPublic. Verifies the signature from a signed S/MIME entity and extracts the message from it.
pub.smime.keystore:createSignedAndEncryptedData	WmPublic. Digitally signs and encrypts a MIME message.
pub.smime.keystore:createSignedData	WmPublic. Creates signed S/MIME data.
pub.smime.keystore:processEncryptedData	WmPublic. Decrypts an encrypted S/MIME message.

pub.smime:createCertsOnlyData

WmPublic. Generates a PKCS #7 certs-only S/MIME entity from an array of certificates.

This service can be used to develop mechanisms for transmitting certificates and certificate chains to other parties.

Input Parameters

certificates **byte[][]** The certificates that are to be encapsulated within the S/MIME entity. Each `byte[]` represents a single certificate.

Output Parameters

SMimeEnvStream **java.io.InputStream** S/MIME entity.

Usage Notes

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

pub.smime:createEncryptedData

WmPublic. Encrypts a MIME message.

Input Parameters

envStream **java.io.InputStream** MIME message that you want to encrypt (for example, the output produced by [pub.mime:getEnvelopeStream](#)).

recipientCerts **byte[][]** The X.509 certificates of the recipients for whom this message will be encrypted. Each element in the list represents a certificate for a single recipient in the form of a `byte[]`.

Note:

When you have multiple recipients, `createEncryptedData` creates a single message that is encrypted for all recipients. It does not create a separate message for each recipient.

encryptionAlg **String** Optional. Code specifying the encryption algorithm to use. Must be `TripleDES` (default), `DES`, or `RC2`.

Note:

If you have enabled the FIPS (Federal Information Processing Standards) mode, then Integration Server uses only `TripleDES`.

keyLength **String** Optional. Length of the encryption key for RC2 encryption. Must be `40`, `64`, or `128` (default).

This parameter is ignored if *encryptionAlg* is not `RC2`.

Output Parameters

SMimeEnvStream **java.io.InputStream** The encrypted MIME message.

Usage Notes

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.smime:createSignedData](#)

[pub.smime:processEncryptedData](#)

[pub.mime:getEnvelopeStream](#)

pub.smime:createSignedAndEncryptedData

WmPublic. *Deprecated* - Replaced by [pub.smime.keystore:createSignedAndEncryptedData](#). Digitally signs a MIME message and then encrypts it.

Important:

You must use this service when you want to create a message that is both signed and encrypted. You cannot produce this type of message using the [pub.smime:createSignedData](#) and [pub.smime:createEncryptedData](#) services.

Input Parameters

envStream **java.io.InputStream** The MIME message that you want to sign and encrypt (for example, the output produced by [pub.mime:getEnvelopeStream](#)).

privKey **byte[]** Private key of the party signing the message.

certificates **byte[][]** Optional. The certificate chain of the party signing the message, where each **byte[]** represents a single certificate in the chain. Certificates must appear in hierarchical order, starting with the signer's certificate in element 0. The following list shows how the elements of a complete chain would appear for a certificate that was issued through two intermediate CAs:

Element	Contents
0	Signer's certificate.
1	Intermediary CA Certificate.
2	Intermediary CA Certificate.

3 Root CA Certificate.

Note:

Although this parameter is optional, it should only be omitted if the party receiving the message is able to process this signature without an accompanying certificate chain.

<i>signerCert</i>	byte[] Digital certificate of the party signing the message.
<i>explicit</i>	<p>String Optional. Flag indicating whether an implicit or explicit signature is to be generated. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to generate an explicit (detached) signature. This is the default. ■ <code>false</code> to generate an implicit signature.
<i>recipientCerts</i>	byte[][] X.509 certificates of the recipients for whom this message will be encrypted. Each element in the list contains the certificate for a single recipient in the form of a byte array.
<i>encryptionAlg</i>	<p>String Optional. Code specifying the encryption algorithm to use. Must be <code>TripleDES</code> (default), <code>DES</code>, or <code>RC2</code>.</p> <p>Note: If you have enabled the FIPS (Federal Information Processing Standards) mode , then Integration Server uses only <code>TripleDES</code>.</p>
<i>keyLength</i>	<p>String Optional. Length of the encryption key for RC2 encryption. Must be 40, 64, or 128 (default).</p> <p>This parameter is ignored if <i>encryptionAlg</i> is not RC2.</p>

Output Parameters

SMimeEnvStream **java.io.InputStream** Signed and encrypted MIME message.

Usage Notes

This service is superseded by [pub.smime.keystore:createSignedAndEncryptedData](#).

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.smime:createEncryptedData](#)

[pub.smime:processEncryptedData](#)

[pub.smime:createSignedData](#)

[pub.smime:processSignedData](#)[pub.smime.keystore:createSignedData](#)[pub.mime:getEnvelopeStream](#)

pub.smime:createSignedData

WmPublic. *Deprecated* - Replaced by [pub.smime.keystore:createSignedData](#). Digitally signs a MIME message.

Input Parameters

envStream **java.io.InputStream** MIME message that you want to sign (for example, the output produced by [pub.mime:getEnvelopeStream](#)).

privKey **byte[]** Private key of the party signing the message.

certificates **byte[][]** Optional. Certificate chain of the party that signed the message, where each `byte[]` represents a single certificate in the chain. Certificates must appear in hierarchical order, starting with the signer's certificate in element 0. The following shows how the elements of a complete chain would appear for a certificate that was issued through two intermediate CAs:

Element	Contents
0	Signer's certificate.
1	Intermediary CA Certificate.
2	Intermediary CA Certificate.
3	Root CA Certificate.

Although this parameter is optional, it should only be omitted if the party receiving the message is able to process this signature without an accompanying certificate chain.

signerCert **byte[]** Digital certificate of the party signing the message.

explicit **String** Optional. Flag indicating whether an implicit or explicit signature is generated. Set to:

- `true` to generate an explicit (detached) signature. This is the default.
- `false` to generate an implicit signature.

Output Parameters

SMimeEnvStream **java.io.InputStream** The signed MIME message.

Usage Notes

This service is superseded by [pub.smime.keystore:createSignedData](#).

For general information about MIME messages and using the MIME services, see the *MIME-S/MIME Developer's Guide*.

See Also

[pub.smime:createEncryptedData](#)

[pub.mime:getEnvelopeStream](#)

pub.smime:processCertsOnlyData

WmPublic. Extracts the certificates from a PKCS #7 certs-only S/MIME entity.

Input Parameters

SMimeEnvStream **java.io.InputStream** The certs-only S/MIME entity.

Output Parameters

certificates **byte[][]** The extracted certificates. Each element in the list contains one of the extracted certificates represented as a `byte[]`.

pub.smime:processEncryptedData

WmPublic. *Deprecated* - Replaced by [pub.smime.keystore:processEncryptedData](#).

Decrypts an encrypted S/MIME message.

Input Parameters

SMimeEnvStream **java.io.InputStream** The encrypted S/MIME entity (for example, the output produced by [pub.smime:createEncryptedData](#)).

recipientCert **byte[]** Digital certificate of the party receiving the message.

privKey **byte[]** Private key of the party receiving the message (that is, the party whose public key was used to encrypt the message).

Output Parameters

mimeData **Document** MIME object containing the decrypted MIME message.

contentDigest **String** Message digest of the encrypted content, base64-encoded. (Some sites return this digest to the sender to acknowledge their receipt of the message.)

encrypted **String** Conditional. Flag indicating whether the decrypted MIME entity is encrypted. A value of:

- `true` indicates that the MIME entity is encrypted.
- `false` indicates that the MIME entity is not encrypted.

signed **String** Conditional. Flag indicating whether the decrypted MIME entity is signed. A value of:

- `true` indicates that the MIME entity is signed.
- `false` indicates that the MIME entity is not signed.

certsOnly **String** Conditional. Flag indicating whether the decrypted MIME entity is a certs-only entity. A value of:

- `true` indicates that the MIME entity is a certs-only entity.
- `false` indicates that the MIME entity is not a certs-only entity.

stream **java.io.InputStream** Conditional. The decrypted MIME entity.

Usage Notes

This service is superseded by [pub.smime.keystore:processEncryptedData](#).

If the decrypted message is signed or encrypted, *mimeData* will be empty, and the decrypted message will reside in *stream*. You can check the state of the *signed* and *encrypted* output variables to determine whether the decrypted message requires additional processing, and pass *stream* to the [pub.smime:processSignedData](#) or [pub.smime:processEncryptedData](#) service as necessary.

Important:

You can examine the contents of *mimeData* during testing and debugging. However, because the internal structure of *mimeData* is subject to change without notice, *do not* explicitly set or map data to/from these elements in your service. To manipulate or access the contents of *mimeData*, use *only* the MIME services that Integration Server provides.

See Also

[pub.smime:processSignedData](#)

[pub.smime:createEncryptedData](#)

pub.smime:processSignedData

WmPublic. Verifies the signature from a signed S/MIME entity and extracts the message from it.

Input Parameters

<i>SMimeEnvStream</i>	java.io.InputStream Signed MIME entity (for example, the output produced by pub.smime:createSignedData).
<i>signerCertChain</i>	byte[][] Optional. Certificate chain of the party that signed the message, where each <code>byte[]</code> represents a single certificate in the chain. Certificates must appear in hierarchical order, starting with the signer's certificate in element 0. The following shows how the elements of a complete chain would appear for a certificate that was issued through two intermediate CAs:

Element	Contents
0	Signer's certificate.
1	Intermediary CA Certificate.
2	Intermediary CA Certificate.
3	Root CA Certificate.

Note:

If the signer included the certificate chain with the digital signature, you do not need to supply *signerCertChain*.

Output Parameters

<i>mimeData</i>	Document MIME object containing the extracted MIME entity.
<i>contentDigest</i>	String Message digest (base64-encoded) that was recalculated by <code>processSignedData</code> .
<i>signerCert</i>	java.security.cert.X509Certificate Signer's X.509 certificate.
<i>encrypted</i>	String Conditional. Flag indicating whether the extracted MIME entity is encrypted. A value of: <ul style="list-style-type: none"> ■ <code>true</code> indicates that the MIME entity is encrypted.

<i>signed</i>	<ul style="list-style-type: none"> ■ <code>false</code> indicates that the MIME entity is not encrypted. <p>String Conditional. Flag indicating whether the extracted MIME entity is signed. A value of:</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates that the MIME entity is signed. ■ <code>false</code> indicates that the MIME entity is not signed.
<i>certsOnly</i>	<p>String Conditional. Flag indicating whether the extracted MIME entity is a certs-only entity. A value of:</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates that the MIME entity is a certs-only entity. ■ <code>false</code> indicates that the MIME entity is not a certs-only entity.
<i>stream</i>	java.io.InputStream Conditional. Extracted MIME entity.
<i>verify</i>	<p>String Flag indicating whether the signature was successfully processed. Success indicates that the signature was successfully verified with the supplied public key. A value of:</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates that signature processing was successful. ■ <code>false</code> indicates that signature processing failed. The signature could not be verified because an <i>errorCode</i> 1, 2, 3, or 4 occurred.
<i>trusted</i>	<p>String Flag indicating whether the signer certificate is trusted or not. A value of:</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates that the signer certificate is trusted. ■ <code>false</code> indicates that the signer certificate is not trusted.
<i>errorCode</i>	<p>String Conditional. Number indicating the kind of error that occurred while processing the signature. See <i>errorMessage</i> for possible values.</p> <p>If no error occurred, <i>errorCode</i> will not be returned.</p>
<i>errorMessage</i>	<p>String Conditional. Textual error message indicating what kind of error occurred while processing the signature. Error codes and messages are as follows:</p>

<i>errorCode</i>	<i>errorMessage</i>
1	Invalid signer certificate file information.
2	Certificate at index 'i' is not in recognizable format.
3	Invalid certificate input at index 'i'.
4	Signature cannot be verified.
5	Expired certificate chain.

6	Error in certificate chain.
7	Untrusted certificate.

Usage Notes

If *verify* is false, the *errorCode* and *errorMessage* values will indicate the error that caused the failure. Note that *errorCode* values 5 through 7 do not represent signature-validation failures and, therefore, do not cause the *verify* flag to be set to false.

If the extracted entity is signed or encrypted, *mimeData* will be empty, and the extracted entity will reside in *stream*. You can check the state of the *signed* and *encrypted* output variables to determine whether the extracted entity requires additional processing, and pass *stream* to the [pub.smime:processEncryptedData](#) service as necessary.

Important:

You can examine the contents of *mimeData* during testing and debugging. However, because the internal structure of *mimeData* is subject to change without notice, *do not* explicitly set or map data to/from these elements in your service. To manipulate or access the contents of *mimeData*, use *only* the MIME services that Integration Server provides.

See Also

[pub.smime:processEncryptedData](#)

[pub.smime:createSignedData](#)

pub.smime.keystore:createSignedAndEncryptedData

WmPublic. Digitally signs and encrypts a MIME message.

Input Parameters

<i>envStream</i>	java.io.InputStream The MIME message that you want to sign and encrypt (for example, the output produced by pub.mime:getEnvelopeStream).
<i>keyStoreAlias</i>	String Alias of the keystore containing the signing key.
<i>keyAlias</i>	String Alias of the private key to be used for signing.
<i>explicit</i>	String Optional. Flag indicating whether an implicit or explicit signature is to be generated. Set to: <ul style="list-style-type: none"> ■ True to generate an explicit (detached) signature. This is the default. ■ False to generate an implicit signature.
<i>recipientCerts</i>	Object List A list of byte[] for the partner certificates for whom this message will be encrypted.

<i>encryptionAlg</i>	String Optional. Code specifying the encryption algorithm to use. Must be TripleDES (default), DES, or RC2.
<i>keyLength</i>	String Optional. Length of the encryption key for RC2 encryption. Must be 40, 64, or 128 (default). This parameter is ignored if encryptionAlg is not RC2.
<i>signingAlg</i>	String Optional. The signing algorithm to use to sign the S/MIME messages. Set to: <ul style="list-style-type: none"> ■ SHA1 ■ SHA224 ■ SHA256 ■ SHA384 ■ SHA512 ■ MD5 <p>The default is SHA1.</p>

Note:

If you do not set this parameter, Integration Server uses SHA512 algorithm to sign the incoming messages.

Note:

The MD5 signing algorithm is not available if FIPS mode is enabled on Integration Server.

Output Parameters

SMimeEnvStream **java.io.InputStream** Signed and encrypted data as a stream.

Usage Notes

This service supersedes [pub.smime:createSignedAndEncryptedData](#)

You must use this service when you want to create a message that is both signed and encrypted.

For information about using aliases for keystores, truststores, and private keys, see the section *Keystores and Truststores* in the *webMethods Integration Server Administrator's Guide* .

pub.smime.keystore:createSignedData

WmPublic. Creates signed S/MIME data.

Input Parameters

<i>envStream</i>	java.io.InputStream MIME message that you want to sign (for example, the output produced by pub.mime:getEnvelopeStream).
<i>keyStoreAlias</i>	String Alias of the keystore.
<i>keyAlias</i>	String Alias of the private key of interest in the keystore.
<i>explicit</i>	<p>String Optional. Flag indicating whether an implicit or explicit signature is generated. Set to:</p> <ul style="list-style-type: none"> ■ True to generate an explicit (detached) signature. This is the default. ■ False to generate an implicit signature.
<i>signingAlg</i>	<p>String Optional. The signing algorithm to use to sign the S/MIME messages. Set to:</p> <ul style="list-style-type: none"> ■ SHA1 ■ SHA224 ■ SHA256 ■ SHA384 ■ SHA512 ■ MD5

The default is SHA1.

Note:

If you do not set this parameter, Integration Server uses SHA1 algorithm to sign the incoming messages.

Note:

The MD5 signing algorithm is not available if FIPS mode is enabled on the Integration Server.

Output Parameters

<i>SMimeEnvStream</i>	java.io.InputStream The signed MIME stream.
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Usage Notes

This service supersedes [pub.smime:createSignedData](#).

For information about using aliases for keystores, truststores, and private keys, see the section *Keystores and Truststores* in the *webMethods Integration Server Administrator's Guide*.

pub.smime.keystore:processEncryptedData

WmPublic. Decrypts an encrypted S/MIME message.

Input Parameters

<i>SMimeEnvStream</i>	java.io.InputStream The encrypted S/MIME stream.
<i>keyStoreAlias</i>	String Alias of the keystore containing the decryption key.
<i>keyAlias</i>	String Alias of the key used for decryption.

Output Parameters

<i>mimeData</i>	Document The decrypted MIME message.
<i>contentDigest</i>	String Message digest of the encrypted content, base64-encoded. (Some sites return this digest to the sender to acknowledge their receipt of the message.)
<i>encrypted</i>	String Flag indicating whether the MIME entity passed in to the service was encrypted. A value of: <ul style="list-style-type: none">■ <code>True</code> indicates that the MIME entity was encrypted.■ <code>False</code> indicates that the MIME entity was not encrypted.
<i>signed</i>	String Flag indicating whether the MIME entity passed in to the service was signed. A value of: <ul style="list-style-type: none">■ <code>True</code> indicates that the MIME entity is signed.■ <code>False</code> indicates that the MIME entity is not signed.
<i>certsOnly</i>	String Flag indicating whether the MIME entity passed in to the service contained only digital certificates. A value of: <ul style="list-style-type: none">■ <code>True</code> indicates that the MIME entity is a certs-only entity.■ <code>False</code> indicates that the MIME entity is not a certs-only entity.
<i>stream</i>	java.io.InputStream The decrypted MIME entity.

Usage Notes

This service supersedes [pub.smime:processEncryptedData](#).

For information about using aliases for keystores, truststores, and private keys, see the section *Keystores and Truststores* in the *webMethods Integration Server Administrator's Guide* .

38 SOAP Folder

■ Summary of Elements in this Folder	794
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You use the elements in the soap folder to compose and send SOAP messages and to receive and retrieve data from within them.

Note:

If the Docker image for a Microservices Runtime excludes web services functionality, then the Docker image for the Microservices Runtime running in the Docker container cannot execute the `pub.soap*` services. Attempts to execute any of the `pub.soap*` services result in a `ServiceException`.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.soap.handler:addBodyBlock	WmPublic. Inserts a document into a SOAP message as a new body block.
pub.soap.handler:addFaultBlock	WmPublic. Inserts a document into a SOAP message as a new fault block.
pub.soap.handler:addHeaderBlock	WmPublic. Inserts a document into a SOAP message as a new header block.
pub.soap.handler:addHeaderElement	WmPublic. <i>Deprecated</i> - Replaced by pub.soap.handler:addHeaderBlock .
pub.soap.handler:generateDocumentTypesFromWSDL	WmPublic. Generates IS document types from a WSDL.
pub.soap.handler:getBodyBlock	WmPublic. Retrieves a body block from a SOAP message.
pub.soap.handler:getBodyBlockQNames	WmPublic. Returns the QName for each body block in a SOAP message.
pub.soap.handler:getFaultBlock	WmPublic. Retrieves a fault block from a SOAP message.
pub.soap.handler:getHeaderBlock	WmPublic. Retrieves a header block from a SOAP message.
pub.soap.handler:getHeaderBlockQNames	WmPublic. Returns the QName for each header block in a SOAP message.
pub.soap.handler:getHeaderElement	WmPublic. <i>Deprecated</i> - Replaced by pub.soap.handler:getHeaderBlock .
pub.soap.handler:getInitialSOAPMessage	WmPublic. Gets the initial SOAP request message from a given message context.

Element	Package and Description
pub.soap.handler:getMessageAddressingProperties	WmPublic. Gets the value of the specified message addressing properties in a SOAP message.
pub.soap.handler:getProperty	WmPublic. Gets the value of a specified property from a message context.
pub.soap.handler:getServicePipeline	WmPublic. Gets the service pipeline from a given message context.
pub.soap.handler:getSOAPMessage	WmPublic. Gets the message addressing properties of the SOAP message in the provided message context.
pub.soap.handler:getWebServiceInvocationProperties	WmPublic. Fetches the web service invocation properties.
pub.soap.handler:handlerSpec	WmPublic. Specification to use as the signature for a service that acts as a header handler.
pub.soap.handler:hasFaultMessage	WmPublic. Determines whether the SOAP message in a given message context contains a SOAP fault message.
pub.soap.handler:listConsumer	WmPublic. Returns a list of the consumer handlers currently registered on Integration Server.
pub.soap.handler:listProvider	WmPublic. Returns a list of the provider handlers currently registered on Integration Server.
pub.soap.handler:registerConsumer	WmPublic. <i>Deprecated</i> - Replaced by pub.soap.handler:registerWmConsumer .
pub.soap.handler:registerProvider	WmPublic. <i>Deprecated</i> - Replaced by pub.soap.handler:registerWmProvider .
pub.soap.handler:registerWmConsumer	WmPublic. Registers a handler for use with consumer.
pub.soap.handler:registerWmProvider	WmPublic. Registers a header handler for use with provider.
pub.soap.handler:removeBodyBlock	WmPublic. Removes a body block from a SOAP message, leaving an empty SOAP body, <code><SOAP-ENV:Body></SOAP-ENV:Body></code> .

Element	Package and Description
pub.soap.handler:removeHeaderBlock	WmPublic. Removes a header block from a SOAP message.
pub.soap.handler:removeHeaderElement	WmPublic. <i>Deprecated</i> - Replaced by pub.soap.handler:removeHeaderBlock .
pub.soap.handler:removeProperty	WmPublic. Removes a property from a message context.
pub.soap.handler:setProperty	WmPublic. Sets the value of a specific property in a message context.
pub.soap.handler:setSOAPMessage	WmPublic. Sets the SOAP message in a message context.
pub.soap.handler:unregisterConsumer	WmPublic. Unregisters a consumer web service descriptor handler.
pub.soap.handler:unregisterProvider	WmPublic. Unregisters a provider web service descriptor handler.
pub.soap.handler:updateFaultBlock	WmPublic. Updates the fault code (<i>code</i>) and the fault string (<i>reasons</i>) in the existing fault block.
pub.soap.processor:list	WmPublic. <i>Deprecated</i> - There is no replacement service. Returns a list of the SOAP processors that are currently registered on the Integration Server.
pub.soap.processor:processMessage	WmPublic. <i>Deprecated</i> - There is no replacement service. Executes the Integration Server's default SOAP processor.
pub.soap.processor:processRPCMessage	WmPublic. <i>Deprecated</i> - There is no replacement service. Executes the Integration Server's SOAP RPC processor.
pub.soap.processor:registerProcessor	WmPublic. <i>Deprecated</i> - There is no replacement service. Registers a service as a SOAP processor on the Integration Server.
pub.soap.processor:unregisterProcessor	WmPublic. <i>Deprecated</i> - There is no replacement service. Unregisters a SOAP processor by removing it from the registry.
pub.soap.schema:encoding	WmPublic. Schema that defines the data types SOAP supports.
pub.soap.schema:encoding_1_2	WmPublic. Schema that defines the data types SOAP 1.2 supports.

Element	Package and Description
pub.soap.schema:envelope	WmPublic. Schema that defines the structure of a SOAP message.
pub.soap.schema:envelope_1_2	WmPublic. Schema that defines the structure of a SOAP 1.2 message.
pub.soap.utils:addBodyEntry	WmPublic. Inserts an entry into the body element of a SOAP message.
pub.soap.utils:addHeaderEntry	WmPublic. Inserts an entry into the header element of a SOAP message.
pub.soap.utils:addTrailer	WmPublic. Inserts a trailer in a SOAP message.
pub.soap.utils:callbackServiceSpec	WmPublic. Defines the input signature for an outbound callback service.
pub.soap.utils:convertToVersionSpecificSOAPFault	WmPublic. Converts the generic SOAP fault structure to the SOAP version-specific fault structure that is used by web service descriptors created in versions of Integration Server prior to 8.2.
pub.soap.utils:createSoapData	WmPublic. Creates a SOAP object consisting of SOAP envelope, body, and header entries.
pub.soap.utils:createXOPObject	WmPublic. Generates a <code>com.wm.util.XOPObject</code> instance from a <code>base64Binary</code> string, a byte array, or an input stream.
pub.soap.utils:exitUnableToUnderstand	WmPublic. Terminates processing and returns a <code>mustUnderstand</code> fault to the client.
pub.soap.utils:getActor	WmPublic. Retrieves the value of the <code>actor</code> attribute (for SOAP 1.1) or the <code>role</code> attribute (for SOAP 1.2) from a given header entry.
pub.soap.utils:getBody	WmPublic. Retrieves the body from a SOAP message as a single node object.
pub.soap.utils:getBodyEntries	WmPublic. Retrieves the body entries from a SOAP message as an array of node objects.
pub.soap.utils:getDocument	WmPublic. Retrieves an entire SOAP message as a node object.
pub.soap.utils:getEncoding	WmPublic. Retrieves the encoding from a SOAP message as a single string.

Element	Package and Description
pub.soap.utils:getHeader	WmPublic. Retrieves the header from a SOAP message as a single node object.
pub.soap.utils:getHeaderEntries	WmPublic. Retrieves the header entries from a SOAP message as an array of node objects.
pub.soap.utils:getMustUnderstand	WmPublic. Returns the mustUnderstand status for a given header entry.
pub.soap.utils:getQName	WmPublic. Returns the qualified name for a given node.
pub.soap.utils:getTrailers	WmPublic. Retrieves the trailers from a SOAP message.
pub.soap.utils:getXOPObjectContent	WmPublic. Retrieves the contents of a com.wm.util.XOPObject instance as a base64Binary string, a byte array, or an InputStream.
pub.soap.utils:QName	WmPublic. Document type that defines the structure of a qualified name.
pub.soap.utils:removeBodyEntry	WmPublic. Deletes a body entry from a SOAP message.
pub.soap.utils:removeHeaderEntry	WmPublic. Deletes a header entry from a SOAP message.
pub.soap.utils:removeTrailer	WmPublic. Deletes a trailer from a SOAP message.
pub.soap.utils:requestResponseSpec	WmPublic. Defines the input/output signature for a custom processor and a target service for the default processor.
pub.soap.utils:resetWSDEffectivePolicy	WmPublic. <i>Deprecated</i> - There is no replacement service. Returns the effective policy for a handler in a web service descriptor to the policy set in the Policy name property in Software AG Designer.
pub.soap.utils.setWSDEffectivePolicy	WmPublic. <i>Deprecated</i> - There is no replacement service. Sets the effective policy for a handler in a web service descriptor.
pub.soap.utils:soapDataToBytes	WmPublic. Converts a SOAP object to a Byte Array.
pub.soap.utils:soapDataToString	WmPublic. Converts a SOAP object to a String.

Element	Package and Description
pub.soap.utils:soapFault	WmPublic. Document type that defines the generic SOAP fault structure used by web service descriptors created in Integration Server 8.2 and later.
pub.soap.utils:streamToSoapData	WmPublic. Converts an InputStream containing a SOAP message to a SOAP object.
pub.soap.utils:stringToSoapData	WmPublic. Converts a String containing a SOAP message to a SOAP object.
pub.soap.utils:validateSoapData	WmPublic. Verifies that a SOAP object represents a valid SOAP message.
pub.soap.wsa:action	WmPublic. Document type that defines the contents of the <code>wsa:Action</code> WS-Addressing header.
pub.soap.wsa:faultTo	WmPublic. Document type that defines the contents of the <code>wsa:FaultTo</code> WS-Addressing header.
pub.soap.wsa:from	WmPublic. Document type that contains the details of the source of the message.
pub.soap.wsa:messageID	WmPublic. Document type that defines the contents of the <code>wsa:MessageID</code> WS-Addressing header.
pub.soap.wsa:problemAction	WmPublic. Document type that captures additional information about faults.
pub.soap.wsa:problemHeaderQName	WmPublic. Document type that captures additional information about faults.
pub.soap.wsa:problemIRI	WmPublic. Document type that captures the IRI that caused the problem.
pub.soap.wsa:relatesTo	WmPublic. Document type that defines the contents of the <code>wsa:RelatesTo</code> WS-Addressing header.
pub.soap.wsa:replyTo	WmPublic. Document type that defines the contents of the <code>wsa:ReplyTo</code> WS-Addressing header.
pub.soap.wsa:retryAfter	WmPublic. Document type that specifies the minimum duration in milliseconds that

Element	Package and Description
	Integration Server waits before retransmitting a message.
pub.soap.wsa:to	WmPublic. Document type that defines the contents of the <code>wsa:To</code> WS-Addressing header.
pub.soap.wsa:schema_wsa	WmPublic. A schema containing the elements from http://www.w3.org/2005/08/addressing namespace.
pub.soap.wsa.submission:action	WmPublic. Document type that defines the contents of the <code>wsa:Action</code> WS-Addressing header.
pub.soap.wsa.submission:faultTo	WmPublic. Document type that defines the contents of the <code>wsa:FaultTo</code> WS-Addressing header.
pub.soap.wsa.submission:from	WmPublic. Document type that contains the details about the source of the message.
pub.soap.wsa.submission:messageID	WmPublic. Document type that defines the contents of the <code>wsa:MessageID</code> WS-Addressing header.
pub.soap.wsa.submission:relatesTo	WmPublic. Document type that defines the contents of the <code>wsa:RelatesTo</code> WS-Addressing header.
pub.soap.wsa.submission:replyTo	WmPublic. Document type that specifies the destination to which the response message is to be sent.
pub.soap.wsa.submission:retryAfter	WmPublic. Document type that specifies the minimum duration in milliseconds that Integration Server waits before retransmitting a message.
pub.soap.wsa.submission:to	WmPublic. Document type that defines the contents of the <code>wsa:To</code> WS-Addressing header.
pub.soap.wsa.submission:schema_wsa_submission	WmPublic. A schema containing the elements from http://schemas.xmlsoap.org/ws/2004/08/addressing namespace.

Element	Package and Description
pub.soap.wsrn:closeSequence	WmPublic. Closes a reliable messaging sequence.
pub.soap.wsrn:createSequence	WmPublic. Sends a request to a reliable messaging destination to create a new reliable messaging sequence.
pub.soap.wsrn:sendAcknowledgementRequest	WmPublic. Requests an acknowledgment for a message sequence.
pub.soap.wsrn:terminateSequence	WmPublic. Terminates a reliable messaging sequence.
pub.soap.wsrn:waitUntilSequenceCompleted	WmPublic. Requests an acknowledgment for a message sequence.

pub.soap.handler:addBodyBlock

WmPublic. Inserts a document into a SOAP message as a new body block.

Input Parameters

<i>messageContext</i>	<p>Object Message context containing the SOAP message to which to add a body block.</p> <p>A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.</p>		
<i>documentType</i>	<p>String Optional. Fully qualified name of the IS document type that specifies the structure of the document that you want to add as a new body block; that is, that specifies the structure of <i>inputBodyBlock/bodyDocument</i>. If specified, <i>inputBodyBlock/bodyDocument</i> must be an instance of this document type.</p> <p>Specify a document type that Integration Server created while creating the consumer or the WSDL first provider web service descriptor or one that was created using the pub.soap.handler:generateDocumentTypesFromWSDL service.</p> <p>If you do not specify a document type, the service performs a literal conversion of <i>inputBodyBlock/bodyDocument</i> into the SOAP body; that is, the conversion will not consider style or use.</p>		
<i>inputBodyBlock</i>	<p>Document Contents of the body block.</p>		
	<table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> </tbody> </table>	Key	Description
Key	Description		

operationQName **Document** Optional. Qualified name for the web service wrapper that the `addBodyBlock` service will use to wrap the XML payload that it generates by converting *bodyDocument* into XML.

The *operationQName* document references the [pub.soap.utils:QName](#) document type.

Note:

The *operationQName* is only relevant for RPC/Encoded and RPC/Literal services; this service ignores *operationQName* for Document/Literal services.

Key	Description
<i>namespaceName</i>	String Namespace name for the web service operation.
<i>localName</i>	String Name of the web service operation on which the handler is being written.

bodyDocument **Document** SOAP body block that you want to add to the SOAP message. Integration Server converts the document to an XML node and inserts it as a body block.

wrapPayloadWithOperationQNameFromContext

String Optional. Flag that indicates whether the service should obtain the qualified name for the web service wrapper from the message context or from *operationQName*. Set to:

- `true` to have the service obtain the qualified name for the web service wrapper from *messageContext*. If the *operationQName* parameters are specified, the service ignores them.
- `false` to have the service use the values you specify in the *operationQName* parameters. This is the default.

Note:

For RPC/Encoded and RPC/Literal services, be sure to set *wrapPayloadWithOperationQNameFromContext* to `true` if you do not specify *operationQName*. This service ignores *wrapPayloadWithOperationQNameFromContext* for Document/Literal services.

validate

String Optional. Flag that indicates whether you want the service to validate *inputBodyBlock/bodyDocument* against the IS document type specified in the *documentType* input parameter. If you do not use *documentType* to specify an IS document type, the validation will fail.

Set *validate* to:

- `true` to validate `inputBodyBlock/bodyDocument`. If the validation fails, an exception is thrown.
- `false` to skip validating `inputBodyBlock/bodyDocument`. This is the default.

Output Parameters

status

String Flag indicating the outcome of the service. A value of:

- `true` indicates that adding the body block was successful.
- `false` indicates that adding the body block failed.

Note:

If the SOAP message already contains a body block, the service sets *status* to `false`.

Usage Notes

If the SOAP message already contains a body block, first use the [pub.soap.handler:removeBodyBlock](#) service to remove the existing body block before using this service to add a new one.

See Also

[pub.soap.handler:getBodyBlock](#)

[pub.soap.handler:removeBodyBlock](#)

pub.soap.handler:addFaultBlock

WmPublic. Inserts a document into a SOAP message as a new fault block.

Input Parameters

messageContext

Object Message context containing the SOAP message to which to add a fault block.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.

documentType **String** Optional. Fully qualified name of the IS document type that specifies the structure of the document in *soapFault/detail*. If specified, *soapFault/detail* must be an instance of this document type.

Specify a document type that Integration Server created while creating the consumer or the WSDL first provider web service descriptor or one that was created using the [pub.soap.handler:generateDocumentTypesFromWSDL](#) service.

If you do not specify a document type, the service performs a literal conversion of *soapFault/detail*; that is, the conversion will not consider style or use.

soapFault **Document** SOAP fault block that you want to add to the SOAP message. Integration Server converts the document to an XML node and inserts it as a fault block.

Key	Descriptions								
<i>code</i>	Document Contains the fault code and possible subcodes.								
	<table border="1"> <thead> <tr> <th>Key</th> <th>Descriptions</th> </tr> </thead> <tbody> <tr> <td><i>namespaceName</i></td> <td>String Namespace name for the SOAP fault code.</td> </tr> <tr> <td><i>localName</i></td> <td>String Code that identifies the fault.</td> </tr> <tr> <td><i>subCodes</i></td> <td> <p>Document List Optional. One or more subcodes that provide further detail. For each subcode, include a Document in the <i>subCodes</i> Document List; each Document should contain:</p> <ul style="list-style-type: none"> ■ <i>namespaceName</i> for the subcode ■ <i>localName</i> that identifies the subcode </td> </tr> </tbody> </table>	Key	Descriptions	<i>namespaceName</i>	String Namespace name for the SOAP fault code.	<i>localName</i>	String Code that identifies the fault.	<i>subCodes</i>	<p>Document List Optional. One or more subcodes that provide further detail. For each subcode, include a Document in the <i>subCodes</i> Document List; each Document should contain:</p> <ul style="list-style-type: none"> ■ <i>namespaceName</i> for the subcode ■ <i>localName</i> that identifies the subcode
Key	Descriptions								
<i>namespaceName</i>	String Namespace name for the SOAP fault code.								
<i>localName</i>	String Code that identifies the fault.								
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<i>reasons</i>	<p>Document List Reasons for the SOAP fault. Each Document in the Document List contains a human readable explanation of the cause of the fault.</p> <table border="1"> <thead> <tr> <th>Key</th> <th>Descriptions</th> </tr> </thead> <tbody> <tr> <td><i>*body</i></td> <td>String Text explaining the cause of the fault.</td> </tr> <tr> <td><i>@lang</i></td> <td>String Optional. Language for the human readable description.</td> </tr> </tbody> </table>	Key	Descriptions	<i>*body</i>	String Text explaining the cause of the fault.	<i>@lang</i>	String Optional. Language for the human readable description.		
Key	Descriptions								
<i>*body</i>	String Text explaining the cause of the fault.								
<i>@lang</i>	String Optional. Language for the human readable description.								
<i>node</i>	String Optional. URI to the SOAP node where the fault occurred.								

<i>role</i>	String Optional. Role in which the node was operating at the point the fault occurred.
<i>detail</i>	Document Optional. Application-specific details about the SOAP fault.
<i>validate</i>	String Optional. Flag that indicates whether you want the service to validate <i>soapFault/detail</i> against the IS document type specified in the <i>documentType</i> input parameter. If you do not use <i>documentType</i> to specify an IS document, the validation will fail.

Set *validate* to:

- `true` to validate *soapFault/detail*. If the validation fails, an exception is thrown.
- `false` to skip validating *soapFault/detail*. This is the default.

Output Parameters

<i>status</i>	String Flag indicating the outcome of the service. A value of: <ul style="list-style-type: none"> ■ <code>true</code> indicates that adding the fault block succeeded. ■ <code>false</code> indicates that adding the fault block failed.
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Note:

If the SOAP message already contains a fault block, the service sets *status* to false.

See Also

[pub.soap.handler:getFaultBlock](#)

pub.soap.handler:addHeaderBlock

WmPublic. Inserts a document into a SOAP message as a new header block.

Input Parameters

<i>messageContext</i>	Object Message context containing the SOAP message to which to add a header block.
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A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same

message context, which enables you to use the message context to pass information among handlers.

documentType

String Name of the IS document type that specifies the structure and namespaces of the document to use as a new header block.

Specify a document type that Integration Server created while creating the consumer or the WSDL first provider web service descriptor or one that was created using the [pub.soap.handler:generateDocumentTypesFromWSDL](#) service.

The QName of the first element in the IS document type is used as the QName of the header block to add to the SOAP message.

The *inputHeaderBlock/headerDocument* must be a instance of this document type.

inputHeaderBlock

Document Contains information used to create the header block to add to the SOAP message.

Key	Description
<i>mustUnderstand</i>	<p>String Optional. Flag that indicates whether a <i>mustUnderstand</i> attribute is added to the new header block. The <i>mustUnderstand</i> attribute specifies whether recipients (the actor or role at which the header is targeted) are required to process a header entry. Recipients that cannot process a mandatory header entry must reject the message and return a SOAP fault.</p> <p>Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to indicate that the attribute <code>mustUnderstand="true"</code> will be added to the header block. This indicates that processing the header entry is required. ■ <code>false</code> to indicate that the <i>mustUnderstand</i> attribute will not be added to the header block. This indicates that processing the header entry is optional. <p>There is no default value.</p> <p>If you do not set <i>mustUnderstand</i>, Integration Server omits the <i>mustUnderstand</i> attribute from the header entry, which is equivalent to setting <i>mustUnderstand</i> to <code>false</code>.</p>

Note:

In SOAP 1.2, the values of the `mustUnderstand` attribute changed from 0 and 1 to `True` and `False`; however, Integration Server processes both sets of values the same and performs any necessary conversions.

role

String Optional. Target of the header entry. The value of *role* determines the value of the actor or role attribute for the header entry. The actor or role attribute specifies a URI for the recipient of a header entry.

There is no default value. If you do not set *role*, Integration Server omits the actor attribute from the header entry, which is equivalent to setting *role* to `Ultimate receiver`.

■ **For SOAP 1.1, set to:**

`Ultimate receiver` to omit the actor attribute from the header block. This indicates that the recipient is the ultimate destination of the SOAP message.

`Next` to add an actor attribute with the value `"http://schemas.xmlsoap.org/soap/actor/next"` to the header block.

`None` to add an actor attribute with the value `"http://www.w3.org/2003/05/soap-envelope/role/none"` to the header block.

User-specified value to specify the target of the header block. Typically, this will be a URI.

■ **For SOAP 1.2, set to:**

`Ultimate receiver` to omit the role attribute from the header block. This indicates that the recipient is the ultimate destination of the SOAP message.

`Next` to add a role attribute with the value `"http://schemas.xmlsoap.org/soap-envelope/role/next"` to the header block.

`None` to add a role attribute with the value `"http://www.w3.org/2003/05/soap-envelope/role/none"` to the header block.

User-specified value to specify the target of the header block. Typically, this will be a URI.

headerDocument

Document Document to add as a header block. Integration Server converts the document to an XML node and inserts it as a header block.

validate

String Optional. Flag that indicates whether you want the service to validate the *inputHeaderBlock/headerDocument* document against the IS document type specified in the *documentType* input parameter. If you do not use *documentType* to specify an IS document type, the validation will fail.

Set *validate* to:

- `true` to validate *inputHeaderBlock/headerDocument*. If the validation fails, an exception is thrown.
- `false` to skip validating *inputHeaderBlock/headerDocument*. This is the default.

Output Parameters

None.

Usage Notes

This service replaces [pub.soap.handler:addHeaderElement](#), which is deprecated.

See Also

[pub.soap.handler:getHeaderBlock](#)

[pub.soap.handler:removeHeaderBlock](#)

pub.soap.handler:addHeaderElement

WmPublic. *Deprecated* - Replaced by [pub.soap.handler:addHeaderBlock](#).

Inserts a document into a SOAP message as a new header element (block).

Input Parameters

messageContext

Object Message context containing the SOAP message to which to add a header element.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the

message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.

QName **Document** Optional. Qualified name (namespace name and local name) of the header element to add.

The *QName* document references the [pub.soap.utils:QName](#) document type.

Note:

If you do not specify *QName* value, you must specify *documentType*.

headerDocument **Document** Document to add as a header element. Integration Server converts the document to an XML node and inserts it as a child element of the header element specified in *QName*.

documentType **String** Optional. Name of the IS document type that specifies the structure and namespaces of the document to use as a new header element. Integration Server uses the universal name assigned to the IS document type to determine the qualified name to use for the new header element. If you specify *documentType*, *headerDocument* must be an instance of this document type.

Note:

If you do not specify *documentType*, you must specify *QName*.

mustUnderstand **String** Optional. Sets the value of the `mustUnderstand` attribute for the new header element (block). The `mustUnderstand` attribute specifies whether recipients (the actor or role at which the header is targeted) are required to process a header entry. Recipients that cannot process a mandatory header entry must reject the message and return a SOAP fault.

Set to:

- `true` to indicate that processing the header entry is optional.
- `false` to indicate that processing the header entry is mandatory.

There is no default value.

If you do not set *mustUnderstand*, Integration Server omits the `mustUnderstand` attribute from the header entry, which is equivalent to setting *mustUnderstand* to `false`.

Note:

In SOAP 1.2, the values of the `mustUnderstand` attribute changed from 0 and 1 to `True` and `False`; however, Integration Server processes both sets of values the same and performs any necessary conversions.

actor

String Optional. Target of the header entry. The value of *actor* determines the value of the actor or role attribute for the header entry. The actor or role attribute specifies a URI for the recipient of a header entry.

If you do not specify a value for *actor*, the actor or role attribute will be blank in the SOAP header. In SOAP 1.1, this indicates that the recipient is the ultimate destination of the SOAP message. In SOAP 1.2, this is equivalent to supplying that attribute with the value "http://www.w3.org/2003/05/soap-envelope/role/ultimateReceiver".

Note:

In SOAP 1.2, the actor attribute is named role; however, Integration Server processes both names the same and performs any necessary conversions.

Output Parameters

None.

Usage Notes

QName and *documentType* are mutually exclusive. Even though the parameters are optional, you must specify one or the other. If you do not specify either, Integration Server displays the following error:

```
[ISS.0088.9422] One of the mutually exclusive parameter QName or documentType is missing or invalid.
```

If you specify values for *QName* and *documentType*, Integration Server uses the *QName* value and ignores *documentType*.

For more information about the `mustUnderstand` and `actor` attributes in SOAP 1.1, see the *Simple Object Access Protocol (SOAP) 1.1 - W3C Note 08 May 2000* at <http://www.w3.org/TR/SOAP/>.

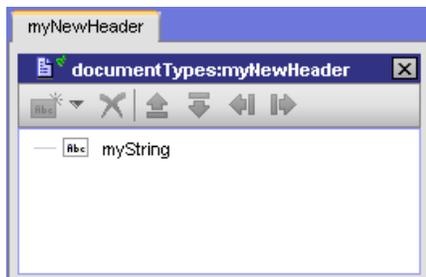
For more information about the `mustUnderstand` and `role` attributes in SOAP 1.2, see the *Simple Object Access Protocol (SOAP) 1.2 specification* at <http://www.w3.org/TR/SOAP12/>.

Example

Suppose that *messageContext* contains a SOAP message with an empty SOAP header and you want to add a header element by passing the `pub.soap.handler:addHeaderElement` service the following input parameters:

Input Parameter	Provided Value
<i>QName</i>	<i>namespaceName</i> userHandlerNamespaceName
	<i>localName</i> userHandlerLocalName

Input Parameter	Provided Value
<i>headerDocument</i>	An instance of <code>documentTypes:myNewHeader</code> , which contains a single field of type <code>String</code> named <i>myString</i> . The value of <i>myString</i> is: value of <code>myString</code> field.
<i>documentType</i>	Not provided.
<i>mustUnderstand</i>	true
<i>actor</i>	soapActor



Execution of the [pub.soap.handler:addHeaderElement](#) service results in this SOAP header for SOAP 1.1:

```
<SOAP-ENV:Envelope
xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/">
<SOAP-ENV:Header
xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
<HDR:userHandlerLocalName
xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:HDR="userHandlerNamespaceName"
SOAP-ENV:actor="soapActor" SOAP-ENV:mustUnderstand="1">
<myString>Value of myString field.</myString>
</HDR:userHandlerLocalName>
</SOAP-ENV:Header>
<SOAP-ENV:Body>
...
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Integration Server uses HDR as the namespace prefix for the namespace name of the header.

See Also

[pub.soap.handler:getHeaderElement](#)

[pub.soap.handler:removeHeaderElement](#)

pub.soap.handler:generateDocumentTypesFromWSDL

WmPublic. Generates IS document types from a WSDL.

Input Parameters

<i>wsdlURL</i>	<p>String Optional. Network accessible URL to a WSDL document or the path to and name of a WSDL on the same file system as the Integration Server.</p> <p>Note: All the XML Schema definitions and WSDL documents imported by or included by the target WSDL document must be network accessible or on the local file system as well.</p>
<i>wsdlString</i>	<p>String Optional. WSDL document as a string.</p> <p>Note: All the XML Schema definitions and WSDL documents imported by or included by the target WSDL document must be network accessible or on the local file system as well.</p>
<i>targetPackageName</i>	<p>String Name of the package in which to place the generated IS document types on Integration Server.</p>
<i>targetFolderName</i>	<p>String Name of the folder in which to place the generated IS document types. Use the format <i>folder.subfolder</i> to specify the folder name. The folder must be empty or must not yet exist.</p>
<i>generateheaderDocs</i>	<p>String Optional. Flag indicating whether the service should generate the documents corresponding to headers in the SOAP messages described in the WSDL document. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to generate the documents. This is the default. ■ <code>false</code> to skip generating the documents.
<i>generateBodyDocs</i>	<p>String Optional. Flag indicating whether the service should generate the documents corresponding to SOAP body in the SOAP messages described in the WSDL document. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to generate the documents. ■ <code>false</code> to skip generating the documents. This is the default.
<i>generateFaultDocs</i>	<p>String Optional. Flag indicating whether the service should generate the documents corresponding to SOAP faults in the SOAP messages described in the WSDL document. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to generate the documents. ■ <code>false</code> to skip generating the documents. This is the default.
<i>generateXOPObjectForBase64Binary</i>	<p>String Optional. Flag indicating whether the service should generate fields of type <code>com.wm.util.XOPObject</code> corresponding to the <code>xsd:base64Binary</code> elements. Set to:</p>

- `true` to generate fields of type `com.wm.util.XOPObject`.
- `false` to skip generating fields of type `com.wm.util.XOPObject`. This is the default.

contentModelCompliance **String** Optional. Flag that specifies how strictly the service represents content models from the XML Schema definition in the generated IS document types. Set to:

- `strict` to generate the IS document type only if Integration Server can represent the content models defined in the XML Schema definition correctly. Document type generation fails if Integration Server cannot accurately represent the content models in the source XML Schema definition.

Currently, Integration Server does not support repeating model groups, nested model groups, or the any attribute. If you select strict compliance, Integration Server does not generate an IS document type from any XML schema definition that contains those items.

- `lax` to generate an IS document type that correctly represents the content models for the complex types defined in the XML schema definition, when possible. If Integration Server cannot correctly represent the content model in the XML Schema definition in the resulting IS document type, Integration Server generates the IS document type using a compliance mode of `None`.

When compliance is set to `lax`, Integration Server will generate the IS document type even if the content models in the XML schema definition cannot be represented correctly.

- `none` to generate an IS document type that does not necessarily represent or maintain the content models in the source XML Schema definition.

When compliance is set to `none`, Integration Server generates IS document types the same way they were generated in Integration Server releases prior to version 8.2.

Output Parameters

warnings

Document List Conditional. Contains any warnings encountered while generating IS document types from the provided WSDL.

Usage Notes

wSDLURL and *wSDLString* are mutually exclusive. Even though the parameters are optional, you must specify one or the other. If you do not specify either, Integration Server displays the following error:

ISS.0088.9422 Either parameter {0} or {1} must be provided.

If you specify values for *wSDLURL* and *wSDLString*, Integration Server uses *wSDLString* and ignores *wSDLURL*.

If the WSDL provided in *wSDLURL* or *wSDLString* is invalid, the service ends in error.

If the package specified in *targetPackageName* does not exist, the service ends in error.

If the folder specified in *targetFolderName* does not exist, Integration Server creates it when the service executes.

If the folder specified in *targetFolderName* exists but is not empty, the service ends in error.

If you want execute this service for the same WSDL more than once, make sure to specify a different *targetFolderName* or delete the contents of *targetFolderName* before re-executing the service for the WSDL again.

If the service ends in error, it throws any errors or warnings as an exception and does not create any IS document types. However, if the service encounters warnings, it places the warnings in the *warnings* field and generates any IS document types.

pub.soap.handler:getBodyBlock

WmPublic. Retrieves a body block from a SOAP message.

Input Parameters

<i>messageContext</i>	<p>Object Message context containing the SOAP message from which to retrieve the body block.</p> <p>A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.</p>
<i>documentType</i>	<p>String Optional. Fully qualified name of the IS document type that specifies the structure of the SOAP body block to be retrieved from the SOAP message.</p> <p>Specify a document type that Integration Server created while creating the consumer or the WSDL first provider web service descriptor or one that was created using the pub.soap.handler:generateDocumentTypesFromWSDL service.</p> <p>If you do not specify a document type, the service performs a literal conversion of body block; that is, the conversion will not consider style or use.</p>

validate

String Optional. Flag that indicates whether you want the service to validate the document returned in the *outputBodyBlock/bodyDocument* parameter against the IS document type specified in the *documentType* input parameter. If you do not use *documentType* to specify an IS document type, the validation will fail.

Set *validate* to:

- `true` to validate the body block. If the validation fails, an exception is thrown.
- `false` to skip validating the body block. This is the default.

Output Parameters

outputBodyBlock **Document** Contents of the body block.

Key	Description						
<i>operationQName</i>	<p>Document Qualified name for the web service wrapper that wraps the XML payload. The service only returns <i>operationQName</i> for RPC/Encoded and RPC/Literal services.</p> <p>The <i>operationQName</i> document references the pub.soap.util:QName document type.</p>						
	<table border="1"> <thead> <tr> <th style="border-bottom: 1px solid black;">Key</th> <th style="border-bottom: 1px solid black;">Description</th> </tr> </thead> <tbody> <tr> <td><i>namespaceName</i></td> <td>String Namespace name for the web service operation.</td> </tr> <tr> <td><i>localName</i></td> <td>String Name of the web service operation on which the handler is being written.</td> </tr> </tbody> </table>	Key	Description	<i>namespaceName</i>	String Namespace name for the web service operation.	<i>localName</i>	String Name of the web service operation on which the handler is being written.
Key	Description						
<i>namespaceName</i>	String Namespace name for the web service operation.						
<i>localName</i>	String Name of the web service operation on which the handler is being written.						
<i>bodyDocument</i>	Contents of the body block. If <i>documentType</i> was specified, the service uses the IS document type to determine the structure of <i>bodyDocument</i> . Otherwise, the service performs a literal conversion of body block; that is, the conversion will not consider style or use.						

See Also

[pub.soap.handler:addBodyBlock](#)

[pub.soap.handler:removeBodyBlock](#)

pub.soap.handler:getBodyBlockQNames

WmPublic. Returns the QName for each body block in a SOAP message.

Note:

RPC/Encoded and RPC/Literal services can have only one body block. However, Document/Literal services can have multiple body blocks.

Input Parameters

messageContext

Object Message context containing the SOAP message from which to retrieve the body block QNames.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.

Output Parameters

bodyBlockQNames

Document List A list of documents containing the qualified names (namespace name and local name) for each body block.

The *bodyBlockQName* document references the [pub.soap.util:QName](#) document type.

See Also

[pub.soap.handler:removeBodyBlock](#)

pub.soap.handler:getFaultBlock

WmPublic. Retrieves a fault block from a SOAP message.

Input Parameters

messageContext

Object Message context containing the SOAP message from which to retrieve the fault block.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message

context, which enables you to use the message context to pass information among handlers.

documentTypes

String List Optional. Fully qualified name of the possible IS document types that could represent the structure of *soapFault/detail*.

Specify document types that Integration Server created while creating the consumer or the WSDL first provider web service descriptor or ones that were created using the [pub.soap.handler:generateDocumentTypesFromWSDL](#) service.

If you do not specify any document type, the service performs a literal conversion of the document; that is, the conversion will not consider style or use.

validate

String Optional. Flag that indicates whether you want the service to validate *soapFault/detail* against one of the IS document types specified in the *documentTypes* input parameter.

Set *validate* to:

- `true` to validate the contents of *soapFault/detail*.

To validate the service uses an IS document type from *documentTypes* that matches the structure. If none of the IS document types specified in *documentTypes* match, validation fails. If you do not use *documentTypes* to specify IS document types, the validation fails. If the validation fails, an exception is thrown.

- `false` to skip validating the contents of *soapFault/detail*. This is the default.

Output Parameters

Document Contents of the fault block.

Key	Description												
<i>soapFault</i>	Document The retrieved fault block.												
	<table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>code</i></td> <td>Document Contains the fault code and possible subcodes.</td> </tr> <tr> <td></td> <td> <table border="1"> <thead> <tr> <th>Key</th> <th>Descriptions</th> </tr> </thead> <tbody> <tr> <td><i>namespaceName</i></td> <td>String Namespace name for the SOAP fault code.</td> </tr> <tr> <td><i>localName</i></td> <td>String Code that identifies the fault.</td> </tr> </tbody> </table> </td> </tr> </tbody> </table>	Key	Description	<i>code</i>	Document Contains the fault code and possible subcodes.		<table border="1"> <thead> <tr> <th>Key</th> <th>Descriptions</th> </tr> </thead> <tbody> <tr> <td><i>namespaceName</i></td> <td>String Namespace name for the SOAP fault code.</td> </tr> <tr> <td><i>localName</i></td> <td>String Code that identifies the fault.</td> </tr> </tbody> </table>	Key	Descriptions	<i>namespaceName</i>	String Namespace name for the SOAP fault code.	<i>localName</i>	String Code that identifies the fault.
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Key	Descriptions												
<i>namespaceName</i>	String Namespace name for the SOAP fault code.												
<i>localName</i>	String Code that identifies the fault.												

<i>subCodes</i>	Document List Subcodes that provide further detail. Each Document in the <i>subCodes</i> Document List contains: <ul style="list-style-type: none"> ■ <i>namespaceName</i> for the subcode ■ <i>localName</i> that identifies the subcode 						
<i>reasons</i>	Document List Reasons for the SOAP fault. Each Document in the Document List contains a human readable explanation of the cause of the fault.						
	<table> <thead> <tr> <th>Key</th> <th>Descriptions</th> </tr> </thead> <tbody> <tr> <td><i>*body</i></td> <td>String Text explaining the cause of the fault.</td> </tr> <tr> <td><i>@lang</i></td> <td>String Optional. Language for the human readable description.</td> </tr> </tbody> </table>	Key	Descriptions	<i>*body</i>	String Text explaining the cause of the fault.	<i>@lang</i>	String Optional. Language for the human readable description.
Key	Descriptions						
<i>*body</i>	String Text explaining the cause of the fault.						
<i>@lang</i>	String Optional. Language for the human readable description.						
<i>node</i>	String URI to the SOAP node where the fault occurred.						
<i>role</i>	String Role in which the node was operating at the point the fault occurred.						
<i>detail</i>	Document Application-specific details about the SOAP fault.						

See Also

[pub.soap.handler:addFaultBlock](#)

pub.soap.handler:getHeaderBlock

WmPublic. Retrieves a header block from a SOAP message.

Input Parameters

<i>messageContext</i>	Object Message context containing the SOAP message from which to retrieve a header block. A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.
<i>documentType</i>	String Fully qualified name of the IS document type that specifies the structure to apply to the content of the header block.

Specify a document type that Integration Server created while creating the consumer or the WSDL first provider web service descriptor or one that was created using the [pub.soap.handler:generateDocumentTypesFromWSDL](#) service.

Integration Server uses the QName of the first field of the document type to determine which header block to retrieve from the SOAP message.

validate

String Optional. Flag that indicates whether you want the service to validate the document returned in the *outputHeaderBlock/headerDocument* parameter against the IS document type specified in the *documentType* input parameter.

Set *validate* to:

- `true` to validate *outputHeaderBlock/headerDocument*. If the validation fails, an exception is thrown.
- `false` to skip validating *outputHeaderBlock/headerDocument*. This is the default.

Output Parameters

outputHeaderBlock

Document List Content of the requested header block(s) as IData. This service returns multiple header blocks if the QName of the first field of the document type matches multiple header blocks in the SOAP message.

Key	Description
<i>mustUnderstand</i>	<p>String Flag indicating whether the <code>mustUnderstand</code> attribute is present in the retrieved header block. A value of:</p> <ul style="list-style-type: none"> ■ <code>true</code> indicates that the header block contained <code>mustUnderstand="true"</code>. ■ <code>false</code> indicates that the <code>mustUnderstand</code> attribute was absent from the header block or <code>mustUnderstand="false"</code>.
<i>role</i>	<p>String For a SOAP 1.1 message, specifies the value of the <code>actor</code> attribute. For a SOAP 1.2 message, specifies the value of the <code>role</code> attribute.</p> <p>The <i>role</i> parameter is not returned if the <code>actor</code> attribute is absent from a SOAP 1.1 message or if the <code>role</code> attribute is absent from a SOAP 1.2 message.</p>

headerDocument

Document Contents of the header block. The IS document type specified for the *documentType* input parameter determines structure of *headerDocument*

Usage Notes

This service replaces [pub.soap.handler:getHeaderElement](#), which is deprecated.

If the very first field in the IS document type specified for *documentType* does not contain a QName, the service returns an empty *outputHeaderBlock* and does not throw an error.

If the QName of the very first field in the IS document type specified for *documentType* does not match a QName of a header block in the SOAP message, the service returns an empty *outputHeaderBlock* and does not throw an error.

If the QName of the very first field in the IS document type specified for *documentType* matches a QName of a header block in the SOAP message but the content of the header block does not match the fields in the IS document type, then the retrieved *headerDocument* fails validation with the error

```
[ISS.0088.9432] SOAP Header data does not conform to Header Record
```

See Also

[pub.soap.handler:addHeaderBlock](#)

[pub.soap.handler:removeHeaderBlock](#)

pub.soap.handler:getHeaderBlockQNames

WmPublic. Returns the QName for each header block in a SOAP message.

Input Parameters

messageContext

Object Message context containing the SOAP message from which to retrieve the header block QNames.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.

Output Parameters

headerBlockQNames **Document List** A list of documents containing the qualified names (namespace name and local name) in the header block.

The *headerBlockQName* document references the [pub.soap.utils:QName](#) document type.

Usage Notes

You can use the [pub.soap.handler:getHeaderBlockQNames](#) to identify the header block QNames in a SOAP message and then use [pub.soap.handler:removeHeaderBlock](#) to remove specific header blocks.

See Also

[pub.soap.handler:removeHeaderBlock](#)

pub.soap.handler:getHeaderElement

WmPublic. *Deprecated* - Replaced by [pub.soap.handler:getHeaderBlock](#).

Retrieves a header element from a SOAP message.

Input Parameters

messageContext **Object** Message context containing the SOAP message from which to retrieve a header element.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.

QName **Document** Optional. Qualified name (namespace name and local name) of the header element to retrieve.

The *QName* document references the [pub.soap.utils:QName](#) document type. If you do not specify *QName*, you must specify *documentType*.

documentType **String** Optional. Fully qualified name of the IS document type that specifies the structure to impose on the resulting document. Integration Server uses the explicit universal name assigned to the document type to determine which header element to retrieve from the SOAP message.

If you do not specify *documentType*, you must specify *QName*.

Output Parameters

outputHeaderDocument **Document** Header element from the SOAP message in the form of a document (IData).

Usage Notes

QName and *documentType* are mutually exclusive. Even though the parameters are optional, you must specify one or the other. If you do not specify either, Integration Server displays the following error:

```
[ISS.0088.9422] One of the mutually exclusive parameter QName or documentType is missing or invalid.
```

If you specify values for *QName* and *documentType*, Integration Server uses *QName* and ignores *documentType*.

Example

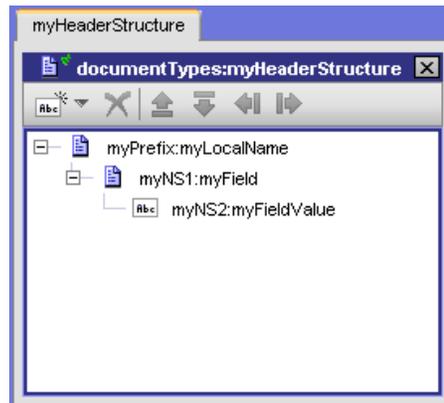
Suppose that *messageContext* contains a SOAP message with the following header:

```
<SOAP-ENV:Envelope
xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:user="userHandlerNamespaceName" xmlns:pfx="pfx1namespace"
xmlns:ns1="ns1namespace" xmlns:ns2="ns2namespace">
<SOAP-ENV:Header>
<user:userHandlerLocalName>
<pfx:myLocalName>
<ns1:myField>
<ns2:myFieldValue>someValue</ns2:myFieldValue>
</ns1:myField>
</pfx:myLocalName>
</user:userHandlerLocalName>
</SOAP-ENV:Header>
<SOAP-ENV:Body>
...
</SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

Additionally, suppose that `pub.soap:handler:getHeaderElement` uses the following input values, where *messageContext* has already been obtained:

Input Parameter	Provided Value
<i>QName</i>	<i>namespaceName</i> userHandlerNamespaceName
	<i>localName</i> userHandlerLocalName
<i>documentType</i>	documentTypes:myHeaderStructure

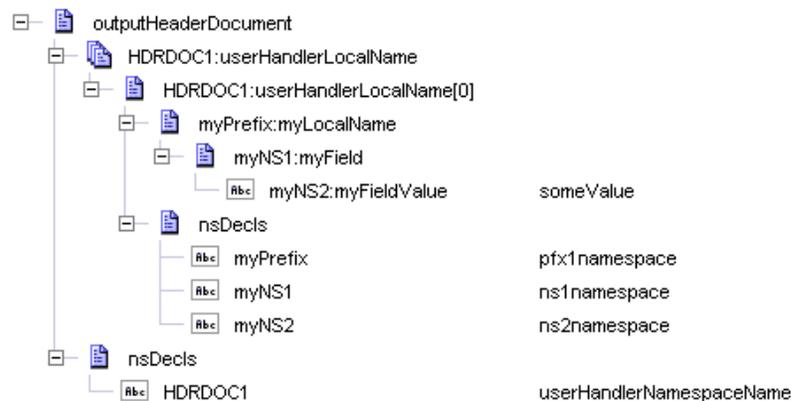
The structure of `documentTypes:myHeaderStructure` looks like this:

Input Parameter**Provided Value**

The prefixes in documentTypes:myHeaderStructure refer to the following namespaces.

Prefix	Namespace
myPrefix	pxf1namespace
myNS1	ns1namespace
myNS2	ns2namespace

Execution of the [pub.soap.handler:getHeaderElement](#) service results in the following value for *outputHeaderDocument*:



Integration Server uses the following conventions in *outputHeaderDocument*:

- *outputHeaderDocument* always contains a document list named *HDRDOC1:localName*. The document list contains the header retrieved by the [pub.soap.handler:getHeaderElement](#) service.
- Integration Server uses HDRDOC1 as the prefix for the header element (block). The value of HDRDOC1 is the namespace name portion of the QName. The *outputHeaderDocument/nsDecls* document identifies the namespace associated with the namespace prefix of the requested header element (block).

- The `HDRDOC1:localName [0]` document contains an `nsDecls` document that identifies the namespace prefixes used within the retrieved header element. Integration Server replaces the prefixes used in the SOAP envelope with the prefixes that the document type specifies for the same namespaces.

Integration Server uses the same general structure when placing SOAP headers in the pipeline for IS services acting as web services. For more information, see "Server Configuration Parameters" in *webMethods Integration Server Administrator's Guide*.

See Also

[pub.soap.handler:addHeaderElement](#)

[pub.soap.handler:removeHeaderElement](#)

pub.soap.handler:getInitialSOAPMessage

WmPublic. Gets the initial SOAP request message from a given message context.

Input Parameters

messageContext **Object** Message context from which to retrieve the initial SOAP request message.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.

Output Parameters

initialSOAPMessage **Object** Object of type `javax.xml.soap.SOAPMessage` that represents the initial SOAP request message.

Usage Notes

You can use the initial SOAP request message retrieved by this service in the outbound callback service. For more information about outbound callback services, see the section *What Are Outbound Callback Services* in the *Web Services Developer's Guide*.

You can use the SOAP message retrieved by this service with any existing public service that takes an object of type `javax.xml.soap.SOAPMessage` as input.

In case of consumer web service descriptors, the [pub.soap.handler:getInitialSOAPMessage](#) service returns the initial outbound SOAP request that Integration Server builds just before sending the SOAP request to the web service provider.

pub.soap.handler:getMessageAddressingProperties

WmPublic. Gets the message addressing properties of the SOAP message in the provided message context.

Input Parameters

<i>messageContext</i>	<p>Object Message context from which to retrieve the message addressing property value.</p> <p>A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.</p>
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Output Parameters

<i>messageAddressingProperties</i>	Document Value of the specified message addressing property.
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Key	Description						
<i>messageID</i>	String Conditional. Unique identifier of the SOAP message.						
<i>relatesTo</i>	Document List Conditional. Contains the relationship information to another SOAP message.						
	<table border="1"> <thead> <tr> <th style="text-align: left;">Key</th> <th style="text-align: left;">Description</th> </tr> </thead> <tbody> <tr> <td><i>value</i></td> <td>String Message ID of the related message.</td> </tr> <tr> <td><i>relationshipType</i></td> <td>String Conditional. The relationship type.</td> </tr> </tbody> </table>	Key	Description	<i>value</i>	String Message ID of the related message.	<i>relationshipType</i>	String Conditional. The relationship type.
Key	Description						
<i>value</i>	String Message ID of the related message.						
<i>relationshipType</i>	String Conditional. The relationship type.						
<i>action</i>	String Conditional. WS-Addressing action specified in the message addressing property of the SOAP message.						
<i>to</i>	<p>Document Conditional. The endpoint reference that specifies the address of the intended receiver of the SOAP message. The <i>to</i> endpoint reference includes:</p> <ul style="list-style-type: none"> ■ <i>attributes</i>, which includes namespaceName, localname, and their values. 						

- *address* and its attributes and values.
 - *referenceParameters*
 - *metadata* and its attributes and elements
 - *extensibleElements*, which are any other elements usually provided for future extensions.
- from* **Document** Conditional. The endpoint reference that specifies the source of the SOAP message. The *from* endpoint reference includes:
- *attributes*, which includes namespaceName, localname, and their values.
 - *address* and its attributes and values.
 - *referenceParameters*
 - *metadata* and its attributes and elements.
 - *extensibleElements*, which are any other elements usually provided for future extensions.
- replyTo* **Document** Conditional. The endpoint reference that specifies the destination address of the response (reply) message. The *replyTo* endpoint reference includes:
- *attributes*, which includes namespaceName, localname, and their values.
 - *address* and its attributes and values.
 - *referenceParameters*
 - *metadata* and its attributes and elements.
 - *extensibleElements*, which are any other elements usually provided for future extensions.
- faultTo* **Document** Conditional. The endpoint reference that specifies the address to which the SOAP fault messages are routed. The *faultTo* endpoint reference includes:
- *attributes*, which includes namespaceName, localname, and their values.
 - *address* and its attributes and values.
 - *referenceParameters*
 - *metadata* and its attributes and elements.

- *extensibleElements*, which are any other elements usually provided for future extensions.

pub.soap.handler:getProperty

WmPublic. Gets the value of a specified property from a message context.

Input Parameters

<i>messageContext</i>	Object Message context from which to retrieve a property value. A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers. For example, in a chain of request header handlers, the first request header handler could set a message property that the second request header handler retrieves.
<i>key</i>	String Name of the selected property whose value to retrieve.

Output Parameters

<i>value</i>	Object Value of the specified property.
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Usage Notes

To access the contents of the service pipeline, use the [pub.soap.handler:getServicePipeline](#) instead of the [pub.soap.handler:getProperty](#) service.

See Also

[pub.soap.handler:getServicePipeline](#)

[pub.soap.handler:removeProperty](#)

[pub.soap.handler:setProperty](#)

pub.soap.handler:getServicePipeline

WmPublic. Gets the service pipeline from a given message context.

Input Parameters

messageContext

Object Message context from which to get the service pipeline.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.

Output Parameters

servicePipeline

Document Document (IData) containing the service pipeline.

The contents of *servicePipeline* depend on whether the `pub.soap.handler.getServicePipeline` service executes as part of a consumer handler chain or a provider handler chain and which type of handler service (request, response, or fault) executes the service.

For this consumer handler service...

servicePipeline contains...

Request handler service Contents of the web service connector pipeline after any pipeline mapping or manipulation occurs during execution of the web service connector but just before Integration Server sends the SOAP request.

Response handler service

The pipeline that becomes the web service connector output pipeline. At this point, the pipeline does not contain data from SOAP response. Integration Server adds the data from the SOAP response after handler processing completes.

Fault handler service

The contents of the web service connector output pipeline. At this point, the pipeline does not contain data from the SOAP fault. Integration Server adds the data from the SOAP fault after handler processing completes.

For this provider handler service...

servicePipeline contains...

Request handler service The pipeline passed as input to the endpoint service. At this point, the pipeline does not yet contain data from the SOAP request. Integration

	Server places data from the SOAP request in the pipeline after handler processing completes
Response handler service	The output pipeline of the endpoint service that corresponds to the invoked web service operation. <i>servicePipeline</i> also contains data from the SOAP request if the endpoint service did not drop the data from the pipeline during service execution.
Fault handler service	The output pipeline of the endpoint service that corresponds to the invoked web service operation. <i>servicePipeline</i> also contains data from the SOAP request if the endpoint service did not drop the data from the pipeline during service execution.

Usage Notes

Use this service to give handler services access to the contents of the pipeline. The handler service can then pass pipeline contents to another service. For example, during execution of a handler service for a provider web service descriptor, you can use the `pub.soap.handler:getServicePipeline` service to:

- Pass pipeline data from the request handler service to the endpoint service.
- Pass pipeline data from the endpoint service to the response handler service or fault handler service.

During execution of a handler service for a consumer web service descriptor, you can use the `pub.soap.handler:getServicePipeline` service to:

- Pass pipeline data from the web service connector input to the request handler service.
- Pass pipeline data from the response handler service or fault handler service to the web service connector output

Use the `pub.soap.handler:getServicePipeline` service to access the pipeline instead of using the `pub.soap.handler:getProperty` service to access the `servicePipeline` property.

pub.soap.handler:getSOAPMessage

WmPublic. Gets the SOAP message from a given message context.

Input Parameters

messageContext **Object** Message context from which to get the SOAP message.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.

Output Parameters

SOAPMessage **Object** Object of type `javax.xml.soap.SOAPMessage` that represents the SOAP message.

Usage Notes

You can use the SOAP message retrieved by this service with any existing public service that takes an object of type `javax.xml.soap.SOAPMessage` as input. For example, you can use the SOAP message as input for the `pub.soap.utils:addBodyEntry` or `pub.soap.utils:addHeaderEntry` services.

See Also

[pub.soap.handler:setSOAPMessage](#)

pub.soap.handler:getWebServiceInvocationProperties

WmPublic. Fetches the web service invocation properties.

Input Parameters

messageContext **Object** Optional. Message context containing the SOAP message from which to retrieve the web service invocation properties.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.

Output Parameters

soapAction **String** SOAP action associated with the SOAP message request.

binderName **String** Name of the WSBinder being invoked.

<i>binding</i>	String Binding against which the service was invoked.						
<i>portType</i>	String Port type against which the service was invoked.						
<i>operationQName</i>	Document Qualified name for the web service wrapper. The service only returns <i>operationQName</i> for RPC/Encoded and RPC/Literal services.						
	<table> <thead> <tr> <th><u>Key</u></th> <th><u>Description</u></th> </tr> </thead> <tbody> <tr> <td><i>namespaceName</i></td> <td>String Namespace name for the web service operation.</td> </tr> <tr> <td><i>localName</i></td> <td>String Name of the web service operation that was invoked.</td> </tr> </tbody> </table>	<u>Key</u>	<u>Description</u>	<i>namespaceName</i>	String Namespace name for the web service operation.	<i>localName</i>	String Name of the web service operation that was invoked.
<u>Key</u>	<u>Description</u>						
<i>namespaceName</i>	String Namespace name for the web service operation.						
<i>localName</i>	String Name of the web service operation that was invoked.						
<i>style</i>	<p>String Style of the SOAP message. Possible values are:</p> <ul style="list-style-type: none"> ■ document ■ rpc 						
<i>use</i>	<p>String Use of the SOAP message. Possible values are:</p> <ul style="list-style-type: none"> ■ literal ■ encoded 						
<i>inbound</i>	<p>String Flag indicating whether the message is incoming or outgoing. A value of:</p> <ul style="list-style-type: none"> ■ true indicates that the SOAP message is incoming. ■ false indicates that the SOAP message is outgoing. 						
<i>soapVersion</i>	<p>String SOAP version of the message. Possible values are:</p> <ul style="list-style-type: none"> ■ SOAP11 ■ SOAP12 						

pub.soap.handler:handlerSpec

WmPublic. Specification to use as the signature for a service that acts as a header handler.

Input Parameters

<i>messageContext</i>	<p>Object Message context to be processed by the header handler.</p> <p>A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same</p>
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message context, which enables you to use the message context to pass information among handlers.

Output Parameters

statusCode **String** Specifies the status of the handler service execution which indicates the action Integration Server will take next. The *statusCode* parameter must be an integer from 0-3. The action Integration Server takes for a particular status code depends on whether the service is registered as a request handler, response handler, or fault handler. For more information, see the section *What Are Handlers and Handler Services* in the *Web Services Developer's Guide* or *Software AG Designer Online Help*.

If *statusCode* does not contain one of the specified values, Integration Server assumes a value of 0.

faultMessage **String** Conditional. Text to be used in the fault message. Integration Server uses the *faultMessage* value for any handler service that returns a status of 2 and when a response handler service returns a status of 3. For more information, see the section *What Are Handlers and Handler Services* in the *Web Services Developer's Guide*. or *Software AG Designer Online Help*.

Usage Notes

Services that act as header handlers do not need to use the `pub.handler:handlerSpec` specification to define the signature of the service. However, services that act as header handlers must take the input parameters and produce the output parameters identified in this specification.

This specification can be used as the signature for the any handler service (request, response, or fault).

Integration Server altered handler chain processing in version 8.0 SP1. If you want created in Integration Server version 7.x of 8.0 to use the handler chain processing behavior available in Integration Server 7.x and 8.0, set the `watt.server.ws.71xHandlerChainBehavior` server configuration parameter to true. For more information about setting server configuration parameters, see *webMethods Integration Server Administrator's Guide*.

See Also

[pub.soap.handler:registerWmConsumer](#)

[pub.soap.handler:registerWmProvider](#)

pub.soap.handler:hasFaultMessage

WmPublic. Determines whether the SOAP message in a given message context contains a SOAP fault message.

Input Parameters

messageContext

Object Message context from which to get the SOAP message.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.

Output Parameters

hasFaultMessage

String Flag indicating whether the SOAP message contains a SOAP fault. A value of:

- `True` indicates the SOAP message contains a SOAP fault.
- `False` indicates the SOAP message does not contain a SOAP fault.

pub.soap.handler:listConsumer

WmPublic. Returns a list of the consumer handlers currently registered on Integration Server.

Input Parameters

None.

Output Parameters

Handlers

Document List A document list identifying the registered consumer handlers on Integration Server. Information about each consumer handler is contained in a separate document.

<u>Key</u>	<u>Description</u>
<i>descriptiveName</i>	String Descriptive name assigned to the consumer handler when it was registered.
<i>className</i>	String Class name of the handler.
<i>policyType</i>	String Conditional. Policy type of the handler. <i>policyType</i> does not apply to service handlers.
<i>handleRequestService</i>	String Conditional. Fully qualified name of the service used as the request header handler. This

	parameter is returned only if a request handler service was registered with the consumer handler.						
<i>handleResponseService</i>	String Conditional. Fully qualified name of the service used as the response header handler. This parameter is returned only if a response handler service was registered with the consumer handler.						
<i>handleFaultService</i>	String Conditional. Fully qualified name of the service used as the fault header handler. This parameter is returned only if a fault handler service was registered with the consumer handler.						
<i>Headers</i>	Document List List of QNames for the headers (i.e., IS document types) registered with the consumer handler.						
	<table><thead><tr><th><u>Key</u></th><th><u>Description</u></th></tr></thead><tbody><tr><td><i>namespace</i></td><td>String Namespace portion of the header's qualified name.</td></tr><tr><td><i>localName</i></td><td>String Local portion of the header's qualified name.</td></tr></tbody></table>	<u>Key</u>	<u>Description</u>	<i>namespace</i>	String Namespace portion of the header's qualified name.	<i>localName</i>	String Local portion of the header's qualified name.
<u>Key</u>	<u>Description</u>						
<i>namespace</i>	String Namespace portion of the header's qualified name.						
<i>localName</i>	String Local portion of the header's qualified name.						

pub.soap.handler:listProvider

WmPublic. Returns a list of the provider handlers currently registered on Integration Server.

Input Parameters

None.

Output Parameters

Handlers **Document List** A document list identifying the registered consumer handlers on Integration Server. Information about each consumer handler is contained in a separate document.

<u>Key</u>	<u>Description</u>
<i>descriptiveName</i>	String Descriptive name given to the provider handler when it was registered.
<i>className</i>	String Class name of the handler.

<i>policyType</i>	String Conditional. Policy type of the handler. <i>policyType</i> does not apply to service handlers.
<i>handleRequestService</i>	String Conditional. Fully qualified name of the service used as the request header handler. This parameter is returned only if a request handler service was registered with the provider handler.
<i>handleResponseService</i>	String Conditional. Fully qualified name of the service used as the response header handler. This parameter is returned only if a response handler service was registered with the provider handler.
<i>handleFaultService</i>	String Conditional. Fully qualified name of the service used as the fault header handler. This parameter is returned only if a fault handler service was registered with the provider handler.
<i>Headers</i>	Document List List of QNames for the headers registered with the provider handler.

<u>Key</u>	<u>Description</u>
<i>namespace</i>	String Namespace portion of the header's qualified name.
<i>localName</i>	String Local portion of the header's qualified name.

pub.soap.handler:registerConsumer

WmPublic. *Deprecated* - Replaced by [pub.soap.handler:registerWmConsumer](#).

Registers a handler based on JAX-RPC with a consumer Web service descriptor.

Input Parameters

<i>descriptiveName</i>	String Name that you want to assign to the SOAP consumer handler.
<i>handler</i>	Object The instance of the handler object.
<i>handlerInfo</i>	Object Optional. The instance of the handlerInfo object.

Output Parameters

None.

pub.soap.handler:registerProvider

WmPublic. *Deprecated* - Replaced by [pub.soap.handler:registerWmProvider](#).

Registers a handler based on JAX-RPC with a provider Web service descriptor.

Input Parameters

<i>descriptiveName</i>	String Name that you want to assign to the SOAP provider handler.
<i>handler</i>	Object The instance of the handler object.
<i>handlerInfo</i>	Object Optional. The instance of the handlerInfo object.

Output Parameters

None.

pub.soap.handler:registerWmConsumer

WmPublic. Registers a handler for use with consumer.

Input Parameters

<i>descriptiveName</i>	String Name to assign to the consumer header handler. Each consumer header handler must have a unique name.
<i>QNameList</i>	Document List Optional. Qualified names of the headers on which the handler operates. In the document list, each document references the pub.soap.utils:QName document type.
<i>handleRequestService</i>	String Optional. Fully qualified name of the service to use as the request header handler.
<i>handleResponseService</i>	String Optional. Fully qualified name of the service to use as the response header handler.
<i>handleFaultService</i>	String Optional. Fully qualified name of the service to use as the fault header handler.

Output Parameters

None.

Usage Notes

This service replaces [pub.soap.handler:registerConsumer](#), which is deprecated.

Before you register a consumer header handler, create the services that will act as the request, response, and fault header handlers.

Integration Server stores information about registered header handlers in memory. Integration Server does not persist registered header handler information across restarts. Consequently, you must register header handlers each time Integration Server starts. To accomplish this, create a service that registers a header handler and make that service a start up service for the package that contains the services that act as header handlers.

You can use a consumer header handler with consumer (WSD) only.

Specify a value for *QNameList* if you want to associate with handler with one or more QNames. Registering QNames with a handler provides the following benefits:

- Integration Server can perform `mustUnderstand` checking for the header with the QName at run time. If a service receives a SOAP message in which a header requires `mustUnderstand` processing by the recipient, Integration Server uses the header QName to locate the handler that processes the header. Note that the handler must be part of the handler chain for the WSD that contains the service.
- When adding headers to a WSD, Designer populate the list of IS document types that can be used as headers in the WSD with the IS document types whose QNames were registered with the handlers already added to the WSD. If you add a IS document type as a header to a WSD and the QName of that IS document type is not associated with a handler, Designer add the header but display a warning stating that there is not an associated handler.
- When consuming WSDL to create a provider or consumer WSD, Integration Server automatically adds a handler to the resulting WSD if the WSDL contains a QName supported by the handler.

Use the [pub.soap.handler:registerWmProvider](#) service to register a header handler for use with provider.

To unregister a consumer header handler, use the `pub.soap.handler:unregisterConsumer` service.

If you specify a service that does not exist for *handleRequest*, *handleResponse*, or *handleFaultService*, Integration Server throws this error:

```
[ISS.0088.9421] The service <serviceName> does not exist.
```

If a registered handler with the same *descriptiveName* already exists, Integration Server throws this error.

```
[ISS.0088.9423] Service handler <handlerName> is already registered.
```

See Also

[pub.soap.handler:registerWmProvider](#)

pub.soap.handler:registerWmProvider

WmPublic. Registers a header handler for use with provider.

Input Parameters

<i>descriptiveName</i>	String Name to assign to the provider header handler. Each provider header handler must have a unique name.
<i>QNameList</i>	Document List Optional. Qualified names of the headers on which the handler operates. In the document list, each document references the pub.soap.utils:QName document type.
<i>handleRequestService</i>	String Optional. Fully qualified name of the service to use as the request header handler.
<i>handleResponseService</i>	String Optional. Fully qualified name of the service to use as the response header handler.
<i>handleFaultService</i>	String Optional. Fully qualified name of the service to use as the fault header handler.

Output Parameters

None.

Usage Notes

This service replaces [pub.soap.handler:registerProvider](#), which is deprecated.

Before you register a provider header handler, create the services that will act as the request, response, and fault header handlers.

Integration Server stores information about registered header handlers in memory. Integration Server does not persist registered header handler information across restarts. Consequently, you need to register header handlers each time Integration Server starts. To accomplish this, create a service that registers a header handler and make that service a start up service for the package that contains the services that act as header handlers.

You can use a provider header handler with provider only.

Specify a value for *QNameList* if you want to associate with handler with one or more QNames. Registering QNames with a handler provides the following benefits:

- Integration Server can perform mustUnderstand checking for the header with the QName at run time. If a service receives a SOAP message in which a header requires mustUnderstand processing by the recipient, Integration Server uses the header QName to locate the handler that processes the header. Note that the handler must be part of the handler chain for the WSD that contains the service.
- When adding headers to a WSD, Designer populate the list of IS document types that can be used as headers in the WSD with the IS document types whose QNames were registered with the handlers already added to the WSD. If you add a IS document type as a header to a WSD

and the QName of that IS document type is not associated with a handler, Designer add the header but display a warning stating that there is not an associated handler.

- When consuming WSDL to create a provider or consumer WSD, Integration Server automatically adds a handler to the resulting WSD if the WSDL contains a QName supported by the handler.

Use the [pub.soap.handler:registerProvider](#) service to register a header handler for use with consumer.

To unregister a provider header handler, use the [pub.soap.handler:unregisterProvider](#) service.

If you specify a service that does not exist for *handleRequest*, *handleResponse*, or *handleFaultService*, Integration Server throws this error:

```
[ISS.0088.9421] The service <serviceName> does not exist.
```

If a registered handler with the same *descriptiveName* already exists, Integration Server throws this error.

```
[ISS.0088.9423] Service handler <handlerName> is already registered.
```

See Also

[pub.soap.handler:registerProvider](#)

pub.soap.handler:removeBodyBlock

WmPublic. Removes a body block from a SOAP message, leaving an empty SOAP body, <SOAP-ENV:Body></SOAP-ENV:Body>.

Input Parameters

messageContext **Object** Message context that contains the SOAP message from which to remove the body block.

A message context contains properties for the SOAP message as well as providing access to the SOAP message. Integration Server creates the message context and passes it to the handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context. This enables you to use the message context to pass information between handlers.

Output Parameters

None.

Usage Notes

If the service encounters any error when removing the body block, it throws an exception.

If you execute the service against a SOAP message that already contains an empty SOAP body, the service performs no action.

See Also

[pub.soap.handler:addBodyBlock](#)

[pub.soap.handler:getBodyBlock](#)

pub.soap.handler:removeHeaderBlock

WmPublic. Removes a header block from a SOAP message.

Input Parameters

<i>messageContext</i>	<p>Object Message context that contains the SOAP message from which to remove a header block.</p> <p>A message context contains properties for the SOAP message as well as providing access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context. This enables you to use the message context to pass information between handlers.</p>
<i>QName</i>	<p>Object Optional. Qualified name of the header block to remove. The <i>QName</i> document references the pub.soap.utils:QName document type.</p> <p>Note: Either <i>QName</i> or <i>documentType</i> must be supplied.</p>
<i>documentType</i>	<p>String Optional. Fully qualified name of the IS document type that corresponds to the structure of the header block that you want to remove. Integration Server uses the <i>QName</i> of the first element in the IS document type to determine which header block to remove.</p> <p>Note: Either <i>QName</i> or <i>documentType</i> must be supplied.</p>
<i>index</i>	<p>String Optional. An integer representing the position of the header block entry with the specified <i>QName</i> to remove. A SOAP message can contain multiple header blocks with the same <i>QName</i>. If you specify an index, Integration Server removes that occurrence of the header block. Note that 0 (zero) represents the first header block with the specified <i>QName</i>.</p> <p>If <i>index</i> is not provided, Integration Server removes all the header blocks with a matching <i>QName</i>.</p>

For example, if *QName* is `myNSName:myLocalName` and *index* is 1, Integration Server removes the second occurrence of the header block with the *QName* `myNSName:myLocalName`.

Output Parameters

status **String** Indicates whether Integration Server removed the header block.

Key	Description
True	<p>If <i>index</i> was specified, indicates that Integration Server removed the header block with the specified <i>QName</i> at the specified index.</p> <p>If <i>index</i> was not specified, indicates that Integration Server removed all the header blocks matching the specified <i>QName</i></p>
False	<p>If <i>index</i> was specified, indicates that Integration Server did not remove the header block at the specified index.</p> <p>For example, if <i>QName</i> is <code>myNSName:myLocalName</code> and <i>index</i> is 1, and the SOAP message does not contain a second header with the <i>QName</i> <code>myNSName:myLocalName</code>, the <i>status</i> is <code>false</code>.</p> <p>If <i>index</i> was not specified, indicates that Integration Server did not remove at least one header block with the specified <i>QName</i>.</p>

Usage Notes

This service replaces [pub.soap.handler:removeHeaderElement](#), which is deprecated.

Either *QName* or *documentType* must be supplied. If both are provided, Integration Server uses *QName* and ignores *documentType*.

pub.soap.handler:removeHeaderElement

WmPublic. *Deprecated* - Replaced by [pub.soap.handler:removeHeaderBlock](#).

Removes a header element (block) from a SOAP message.

Input Parameters

messageContext **Object** Message context that contains the SOAP message from which to remove a header element (block).

A message context contains properties for the SOAP message as well as providing access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked

by a given instance of a SOAP request or SOAP response use the same message context. This enables you to use the message context to pass information between handlers.

QName **Object** Qualified name of the header element (block) to remove. The *QName* document references the [pub.soap.utils:QName](#) document type.

Output Parameters

status **String** Indicates whether Integration Server successfully removed the header element. A value of:

- `True` indicates that Integration Server removed the header element.
- `False` indicates that Integration Server did not remove the header element because the SOAP message did not contain a header element that matched the provided *QName*.

See Also

[pub.soap.handler:addHeaderElement](#)

[pub.soap.handler:getHeaderElement](#)

pub.soap.handler:removeProperty

WmPublic. Removes a property from a message context.

Input Parameters

messageContext **Object** Message context from which to remove a property.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers. For example, in a chain of request header handlers, the first request header handler could set a message property that the second request header handler retrieves.

key **String** Name of the property to remove.

Output Parameters

None.

Usage Notes

The SOAP message contains properties reserved for use by Integration Server. Do not use [pub.soap.handler:setProperty](#) to set any of these properties or use [pub.soap.handler:removeProperty](#) to remove any of these properties as it may result in unpredictable behavior. The reserved properties are:

ContentType	@MESSAGE_USER_FROM_USER_NAME_TOKEN
originalContext	@MESSAGE_USER_FROM_X509_TOKEN
servicePipeline	@TRANSPORT_URL
style	@TRANSPORT_USER
use	

See Also

[pub.soap.handler:getProperty](#)

[pub.soap.handler:setProperty](#)

pub.soap.handler:setProperty

WmPublic. Sets the value of a specific property in a message context.

Input Parameters

<i>messageContext</i>	Object Message context in which to set a property. A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers. For example, in a chain of request header handlers, the first request header handler could set a message property that the second request header handler retrieves.
<i>key</i>	String Name of the property to set.
<i>value</i>	Object Value to assign to the specified property.

Output Parameters

None.

Usage Notes

The SOAP message contains properties reserved for use by Integration Server. Do not use [pub.soap.handler:setProperty](#) to set any of these properties or use [pub.soap.handler:removeProperty](#) to remove any of these properties as it may result in unpredictable behavior. The reserved properties are:

ContentType	@MESSAGE_USER_FROM_USER_NAME_TOKEN
originalContext	@MESSAGE_USER_FROM_X509_TOKEN
servicePipeline	@TRANSPORT_URL
style	@TRANSPORT_USER
use	

See Also

[pub.soap.handler:getProperty](#)

[pub.soap.handler:removeProperty](#)

pub.soap.handler:setSOAPMessage

WmPublic. Sets the SOAP message in a message context.

Input Parameters

<i>messageContext</i>	Object Message context in which to set the SOAP message. A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the header handler. All handlers invoked by a given instance of a SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.
<i>SOAPMessage</i>	Object of type <code>javax.xml.soap.SOAPMessage</code> to use to overwrite the existing SOAP message in the message context.

Output Parameters

None.

Usage Notes

Use this service with caution, as it overwrites the entire SOAP message, including the SOAP header, body, and fault.

See Also

[pub.soap.handler:getSOAPMessage](#)

pub.soap.handler:unregisterConsumer

WmPublic. Unregisters a consumer web service descriptor handler.

Input Parameters

descriptiveName **String** Name of the consumer web service descriptor handler that you want to unregister.

Output Parameters

None.

pub.soap.handler:unregisterProvider

WmPublic. Unregisters a provider web service descriptor handler.

Input Parameters

descriptiveName **String** Name of the provider web service descriptor handler that you want to unregister.

Output Parameters

None.

pub.soap.handler:updateFaultBlock

WmPublic. Updates the code, subcodes, reasons, node, and role in an existing fault block.

Input Parameters

messageContext **Object** Message context containing the SOAP message that contains the fault block to be updated.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the handler. All handlers invoked by a given instance of a

SOAP request or SOAP response use the same message context, which enables you to use the message context to pass information among handlers.

If the SOAP Message in *messageContext* does not contain a SOAP fault, the service returns the *status* output parameter as *false*.

soapFault

Document The IData instance to be used to update the values in the fault block.

Key	Description																
<i>reasons</i>	Document List Optional. Reasons for the SOAP fault. Each Document in the Document List contains a human readable explanation of the cause of the fault.																
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<i>code</i>	Document Optional. Contains the fault code and possible subcodes.																
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<i>node</i>	String Optional. URI to the SOAP node where the fault occurred.																
<i>role</i>	String Optional. Role in which the node was operating at the point the fault occurred.																

Output Parameters

- status* **String** Flag indicating whether the fault block was updated successfully. A value of:
- `true` indicates that the fault block was successfully updated.
 - `false` indicates that either a fault block is not present in the *messageContext* parameter or that the fault block was not successfully updated.

Usage Notes

You can use this service on a provider response handler or fault handler to update the fault block so that the values for code, subcodes, reasons, node, and role that Integration Server generates can be overridden by the custom values you specify.

If you are using this service to override the information in a fault block in a SOAP 1.1 message, keep the following points in mind:

- If multiple reasons are specified, Integration Server uses only the first reason specified because SOAP 1.1 does not support multiple reasons.
- If any subcodes or node values are specified, Integration Server ignores them because subcodes and node elements are not available in the SOAP 1.1 fault structure.

See Also

[pub.soap.handler:addFaultBlock](#)

[pub.soap.handler:getFaultBlock](#)

pub.soap.processor:list

WmPublic. *Deprecated* - There is no replacement service.

Returns a list of the SOAP processors that are currently registered on the Integration Server.

Input Parameters

None.

Output Parameters

- list* **Document List** List of processors currently registered on the server. Each document in the list contains the following information:

<u>Key</u>	<u>Description</u>
------------	--------------------

<i>directive</i>	String Process directive that is assigned to the SOAP processor.
<i>svcName</i>	String Fully qualified name of the service that functions as the SOAP processor.
<i>descriptiveName</i>	String Descriptive comment that was given to the SOAP processor when it was registered. This element will be empty if the processor was not registered with a descriptive comment.
<i>validateSOAPMessage</i>	String Flag indicating whether the SOAP message handler validates the SOAP messages that this processor sends and receives. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that messages are validated by the SOAP message handler. Be aware that the validation process checks only that the message envelope is structured correctly. For example, it checks the message has at least one body element and there is at most one header element. It does not validate any of the data carried by the message.<p>This setting overrides the server's global <code>watt.server.SOAP.validateSOAPMessage</code> setting.</p>■ <code>indicates</code> that messages are not validated by the SOAP message handler.<p>This setting overrides the server's global <code>watt.server.SOAP.validateSOAPMessage</code> setting.</p> If <i>validateSOAPMessage</i> is null, message validation for the processor is determined by the server's <code>watt.server.SOAP.validateSOAPMessage</code> setting.

Notes

This service is deprecated. There is not a replacement service.

See Also

[pub.soap.processor:registerProcessor](#)

[pub.soap.processor:unregisterProcessor](#)

pub.soap.processor:processMessage

WmPublic. *Deprecated* - There is no replacement service.

Executes the Integration Server's default SOAP processor.

This service behaves exactly like the built-in default SOAP processor. However, this service can be wrapped in a flow service, which enables you to create an access-controlled SOAP processor.

Input Parameters

<i>soapRequestData</i>	Object SOAP object containing the SOAP request submitted to the Integration Server by a client.
<i>soapResponseData</i>	Object Empty SOAP object that the service will use to compose the SOAP response message.

Output Parameters

<i>soapResponseData</i>	Object SOAP object containing the SOAP response message that is to be returned to the client.
-------------------------	--

Usage Notes

This service is deprecated. There is not a replacement service.

You invoke `processMessage` from a wrapper service that you create and register as a SOAP processor on the Integration Server. To impose access control on the processor, you assign an access control list (ACL) to the wrapper service.

pub.soap.processor:processRPCMessage

WmPublic. *Deprecated* - There is no replacement service.

Executes the Integration Server's SOAP RPC processor.

This service behaves exactly like the built-in SOAP RPC processor. However, this service can be wrapped in a flow service, which enables you to create an access-controlled SOAP processor.

Input Parameters

<i>soapRequestData</i>	Object SOAP object containing the SOAP request submitted to the Integration Server by a client.
<i>soapResponseData</i>	Object Empty SOAP object that the service will use to compose the SOAP response message.

Output Parameters

<i>soapResponseData</i>	Object SOAP object containing the SOAP response message that is to be returned to the client.
-------------------------	--

Usage Notes

This service is deprecated. There is not a replacement service.

You invoke `processRPCMessage` from a wrapper service that you create and register as a SOAP processor on the Integration Server. To impose access control on the processor, you assign an access control list (ACL) to the wrapper service.

pub.soap.processor:registerProcessor

WmPublic. *Deprecated* - There is no replacement service.

Registers a service as a SOAP processor on the Integration Server.

Input Parameters

directive **String** Process directive that you want to assign to the SOAP processor.

Note:

Use only letters, digits, or the characters `-_!~*'()` in the name you specify in *directive*.

svcName **String** Fully qualified name of the service that you are registering as a SOAP processor.

descriptiveName **String** Descriptive comment for this SOAP processor. This comment is shown when you run the utility service [pub.soap.processor:list](#) to get a list of the registered SOAP processors.

validateSOAPMessage **String** Optional. Flag indicating whether the SOAP message handler validates the SOAP messages that this processor sends and receives. Set to:

- `true` to validate messages sent and received by this SOAP processor. Be aware that the validation process checks only that the message envelope is structured correctly. For example, it checks the message has at least one body element and there is at most one header element. It does not validate any of the data carried by the message.

This setting overrides the server's global `watt.server.SOAP.validateSOAPMessage` setting.

- `false` to bypass validation on messages sent and received by this SOAP processor.

This setting overrides the server's global `watt.server.SOAP.validateSOAPMessage` setting.

Or, leave *validateSOAPMessage* null to validate messages according to the Integration Server's `watt.server.SOAP.validateSOAPMessage` setting. This is the default.

Output Parameters

None.

Usage Notes

This service is deprecated. There is not a replacement service.

See Also

[pub.soap.processor:list](#)

[pub.soap.processor:unregisterProcessor](#)

pub.soap.processor:unregisterProcessor

WmPublic. *Deprecated* - There is no replacement service.

Unregisters a SOAP processor by removing it from the registry.

Input Parameters

directive

String Process directive that you want to remove from the registry. Directive names are case sensitive.

Tip:

To obtain a list of the current SOAP processor directives registered on the server, run the [pub.soap.processor:list](#) service.

Output Parameters

None.

Usage Notes

This service is deprecated. There is not a replacement service.

If the directive specified in *directive* is not registered on the Integration Server, `unregisterProcessor` throws an exception.

See Also

[pub.soap.processor:list](#)

[pub.soap.processor:registerProcessor](#)

pub.soap.schema:encoding

WmPublic. Schema that defines the data types SOAP supports.

pub.soap.schema:encoding_1_2

WmPublic. Schema that defines the data types SOAP 1.2 supports.

pub.soap.schema:envelope

WmPublic. Schema that defines the structure of a SOAP message.

pub.soap.schema:envelope_1_2

WmPublic. Schema that defines the structure of a SOAP 1.2 message.

pub.soap.utils:addBodyEntry

WmPublic. Inserts an entry into the body element of a SOAP message.

Input Parameters

soapData

Object SOAP object to which you want the body entry added.

bodyEntry

com.wm.lang.xml.Node XML node containing the body entry that you want to add to *soapData*.

Note:

An XML node is a parsable representation of a node in an XML document. You generate an XML node using services such as [pub.xml.xmlStringToXMLNode](#).

Important:

This service adds a single body entry to a SOAP object. If you need to add more than one entry, execute [pub.soap.utils:addBodyEntry](#) once for each entry.

Important:

In webMethods Integration Server versions 6.0.1 and later, this service expects the node in *bodyEntry* to be namespace qualified. If the node is not qualified, the service throws an exception. If you created solutions based on the earlier behavior of this service (which permitted non-qualified entries), you can disable namespace enforcement by setting the server's `watt.server.SOAP.EnforceMsgPartNS` parameter to false.

Output Parameters

soapData **Object** SOAP object to which the body entry was added.

Usage Notes

A SOAP object is an object that represents a SOAP message.

If you are composing a new SOAP message, you must first create an empty SOAP object (called *soapData*) with the `createSoapData` service and then add your header entries to with [pub.soap.utils:addHeaderEntry](#).

If you are composing a SOAP response, you use [pub.soap.utils:addBodyEntry](#) to populate the *soapResponseData* object that the SOAP message handler generates and puts in the pipeline.

See Also

[pub.soap.utils:createSoapData](#)

[pub.soap.utils:addBodyEntry](#)

[pub.soap.utils:addHeaderEntry](#)

[pub.soap.utils:addTrailer](#)

[pub.soap.utils:getBody](#)

pub.soap.utils:addHeaderEntry

WmPublic. Inserts an entry into the header element of a SOAP message.

Input Parameters

soapData **Object** SOAP object to which you want the header entry added.

headerEntry **com.wm.lang.xml.Node** XML node containing the entry that you want to add to *soapData*.

Note:

An XML node is a parsable representation of a node in an XML document. You generate an XML node using services such as [pub.xml:xmlStringToXMLNode](#).

Important:

This service adds a single header entry to a SOAP object. If you need to add more than one entry, execute `addHeaderEntry` once for each entry.

Important:

In webMethods Integration Server versions 6.0.1 and later, this service expects the node in `headerEntry` to be namespace qualified. If the node is not qualified, the service throws an exception. If you created solutions based on the earlier behavior of this service (which permitted non-qualified entries), you can disable namespace enforcement by setting the server's `watt.server.SOAP.EnforceMsgPartNS` parameter to `false`.

mustUnderstand

String Optional. Value to which you want the `mustUnderstand` attribute set.

The `mustUnderstand` attribute specifies whether recipients are required to process a header entry (that is, whether processing of the entry is mandatory or optional). Recipients that cannot process a mandatory header entry must reject the message and return a SOAP fault.

A value of:

- 0 indicates that the header is optional.
- 1 indicates that the header is mandatory.

For additional information about the `mustUnderstand` attribute, see the *Simple Object Access Protocol (SOAP) 1.1 - W3C Note 08 May 2000* at <http://www.w3.org/TR/SOAP/>.

Note:

If you do not set *mustUnderstand*, the `mustUnderstand` attribute is omitted from the header entry, which is equivalent to setting `mustUnderstand` to 0.

actor

String Optional. Value to which you want the `actor` attribute set.

The `actor` attribute specifies a URI that identifies the recipient to which a header entry is targeted. For additional information about the `mustUnderstand` attribute, see the *Simple Object Access Protocol (SOAP) 1.1 - W3C Note 08 May 2000* at <http://www.w3.org/TR/SOAP/>.

Output Parameters

soapData **Object** SOAP object to which the header entry was added.

Usage Notes

A SOAP object is an object that represents a SOAP message.

If you are composing a new SOAP message, you must first create an empty SOAP object (called *soapData*) with the `createSoapData` service and then add your header entries to with [pub.soap.utils:addHeaderEntry](#).

If you are composing a SOAP response, you use `addHeaderEntry` to populate the *soapResponseData* object that the SOAP message handler generates and puts in the pipeline.

See Also

[pub.soap.utils:createSoapData](#)

[pub.soap.utils:addBodyEntry](#)

[pub.soap.utils:addTrailer](#)

[pub.soap.utils:getHeader](#)

[pub.soap.utils:getHeaderEntries](#)

pub.soap.utils:addTrailer

WmPublic. Inserts a trailer in a SOAP message.

(A trailer is an arbitrary element that follows the Body element in the SOAP envelope.)

Important:

It appears likely that trailers will not be permitted in future versions of SOAP (versions 1.2 and later). If you are designing a completely new solution, we recommend that you avoid using trailers. However, if you exchange SOAP messages with older systems that already make use of trailers, this service allows you to insert them into a SOAP message.

Input Parameters

soapData **Object** SOAP object to which you want the trailer added.

trailer **com.wm.lang.xml.Node** XML node containing the trailer that you want to add to *soapData*.

Note:

An XML node is a parsable representation of a node in an XML document. You generate an XML node using services such as [pub.xml:xmlStringToXMLNode](#).

Important:

This service adds a single trailer to a SOAP object. If you need to insert more than one trailer in the message, execute `addTrailer` once for each trailer that needs to be added.

Note:

The SOAP specification states that trailers must be namespace qualified, so be sure that the node in *trailer* specifies a namespace.

Output Parameters

soapData **Object** SOAP object to which the trailer was added.

Usage Notes

A SOAP object is an object that represents a SOAP message.

- If you are composing a new SOAP message, you must first create an empty SOAP object (called *soapData*) with the `createSoapData` service and then add your header entries to with [pub.soap.utils:addHeaderEntry](#).
- If you are composing a SOAP response, you use [pub.soap.utils:addHeaderEntry](#) to populate the *soapResponseData* object that the SOAP message handler generates and puts in the pipeline.

See Also

[pub.soap.utils:createSoapData](#)

[pub.soap.utils:addHeaderEntry](#)

[pub.soap.utils:addBodyEntry](#)

[pub.soap.utils:getTrailers](#)

pub.soap.utils:callbackServiceSpec

WmPublic. Defines the input signature for an outbound callback service.

Input Parameters

messageContext **Object** Message context to be processed by the outbound callback service.

A message context contains properties for the SOAP message and provides access to the SOAP message. Integration Server creates the message context and passes it to the outbound callback service.

Output Parameters

None.

pub.soap.utils:convertToVersionSpecificSOAPFault

WmPublic. Converts the generic SOAP fault structure to the SOAP version-specific fault structure that is used by web service descriptors created in versions of Integration Server prior to 8.2.

Input Parameters

- soapProtocol* **String** Optional. SOAP protocol with which the SOAP fault to convert works. Valid values are SOAP 1.1 Protocol or SOAP 1.2 Protocol. The default is SOAP 1.2 Protocol.
- fault* **Document** The generic SOAP fault that is to be converted.
- The *fault* document references the [pub.soap.utils:soapFault](#) document type.

Output Parameters

SOAP-FAULT **Document** Document containing the converted SOAP fault.

Key	Description
<i>soapProtocol</i>	String Indicates the SOAP protocol to which the SOAP object works. This is the same as the <i>soapProtocol</i> input parameter. Valid values are SOAP 1.1 Protocol or SOAP 1.2 Protocol.
<i>Fault_1_1</i>	Document Conditional. Converted fault information. <i>Fault_1_1</i> and its child variables are populated only when <i>soapProtocol</i> is SOAP 1.1 Protocol.

Key	Description
<i>faultcode</i>	<p>String Conditional. A code that identifies the fault. This field corresponds to the SOAP 1.1 <i>faultcode</i> element.</p> <p>This field is set based on the value of the <i>code/namespaceName</i> field of the <i>fault</i> input parameter.</p> <p>When <i>namespaceName</i> contains:</p>

- <http://schemas.xmlsoap.org/soap/envelope/>, which is the standard namespace name for a SOAP 1.1 Envelope, *faultcode* is set to the following:

SOAP-ENV:*localName*

- **Any other value**, *faultcode* is set to the following:

{*namespaceName*}*localName*

In the above, *localName* is the value of the *code/localName* field and *namespaceName* is value of the *code/namespaceName* field of the *fault* input parameter

<i>faultstring</i>	<p>String Conditional. A human readable explanation of the fault. This field corresponds to the SOAP 1.1 <i>faultstring</i> element.</p> <p>The service maps the <i>*body</i> value from the first <i>reasons</i> document of the <i>fault</i> input parameter.</p>
<i>faultactor</i>	<p>String Conditional. Information about the cause of the fault. This field corresponds to the SOAP 1.1 <i>faultactor</i> element.</p> <p>The service maps the value from the <i>role</i> field of the <i>fault</i> input parameter.</p>
<i>detail</i>	<p>Document Conditional. Application-specific details about the SOAP fault. This field corresponds to the SOAP 1.1 <i>detail</i> element.</p> <p>The service maps the value from the <i>detail</i> field of the <i>fault</i> input parameter.</p>

Fault_1_2 **Document** Conditional. Converted fault information. *Fault_1_2* and its child variables are populated only when *soapProtocol* is SOAP 1.2 Protocol.

Key	Description
SOAP-ENV:Code	<p>Document Conditional. Contains the fault code.</p>
SOAP-ENV:CodeValue	<p>String A code that identifies the fault. This corresponds to the SOAP 1.2 <i>Code</i> element.</p> <p>This field is set based on the value of the <i>code/namespaceName</i> field of the <i>fault</i> input parameter. When <i>namespaceName</i> contains:</p>

- <http://www.w3.org/2003/05/soap-envelope>, which is, the standard namespace name for a SOAP 1.2 Envelope, *faultcode* is set to the following:

SOAP-ENV:*localName*

- **Any other value**, *faultcode* is set to the following:

{*namespaceName*}*localName*

In the above, *localName* is the value of the *code/localName* field and *namespaceName* is value of the *code/namespaceName* field of the *fault* input parameter

SOAP-ENV:Reason **Document** Conditional. Document containing the reason for the SOAP fault. This corresponds to the SOAP 1.2 Reason element.

SOAP-Env:Text **Document** Conditional. Document containing the human readable explanation of the cause of the fault. The service maps the first document of the *reasons* field of the *fault* input parameter.

@XML:*lang* **String** Conditional. Specifies the language for the human readable description. This field corresponds to the `xml:lang` attribute of the `Text` child element of the SOAP1.2 Reason element.

body* **String Conditional. Text explaining the cause of the fault. This field corresponds to the `Text` child element of the SOAP 1.2 Reason element.

SOAP-ENV:Node **String** Conditional. URI to the SOAP node where the fault occurred. This field corresponds to the SOAP 1.2 Node element.

The service maps the value from the *node* field of the *fault* input parameter.

SOAP-ENV:Role **String** Conditional. Role in which the node was operating at the point the fault occurred. This field corresponds to the SOAP 1.2 `Role` element.

The service maps the value from the *role* field of the *fault* input parameter.

SOAP-ENV:Detail **Document** Conditional. Application- specific details about the SOAP fault. This field corresponds to the SOAP 1.2 `Detail` element.

The service maps the value from the *detail* field of the *fault* input parameter.

Usage Notes

The following are instances where Integration Server generates a generic SOAP fault structure that you might want to convert to a SOAP version-specific fault structure:

- The *fault* output parameter from a web service connector generated from a web service descriptor created in Integration Server 8.2.
- The *soapFault* output parameter from the [pub.soap.handler:getFaultBlock](#) service.

The following lists instances where the service might not be able to convert all data in the generic SOAP fault structure to a corresponding field in the output.

- The data in the *code/subcodes* field of the *fault* input parameter does not map to any output parameter. As a result, the service does not convert the data for either the SOAP 1.1 or SOAP 1.2 protocol.
- The service might not be able to map all the data in the *reasons* field of the *fault* input parameter to the corresponding output parameters. The *reasons* field is a Document List that can represent the reason in multiple languages. However, the output can represent only a single value.
 - For the SOAP 1.1 protocol, the service maps the **body* from the first Document of the *fault/reasons* input parameter to the *Fault_1_1/faultstring* output parameter.
 - For the SOAP 1.2 protocol, the service maps only the first Document of the *fault/reasons* to the output parameter *Fault_1_2/SOAP-ENV:Reason/SOAP-Env:Text*.
- The data in the *node* field of the *fault* input parameter does not map to any element of the *Fault_1_1* output parameter. As a result, the service does not convert the value for the SOAP 1.1 protocol.

See Also

[pub.soap.handler:getFaultBlock](#)

pub.soap.utils:createSoapData

WmPublic. Creates a SOAP object consisting of SOAP envelope, body, and header entries.

Input Parameters

encoding **String** Optional. Specifies the encoding method. Default value is UTF-8.

addEmptyHeader **String** Optional. Specifies whether to create an empty header entry along with the SOAP envelope and body entries in the SOAP message. Set to:

- `True` to create an empty header entry in the SOAP message.
- `False` to create only the SOAP envelope and body entries.

This setting overrides the global `watt.server.SOAP.addEmptyHeader` setting of Integration Server.

Important:

There is no default value. If you do not specify a value for the *addEmptyHeader* parameter, the service adds an empty header entry, which is equivalent to setting *addEmptyHeader* to `True`.

soapProtocol **String** Optional. Indicates the SOAP protocol that the SOAP object works with. The default value is read from the `watt.server.SOAP.defaultProtocol` property. Set to:

- `SOAP 1.1 protocol` to indicate the SOAP object works with SOAP 1.1.
- `SOAP 1.2 protocol` to indicate the SOAP object works with SOAP 1.2.

Output Parameters

soapData **Object** SOAP object.

Usage Notes

The *encoding* parameter can support incoming SOAP messages in any encoding. Outgoing messages, however, are always encoded in UTF-8.

See Also

[pub.soap.utils:addHeaderEntry](#)

[pub.soap.utils:addBodyEntry](#)

[pub.soap.utils:addTrailer](#)

pub.soap.utils:createXOPObject

WmPublic. Generates a `com.wm.util.XOPObject` instance from a `base64Binary` string, a byte array, or an input stream.

Input Parameters

contentType **String** Optional. MIME type of the input data.

data **Document** Data from which you want to generate a `com.wm.util.XOPObject` instance.

<u>Key</u>	<u>Description</u>
<i>base64String</i>	String Optional. The base64-encoded string from which you want to generate the <code>com.wm.util.XOPObject</code> instance.
<i>bytes</i>	byte [] Optional. The byte array from which you want to generate the <code>com.wm.util.XOPObject</code> instance.
<i>stream</i>	Object Optional. The <code>InputStream</code> from which you want to generate the <code>com.wm.util.XOPObject</code> instance.

Output Parameters

xopObject **Object** Conditional. An instance of `com.wm.util.XOPObject` generated from the input data.

The value of *xopObject* will be null if you do not specify any value for the *data* input parameter.

Usage Notes

You use the object of type `com.wm.util.XOPObject` to send or receive data as an MTOM stream. For more information about MTOM streaming, see the section *Configuring MTOM Streaming for a Web Service Descriptor* in the *Web Services Developer's Guide*.

If you specify values for more than one key of the *data* input parameter, Integration Server uses only one value in the following order or precedence:

- *base64String*
- *bytes*
- *stream*

For example, if you provide values for *base64String*, *bytes*, and *stream* keys, Integration Server will execute the `pub.soap.utils:createXOObject` service with the *base64String* value and will ignore the values provided for *bytes* and *stream* keys.

pub.soap.utils:exitUnableToUnderstand

WmPublic. Terminates processing and returns a `mustUnderstand` fault to the client.

You execute this service when your SOAP processor detects a mandatory header entry that it cannot process.

Input Parameters

headerEntry **com.wm.lang.xml.Node** XML node containing the header entry that cannot be understood.

Output Parameters

None.

Usage Notes

This service throws an exception, which is meant to be caught by the message handler so that the appropriate SOAP fault will be returned to the client. Your processor should not catch this exception.

pub.soap.utils:getActor

WmPublic. Retrieves the value of the `actor` attribute (for SOAP 1.1) or the `role` attribute (for SOAP 1.2) from a given header entry.

Input Parameters

headerEntry **com.wm.lang.xml.Node** The header entry whose `actor` value you want to retrieve.

- If you use [pub.soap.utils:getHeaderEntries](#) to retrieve header entries, you can loop over the list of header nodes to retrieve the `actor` value from each entry.
- If you use [pub.soap.utils:getHeader](#) to retrieve header entries, you must query the node returned by that service (using the [pub.xml:queryXMLNode](#) service) to extract a node for an individual header entry. Then you can run `getActor` on the resulting node.

Output Parameters

actor **String** Value of the header entry's *actor* attribute (for SOAP 1.1) or the *role* attribute (for SOAP 1.2). If the header entry does not have an *actor* attribute, *actor* will be null.

See Also

[pub.soap.utils:addHeaderEntry](#)

[pub.soap.utils:getMustUnderstand](#)

[pub.soap.utils:getHeader](#)

[pub.soap.utils:getHeaderEntries](#)

pub.soap.utils:getBody

WmPublic. Retrieves the body from a SOAP message as a single node object.

Input Parameters

soapData **Object** SOAP object containing the message whose Body node you want to retrieve.

Output Parameters

body **com.wm.lang.xml.Node** The Body node from the SOAP message (that is, `<SOAP-ENV:Body>` to `</SOAP-ENV:Body>`).

Usage Notes

This service returns the entire Body element in *body*. To extract data from the Body element, query *body* with the [pub.xml:queryXMLNode](#) service.

If you want to extract the body of the message as an array of nodes, use the [pub.soap.utils:getBodyEntries](#) service.

See Also

[pub.soap.utils:getBodyEntries](#)

[pub.soap.utils:addBodyEntry](#)

pub.soap.utils:getBodyEntries

WmPublic. Retrieves the body entries from a SOAP message as an array of node objects.

Input Parameters

soapData **Object** The SOAP object containing the message whose body entries you want to retrieve.

Output Parameters

bodyEntries **com.wm.lang.xml.Node[]** An array of XML nodes, where each node represents a body entry from the message.

Usage Notes

This service returns each body entry as a separate node. You can loop over *bodyEntries* and extract data from each node with the [pub.xml:queryXMLNode](#) service.

If you want to extract the body of the message as a single node, use the [pub.soap.utils:getBody](#) service.

See Also

[pub.soap.utils:getBody](#)

[pub.soap.utils:addBodyEntry](#)

pub.soap.utils:getDocument

WmPublic. Retrieves an entire SOAP message as a node object.

This service is useful when you want to use [pub.xml:queryXMLNode](#) to query an entire SOAP message. Since [queryXMLNode](#) requires a node as input, you cannot use it to query a SOAP object directly. Instead, you must convert the SOAP object to a node and then query the resulting node.

Input Parameters

soapData **Object** SOAP object for which you want a node representation.

Output Parameters

node **com.wm.lang.xml.Node** Node representation of the entire SOAP message in *soapData* (that is, `<SOAP-ENV:Envelope>` to `</SOAP-ENV:Envelope>`).

See Also

[pub.soap.utils:getBody](#)

[pub.soap.utils:getBodyEntries](#)

[pub.soap.utils:getHeader](#)

[pub.soap.utils:getHeaderEntries](#)

[pub.soap.utils:getTrailers](#)

pub.soap.utils:getEncoding

WmPublic. Retrieves the encoding from a SOAP message as a single string.

Input Parameters

soapData **Object** SOAP object containing the message whose encoding you want to retrieve.

Output Parameters

encoding **com.wm.lang.xml.Node** Encoding from the SOAP message.

See Also

[pub.soap.utils:getHeaderEntries](#)

[pub.soap.utils:getBody](#)

[pub.soap.utils:getBodyEntries](#)

[“pub.soap.utils:getDocument” on page 865](#)

[pub.soap.utils:getTrailers](#)

[pub.soap.utils:addHeaderEntry](#)

pub.soap.utils:getHeader

WmPublic. Retrieves the header from a SOAP message as a single node object.

Input Parameters

soapData **Object** SOAP object containing the message whose Header node you want to retrieve.

Output Parameters

header **com.wm.lang.xml.Node** Header node from the SOAP message (that is, <SOAP-ENV:Header> to </SOAP-ENV:Header>).

Usage Notes

This service returns the entire Header element in *header*. To extract data from the Header element, query *header* with the [pub.xml:queryXMLNode](#) service. If you want to extract the contents of the header as an array of nodes, use the [pub.soap.utils:getHeaderEntries](#) service.

See Also

[pub.soap.utils:getHeaderEntries](#)

[pub.soap.utils:getBody](#)

[pub.soap.utils:getBodyEntries](#)

[pub.soap.utils:getTrailers](#)

[pub.soap.utils:addHeaderEntry](#)

pub.soap.utils:getHeaderEntries

WmPublic. Retrieves the header entries from a SOAP message as an array of node objects.

This service is useful when you want to build a process that loops through all the header entries in a message and identify entries with specific QNames (using the [pub.soap.utils:getQName](#) service) or actor attributes (using the [pub.soap.utils:getActor](#) service).

Input Parameters

soapData **Object** SOAP object containing the message whose header entries you want to retrieve.

Output Parameters

headerEntries **com.wm.lang.xml.Node[]** Header entries from the SOAP message. Each node in the array represents a header entry from the message.

Usage Notes

This service returns each header entry as a separate node. You can loop over *headerEntries* and extract data from each node with the [pub.xml:queryXMLNode](#) service or get the entry's QName and/or actor value using the [pub.soap.utils:getQName](#) and [pub.soap.utils:getActor](#) services.

If you want to extract the message header as a single node, use the [pub.soap.utils:getHeader](#) service.

See Also

[pub.soap.utils:getHeader](#)

[pub.soap.utils:getBody](#)

[pub.soap.utils:getBodyEntries](#)

[pub.soap.utils:getDocument](#)

[pub.soap.utils:addHeaderEntry](#)

[pub.soap.utils:getActor](#)

[pub.soap.utils:getQName](#)

pub.soap.utils:getMustUnderstand

WmPublic. Returns the mustUnderstand status for a given header entry.

The mustUnderstand status specifies whether recipients are *required* to process a header entry (that is, whether processing of the entry is mandatory or optional). Recipients that cannot process a mandatory header entry must reject the message and return a SOAP fault. (See the [pub.soap.utils:exitUnableToUnderstand](#) service.)

Input Parameters

headerEntry **com.wm.lang.xml.Node** The header entry whose mustUnderstand status you want to retrieve.

- If you use [pub.soap.utils:getHeaderEntries](#) to retrieve header entries, you can loop over the list of header nodes to check the status of each entry.
- If you use [pub.soap.utils:getHeader](#) to retrieve header entries, you will need to query the node returned by that service (using the

[pub.xml:queryXMLNode](#) service) to extract a node for an individual header entry. Then you can run [pub.soap.utils:getMustUnderstand](#) on the resulting node.

Output Parameters

mustUnderstand

String Header entry's `mustUnderstand` status. If the header entry has a `mustUnderstand` attribute, *mustUnderstand* will return one of the following values:

- 0 indicates that the header is optional.
- 1 indicates that the header is mandatory.

If the header entry does not have a *mustUnderstand* attribute, `mustUnderstand` will return 0.

Usage Notes

For additional information about the `mustUnderstand` attribute, see the *Simple Object Access Protocol (SOAP) 1.1 - W3C Note 08 May 2000* at <http://www.w3.org/TR/SOAP/> and for SOAP 1.2, see the *SOAP 1.2 W3C Recommendation 27 April 2007* at <http://www.w3.org/TR/soap12-part1/>.

See Also

[pub.soap.utils:addHeaderEntry](#)

[pub.soap.utils:getActor](#)

[pub.soap.utils:getHeader](#)

[pub.soap.utils:getHeaderEntries](#)

[pub.soap.utils:exitUnableToUnderstand](#)

pub.soap.utils:getQName

WmPublic. Returns the qualified name for a given node.

Input Parameters

node

com.wm.app.b2b.server.saaj.SOAPElement The XML node whose qualified name you want to discover.

Output Parameters

Qname **Document** The node's qualified name. *Qname* will contain the following keys:

<u>Key</u>	<u>Description</u>
<i>namespaceName</i>	String Namespace portion of the node's qualified name.
<i>localName</i>	String Local portion of the node's qualified name.

Usage Notes

Generally, you use this service in conjunction with the [pub.soap.utils:getHeaderEntries](#) or [pub.soap.utils:getBodyEntries](#) service to loop over the message's header or body entries and identify entries with a particular qualified name.

See Also

[pub.soap.utils:getBodyEntries](#)

[pub.soap.utils:getHeaderEntries](#)

pub.soap.utils:getTrailers

WmPublic. Retrieves the trailers from a SOAP message.

(A trailer is an arbitrary element that follows the Body element in the SOAP envelope.)

Important:

It appears likely that trailers will not be permitted in future versions of SOAP (versions 1.2 and later). If you are designing a completely new solution, we recommend that you avoid using trailers. However, if you exchange SOAP messages with older systems that already make use of trailers, this service allows you to retrieve them from a SOAP message.

Input Parameters

soapData **Object** SOAP object containing the message whose trailers you want to retrieve.

Output Parameters

trailers **com.wm.lang.xml.Node[]** Array of nodes wherein each node represents a trailer from the message. If the message does not contain trailers, *trailers* will be null.

See Also

[pub.soap.utils:addTrailer](#)

[pub.soap.utils:getHeader](#)

[pub.soap.utils:getHeaderEntries](#)

[pub.soap.utils:getBody](#)

[pub.soap.utils:getBodyEntries](#)

[pub.soap.utils:getDocument](#)

pub.soap.utils:getXOPObjectContent

WmPublic. Retrieves the contents of a com.wm.util.XOPObject instance as a base64Binary string, a byte array, or an InputStream.

Input Parameters

xopObject **Object** Optional. The object of type com.wm.util.XOPObject.

getAs **String** Optional. The object type in which you want to retrieve the contents in the com.wm.util.XOPObject instance.

Select...	To...
base64String	Default. Retrieve the contents of the com.wm.util.XOPObject instance as a base64-encoded string.
bytes	Retrieve the contents of the com.wm.util.XOPObject instance as a byte array.
stream	Retrieve the contents of the com.wm.util.XOPObject instance as an InputStream.

Output Parameters

contentType **String** Conditional. MIME type of the contents in the input `com.wm.util.XOPObject` instance. The *contentType* parameter is returned only if you have specified a value for the *xopObject* input parameter.

data **Document** Contents of the input `com.wm.util.XOPObject` instance.
If the *xopObject* input parameter is null, this parameter has a null value.

<u>Value</u>	<u>Description</u>
<i>base64String</i>	String Conditional. Returns the contents of the <code>com.wm.util.XOPObject</code> instance as a base64-encoded string if the <i>getAs</i> input parameter is set to <code>base64String</code> .
<i>bytes</i>	byte [] Conditional. Returns the contents of the <code>com.wm.util.XOPObject</code> instance as a byte array if the <i>getAs</i> input parameter is set to <code>bytes</code> .
<i>stream</i>	Object Conditional. Returns the contents of the <code>com.wm.util.XOPObject</code> instance as an <code>InputStream</code> if the <i>getAs</i> input parameter is set to <code>stream</code> .

Usage Notes

You use the object of type `com.wm.util.XOPObject` to send or receive data as an MTOM stream. For more information about MTOM streaming, see the section *Configuring MTOM Streaming for a Web Service Descriptor* in the *Web Services Developer's Guide*.

The content of the `XOPObject` can only be read one time. After you use the `pub.soap.utils:getXOPObjectContent` service to read the `XOPObject` content one time, subsequent attempts to re-read the `XOPObject` content will fail. It is recommended that after the `XOPObject` content is read that you drop it from the pipeline to make it clear to programming logic downstream that it is no longer available to be read.

When you set the *getAs* input parameter to `stream` so that the service returns the contents of the `com.wm.util.XOPObject` instance as a stream, the `pub.soap.utils:getXOPObjectContent` service does not automatically close the stream object. You can close the stream using the `pub.io:close` service.

pub.soap.utils:QName

`WmPublic`. Document type that defines the structure of a qualified name.

Parameters

namespaceName **String** The namespace portion of a qualified name.

localName **String** The local portion of a qualified name.

pub.soap.utils:removeBodyEntry

WmPublic. Deletes a body entry from a SOAP message.

Input Parameters

soapData **Object** SOAP object containing the body entry that you want to delete.

bodyEntry **com.wm.lang.xml.Node** Optional. The entry that you want to remove from *soapData*. (You would obtain the node with the [pub.soap.utils:getBodyEntries](#) service.)

Note:

You can use *bodyEntry* or *index* to specify the entry that you want `removeBodyEntry` to delete.

index **String** Optional. Index of the entry that you want to remove (where index 0 represents the first body entry). *index* is ignored if *bodyEntry* is specified.

Output Parameters

None.

Usage Notes

When you use the *bodyEntry* parameter, be sure that it specifies the correct node. This service deletes whatever node is specified in *bodyEntry*, even if the node is not a body entry. For example, if *bodyEntry* contains the whole Body element, `removeBodyEntry` will delete the body of the message.

Be aware that if you use the *index* parameter to delete an entry, you will change the index numbers (positions) of all entries following the one you deleted. For example, if your message contains four body entries (0, 1, 2, 3) and you delete entry 1, then the entries originally at positions 2 and 3 will subsequently occupy positions 1 and 2.

See Also

[pub.soap.utils:removeHeaderEntry](#)

[pub.soap.utils:removeTrailer](#)

[pub.soap.utils:addBodyEntry](#)

[pub.soap.utils:getBody](#)

[pub.soap.utils:getBodyEntries](#)

pub.soap.utils:removeHeaderEntry

WmPublic. Deletes a header entry from a SOAP message.

Input Parameters

<i>soapData</i>	Object SOAP object containing the header entry that you want to delete.
<i>headerEntry</i>	com.wm.lang.xml.Node Optional. The header entry that you want to remove from <i>soapData</i> . (You would obtain the node with the pub.soap.utils:getHeaderEntries service.)
	Note: You can use <i>headerEntry</i> or <i>index</i> to specify the entry that you want <code>removeHeaderEntry</code> to delete.
<i>index</i>	String Optional. Index of the entry that you want to remove (where index 0 represents the first header entry). <i>index</i> is ignored if <i>headerEntry</i> is specified.

Output Parameters

None.

Usage Notes

When you use the *headerEntry* parameter, be sure that it specifies the correct node. This service deletes whatever node is specified in *headerEntry*, even if the node is not a header entry. For example, if *headerEntry* contains the whole Header element, `removeHeaderEntry` will delete the entire header from the message.

Note:
Be aware that if you use the *index* parameter to delete an entry, you will change the index numbers (positions) of all entries following the one you deleted. For example, if your header contains four entries (0, 1, 2, 3) and you delete entry 1, then the entries originally at positions 2 and 3 will subsequently occupy positions 1 and 2.

See Also

[pub.soap.utils:removeBodyEntry](#)

[pub.soap.utils:removeTrailer](#)

[pub.soap.utils:addHeaderEntry](#)

[pub.soap.utils:getHeader](#)

[pub.soap.utils:getHeaderEntries](#)

pub.soap.utils:removeTrailer

WmPublic. Deletes a trailer from a SOAP message.

Input Parameters

<i>soapData</i>	Object SOAP object containing the trailer that you want to delete.
<i>trailer</i>	com.wm.lang.xml.Node Optional. The trailer that you want to remove from <i>soapData</i> . (You would obtain the node with the pub.soap.utils:getTrailers service.)

Note:

You can use *trailer* or *index* to specify the trailer that you want `removeTrailer` to delete.

<i>index</i>	String Optional. Index of the trailer that you want to remove (where index 0 represents the first trailer). <i>index</i> is ignored if <i>trailer</i> is specified.
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Output Parameters

None.

Usage Notes

When you use the *trailer* parameter, be sure that it specifies the correct node. This service deletes whatever node is specified in *trailer*, even if the node is not a trailer. For example, if *trailer* contains the Body element, `removeTrailer` will delete the entire body of the message.

Note:

Be aware that if you use the index parameter to delete a trailer, you will change the index numbers (positions) of all trailers following the one you deleted. For example, if your message contains four trailers (0, 1, 2, 3) and you delete trailer 1, then the trailers originally at positions 2 and 3 will subsequently occupy positions 1 and 2.

See Also

[pub.soap.utils:removeHeaderEntry](#)

[pub.soap.utils:removeBodyEntry](#)

[pub.soap.utils:addTrailer](#)

[pub.soap.utils:getTrailers](#)

pub.soap.utils:requestResponseSpec

WmPublic. Defines the input/output signature for a custom processor and a target service for the default processor.

Input Parameters

<i>soapRequestData</i>	Object SOAP object containing the SOAP request submitted to the Integration Server by the client.
<i>soapResponseData</i>	Object Empty SOAP object that the custom processor or target service uses to compose the SOAP response message.

Output Parameters

<i>soapResponseData</i>	Object SOAP object containing the message that is to be returned to the client.
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pub.soap.utils:resetWSDEffectivePolicy

WmPublic. *Deprecated* - There is no replacement service.

Returns the effective policy for a handler in a web service descriptor to the policy set in the **Policy** name property in Software AG Designer.

Input Parameters

<i>wsdName</i>	String The name of the web service descriptor for which you want to reset the effective policy.
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Note:

The `resetWSDEffectivePolicy` service applies only to web services that run in pre-8.2 compatibility mode (i.e., the **Pre-8.2 compatibility mode** property is set to `true`).

<i>handlerName</i>	String The name of the handler for which you want to reset the effective policy.
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Output Parameters

None.

Usage Notes

The `pub.soap.utils.resetWSDEffectivePolicy` service is deprecated because the service applies only to web services that run in pre-8.2 compatibility mode. The ability to run in pre-8.2 compatibility mode is deprecated as of Integration Server 10.4 due to the deprecation of the web services implementation that was introduced in Integration Server version 7.1

You can also use Designer to reset the effective policy. In Designer, open the web service descriptor, select the handler on the **Handlers** view, and modify the value of **Effective policy name** property assigned to the handler.

The `pub.soap.utils.resetWSDEffectivePolicy` service throws an exception if the provided inputs are invalid.

See Also

[pub.soap.utils.setWSDEffectivePolicy](#)

pub.soap.utils.setWSDEffectivePolicy

WmPublic. *Deprecated* - There is no replacement service.

Sets the effective policy for a handler in a web service descriptor.

Input Parameters

wsdName **String** The name of the web service descriptor for which you want to set the effective policy.

Note:

The `setWSDEffectivePolicy` service applies only to web services that run in pre-8.2 compatibility mode (i.e., the **Pre-8.2 compatibility mode** property is set to true).

handlerName **String** The name of the handler for which you want to set the effective policy.

effectivePolicyID **String** The unique identifier for the policy that you want to use with the handler in the web service descriptor.

Output Parameters

None.

Usage Notes

The `pub.soap.utils.setWSDEffectivePolicy` service is deprecated because the service applies only to web services that run in pre-8.2 compatibility mode. The ability to run in pre-8.2 compatibility mode

is deprecated as of Integration Server 10.4 due to the deprecation of the web services implementation that was introduced in Integration Server version 7.1.

The `pub.soap.utils.setWSEffectivePolicy` service overrides the policy originally assigned to the handler in the web service descriptor.

The `pub.soap.utils.setWSEffectivePolicy` service applies to provider web service descriptors as well as consumer web service descriptors.

The `pub.soap.utils.setWSEffectivePolicy` service throws an exceptions if the provided input is incorrect. The service also verifies that the provided effective policy actually exists.

You can also use Designer to set the effective policy. In Designer, open the web service descriptor, select the handler in the **Handlers** view, and modify the value of **Effective policy name** property assigned to the handler.

You can reset the effective policy using the `pub.soap.utils.resetWSEffectivePolicy` service.

See Also

[pub.soap.utils.resetWSEffectivePolicy](#)

pub.soap.utils:soapDataToBytes

WmPublic. Converts a SOAP object to a Byte Array.

This is useful when you want to use the message with a process that requires the message to be in the form of a Byte Array.

Input Parameters

soapData **Object** SOAP object that you want to convert to a Byte Array.

Output Parameters

bytes **Object** Entire SOAP message.

See Also

[pub.soap.utils.soapDataToString](#)

[pub.soap.utils.streamToSoapData](#)

[pub.soap.utils.stringToSoapData](#)

pub.soap.utils:soapDataToString

WmPublic. Converts a SOAP object to a String.

This is useful when you want to use the message with a process that requires the message to be in the form of a String.

Input Parameters

soapData **Object** SOAP object that you want to convert to a String.

Output Parameters

string **String** Entire SOAP message.

See Also

[pub.soap.utils:soapDataToBytes](#)

[pub.soap.utils:streamToSoapData](#)

[pub.soap.utils:stringToSoapData](#)

pub.soap.utils:soapFault

WmPublic. Document type that defines the generic SOAP fault structure used by web service descriptors created in Integration Server 8.2 and later.

Parameters

code **Document** Contains the fault code and possible subcodes.

<u>Key</u>	<u>Description</u>
<i>namespaceName</i>	String Optional. Namespace name for the SOAP fault code.
<i>localName</i>	String Code that identifies the fault.
<i>subCodes</i>	<p>Document List Optional. Subcodes that provide further detail. Each Document in the <i>subCodes</i> Document List contains:</p> <ul style="list-style-type: none"> ■ <i>namespaceName</i> for the subcode ■ <i>localName</i> that identifies the subcode

<i>reasons</i>	Document List Reasons for the SOAP fault. Each Document in the Document List contains a human readable explanation of the cause of the fault.						
	<table> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>*body</i></td> <td>String Text explaining the cause of the fault.</td> </tr> <tr> <td><i>@lang</i></td> <td>String Optional. Language for the human readable description.</td> </tr> </tbody> </table>	Key	Description	<i>*body</i>	String Text explaining the cause of the fault.	<i>@lang</i>	String Optional. Language for the human readable description.
Key	Description						
<i>*body</i>	String Text explaining the cause of the fault.						
<i>@lang</i>	String Optional. Language for the human readable description.						
<i>node</i>	String Optional. URI to the SOAP node where the fault occurred.						
<i>role</i>	String Optional. Role in which the node was operating at the point the fault occurred.						
<i>detail</i>	Document Optional. Application-specific details about the SOAP fault.						

pub.soap.utils:streamToSoapData

WmPublic. Converts an InputStream containing a SOAP message to a SOAP object.

(A SOAP message must be represented as a SOAP object to be used with the data-retrieval services such as [pub.soap.utils:getHeader](#) and [pub.soap.utils:getBody](#)).

Note:

This service is a convenient way to produce a SOAP object during development and testing. It is not meant to be used for production purposes because *it does not ensure that a valid SOAP message is produced*. For production purposes, we recommend that you create SOAP objects with the [pub.soap.utils:createSoapData](#) service and populate them with the message-composition services (for example, [pub.soap.utils:addBodyEntry](#) and [pub.soap.utils:addHeaderEntry](#)).

Input Parameters

<i>stream</i>	java.io.InputStream SOAP message that is to be converted to a SOAP object.
<i>soapProtocol</i>	<p>String Optional. Indicates the SOAP protocol that the resulting SOAP object will work with. The default value is read from the <code>watt.server.SOAP.defaultProtocol</code> property. Set to:</p> <ul style="list-style-type: none"> ■ SOAP 1.1 Protocol to indicate the SOAP object works with SOAP 1.1. ■ SOAP 1.2 Protocol to indicate the SOAP object works with SOAP 1.2.

Output Parameters

<i>soapData</i>	Object SOAP object representation of the SOAP message in <i>stream</i> .
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Usage Notes

Be aware that if *stream* does not contain a valid SOAP message, this service does not throw an exception. Instead, it produces a *soapData* that contains a representation of whatever it received in *stream* (which might not even be an XML document). This will cause problems later when you attempt to use the *soapData* with other SOAP utilities or pass it to the message handler. To determine whether *soapData* represents a valid SOAP message, we recommend that you always execute the [pub.soap.utils:validateSoapData](#) service immediately after using `streamToSoapData`.

See Also

[pub.soap.utils:soapDataToBytes](#)

[pub.soap.utils:stringToSoapData](#)

[pub.soap.utils:validateSoapData](#)

pub.soap.utils:stringToSoapData

WmPublic. Converts a String containing a SOAP message to a SOAP object.

(A SOAP message must be represented as a SOAP object to be used with the data-retrieval services such as [pub.soap.utils:getHeader](#) and [pub.soap.utils:getBody](#)).

Note:

This service is a convenient way to produce a SOAP object during development and testing. It is not meant to be used for production purposes because *it does not ensure that a valid SOAP message is produced*. Additionally, producing a SOAP object from a String is a very time-consuming process. For production purposes, we recommend that you create SOAP objects with the such as [pub.soap.utils:getHeader](#) and [pub.soap.utils:getBody](#)).

Input Parameters

<i>string</i>	String SOAP message that is to be converted to a SOAP object.
<i>soapProtocol</i>	<p>String Optional. Indicates the SOAP protocol that the resulting SOAP object will work with. The default value is read from the <code>watt.server.SOAP.defaultProtocol</code> property. Set to:</p> <ul style="list-style-type: none"> ■ SOAP 1.1 Protocol to indicate the SOAP object works with SOAP 1.1. ■ SOAP 1.2 Protocol to indicate the SOAP object works with SOAP 1.2.
<i>addEmptyHeader</i>	<p>String Optional. Specifies whether to create an empty header entry along with the SOAP envelope and body entries in the SOAP message. Set to:</p> <ul style="list-style-type: none"> ■ True to create an empty header entry in the SOAP message. ■ False to create only the SOAP envelope and body entries.

This setting overrides the global `watt.server.SOAP.addEmptyHeader` setting of Integration Server.

Important:

There is no default value. If you do not specify a value for the `addEmptyHeader` parameter, the service uses the value specified in the `watt.server.SOAP.addEmptyHeader` server configuration parameter. For more information about `watt.server.SOAP.addEmptyHeader`, see *webMethods Integration Server Administrator's Guide*.

Output Parameters

soapData **Object** SOAP object representation of the SOAP message in *string*.

See Also

[pub.soap.utils:soapDataToBytes](#)

[pub.soap.utils:streamToSoapData](#)

[pub.soap.utils:validateSoapData](#)

pub.soap.utils:validateSoapData

WmPublic. Verifies that a SOAP object represents a valid SOAP message.

You can use this service to validate a SOAP object that was generated directly from an `InputStream` or `String` with [pub.soap.utils:stringToSoapData](#) or [pub.soap.utils:streamToSoapData](#). If `soapData` does not contain a valid SOAP message, `validateSoapData` will throw an exception.

This service validates the SOAP object against the schema in [pub.soap.schema:envelope](#).

Input Parameters

soapData **Object** SOAP object that you want to validate.

Output Parameters

None.

Usage Notes

If you create SOAP objects using the standard message-composition services (for example, [pub.soap.utils:createSoapData](#), [pub.soap.utils:addBodyEntry](#), [pub.soap.utils:addHeaderEntry](#)) there is no need to

use this service. This service is only necessary when you generate a SOAP object directly from an `InputStream` or a `String`.

When validating SOAP, Integration Server uses the W3C recommendation *XML Schema Part 2: Datatypes*. If you want to validate the input of this service for illegal values in the SOAP envelope and header, set the `watt.core.validation.w3cConformant` configuration parameter to `true`. For information about setting this configuration parameter, see *webMethods Integration Server Administrator's Guide*.

See Also

[pub.soap.utils:stringToSoapData](#)

[pub.soap.utils:streamToSoapData](#)

pub.soap.wsa:action

WmPublic. Document type that defines the contents of the `wsa:Action` WS-Addressing header.

Parameters

wsa:Action **Document** Contains the WS-Addressing action.

Key	Description
<i>*body</i>	String Value of the WS-Addressing action.

Usage Notes

To add, retrieve, or remove the `wsa:Action` header of a SOAP message, use `pub.soap.wsa:action` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

For more details about how Integration Server implements WS-Addressing, see the the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa:faultTo

WmPublic. Document type that defines the contents of the `wsa:FaultTo` WS-Addressing header.

Parameters

wsa:FaultTo **Document** Contains the address of the intended receiver of the fault message.

Key	Description
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<i>wsa:Address</i>	Document Contains the end point URI for the fault message.				
	<table> <thead> <tr> <th><u>Key</u></th> <th><u>Description</u></th> </tr> </thead> <tbody> <tr> <td><i>*body</i></td> <td>String The end point URI for the fault message.</td> </tr> </tbody> </table>	<u>Key</u>	<u>Description</u>	<i>*body</i>	String The end point URI for the fault message.
<u>Key</u>	<u>Description</u>				
<i>*body</i>	String The end point URI for the fault message.				
<i>wsa:Reference Parameters</i>	Document Contains the set of reference parameter elements.				
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<u>Key</u>	<u>Description</u>				
<i>*any</i>	Object List The metadata elements.				
<i>*any</i>	Object List Contains other extensible elements, if any.				

Usage Notes

To add, retrieve, or remove the `wsa:FaultTo` header of a SOAP message, use `pub.soap.wsa:faultTo` as the value for the `documentType` input parameter of the `pub.soap.handler:addHeaderBlock`, `pub.soap.handler:getHeaderBlock`, and `pub.soap.handler:removeBodyBlock` services.

For more details about how Integration Server implements WS-Addressing, see the the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa:from

WmPublic. Document type that contains the details of the source of the message.

Parameters

<i>wsa:From</i>	Document Contains the details about the source of the message.										
	<table> <thead> <tr> <th><u>Key</u></th> <th><u>Description</u></th> </tr> </thead> <tbody> <tr> <td><i>wsa:Address</i></td> <td>Document Contains the address of the source of the message.</td> </tr> <tr> <td></td> <td> <table> <thead> <tr> <th><u>Key</u></th> <th><u>Description</u></th> </tr> </thead> <tbody> <tr> <td><i>*body</i></td> <td>String The address of the source of the message.</td> </tr> </tbody> </table> </td> </tr> </tbody> </table>	<u>Key</u>	<u>Description</u>	<i>wsa:Address</i>	Document Contains the address of the source of the message.		<table> <thead> <tr> <th><u>Key</u></th> <th><u>Description</u></th> </tr> </thead> <tbody> <tr> <td><i>*body</i></td> <td>String The address of the source of the message.</td> </tr> </tbody> </table>	<u>Key</u>	<u>Description</u>	<i>*body</i>	String The address of the source of the message.
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<u>Key</u>	<u>Description</u>										
<i>*body</i>	String The address of the source of the message.										

wsa:ReferenceParameters **Document** Contains the set of reference parameter elements.

Key	Description
<i>*any</i>	Object List The reference parameter elements.

wsa:Metadata **Document** Contains the set of metadata elements.

Key	Description
<i>*any</i>	Object List The metadata elements.

any* **Object List Contains other extensible elements, if any.

Usage Notes

To add, retrieve, or remove the `wsa:From` header of a SOAP message, use `pub.soap.wsa:from` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

For more details about how Integration Server implements WS-Addressing, see the the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa:messageID

WmPublic. Document type that defines the contents of the `wsa:MessageID` WS-Addressing header.

Parameters

wsa:MessageID **Document** Unique identifier of the SOAP message.

Key	Description
<i>*body</i>	String The unique identifier of the SOAP message.

Usage Notes

To add, retrieve, or remove the `wsa:MessageID` header of a SOAP message, use `pub.soap.wsa:messageID` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa:problemAction

WmPublic. Document type that captures additional information about faults.

Parameters

wsa:ProblemAction **Document** Contains additional information about faults.

<u>Key</u>	<u>Description</u>
<i>wsa:Action</i>	Document Optional. Element that provides the details about the [action] that caused the problem.
<u>Key</u>	<u>Description</u>
<i>*body</i>	String Optional. The [action] that caused the problem.
<i>wsa:SoapAction</i>	String Optional. Element that contains the SOAPAction IRI that caused the problem.

Usage Notes

To add, retrieve, or remove the `wsa:ProblemAction` header of a SOAP message, use `pub.soap.wsa:problemAction` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa:problemHeaderQName

WmPublic. Document type that captures additional information about faults.

Parameters

*wsa:ProblemHeader
QName* **Document** Contains additional information about faults.

<u>Key</u>	<u>Description</u>
<i>*body</i>	String Optional. The QName representing the name of the root element of the problem header block.

Usage Notes

To add, retrieve, or remove the `wsa:ProblemHeaderQName` header of a SOAP message, use `pub.soap.wsa:problemHeaderQName` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa:problemIRI

WmPublic. Document type that captures the IRI that caused the problem.

Parameters

wsa:ProblemIRI **Document** Contains the IRI that caused the problem.

Key	Description
<i>*body</i>	String Optional. The string representing the IRI that caused the problem.

Usage Notes

To add, retrieve, or remove the `wsa:ProblemIRI` header of a SOAP message, use `pub.soap.wsa:problemIRI` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa:relatesTo

WmPublic. Document type that defines the contents of the `wsa:RelatesTo` WS-Addressing header.

Parameters

wsa:RelatesTo **Document** Contains the relationship information.

Key	Description
<i>@RelationshipType</i>	String Optional. The relationship type.
<i>*body</i>	String <wsa:MessageID> of the related SOAP message.

Usage Notes

To add, retrieve, or remove the `wsa:RelatesTo` header of a SOAP message, use `pub.soap.wsa:relatesTo` as the value for the `documentType` input parameter of the `pub.soap.handler:addHeaderBlock`, `pub.soap.handler:getHeaderBlock`, and `pub.soap.handler:removeBodyBlock` services.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa:replyTo

WmPublic. Document type that defines the contents of the `wsa:ReplyTo` WS-Addressing header.

Parameters

<i>wsa:ReplyTo</i>	Document Contains the address of the intended receiver of the response message.																												
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Usage Notes

To add, retrieve, or remove the `wsa:ReplyTo` header of a SOAP message, use `pub.soap.wsa:replyTo` as the value for the `documentType` input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa:retryAfter

WmPublic. Document type that you can use to retrieve the `wsa:RetryAfter` header of a SOAP message.

Parameters

wsa:RetryAfter

Document Contains the `wsa:RetryAfter` header of a SOAP message.

Key	Description
<i>*body</i>	String Optional. The retry after duration retrieved from the <code>wsa:RetryAfter</code> SOAP header.

Usage Notes

To add, retrieve, or remove the `wsa:RetryAfter` header of a SOAP message, use `pub.soap.wsa:retryAfter` as the value for the `documentType` input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa:to

WmPublic. Document type that defines the contents of the `wsa:To` WS-Addressing header.

Parameters

wsa:To

Document Contains the address of the intended receiver of the message.

Key	Description
<i>*body</i>	String The address of the intended receiver of the message.

Usage Notes

To add, retrieve, or remove the `wsa:To` header of a SOAP message, use `pub.soap.wsa:to` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa:schema_wsa

WmPublic. A schema containing the elements from <http://www.w3.org/2005/08/addressing> namespace.

pub.soap.wsa.submission:action

WmPublic. Document type that defines the contents of the `wsa:Action` WS-Addressing header.

Parameters

wsa:Action **Document** Contains the WS-Addressing action.

<u>Key</u>	<u>Description</u>
<i>*body</i>	String Value of the WS-Addressing action.

Usage Notes

To add, retrieve, or remove the `wsa:Action` header of a SOAP message, use `pub.soap.wsa.submission:action` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

The `pub.soap.wsa.submission:action` document type relates to the W3C WS-Addressing Submission version of WS-Addressing specification.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa.submission:faultTo

WmPublic. Document type that defines the contents of the `wsa:FaultTo` WS-Addressing header.

Parameters

wsa:FaultTo **Document** Contains the address of the intended receiver of the fault message.

Key	Description						
<i>wsa:Address</i>	Document Contains the end point URI for the fault message.						
	<table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>*body</i></td> <td>String Optional. The end point URI for the fault message.</td> </tr> </tbody> </table>	Key	Description	<i>*body</i>	String Optional. The end point URI for the fault message.		
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<i>*body</i>	String Optional. The end point URI for the fault message.						
<i>wsa:Reference Properties</i>	Document Optional. The properties that are required to identify the entity or resource being conveyed.						
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<i>*any</i>	Object List Optional. The reference parameter elements.						
<i>wsa:PortType</i>	Document Optional. Contains the QName of the primary portType of the endpoint being conveyed.						
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Key	Description						
<i>*body</i>	Object List Optional. The QName of the primary portType of the endpoint being conveyed.						
<i>wsa:Service Name</i>	Document Optional. Represents the QName identifying the WSDL service element that contains the definition of the endpoint being conveyed.						
	<table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>@PortName</i></td> <td>String Optional. The name of the <wsdl:port> definition that corresponds to the endpoint being referenced.</td> </tr> <tr> <td><i>*body</i></td> <td>String Optional. The <wsdl:service> definition that contains a WSDL description of the endpoint being referenced.</td> </tr> </tbody> </table>	Key	Description	<i>@PortName</i>	String Optional. The name of the <wsdl:port> definition that corresponds to the endpoint being referenced.	<i>*body</i>	String Optional. The <wsdl:service> definition that contains a WSDL description of the endpoint being referenced.
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<i>@PortName</i>	String Optional. The name of the <wsdl:port> definition that corresponds to the endpoint being referenced.						
<i>*body</i>	String Optional. The <wsdl:service> definition that contains a WSDL description of the endpoint being referenced.						
<i>*any</i>	Object List Optional. Contains other extensible elements, if any.						

Usage Notes

To add, retrieve, or remove the `wsa:FaultTo` header of a SOAP message, use `pub.soap.wsa.submission:faultTo` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

The `pub.soap.wsa.submission:faultTo` document type relates to the W3C WS-Addressing Submission version of WS-Addressing specification.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa.submission:from

WmPublic. Document type that contains the details about the source of the message.

Parameters

<i>wsa:From</i>	Document Contains the details about the source of the message.																																
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Usage Notes

To add, retrieve, or remove the `wsa:MessageID` header of a SOAP message, use `pub.soap.wsa.submission:messageID` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

The `pub.soap.wsa.submission:messageID` document type relates to the W3C WS-Addressing Submission version of WS-Addressing specification.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa.submission:relatesTo

WmPublic. Document type that defines the contents of the `wsa:RelatesTo` WS-Addressing header.

Parameters

<i>wsa:RelatesTo</i>	Document Contains the relationship information.						
	<table><thead><tr><th>Key</th><th>Description</th></tr></thead><tbody><tr><td><i>@RelationshipType</i></td><td>String Optional. The relationship type.</td></tr><tr><td><i>*body</i></td><td>String <wsa:MessageID> of the related SOAP message.</td></tr></tbody></table>	Key	Description	<i>@RelationshipType</i>	String Optional. The relationship type.	<i>*body</i>	String <wsa:MessageID> of the related SOAP message.
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<i>@RelationshipType</i>	String Optional. The relationship type.						
<i>*body</i>	String <wsa:MessageID> of the related SOAP message.						

Usage Notes

To add, retrieve, or remove the `wsa:RelatesTo` header of a SOAP message, use `pub.soap.wsa.submission:relatesTo` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

The `pub.soap.wsa.submission:relatesTo` document type relates to the W3C WS-Addressing Submission version of WS-Addressing specification.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa.submission:replyTo

WmPublic. Document type that specifies the destination to which the response message is to be sent.

Parameters

<i>wsa:FaultTo</i>	Document Contains the address of the intended receiver of the response message.																																												
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description of the endpoint being referenced.

any* **Object List Optional. Contains other extensible elements, if any.

Usage Notes

To add, retrieve, or remove the `wsa:ReplyTo` header of a SOAP message, use `pub.soap.wsa.submission:replyTo` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

The `pub.soap.wsa.submission:replyTo` document type relates to the W3C WS-Addressing Submission version of WS-Addressing specification.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa.submission:retryAfter

WmPublic. Document type that you can use to retrieve the `wsa:RetryAfter` header of a SOAP message.

Parameters

wsa:RetryAfter **Document** Contains you can use to retrieve the `wsa:RetryAfter` header of a SOAP message.

Key	Description
<i>*body</i>	String Optional. The retry after duration retrieved from the <code>wsa:RetryAfter</code> SOAP header.

Usage Notes

To add, retrieve, or remove the `wsa:RetryAfter` header of a SOAP message, use `pub.soap.wsa.submission:retryAfter` as the value for the *documentType* input parameter of the [pub.soap.handler:addHeaderBlock](#), [pub.soap.handler:getHeaderBlock](#), and [pub.soap.handler:removeBodyBlock](#) services.

The `pub.soap.wsa.submission:retryAfter` document type relates to the W3C WS-Addressing Submission version of WS-Addressing specification.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa.submission:to

WmPublic. Document type that defines the contents of the `wsa:To` WS-Addressing header.

Parameters

wsa:To **Document** Contains the address of the intended receiver of the message.

Key	Description
<i>*body</i>	String The address of the intended receiver of the message.

Usage Notes

To add, retrieve, or remove the `wsa:To` header of a SOAP message, use `pub.soap.wsa.submission:to` as the value for the *documentType* input parameter of the `pub.soap.handler:addHeaderBlock`, `pub.soap.handler:getHeaderBlock`, and `pub.soap.handler:removeBodyBlock` services.

The `pub.soap.wsa.submission:to` document type relates to the W3C WS-Addressing Submission version of WS-Addressing specification.

For more details about how Integration Server implements WS-Addressing, see the section *About WS-Addressing in Integration Server* in the *Web Services Developer's Guide*.

pub.soap.wsa.submission:schema_wsa_submission

WmPublic. A schema containing the elements from `http://schemas.xmlsoap.org/ws/2004/08/addressing` namespace.

pub.soap.wsrn:closeSequence

WmPublic. Closes a reliable messaging sequence.

Input Parameters

serverSequenceId **String** Unique identifier associated with the reliable messaging sequence that you want to close.

Note:

The *serverSequenceId* parameter is returned as the output parameter of the `pub.soap.wsrn:createSequence` service or as the *reliableMessagingInfo/responseReliableMessagingProperties/serverSequenceId* output parameter of a web service connector.

Output Parameters

- fault* **Document** Conditional. Contents of the fault block.
The fault document references the [pub.soap.utils:soapFault](#) document type.
- transportInfo* **Document** Conditional. Headers from response and request messages.
The contents of *transportInfo* vary depending on the actual transport used by the service.

Note:

The transport information returned by this service is similar to the transport information returned by a web service connector. For more information, see the section *About Transport and Fault Information Returned by a Web Service Connector* in the *Web Services Developer's Guide*.

The *transportInfo* parameter contains the following keys:

Key	Description
<i>requestHeaders</i>	Document Conditional. Header fields from the request message issued by the reliable messaging source.
<i>responseHeaders</i>	Document Conditional. Header fields from the response. Each key in <i>responseHeaders</i> represents a field (line) of the response header. Key names represent the names of header fields. The key values are Strings containing the values of the fields. Whether or not the service returns the <i>responseHeaders</i> parameter depends on the success or failure of the service. In the case of failure, the point at which the failure occurs determines the presence of the <i>responseHeaders</i> parameter.
<i>status</i>	Document Conditional. Status code from the request.
<i>statusMessage</i>	Document Conditional. Description of the status code returned by the underlying transport.

pub.soap.wsrn:createSequence

WmPublic. Sends a request to a reliable messaging destination to create a new reliable messaging sequence.

Input Parameters

consumer WebServiceDescriptorName **String** Fully qualified name of the consumer web service descriptor for which the reliable message sequence is to be created. That is, the consumer web service descriptor that contains the reliable messaging destination endpoint information.

Note:

The consumer web service descriptor must have a reliable messaging policy attached or must be created from a reliable messaging policy annotated WSDL.

_port **String** Specifies the port that Integration Server uses to resolve the endpoint address with which the reliable messaging sequence is to be established.

sequenceKey **String** Optional. Unique key to identify the message sequence. A reliable messaging client associates a sequence key to a message sequence based on the endpoint URL to which the message sequence is directed. In cases where there are several message sequences directed to the same endpoint URL, you can specify a custom sequence key to identify each sequence. Each sequence is then uniquely identified by the endpoint URL and the user-specified sequence key.

Important:

The user-specified sequence key should not exceed 32 characters in length.

acksTo **Document** Optional. Consumer response endpoint address to which the reliable message destination must send the acknowledgment. To specify the consumer response endpoint address, use the **Response endpoint address template** binder property of the consumer web service descriptor for which the reliable message sequence is to be created, as the address template and replace the placeholders <server> and <port> with appropriate values.

If no address is specified as *acksTo*, the acknowledgment messages are sent back to the requester.

Key	Description
<i>address</i>	Document Document specifying the address to which the acknowledgment is to be sent.
Key	Description
<i>value</i>	String Address to which the acknowledgment is to be sent.

auth **Document** Optional. Transport-level credentials to include in the request. Integration Server uses the information provided in *auth* to create the SOAP request.

Note:

Information specified in *auth* overwrites any authentication credentials specified in the consumer endpoint alias that is assigned to the binder.

Key	Description
<i>transport</i>	<p>Document Optional. Transport level authorization parameters to include in the HTTP request. Integration Server uses the information specified in the <i>transport</i> variable to populate the Authorization header in the HTTP request.</p> <p>You only need to provide credentials in <i>transport</i> if the endpoint URL specifies HTTPS and you want to overwrite the credentials specified in the consumer endpoint alias assigned to the binder.</p>
Key	Description
<i>type</i>	<p>String Optional. Type of authentication required by the reliable messaging client. If <i>type</i> is not specified, Integration Server uses Basic.</p>
	<p>Note: If any value other than Basic is specified, Integration Server ignores the credentials provided in <i>user</i>, <i>pass</i>, and <i>serverCerts</i>.</p>
<i>user</i>	<p>String Optional. User name used to authenticate the reliable messaging client at the HTTP or HTTPS transport level on the reliable messaging server.</p>
<i>pass</i>	<p>String Optional. Password used to authenticate the reliable messaging client to the reliable messaging server.</p>
<i>serverCerts</i>	<p>Document Optional. The private key and certificate chain of the message signer.</p> <ul style="list-style-type: none"> ■ <i>keyStoreAlias</i> String Alias to the keystore that contains the private key used to securely connect to the reliable messaging server. ■ <i>keyAlias</i> String Alias to the key in the keystore that contains the private key used to connect to the

reliable messaging server securely. The key must be in the keystore specified in *keyStoreAlias*.

<i>timeout</i>	<p>String Optional. Time (in milliseconds) to wait for a response from the reliable messaging server before timing out and terminating the request.</p> <p>If <i>timeout</i> is not specified, or a value less than 0 is specified, Integration Server uses the value of the <code>watt.server.SOAP.request.timeout</code> server property.</p> <p>For more information about server configuration properties, see <i>webMethods Integration Server Administrator's Guide</i>.</p> <p>A <i>timeout</i> value of 0 means Integration Server waits for a response indefinitely. If the connection to the reliable messaging server ends before Integration Server receives a response, the service ends with an exception and a status code of 408.</p>
<i>_url</i>	<p>String Optional. URL to use as the endpoint URL for the web service. If supplied, the value of <i>_url</i> overwrites the endpoint URL in the original WSDL.</p>
<i>transportHeaders</i>	<p>Document Optional. Transport header fields that you want to explicitly set in the request issued by the reliable messaging client.</p> <p>Specify a key in <i>transportHeaders</i> for each header field that you want to set. The key name represents the name of the header field and the key value represents the value of that header field. The names and values supplied to <i>transportHeaders</i> must be of type String. For information about using <i>transportHeaders</i>, including a description of the default Integration Server behavior, see the section <i>Signature for a Web Service Connector</i> in the <i>Web Services Developer's Guide</i>.</p>

Output Parameters

<i>serverSequenceId</i>	<p>String Unique identifier returned by Integration Server and associated with each message sequence.</p>
	<p>Note: The <i>serverSequenceId</i> is used as the input parameter of <code>pub.soap.wsrn:closeSequence</code>, <code>pub.soap.wsrn:sendAcknowledgementRequest</code>, <code>pub.soap.wsrn:terminateSequence</code>, and <code>pub.soap.wsrn:waitUntilSequenceCompleted</code> services.</p>
<i>fault</i>	<p>Document Conditional. Contents of the fault block.</p> <p>The fault document references the “pub.soap.utils:soapFault” on page 879 document type.</p>
<i>transportInfo</i>	<p>Document Conditional. Headers from response and request messages.</p>

The contents of *transportInfo* vary depending on the actual transport used by the service.

Note:

The transport information returned by this service is similar to the transport information returned by a web service connector. For more information, see the section *About Transport and Fault Information Returned by a Web Service Connector* in the *Web Services Developer's Guide*.

The *transportInfo* parameter contains the following keys:

Key	Description
<i>requestHeaders</i>	Document Conditional. Header fields from the request message issued by the reliable messaging source.
<i>responseHeaders</i>	Document Conditional. Header fields from the response. Each key in <i>responseHeaders</i> represents a field (line) of the response header. Key names represent the names of header fields. The key values are Strings containing the values of the fields. Whether or not the service returns the <i>responseHeaders</i> parameter depends on the success or failure of the service. In the case of failure, the point at which the failure occurs determines the presence of the <i>responseHeaders</i> parameter.
<i>status</i>	Document Conditional. Status code from the request.
<i>statusMessage</i>	Document Conditional. Description of the status code returned by the underlying transport.

pub.soap.wsrn:sendAcknowledgementRequest

WmPublic. Requests an acknowledgment for a message sequence.

Input Parameters

serverSequenceId **String** Unique identifier associated with the reliable messaging sequence for which you want an acknowledgment.

Note:

The *serverSequenceId* parameter is returned as the output parameter of the *pub.soap.wsrn:createSequence* service or as the *reliableMessagingInfo/responseReliableMessagingProperties/ serverSequenceId* output parameter of the web service connector.

Output Parameters

- fault* **Document** Conditional. Contents of the fault block.
- The fault document references the “[pub.soap.utils:soapFault](#)” on page 879 document type.
- transportInfo* **Document** Conditional. Headers from response and request messages.
- The contents of *transportInfo* vary depending on the actual transport used by the service.

Note:

The transport information returned by this service is similar to the transport information returned by a web service connector. For more information, see the section *About Transport and Fault Information Returned by a Web Service Connector* in the *Web Services Developer’s Guide*.

The *transportInfo* parameter contains the following keys:

Key	Description
<i>requestHeaders</i>	Document Conditional. Header fields from the request message issued by the reliable messaging source.
<i>responseHeaders</i>	<p>Document Conditional. Header fields from the response.</p> <p>Each key in <i>responseHeaders</i> represents a field (line) of the response header. Key names represent the names of header fields. The key values are Strings containing the values of the fields.</p> <p>Whether or not the service returns the <i>responseHeaders</i> parameter depends on the success or failure of the service. In the case of failure, the point at which the failure occurs determines the presence of the <i>responseHeaders</i> parameter.</p>
<i>status</i>	Document Conditional. Status code from the request.
<i>statusMessage</i>	Document Conditional. Description of the status code returned by the underlying transport.

pub.soap.wsrn:terminateSequence

WmPublic. Terminates a reliable messaging sequence.

Input Parameters

serverSequenceId **String** Unique identifier associated with the reliable messaging sequence that you want to terminate.

Note:

The *serverSequenceId* parameter is returned as the output parameter of the `pub.soap.wsrn:createSequence` service or as the `reliableMessagingInfo/responseReliableMessagingProperties/serverSequenceId` output parameter of the web service connector.

Output Parameters

fault **Document** Conditional. Contents of the fault block.

The fault document references the [“pub.soap.utils:soapFault” on page 879](#) document type.

transportInfo **Document** Conditional. Headers from response and request messages.

The contents of *transportInfo* vary depending on the actual transport used by the service.

Note:

The transport information returned by this service is similar to the transport information returned by a web service connector. For more information, see the section *About Transport and Fault Information Returned by a Web Service Connector* in the *Web Services Developer's Guide*.

The *transportInfo* parameter contains the following keys:

Key	Description
<i>requestHeaders</i>	Document Conditional. Header fields from the request message issued by the reliable messaging source.
<i>responseHeaders</i>	<p>Document Conditional. Header fields from the response.</p> <p>Each key in <i>responseHeaders</i> represents a field (line) of the response header. Key names represent the names of header fields. The key values are Strings containing the values of the fields.</p> <p>Whether or not the service returns the <i>responseHeaders</i> parameter depends on the success or failure of the service. In the case of failure, the</p>

	point at which the failure occurs determines the presence of the <i>responseHeaders</i> parameter.
<i>status</i>	Document Conditional. Status code from the request.
<i>statusMessage</i>	Document Conditional. Description of the status code returned by the underlying transport.

pub.soap.wsrn:waitUntilSequenceCompleted

WmPublic. Instructs Integration Server to wait for a reliable messaging sequence to complete before terminating it.

Input Parameters

<i>serverSequenceId</i>	String Unique identifier associated with a reliable messaging sequence. Integration Server waits for all the messages in the specified message sequence to be sent and acknowledged before terminating the sequence.
-------------------------	---

Note:

The *serverSequenceId* parameter is returned as the output parameter of the `pub.soap.wsrn:createSequence` service or as the `reliableMessagingInfo/responseReliableMessagingProperties/serverSequenceId` output parameter of the web service connector.

<i>maxWaitingTime</i>	String Optional. Maximum time (in milliseconds) to wait for the reliable messaging sequence to complete before terminating it. If no value is specified, the service waits indefinitely until it receives a reply.
-----------------------	---

Output Parameters

<i>fault</i>	Document Conditional. Contents of the fault block. The fault document references the “pub.soap.utils:soapFault” on page 879 document type.
<i>transportInfo</i>	Document Conditional. Headers from response and request messages. The contents of <i>transportInfo</i> vary depending on the actual transport used by the service.

Note:

The transport information returned by this service is similar to the transport information returned by a web service connector. For more information, see the section *About Transport and Fault Information Returned by a Web Service Connector* in the *Web Services Developer's Guide*.

The *transportInfo* parameter contains the following keys:

Key	Description
<i>requestHeaders</i>	Document Conditional. Header fields from the request message issued by the reliable messaging source.
<i>responseHeaders</i>	Document Conditional. Header fields from the response. Each key in <i>responseHeaders</i> represents a field (line) of the response header. Key names represent the names of header fields. The key values are Strings containing the values of the fields. Whether or not the service returns the <i>responseHeaders</i> parameter depends on the success or failure of the service. In the case of failure, the point at which the failure occurs determines the presence of the <i>responseHeaders</i> parameter.
<i>status</i>	Document Conditional. Status code from the request.
<i>statusMessage</i>	Document Conditional. Description of the status code returned by the underlying transport.

39 Storage Folder

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You use the elements in the storage folder to create, close, and delete data stores in the Integration Server short-term store.

About the Storage Elements

You use the elements in the storage folder to create, close, and delete data stores in the Integration Server short-term store. Integration Server uses the short-term store for information that needs to persist across server restarts. For example, if the Integration Server on which your flow service is executing becomes unavailable and then restarts, the flow service can check the state information in the short-term store and begin processing at the point where the flow service was interrupted. The short-term store exists as the IS_DATASTORE table in an external database identified to Integration Server through the ISInternal functional alias.

When using the `pub.storage` services, keep in mind that the short-term store is not intended to be used as a general-purpose storage engine. Rather, it is primarily provided to support shared storage of application resources and transient data in an Integration Server clustered environment. Consequently, Software AG recommends that you do not use the short-term store to process high volumes, large data records, or to permanently archive records.

Important:

These services are a tool for maintaining state information in the short-term store. It is up to the developer of the flow service to make sure the flow service keeps track of its state and correctly handles restarts.

In Release 7.1, the Integration Server 6.1 Repository Server was replaced by a set of database tables collectively called IS Internal. During Integration Server installation, you can choose to use the embedded IS Internal database, or you can choose to use an external RDBMS in which you have created or will create the IS Internal database component. If you choose the external RDBMS, data associated with the `pub.storage` services will be stored in the IS_DATASTORE table in the IS Internal database component. For DB2, the size of a BLOB column is defined when the table is created; you might find that the VALUE column in the IS_DATASTORE table is not wide enough to accommodate your `pub.storage` data. If you have not yet created the IS Internal database component, open the appropriate table creation script below in a text editor and modify the width of the VALUE column in the IS_DATASTORE table:

- `Software AG_directory \common\db\scripts\db2\isinternal\version\create\db2_isi_c_ddl.sql`
- `Software AG_directory \common\db\scripts\db2as400\isinternal\version\create\db2as400_isi_c_ddl.sql`

Where *version* is the directory that contains the latest version of the external RDBMS.

Tip:

The directory with the highest number corresponds to the latest version of the external RDBMS.

If you have already created the IS Internal database component and the VALUE column is not wide enough to accommodate your `pub.storage` data, use DB2 commands to modify the width of the VALUE column in the IS_DATASTORE table.

Note: Integration Server provides a performance optimization in the `pub.storage` implementation. This optimization caches database keys in local memory. Set `watt.server.storage.optimizeForStandalone` to `true` to use this optimization for a stand-alone Integration Server. The `watt.server.storage.optimizeForStandalone` must be set to `false` in a cluster. When in a cluster, the local cache can get out of sync with the database if another server in the cluster deletes then recreates data with the same `storeName` and `key` as the locally cached data.

Locking Considerations

The following sections describe in general how the `pub.storage` services handle locking requests. See the individual service descriptions for more detailed information.

Entry Locking

To maintain data integrity, the short-term store uses locking to ensure that multiple threads do not modify the same entry at the same time. For insertions and removals, the short-term store sets and releases the lock. For updates, the client must set and release the lock. Using locking improperly, that is, creating a lock but not releasing it, can cause deadlocks in the short-term store.

The following guidelines can help you avoid short-term store deadlock:

- Release locks in the thread through which they were set. In other words, you cannot set a lock in one thread and release it in another. The safest way to do this is to release each lock in the flow service that acquired it.
- Unlock entries before the flow completes. Entries remain locked until released via a `pub.storage:put` or an explicit unlock (`pub.storage:unlock`). To accomplish this, always pair a call to `pub.storage:get` or `pub.storage:lock` with a call to `pub.storage:put` or `pub.storage:unlock` so that every lock is followed by an unlock. In addition, use a Try-Catch pattern in your flow service so that an exception does not prevent the flow service from continuing and releasing the lock.
- Set limits on how long the threads will wait for a lock to be set or released. By setting finite limits, you allow the `pub.storage` service to release locks after a set amount of time and thereby avoid a deadlock situation. For more information, see [“Wait Time and Duration” on page 910](#).

Following these guidelines might not be sufficient in some situations. For example, an Integration Server or hardware crash might result in a prematurely terminated flow service, thereby leaving an outstanding lock on the `pub.storage` service. Or, a client flow service might hang while requesting a lock. In these situations, having limits on how long a lock can exist (*duration*) or how long a lock request will wait (*wait time*) can prevent an application deadlock while using `pub.storage` services. For more information about lock duration and wait time, see [“Wait Time and Duration” on page 910](#).

Data Store Locking

When a `pub.storage` service locks an entry, the service also implicitly locks the data store in which the entry resides. This behavior prevents another thread from deleting the entire data store and the entries it contains while your thread is working with the entry. When the locked entry is unlocked, the implicit lock on the data store is also released.

Be careful when explicitly unlocking data stores. Consider the following example:

1. User_A locks an item. This creates two locks: an explicit lock on the entry, and an implicit lock on the data store.
2. User_A later unlocks the data store explicitly while still holding the lock on the entry.
3. User_B locks, then deletes the data store, including the entry locked by User_A in the first step.

When User_A explicitly unlocked the data store in step 2, User_B was able to delete the entry the User_A was working with.

Automatic Promotion to Exclusive Lock

If a `pub.storage` service tries to acquire an exclusive lock on an object, but finds a shared lock from the same thread already in place on the object, the service will try to promote the lock to an exclusive lock.

If a `pub.storage` service that requires an exclusive lock encounters a shared or exclusive lock held by another thread, it will wait until the object becomes available. If the object remains locked for the period specified by the `waitlength` parameter passed by the service, or the value configured on the `watt.server.storage.lock.maxWait` property, the service will fail.

Wait Time and Duration

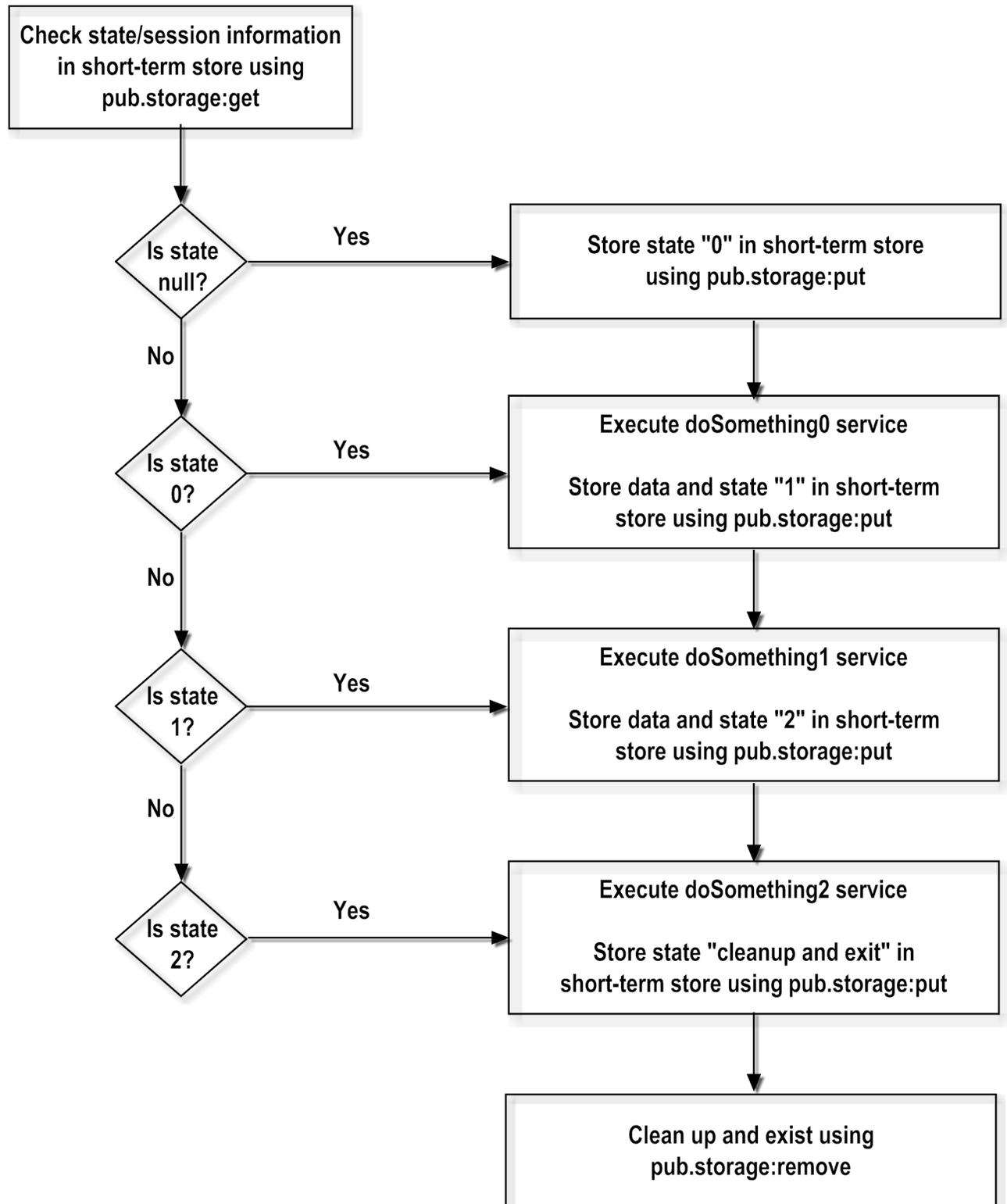
You can control how long Integration Server will wait to obtain a lock and how long it will hold a lock by using the following server properties:

- You can change the lock wait by using the `watt.server.storage.lock.maxWait` property from the **Settings > Extended** page in Integration Server Administrator. By default, a lock request will wait 240000 milliseconds (4 minutes) to obtain a lock. If a `pub.storage` service specifies a lock wait through the `waitlength` parameter, Integration Server uses this value instead of the value specified on the `watt.server.storage.lock.maxWait` property.
- You can change the lock duration by using the `watt.server.storage.lock.maxDuration` property from the **Settings > Extended** page in Integration Server Administrator. By default, a lock can exist for 180000 milliseconds (3 minutes). After 3 minutes, the server forcibly releases the lock.

Sample Flow Service for Checkpoint Restart

The following diagram shows how to code checkpoint restart into your services. The following diagram explains the logic of a flow and shows where the various `pub.storage` services are used to achieve checkpoint restart.

Logic to achieve checkpoint restart



Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.storage:add	WmPublic. Inserts a new entry into a data store.
pub.storage:closeStore	WmPublic. <i>Obsolete</i> – Closes a data store and unregisters the data store with the server.
pub.storage:deleteStore	WmPublic. Deletes a data store and all its contents. Any data in the data store is deleted. If the data store does not exist, the service takes no action.
pub.storage:get	WmPublic. Retrieves a value from a data store and locks the entry and the data store on behalf of the thread that invoked the service.
pub.storage:keys	WmPublic. Obtains a list of all the keys in a data store.
pub.storage:listLocks	WmPublic. Lists all pub.storage locks held by the supplied lock holder or target. If no input is supplied, the service returns a list of all pub.storage locks.
pub.storage:lock	WmPublic. Locks an entry and/or data store on behalf of the thread invoking this service.
pub.storage:put	WmPublic. Inserts or updates an entry in a data store. If the key does not exist in the data store, the entry is inserted.
pub.storage:registerStore	WmPublic. <i>Obsolete</i> – Opens or creates a data store and registers the store with the server.
pub.storage:releaseLocks	WmPublic. Releases all pub.storage locks held by the identified lock holders and ids. If both holders and ids are specified, the service ignores the holders and uses ids.
pub.storage:remove	WmPublic. Removes an entry from a data store.
pub.storage:shutdown	WmPublic. Releases internal resources used by the pub.storage services. This service is run automatically when the WmPublic package is unloaded and should <i>not</i> be explicitly invoked by a client.
pub.storage:startup	WmPublic. Performs initialization of internal facilities used by the pub.storage services. This service is run automatically when the WmPublic package is loaded and should <i>not</i> be explicitly invoked by a client.
pub.storage:unlock	WmPublic. Unlocks an entry or a data store.

pub.storage:add

WmPublic. Inserts a new entry into a data store.

If the key already exists in the data store, the `pub.storage:add` service does nothing.

Input Parameters

<i>storeName</i>	String Name of the data store in which to insert the entry.
<i>key</i>	String Key under which the entry is to be inserted.
<i>value</i>	Document Value (IData object) to be inserted.

Output Parameters

<i>result</i>	String Flag indicating whether the entry was successfully added. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates that the new entry was inserted successfully.■ <code>false</code> indicates that the entry was not inserted (usually because an entry for <i>key</i> already exists).
<i>error</i>	String Error message generated while inserting the new entry into the data store.

pub.storage:closeStore

WmPublic. *Obsolete* – Closes a data store and unregisters the data store with the server.

If the data store is not registered with the server, an exception will be thrown. A data store cannot be accessed after it has been unregistered. If you want to access the data in the data store, you need to register the data store again using [pub.storage:registerStore](#).

Input Parameters

<i>storeName</i>	String Name of the data store to close and unregister.
------------------	---

Output Parameters

None.

Usage Notes

This service is obsolete. When the repository was removed for Integration Server version 7.1.2, this service became a NOP (no operation).

pub.storage:deleteStore

WmPublic. Deletes a data store and all its contents. Any data in the data store is deleted. If the data store does not exist, the service takes no action.

Input Parameters

<i>storeName</i>	String Name of the data store to delete.
<i>waitLength</i>	String Optional. Length of time, in milliseconds, that you want to wait for this data store to become available for deletion if it is already locked by another thread. The default is the default Maximum Lock Wait value, which is specified on the <code>watt.server.storage.lock.maxWait</code> property. You can update this property by using the <code>Settings > Extended</code> page on the Integration Server Administrator.

Output Parameters

<i>count</i>	String Number of data store entries that were deleted. If the store does not exist, this value is 0.
--------------	---

Usage Notes

This service obtains an exclusive lock on the data store, but no locks on the individual entries in the data store.

If this service finds a shared lock from the same thread on the data store, the service will automatically promote the lock to an exclusive lock.

The exclusive lock prevents other threads from acquiring locks on the data store or entries within the data store during the delete operation.

pub.storage:get

WmPublic. Retrieves a value from a data store and locks the entry and the data store on behalf of the thread that invoked the service.

Important:

This service does not automatically release the lock on the data store or entry after performing the get operation, so you need to make sure the lock is released by calling the [pub.storage:put](#) or [pub.storage:unlock](#) service. If you do not release the lock, other threads will not be able to access

the resource until Integration Server automatically releases the lock after the amount of time specified on the `watt.server.storage.lock.maxDuration` property has passed.

Input Parameters

<i>storeName</i>	String Name of the data store from which you want to retrieve the entry.
<i>key</i>	String Key of the entry whose value you want to retrieve.
<i>waitLength</i>	String Optional. Length of time, in milliseconds, that you want to wait for this entry to become available if it is already locked by another thread. The default is the default Maximum Lock Wait value, which is specified on the <code>watt.server.storage.lock.maxWait</code> property. You can update this property by using the Settings > Extended page on the Integration Server Administrator.
<i>lockMode</i>	<p>String Optional. Type of lock you want to place on the entry. Set to:</p> <ul style="list-style-type: none"> ■ Exclusive to prevent other threads from reading or updating the entry while you are using it. The service also obtains a shared lock on the data store. An exclusive lock on an entry allows you to modify the entry. ■ Read is obsolete. If this value is specified, the service obtains a shared lock. ■ Share to prevent other threads from obtaining an exclusive lock on the entry. The service also obtains a shared lock on the data store. A shared lock on an entry allows you to read, but not modify, the entry. This is the default.

Output Parameters

<i>value</i>	Document Retrieved entry (IData object). If the requested entry does not exist, the value of this parameter is null.
--------------	---

Usage Notes

If you request an exclusive lock and the service finds a shared lock from the same thread on the entry, the service will automatically promote the shared lock on the entry to an exclusive lock.

When this service locks an entry, it also acquires a shared lock on the associated data store to prevent another thread from deleting the data store, and the entries it contains, while your thread has the entry locked.

When storing and retrieving the flow state in the short-term store for checkpoint restart purposes, be sure the value of *key* is unique to the transaction.

pub.storage:keys

WmPublic. Obtains a list of all the keys in a data store.

Input Parameters

storeName **String** Name of the data store from which you want to obtain a list of keys.

Output Parameters

keys **String List** Keys for the data store specified in *storeName*.

pub.storage:listLocks

WmPublic. Lists all pub.storage locks held by the supplied lock holder or target. If no input is supplied, the service returns a list of all pub.storage locks.

Input Parameters

holder **String** Optional. Identifies the holder whose pub.storage locks are to be listed. The format is "_DataStore_<sessionId:threadId>", where:

- *sessionId* is a unique, internally generated identifier for the client's session in Integration Server.
- *threadId* is a unique, internally generated identifier for the client's thread in Integration Server.

target **String** Optional. Identifies the target whose pub.storage locks are to be listed.

Output Parameters

locks **Document List** The list of pub.storage locks. This output variable can be null.

<u>Value</u>	<u>Description</u>
id	String The internal ID of the lock
target	String Item that is locked, specified as a data store name or the key for an entry

holder	String Holder of the lock. This value is generated internally by the <code>pub.storage</code> services.
type	String "EXCLUSIVE" or "SHARE"
count	String Number of lock holders sharing this lock
time	String The time the lock was created.

pub.storage:lock

WmPublic. Locks an entry and/or data store on behalf of the thread invoking this service.

Important:

When you lock an entry or data store using this service, you must release the lock by using a `put` (`pub.storage:put`) or an explicit `unlock` (`pub.storage:unlock`). If you do not release the lock, other threads will not be able to access the resource until Integration Server automatically releases the lock after the amount of time specified on the `watt.server.storage.lock.maxDuration` parameter has passed.

Important:

Be careful when releasing locks with the `pub.storage:unlock` service. If you release a lock on a data store, another thread can obtain a lock on the data store and delete it, and the entries it contains, even if your thread still has locks on one or more of the entries.

Input Parameters

storeName **String** Name of the data store containing the entry.

key **String** Optional. Key of the entry that you want to lock.

If *key* is not supplied and you request:

- A shared lock, the service obtains a shared lock on the data store, allowing other threads to read and modify entries, but not to delete them.
- An exclusive lock, the service obtains an exclusive lock on the data store, preventing other threads from locking the data store and the entries, thereby preventing those threads from reading, modifying, or deleting the entries or the data store.

If both *storeName* and *key* are specified and you request:

- A shared lock, the service obtains a shared lock on the data store and the entry.
- An exclusive lock, the service obtains a shared lock on the data store and an exclusive lock on the entry.

<i>waitLength</i>	String Optional. Length of time, in milliseconds, that you want to wait for this entry to become available if it is already locked by another thread. The default is the default Maximum Lock Wait value, which is specified on the <code>watt.server.storage.lock.maxWait</code> property. You can update this property by using the Settings > Extended page on the Integration Server Administrator.
<i>lockMode</i>	String Optional. Type of lock you want to place on the entry or data store. Set to: <ul style="list-style-type: none">■ <code>Exclusive</code> to prevent other threads from obtaining a lock on the data store or entry.<p>An exclusive lock on an entry allows you to modify the entry, and prevents other threads from reading or modifying the entry.</p><p>An exclusive lock on a data store also locks the entries in the data store. In addition, an exclusive lock on a data store allows you to delete the data store.</p>■ <code>Read</code> is obsolete. If this value is specified, the service obtains a shared lock.■ <code>Share</code> to prevent other threads from obtaining an exclusive lock on an entry or a data store. A shared lock on an entry allows you to read, but not modify, the entry. A shared lock on a data store prevents another thread from deleting the data store. This is the default.

Output Parameters

None.

Usage Notes

If you have not specified a *key*, and your flow service does not invoke `pub.storage:put` or `pub.storage:unlock`, or your service throws an exception before invoking `pub.storage:put` or `pub.storage:unlock`, the entire data store remains locked until the amount of time specified on the `watt.server.storage.lock.maxDuration` parameter has passed.

If the key does not exist in the data store at the time your flow service executes, the `pub.storage:lock` service is a NOP (no operation). Set the `watt.server.storage.addKeyToStoreIfNotPresent` parameter to true if you want the `pub.storage:lock` service to add the specified key to the data store if the key does not exist at the time the service executes. When the `watt.server.storage.addKeyToStoreIfNotPresent` parameter is set to true, the `pub.storage:lock` service creates the specified key, assigns it a NULL value, and then locks the entry in the data store.

If you request an exclusive lock on an entry, the service obtains an exclusive lock on the entry and a shared lock on the data store. If this service finds a shared lock from the same thread on the entry, the service will automatically promote the shared lock on the entry to an exclusive lock.

If you request a shared lock on an entry, the service obtains a shared lock on the entry and a shared lock on the data store.

If you request a shared lock on an entry or a data store and this service finds an exclusive lock from the same thread, the existing exclusive lock will be reused. The exclusive lock will not be demoted to a shared lock.

If you request an exclusive lock on a data store, and this service finds a shared lock from the same thread on the data store, the service will automatically promote the shared lock on the data store to an exclusive lock.

pub.storage:put

WmPublic. Inserts or updates an entry in a data store. If the key does not exist in the data store, the entry is inserted.

If the requested entry is not currently locked by the thread that invoked this service, the `pub.storage:put` service will automatically attempt to lock the entry for the duration of the `put` operation.

The service obtains an exclusive lock on the entry and a shared lock on the data store. If the service finds a shared lock from the same thread on the entry, the service will automatically promote the shared lock to an exclusive lock.

This service releases the lock when the `put` operation has completed.

Input Parameters

<i>storeName</i>	String Name of the data store into which you want to insert or update the entry.
<i>value</i>	Document Value (IData object) to be inserted or updated.
<i>waitLength</i>	String Optional. Length of time, in milliseconds, that you want to wait for this entry to become available if it is already locked by another thread. If the wait length expires before a lock is obtained, the service fails and throws an exception. The default is the default Maximum Lock Wait value, which is specified on the <code>watt.server.storage.lock.maxWait</code> property. You can update this property by using the Settings > Extended page on the Integration Server Administrator. This parameter is used only when your service did not explicitly lock the entry beforehand.
<i>key</i>	String Key where you want to insert or update the entry.

Output Parameters

error **String** Error message generated while inserting the new entry into the data store.

Usage Notes

When storing and retrieving the flow state in the short-term store for checkpoint restart purposes, be sure the value of *key* is unique to the transaction.

pub.storage:registerStore

WmPublic. *Obsolete* – Opens or creates a data store and registers the store with the server.

A data store must be registered before it can be accessed. If the store is already registered with the server, this service does nothing.

Input Parameters

storeName **String** Name of the data store to register.

Output Parameters

None.

pub.storage:releaseLocks

WmPublic. Releases all pub.storage locks held by the identified lock holders and ids. If both holders and ids are specified, the service ignores the holders and uses IDs.

This service is intended primarily for administrators. It is most useful when used in combination with pub.storage:listLocks. You can map the locks/holder string list from that service to the holders input variable in this service or the locks/id string list to the ids input variables. If neither ids nor holders are supplied, no locks are released.

Important:

Use this service with care. It will release locks held by active threads and could cause their processing to fail. In addition, if you release a lock on a data store, another thread can obtain a lock on the data store and delete it, and the entries it contains, even if the original thread still has locks on one or more of the entries.

Input Parameters

holders **String List** Optional. Holders whose pub.storage locks are to be released.

ids **String** Optional. Ids whose pub.storage locks are to be released.

Output Parameters

count **String List** Number of locks that were released.

pub.storage:remove

WmPublic. Removes an entry from a data store. This service obtains an exclusive lock on the entry and a shared lock on the data store.

Input Parameters

storeName **String** Name of the data store from which to remove an entry.

key **String** Key of the entry that you want to remove.

waitLength **String** Optional. Length of time, in milliseconds, that you want to wait for this entry to become available for deletion if it is already locked by another thread. The default is the default Maximum Lock Wait value, which is specified on the `watt.server.storage.lock.maxWait` property. You can update this property by using the **Settings > Extended** page on the Integration Server Administrator.

Output Parameters

result **String** Flag indicating whether the entry was successfully removed. A value of:

- `true` indicates that the entry was removed successfully.
- `false` indicates that the entry was not removed (usually because an entry for key does not exist).

pub.storage:shutdown

WmPublic. Releases internal resources used by the `pub.storage` services. This service is run automatically when the WmPublic package is unloaded and should *not* be explicitly invoked by a client.

pub.storage:startup

WmPublic. Performs initialization of internal facilities used by the `pub.storage` services. This service is run automatically when the WmPublic package is loaded and should *not* be explicitly invoked by a client.

pub.storage:unlock

WmPublic. Unlocks an entry or a data store.

When a flow service retrieves an entry using the `pub.storage:get` service, the entry is locked to prevent modification by other users before the flow completes. The entry remains locked until the lock owner invokes a `pub.storage:put` service. To unlock a service without using the `pub.storage:put` service, use the `pub.storage:unlock` service.

In addition, if a flow service uses the `pub.storage:lock` service to lock an entry or data store, you must use the `pub.storage:unlock` or `pub.storage:put` service to release the lock.

Important:

Be careful when releasing locks with this service. If you release a lock on a data store, another thread can obtain a lock on the data store and delete it, and the entries it contains, even if the original thread still has locks on one or more of the entries.

Input Parameters

<i>storeName</i>	String Name of the data store in which to unlock an entry.
<i>key</i>	String Optional. Key of the entry that you want to unlock. If <i>key</i> is not supplied, the lock will be removed from the data store specified in <i>storeName</i> , but any locks on entries in the data store will remain.

Output Parameters

None.

40 String Folder

■ Summary of Elements in this Folder	924
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You use the elements in the string folder to perform string manipulation and substitution operations.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.string:base64Decode	WmPublic. Decodes a Base-64 encoded string into a sequence of bytes.
pub.string:base64Encode	WmPublic. Converts a sequence of bytes into a Base64-encoded String.
pub.string:bytesToString	WmPublic. Converts a sequence of bytes to a String.
pub.string:compareStrings	WmPublic. Performs a case-sensitive comparison of two strings, and indicates whether the strings are identical.
pub.string:concat	WmPublic. Concatenates two strings.
pub.string:HTMLDecode	WmPublic. Replaces HTML character entities with native characters.
pub.string:HTMLEncode	WmPublic. Replaces HTML-sensitive characters with equivalent HTML character entities.
pub.string:indexOf	WmPublic. Returns the index of the first occurrence of a sequence of characters in a string.
pub.string:isAlphanumeric	WmPublic. Determines whether a string consists entirely of alphanumeric characters (in the ranges A–Z, a–z, or 0–9).
pub.string:isDate	WmPublic. Determines whether a string follows a specified date pattern.
pub.string:isNullEmptyOrWhitespace	WmPublic. Determines if a string is null, empty, or only whitespace.
pub.string:isNullOrBlank	WmPublic. Deprecated - Use pub.string:isNullEmptyOrWhitespace . Checks a string for a null value or empty value.
pub.string:isNumber	WmPublic. Determines whether the contents of a string can be converted to a float value.
pub.string:length	WmPublic. Returns the length of a string.
pub.string:lookupDictionary	WmPublic. Looks up a given key in a hash table and returns the string to which that key is mapped.
pub.string:lookupTable	WmPublic. Locates a key in a String Table and returns the string to which that key is mapped.

Element	Package and Description
pub.string:makeString	WmPublic. Builds a single string by concatenating the elements of a String List.
pub.string:messageFormat	WmPublic. Formats an array of strings into a given message pattern.
pub.string:numericFormat	WmPublic. Formats a number into a given numeric pattern.
pub.string:objectToString	WmPublic. Converts an object to string representation using the Java toString() method of the object.
pub.string:padLeft	WmPublic. Pads a string to a specified length by adding pad characters to the beginning of the string.
pub.string:padRight	WmPublic. Pads a string to a specified length by adding pad characters to the end of the string.
pub.string:replace	WmPublic. Replaces all occurrences of a specified substring with a substitute string.
pub.string:stringToBytes	WmPublic. Converts a string to a byte array.
pub.string:substitutePipelineVariables	WmPublic. Replaces a pipeline variable with its corresponding value.
pub.string:substring	WmPublic. Returns a substring of a given string.
pub.string:tokenize	WmPublic. Tokenizes a string using specified delimiter characters and generates a String List from the resulting tokens.
pub.string:toLowerCase	WmPublic. Converts all characters in a given string to lowercase.
pub.string:toUpperCase	WmPublic. Converts all characters in a given string to uppercase.
pub.string:trim	WmPublic. Trims leading and trailing white space from a given string.
pub.string:URLDecode	WmPublic. Decodes a URL-encoded string.
pub.string:URLEncode	WmPublic. URL-encodes a string.

pub.string:base64Decode

WmPublic. Decodes a Base-64 encoded string into a sequence of bytes.

Input Parameters

<i>string</i>	String A Base64-encoded String to decode into bytes.
<i>encoding</i>	String Optional. Specifies the encoding method for the <i>string</i> value. That is, describes how the input Base64-encoded String is constructed. Set to: <ul style="list-style-type: none">■ ASCII. This is the default.■ UTF-8 <p>If the Base64-encoded String in <i>string</i> was generated by the <code>pub.string:base64Encode</code> service, the value of the <i>encoding</i> input parameter for <code>pub.string:base64Decode</code> must match the value of the <i>encoding</i> parameter used in the <code>pub.string:base64Encode</code> service invocation.</p> <p>If the Base64-encoded String in <i>string</i> was obtained from somewhere besides the <code>pub.string:base64Encode</code> service, set the <i>encoding</i> parameter to ASCII.</p>

Output Parameters

<i>value</i>	byte[] The sequence of bytes decoded from the Base64-encoded String.
--------------	--

pub.string:base64Encode

WmPublic. Converts a sequence of bytes into a Base64-encoded String.

Input Parameters

<i>bytes</i>	byte[] Sequence of bytes to encode into a Base64-encoded String. The input <code>byte[]</code> can be any Java supported charset-encoded <code>byte[]</code> .
<i>useNewLine</i>	String Optional. Flag indicating whether to retain or remove the line breaks. Set to: <ul style="list-style-type: none">■ <code>true</code> to retain the line breaks. This is the default.■ <code>false</code> to remove the line breaks.
<i>encoding</i>	String Optional. Specifies the encoding method to be used when encoding <i>bytes</i> . Set to: <ul style="list-style-type: none">■ ASCII. This is the default.■ UTF-8

Output Parameters

value **String** Base64-encoded String encoded from the sequence of bytes.

Usage Notes

By default, the `pub.string:base64Encode` service inserts line breaks after 76 characters of data, which is not the canonical lexical form expected by implementations such as MTOM. You can use the `useNewLine` parameter to remove the line breaks. For more information about MTOM implementations, refer to *Web Services Developer's Guide*.

pub.string:bytesToString

WmPublic. Converts a sequence of bytes to a String.

Input Parameters

bytes **byte[]** Sequence of bytes to convert to a String.

encoding **String** Optional. Name of a registered, IANA character set (for example, ISO-8859-1). If you specify an unsupported encoding, the system throws an exception.

To use the default encoding, set *encoding* to `autoDetect`.

ignoreBOMChars **String** Optional. Flag indicating whether or not Integration Server removes the byte order mark (BOM) characters in the input sequence of bytes before converting the byte array to string. Set to:

- `true` to remove the byte order mark (BOM) characters before converting the input sequence of bytes to string, if the byte array contains BOM characters.
- `false` to include the byte order mark (BOM) characters while converting the input sequence of bytes to string. The default is `false`.

Output Parameters

string **String** String representation of the contents of *bytes*.

pub.string:compareStrings

WmPublic. Performs a case-sensitive comparison of two strings, and indicates whether the strings are identical.

Input Parameters

<i>inString1</i>	String Optional. String to compare against <i>inString2</i> . This input variable can be null.
<i>inString2</i>	String Optional. String to compare against <i>inString1</i> . This input variable can be null.

Output Parameters

<i>isEqual</i>	String Indicates whether or not <i>inString1</i> and <i>inString2</i> are identical. <ul style="list-style-type: none">■ <code>true</code> indicates that <i>inString1</i> and <i>inString2</i> are identical.■ <code>false</code> indicates that <i>inString1</i> and <i>inString2</i> are not identical.
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Note:

If both *inString1* and *inString2* are null, the service considers the strings to be identical and returns `true`.

pub.string:concat

WmPublic. Concatenates two strings.

Input Parameters

<i>inString1</i>	String String to which you want to concatenate another string.
<i>inString2</i>	String String to concatenate to <i>inString1</i> .

Output Parameters

<i>value</i>	String Result of concatenating <i>inString1</i> with <i>inString2</i> (<i>inString1</i> + <i>inString2</i>).
--------------	---

pub.string:HTMLDecode

WmPublic. Replaces HTML character entities with native characters.

Specifically, the service:

Replaces this HTML character entity...	With...
--	---------

>	>
<	<
&	&
"	"

Input Parameters

inString **String** An HTML-encoded String.

Output Parameters

value **String** Result from decoding the contents of *inString*. Any HTML character entities that existed in *inString* will appear as native characters in *value*.

pub.string:HTMLEncode

WmPublic. Replaces HTML-sensitive characters with equivalent HTML character entities.

Specifically, this service:

Replaces this native language character...	With...
--	---------

>	>
<	<
&	&
"	"
'	'

These translations are useful when displaying text in an HTML context.

Input Parameters

inString **String** The character you want to encode in HTML.

Output Parameters

value **String** Result from encoding the contents of *inString*. Any HTML-sensitive characters that existed in *inString* (for example, > or &) will appear as the equivalent HTML character entities in *value*.

pub.string:indexOf

WmPublic. Returns the index of the first occurrence of a sequence of characters in a string.

Input Parameters

inString **String** String in which you want to locate a sequence of characters.

subString **String** Sequence of characters to locate.

fromIndex **String** Optional. Index of *inString* from which to start the search. If no value is specified, this parameter contains 0 to indicate the beginning of the string.

Output Parameters

value **String** Index of the first occurrence of *subString* in *inString*. If no occurrence is found, this parameter contains -1.

pub.string:isAlphanumeric

WmPublic. Determines whether a string consists entirely of alphanumeric characters (in the ranges A–Z, a–z, or 0–9).

Input Parameters

inString **String** Optional. String to be checked for alphanumeric characters.

Output Parameters

isAlphanumeric **String** Indicates whether or not all the characters in *inString* are alphanumeric.

- true indicates that all the characters in *inString* are alphanumeric.
- false indicates that *not all* the characters in *inString* are alphanumeric.

The service returns `false` if *inString* is not specified.

pub.string:isDate

WmPublic. Determines whether a string follows a specified date pattern.

Input Parameters

inString **String** Optional. String to be checked for adherence to the specified date pattern.

pattern **String** Date format for specifying the *inString* parameter (for example, yyyyMMdd HH:mm:ss.SSS).

For more information about the pattern strings that can be specified for the date, see [“Pattern String Symbols” on page 224](#).

Output Parameters

isDate **String** Indicates whether or not *inString* follows the specified date pattern.

- `true` indicates that *inString* follows the specified date pattern.
- `false` indicates that *inString* does not follow the specified date pattern.

The service returns `false` if *inString* is not specified.

Usage Notes

The service returns an error if both *inString* and *pattern* are not specified.

You can specify any random string (for example, 111212) as both *inString* and *pattern*. The service returns `true` if the same user-defined string is specified as both *inString* and *pattern*. This is because the `java.text.SimpleDateFormat` class parses the user-defined input string and pattern to a valid date when the particular input values are identical.

You must ensure that the date you provide as *inString* has the same format as *pattern*. Because the `java.text.SimpleDateFormat` class allows you to specify any user-defined input string as a date format, the `pub.string:isDate` service might return `true` even if the *inString* format does not match the specified *pattern*.

pub.string:isNullEmptyOrWhitespace

WmPublic. Determines if a string is null, empty, or only whitespace.

Input Parameters

<i>inString</i>	String Optional. String to be checked.
<i>ifPresent</i>	Boolean Optional. <ul style="list-style-type: none">■ If the value is set to <code>true</code>, the service checks whether <i>inString</i> is present or not, and only then proceeds with validation of the input.■ If the value is set to <code>false</code>, the service throws an exception when <i>inString</i> is absent. Else, the service proceeds to validate the input.

Output Parameters

<i>isEmptyOrNullOrWhitespace</i>	String Indicates whether <i>inString</i> is null, empty, or only whitespace. <ul style="list-style-type: none">■ <code>true</code> indicates that <i>inString</i> has a null value, is empty, or is only whitespace.■ <code>false</code> indicates that <i>inString</i> is not null, not empty, or is not only whitespace.
----------------------------------	--

Examples:

Service with *inString* = " \t\n\r\n" and *ifPresent* = `true`, returns `true`

Service with *inString*=" \t\n\r\n" and *ifPresent* = `false`, returns `true`

Service with *inString* = "abcd" and *ifPresent* = `true`, returns `false`

Service with *inString* = "abcd" and *ifPresent* = `false`, returns `false`

Service with *ifPresent* = `true`, returns `true`

Service with *ifPresent* = `false`, throws an exception.

Usage Notes

`pub.string:isEmptyOrNullOrWhitespace` replaces `pub.string:isNullOrBlank` which is deprecated.

`pub.string:isNullOrBlank`

`WmPublic`. *Deprecated* - Use [pub.string:isEmptyOrNullOrWhitespace](#).

Checks a string to determine if it has a null or empty value.

Input Parameters

inString **String** Optional. String to be checked.

ifPresent **Boolean** Optional.

- If the value is set to `true`, the service checks whether *inString* is present or not, and only then proceeds with validation of the input.
- If the value is set to `false`, the service throws an exception when *inString* is absent. Else, the service proceeds to validate the input.

Output Parameters

isNullorBlank **String** Indicates whether or not *inString* has a null or empty value.

- `true` indicates that *inString* has either a null value or an empty value.
- `false` indicates that *inString* contains a value that is not null or not empty.

Examples:

Service with *inString* = " \t\n\r\n" and *ifPresent* = `true`, return `true`

Service with *inString*=" \t\n\r\n" and *ifPresent* = `false`, return `true`

Service with *inString* = "abcd" and *ifPresent* = `true`, returns `false`

Service with *inString* = "abcd" and *ifPresent* = `false`, returns `false`

Service with *ifPresent* = `true`, returns `true`

Service with *ifPresent* = `false`, throws an exception.

pub.string:isNumber

WmPublic. Determines whether the contents of a string can be converted to a float value.

Input Parameters

inString **String** Optional. String to be checked for conversion to float.

Output Parameters

isNumber **String** Indicates whether or not *inString* can be converted to a float value.

- `true` indicates that *inString* can be converted to a float value.
- `false` indicates that *inString* cannot be converted to a float value.

The service returns `false` if *inString* is not specified.

pub.string:length

WmPublic. Returns the length of a string.

Input Parameters

inString **String** String whose length you want to discover.

Output Parameters

value **String** The number of characters in *inString*.

pub.string:lookupDictionary

WmPublic. Looks up a given key in a hash table and returns the string to which that key is mapped.

Input Parameters

hashtable **java.util.Hashtable** Hash table that uses String objects for keys and values.

key **String** Key in *hashtable* whose value you want to retrieve.

Note:
The key is case sensitive.

Output Parameters

value **String** Value of the string to which *key* is mapped. If the requested key in *hashtable* is null or if *key* is not mapped to any value in *hashtable*, the service returns null.

pub.string:lookupTable

WmPublic. Locates a key in a String Table and returns the string to which that key is mapped.

Input Parameters

<i>lookupTable</i>	String [] [] A multi-row, multi-column string table in which to search.
<i>keyColumnIndex</i>	String Index of the "key" column. Default is 0.
<i>valueColumnIndex</i>	String Index of the "value" column. Default is 1.
<i>key</i>	String Key to locate.
	<p>Note: The key is case sensitive.</p>
<i>ignoreCase</i>	<p>String Optional. Flag indicating whether to perform a case-sensitive or case-insensitive search. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to perform a case-insensitive search. ■ <code>false</code> to perform a case-sensitive search. This is the default.
<i>useRegex</i>	<p>String Optional. Flag indicating whether the values in the table are to be interpreted as regular expressions.</p> <p>Note: The regular expressions in the table should not include slashes. For example, use <code>hello.*</code>, not <code>/hello.*/</code>.</p> <p>Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to interpret the key column values in the table as regular expressions. ■ <code>false</code> to interpret the key column values in the table as literal values (that is, not regular expressions). This is the default.

Output Parameters

<i>value</i>	String First value in the "value" column whose key matches <i>key</i> . If no match is found, this parameter is null.
--------------	--

Usage Notes

The `pub.string:lookupTable` service can treat the key column values of the table as regular expressions when `useRegex` is set to `true`. By default, Integration Server uses the Perl 5 pattern matching provided by the Jakarta ORO libraries. If you want Integration Server to use Java regular expression pattern matching provided in the `java.util.regex.Pattern` class, set `watt.server.usejavaregex` to `true`. After enabling Java regular expression pattern matching, if execution of `pub.string:lookupTable` service results in the `java.util.regex.PatternSyntaxException`, you may need to change the syntax of the

supplied pattern in *delim*. As an example, if your regular expression has a value of “(\\|*|\\?|\\{)”, it needs to be changed with “(\\|*|\\?|\\{)” i.e., characters like { or }, need to be escaped with \.

Important:

The Jakarta ORO project was retired by Apache in September 2010 because there were not any new features or releases planned. Software AG strongly recommends modifying regular expressions that relied on Perl 5 pattern matching to use Java regular expressions. The `java.util.regex.Pattern` class API documentation can be found here: <https://docs.oracle.com/en/java/javase/11/docs/api/index.html> The section “Comparison to Perl 5” identifies Perl 5 constructs that are not supported by `java.util.regex.Pattern`. Keep in mind that there could be issues that are not described in the documentation.

Note:

The `watt.server.usejavaregex` parameter and the use of Perl 5 regular expression pattern matching as the default was introduced in PIE-80824 (IS_10.15_Core_Fix4 and higher). Prior to application of this fix, Integration Server 10.15 did not include the Jakarta ORO libraries. As a result, Integration Server performed Java regular expression pattern matching as described in the `java.util.regex.Pattern` class.

pub.string:makeString

WmPublic. Builds a single string by concatenating the elements of a String List.

Input Parameters

<i>elementList</i>	String List Strings to concatenate.
<i>separator</i>	String String to insert between each non-null element in <i>elementList</i> .

Output Parameters

<i>value</i>	String Result from concatenating the strings in <i>elementList</i> . Strings are separated by the characters specified in <i>separator</i> .
--------------	---

pub.string:messageFormat

WmPublic. Formats an array of strings into a given message pattern.

Input Parameters

<i>pattern</i>	String Message that includes "placeholders" where elements from <i>argumentList</i> are to be inserted. The message can contain any sequence of characters. Use the { <i>n</i> } placeholder to insert elements from <i>argumentList</i> , where <i>n</i> is the index of the element that you want to insert. For example, the following pattern string inserts elements 0 and 1 into the message:
----------------	--

```
Test results: {0} items passed, {1} items failed.
```

Note:

Do not use any characters except digits for n .

argumentList

String List Optional. List of strings to use to populate *pattern*. If *argumentList* is not supplied, the service will not replace placeholders in *pattern* with actual values.

Output Parameters

value

String Result from substituting *argumentList* into *pattern*. If *pattern* is empty or null, this parameter is null.

pub.string:numericFormat

WmPublic. Formats a number into a given numeric pattern.

Note:

The rounding mode for `pub.string:numericFormat` service is `HALF_EVEN`. For more rounding modes, use the `pub.math:roundNumber` service.

Input Parameters

num

String The number to format.

pattern

String A pattern string that describes the way in which *num* is to be formatted:

This symbol...	Indicates...
0	A digit.
#	A digit. Leading zeroes will not be shown.
.	A placeholder for a decimal separator.
,	A placeholder for a grouping separator.
;	A separation in format.
-	The default negative prefix.
%	That <i>num</i> will be multiplied by 100 and shown as a percentage.
X	Any character used as a prefix or suffix (for example, A, \$).

' That special characters are to be used as literals in a prefix or suffix. Enclose the special characters within " (for example, '#').

The following are examples of pattern strings:

Pattern	Description
#,###	Use commas to separate into groups of three digits. The pound sign denotes a digit and the comma is a placeholder for the grouping separator.
#,####	Use commas to separate into groups of four digits.
\$#.00	Show digits before the decimal point as needed and exactly two digits after the decimal point. Prefix with the \$ character.
'##.#0	Show digits before the decimal point as needed and exactly one digit after the decimal point. Prefix with the # character. The first character in a pattern is the dollar sign (\$). The pound sign denotes a digit and the period is a placeholder for decimal separator.

Output Parameters

value **String** *num* formatted according to *pattern*. If *pattern* is an empty (not null) string, the default pattern of comma separators is used and the number of digits after the decimal point remains unchanged.

pub.string:objectToString

WmPublic. Converts an object to string representation using the Java toString() method of the object.

Input Parameters

object **Object** The object to be converted to string representation.

Output Parameters

string **String** String representation of the input object converted using the Java toString() method of the object.

pub.string:padLeft

WmPublic. Pads a string to a specified length by adding pad characters to the beginning of the string.

Input Parameters

<i>inString</i>	String String that you want to pad.
<i>padString</i>	String Characters to use to pad <i>inString</i> .
<i>length</i>	String Total length of the resulting string, including pad characters.

Output Parameters

<i>value</i>	String Contents of <i>inString</i> preceded by as many pad characters as needed so that the total length of the string equals <i>length</i> .
--------------	--

Usage Notes

If *padString* is longer than one character and does not fit exactly into the resulting string, the beginning of *padString* is aligned with the beginning of the resulting string. For example, suppose *inString* equals shipped and *padString* equals x9y.

If <i>length</i> equals...	Then <i>value</i> will contain...
7	shipped
10	x9yshipped
12	x9x9yshipped

If *inString* is longer than *length* characters, only the last *length* characters from *inString* are returned. For example, if *inString* equals acct1234 and *length* equals 4, value will contain 1234.

pub.string:padRight

WmPublic. Pads a string to a specified length by adding pad characters to the end of the string.

Input Parameters

<i>inString</i>	String String that you want to pad.
<i>padString</i>	String Characters to use to pad <i>inString</i> .

length **String** Total length of the resulting string, including pad characters.

Output Parameters

value **String** Contents of *inString* followed by as many pad characters as needed so that the total length of the string equals *length*.

Usage Notes

If *padString* is longer than one character and does not fit exactly into the resulting string, the end of *padString* is aligned with the end of the resulting string. For example, suppose *inString* equals shipped and *padString* equals x9y.

If <i>length</i> equals...	Then <i>value</i> will contain...
----------------------------	-----------------------------------

7	shipped
10	shippedx9y
12	shippedx9y9y

If *inString* is longer than *length* characters, only the first *length* characters from *inString* are returned. For example, if *inString* equals 1234acct and *length* equals 4, *value* will contain 1234.

pub.string:replace

WmPublic. Replaces all occurrences of a specified substring with a substitute string.

Input Parameters

inString **String** String containing the substring to replace.

searchString **String** Substring to replace within *inString*.

replaceString **String** Character sequence that will replace *searchString*. If this parameter is null or empty, the service removes all occurrences of *searchString* from *inString*.

useRegex **String** Optional. Flag indicating whether *searchString* is a regular expression. When regular expressions are used to specify a search string, *replaceString* may also contain interpolation variables (for example, "\$1") that match parenthetical subexpressions in *searchString*.

Set to:

- true to indicate that *searchString* is a regular expression.

- `false` to indicate that *searchString* is not a regular expression. This is the default.

Output Parameters

value **String** Contents of *inString* with replacements made.

Usage Notes

The `pub.string:replace` service accepts a regular expression as an input. By default, Integration Server uses the Perl 5 pattern matching provided by the Jakarta ORO libraries. If you want Integration Server to use Java regular expression pattern matching provided in the `java.util.regex.Pattern` class, set `watt.server.usejavaregex` to `true`. After enabling Java regular expression pattern matching, if execution of `pub.string:replace` service results in the `java.util.regex.PatternSyntaxException`, you may need to change the syntax of the supplied pattern in *searchString*. As an example, if your regular expression has a value of `"(\\|*|\\?|\\{)"`, it needs to be changed with `"(\\|*|\\?|\\{)"` i.e., characters like `{` or `}`, need to be escaped with `\`.

Important:

The Jakarta ORO project was retired by Apache in September 2010 because there were not any new features or releases planned. Software AG strongly recommends modifying regular expressions that relied on Perl 5 pattern matching to use Java regular expressions. The `java.util.regex.Pattern` class API documentation can be found here: <https://docs.oracle.com/en/java/javase/11/docs/api/index.html> The section “Comparison to Perl 5” identifies Perl 5 constructs that are not supported by `java.util.regex.Pattern`. Keep in mind that there could be issues that are not described in the documentation.

Note:

The `watt.server.usejavaregex` parameter and the use of Perl 5 regular expression pattern matching as the default was introduced in PIE-80824 (IS_10.15_Core_Fix4 and higher). Prior to application of this fix, Integration Server 10.15 did not include the Jakarta ORO libraries. As a result, Integration Server performed Java regular expression pattern matching as described in the `java.util.regex.Pattern` class.

pub.string:stringToBytes

WmPublic. Converts a string to a byte array.

Input Parameters

string **String** String to convert to a byte[].

encoding **String** Optional. Name of a registered, IANA character set that specifies the encoding to use when converting the String to an array of bytes (for example: ISO-8859-1).

To use the default encoding, set this value to `autoDetect`. If you specify an unsupported encoding, an exception will be thrown.

Output Parameters

bytes **byte[]** Contents of *string* represented as a `byte[]`.

pub.string:substitutePipelineVariables

WmPublic. Replaces a pipeline variable with its corresponding value.

Input Parameters

inString **String** Optional. String containing the pipeline variable to replace. Specify the name of the pipeline variable between the % symbols (for example, `%phone%` or `%array_name[n]%`).

Output Parameters

value **String** Contents of *inString* with the pipeline variable replaced.

Usage Notes

The service returns an error if *inString* is not specified.

If *inString* does not contain a pipeline variable (a variable or an array element) between the % symbols, the service does not perform any variable substitution from the pipeline.

If you want to include the % symbol in the output, you can specify it as `\%` in *inString*. To specify the value of the pipeline variable as a percentage in the output, append `\%` after the variable name in *inString*. For example, suppose a pipeline variable *revenueIncreasePercent* has a value of `100`.

If <i>inString</i> equals...	Then <i>value</i> will contain...
<code>%revenueIncreasePercent%\%</code>	<code>100%</code>

The service cannot be used for substitution of global variables.

pub.string:substring

WmPublic. Returns a substring of a given string.

Input Parameters

<i>inString</i>	String String from which to extract a substring.
<i>beginIndex</i>	String Beginning index of the substring to extract (inclusive).
<i>endIndex</i>	String Ending index of the substring to extract (exclusive). If this parameter is null or empty, the substring will extend to the end of <i>inString</i> .

Output Parameters

<i>value</i>	String Substring from <i>beginIndex</i> and extending to the character at <i>endIndex</i> - 1.
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pub.string:tokenize

WmPublic. Tokenizes a string using specified delimiter characters and generates a String List from the resulting tokens.

This service does not return delimiters as tokens.

Input Parameters

<i>inString</i>	String String you want to tokenize (that is, break into delimited chunks).
<i>delim</i>	String Delimiter characters. If null or empty, the service uses the default delimiters <code>\t\n\r</code> , where <code>t</code> , <code>n</code> , and <code>r</code> represent the white space characters tab, new line, and carriage return).
<i>useRegex</i>	Boolean Optional <ul style="list-style-type: none">■ If the value is set to <code>true</code>, Integration Server supports recognizing the delimiter character set for the <i>delim</i> parameter as a regular expression.■ If the value is set to <code>false</code>, Integration Server considers the delimiter character set for the <i>delim</i> parameter as an individual character. This is the default.

Output Parameters

<i>valueList</i>	String List Strings containing the tokens extracted from <i>inString</i> .
------------------	---

pub.string:toLower

WmPublic. Converts all characters in a given string to lowercase.

Input Parameters

<i>inString</i>	String String to convert.
<i>language</i>	String Optional. Lowercase, two-letter ISO-639 code. If this parameter is null, the system default is used.
<i>country</i>	String Optional. Uppercase, two-letter ISO-3166 code. If this parameter is null, the system default is used.
<i>variant</i>	String Optional. Vendor and browser-specific code. If null, this parameter is ignored.

Output Parameters

<i>value</i>	String Contents of <i>inString</i> , with all uppercase characters converted to lowercase.
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pub.string:toUpper

WmPublic. Converts all characters in a given string to uppercase.

Input Parameters

<i>inString</i>	String String to convert.
<i>language</i>	String Optional. Lowercase, two-letter ISO-639 code. If this parameter is null, the system default is used.
<i>country</i>	String Optional. Uppercase, two-letter ISO-3166 code. If this parameter is null, the system default is used.
<i>variant</i>	String Optional. Vendor and browser-specific code. If null, this parameter is ignored.

Output Parameters

<i>value</i>	String Contents of <i>inString</i> , with all lowercase characters converted to uppercase.
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pub.string:trim

WmPublic. Trims leading and trailing white space from a given string.

Input Parameters

inString **String** String to trim.

Output Parameters

value **String** Contents of *inString* with white space trimmed from both ends.

pub.string:URLDecode

WmPublic. Decodes a URL-encoded string.

Input Parameters

inString **String** URL-encoded string to decode.

Output Parameters

value **String** Result from decoding *inString*. If *inString* contained plus (+) signs, they will appear in *value* as spaces. If *inString* contained %*hex* encoded characters, they will appear in *value* as the appropriate native character.

pub.string:URLEncode

WmPublic. URL-encodes a string.

Encodes characters the same way that data posted from a WWW form is encoded (that is, the application/x-www-form-urlencoded MIME type).

Input Parameters

inString **String** String to URL-encode.

Output Parameters

value **String** Result from URL-encoding *inString*. If *inString* contained non-alphanumeric characters (except `-_.*@`), they will appear in *value* as their URL-encoded equivalents (% followed by a two-digit hex code). If *inString* contained spaces, they will appear in *value* as plus (+) signs.

41 Sync Folder

■ Summary of Elements in this Folder	948
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You use the elements in the sync folder to coordinate the execution of services. You can coordinate services so that a waiting service will execute if and only if a notifying service produces the input required by the waiting service within a specified time period. The synchronization services wait for and send notification using a key. A notifying service only delivers input to waiting services with the same key.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.sync:notify	WmPublic. Notifies services waiting on the specified key and delivers the input document to the services.
pub.sync:shutdown	WmPublic. Releases internal resources used by the pub.sync services. This service is run automatically when the WmPublic package is unloaded and should <i>not</i> be explicitly invoked by a client.
pub.sync:wait	WmPublic. Allows one or more services to wait for delivery of data from a notifying service.

pub.sync:notify

WmPublic. Notifies services waiting on the specified key and delivers the input document to the services.

Input Parameters

<i>key</i>	String Name of the key. Waiting services with the same <i>key</i> will receive notification and input from this service.
<i>value</i>	Document Input for the waiting services.

Output Parameters

<i>notified</i>	String Number of waiting services that received the notification. The <i>notified</i> count only includes services waiting at the time the pub.sync:notify service was called. Wait requests that start after pub.sync:notify executes are not included in the <i>notified</i> count.
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Usage Notes

The value of the server property `watt.server.sync.timeout` determines the maximum length of time that the notification can exist. However, if a service with an exclusive wait is registered for the notification *key*, the notification ends as soon as the exclusive wait receives the notification.

pub.sync:shutdown

WmPublic. Releases internal resources used by the pub.sync services. This service is run automatically when the WmPublic package is unloaded and should *not* be explicitly invoked by a client.

pub.sync:wait

WmPublic. Allows one or more services to wait for delivery of data from a notifying service.

Input Parameters

key **String** Name of the key for which the service is waiting notification. The service receives notification and data from a notifying service with the same *key*.

time **String** Length of time, in seconds, the service waits for notification. If the request times out, an exception is thrown.

Note:

A *time* value of -1 or 0 results in undefined behavior.

exclusive **String** Optional. Flag indicating whether this service waits exclusively for the notification and prevents other services from waiting for a notification for the specified *key*. Set to:

- **yes** to specify that this service waits exclusively for the notification from the specified *key*. Integration Server prevents other services from waiting for the specified notification.
- **no** to allow multiple services to wait for notification. This is the default.

Output Parameters

value **Document** Input delivered by the notifying service.

Usage Notes

Any service that is waiting for the *key* notification, receives the notification as long as the lifespan of the wait request overlaps with the lifespan of the notification. However, if a service with an exclusive wait registers for the notification *key*, the notification ends as soon as the exclusive wait is notified.

An exclusive wait might not be the only wait that receives the notification. For example, an exclusive wait might be registered after other non-exclusive waits have been notified. However, once an exclusive wait is registered, it will be the last wait to be notified.

Notification must occur within the time period specified by the *time* parameter. If the wait request expires before receiving a notification, Integration Server throws a `ServiceException`: [ISS.0086.9067] wait timed out.

If the `pub.sync.wait` service specifies a *key* for which an exclusive wait already exists, Integration Server returns a `ServiceException`: [ISS.0086.9065] already in exclusive wait.

If the `pub.sync.wait` service specifies an exclusive wait for a *key* for which regular wait threads already exists, Integration Server throws a `ServiceException`: [ISS.0086.9066] cannot obtain exclusive wait.

42 Synchronization Folder

■ Summary of Elements in this Folder	952
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You use the elements in the synchronization folder to perform latching and cross-referencing operations in a publish-and-subscribe integration.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.synchronization.latch:closeLatch	WmPublic. Closes the latch for a resource.
pub.synchronization.latch:isLatchClosed	WmPublic. Checks a resource's latch status.
pub.synchronization.latch:openLatch	WmPublic. Opens the latch for a resource.
pub.synchronization.xref:createXReference	WmPublic. Creates a cross-reference between a canonical key and a native ID.
pub.synchronization.xref:deleteByObjectId	WmPublic. Removes all cross-reference records associated with a particular process or synchronization.
pub.synchronization.xref:deleteXReference	WmPublic. Deletes a cross-reference record from the cross-reference table.
pub.synchronization.xref:getCanonicalKey	WmPublic. Retrieves the canonical key for a specified native ID.
pub.synchronization.xref:getNativeId	WmPublic. Retrieves the native ID of a resource record associated with a canonical key.
pub.synchronization.xref:insertXReference	WmPublic. Inserts a cross-reference between a native ID and a canonical key.

pub.synchronization.latch:closeLatch

WmPublic. Closes the latch for a resource.

The resource cannot be acted upon while the latch is closed. By closing a latch, you can prevent a circular update between the source and target resources.

Input Parameters

<i>appId</i>	String A unique identifier for the target resource for which you want to close a latch. Typically, the <i>appId</i> is the name of the adapter or the resource.
<i>canonicalKey</i>	String The canonical key. A unique identifier for the canonical document used in the synchronization.

objectId **String** A unique identifier for the object or process being synchronized. Typically, the *objectId* field is set to the name of the business process for which you are performing synchronization, such as "order" or "customer."

Output Parameters

None.

pub.synchronization.latch:isLatchClosed

WmPublic. Checks a resource's latch status.

By checking the latch status, you can determine whether a resource has been updated.

Input Parameters

appId **String** A unique identifier for the resource for which you want to check the latch status. Typically, the *appId* is the name of the adapter or the resource.

canonicalKey **String** The canonical key. A unique identifier for the canonical document used in the synchronization.

objectId **String** A unique identifier for the object or process being synchronized. Typically, the *objectId* field is set to the name of the business process for which you are performing synchronization, such as "order" or "customer."

Output Parameters

isLatchClosed **String** The status of the latch. A value of:

- `true` indicates that the latch is closed. The resource has been updated.
- `false` indicates that the latch is open. The resource has not been updated.

Usage Notes

Use the latch status to determine whether or not to update the resource.

- If the latch is closed (*isLatchClosed* is true), the resource is already updated. Use the [pub.synchronization.latch:openLatch](#) service to end execution of the update and open the latch in preparation for the next update to the resource.
- If the latch is open (*isLatchClosed* is false), the resource has not yet been updated. Invoke services to locate and update the record in the target resource. Then invoke the [pub.synchronization.latch:closeLatch](#) service to close the latch and prevent circular updates.

For more information about using the `pub.synchronization.latch` services to prevent echo suppression, see the *Publish-Subscribe Developer's Guide*.

See Also

[pub.synchronization.latch:closeLatch](#)

[pub.synchronization.latch:openLatch](#)

pub.synchronization.latch:openLatch

WmPublic. Opens the latch for a resource.

By opening the latch, you can end propagation of the update and make the resource available for future updates.

Input Parameters

<i>appId</i>	String A unique identifier for the resources for which you want to open the latch. Typically, the <i>appId</i> is the name of the adapter or the resource.
<i>canonicalKey</i>	String The canonical key. A unique identifier for the canonical document used in the synchronization.
<i>objectId</i>	String A unique identifier for the object or process being synchronized. Typically, the <i>objectId</i> field is set to the name of the business process for which you are performing synchronization, such as "order" or "customer."

Output Parameters

None.

pub.synchronization.xref:createXReference

WmPublic. Creates a cross-reference between a canonical key and a native ID.

Input Parameters

<i>appId</i>	String A unique identifier for the resource (application) for which you want to create a cross-reference to a canonical key.
<i>nativeId</i>	String A unique identifier for the resource record for which you want to create a cross-reference to a canonical key.
<i>canonicalKey</i>	String Optional. A canonical key. If a canonical key is not provided as input, <code>createXReference</code> creates the canonical key and the cross-reference.

objectId **String** A unique identifier for the object or process being synchronized. Typically, the *objectId* field is set to the name of the business process for which you are performing synchronization, such as "order" or "customer."

Output Parameters

canonicalKey **String** The canonical key. This key correlates native IDs of records from different resources. This will be a new, unique key if *canonicalKey* was not provided as an input parameter. If *canonicalKey* was provided as input, this output parameter returns the same value.

Usage Notes

The canonical document is the standard format that a document assumes while it travels through webMethods components. A source resource will convert or map data from its proprietary data format into the canonical format before publishing the document. A target resource (a subscriber to the canonical document) will map the canonical document to the target resource's proprietary data format before processing the document. The canonical document acts as the intermediary data format between resources.

On the source side of the synchronization, use the `createXReference` service to create the canonical key for the canonical document and establish a cross-reference between the record in the source application and the canonical document. Before publishing the canonical document, link the generated *canonicalKey* to the canonical document.

On the target side of synchronization, use the [pub.synchronization.xref:insertXReference](#) service to insert the cross-reference between a canonical key and the native ID for the record in the target resource.

For more information about using the `createXReference` service to create synchronizations, see the section Built-In Services for Key Cross-Referencing in the *Publish-Subscribe Developer's Guide*.

See Also

[pub.synchronization.xref:insertXReference](#)

pub.synchronization.xref:deleteByObjectId

WmPublic. Removes all cross-reference records associated with a particular process or synchronization.

Input Parameters

objectId **String** A unique identifier for the object or process for which you want to delete all cross-reference records. Typically, the *objectId* field is set to the name of the business process for which you are performing synchronization, such as "order" or "customer."

Output Parameters

None.

Usage Notes

You can use this service to purge unwanted cross-reference records from the cross-reference table. For example, if you wanted to delete all cross-reference records for the purchaseOrder synchronization, specify "purchaseOrder" as the *objectId*.

pub.synchronization.xref:deleteXReference

WmPublic. Deletes a cross-reference record from the cross-reference table.

This service deletes only one cross-reference record.

Input Parameters

<i>appId</i>	String A unique identifier for the resource (application) for which you want to delete a cross-reference record.
<i>canonicalKey</i>	String The canonical key. A unique identifier for the canonical document for which you want to delete a cross-reference.
<i>objectId</i>	String A unique identifier for the object or process for which you want to delete a cross-reference. Typically, the <i>objectId</i> field is set to the name of the business process for which you are performing synchronization, such as "order" or "customer."

Output Parameters

None.

pub.synchronization.xref:getCanonicalKey

WmPublic. Retrieves the canonical key for a specified native ID.

Input Parameters

<i>appId</i>	String A unique identifier for the resource (application) that contains the native ID for which you want to retrieve a canonical key.
<i>nativeId</i>	String A unique identifier for the resource record for which you want to obtain the canonical key.

objectId **String** A unique identifier for the object or process being synchronized. Typically, the *objectId* field is set to the name of the business process for which you are performing synchronization, such as "order" or "customer."

Output Parameters

canonicalKey **String** The canonical key for the provided native ID. If the requested key cannot be found or does not exist in the cross-reference table, an empty string is returned.

Usage Notes

You can use this service to determine whether you need to insert or update a record in the resource.

- If the canonical key exists (*canonicalKey* contains a value), a cross-reference between the native ID and the canonical key already exists. The record with the specified *nativeId* is not a new record. You can then invoke the [pub.synchronization.latch:isLatchClosed](#) service to determine whether the resource needs to be updated.
- If the canonical key does not exist (*canonicalKey* contains an empty string), then the record with the native ID is a new record. You can use the [pub.synchronization.xref:createXReference](#) service to generate the canonical key and create the cross-reference to the native ID.

For more information about using the `getCanonicalKey` service in synchronizations, see the *Publish-Subscribe Developer's Guide*.

See Also

[pub.synchronization.latch:isLatchClosed](#)

[pub.synchronization.xref:createXReference](#)

pub.synchronization.xref:getNativeId

WmPublic. Retrieves the native ID of a resource record associated with a canonical key.

Input Parameters

appId **String** A unique identifier for the resource from which you want to retrieve the native ID associated with the provided canonical key.

canonicalKey **String** The canonical key for which you want to obtain the corresponding native ID.

objectId **String** A unique identifier for the object or process being synchronized. Typically, the *objectId* field is set to the name of the business process for which you are performing synchronization, such as "order" or "customer."

Output Parameters

nativeId **String** A unique identifier for the resource record associated with the provided canonical key. If the requested *nativeId* cannot be found in the cross-reference table, an empty string is returned.

Usage Notes

You can use the `getNativeId` service on the target side of a synchronization to determine if the record in the target resource needs to be inserted or just updated.

- If the native ID does not exist (the *nativeId* field contains an empty string) and you specified the correct input values, then the record does not exist in the resource. You will need to insert the record in the resource to generate the native ID. Then use the [pub.synchronization.xref:insertXReference](#) service to insert a cross-reference between the native ID and the canonical key.
- If the native ID exists (the *nativeId* field contains a value), then a cross-reference between the canonical key and the record already exists. The record already exists in the resource and only needs to be updated.

After you insert or update the record in the resource, make sure to use [pub.synchronization.latch:closeLatch](#) to close the latch for the record to prevent circular updates (echoes).

For more information about using the `getNativeId` service in synchronizations, see the *Publish-Subscribe Developer's Guide*.

See Also

[pub.synchronization.latch:closeLatch](#)

[pub.synchronization.xref:insertXReference](#)

pub.synchronization.xref:insertXReference

WmPublic. Inserts a cross-reference between a native ID and a canonical key.

Input Parameters

appId **String** A unique identifier for the resource for which you want to establish a cross-reference between a native ID and a canonical key.

nativeId **String** A unique identifier for the resource record with which you want to establish a cross-reference to *canonicalKey*.

canonicalKey **String** The canonical key with which you want to establish a cross-reference to *nativeId*.

objectId **String** A unique identifier for the object or process being synchronized. Typically, the *objectId* field is set to the name of the business process for which you are performing synchronization, such as "order" or "customer."

Output Parameters

None.

Usage Notes

Use this service on the target side of a synchronization to create a cross-reference between the new record in the target resource and the canonical document.

Most resources generate a unique ID for a new record. Invoke the `insertXReference` service after you add the new record in the resource.

After you insert the cross-reference between the new native ID and the canonical key, use [pub.synchronization.latch:closeLatch](#) to close the latch for the record to prevent circular updates (echoes).

For more information about using the `insertXReference` service in synchronizations, see the *Publish-Subscribe Developer's Guide*.

See Also

[pub.synchronization.latch:closeLatch](#)

[pub.synchronization.xref:createXReference](#)

43 Trigger Folder

■ Summary of Elements in this Folder	962
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You can use the services in the trigger folder to create and delete webMethods messaging trigger and JMS triggers. You can also use services to manage document retrieval and document processing for individual webMethods messaging triggers and change the state of one or more JMS triggers.

A webMethods messaging trigger is a trigger that subscribes to and processes documents published to a webMethods messaging provider (webMethods Broker or Software AG Universal Messaging) or published locally within the Integration Server. A JMS trigger is a trigger that receives messages from a Destination (queue or topic) on a JMS provider and then processes those messages.

Note: webMethods Broker is deprecated.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.trigger:createJMSTrigger	WmPublic. Creates a JMS trigger.
pub.trigger:createTrigger	WmPublic. Creates a webMethods messaging trigger.
pub.trigger:deleteJMSTrigger	WmPublic. Deletes a JMS trigger.
pub.trigger:deleteTrigger	WmPublic. Deletes a webMethods messaging trigger.
pub.trigger:disableJMSTriggers	WmPublic. Disables one or more JMS triggers.
pub.trigger:enableJMSTriggers	WmPublic. Enables one or more JMS triggers.
pub.trigger:resourceMonitoringSpec	WmPublic. Specification for the signature of a resource monitoring service.
pub.trigger:resumeProcessing	WmPublic. Resumes document processing for the specified webMethods messaging trigger.
pub.trigger:resumeRetrieval	WmPublic. Resumes retrieval of documents from the messaging provider for a specific webMethods messaging trigger.
pub.trigger:suspendJMSTriggers	WmPublic. Suspends one or more JMS triggers.
pub.trigger:suspendProcessing	WmPublic. Suspends document processing for the specified webMethods messaging trigger.
pub.trigger:suspendRetrieval	WmPublic. Suspends retrieval of documents from the messaging provider for a specific webMethods messaging trigger.

pub.trigger:createJMSTrigger

WmPublic. Creates a JMS trigger.

Input Parameters

triggerName **String** Fully qualified name for the JMS new trigger. Names use any combination of letters, and/or the underscore character. Make sure to specify the name of the folder and subfolder in which you want to save the JMS trigger.

Note:

For a list of reserved words and symbols for element names, see *webMethods Service Development Help*.

package **String** Name of the package in which you want to save the trigger.

aliasName **String** Name of the JMS connection alias that you want this JMS trigger to use to receive messages from the JMS provider.

The JMS connection alias must already exist at the time this service executes. Although a JMS connection alias does not need to be enabled at the time you create the JMS trigger, the JMS connection alias must be enabled for the JMS trigger to execute at run time.

A transacted JMS connection alias cannot be assigned to a JMS trigger if a cluster policy is applied to the connection factory used by the JMS connection alias.

jmsTriggerType **String** Type of JMS trigger. Specify:

- Standard to create a standard JMS trigger. This is the default.
- SOAPJMS to create a SOAP-JMS trigger.

properties **Document** Optional. Properties that you want to assign to the JMS trigger.

Key	Description
<i>enabled</i>	<p>String Flag indicating whether the new JMS trigger is enabled or disabled. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to create the JMS trigger in an enabled state. ■ <code>false</code> to create the JMS trigger in a disabled state. This is the default.
<i>joinTimeout</i>	<p>String Optional. Number of milliseconds Integration Server waits for additional messages to fulfill the join. Integration Server starts the join time-out period when it receives the first message that satisfies the join.</p> <p>Set <i>joinTimeout</i> to <code>-1</code> to indicate that the join condition never expires.</p> <p>The default is one day (86400000 milliseconds).</p>

You need to specify a *joinTimeout* only when the *joinType* is AND or XOR. You do not need to specify a join time-out for an OR join.

Note:

You can specify a *joinTimeout* for a standard JMS trigger only. SOAP-JMS triggers cannot have joins.

joinType

String Specifies the join type for this standard JMS trigger. The join type indicates whether Integration Server needs to receive messages from all, any, or only one of destinations to execute the trigger service.

You only need to set *joinType* if the JMS trigger receives messages from multiple destinations.

Note:

You can specify a *joinType* for a standard JMS trigger only. SOAP-JMS triggers can receive messages from one destination only and therefore cannot have joins.

Set to:

- N/A to indicate that this JMS trigger does not have a join. That is, the JMS trigger receives messages from one Destination only.
- AND to invoke the trigger service when the standard JMS trigger receives a message from every destination within the join time-out period. The messages must have the same activation.

For more information about activation IDs, see *Using webMethods Integration Server to Build a Client for JMS*.

- OR to invoke the trigger service when the standard JMS trigger receives a message from any of the specified destinations.

Note:

Using an Any (OR) join is similar to creating multiple JMS triggers that listen to different destinations. While a JMS trigger with an Any (OR) join will use fewer resources (a single thread will poll each destination for messages), it may cause a decrease in performance (it may take longer for one thread to poll multiple destinations).

	<ul style="list-style-type: none"> ■ XOR to invoke the trigger service when it receives a message from any of the specified destinations. For the duration of the join time-out period, the Integration Server discards any messages with the same activation that the trigger receives from the specified destinations.
<i>maxRetryAttempts</i>	<p>String Optional. Maximum number of times Integration Server should re-execute the trigger service when the trigger service ends because of a transient error that causes an <code>ISRuntimeException</code>. The default is 0 attempts (indicating the trigger service does not retry)</p> <p>Note:<i>maxRetryAttempts</i> applies to non-transacted JMS triggers only.</p>
<i>retryInterval</i>	<p>String Optional. Length of time Integration Server waits between retry attempts. The default is 10 seconds.</p> <p>Note:<i>retryInterval</i> applies to non-transacted JMS triggers only.</p>
<i>onTransientError</i>	<p>String Flag indicating how Integration Server handles transient errors for the JMS trigger.</p> <p>For a non-transacted JMS trigger, indicates how Integration Server handles a retry failure for a JMS trigger. A retry failure occurs when Integration Server reaches the maximum number of retry attempts and the trigger service still fails because of an <code>ISRuntimeException</code>.</p> <p>For a transacted JMS trigger, indicates how Integration Server handles a transient error that occurs during service execution, resulting in the entire transaction being rolled back.</p> <p>Specify one of the following:</p> <ul style="list-style-type: none"> ■ Throw Exception/ Recover Only <p>This is the default.</p> <p>For a non-transacted JMS trigger, indicate that Integration Server throws a <code>ServiceException</code> when the last allowed retry attempt ends because of an <code>ISRuntimeException</code>.</p>

For a transacted JMS trigger, indicate that Integration Server recovers the message back to the JMS provider. Integration Server receives the message again almost immediately.

- Suspend and Retry Later/ Suspend and Recover

For a non-transacted JMS trigger, indicate that Integration Server suspends the trigger when the last allowed retry attempt ends because of an `ISRuntimeException`. Integration Server retries the trigger service at a later time when the resources needed by the trigger service become available.

For a transacted JMS trigger, indicate that Integration Server suspends the JMS trigger and then recovers the message back to the JMS provider. Integration Server executes the trigger service at a later time when the resources needed by the trigger service become available.

Selecting Suspend and Retry Later/ Suspend and Recover also instructs Integration Server to suspend the trigger when a transient error occurs during trigger preprocessing. For more information about transient error handling during trigger preprocessing, see *webMethods Service Development Help*.

resumeTaskSvcName

String Optional. Fully qualified name of the service that Integration Server executes when one of the following occurs:

- The trigger service ends because of a retry failure and `onTransientError` is set to Suspend and Retry Later/Suspend and Recover.
- The trigger service is part of a transacted JMS trigger and `onTransientError` property is set to Suspend and Retry Later/Suspend and Recover.
- The document resolver service used for exactly-once processing (`dupResolverSvcName`) ends because of a run-time exception and the `watt.server.trigger.preprocess.suspendAndRetryOnError` is set to true.

isConcurrent

String Flag indicating whether the JMS trigger uses a concurrent processing mode or a serial processing mode. Set to:

	<ul style="list-style-type: none"> ■ true to specify a concurrent processing mode. Integration Server processes multiple messages for this trigger at one time. ■ false to specify a serial processing mode. Integration Server processes messages received by this trigger one after the other. This is the default.
<i>suspendOnError</i>	<p>String Flag indicating whether Integration Server suspends the JMS trigger when an exception occurs during trigger service execution. Set to:</p> <ul style="list-style-type: none"> ■ true to suspend the trigger when a trigger service ends with a fatal error. ■ false to not suspend the JMS trigger when a trigger service ends with a fatal error. This is the default.
<i>maxExecutionThreads</i>	<p>String Optional. Maximum number of messages that Integration Server can process concurrently on each connection for this trigger. <i>maxExecutionThreads</i> must be greater than or equal to <i>connectionCount</i>.</p> <p>The default is 1.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: This setting applies to concurrent JMS triggers only.</p> </div> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Note: If the JMS provider from which the JMS trigger retrieves messages does not support concurrent access by durable subscribers, set the value of <i>maxExecutionThreads</i> to 1.</p> </div>
<i>maxBatchSize</i>	<p>String Optional. Maximum number of messages that the trigger service can receive at one time. If you do not want the trigger to perform batch processing, leave this property set to 1. The default is 1.</p> <p>A transacted JMS trigger can be used for batch processing if the JMS connection alias used by the trigger connects to a JMS provider that supports the reuse of transacted JMS sessions. If the JMS provider does not support the reuse of transacted JMS sessions, set <i>maxBatchSize</i> to 1. Consult the documentation for your JMS provider to determine whether or not the JMS provider supports the reuse of transacted JMS</p>

sessions. Note that webMethods Broker version 8.2 and higher and Universal Messaging version 9.5 support the reuse of transacted JMS sessions.

Note:

For a SOAP-JMS trigger the *maxBatchSize* must be set to 1.

dupDetection

String Flag indicating whether exactly-once processing is enabled for the JMS trigger. Set to:

- `true` to specify that exactly-once processing is provided for messages received by this trigger.
- `false` to specify that exactly-once processing is not provided for messages received by this trigger. This is the default.

dupHistory

String Flag indicating whether a document history database will be maintained and used to determine whether a message is a duplicate. Set to:

- `true` to indicate that Integration Server uses a document history database as part of exactly-once processing.
- `false` to indicate that Integration Server does not use a document history database as part of exactly-once processing. This is the default.

dupHistoryTTL

String Optional Number of milliseconds that the document history database maintains an entry for a document processed by this trigger.

The default is 2 hours (7200000 milliseconds).

dupResolverSvcName

String Optional. Specifies the service that you created to determine whether message's status is New, Duplicate, or In Doubt.

prefetchSize

String Optional. Specifies the maximum number of messages Integration Server attempts to retrieve for this JMS trigger when it requests more messages from the webMethods Broker.

The default is 10.

Note:

This parameter applies only when working with the webMethods Broker or Universal Messaging as a JMS provider.

acknowledgeMode

String Indicates how the JMS trigger acknowledges messages it receives to the JMS provider.

Note: *acknowledgeMode* applies to non-transacted JMS triggers only. When creating a transacted JMS trigger, Integration Server ignores *acknowledgeMode*. The JMS connection alias specified for *aliasName* determines whether or not the created trigger is transacted or non-transacted.

Set to:

- CLIENT_ACKNOWLEDGE to acknowledge or recover the message only after the JMS trigger processes the message completely. This is the default.
- AUTO_ACKNOWLEDGE to automatically acknowledge the message when it is received by the JMS trigger. The Integration Server will acknowledge the message before the trigger completes processing. The JMS provider cannot redeliver the message if Integration Server becomes unavailable before message processing completes.
- DUPS_OK_ACKNOWLEDGE to lazily acknowledge the delivery of messages. This may result in the delivery of duplicate messages.

executeUser

String Optional. Name of the user account whose credentials Integration Server uses to execute a service associated with the JMS trigger. You can specify a locally defined user account or a user account defined in a central or external directory. The default is Administrator.

connectionCount

String Optional. Specifies the number of connections a concurrent JMS trigger can use to retrieve messages from the JMS provider. *connectionCount* must be less than or equal to *maxExecutionThreads*. The default is 1.

Note: *connectionCount* applies only when the JMS connection alias specified for *aliasName* is configured to create a separate connection for each JMS trigger.

Note: When using multiple connections to the webMethods Broker acting as the JMS provider, Integration Server uses a different client ID for

each JMS trigger that uses the JMS connection alias. However, when Integration Server connects to other JMS providers, it uses the same client ID for each connection. Some JMS providers do not permit multiple connections to use the same client ID to retrieve messages from a Topic with a durable subscriber. Review the JMS provider documentation before configuring the use of multiple connections for a JMS connection alias and any concurrent JMS triggers that use the JMS connection alias.

destinations

Document List Destinations from which the JMS trigger receives messages.

Note:

For a SOAP-JMS trigger, you can specify one destination only.

Key	Description
<i>destination</i>	<p>String Name or lookup name of the Destination from which you want the JMS trigger to receive messages.</p> <p>Specify the lookup name of the Destination object when the JMS connection alias uses JNDI to retrieve administered objects. Specify the provider-specific name of the Destination when the JMS connection alias uses the native webMethods API to connect directly to the webMethods Broker.</p>
<i>destinationType</i>	<p>String Optional. Type of destination from which the JMS trigger receives messages. Set to:</p> <ul style="list-style-type: none"> ■ <code>Queue</code> to specify that the destination is a queue. This is the default. ■ <code>Topic</code> to specify that the destination is a topic.
<i>messageSelector</i>	<p>String Optional. Filter used to receive a subset of messages from the specified destination. A <i>message selector</i> allows a client to filter the messages it wants to receive by use of a SQL92 string expression in the message header. That expression is applied to properties in the message header (not to the message body content) containing the value to be filtered.</p>
<i>durableSubscriber Name</i>	<p>String Optional. Name of the durable subscriber that you want to create for this JMS trigger on the JMS provider. A durable subscriber creates a durable subscription on the JMS provider. A durable subscription allows the subscriber to receive all the</p>

messages published on a topic, including those published while the subscriber is inactive.

Note: *durableSubscriberName* applies when *destinationType* is set to `Topic` only.

durableSubscriberNoLocal **String** Optional. Flag indicating whether the JMS trigger ignores messages sent by the same Integration Server on which the JMS trigger resides.

Set to:

- `true` to indicate that the JMS trigger ignores messages sent by the same Integration Server on which the JMS trigger resides.
- `false` to indicate that the JMS trigger receives and processes messages sent by the same Integration Server on which the JMS trigger resides. This is the default.

Note: *durableSubscriberNoLocal* applies when *destinationType* is set to `Topic` only.

Note:

If the JMS connection alias specified for this trigger has the **Create New Connection per Trigger** option enabled, then set *durableSubscriberNoLocal* to `false`. For the JMS trigger to ignore locally published messages, the publisher and subscriber must share the same connection. When the JMS connection alias uses multiple connections per trigger, the publisher and subscriber will not share the same connection.

routingRules

Document List Optional. Routing rules for messages received by this standard JMS trigger.

Note:

You only need to specify routing rules for standard JMS triggers. SOAP-JMS triggers do not use routing rules.

Key	Description
<i> ruleName </i>	String Name for the routing rule.
<i> serviceName </i>	String Fully qualified name of the service Integration Server invokes when it receives a message from one of the specified destinations.

filter

String Optional. Filter that you want Integration Server to apply to messages the JMS trigger receives. A filter specifies criteria for the contents of the message body. Integration Server applies a local filter to message after the JMS trigger receives the message from the JMS provider.

Note: Integration Server evaluates the routing rules in the same order in which the rules appear in the *routingRules* document list. It is possible that a message could satisfy more than one routing rule. However, Integration Server executes only the service associated with the first satisfied routing rule and ignores the remaining routing rules. Therefore, the order in which you list routing rules is important.

Output Parameters

None.

Usage Notes

You can use `pub.trigger:createJMSTriggers` to create standard JMS triggers or SOAP-JMS triggers.

Even though WS endpoint triggers are SOAP-JMS triggers, you can create WS endpoint triggers via Integration Server Administrator only. For more information about WS endpoint triggers, see *webMethods Integration Server Administrator's Guide*.

If you use a JNDI provider to store JMS administered objects, the Connection Factories and Destinations (queues and topics) that you want this JMS trigger to use to consume messages must already exist if the JMS provider is not . If they do not exist, the JMS trigger will be created but will not start. The JMS trigger will appear disabled in Designer and Integration Server Administrator. However, if the JMS provider is , administered objects can be created on demand. If you specify a destination that does not exist in the JNDI namespace and the JMS connection alias specified for the *aliasName* input parameter is configured to create administered objects on demand, Integration Server creates the destination the first time that JMS trigger starts. For more information about creating administered objects on demand, see *webMethods Integration Server Administrator's Guide*

If you use the native webMethods API to connect directly to the webMethods Broker, the Destinations from which you want the JMS trigger to receive messages must exist on the Broker. However, if you intend to use a durable subscriber to receive messages, it can be created by Integration Server when the `pub.trigger:createJMSTrigger` executes successfully. For more information about creating Destinations on the Broker, see *Administering webMethods Broker*.

The transaction type of the JMS connection alias determines whether or not the JMS trigger is transacted (that is, it receives and processes messages as part of a transaction). Transacted JMS triggers have slightly different properties and operate differently than non-transacted JMS triggers.

For a standard JMS trigger, the trigger service that you want to specify in the routing rule must already exist on the same Integration Server on which you create the JMS trigger.

A standard JMS trigger can contain multiple routing rules. Each routing rule must have a unique name.

A standard JMS trigger that contains an All (AND) or Only one (XOR) join can only have one routing rule and cannot have a batch processing size (*maxBatchSize* input parameter value or **Max batch messages** property) greater than 1. A standard JMS trigger with an Any (Or) join can have multiple routing rules.

When you select `Topic` as the *destinationType* and specify a value for *durableSubscriberName*, Integration Server creates a durable subscriber for the JMS trigger on the JMS provider. A *durable subscriber* establishes a durable subscription with a unique identity on the JMS provider. A *durable subscription* allows subscribers to receive all the messages published on a topic, including those published while the subscriber is inactive (for example, if the JMS trigger is disabled). When the associated JMS trigger is disabled, the JMS provider holds the messages in nonvolatile storage. If a durable subscription already exists for the specified durable subscriber on the JMS provider, this service resumes the subscription.

When you select `Topic` as the *destinationType*, but do not specify a durable subscriber name, Integration Server creates a non-durable subscriber for the JMS trigger. A non-durable subscription allows subscribers to receive messages on their chosen topic only if the messages are published while the subscriber is inactive. A non-durable subscription lasts the lifetime of its message consumer. Note that non-durable subscribers cannot receive messages in a load-balanced fashion.

Integration Server uses a consumer to receive messages for a JMS trigger. This consumer encapsulates the actual `javax.jms.MessageConsumer` and `javax.jms.Session`.

Triggers and services can both be configured to retry. When a standard trigger invokes a service (that is, the service functions as a trigger service), Integration Server uses the trigger retry properties instead of the service retry properties. For a SOAP-JMS trigger, Integration Server uses the retry properties of the SOAP-JMS trigger instead of the retry properties of the service used as an operation in the web service descriptor.

When Integration Server retries a trigger service and the trigger service is configured to generate audit data on error, Integration Server adds an entry to the audit log for each failed retry attempt. Each of these entries will have a status of "Retried" and an error message of "Null". However, if Integration Server makes the maximum retry attempts and the trigger service still fails, the final audit log entry for the service will have a status of "Failed" and will display the actual error message. Integration Server makes the audit log entry regardless of which retry failure option the trigger uses.

Integration Server generates the following journal log message between retry attempts:

```
[ISS.0014.0031D] Service serviceName failed with ISRuntimeException.  
Retry x of y will begin in retryInterval milliseconds.
```

If you do not configure service retry for a trigger, set the *maxRetryAttempts* to 0. Because managing service retries creates extra overhead, setting this property to 0 can improve the performance of services invoked by the trigger.

You can invoke the `pub.flow:getRetryCount` service within a trigger service to determine the current number of retry attempts made by Integration Server and the maximum number of retry attempts

allowed for the trigger service. For more information about the `pub.flow:getRetryCount` service, see the *webMethods Integration Server Built-In Services Reference*.

Before a standard JMS trigger can be enabled, the trigger service must already exist on the same Integration Server.

The signature for a standard JMS trigger service must reference one of the following specifications:

- Use `pub.jms:triggerSpec` as the specification reference if the trigger service will process one message at a time.
- Use `pub.jms:batchTriggerSpec` as the specification reference if the trigger service will process multiple messages at one time. That is, the trigger service will receive a batch of messages as input and process all of those messages in a single execution. A trigger that receives and processes a batch of messages is sometimes referred to as a *batch trigger*.

Prefetch caching, which enables the JMS trigger to retrieve multiple messages from the JMS provider at once can only be used when the JMS provider is webMethods Broker or Universal Messaging. Further, for a JMS trigger that retrieves messages from Universal Messaging, prefetch caching (also called consumer caching) can be used only for a concurrent, non-transacted JMS trigger. Additionally, the `prefetchSize` value must be greater than 1 for the prefetch caching functionality to be used.

If you create a concurrent JMS trigger that uses multiple connections to receive messages from the JMS provider, (you specified a value greater than 0 for `connectionCount`), keep the following points in mind:

- The JMS connection alias associated with this trigger must be configured to create an individual connection for each trigger. That is, the **Create New Connection per Trigger** option must be set to **Yes** for the JMS connection alias.
- If the JMS connection alias specifies a connection to the webMethods Broker, the following must be true:
 - The webMethods Broker must be webMethods Broker version 7.1 or higher.
 - The versions of following three Broker jar files installed on Integration Server must be the 8.0 SP1 or higher versions of the files.
 - `Software AG_directory /common/lib/wm-jmsclient.jar`
 - `Software AG_directory /common/lib/wm-brokerclient.jar`
 - `Software AG_directory / Integration Server_directory /instances/instance_name/lib/jars/wm-jmsnaming.jar`
- The JMS trigger must be configured for concurrent processing (`isConcurrent` is set to true). You cannot use multiple connections with JMS triggers that perform serial processing.
- The JMS trigger must receive messages from Queues or from Topics using a durable subscriber. You cannot use multiple connections with JMS triggers that receive messages from Topics using a non-durable subscriber.
- The `connectionCount` value must be less than or equal to the `maxExecutionThreads` value.

SOAP-JMS triggers do not use routing rules. For SOAP-JMS triggers, Integration Server processes the SOAP message contained in the JMS message by executing an operation in a web service descriptor.

To use a SOAP-JMS trigger as a listener for provider web service descriptors, do the following:

- Create a provider web service endpoint alias for the JMS transport in which the SOAP-JMS trigger is specified as the JMS trigger that acts as a listener.
- Assign the web service endpoint alias to the JMS binder in the web service descriptor for which you want the SOAP-JMS trigger to listen for messages.

For more information about creating JMS triggers, see *webMethods Service Development Help*.

If the Docker image for a Microservices Runtime excludes web services functionality, attempts to execute `pub.trigger:createJMSTrigger` where `jmsTriggerType = SOAPJMS` end with a `ServiceException`.

See Also

[pub.trigger:deleteJMSTrigger](#)

[pub.jms:triggerSpec](#)

[pub.jms:batchTriggerSpec](#)

pub.trigger:createTrigger

WmPublic. Creates a webMethods messaging trigger.

Input Parameters

triggerName **String** Fully qualified name for the new trigger that uses any combination of letters, and/or the underscore character. Make sure to specify the name of the folder and subfolder in which you want to save the trigger.

Note:

For a list of reserved words and symbols for element names, see *webMethods Service Development Help*.

package **String** Name of the package in which you want to save the trigger.

properties **Document** Optional. Properties that you want to assign to the trigger.

Key

Description

joinTimeOut

String Number of milliseconds Integration Server waits for the other documents in the join condition. Integration Server starts the join time-out period when it pulls the first

document that satisfies the join condition from the trigger queue.

You need to specify a join time-out only when your condition is an AND or XOR join type. You do not need to specify a join time-out for an OR join condition or a condition that does not use joins.

Set *joinTimeOut* to -1 to indicate that the join condition never expires.

The default is 1 day.

queueCapacity

String Maximum number of documents that Integration Server maintains in the queue for this trigger.

The default is 10.

queueRefillLevel

String Number of unprocessed documents that must remain in the trigger queue before Integration Server retrieves more documents for the trigger from the Broker.

The default is 4.

The *queueRefillLevel* value must be less than or equal to the *queueCapacity* value.

Note:

The *queueRefillLevel* parameter applies to a webMethods messaging trigger that receives documents from the Broker only. At run time, Integration Server ignores the *queueRefillLevel* if the trigger receives documents from Universal Messaging.

ackQueueSize

String Maximum number of pending document acknowledgments for the trigger. The value must be greater than zero.

The default is 1.

maxRetryAttempts

String Maximum number of times Integration Server should attempt to re-execute the trigger service. If you want the trigger service to retry until it executes successfully, specify -1.

The default is 5 retries.

*retryInterval***String** Number of seconds Integration Server waits between retry attempts.

The default is 10 seconds.

*onRedeliveryFailure***String** Specifies how Integration Server handles retry failure for the trigger. Retry failure occurs when Integration Server reaches the maximum number of retry attempts and the trigger service still fails because of a run-time exception.

Specify one of the following values:

- **Throw Exception** to indicate that Integration Server throws a `ServiceException` when the last allowed retry attempt ends because of a run-time exception.

This is the default.

- **Suspend and Retry Later** to indicate that Integration Server suspends the trigger when the last allowed retry attempt ends because of a run-time exception. Integration Server retries the trigger service at a later time.

Note:

If you set *onRedeliveryFailure* to **Suspend and Retry later**, you must specify a service for the *resumeTaskSvcName* parameter. If you do not specify a service and the trigger suspends because of retry failure, Integration Server will not resume the trigger automatically. You must resume the trigger manually.

Selecting **Suspend and Retry Later** also instructs Integration Server to suspend the trigger when a transient error occurs during trigger preprocessing. For more information about transient error handling during trigger preprocessing, see *webMethods Service Development Help*.

*resumeTaskSvcName***String** Fully qualified name of the service that Integration Server executes when one of the following occurs:

- During exactly-once processing, the document resolver service ends because of a transient error. Integration Server suspends the trigger and invokes the *resumeTaskSvcName* to determine when the resources associated with the document resolver service are available. After the resources become available, Integration Server resumes document retrieval and document processing for the trigger.
- A trigger ends because of retry failure and the *onRedeliveryFailure* variable is set to Suspend and Retry Later. Integration Server executes the *resumeTaskSvcName* to determine whether the resources associated with a trigger service are available. If the resources are available, Integration Server resumes document retrieval and document processing for the trigger.

isPriorityEnabled

Boolean Indicates whether the trigger receives messages in order of priority or in the order in which they are published. Specify one of the following values:

- `true` to indicate that documents should reach the trigger in order of priority. The higher the priority the faster the document will be received.
- `false` to indicate that documents should reach the trigger in the order in which they are published. This is the default.

Note:

The *isPriorityEnabled* parameter applies to a webMethods messaging trigger that receives documents from the Broker only. At run time, Integration Server ignores the *isPriorityEnabled* value if the trigger receives a locally published documents or receives documents from Universal Messaging.

All webMethods messaging triggers that receive documents from Universal Messaging receive higher priority documents in an expedited fashion.

<i>isConcurrent</i>	<p>String Indicates whether the trigger uses a concurrent processing mode or a serial processing mode. Specify one of the following values:</p> <ul style="list-style-type: none">■ <code>true</code> to specify a concurrent processing mode. Integration Server processes as many documents in the trigger queue as it can at once.■ <code>false</code> to specify a serial processing mode. Integration Server processes documents in the trigger queue one after the other. This is the default.
<i>serialSuspendOnError</i>	<p>String Indicates whether Integration Server suspends document processing and document retrieval automatically when a trigger service ends with an error. Set to:</p> <ul style="list-style-type: none">■ <code>true</code> to indicate that Integration Server suspends the trigger automatically if an error occurs during trigger service execution.■ <code>false</code> to indicate that Integration Server should not suspend a trigger if an error occurs during trigger service execution. This is the default.
<i>maxExecutionThreads</i>	<p>String Maximum number of documents that Integration Server can process concurrently for this trigger. Integration Server uses one server thread to process each document in the trigger queue.</p>
<i>dupDetection</i>	<p>String Indicates whether Integration Server performs exactly-once processing for guaranteed documents received by this trigger. Set to:</p> <ul style="list-style-type: none">■ <code>true</code> to indicate that Integration Server performs exactly-once processing for guaranteed documents received by this trigger.■ <code>false</code> to indicate that exactly-once processing is not performed. This is the default.

<i>dupHistory</i>	<p>String Indicates whether Integration Server uses a document history database as part of performing exactly-once processing. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to indicate that Integration Server uses a document history database as part of exactly-once processing. ■ <code>false</code> to indicate that Integration Server does not use a document history database as part of exactly-once processing. This is the default.
<i>dupHistoryTTL</i>	<p>String Number of milliseconds that the document history database maintains an entry for a document processed by this trigger.</p> <p>The default is 2 hours.</p>
<i>dupResolverSvcName</i>	<p>String Fully qualified name of the service used to determine conclusively whether a document's status is New, Duplicate, or In Doubt.</p>
<i>executeUser</i>	<p>String Optional. Name of the user account whose credentials Integration Server uses to execute a service associated with the trigger. You can specify a locally defined user account or a user account defined in a central or external directory. The default is Administrator.</p> <div style="background-color: #f0f0f0; padding: 10px; margin-top: 10px;"> <p>Note: The <i>executeUser</i> parameter applies to webMethods messaging triggers that receive message from Universal Messaging only. At run time, Integration Server ignores the <i>executeUser</i> value if the trigger receives documents from the Broker or locally published documents. To set the execution user for webMethods messaging triggers that receive documents from Broker or locally published documents, use Integration Server Administrator to set the User property on the Settings > Resources > Store Settings > Edit Document Store Settings page.</p> </div>
<i>conditions</i>	<p>Document List Optional. Specifies the conditions for the trigger. A condition associates one or more publishable document types with a</p>

single service. The publishable document type acts as the subscription piece of the trigger. The service is the processing piece. When the trigger receives documents to which it subscribes, the Integration Server processes the document by invoking the service specified in the condition. Triggers can contain multiple conditions; however, a trigger can contain only one join condition.

Note:

The order in which you list conditions in the *conditions* list is important because it indicates the order in which Integration Server evaluates the conditions at run time. When Integration Server receives a document, it invokes the service specified in the first condition that is satisfied by the document. The remaining conditions are ignored. For more information about the order in which conditions are evaluated, see the *Publish-Subscribe Developer's Guide*.

Key	Description
<i>conditionName</i>	<p>String Name you want to assign to the condition.</p> <p>By default, Integration Server assigns each condition a default name such as Condition1 or Condition2.</p>
<i>serviceName</i>	<p>String Fully qualified name of the service that to be invoked when the trigger receives documents or messages to which it subscribes.</p>
<i>joinType</i>	<p>String The join type for the condition. The join type determines whether Integration Server needs to receive all, any, or only one of the documents or messages in the condition to execute the trigger service.</p> <p>You must specify a <i>joinType</i> if the condition subscribes to more than one document type or message. That is, if <i>messageTypeFilterPairs</i> contains more than one pair, you must select a <i>joinType</i>. Specify one of the following:</p> <ul style="list-style-type: none"> ■ N/A to indicate this is not a join condition. ■ AND to indicate that Integration Server invokes the trigger service when the server receives an instance of each specified message type within the join time-out period. The instance documents must have the same activation ID. <p>This is the default join type.</p>

- OR to indicate that Integration Server invokes the associated trigger service when it receives an instance of any one of the specified publishable document types.
- XOR to indicate that Integration Server invokes the associated trigger service when it receives an instance of any of the specified document types. For the duration of the join time-out period, Integration Server discards (blocks) any instances of the specified publishable document types with the same activation ID.

messageTypeFilterPairs

Document List Specifies the messages and document types to which a trigger subscribes and the filter that must be applied to instances of the message or document type.

Key	Description
<i>messageType</i>	String Fully qualified name of the publishable document type or message to which the trigger subscribes.
<i>filter</i>	<p>String Optional. Filter that you want applied to each received document. The trigger processes only those documents that meet the filter criteria.</p> <p>If the publishable document type uses Broker as the messaging provider, specify a filter that you want Integration Server and/or Broker to apply to each instance of this publishable document type.</p> <p>If the publishable document type uses Universal Messaging as the messaging provider, specify the local filter that you want Integration Server to apply to each instance of the publishable document type received by the trigger.</p>

providerFilter **String** Optional. Filter that you want Universal Messaging to apply to each instance of the publishable document type. Universal Messaging enqueues the document for the trigger only if the filter criteria is met.

Note:

At run time, Integration Server ignores the *providerFilter* if the trigger receives documents from Broker or locally published documents.

Note:

If you specify multiple *messageType* values in one condition, you need to select a *joinType*.

Output Parameters

None.

Usage Notes

The client executing this service must have write access to the folders and packages in which the client wants to save the new webMethods messaging trigger. If the client does not have write access, Integration Server throws a write permissions error. For more information about assigning access permissions to folders and packages, see *webMethods Service Development Help*.

The messaging connection alias assigned to the publishable document type determines the messaging provider used by any triggers that subscribe to the publishable document type.

Integration Server validates the webMethods messaging trigger before saving it. If Integration Server determines that the webMethods messaging trigger does not meet the following requirements, Integration Server throws a *ServiceException* and does not create the trigger.

- The webMethods messaging trigger contains at least one condition.
- Each condition in the webMethods messaging trigger specifies a unique name.
- Each condition in the webMethods messaging trigger specifies a service.
- Each condition in the webMethods messaging trigger specifies at least one publishable document type.
- If more than one condition in the webMethods messaging trigger specifies the same publishable document type and the trigger receives messages from the Broker, the contents of *conditions/messageTypeFilterPairs/filter* must be the same for each condition. Software AG does

not recommend using the same publishable document type in more than one condition in the same trigger.

- If more than one condition in the webMethods messaging trigger specifies the same publishable document type and the trigger receives messages from Universal Messaging, the contents of *conditions/messageTypeFilterPairs/providerFilter* must be the same for each condition. The contents of *conditions/messageTypeFilterPairs/filter* can be different for each condition.
- The webMethods messaging trigger contains no more than one join condition.
- The webMethods messaging trigger receives messages using the same messaging connection alias. That is, the publishable document types to which the trigger subscribes must all specify the same messaging connection alias. For the publishable document types to which the trigger subscribes, the value of the **Connection alias name** property can be:
 - The name of a specific messaging connection alias.
 - DEFAULT where the default messaging connection alias is the same as the alias specified for the other publishable document types to which the trigger subscribes.
- The syntax of a filter in *conditions/messageTypeFilterPairs/filter* must be correct. Create this filter using the conditional expression syntax described in *webMethods Service Development Help*. Integration Server validates the filter syntax when the `pub.trigger:createTrigger` service executes.

Note: Integration Server does not validate the syntax of the filter in *conditions/messageTypeFilterPairs/providerFilter*.

A trigger service for a webMethods messaging trigger must meet the following requirements:

- Before you can enable a webMethods messaging trigger, the trigger service must already exist on the same Integration Server.
- The input signature for the trigger service needs to have a document reference to the publishable document type.
- The name for this document reference must be the fully qualified name of the publishable document type. The fully qualified name of a publishable document type conforms to the following format: `folder.subfolder:PublishableDocumentTypeName`

For example, suppose that you want a webMethods messaging trigger to associate the `Customers:customerInfo` publishable document type with the `Customers:addToCustomerStore` service. On the **Input/Output** tab of the service, the input signature must contain a document reference named `Customers:customerInfo`.

- If you intend to use the service in a join condition (a condition that associates multiple publishable document types with a service), the service's input signature must have a document reference for each publishable document type. The names of these document reference fields must be the fully qualified names of the publishable document type they reference.

If the `pub.trigger:createTrigger` service executes successfully, Integration Server establishes the subscription locally by creating a trigger queue for the webMethods messaging trigger on the Integration Server.

If the trigger subscribes to one or more publishable document types that specify a Broker connection alias, one of the following occurs when the `pub.trigger:createTrigger` service executes:

- If the Broker connection alias is enabled, Integration Server registers the trigger subscription with the Broker by creating a client for the trigger on the Broker. Integration Server also creates a subscription for each *messageType* specified in the trigger conditions and saves the subscriptions with the trigger client. Broker validates the filters in the `webMethods` messaging trigger conditions when Integration Server creates the subscriptions.
- If the Broker connection alias is not enabled, the trigger will only receive documents published locally. When Integration Server reconnects to Broker, the next time Integration Server restarts, Integration Server will create a client for the trigger on the Broker and create subscriptions for the publishable document types identified in the trigger conditions. Broker validates the filters in the trigger conditions when Integration Server creates the subscriptions.

If the trigger subscribes to a publishable document type that uses Universal Messaging as the messaging provider, one of the following happens upon saving the trigger.

- If Integration Server is currently connected to Universal Messaging, Integration Server creates a durable subscription on the channel that corresponds to the publishable document type.
- If Integration Server is not currently connected to Universal Messaging, you need to synchronize the publishable document type with the provider when the connection becomes available. Synchronizing the document type will create the durable subscription on the channel that corresponds to the publishable document type.

If *messageType* specifies a publishable document type that does not exist on the Broker (that is, there is no associated Broker document type), Integration Server still creates the trigger and the trigger client on the Broker, but does not create any subscriptions on the Broker. Integration Server creates the subscriptions when you synchronize (push) the publishable document type with the Broker.

If *messageType* specifies a publishable document type that does not have a corresponding provider definition (channel) on Universal Messaging, Integration Server creates the trigger. On the **Messaging > webMethods triggers** page, Integration Server Administrator displays an error that indicates the channel does not exist beneath the trigger name.

If a `webMethods` messaging trigger subscribes to a publishable document type that is not in the same package as the trigger or uses a triggers service that is not in the same package as the trigger, create package dependencies on the package containing the publishable document type and/or trigger service from the package containing the trigger. This ensures that Integration Server loads the package containing the publishable document type before loading the trigger.

If a `webMethods` messaging trigger subscribes to publishable document types associated with a Universal Messaging connection alias, you can create the following types of filters:

- A provider filter that Universal Messaging applies to the documents that it receives. Universal Messaging saves the filter along with the subscription to the document type. When Universal Messaging receives an instance of the publishable document type, Universal Messaging applies the filter to the document and enqueues the document for the trigger only if the filter criteria is met. Use the `conditions/messageTypeFilterPairs/providerFilter` field to specify a provider filter.

For information about the syntax for provider filters for Universal Messaging, see the Universal Messaging documentation.

Note:

The scope of the provider filter depends on the encoding type for the publishable document type. When IData is the encoding type, Universal Messaging applies the filter to the custom header fields added to a published document via the *_properties* field. When protocol buffers is the encoding type, Universal Messaging applies the filter to the body of the document only. Because Integration Server includes the headers in the body of the published document as well as in the document header, you can still filter on the document headers when the encoding type is protocol buffers.

- A local filter that Integration Server applies to the published document header or document contents after the trigger receives the document. Use the *conditions/messageTypeFilterPairs/filter* to specify a local filter. Create the local filter using the conditional expression syntax described in *webMethods Service Development Help*.

When the encoding type for a publishable document type is IData, it is optional to include *_properties* in the provider filter for a webMethods messaging trigger. However, when the encoding type is protocol buffers, you need to include *_properties* in the provider filter. If you want a provider filter that operates on the contents of *_properties* to work regardless of the encoding type, always include *_properties* in the filter expression.

If a webMethods messaging trigger subscribes to publishable document types associated with a Broker connection alias, you can specify a single filter that can be used by Broker and/or Integration Server. Use the *conditions/messageTypeFilterPairs/filter* to specify the filter. Create the filter using the conditional expression syntax described in *webMethods Service Development Help*.

For more information about creating webMethods messaging triggers, see *webMethods Service Development Help*.

See Also

[pub.trigger:deleteTrigger](#)

pub.trigger:deleteJMSTrigger

WmPublic. Deletes a JMS trigger.

Input Parameters

<i>triggerName</i>	String Fully qualified name of the JMS trigger to delete.
--------------------	--

Output Parameters

None

See Also

[pub.trigger:createJMSTrigger](#)

pub.trigger:deleteTrigger

WmPublic. Deletes a webMethods messaging trigger.

Input Parameters

<i>triggerName</i>	String Fully qualified name of the webMethods messaging trigger that you want to delete.
--------------------	---

Output Parameters

None.

Usage Notes

The trigger must be unlocked for this service to execute successfully. If the trigger is locked when this service executes, Integration Server throws an error stating "Trigger is locked, change not permitted."

When you delete a webMethods messaging trigger that uses a Broker connection alias that specifies a shared client prefix, deleting the trigger will not delete the corresponding client queue on the Broker. When the client prefix is shared, the client queue might be used by other Integration Servers. The publishable document type to which a webMethods messaging trigger subscribes determines the connection alias used by the trigger.

When you delete a webMethods messaging trigger that uses a Universal Messaging connection alias that specifies a shared client prefix, deleting the trigger will not delete the corresponding NamedObject. When the client prefix is shared, the NamedObject might be used by other Integration Servers. The publishable document type to which a webMethods messaging trigger subscribes determines the connection alias used by the trigger.

See Also

[pub.trigger:createTrigger](#)

pub.trigger:disableJMSTriggers

WmPublic. Disables one or more JMS triggers.

Input Parameters

triggerNameList

String List Specifies the JMS triggers that you want to disable.

*applyChangeAcross
Cluster*

String Optional. Flag indicating whether the specified JMS triggers should be disabled across all the servers in the cluster. Set to:

- `true` to disable the specified JMS triggers on all the nodes in the cluster.

Note:

To make the state change on all the servers in a cluster, Integration Server must be configured to synchronize trigger changes across the cluster. For more information about configuring an Integration Server to synchronize trigger management changes across a cluster, see *webMethods Integration Server Administrator's Guide*.

- `false` to disable the JMS triggers on the local Integration Server only. This is the default.

Output Parameters

None.

Usage Notes

When a JMS trigger is disabled, the JMS trigger is stopped. Integration Server neither retrieves nor processes messages for the JMS trigger. The JMS trigger remains in this state until you enable the trigger.

When you disable a JMS trigger that has a non-durable subscriber, the JMS provider will remove any messages for the JMS trigger.

If you disable a SOAP-JMS trigger that acts as a listener for one or more provider web service descriptors, Integration Server will not retrieve any messages for those web service descriptors.

When you disable a JMS trigger, Integration Server does the following:

- If the JMS trigger is waiting before making a retry attempt, Integration Server interrupts processing for the JMS trigger.
- If the JMS trigger is currently processing messages, Integration Server waits a specified amount of time before forcing the JMS trigger to stop processing messages. If it does not complete in the allotted time the message consumer used to receive messages for the JMS trigger is stopped and the JMS session is closed. At this point the server thread for the JMS trigger continues to run to completion. However, the JMS trigger will not be able to acknowledge the message when processing completes. If the message is guaranteed (PERSISTENT), this can lead to duplicate messages.

The time Integration Server waits between the request to disable the JMS trigger and forcing the trigger to stop is specified by the `watt.server.jms.trigger.stopRequestTimeout` property

Because administered objects, like destinations, are configured outside of Integration Server, disabling a JMS trigger has no impact on the subscription.

Use the [pub.trigger:enableJMSTriggers](#) service to enable one or more JMS triggers.

Use the [pub.trigger:suspendJMSTriggers](#) service to suspend one or more JMS triggers.

You can also use the **Messaging > JMS triggers** page in Integration Server Administrator to disable, enable, and suspend JMS triggers. For more information, see *webMethods Integration Server Administrator's Guide*.

If you set `applyChangeAcrossCluster` to `true` and the synchronization is not successful, the following occurs:

- If Integration Server does not update all the Integration Servers in the cluster successfully, the Integration Server writes the following server log entry for each server that could not be updated:

```
[ISS.0098.0107E] Error occurred during cluster invoke:
Alias = remoteAliasName; Service = serviceName; Exception = exceptionName
```

The Integration Server Administrator also displays the following message:

```
[ISS.0085.9203] Errors occurred while updating remote aliases
(x of y updates failed). See server logs for more details.
```

- If Integration Server cannot update the Integration Servers in the cluster because the change could not be made locally, the Integration Server Administrator displays the following message:

```
[ISS.0085.9204] Local update failed: Exception providing reason for failure.
(Note: The cluster synchronization will not run until all local errors are
resolved.)
```

- If Integration Server cannot update the other Integration Servers in the cluster because cluster synchronization is not configured, the Integration Server writes the following server log entry:

```
[ISS.0033.0156W] Cluster invoke did not complete successfully.
Cluster Synchronization feature is not configured.
```

See Also

[pub.trigger:enableJMSTriggers](#)

[pub.trigger:suspendJMSTriggers](#)

pub.trigger:enableJMSTriggers

WmPublic. Enables one or more JMS triggers.

Input Parameters

triggerNameList

String List Specifies the JMS triggers that you want to enable.

applyChangeAcrossCluster

String Optional. Flag indicating whether the specified JMS triggers should be enabled across all the servers in the cluster. Set to:

- `true` to enable the specified JMS triggers on all the nodes in the cluster.

Note:

To make the state change on all the servers in a cluster, the Integration Server must be configured to synchronize trigger changes across the cluster. For more information about configuring an Integration Server to synchronize trigger management changes across a cluster, see *webMethods Integration Server Administrator's Guide*.

- `false` to enable the JMS triggers on the local Integration Server only. This is the default.

Output Parameters

None.

Usage Notes

When a JMS trigger is enabled, the JMS trigger is running and connected to the JMS provider. Integration Server retrieves and processes messages for the JMS trigger.

You can also use the **Messaging > JMS triggers** pages in Integration Server Administrator to disable, enable, and suspend JMS triggers. For more information, see *webMethods Integration Server Administrator's Guide*.

You can use the [pub.trigger:disableJMSTriggers](#) service to disable one or more JMS triggers.

Use the [pub.trigger:suspendJMSTriggers](#) service to suspend one or more JMS triggers.

If you set *applyChangeAcrossCluster* to `true` and the synchronization is not successful, the following occurs:

- If Integration Server does not update all the Integration Servers in the cluster successfully, the Integration Server writes the following server log entry for each server that could not be updated:

```
[ISS.0098.0107E] Error occurred during cluster invoke:
Alias = remoteAliasName; Service = serviceName; = exceptionName
```

The Integration Server Administrator also displays the following message:

```
[ISS.0085.9203] Errors occurred while updating remote aliases
(x of y updates failed). See server logs for more details.
```

- If Integration Server cannot update the Integration Servers in the cluster because the change could not be made locally, the Integration Server Administrator displays the following message:

```
[ISS.0085.9204] Local update failed: Exception providing reason for failure.
(Note: The cluster synchronization will not run until all local errors
are resolved.)
```

- If the Integration Server cannot update the Integration Servers in the cluster because cluster synchronization is not configured, the Integration Server writes the following server log entry:

```
[ISS.0033.0156W] Cluster invoke did not complete successfully.
Cluster Synchronization feature is not configured.
```

You can use the Integration Server Administrator to view and change cluster synchronization status for triggers. For more information, see *webMethods Integration Server Administrator's Guide*.

See Also

[pub.trigger:disableJMSTriggers](#)

[pub.trigger:suspendJMSTriggers](#)

pub.trigger:resourceMonitoringSpec

WmPublic. Specification for the signature of a resource monitoring service.

Input Parameters

None.

Output Parameters

isAvailable

String Indicates whether the resources needed by the trigger (webMethods messaging trigger or JMS) to perform exactly-once processing or to execute the trigger service are available. The value of this field determines whether Integration Server resumes the trigger or re-executes the resource monitoring service. Integration Server continues to execute a resource monitoring service until the value of *isAvailable* is "true" or the maximum retry attempts have been made. The *isAvailable* field must have one of the following values:

- `true` to indicate that the resources associated with the trigger are available. For a webMethods messaging trigger, Integration Server resumes document retrieval and document processing for the trigger. For a JMS trigger, Integration Server enables the trigger. For an MQTT trigger, Integration Server enables the trigger.
- `false` to indicate that the resources associated with the trigger are not available. Integration Server will not resume the trigger.

Usage Notes

The `pub.trigger:resourceMonitoringSpec` must be used as the service signature for any service used as a resource monitoring service. A *resource monitoring service* determines whether the resources associated with a trigger (webMethods messaging trigger, JMS, or MQTT) are available for exactly-once processing, document pre-processing, or message/document processing. Integration Server executes a resource monitoring service after retry failure occurs for the trigger or when the document resolver service fails because of a run-time exception. For more information about building a resource monitoring service, see the *Publish-Subscribe Developer's Guide*.

pub.trigger:resumeProcessing

WmPublic. Resumes document processing for the specified webMethods messaging trigger.

Input Parameters

<i>triggerName</i>	String Fully qualified name of the webMethods messaging trigger for which you want to resume document processing.
<i>persistChange</i>	<p>String Optional. Flag indicating whether the document processing change should be permanent or temporary. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to save the change to file. Integration Server persists the change across server restarts, package reloads, and changes to trigger properties. The trigger will continue to process documents until it is actively suspended via the Integration Server Administrator or by execution of the <code>pub.trigger:suspendProcessing</code> service. ■ <code>false</code> to indicate that the change is temporary and will not be maintained when the server restarts, the trigger is enabled or disabled, or the package containing the trigger reloads. This is the default.
<i>applyChangeAcrossCluster</i>	<p>String Optional. Flag indicating whether document processing should be resumed for this trigger across all the servers in the cluster. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to resume document processing for the specified trigger on all the nodes in the cluster.

Note:

To make the document processing change on all the servers in a cluster, the Integration Server must be configured to synchronize trigger changes across the cluster. For more information about configuring an Integration Server to synchronize trigger management changes across a cluster, see *webMethods Integration Server Administrator's Guide*.

- `false` to indicate that document processing for this trigger should be resumed on the local Integration Server only. This is the default.

Output Parameters

None.

Usage Notes

This service affects all documents in the specified trigger queue on the Integration Server, including documents retrieved from the messaging provider and from local publishing.

If you do not persist the change, the trigger reverts to the previously saved document processing state when the Integration Server restarts, the trigger is enabled or disabled, or the package containing the trigger reloads.

After this service executes, the Integration Server resumes document processing for this trigger at the percentage specified in the **Execution Threads Throttle** field on the **Messaging > webMethods triggers** page in the Integration Server Administrator.

Integration Server resumes document processing for the specified trigger even if document processing is suspended for all triggers on the Integration Server (that is, the **Processing State** for all triggers is set to Suspended).

Integration Server will not resume document processing for the specified trigger if the trigger is locked by a user. For more information about locking elements, see *webMethods Service Development Help*.

If you set *applyChangeAcrossCluster* to `true` and the synchronization is not successful, the following occurs:

- If the Integration Server does not update all the Integration Servers in the cluster successfully, the Integration Server writes the following server log entry for each server that could not be updated:

```
[ISS.0098.0107E] Error occurred during cluster invoke:
Alias = remoteAliasName; Service = serviceName; Exception = exceptionName
```

The Integration Server Administrator also displays the following message:

```
[ISS.0085.9203] Errors occurred while updating remote aliases
(x of y updates failed). See server logs for more details.
```

- If the Integration Server cannot update the Integration Servers in the cluster because the change could not be made locally, the Integration Server Administrator displays the following message:

```
[ISS.0085.9204] Local update failed: Exception providing reason for failure.
(Note: The cluster synchronization will not run until all local errors are
resolved.)
```

- If the Integration Server cannot update the Integration Servers in the cluster because cluster synchronization is not configured, the Integration Server writes the following server log entry:

```
[ISS.0033.0156W] Cluster invoke did not complete successfully.
Cluster Synchronization feature is not configured.
```

You can use the Integration Server Administrator to view and change cluster synchronization status for triggers. For more information, see *webMethods Integration Server Administrator's Guide*.

In a Java service, you can resume document processing using `com.wm.app.b2b.server.dispatcher.trigger.TriggerFacade.setProcessingSuspended()`. For more information about this method, see the *webMethods Integration Server Java API Reference* for the `com.wm.app.b2b.server.dispatcher.trigger.TriggerFacade` class.

You can resume and suspend document processing for an individual trigger or all triggers using the Integration Server Administrator. For more information, see *webMethods Integration Server Administrator's Guide*.

See Also

[pub.trigger:suspendProcessing](#)

pub.trigger:resumeRetrieval

`WmPublic`. Resumes retrieval of documents from the messaging provider for a specific `webMethods` messaging trigger.

Input Parameters

<i>triggerName</i>	String Fully qualified name of the <code>webMethods</code> messaging trigger for which you want to resume document retrieval.
<i>persistChange</i>	<p>String Optional. Flag indicating whether the document retrieval change should be permanent or temporary. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to save the change to file. Integration Server persists the change across server restarts, package reloads, and changes to trigger properties. The trigger will continue to retrieve documents until it is actively suspended via the Integration Server Administrator or by execution of the <code>pub.trigger:suspendRetrieval</code> service. ■ <code>false</code> to indicate that the change is temporary and will not be maintained when the server restarts, the trigger is enabled or disabled, or the package containing the trigger reloads. This is the default.
<i>applyChangeAcross Cluster</i>	<p>String. Optional. Flag indicating whether document retrieval should be resumed for this trigger across all the servers in the cluster. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to resume document retrieval for the specified trigger on all the servers in the cluster.

Note:

To make the document retrieval change on all the servers in a cluster, the Integration Server must be configured to synchronize trigger changes across the cluster. For more information about

configuring an Integration Server to synchronize trigger management changes across a cluster, see *webMethods Integration Server Administrator's Guide*.

- `false` to indicate that document retrieval for this trigger should be resumed on the local Integration Server only. This is the default.

Output Parameters

None.

Usage Notes

This service does not affect document retrieval for locally published documents to which this trigger subscribes.

If you do not persist the change, the trigger reverts to the previously saved document retrieval state when the server restarts, the trigger is enabled or disabled, or the package containing the trigger reloads.

After this service executes, the Integration Server resumes document retrieval for this trigger at the percentage specified in the **Queue Capacity Throttle** field on the **Messaging > webMethods triggers** page in the Integration Server Administrator.

The Integration Server resumes document retrieval for the specified trigger even if document retrieval is suspended for all the triggers on the Integration Server (that is, the **Retrieval State** for all triggers is set to Suspended).

The Integration Server will not resume document retrieval for the specified trigger if the trigger is locked by a user. For more information about locking elements, see *webMethods Service Development Help*.

If you set `applyChangeAcrossCluster` to `true` and the synchronization is not successful, the following occurs:

- If the Integration Server does not update all the Integration Servers in the cluster successfully, the Integration Server writes the following server log entry for each server that could not be updated:

```
[ISS.0098.0107E] Error occurred during cluster invoke:
Alias = remoteAliasName; Service = serviceName; Exception = exceptionName
```

The Integration Server Administrator also displays the following message:

```
[ISS.0085.9203] Errors occurred while updating remote aliases
(x of y updates failed). See server logs for more details.
```

- If the Integration Server cannot update the Integration Servers in the cluster because the change could not be made locally, the Integration Server Administrator displays the following message:

```
[ISS.0085.9204] Local update failed: Exception providing reason for failure.
(Note: The cluster synchronization will not run until all local errors are
```

```
resolved.)
```

- If the Integration Server cannot update the Integration Servers in the cluster because cluster synchronization is not configured, the Integration Server writes the following server log entry:

```
[ISS.0033.0156W] Cluster invoke did not complete successfully.  
Cluster Synchronization feature is not configured.
```

You can use the Integration Server Administrator to view and change cluster synchronization status for triggers. For more information, see *webMethods Integration Server Administrator's Guide*.

In a Java service, you can resume document retrieval by calling `com.wm.app.b2b.server.dispatcher.trigger.TriggerFacade.setRetrievalSuspended()`. For more information about this method, see the *webMethods Integration Server Java API Reference* for the `com.wm.app.b2b.server.dispatcher.trigger.TriggerFacade` class.

You can resume and suspend document retrieval for an individual trigger or all triggers using the Integration Server Administrator. For more information, see *webMethods Integration Server Administrator's Guide*.

See Also

[pub.trigger:suspendRetrieval](#)

pub.trigger:suspendJMSTriggers

WmPublic. Suspends one or more JMS triggers.

Input Parameters

<i>triggerNameList</i>	String List Specifies the JMS triggers that you want to suspend.
<i>applyChangeAcross Cluster</i>	String Optional. Flag indicating whether the specified JMS triggers should be suspended across all the servers in the cluster. Set to:

- `true` to suspend the specified JMS triggers on all the nodes in the cluster.

Note:

To make the status change on all the servers in a cluster, the Integration Server must be configured to synchronize trigger changes across the cluster. For more information about configuring an Integration Server to synchronize trigger management changes across a cluster, see *webMethods Integration Server Administrator's Guide*.

- `false` to suspend the JMS triggers on the local Integration Server only. This is the default.

Output Parameters

None.

Usage Notes

When a JMS trigger is suspended, the JMS trigger is running and connected to the JMS provider. Integration Server has stopped message retrieval, but continues processing any messages it has already retrieved. Integration Server enables the JMS trigger automatically upon server restart or when the package containing the JMS trigger reloads.

If you suspend a SOAP-JMS trigger that acts as a listener for one or more provider web service descriptors, Integration Server will not retrieve any messages for those web service descriptors.

If a JMS trigger is processing messages when this service executes, the JMS trigger will complete processing. JMS trigger also acknowledges the messages to the JMS provider.

After a suspending a JMS trigger, Integration Server will not start processing for any additional messages already received by the JMS trigger.

Use the [pub.trigger:disableJMSTriggers](#) service to disable one or more JMS triggers.

Use the [pub.trigger:enableJMSTriggers](#) service to enable one or more JMS triggers.

You can also use the **Messaging > JMS triggers** pages in Integration Server Administrator to disable, enable, and suspend JMS triggers. For more information, see *webMethods Integration Server Administrator's Guide*.

If you set *applyChangeAcrossCluster* to `true` and the synchronization is not successful, the following occurs:

- If Integration Server does not update all the Integration Servers in the cluster successfully, the Integration Server writes the following server log entry for each server that could not be updated:

```
[ISS.0098.0107E] Error occurred during cluster invoke:
Alias = remoteAliasName; Service = serviceName; Exception = exceptionName
```

The Integration Server Administrator also displays the following message:

```
[ISS.0085.9203] Errors occurred while updating remote aliases
(x of y updates failed). See server logs for more details.
```

- If Integration Server cannot update the Integration Servers in the cluster because the change could not be made locally, the Integration Server Administrator displays the following message:

```
[ISS.0085.9204] Local update failed: Exception providing reason for failure.
(Note: The cluster synchronization will not run until all local errors
are resolved.)
```

- If Integration Server cannot update the other Integration Servers in the cluster because cluster synchronization is not configured, the Integration Server writes the following server log entry:

```
[ISS.0033.0156W] Cluster invoke did not complete successfully.
```

Cluster Synchronization feature is not configured.

See Also

[pub.trigger:disableJMSTriggers](#)

[pub.trigger:enableJMSTriggers](#)

pub.trigger:suspendProcessing

WmPublic. Suspends document processing for the specified webMethods messaging trigger.

Input Parameters

<i>triggerName</i>	String Fully qualified name of the webMethods messaging trigger for which you want to suspend document processing.
<i>persistChange</i>	<p>String Optional. Flag indicating whether the document processing change should be permanent or temporary. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to save the change to file. Integration Server persists the change across server restarts, package reloads, and changes to trigger properties. The trigger will not process documents until processing is actively resumed via the Integration Server Administrator or by execution of the <code>pub.trigger:resumeProcessing</code> service. ■ <code>false</code> to indicate that the change is temporary and will not be maintained when the server restarts, the trigger is enabled or disabled, or the package containing the trigger reloads. This is the default.
<i>applyChangeAcross Cluster</i>	<p>String Optional. Flag indicating whether document processing should be suspended for this trigger across all the servers in the cluster. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to suspend document processing for the specified trigger on all the servers in the cluster. <div style="background-color: #f0f0f0; padding: 10px; margin: 10px 0;"> <p>Note: To make the document processing change on all the servers in a cluster, the Integration Server must belong to a properly configured cluster and it must be configured to synchronize trigger changes across the cluster. For more information about configuring an Integration Server to synchronize trigger management changes across a cluster, see <i>webMethods Integration Server Administrator's Guide</i>.</p> </div> <ul style="list-style-type: none"> ■ <code>false</code> to indicate that document processing for this trigger should be suspended on the local Integration Server only. This is the default.

Output Parameters

None.

Usage Notes

This service affects all documents in the specified trigger queue on the Integration Server, including documents retrieved from the messaging provider and from local publishing.

When you suspend document processing, the Integration Server will not dispatch any more server threads to process documents in the trigger's queue. Any server threads currently processing documents for the trigger will execute to completion. This includes documents that are being retried.

When you suspend document processing, documents that the trigger retrieves will collect in the trigger queue until the trigger resumes document processing. If the server restarts before document processing resumes, volatile documents are discarded.

If you do not persist the change, the trigger reverts to the previously saved document processing state when the server restarts, the trigger is enabled or disabled, or the package containing the trigger reloads.

The Integration Server will not suspend document processing for the specified trigger if the trigger is locked by a user. For more information about locking elements, see *webMethods Service Development Help*.

If you suspend document processing, but do not suspend document retrieval for a trigger, the trigger queue fills to capacity and Integration Server stops retrieving documents for this trigger from the messaging provider.

If you set *applyChangeAcrossCluster* to `true` and the synchronization is not successful, the following occurs:

- If the Integration Server does not update all the Integration Servers in the cluster successfully, the Integration Server writes the following server log entry for each server that could not be updated:

```
[ISS.0098.0107E] Error occurred during cluster invoke:
Alias = remoteAliasName; Service = serviceName; Exception = exceptionName
```

The Integration Server Administrator also displays the following message:

```
[ISS.0085.9203] Errors occurred while updating remote aliases
(x of y updates failed). See server logs for more details.
```

- If the Integration Server cannot update the Integration Servers in the cluster because the change could not be made locally, the Integration Server Administrator displays the following message:

```
[ISS.0085.9204] Local update failed: Exception providing reason for failure.
(Note: The cluster synchronization will not run until all local errors
are resolved.)
```

- If the Integration Server cannot update the Integration Servers in the cluster because cluster synchronization is not configured, the Integration Server writes the following server log entry:

```
[ISS.0033.0156W] Cluster invoke did not complete successfully.
Cluster Synchronization feature is not configured.
```

You can use the Integration Server Administrator to view and change cluster synchronization status for triggers. For more information, see *webMethods Integration Server Administrator's Guide*.

In a Java service, you can suspend document processing by calling `com.wm.app.b2b.server.dispatcher.trigger.TriggerFacade.setProcessingSuspended()`. For more information about this method, see the *webMethods Integration Server Java API Reference* for the `com.wm.app.b2b.server.dispatcher.trigger.TriggerFacade` class.

You can resume and suspend document processing for an individual trigger or all triggers using the Integration Server Administrator. For more information, see *webMethods Integration Server Administrator's Guide*.

See Also

[pub.trigger:resumeProcessing](#)

pub.trigger:suspendRetrieval

WmPublic. Suspends retrieval of documents from the messaging provider for a specific webMethods messaging trigger.

Input Parameters

<i>triggerName</i>	String Fully qualified name of the webMethods messaging trigger for which you want to suspend document retrieval.
<i>persistChange</i>	<p>String Optional. Flag indicating whether the document retrieval change should be permanent or temporary. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to save the change to file. Integration Server persists the change across server restarts, package reloads, and changes to trigger properties. The trigger will not retrieve documents until retrieval is actively resumed via the Integration Server Administrator or by execution of the <code>pub.trigger:resumeProcessing</code> service. ■ <code>false</code> to indicate that the change is temporary and will not be maintained when the server restarts, the trigger is enabled or disabled, or the package containing the trigger reloads. This is the default.
<i>applyChangeAcrossCluster</i>	<p>String Optional. Flag indicating whether document retrieval should be suspended for this trigger across all the servers in the cluster. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to suspend document retrieval for the specified trigger on all the servers in the cluster.

Note:

To make the document retrieval change on all the servers in a cluster, the Integration Server be configured to synchronize trigger changes across the cluster. For more information about configuring an Integration Server to synchronize trigger management changes across a cluster, see *webMethods Integration Server Administrator's Guide*.

- `false` to indicate that document retrieval for this trigger should be suspended on the local Integration Server only. This is the default.

Output Parameters

None.

Usage Notes

This service does not affect document retrieval for locally published documents to which the specified trigger subscribes.

When you suspend document retrieval, the specified trigger will continue to receive documents delivered to the default client.

Integration Server will not suspend document processing for the specified trigger if the trigger is locked by a user. For more information about locking elements, see *webMethods Service Development Help*.

When you suspend document retrieval, Integration Server will not dispatch any server threads to retrieve documents from the messaging provider for the trigger. Any server threads currently retrieving documents for the trigger will execute to completion.

When you suspend document retrieval, documents to which this trigger subscribes will collect on the messaging provider. Documents remain in the trigger's client queue until document retrieval resumes for the trigger or the documents expire.

If you do not resume document retrieval before the server restarts, the trigger package reloads, or the trigger properties are modified, the messaging provider discards any volatile documents for the trigger.

If you do not persist the change, the trigger reverts to the previously saved document retrieval state when the server restarts, the trigger is enabled or disabled, or the package containing the trigger reloads.

When you suspend document retrieval, documents to which a webMethods messaging trigger subscribes will collect on the messaging provider. Documents remain on the messaging provider until document retrieval resumes for the trigger or the documents expire. Specifically, one of the following happens:

- For a webMethods messaging trigger that receives documents from the Broker, Integration Server stops polling for documents.

- For a webMethods messaging trigger that receives documents from Universal Messaging, Integration Server pauses the subscription.

Note:

Prior to Integration Server version 10.7, suspending a trigger that received messages from Universal Messaging resulted in Integration Server stopping and closing the subscription. Integration Server rolled back all of the documents that had been retrieved but not acknowledged to Universal Messaging, including unprocessed documents in the trigger queue and documents currently being processed. This led to duplicates. Pausing the subscription will not cause any documents to be rolled back, thus introducing duplicates. Any messages already received by the trigger will be processed as long as the trigger is enabled and processing is not suspended.

If you set *applyChangeAcrossCluster* to true and the synchronization is not successful, the following occurs:

- If the Integration Server does not update all the Integration Servers in the cluster successfully, the Integration Server writes the following server log entry for each server that could not be updated:

```
[ISS.0098.0107E] Error occurred during cluster invoke:
Alias = remoteAliasName; Service = serviceName; Exception = exceptionName
```

The Integration Server Administrator also displays the following message:

```
[ISS.0085.9203] Errors occurred while updating remote aliases (x of y
updates failed). See server logs for more details.
```

- If the Integration Server cannot update the Integration Servers in the cluster because the change could not be made locally, the Integration Server Administrator displays the following message:

```
[ISS.0085.9204] Local update failed: Exception providing reason for failure.
(Note: The cluster synchronization will not run until all local errors
are resolved.)
```

- If the Integration Server cannot update the Integration Servers in the cluster because cluster synchronization is not configured, the Integration Server writes the following server log entry:

```
[ISS.0033.0156W] Cluster invoke did not complete successfully.
Cluster Synchronization feature is not configured.
```

You can use the Integration Server Administrator to view and change cluster synchronization status for triggers. For more information, see *webMethods Integration Server Administrator's Guide*.

In a Java service, you can suspend document retrieval by calling `setRetrievalSuspended()`. For more information about this method, see the *webMethods Integration Server Java API Reference* for the `com.wm.app.b2b.server.dispatcher.trigger.TriggerFacade` class.

You can resume and suspend document retrieval for an individual trigger or all triggers using the Integration Server Administrator. For more information, see *webMethods Integration Server Administrator's Guide*.

See Also

[pub.trigger:resumeRetrieval](#)

44 TX Folder

■ Summary of Elements in this Folder	1006
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Use services in the tx folder to perform administrative tasks for guaranteed delivery transactions. For more information about guaranteed delivery, see the *Guaranteed Delivery Developer's Guide* and *webMethods Integration Server Administrator's Guide*.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.tx:init	WmPublic. Initializes the processing of inbound guaranteed delivery requests.
pub.tx:shutdown	WmPublic. Stops the processing of inbound guaranteed delivery requests.
pub.tx:resetOutbound	WmPublic. Reinitializes the processing of outbound guaranteed delivery requests.

pub.tx:init

WmPublic. Starts processing inbound guaranteed delivery requests. These are guaranteed delivery transactions sent to Integration Server from client applications.

Input Parameters

None.

Output Parameters

Operation **String** A message indicating whether the service completed successfully. The service returns an exception if an error is encountered.

Usage Notes

If you shut down the guaranteed delivery capabilities of Integration Server to correct a configuration problem or to make an administrative change, use this service to reinitialize guaranteed delivery.

You can also use this service to reinitialize guaranteed delivery if it becomes disabled due to an error (for example, because of a disk full condition or if the job store database becomes inaccessible). Reinitialize guaranteed delivery after you correct the problem.

pub.tx:shutdown

WmPublic. Stops processing inbound guaranteed delivery requests. These are guaranteed delivery transactions sent to Integration Server from client applications.

Input Parameters

None.

Output Parameters

Operation **String** A message indicating whether the service completed successfully. The service returns an exception if an error is encountered.

Usage Notes

You might want to shut down guaranteed delivery to perform some administration functions, such as correcting configuration errors or starting a new audit-trail log. (To start a new audit-trail log, move or rename the existing log; the server automatically starts a new log if one does not already exist.)

pub.tx:resetOutbound

WmPublic. Reinitializes the processing of outbound guaranteed delivery requests. Outbound guaranteed delivery requests are those sent to another Integration Server.

Input Parameters

None.

Output Parameters

Operation **String** A message indicating whether the service completed successfully. The service returns an exception if an error is encountered.

Usage Notes

If guaranteed delivery capabilities for outbound transactions become disabled due to an error (for example, if the server encounters a disk full condition or if the job store database becomes inaccessible), use this service to reinitialize guaranteed delivery after you correct the problem. If you invoke this service while outbound guaranteed delivery is functioning normally, the service will throw an exception and outbound guaranteed delivery will not be reinitialized.

45 UniversalName Folder

■ Summary of Elements in this Folder	1010
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You use the elements in the universalName folder to list the contents of the Universal Name Registry and to look up services or document types by their universal names.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.universalName:find	WmPublic. Returns the fully qualified service name for an explicit universal name.
pub.universalName:findDocumentType	WmPublic. Returns the fully qualified document type name for a provided explicit universal name
pub.universalName:list	WmPublic. Returns a list of services in the current universal-name registry.
pub.universalName:listAll	WmPublic. Returns the contents of the current universal-name registry, including services and document types.

pub.universalName:find

WmPublic. Returns the fully qualified service name for an explicit universal name.

Input Parameters

<i>namespaceName</i>	String Namespace portion of the universal name.
<i>localName</i>	String Local portion of the universal name.

Output Parameters

<i>svcName</i>	String Conditional. Fully qualified name of the service associated with the universal name in <i>namespaceName</i> and <i>localName</i> . If the specified universal name is not in the registry, <i>svcName</i> will be null.
----------------	---

pub.universalName:findDocumentType

WmPublic. Returns the fully qualified document type name for a provided explicit universal name.

Input Parameters

<i>namespaceName</i>	String Namespace portion of the universal name.
----------------------	--

localName **String** Local name portion of the universal name.

Output Parameters

svcName **String** Conditional. Fully qualified name of the document type associated with the universal name in *namespaceName* and *localName*. If the specified universal name is not in the registry, *svcName* will be null.

pub.universalName:list

WmPublic. Returns a list of services in the current universal-name registry.

Input Parameters

None.

Output Parameters

names **Document List** Service entries in the universal name registry. Each document (IData object) in the list represents a service entry in the universal-name registry. (There is one entry for every *explicit* universal name that has been defined on the server. Implicit universal names are not maintained in the registry.)

Each document in the list contains the following information:

Key	Description						
<i>universalName</i>	Document The universal name associated with the entry. This document contains the following information:						
	<table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>namespaceName</i></td> <td>String Namespace portion of the universal name.</td> </tr> <tr> <td><i>localName</i></td> <td>String Local portion of the universal name.</td> </tr> </tbody> </table>	Key	Description	<i>namespaceName</i>	String Namespace portion of the universal name.	<i>localName</i>	String Local portion of the universal name.
Key	Description						
<i>namespaceName</i>	String Namespace portion of the universal name.						
<i>localName</i>	String Local portion of the universal name.						
<i>svcName</i>	String Fully qualified webMethods service name associated with the entry (for example, <code>gl.post:postEntry</code>).						

Usage Notes

To return the entire contents of the universal-name registry, use the [pub.universalName:listAll](#) service.

pub.universalName:listAll

WmPublic. Returns the contents of the current universal-name registry, including services and document types.

Input Parameters

None.

Output Parameters

names **Document List** Entries in the universal name registry. Each document (IData object) in the list represents an entry in the universal-name registry.

There is one entry for every *explicit* universal name that has been defined on the server. Implicit universal names are not maintained in the registry.

Each document in the list contains the following information:

<u>Key</u>	<u>Description</u>						
<i>universalName</i>	Document Universal name associated with the entry. This document contains the following information: <table><thead><tr><th><u>Key</u></th><th><u>Description</u></th></tr></thead><tbody><tr><td><i>namespaceName</i></td><td>String Namespace portion of the universal name.</td></tr><tr><td><i>localName</i></td><td>String Local portion of the universal name.</td></tr></tbody></table>	<u>Key</u>	<u>Description</u>	<i>namespaceName</i>	String Namespace portion of the universal name.	<i>localName</i>	String Local portion of the universal name.
<u>Key</u>	<u>Description</u>						
<i>namespaceName</i>	String Namespace portion of the universal name.						
<i>localName</i>	String Local portion of the universal name.						
<i>svcName</i>	String Fully qualified Integration Server service name or document type name associated with the entry (for example, <code>gl.post:postEntry</code>).						

Usage Notes

To return a list of the services in the universal-name registry only, use the `pub.universalName:listservic`.

46 Utils Folder

■ Summary of Elements in this Folder	1014
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The utils folder contains utility services.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.utils:deepClone	WmPublic. Clones an object using the default Java serialization mechanism.
pub.utils:executeOSCommand	WmPublic. Executes an operating system command such as <code>dir</code> in Windows or <code>ls</code> in UNIX.
pub.utils:generateUUID	WmPublic. Generates a random Universally Unique Identifier (UUID).
pub.utils:getServerProperty	WmPublic. Retrieves the value of a specified server property.
pub.utils.messaging:getUMDependencies	WmPublic. Generates a list of Universal Messaging assets on which Integration Server depends, such as channels, queues, durables, and Administered Objects for a JMS messaging connection alias and/or a Universal Messaging connection alias.
pub.utils.messaging:migrateDocTypesTriggersToUM	WmPublic. Migrates the messaging provider for one or more publishable document types and webMethods messaging trigger from Broker to Universal Messaging.
pub.utils.messaging:syncDocTypesToUM	WmPublic. Synchronizes an updated protocol buffer descriptor for one or more publishable document types with the associated provider definition (channel) on Universal Messaging.
pub.utils:transcode	WmPublic. Transcodes data from one encoding to another.
pub.utils.ws:setCompatibilityModeFalse	WmPublic. Changes the value of the Pre-8.2 compatibility mode property for a web service descriptor to false.

pub.utils:deepClone

WmPublic. Clones an object using the default Java serialization mechanism.

The *originalObject* and all its members must support the `java.io.Serializable` interface.

Input Parameters

originalObject **java.io.Serializable** Object to be cloned.

Output Parameters

clonedObject **Object** Copy of the *originalObject*.

pub.utils:executeOSCommand

WmPublic. Executes an operating system command such as `dir` in Windows or `ls` in UNIX.

CAUTION:

Use the `pub.utils:executeOSCommand` service with extreme caution; the commands can affect the production systems where Integration Server is running.

Parameter Settings for OSCommands.cnf file

The `OSCommands.cnf` configuration file in the *Integration Server_directory* \instances*instance_name*\packages\WmPublic\config directory contains parameters that Integration Server uses to provide validation checks to make the `pub.utils:executeOSCommand` service secure.

Note:

If you make any changes to the `OSCommands.cnf`, you must reload the WmPublic package or restart Integration Server for the changes to take effect.

For security reasons, the `pub.utils:executeOSCommand` service checks the input *command* parameter against the list of *allowedOSCommands* in the `OSCommands.cnf` file. The service also checks the input *workingDirectory* parameter against the list of *allowedWorkingDirectories*. If the input command or directory is not on the allowed list, the service throws an exception.

Parameter Settings

The following table shows the parameter settings for the `OSCommands.cnf` file:

Parameter	Description
<i>allowedOSCommands</i>	List of commands that can be executed using the <code>pub.utils.executeOSCommand</code> service. You can specify commands and command parameters. If you specify a command (example, <code>ps</code>), Integration Server will run any command parameter with that command (such as <code>ps -ef</code> or <code>ps -aux</code>). If you specify a particular

Parameter	Description
	command parameter (example, <code>ps -ef</code>) Integration Server will run <i>only</i> that command parameter, not any other parameter associated with the command (such as <code>ps -aux</code>).
<i>allowedWorkingDirectories</i>	List of directories where the allowed commands can be executed.

When modifying the parameters in the `OSCommands.cnf` file, keep the following points in mind:

- Use semicolon (;) as the delimiter for the *allowedOSCommands* and *allowedWorkingDirectories* parameters.
- If a command name or working directory has a semicolon (;), use backslashes (\\) before the semicolon while specifying the allowed paths.

For example, if the allowed command is `cmd.exe /c c:/temp/ab;c.txt`, specify it as `cmd.exe /c c:/temp/ab\\;c.txt` when specifying it as a parameter for the `OSCommands.cnf` file.

Input Parameters

<i>command</i>	<p>String Command to be executed on the target operating system. You can include command parameters only if the command parameters do not contain spaces.</p> <div style="background-color: #f0f0f0; padding: 5px;"> <p>Important: You must use <i>arguments</i> to specify all of the command parameters if any one of the parameters contains spaces.</p> </div>
<i>arguments</i>	<p>String List Optional. All of the command parameters for the <i>command</i>. Add one element to the parameter for each command parameter that you specify.</p>
<i>environment</i>	<p>String List Optional. An array of strings of environment variable settings in the <code>name=value</code> format. Set the value to null if you want the service to use the environment of the current process as the environment for its subprocesses.</p>
<i>workingDirectory</i>	<p>String List Optional. The working directory from which the command is to be executed. Set the value to null if you want the service to use the working directory of the current process as the working directory of its subprocesses.</p>

Output Parameters

<i>status</i>	<p>String The exit value of the executed command. The value 0 (zero) indicates normal termination.</p>
<i>outputMessage</i>	<p>String Output of the executed command.</p>

errorMessage **String** Errors that occurred during command execution.

Usage Notes

To execute the `dir` command on Windows XP using the `pub.utils:executeOSCommand`, the *command* parameter is passed as `cmd.exe /c dir` and the *working directory* parameter is passed as `c:/temp`. The *outputMessage* parameter will contain the files of `c:/temp` directory.

pub.utils:generateUUID

WmPublic. Generates a random Universally Unique Identifier (UUID).

Input Parameters

None.

Output Parameters

UUID **String** A randomly generated Universally Unique Identifier (UUID).

pub.utils:getServerProperty

WmPublic. Retrieves the value of a specified server property.

Input Parameters

propertyName **String** The name of the server property whose value you want to retrieve (for example, `watt.server.SOAP.directive`).

defaultValue **String** Optional. The default value to return if the server property specified in *propertyName* does not exist. If the server property does exist, the `getServerProperty` service ignores this value.

Output Parameters

propertyValue **String** The value of the requested server property. If the property does not exist, and you did not set a *defaultValue*, the `getServerProperty` service returns null.

pub.utils.messaging:getUMDependencies

WmPublic. Generates a list of Universal Messaging assets on which Integration Server depends, such as channels, queues, durables, and Administered Objects for a JMS messaging connection alias and/or a Universal Messaging connection alias.

Input Parameters

<i>exportFormat</i>	<p>String Optional. Format for the output data. Set to one of the following:</p> <ul style="list-style-type: none">■ IDATA■ XML The XML format matches the Universal Messaging import/export schema. This is the default. <p>If you intend to import the list into Universal Messaging, select XML.</p>
<i>messagingType</i>	<p>String Optional. Type of messaging for which to export a list of related Universal Messaging assets. Set to:</p> <ul style="list-style-type: none">■ ALL - To export assets for JMS messaging and webMethods messaging. This is the default.■ JMS - To export assets for JMS messaging.■ NATIVE - To export assets for webMethods messaging.
<i>connectionAliasName</i>	<p>String Optional. Name of the connection alias for which to export a list of related Universal Messaging assets. If you do not provide a value, the <code>pub.utils.messaging:getUMDependencies</code> service exports assets for all the messaging aliases for the specified <i>messagingType</i>.</p> <p>If you specify a connection alias that does not depend on any Universal Messaging assets, the resulting output will be empty.</p>
<i>includeDefaultUMConfiguration</i>	<p>String Optional. Whether default Universal Messaging configuration values are included in the output. Set to:</p> <ul style="list-style-type: none">■ true - If the service adds all Universal Messaging fields to the output including fields that are not relevant to Integration Server but are needed by

the Universal Messaging Enterprise Manager import XML functionality. This is the default.

- `false` - If the service does not include all the Universal Messaging fields needed for Universal Messaging configuration.

includeWmAssets

String Optional. Whether to include Integration Server assets (publishable document types and triggers) in system packages that begin with “Wm”. Set to:

- `true` - To include Integration Server assets from system “Wm*” packages the output.
- `false` - To exclude Integration Server assets from system “Wm” packages in the output. This is the default.

Output Parameters

document **Document** Conditional. An IData containing the exported data. The service returns the *document* field only when *exportFormat* is IDATA.

xmldata **String** Conditional. An XML string containing the exported data. The service returns the *xmldata* field only when *exportFormat* is XML.

pub.utils.messaging:migrateDocTypesTriggersToUM

WmPublic. Changes one or more publishable document types to use a Universal Messaging server as the messaging provider.

The `pub.utils.messaging.migrateDocTypesTriggersToUM` service does one or more of the following depending on the provided input:

- Changes the messaging connection alias assigned to the publishable document type to one specified in the service.
- Sets the encoding type of the publishable document type to protocol buffers.
- Synchronizes the updated publishable document types with the messaging provider.
- Converts the filters used by the `webMethods` messaging trigger that subscribe to the publishable document types. Specifically, the service migrates the filter expressions that can be evaluated by the Universal Messaging server from the **Filter** field for a trigger condition to the **Provider Filter (UM)** field. This may include some syntax changes.

Input Parameters

reportOnly

java.lang.Boolean Optional. Indicates whether the service changes the document types and webMethods messaging triggers and returns a summary of the changes or if the service returns only a summary without making any changes. Set to:

- `true` to return a summary of the document types and webMethods messaging trigger that the service would successfully and unsuccessfully update, including the errors and warnings that would be encountered. The service does not modify any document types and triggers. This is the default.
- `false` to update the publishable document types and webMethods messaging triggers, synchronize the publishable document types with the messaging provider, and return a summary of the changes.

backupPackages

java.lang.Boolean Optional. Indicates whether the service creates a package archive for each package affected by this service prior to making any updates to the publishable document types and webMethods messaging trigger. Set to:

- `true` to create an archive for each package that contains a publishable document type or webMethods messaging trigger that will be updated by this service. The archive will be named *packageName.zip_timeStamp* and placed in the following directory: and will be located in the following directory: *Integration Server_directory* \instances*instance_name*\replicate\archive. This is the default.
- `false` to skip creating an archive of each affected package before making updates.

Important:Software AG recommends that you set *backupPackages* to true when *reportOnly* is set to false if you have not taken other measures to back up the packages containing the publishable document types and triggers to be migrated prior to executing the `pub.utils.messaging:migrateDocTypesTriggersToUM` service. After the service executes successfully, restoring from a backup file is the only way to revert a change made by the service.

packageNames

String List Optional. Name of the packages containing the publishable document types that you want to migrate. Integration Server also migrates any webMethods messaging triggers in packages that reference publishable document types contained in the specified packages.

The *packageNames* and *documentTypesNames* input parameters are mutually exclusive. If you specify a value for both parameters, the service fails with an exception. If you do not specify a value for either, the service updates publishable document types and webMethods messaging triggers in all packages that do not start with the letters “wm” in any case combination.

<i>documentTypeNames</i>	String List Optional. Fully qualified names of the publishable document types that you want to update.
	The <i>packageName</i> s and <i>documentTypeNames</i> input parameters are mutually exclusive. If you specify a value for both parameters, the service fails with an exception. If you do not specify a value for either, the service updates publishable document types and webMethods messaging triggers in all packages that do not start with the letters “wm” in any case combination.
<i>newConnectionAlias</i>	String Optional. Name of the Universal Messaging (UM) connection alias to assign to the publishable document types. Any webMethods messaging trigger that subscribe to updated publishable document types will use this alias to receive published documents.
	You must specify a <i>newConnectionAlias</i> to update any publishable document types that currently specify the Broker connection alias or are publishable locally only. If you do not specify a <i>newConnectionAlias</i> , the service skips these publishable document types.
	If the default connection alias is the Broker connection alias and you do not specify a <i>newConnectionAlias</i> , the service skips any publishable document types that use the default connection alias. However, if you change the default connection alias to be Universal Messaging connection alias and then execute the <code>pub.utils.messaging:migrateDocTypesTriggersToUM</code> service, the service migrates any publishable document types that use the default messaging connection alias as well as any triggers that subscribe to those publishable document types.
	If a publishable document types already specifies a Universal Messaging connection alias, you do not need to specify a <i>newConnectionAlias</i> . However, you can use the service to change the Universal Messaging connection alias used by one or more publishable document types.

Output Parameters

<i>affectedPackages</i>	Document Conditional. An IData containing key=value pairs that identify the packages impacted by the migration and the name of the archive created for the package. The service returns an archive name only if <i>reportOnly</i> is set to false and <i>backupPackages</i> is set to true. The archive will be named <i>packageName.zip_timeStamp</i> and will be located in the following directory: <code>Integration Server_directory \instances \instance_name \replicate \archive</code> .
	The service returns <i>affectedPackages</i> only if the service finds at least one publishable document type or webMethods messaging trigger to update.
<i>failedPackages</i>	Document List Conditional. List of the packages that could not be archived. If Integration Server cannot create a package archive for any of the affected packages, the service ends with an error and nothing is migrated.

The service attempts to archive a package only when *backupPackages* is set to true.

The service returns the *failedPackages* parameter only if one of the following occurs:

- The *backupPackages* input parameter is set to true and an error prevented the service from archiving at least one package.
- A package listed in the *packageNames* input parameter did not contain any publishable document types or webMethods messaging triggers to update.

Key	Description
<i>package</i>	String Name of the package that the service could not archive because of an error.
<i>errors</i>	String Text of the error message that caused package archiving to fail.

updatedDocumentTypes

Document List Conditional. List of the publishable document types updated by the service.

The service returns the *updatedDocumentTypes* parameter only if the service updated one or more publishable document types.

Key	Description
<i>package</i>	String Name of the package containing the updated publishable document type.
<i>name</i>	String Fully qualified name of the updated publishable document type.

skippedDocumentTypes

Document List Conditional. List of the publishable document types that were not updated because there were no changes to make. Some reasons the service might skip a publishable document type include, but are not limited to:

- The publishable document type already uses the messaging connection alias specified in *newConnectionAlias* and the encoding type for the publishable document type is already set to protocol buffers.
- The publishable document type uses a Broker connection alias and a Universal Messaging connection alias was not specified in *newConnectionAlias*.
- Values were not specified for either the *packageNames* or the *documentTypeNames* input parameters and Integration Server found publishable document types in packages whose names started with the letters “wm” in any case combination

The service returns the *skippedDocumentTypes* parameter only if the service skipped updating one or more publishable document types.

Key	Description
<i>package</i>	String Name of the package containing the skipped publishable document type.
<i>name</i>	String Fully qualified name of the skipped publishable document type.
<i>reason</i>	String Message indicating why the service did not update the publishable document type.

failedDocumentTypes

Document List Conditional. List of the publishable document types that the service could not update because of an error.

The service returns the *failedDocumentTypes* parameter only if there were one or more publishable document types that the service could not update because of an error.

Key	Description
<i>package</i>	String Name of the package containing the publishable document type that the service could not update because of an error.
<i>name</i>	String Name of the publishable document type that the service could not update because of an error.
<i>errors</i>	String Text of the error message that prevented the service from updating the publishable document type.

providerSyncResults

Document List Conditional. Results of synchronizing the updated publishable document types with the messaging provider.

The service only produces this output parameter when *reportOnly* is set to false and the service updated at least one publishable document type.

Key	Description
<i>successfulPDTs</i>	String List Fully qualified names of the publishable document types that the service synchronized successfully with the messaging provider.
<i>unsuccessfulPDTs</i>	String List Fully qualified names of the publishable document types that the service did not synchronize successfully with the messaging provider.
<i>errors</i>	Document List List of any errors that occurred during document type synchronization.

warnings **Document List** List of any warnings that occurred during document type synchronization

updatedTriggers **Document List** Conditional. List of the webMethods messaging triggers updated without warnings by the service. When warnings do not occur when updating the trigger, it indicates that Integration Server migrated the entire contents of the **Filter** field to the **Provider Filter (UM)** field for all the conditions in the trigger.

The service returns the *updatedTriggers* parameter only if the service updated at least one trigger without warnings.

Key	Description
<i>package</i>	String Name of the package containing the updated webMethods messaging trigger.
<i>name</i>	String Fully qualified name of the updated webMethods messaging trigger.
<i>reason</i>	String Identifies any filters that were converted. For a trigger that was updated without warnings, <i>reason</i> displays the contents of the Filter field prior to migration of the trigger filter, the contents of the Provider Filter (UM) field after migration of the trigger filter, and an indication that the filter was converted successfully.

updatedTriggers WithWarning **Document List** Conditional. List of the webMethods messaging triggers updated but with warnings. Warnings indicate that the service could not migrate the entire contents of the **Filter** field to the **Provider Filter (UM)** field for all the conditions in the trigger. Integration Server might have migrated some expressions in the trigger conditions, but not the entire filter.

When a trigger is updated with warnings, the service keeps the original filter in the **Filter** field and places the filter expressions that were migrated in the **Provider Filter (UM)** field

The service returns the *updatedTriggersWithWarning* parameter only if the service updated at least one trigger for which a warning occurred.

Key	Description
<i>package</i>	String Name of the package containing the updated webMethods messaging trigger.
<i>name</i>	String Fully qualified name of the updated webMethods messaging trigger.
<i>reason</i>	String Identifies any filters that were converted. For a trigger that was updated with warnings, <i>reason</i> displays the expressions in the Filter field that were migrated, the

converted expression in the **Provider Filter (UM)**, and an indication that the filter was converted successfully.

warning **String** Warning message indicating why the complete original filter in the **Filter** field could not be migrated to the **Provider Filter (UM)** field.

skippedTriggers **Document List** Conditional. List of the webMethods messaging triggers that the service did not update because no changes were needed.

The service returns the *skippedTriggers* parameter only if the service skipped updating at least one trigger.

Key	Description
<i>package</i>	String Name of the package containing the skipped webMethods messaging trigger.
<i>name</i>	String Fully qualified name of the skipped webMethods messaging trigger.
<i>reason</i>	String Message indicating why the service did not make any updates for the webMethods messaging trigger. For example, if the trigger conditions did not contain any filters, the reason will be "Trigger did not contain any filters."

failedTriggers **Document List** Conditional. List of the webMethods messaging triggers that the service could not update because of an error.

The service returns the *failedTriggers* parameter only if at least one trigger failed migration.

Key	Description
<i>package</i>	String Name of the package containing the webMethods messaging trigger that the service could not update because of an error.
<i>name</i>	String Name of the webMethods messaging trigger that the service could not update because of an error.
<i>errors</i>	String Text of the error message that prevented the service from updating the webMethods messaging trigger

Usage Notes

To execute the `pub.utils.messaging.migrateDocTypesTriggersToUM`, Integration Server must be connected to a Broker. Integration Server must have a Broker connection alias that configures a connection to the Broker that contains the provider definitions for the publishable document types and the trigger subscriptions that you want to updated. The Broker connection alias must be enabled at the time the `pub.utils.messaging.migrateDocTypesTriggersToUM` executes.

Make sure the publishable document types that use a Broker connection alias are synchronized with the associated Broker document types prior to executing the `pub.utils.messaging.migrateDocTypesTriggersToUM` service. You can synchronize publishable document types using Designer or by executing the `pub.publish:syncToProvider` service.

When using Universal Messaging as the messaging provider, `webMethods` messaging trigger require more server threads and system threads than needed when using Broker as the messaging provider. Before migrating publishable document types and `webMethods` messaging triggers to work with Universal Messaging, Software AG recommends increasing the size of your server thread pool by at least two additional threads per trigger that will be migrated. For example, if you intend to migrate 100 triggers, increase the server thread pool by 200 threads.

As part of updating publishable document types and `webMethods` messaging triggers to work with Universal Messaging, first run the `pub.utils.messaging.migrateDocTypesTriggersToUM` service in report only mode, that is with `reportOnly` set to true. Use the service output to find potential problems in the migration, such as identifying publishable document types and triggers that will not be migrated successfully. When you are confident that all the publishable document types and `webMethods` messaging triggers that you want to migrate will do so successfully, run the `pub.utils.messaging.migrateDocTypesTriggersToUM` service is with `reportOnly` set to false.

Prior to executing the `pub.utils.messaging:migrateDocTypesTriggersToUM` service, if you have not taken other measures to back up the packages containing the publishable document types and triggers to be migrated, Software AG recommends that you set `backupPackages` to true when `reportOnly` is set to false. After the service executes successfully, restoring from a backup file is the only way to revert a change made by the service.

Publishable document types that use a Universal Messaging connection alias cannot be published locally. Do not migrate a publishable document type that is used in local publishing.

When determining which publishable document types to migrate, make sure that you migrate all of the document types subscribed to by a group of `webMethods` messaging triggers at one time. This ensures that the `webMethods` messaging triggers will subscribe to document types that use the same messaging connection alias. Integration Server considers a trigger to be invalid if it subscribes to publishable document types that use different messaging connection aliases. The `pub.utils.messaging.migrateDocTypesTriggersToUM` service will save a `webMethods` messaging trigger that uses mixed connection aliases but will disable the trigger. Additionally, the service will not attempt to convert any of the filters in conditions of the disabled trigger. To resolve this issue, you can modify the publishable document types used by the trigger so that the publishable document types all use the same messaging connection alias. You can then re-execute the `pub.utils.messaging.migrateDocTypesTriggersToUM` service to migrate the encoding type of the publishable document types as well as the trigger filters. Alternatively, you can restore the publishable document types that the trigger subscribes to by replacing the migrated packages with the archive packages created by the service when `backupPackages` is set to true. For example, suppose that trigger `triggerAB` subscribes to `documentA` and `documentB` both of which use a Broker connection alias. In `documentTypeNames`, you specify only `documentA`. When the service executes it migrates `documentA`. However, the service does not migrate `triggerAB` because the trigger subscribes to publishable document types that use different messaging connection aliases. This configuration is invalid. The service saves `triggerAB` in a disabled state.

If you do not specify a `newConnectionAlias`, the publishable document type already uses a Universal Messaging connection alias, and the publishable document type has an encoding type of `IData`,

the `pub.utils.messaging.migrateDocTypesTriggersToUM` service changes the encoding type of the publishable document type to protocol buffers. The service then updates the filters for any `webMethods` messaging triggers that subscribe to the document types so that the filters are compatible with protocol buffers.

If publishable document type use the default messaging connection alias and the default messaging connection alias is the Broker connection alias, you can migrate your document types and triggers to work with Universal Messaging and use the protocol buffer encoding type by first switching the default connection alias to a Universal Messaging connection alias and then running the `pub.utils.messaging:migrateDocTypesTriggersToUM` service with `reportOnly` set to false. Use Integration Server Administrator to change the default messaging connection alias. Note that a publishable document type uses the default messaging connection alias if the **Connection alias name** property for the document type is set to `DEFAULT`.

The `pub.utils.messaging:migrateDocTypesTriggersToUM` service automatically attempts to migrate the `webMethods` messaging triggers that subscribe to the publishable document types updated by the service. Migrating a trigger consists of migrating a filter. To migrate a filter, the service does the following:

1. The `pub.utils.messaging:migrateDocTypesTriggersToUM` service examines the expressions in the **Filter** field in a trigger condition and determines which expressions can become a provider filter on Universal Messaging. Some filter expressions that are valid as local filters on Integration Server or valid as filters on Broker contain syntax that is not supported by protocol buffers or Universal Messaging
2. The `pub.utils.messaging:migrateDocTypesTriggersToUM` service migrates expressions that are valid filters for protocol buffers to the **Provider Filter (UM)** field.
3. The service then does one of the following:
 - If the `pub.utils.messaging:migrateDocTypesTriggersToUM` service can migrate all the expressions in the **Filter** field to the **Provider Filter (UM)** field, the service deletes the contents of the **Filter** field. The service lists the trigger in the `updatedTriggers/name` output parameter. The service lists the successfully migrated filter expressions in `updatedTriggers/reason` output parameter.
 - If the `pub.utils.messaging:migrateDocTypesTriggersToUM` service can migrate only some of the expressions in the **Filter** field, the service migrates the filter expressions that it can in the **Provider Filter (UM)** field. The service leaves the original filter in the **Filter** field. The service lists the trigger in the `updatedTriggersWithWarning/name` output parameter. The service lists the successfully migrated filter expressions in `updatedTriggersWithWarning/reason` output parameter and lists the filter expressions that it could not migrate in the `updatedTriggersWithWarning/warning` output parameter.

For a `webMethods` messaging trigger that receives messages from Universal Messaging, the contents of the **Filter** field are used as a local filter. Integration Server applies the local filter after it receives the message from Universal Messaging

- If the `pub.utils.messaging:migrateDocTypesTriggersToUM` service cannot migrate any of the expressions in the **Filter** field, the service leaves the original filter in the **Filter** field. The service lists the trigger in the `updatedTriggersWithWarning/name` output parameter. The

service lists the filter expressions that it could not migrate in the *updatedTriggersWithWarning/warning* output parameter.

The `pub.utils.messaging.migrateDocTypesTriggersToUM` updates publishable document types contained in packages that begin with “Wm” when the document type is specified in *documentTypeNames* or the package is specified in *packageNames* only.

The `pub.utils.messaging:migrateDocTypesTriggersToUM` service synchronizes updated publishable document types with the provider definition on the messaging provider. Be sure to review the contents of *providerSyncResults/errors* and *providerSyncResults/warnings* for errors and warnings that Integration Server generated during synchronization

If Integration Server did not successfully synchronize an updated publishable document type use the returned errors in *providerSyncResults/errors* to determine why Integration Server could not synchronize the publishable document type. Then, fix the cause of the error and synchronize the publishable document type with the messaging provider. You can synchronize documents using Designer or by executing the `pub.publish:syncToProvider` service.

The `pub.utils.messaging:migrateDocTypesTriggersToUM` service will not modify any publishable document types or webMethods messaging triggers that are locked for edit by another user or checked out at the time the service executes.

To use the `pub.utils.messaging:migrateDocTypesTriggersToUM` service to update a publishable document type and webMethods messaging trigger, the user or client invoking the service must have Write access to the publishable document type and webMethods messaging triggers.

Use the *webMethods Error Message Reference* to find out more information about the error and warning messages returned by `pub.utils.messaging:migrateDocTypesTriggersToUM` service.

To generate additional logging information in the Server log when the `pub.utils.messaging:migrateDocTypesTriggersToUM` service executes, set the logging level for the server log facilities **0153 Dispatcher (Universal Messaging)** and **0154 Protocol Buffer Encoding (Universal Messaging)** to Debug or Trace. Increased logging can help you to locate problems that occur during service execution.

webMethods Broker is deprecated.

pub.utils.messaging:syncDocTypesToUM

WmPublic. Synchronizes one or more publishable document types with the associated provider definition (channel) on Universal Messaging. For each publishable document type with an encoding type of protocol buffers, the service:

- Creates an updated protocol buffer definition.
- Compiles the updated definition into an updated protocol buffer descriptor.
- Sends the updated protocol buffer descriptor to Universal Messaging.

This is different from `pub.publish:syncToProvider` which synchronizes the existing protocol buffer descriptor with Universal Messaging.

Input Parameters

- reportOnly* **java.lang.Boolean** Optional. Indicates whether the service updates and synchronizes the protocol buffer descriptors with Universal Messaging and returns a summary of the changes or if the service returns only a summary without making any changes. Set to:
- `true` to return a summary of the publishable document types for which the service would successfully and unsuccessfully update the protocol buffer descriptor, including the errors and warnings that would be encountered. The service does not update any protocol buffer descriptors. This is the default.
 - `false` to update the protocol buffer descriptor for the selected document types and synchronize the protocol buffer descriptor with the associated channel on Universal Messaging. The service returns a summary of the changes.
- backupPackages* **java.lang.Boolean** Optional. Indicates whether the service creates a package archive for each package affected by this service prior to creating a new protocol buffer definition for the publishable document types. Set to:
- `true` to create an archive for each package that contains a publishable document type that will be updated by this service. The archive will be named `packageName.zip_timeStamp` and placed in the following directory: *Integration Server_directory* \instances*instance_name*\replicate\archive. This is the default.
 - `false` to skip creating an archive of each affected package before making updates.
- Important:**Software AG recommends that you set *backupPackages* to `true` when *reportOnly* is set to `false` if you have not taken other measures to back up the packages containing the publishable document types to be synchronized using the `pub.utils.messaging:syncDocTypesToUM` service. After the service executes successfully, restoring from a backup file is the only way to revert a change made by the service.
- packageNames* **String List** Optional. Name of the packages containing the publishable document types that you want to synchronize. The *packageNames* and *documentTypesNames* input parameters are mutually exclusive. If you specify a value for both parameters, the service fails with an exception. If you do not specify a value for either, the service updates publishable document types that use the protocol buffer encoding type in all packages that do not start with the letters "wm" in any case combination.
- documentTypeNames* **String List** Optional. Fully qualified names of the publishable document types that you want to synchronize.

Output Parameters

affectedPackages **Document** Conditional. An IData containing key=value pairs that identify the packages impacted by the synchronization and the name of the archive created for the package. The service returns an archive name only if *reportOnly* is set to false and *backupPackages* is set to true. The archive will be named *packageName.zip_timeStamp* and will be located in the following directory: *Integration Server_directory \instances \ \replicate \archive*. The service returns *affectedPackages* only if the service finds at least one publishable document type to update and synchronize.

failedPackages **Document List** Conditional. List of the packages that could not be archived. If Integration Server cannot create a package archive for any of the affected packages, the service ends with an error and nothing is migrated.

The service attempts to archive a package only when *backupPackages* is set to true .

The service returns the *failedPackages* parameter only if one of the following occurs:

- The *backupPackages* input parameter is set to true and an error prevented the service from archiving at least one package.
- A package listed in the *packageNames* input parameter did not contain any publishable document types to update.

Key	Description
<i>package</i>	String Name of the package that the service could not archive because of an error.
<i>errors</i>	String Text of the error message that caused package archiving to fail.

updatedDocumentTypes **Document List** Conditional. List of the publishable document types updated by the service. The service returns the *updatedDocumentTypes* parameter only if the service updated one or more publishable document types.

Key	Description
<i>package</i>	String Name of the package containing the updated publishable document type.
<i>name</i>	String Fully qualified name of the updated publishable document type.

skippedDocumentTypes **Document List** Conditional. List of the publishable document types that were not updated because there were no changes to make. Some reasons the service might skip a publishable document type include, but are not limited to:

- The publishable document type uses a Broker connection alias.
- The publishable document type does not use protocol buffers as the encoding type.
- Values were not specified for either the *packageNames* or the *documentTypeNames* input and Integration Server found publishable document types in packages whose names started with the letters "wm" in any case combination

The service returns the *skippedDocumentTypes* parameter only if the service skipped updating one or more publishable document types.

Key	Description
<i>package</i>	String Name of the package containing the skipped publishable document type.
<i>name</i>	String Fully qualified name of the skipped publishable document type.
<i>reason</i>	String Message indicating why the service did not update the publishable document type.

failedDocumentTypes **Document List** Conditional. List of the publishable document types that the service could not update because of an error. The service returns the *failedDocumentTypes* parameter only if there were one or more publishable document types that the service could not update because of an error.

Key	Description
<i>package</i>	String Name of the package containing the publishable document type that the service could not update because of an error.
<i>name</i>	String Name of the publishable document type that the service could not update because of an error.
<i>errors</i>	String Text of the error message that prevented the service from updating the publishable document type.

providerSyncResults **Document List** Conditional. Results of synchronizing the updated publishable document types with the messaging provider. The service only produces this output parameter when *reportOnly* is set to false and the service updated at least one publishable document type.

<u>Key</u>	<u>Description</u>
<i>successfulPDTs</i>	String List Fully qualified names of the publishable document types that the service synchronized successfully with the messaging provider.
<i>unsuccessfulPDTs</i>	String List Fully qualified names of the publishable document types that the service did not synchronize successfully with the messaging provider.
<i>errors</i>	Document List List of any errors that occurred during document type synchronization.
<i>warnings</i>	Document List List of any warnings that occurred during document type synchronization.

Usage Notes

The `pub.utils.messaging:syncDocTypesToUM` service can be useful for updating the protocol buffer descriptors for multiple publishable document types at once. For example, if an Integration Server fix alters the way in which a protocol buffer descriptor is generated, to see the full effect of the fix, you would need to edit all of the publishable document types that use the protocol buffer encoding type, save them to cause an updated protocol buffer definition to be created and the updated protocol descriptor to be compiled, and then sync the publishable document types with the provider. While this can be done on an individual publishable document type basis with Designer, using the `pub.utils.messaging:syncDocTypesToUM` service enables the updating and synchronizing of many publishable document types at one time.

The `pub.utils.messaging.syncDocTypesToUM` updates publishable document types contained in packages that begin with "Wm" when the document type is specified in *documentTypeNames* or the package is specified in *packageNames* only.

The `pub.utils.messaging:syncDocTypesToUM` service synchronizes the updated protocol buffer descriptor for a publishable document types with the corresponding Universal Messaging channel. Be sure to review the *contents of providerSyncResults/errors* and *providerSyncResults/warnings* for errors and warnings that Integration Server generated during synchronization.

If Integration Server did not successfully synchronize an updated publishable document type use the returned errors in *providerSyncResults/errors* to determine why Integration Server could not synchronize the publishable document type. Then, fix the cause of the error and synchronize the publishable document type with the messaging provider. You can synchronize documents using Designer or by executing the `pub.publish:syncDocTypesToUM` service.

The `pub.utils.messaging:syncDocTypesToUM` service will not modify any publishable document types that are locked for edit by another user or checked out at the time the service executes.

To use the `pub.utils.messaging:syncDocTypesToUM` service to update a publishable document type, the user or client invoking the service must have Write access to the publishable document type.

To generate additional logging information in the Server log when the `pub.utils.messaging:syncDocTypesToUM` service executes, set the logging level for the server log facility 0154 Protocol Buffer Encoding (Universal Messaging) to Debug or Trace.

pub.utils:transcode

WmPublic. Transcodes data from one encoding to another.

Input Parameters

inputData **Document** Data to be transcoded. Depending on the data type of the source data, use *string* or *bytes* variable to specify the data.

You must provide input data to *string* or *bytes*. If you do not specify input data in either *string* or *bytes*, the `pub.utils:transcode` service ends with an exception. If you specify input data for both *string* and *bytes*, the `pub.utils:transcode` service uses the contents of *string*, ignoring *bytes*.

Key	Description
<i>string</i>	String Optional. String containing the data to convert to another encoding
<i>bytes</i>	byte[] Optional. Sequence of bytes to convert to another encoding.

sourceEncoding **String** Encoding used for the source data. This must be an encoding supported by the JRE used with Integration Server.

targetEncoding **String** Encoding to which the source data needs to be transcoded. This must be an encoding supported by the JRE used with Integration Server.

onTranscodingError **String** Optional. Specifies the action to take when encountering unmappable characters. When transcoding data from one character set to another, it is possible that a character in the source encoding cannot be mapped to a character in the target encoding. Specify one of the following:

- `replace` to replace an unmappable character with a replacement character. If you select `replace`, specify a replacement character in *replaceWith*.
- `ignore` to drop any unmappable characters.
- `report` to throw a `ServiceException` if the service encounters any unmappable characters. This is the default.

replaceWith **Document** Optional. Character used to replace an unmappable character found during transcoding. Specify a replacement character for characters that cannot be mapped in *string* or *bytes*.

The `pub.utils:transcode` service uses a replacement character only when *onTranscodingError* is set to `replace`.

If *onTranscodingError* is set to *replace* and a replacement character is not specified, the `pub.utils:transcode` service uses the default replacement character of space (“\u0020”).

If you specify a replacement character for both *string* and *bytes*, the `pub.utils:transcode` service uses the contents of *string*, ignoring *bytes*.

Key	Description
<i>string</i>	String Optional. The replacement character to use for unmappable characters in the input data.
<i>bytes</i>	byte[] Optional. The replacement character to use for unmappable characters in the input data.

outputAs **String** Optional. The data type to use for the output data. Specify one of the following:

- `string`
- `bytes`

If you do not specify a value for *outputAs*, the `pub.utils:transcode` service returns the output in the same data type used for *inputData*. For example, if you supplied the source data to *inputData/string*, the service returns the target data to the *outputData/string* output parameter.

normalizationForm **String** Optional. The Unicode normalization form to use during transcoding. Specify one of the following:

- `none` indicates that normalization is not done.
- `NFC` (Normalization Form C). Canonical Decomposition, followed by Canonical Composition. This is the default.
- `NFD` (Normalization Form D). Canonical Decomposition.
- `NFKC` (Normalization Form KC). Compatibility Decomposition, followed by Canonical Composition
- `NFKD` (Normalization Form KD) Compatibility Decomposition.

Output Parameters

outputData **Document** Transcoded data. The `pub.utils:transcode` service returns the transcoded data in *outputData/string* or *outputData/bytes*, depending on the value of the *outputAs* input parameter. If a value was not specified for *outputAs*, the service returns the transcoded data in the same data type as the supplied input data.

Key	Description
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<i>string</i>	String Conditional. Transcoded contents of <i>inputData</i> as a String. The <code>pub.utils:transcode</code> service returns this output parameter if the input data was supplied in <i>inputData/string</i> or <i>outputAs</i> was set to <code>string</code> .
<i>bytes</i>	bytes[] Conditional. Transcoded contents of <i>inputData</i> as a <code>byte[]</code> . The <code>pub.utils:transcode</code> service returns this output parameter if the input data was supplied in <i>inputData/bytes</i> or <i>outputAs</i> was set to <code>bytes</code> .

pub.utils.ws:setCompatibilityModeFalse

WmPublic. Changes the value of the **Pre-8.2 compatibility mode** property for a web service descriptor to false.

Input Parameters

<i>reportOnly</i>	<p>java.lang.Boolean Optional. Indicates whether the service actually changes the Pre-8.2 compatibility mode property for the web service descriptors and returns a summary of the changes or if the service returns only a summary without making any changes. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to return a summary of the web service descriptors that the service would successfully and unsuccessfully change, including the errors and warnings that would be encountered. The service does not modify any web service descriptors. ■ <code>false</code> to change the Pre-8.2 compatibility mode property to false for the specified web service descriptors, save the web service descriptor, and return a summary of the changes. This is the default.
<i>convertAllPackages</i>	<p>java.lang.Boolean Optional. Indicates whether the service changes the Pre-8.2 compatibility mode property for web service descriptors in all of the packages on Integration Server or only web service descriptors in specific packages. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to change the web service descriptors in all of the packages on Integration Server.

Note:

When *convertAllPackages* is set to `true`, the `pub.utils.ws:setCompatibilityModeFalse` service changes the **Pre-8.2 compatibility mode** property for those web service descriptors in enabled packages only. Additionally, the service skips any packages whose names begin with "Wm".

- `false` to change the web service descriptors in the packages specified in `packageNames` only. This is the default.

Note:

If you set `convertAllPackages` to `false`, you must specify packages in `packageNames`.

`packageNames`

String List Optional. Names of the packages containing the web service descriptors for which you want to change the **Pre-8.2 compatibility mode** property to `false`. The packages you specify must be enabled. Note that package names are not case-sensitive.

Note:

If you do not specify any packages in `packageNames`, you must set `convertAllPackages` to `true`.

Output Parameters

`updatedWarningCount`

String Conditional. Number of web service descriptors for which changing the value of the **Pre-8.2 compatibility mode** property to `false` resulted in a warning. If `reportOnly` is set to `true`, `updatedWarningCount` indicates the number of web service descriptors for which a warning would be generated. The service returns `updatedWarningCount` only if Integration Server encountered a warning when successfully changing the value of the **Pre-8.2 compatibility mode** property from `true` to `false` for at least one web service descriptor.

If the service did not (or would not if `reportOnly` is set to `true`) update any web service descriptors, `updatedWarningCount` is not returned.

Note:

Some warnings require further action to be taken, such as regenerating web service connectors. Be sure to review all warnings.

`updated`

Document List Conditional. The web service descriptors for which the service successfully changed the value of the **Pre-8.2 compatibility mode** property from `true` to `false`, including any warnings that occurred. If `reportOnly` is set to `true`, `updated` indicates the number of web service descriptors that the service would successfully change and any warnings that the service would encounter.

The service returns the `updated` parameter only if the service successfully changed the value of the **Pre-8.2 compatibility mode** property from `true` to `false` for at least one web service descriptor.

Key	Description
<code>package</code>	String Package that contains the updated web service descriptor.

<i>name</i>	String Fully qualified name of the updated web service descriptor.
<i>warnings</i>	String List List of any warning that occurred when the service changed the Pre-8.2 compatibility mode property from true to false.
<i>failed</i>	Document List Conditional. The web service descriptors for which the service could not change the value of the Pre-8.2 compatibility mode from true to false because an error occurred.

The service returns the *failed* parameter only if an error prevented the service from changing the value of the **Pre-8.2 compatibility mode** property from true to false for at least one web service descriptor.

Key	Description
<i>package</i>	String Package containing the web service descriptor that could not be changed.
<i>name</i>	String Fully qualified name of the web service descriptor that could not be changed because of an error.
<i>warnings</i>	String List List of the warnings that occurred when the service attempted to change the Pre-8.2 compatibility mode property from true to false.
<i>errors</i>	String List List of the errors that prevented the service from changing the value of the Pre-8.2 compatibility mode property from true to false.

<i>skipped</i>	Document List Conditional. The web service descriptors for which the Pre-8.2 compatibility mode property is already set to false.
	The service returns the <i>skipped</i> parameter only if the service encountered web service descriptors for which Pre-8.2 compatibility mode property was already set to false.

Key	Description
<i>package</i>	String Package containing the web service descriptor.
<i>name</i>	String Fully qualified name of the web service descriptors for which Pre-8.2 compatibility mode property was already set to false.

Usage Notes

The **Pre-8.2 compatibility mode** property and the ability to run in pre-8.2 compatibility mode are deprecated as of Integration Server 10.4 due to the deprecation of the earlier web services implementation introduced in Integration Server version 7.1.

Even though the *convertAllPackages* and *packageNames* input parameters are optional, you must either set *convertAllPackages* to `true` or specify packages in *packageNames*.

Use the `pub.utils.ws:setCompatibilityModeFalse` service to change the **Pre-8.2 compatibility mode** property value for multiple web service descriptors at one time.

The **Pre-8.2 compatibility mode** property indicates the version of the web service stack with which the web service descriptor is compatible:

- When the **Pre-8.2 compatibility mode** property is set to `true`, the web service descriptor runs on the earlier version of the web services stack, specifically the web services stack available in Integration Server versions 7.x, 8.0, and 8.0 SP1. web service descriptors running in pre-8.2 compatibility mode have the same design-time features and run-time behavior as web service descriptors run in versions of Integration Server prior to version 8.2.
- When the **Pre-8.2 compatibility mode** property is set to `false`, the web service descriptor runs on the current version of the web services stack. web service descriptors that do not run in pre-8.2 compatibility mode have the design-time features and run-time behavior available in the current version of the web services stack.

For more details about which features are impacted by the compatibility mode of the web service descriptor, see the *Web Services Developer's Guide*.

Before changing the web service descriptor, the service verifies that the web service descriptor can be deployed to the web services stack that corresponds to the chosen compatibility mode. Warnings indicate that the web service descriptor can be deployed to the web services stack successfully but some run-time behavior might change. If warnings occur for a particular web service descriptor, the service changes the compatibility mode and lists warnings in the *updated* output parameter. Errors identify the functionality that is incompatible with the web services stack. If errors occur for a particular web service descriptor, the service does not change the compatibility mode for that web service descriptor. the service identifies the errors in the *failed* output parameter.

Some warnings require further action to be taken, such as regenerating web service connectors. Be sure to review all warnings.

The `pub.utils.ws:setCompatibilityModeFalse` service will not modify any web service descriptors that are locked for edit or checked out at the time the service executes.

To use the `pub.utils.ws:setCompatibilityModeFalse` service to change the **Pre-8.2 compatibility mode** property for a web service descriptor, you or whichever client is invoking the service must have Write access to the web service descriptors.

If the Docker image for a Microservices Runtime excludes the web services functionality, then the Docker image for the Microservices Runtime running in the Docker container cannot execute the `pub.utils.ws:setCompatibilityModeFalse` service. Attempts to execute the `pub.utils.ws:setCompatibilityModeFalse` service end with a `ServiceException`.

47 WebSocket Folder

■ Summary of Elements in this Folder	1040
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You can use the services in the WebSocket folder to allow clients to send messages, close, and disconnect the WebSocket session.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.websocket:close	WmPublic. Closes the WebSocket connection attempt, if any.
pub.websocket:disconnect	WmPublic. Closes the WebSocket connection abruptly, if any.
pub.websocket:getCookies	WmPublic: Retrieves the cookies that are part of the HTTP request to establish a WebSocket connection.
pub.websocket:getExtensions	WmPublic: Retrieves the extensions used in the request URL to establish a WebSocket connection.
pub.websocket:getHeaders	WmPublic: Retrieves the headers used in the request URL to establish a WebSocket connection.
pub.websocket:getPathParameter	WmPublic: Retrieves the path parameter used in the request URL to establish a WebSocket connection.
pub.websocket:getPathParameters	WmPublic: Retrieves the path parameters used in the request URL to establish a WebSocket connection.
pub.websocket:getRequest	WmPublic: Retrieves the HTTP request information used to establish the WebSocket connection.
pub.websocket:getQueryParameter	WmPublic: Retrieves the value of a specific query parameter used in the request URL to establish the WebSocket connection.
pub.websocket:getQueryParameters	WmPublic: Retrieves the query parameters used in the request URL to establish a WebSocket connection.
pub.websocket:getSubProtocols	WmPublic: Retrieves the subprotocols used in the request URL to establish a WebSocket connection
pub.websocket:onBinary	WmPublic. Specification for a callback service related to WebSocket server or client endpoint that handles binary payload.
pub.websocket:onClose	WmPublic. Specification for a callback service related to WebSocket server or client endpoint that gets invoked when a WebSocket session is closed or disconnected.
pub.websocket:onConnect	WmPublic. Specification for a callback service related to WebSocket server or client endpoint that gets invoked when a WebSocket session is successfully established.

Element	Package and Description
pub.websocket:onError	WmPublic. Specification for a callback service related to WebSocket server or client endpoint that gets invoked when an error is encountered resulting in WebSocket session termination.
pub.websocket:onText	WmPublic. Specification for a callback service related to WebSocket server or client endpoint that handles text payload.
pub.websocket:ping	WmPublic: Sends a ping message containing the given application data to the remote endpoint after establishing the connection.
pub.websocket:pong	WmPublic: Sends back an unsolicited pong message with the exact application data as the ping for the WebSocket session.
pub.websocket:send	WmPublic. Sends a message on a connected WebSocket connection.

pub.websocket:close

WmPublic. Closes the WebSocket connection.

Input Parameters

sessionId **String** Session ID to identify the WebSocket session.

Output Parameters

closed **Boolean** Flags whether the WebSocket session is closed. A value of :

- `true` indicates that the WebSocket session was closed successfully.
- `false` indicates that the WebSocket session was not closed successfully.

pub.websocket:disconnect

WmPublic. Closes the WebSocket connection abruptly.

Input Parameters

sessionId **String** Session ID to identify the WebSocket session.

Output Parameters

- disconnected* **Boolean** Flags whether the WebSocket connection is disconnected. A value of :
- `true` indicates that the WebSocket session was disconnected successfully.
 - `false` indicates that the WebSocket session was not disconnected successfully.

pub.websocket:getCookies

WmPublic: Retrieves the cookies that are part of the HTTP request to establish a WebSocket connection.

Input Parameters

- sessionId* **String** Session ID for the WebSocket session for which you want to retrieve the cookies information.

Output Parameters

- cookies* **Document List- Conditional.** List of the cookies that are part of the HTTP request to establish a WebSocket connection. This parameter returns value only if cookies were part of the request.

<u>Key</u>	<u>Description</u>
<i>name</i>	String The name of the cookie.
<i>comment</i>	String Description about the purpose of the cookie. This parameter returns <code>null</code> if the cookie has no comment.
<i>commentURL</i>	String The comment URL which describes the purpose of the cookie. This parameter returns <code>null</code> if the cookie has no comment.
<i>discard</i>	String The value of the discard attribute for the cookie.
<i>domain</i>	String The domain name set for the given cookies.
<i>maxAge</i>	String The maximum age of the cookie specified in seconds.

<i>path</i>	String The path on the server to which the browser returns the cookie.
<i>portlist</i>	String The value of the port list attribute of the cookie.
<i>secure</i>	String Indicates whether sending the cookie is restricted to a secure protocol or any protocol. <ul style="list-style-type: none"> ■ True Sending the cookie is restricted to a secure protocol. ■ False The cookie can be sent using any protocol.
<i>value</i>	String The value of the cookie.
<i>version</i>	String The version of the protocol with which the cookie complies.

pub.websocket:getExtensions

WmPublic: Retrieves the extensions used in the request URL to establish a WebSocket connection.

Input Parameters

<i>sessionId</i>	String Session ID for the WebSocket session for which you want to retrieve the extension information.
------------------	--

Output Parameters

<i>extensions</i>	Document List Conditional. The list of extensions for a WebSocket connection.														
	<table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>name</i></td> <td>String The name of the header.</td> </tr> <tr> <td><i>parameterizedName</i></td> <td>String The parameterized name of the extension.</td> </tr> <tr> <td><i>parameterKeys</i></td> <td>String List The parameterized keys of the extension.</td> </tr> <tr> <td><i>parameters</i></td> <td> Document List The list of parameters for the given extension. <table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>name</i></td> <td>String The name of the parameter.</td> </tr> </tbody> </table> </td> </tr> </tbody> </table>	Key	Description	<i>name</i>	String The name of the header.	<i>parameterizedName</i>	String The parameterized name of the extension.	<i>parameterKeys</i>	String List The parameterized keys of the extension.	<i>parameters</i>	Document List The list of parameters for the given extension. <table border="1"> <thead> <tr> <th>Key</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td><i>name</i></td> <td>String The name of the parameter.</td> </tr> </tbody> </table>	Key	Description	<i>name</i>	String The name of the parameter.
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Key	Description														
<i>name</i>	String The name of the parameter.														

value **String** The value of the parameter.

pub.websocket:getHeaders

WmPublic: Retrieves the headers used in the request URL to establish a WebSocket connection.

Input Parameters

sessionId **String** Session ID for the WebSocket session for which you want to retrieve the header information.

Output Parameters

headers **String** Conditional. The list of the headers included in with the request to establish a WebSocket connection. This parameter returns a value only if headers were part of the request.

<u>Key</u>	<u>Description</u>
<i>name</i>	String The name of the header.
<i>value</i>	String The value of the header.

pub.websocket:getPathParameters

WmPublic: Retrieves the path parameters used in the request URL to establish a WebSocket connection.

Input Parameters

sessionId **String** Session ID for the WebSocket session for which you want to retrieve the path parameters information.

Output Parameters

queryParameters **Document List** Conditional. The path parameters included in with the request for establishing a WebSocket connection.

<u>Key</u>	<u>Description</u>
<i>name</i>	String The name of the path parameter.
<i>value</i>	String List The value of the path parameter.

pub.websocket:getPathParameter

WmPublic: Retrieves the path parameter used in the request URL to establish a WebSocket connection.

Input Parameters

<i>sessionId</i>	String Session ID for the WebSocket session for which you want to retrieve the path parameter information.
<i>pathParameterName</i>	String The path parameter name of the query parameter for which you want to obtain a value.

Output Parameters

<i>pathParameterValue</i>	String Conditional. The value for the provided parameter name. This parameter is returned only if a path parameter of the specified value was part of the request.
---------------------------	---

pub.websocket:getRequest

WmPublic: Retrieves the HTTP request information used to establish the WebSocket connection.

Input Parameters

<i>sessionId</i>	String Session ID for the WebSocket session for which you want to retrieve HTTP request information.
------------------	---

Output Parameters

<i>requestURI</i>	String The Uniform Resource Identifier used by the client to identify the request.
<i>queryString</i>	String One or more name/value pairs included as part of the query strings in request uniform resource locator(URL) which assigns values to specified parameters. For example, ?name=ferret&color=purple.
<i>host</i>	String Name or IP address of the WebSocket server that received the upgrade request.
<i>httpVersion</i>	String The HTTP version used in the request.
<i>method</i>	String The HTTP method used for establishing WebSocket connection.
<i>origin</i>	String The value of the origin request header.

userPrincipal **String** The name of the authenticated user used in the request.

pub.websocket:getQueryParameters

WmPublic: Retrieves the query parameters used in the request URL to establish a WebSocket connection.

Input Parameters

sessionId **String** Session ID for the WebSocket session for which you want to obtain query parameters.

Output Parameters

queryParameters **Document List** Conditional. The list of query parameters used on the URL that established a WebSocket connection.

<u>Key</u>	<u>Description</u>
<i>name</i>	String The name of the query parameter.
<i>value</i>	String List The value of the query parameter.

pub.websocket:getQueryParameter

WmPublic: Session ID for the WebSocket session for which you want to retrieve the value of a specific query parameter information.

Input Parameters

sessionId **String** Session ID for the WebSocket session for which you want to obtain query parameters.

queryParameterName **String** The name of the query parameter for which you want to obtain a value.

Output Parameters

queryParameterValue **String** Conditional. The value for the provided parameter name. The parameter is only returned if there is a query parameter of that name in the URL.

pub.websocket:getSubProtocols

WmPublic: Retrieves the subprotocols used in the request URL to establish a WebSocket connection.

Input Parameters

sessionId **String** Session ID for the WebSocket session for which you want to retrieve the subprotocols of the connection.

Output Parameters

subProtocols **String List** The WebSocket protocols used as part of establishing a WebSocket connection.

pub.websocket:onBinary

WmPublic. Specification for a callback service related to WebSocket server or client endpoint that handles binary payload.

Input Parameters

sessionId **String** Session ID to identify the WebSocket session.

payload **byte[]** Byte array that contains the payload.

offset **Integer** The offset from the byte array till which the data is to be read.

length **Integer** The maximum number of byte array to read from the payload.

Output Parameters

None.

pub.websocket:onClose

WmPublic. Specification for a callback service related to WebSocket server or client endpoint that gets invoked when a WebSocket session is closed or disconnected.

Input Parameters

sessionId **String** Session ID to identify the WebSocket session.

<i>statusCode</i>	Integer Indicates the reason why the underlying WebSocket connection was closed. The pre-defined status codes when closing an established connection are defined in Section https://tools.ietf.org/html/rfc6455#section-7.4 .
<i>reason</i>	String Text explaining the reason for closure.

Output Parameters

None.

pub.websocket:onConnect

WmPublic. Specification for a callback service related to WebSocket server or client endpoint that gets invoked when a WebSocket session is successfully established.

Input Parameters

<i>sessionId</i>	String Session ID to identify the WebSocket session.
------------------	---

Output Parameters

None.

pub.websocket:onError

WmPublic. Specification for a callback service related to WebSocket server or client endpoint that gets invoked when an error is encountered resulting in WebSocket session termination.

Input Parameters

<i>sessionId</i>	String Session ID to identify the WebSocket session.
<i>cause</i>	String Text explaining the cause of the error.

Output Parameters

None.

pub.websocket:onText

WmPublic. Specification for a callback service related to WebSocket server or client endpoint that handles text payload.

Input Parameters

<i>sessionId</i>	String Session ID to identify the WebSocket session.
<i>message</i>	String The content of the message.

Output Parameters

None.

pub.websocket:ping

WmPublic: Sends a ping message containing the given application data to the remote endpoint after establishing the connection.

Input Parameters

<i>sessionId</i>	String Required. Session ID for the WebSocket session for which you want to send the ping message.
<i>applicationData</i>	String Optional. The application data to be sent as part of the ping message. If the parameter value is null an empty buffer will be sent.
<i>charset</i>	String Optional. The character encoding. If the parameter value is null, the default character set is used.

Output Parameters

<i>pinged</i>	String Indicates the success or failure of the ping message. This parameter returns a value of true if the ping message is received successfully. Else the parameter returns the value false.
---------------	--

pub.websocket:pong

WmPublic: Sends back an unsolicited pong message with the exact application data as the ping for the WebSocket session.

Input Parameters

<i>sessionId</i>	String Session ID for the WebSocket session for which you want to send the pong message.
<i>applicationData</i>	String Optional. The application data to be sent as part of the pong message. If the parameter value is null an empty buffer will be sent.
<i>charset</i>	String Optional. The character encoding. If the parameter value is null, the default character set is used.

Output Parameters

<i>ponged</i>	String Conditional. Indicates the success or failure of the pong message. This parameter returns a value of true if the pong message is received successfully. Else the parameter returns the value of false.
---------------	--

pub.websocket:send

WmPublic. Sends a message on a connected WebSocket session.

Input Parameters

<i>sessionId</i>	String Session ID to identify the WebSocket session.
<i>message</i>	Object Sends messages containing the payload to the destination. The message could be a byte array or a text message.

Output Parameters

<i>sent</i>	Boolean Flags indicating the result of the send operation. A value of : <ul style="list-style-type: none">■ true indicates that the WebSocket session was sent successfully.■ false indicates that the WebSocket session was not sent successfully.
-------------	---

48 XML Folder

■ Summary of Elements in this Folder	1052
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You use the elements in the xml folder to perform operations on XML documents.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.xml:documentToXMLString	WmPublic. Converts a document (IData object) to an XML string.
pub.xml:freeXMLNode	WmPublic. Frees the resources allocated to a given XML node.
pub.xml:getNextXMLNode	WmPublic. Gets the next XML node from a NodeIterator.
pub.xml:getXMLNodeIterator	WmPublic. Creates and returns a NodeIterator.
pub.xml:getXMLNodeType	WmPublic. Returns information about an XML node.
pub.xml:loadEnhancedXMLNode	WmPublic. Retrieves an XML document via HTTP or HTTPS, parses it using the enhanced XML parser, and produces an org.w3c.dom.Node object.
pub.xml:loadXMLNode	WmPublic. Retrieves an XML document via HTTP or HTTPS, parses it using the legacy XML parser, and produces an XML node.
pub.xml:queryXMLNode	WmPublic. Queries an XML node.
pub.xml:xmlNodeToDocument	WmPublic. Converts an XML node to a document (an IData object).
pub.xml:xmlStringToEnhancedXMLNode	WmPublic. Converts an XML document (represented as a String, byte[], or InputStream) to an org.w3c.dom.Node object using the enhanced XML parser.
pub.xml:xmlStringToXMLNode	WmPublic. Converts an XML document (represented as a String, byte[], or InputStream) to an XML node using the legacy XML parser.

pub.xml:documentToXMLString

WmPublic. Converts a document (IData object) to an XML string.

This service recurses through a given document, building an XML representation from the elements within it. Key names are turned into XML elements, and the key values are turned into the contents of those elements.

This service would convert this document (IData object)...

document	
@version	1.0
AcctInfo	
name	Midwest Extreme Sports
rep	Laura M. Sanchez
accNum	
@type	Platinum
*body	G97041A
phoneNum	
@cc	011
*body	216-741-7566
address[0]	
@country	USA
street1	10211 Brook Road
city	Cleveland
state	OH
postalCode	22130
address[1]	
@country	USA
street1	10211 Brook Road
city	Cleveland
state	OH
postalCode	22130
landmark	Ohio River-Bank Square
*doctype	DerivedAddress.documentLocation:docTypeRef_tns_DerivedAddress
serialNum	19970523A

To an XML document that looks like this...

```
<?xml version="1.0" ?>
<tns:AcctInfo>
  xmlns:tns="http://localhost/DerivedAddress/schema.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" >
  <name>Midwest Extreme Sports</name>
  <rep>Laura M. Sanchez</rep>
  <acctNum type=platinum>G97041A</acctNum>
  <phoneNum cc=011>216-741-7566</phoneNum>
  <address country=USA>
    <street1>10211 Brook Road</street1>
    <city>Cleveland</city>
    <state>OH</state>
    <postalCode>22130</postalCode>
  </address>
  <address country=USA xsi:type="tns:DerivedAddress">
    <street1>10211 Brook Road</street1>
    <city>Cleveland</city>
    <state>OH</state>
    <postalCode>22130</postalCode>
    <landMark>Besides Ohio River-Bank Square</landMark>
    <telNo>001222555</telNo>
  </address>
  <serialNum>19970523A</serialNum>
  <serialNum>20001106G</serialNum>
  <serialNum>20010404K</serialNum>
</tns:AcctInfo>
```

```
</tns:AcctInfo>
```

Note that:

- Key names that start with the attribute prefix (which, in this example, is the "@" character) are turned into attributes of the elements in which they occur. For example, the @type key in the acctNum element is converted to the type=platinum attribute of the <acctNum> element in the resulting XML String.
- Some modules, such as EDI and FlatFile, have fields that begin with the @ symbol that will be considered attributes regardless of whether the attrPrefix is @ or another character. For example, the FlatFile module always considers fields named @record-id and @delimiters to be attributes.
- When a document type contains a String variable that represents a required attribute (meaning that the variable name starts with the "@" symbol and the **Required** property is set to **True** in Designer) and the input document does not contain the required attribute, Integration Server adds an empty attribute during document encoding. For example, if the document type contains a required String variable named @myAttribute but @myAttribute is missing from the input document, Integration Server adds myAttribute="" to the XML document.

Note:

Because empty xmlns attributes are invalid, if the document type contains a required String variable named @xmlns and the input document does not specify a value for the @xmlns attribute, Integration Server *does not* add xmlns="" to the XML document.

- Also note that the *body key is used to represent the value of a simple element that contains both a text value and an attribute. See the acctNum and phoneNum keys for an example of this kind of element.
- The *doctype field is used to represent the IS document type to which the IData object conforms. This field is used to populate the relevant value for the xsi:type attribute in the XML string. The document type referred by the *doctype field should either be created by importing an XSD file (XML schema) or generated while consuming WSDL for a provider or consumer web service descriptor. You should also select the **Register document types with schema type** option in the New Document Type wizard when generating a document type from an XML schema.
- Fields that are not String or Document based (for example, Floats or Integers) are converted to XML values using the underlying object's toString method.

Input Parameters

attrPrefix

String Optional. Prefix that designates keys containing attributes. The default prefix is "@".

For example, if you set *attrPrefix* to ATT_ and *document* contained the following element:



`pub.xml:documentToXMLString` would convert the `ATT_currency` key to the attribute, `currency=dollars`, in the `<tx>` element as shown below:

```
<tx currency=dollars>
<acct>cash</acct>
<amt>120.00</amt>
</tx>
```

document

Document IData object that is to be converted to XML. Note that if you want to produce a valid XML document (one with a single root node), *document* must contain only one top-level IData object (that is, a single document). The name of that document will serve as the name of the XML document's root element.

For example, *document* shown in the example in this service's description contains one top-level document named `AcctInfo`, which would result in one root element named `<AcctInfo>` in the resulting XML String.

If you needed to produce an XML fragment (for example, a loose collection of elements that are not encompassed within a single root element) then *document* can contain multiple top-level elements. To produce this type of output, you must also set the *addHeader* and *enforceLegalXML* parameters to `false`.

nsDecls

Document Optional. Namespaces associated with any namespace prefixes that are used in the key names in *document*. Each entry in *nsDecls* represents a namespace prefix/URI pair, where a key name represents a prefix and the value of the key specifies the namespace URI.

For example, to define the URIs associated with two prefixes called `GSX` and `TxMon`, you would set *nsDecls* as follows:

```
nsDecls
├── GSX http://www.gsx.com
└── TxMon http://www.acutrak/txmonitor
```

For each prefix specified in *nsDecls*, `pub.xml:documentToXMLString` generates an `xmlns` attribute and inserts it into the top-most element of the resulting XML String. For example, if *nsDecls* had the two keys shown above, `pub.xml:documentToXMLString` would insert the following attributes into the root element of the XML String:

```
xmlns:gsx="http://www.gsx.com"
xmlns:TxMon="http://www.acutrak/txmonitor"
```

Note:

Alternatively, you can declare a namespace by including an `@xmlns` key in *document*. (If you were not using the `@` character to designate attributes, use the correct attribute prefix in your code.)

addHeader

String Optional. Flag specifying whether the header element:

```
<?xml version="1.0"?>
```

is to be included in the resulting XML String.

Set to:

- `true` to include the header. This is the default.
- `false` to omit the header. (You would omit the header to generate an XML fragment or to insert a custom header.)

encode

String Optional. Flag indicating whether to HTML-encode the data. Set this parameter to `true` if your XML data contains special characters, including the following: `<` `>` `&` `"` `'`

Set to:

- `true` to HTML-encode the data.

For example, the string expression `5 < 6` would be converted to `<expr>5 < 6</expr>`, which is valid.

If you do not want a leading `&` (ampersand) character encoded when it appears as part of a character or entity reference, set *preserveRefs* to `true`.

- `false` to not HTML-encode the data. This is the default.

For example, the string expression `5 < 6` would be converted to `<expr>5 < 6</expr>`, which is invalid.

The behavior of this parameter can be restricted by the *strictEncodeElements* parameter. If the *strictEncodeElements* parameter is set to `true` when the *encode* parameter is `true`, then only the `<` `>` `&` characters in the element content are HTML-encoded (the apostrophe and quote characters are not HTML-encoded).

The default value of the *encode* parameter is `false`.

strictEncodeElements

String Optional. Controls the behavior of the *encode* parameter. If this parameter is set to `true` when the *encode* parameter is `true`, then only the `<` `>` `&` characters in the element content are HTML-encoded (the apostrophe and quote characters are not HTML-encoded).

The default value of the *strictEncodeElements* parameter is `false`.

preseveRefs

String Optional. Flag indicating whether the leading `&` (ampersand) of a well-formed entity or character reference is left as `&` or further encoded as `&`; when the data is to be HTML-encoded (*encode* is set to `true`).

Set to:

- `true` to preserve the leading `&` (ampersand) in an entity or character reference when the service HTML-encodes the data.

- `false` to encode the leading `&` (ampersand) as `&` when the `&` appears in an entity or character reference. This is the default.

The `pub.xml:documentToXMLString` service ignores the value of `preserveRefs` when `encode` is set to `false`.

documentTypeName **String** Optional. Fully qualified name of the document type that describes the structure and format of the output document (for example, `examples.rtd:exampleRecord1`).

You can use this parameter to ensure that the output includes elements that might not be present in *document* at run time, or to describe the order in which elements are to appear in the resulting XML String.

If you are using derived type processing, you must provide this parameter.

generateRequiredTags **String** Optional. Flag indicating whether empty tags are to be included in the output document if a mandatory element appears in the document type specified in *documentTypeName* but does not appear in *document*. Set to:

- `true` to include mandatory elements if they are not present in *document*.
- `false` to omit mandatory elements if they are not present in *document*. This is the default.

Note:

The *generateRequiredTags* is only applicable if *documentTypeName* is provided.

generateNilTags **String** Optional. Flag indicating whether the resulting XML string includes the attribute `xsi:nil` for elements that are null. Set to:

- `true` to generate the `xsi:nil` attribute for an element if the **Allow null** property for the corresponding field is set to `true` and the field is null in *document*.

Note: *generateRequiredTags* must also be set to `true` to generate the `xsi:nil` attribute in the XML String.

- `false` to omit the `xsi:nil` attribute even if a nillable field is, in fact, null. This is the default.

enforceLegalXML **String** Optional. Flag indicating whether the service throws an exception when *document* contains multiple root elements or illegal XML tag names. Set to:

- `true` to throw an exception if *document* would produce an XML String containing multiple root elements and/or illegal XML tag names.

- `false` to allow the resulting XML String to contain multiple root elements and/or illegal XML tag names. You would use this setting, for example, to create an XML fragment composed of multiple elements that were not all enclosed within a root element. This is the default.

dtdHeaderInfo

Document Optional. Contents of the DOCTYPE header to be inserted into the XML String. (You can retrieve this information from an incoming document using [pub.xml:getXMLNodeType](#).)

Key	Description
<i>systemID</i>	String Optional. System identifier for the DTD, if any.
<i>publicID</i>	String Optional. Public identifier for the DTD, if any.
<i>rootNSPrefix</i>	String Optional. Namespace prefix of the <i>rootLocalName</i> , if any.
<i>rootLocalName</i>	String Optional. Local name (excluding the namespace prefix) of the root element.

bufferSize

String Optional. Initial size (in bytes) of the String buffer that `documentToXMLString` uses to assemble the output XML String. If the String buffer fills up before `documentToXMLString` is finished generating the XML String, it reallocates the buffer, expanding it by this amount each time the buffer becomes full.

If you do not set *bufferSize*, `documentToXMLString` looks to see whether a default buffer size is specified in the following parameter on the server:

```
watt.server.recordToDocument.bufferSize
```

If so, it uses this value to allocate the String buffer. If this parameter is not set, `documentToXMLString` uses a default buffer size of 4096 bytes.

For best performance, you should always set *bufferSize* to a value that closely matches the size of the XML String that you expect `documentToXMLString` to produce. This practice will spare the server from having to enlarge the buffer repeatedly if the XML String is many times larger than the default buffer or if you arbitrarily set *bufferSize* to a value that is too small.

Setting *bufferSize* to an appropriately sized value will also prevent your service from unnecessarily consuming more memory than it needs if the XML String is much smaller than the default buffer size or if you arbitrarily set *bufferSize* to a value that is too large.

treatXsiNilAsNull

Boolean Optional. Flag indicating whether Integration Server should consider the *xsi:nilattribute* of an empty XML tag as null in the resulting XML string. Set to:

- true to treat the *xsi:nil* attribute for an empty XML tag as null.
- false to treat the *xsi:nil* attribute as a blank string.

By default, the *treatXsiNilAsNull* parameter value is blank.

Output Parameters

xmldata

String XML String produced from *document*.

Usage Notes

If you are building an IData that will be converted to an XML String, keep the following points in mind:

- If you want to generate a simple element that contains only a character value, represent it with a String element in *document* as shown in the following:

```
abc name           Midwest Extreme Sports
```

- If you want to generate an element that contains children, represent with an IData in *document* as shown in the following.

```
address1
  abc @country      USA
  abc street1      10211 Brook Road
  abc city          closed
  abc state         OH
  abc postalCode    22130
```

To produce attributes, put the attribute values in keys whose name starts with the character(s) specified in *attrPrefix*. For example, if you use the default *attrPrefix*, the names of all keys containing attributes (and only those keys containing attributes) must start with the @ character (for example, @type, @xmlns).

Also, when you include attributes, make sure that keys representing attributes are direct children of the elements in which they are to be applied. For example, if you want to include an *xmlns* attribute in the <AcctInfo> element in the example shown in the description of this service, you must create a String field named @xmlns in the *AcctInfo* field within *document*.

- If you want to generate a simple element that contains a character value and one or more attributes, you must represent it as an IData that has one key for each attribute and a key named *body that contains element's value. For example, if you wanted to produce the following element:

```
<phoneNum cc=@11>216-741-7566</phoneNum>
```

You would include the following in *document*:

```

phoneNum
  @cc      011
  *body   216-741-7586

```

- To include namespaces, make sure you do the following:
 - Include the appropriate namespace prefix in the key names in *document*. For example, to produce an element called `acctNum` that belongs to a namespace that is represented by the "GSX" prefix, you would include a key named `GSX:acctNum` in *document*.
 - Define the URIs for the prefixes that appear in *document*. You can do this through *nsDecls* or by including an `@xmlns` key in the element where you want the `xmlns` attribute to be inserted. See the *nsDecls* description above for more information about declaring namespaces.

To return the processed XML document to the client that originally submitted it, invoke [pub.flow:setResponse](#). Keep in mind that you may need to modify the encoding.

To generate the `xsi:nil` attribute for an element in the XML String, the following must be true:

- *documentTypeName* must be provided.
- *generateRequiredTags* and *generateNilTags* must be set to `true`.
- The element must correspond to a field that is nillable. That is, the **Allow null** property must be set to **True**.
- If the element corresponds to a document field, at run time, the document must not contain any content. However, if the document contains a **body* field, the [pub.xml:documentToXMLString](#) service generates the `xsi:nil` attribute for the corresponding element if the value of **body* is null.

If a document field is nillable and is null at run time, the resulting XML String does not contain any child elements for the element that corresponds to the document.

By default, the [pub.xml:documentToXMLString](#) service uses the prefix "xsi" for the nil attribute, where `xsi` refers to the namespace `http://www.w3.org/2001/XMLSchema-instance`. If *nsDecls* declares a different prefix for this namespaces, the service uses that prefix instead of `xsi`.

pub.xml:freeXMLNode

WmPublic. Frees the resources allocated to a given XML node.

You can optionally call this service when you are using a `NodeIterator` to iterate over an XML node and you decide to stop processing the node before reaching the end. By explicitly calling [pub.xml:freeXMLNode](#), you immediately free the resources associated with the node instead of waiting for Java garbage collection to do this. Although it is not mandatory to call this service when you finish processing an XML node with a `NodeIterator`, doing so can boost server performance. Note that after you have freed an XML node using this service, the node becomes unstable and should not be used by any subsequent processes.

Input Parameters

rootNode XML node or enhanced XML node whose resources you want to release. This parameter supports the following types of input:

- **com.wm.lang.xml.Document** An XML node whose resources you want to release.
- **enhanced XML node** An enhanced XML node whose resources you want to release.

Specify the same type of input that you supplied to `pub.xml:getXMLNodeIterator`.

Output Parameters

None.

pub.xml:getNextXMLNode

WmPublic. Gets the next XML node from a `NodeIterator`.

Input Parameters

iterator **com.wm.app.b2b.util.NodeIterator** `NodeIterator` from which to retrieve the next node.

Output Parameters

next **Document** Conditional. The requested node. Will be null when the `NodeIterator` has no more nodes to return. Otherwise, *next* will contain the following:

Key	Description
<i>name</i>	String Element type name of the node. If the element belongs to a namespace and the namespace is declared at the time the <code>NodeIterator</code> was constructed, <i>name</i> will have the prefix declared for that namespace. If the namespace is not declared, <i>name</i> will use prefix that occurs in the XML.
<i>node</i>	XML node identified by the input criteria used to originally generate the <code>NodeIterator</code> . <i>node</i> will be one of the following types and depends on

what was supplied to the *node* input parameter for the `pub.xml:getXMLNodeIterator` service:

- `com.wm.lang.xml.Node`
- **enhanced XML node**

It is possible that all calls to `getNextXMLNode` on a given `NodeIterator` will yield the same document instance, where the values of the instance's entries vary. For this reason, applications should assume that each call to `getNextXMLNode` invalidates the document returned by the previous call. This approach maximizes the speed of the server and minimizes the use of resources.

Usage Notes

A `NodeIterator` is acquired via the service `pub.xml:getXMLNodeIterator`. The output of that service is a document (IData object) containing the element type name of the node and the node itself. The instance of this document is only valid until the next `getNextXMLNode` call on the same `NodeIterator`, because `getNextXMLNode` uses the same document object for each call.

pub.xml:getXMLNodeIterator

WmPublic. Creates and returns a `NodeIterator`.

A `NodeIterator` iterates over the element node descendants of an XML node and returns the element nodes that satisfy the given criteria. The client application or flow service uses the service `pub.xml:getNextXMLNode` to get each node in turn. `NodeIterators` can only be created for XML nodes (not for HTML nodes).

`pub.xml:getXMLNodeIterator` is useful for loading and parsing documents on demand. Large or slow documents need only be loaded as far as needed to get the desired data. `NodeIterators` are also useful for providing service as the pertinent information in the document arrives rather than first waiting for the entire document to load. This service is primarily intended to deal with large documents or documents that arrive slowly.

`NodeIterator` provides a moving-window mode, in which the only node that is resident in memory is the last node returned by `pub.xml:getNextXMLNode`. In this mode, when `pub.xml:getNextXMLNode` is called, all nodes preceding the newly returned node become invalid, including all nodes previously returned by `pub.xml:getNextXMLNode`. The client must fully complete processing preceding nodes before advancing the window by calling `pub.xml:getNextXMLNode` again. In moving-window mode, the document consumes at least enough memory to hold the most recently returned node.

Moving-window mode allows the server to process multi-megabyte XML documents using very little memory. Moving-window mode may only be used on a node that represents an entire XML document and not on any descendant node. In other words, in moving-window mode, the input node must be the top-level node returned by `pub.xml:xmlStringToXMLNode` or `pub.xml:loadXMLNode`.

When operating in moving-window mode, the `NodeIterator` skips XML nodes that do not match the criteria set for the `NodeIterator` in `pub.xml:getXMLNodeIterator`. The `NodeIterator` frees skipped XML nodes after every `pub.xml:getNextXMLNode` execution. While this is the preferred and more performant behavior, some implementations might rely on earlier behavior where the `NodeIterator` retains skipped XML nodes until a successful match is found. Retaining skipped XML nodes makes it difficult to iterate over large XML files when there is a large number of intervening non-matching nodes between successful matches. Integration Server provides the server configuration parameter `watt.core.nodeIterator.retainFailures` to obtain the behavior of retaining skipped XML nodes. When `watt.core.nodeIterator.retainFailures` is set to `true`, a `NodeIterator` operating in moving-window mode retains skipped XML nodes until a successful match is found for the criteria specified in `pub.xml:getXMLNodeIterator`. `NodeIterator` purges the skipped XML nodes only after a successful `pub.xml:getNextXMLNode`. When `watt.core.nodeIterator.retainFailures` is set to `false`, a `NodeIterator` operating in moving-window mode frees skipped XML nodes after every `pub.xml:getNextXMLNode` execution. The default value is `false`.

Note:

You can use moving-window mode if the input node is of type `com.wm.lang.xml.Node` only. Moving-window mode cannot be used with an enhanced XML node.

Order of Node Traversal

The `NodeIterator` traverses the nodes in XML document order, sometimes called depth-first traversal order. Basically, this is the same order that individual elements appear in the source XML. However, unlike a full traversal, when a node satisfies the search criterion and is returned, the search for the next node ignores the children of the returned node. Instead on the next call to `pub.xml:getNextXMLNode`, the search resumes with the next peer of the returned element. If there is no next peer, the search resumes with the next peer of the returned node's parent node.

Consider the following input XML document:

```
<alpha id="1" >
  <beta id="2" >
    <gamma id="3" >
      <delta id="4" />
      <delta id="5" />
    </gamma>
    <beta id="6" />
    <alpha id="7" />
  </beta>
  <gamma id="8" />
  <delta id="9" />
</alpha>
```

For a `NodeIterator` with search criterion "alpha", a call to `pub.xml:getNextXMLNode` returns only the document element `<alpha id="1">`. The children of `<alpha id="1">` are not searched. Subsequent calls to `pub.xml:getNextXMLNode` return null.

For a `NodeIterator` with search criterion "beta", a call to `pub.xml:getNextXMLNode` returns only the element `<beta id="2">`. The children of `<beta id="2">` are not searched. Subsequent calls to `pub.xml:getNextXMLNode` return null because there are no elements named beta among the following peer elements.

For a `NodeIterator` with search criterion "gamma", the first call to `pub.xml:getNextXMLNode` returns the element `<gamma id="3">`. The next call to a call to `pub.xml:getNextXMLNode` returns `<gamma id="8"/>`.

For a `NodeIterator` with search criterion "delta", the first call to `pub.xml:getNextXMLNode` returns the element `<delta id="4"/>`. Subsequent calls to `pub.xml:getNextXMLNode` return the element `<delta id="5"/>` and then the element `<delta id="9"/>`.

For a `NodeIterator` with search criteria "gamma" or "delta", the first call to `pub.xml:getNextXMLNode` returns the element `<gamma id="3">`. Subsequent calls to `pub.xml:getNextXMLNode` return the element `<gamma id="8"/>` and then the element `<delta id="9"/>`. Elements `<delta id="4"/>` and `<delta id="5"/>` are not returned because they are children of `<gamma id="3">` which satisfied the search request in the first call to `pub.xml:getNextXMLNode`. As a result, the children of `<gamma id="3">` are not searched in subsequent calls to `pub.xml:getNextXMLNode`.

Input Parameters

node

The XML node or enhanced XML node for which you want to produce a `NodeIterator`. This parameter supports the following types of input:

- **com.wm.lang.xml.Node** XML node for which you want to produce a `NodeIterator`. The node can represent either an XML document or an element of an XML document; however, if the `NodeIterator` will be used in moving-window mode, a whole XML document must be used. This is because moving window mode is only meaningful for managing the loading process of a document, and to operate on a node is to have already loaded the node
- **enhanced XML node** An enhanced XML node for which you want to produce a `NodeIterator`. An enhanced XML node can be produced by `pub.xml:loadEnhancedXMLNode`, `pub.xml:xmlStringToEnhancedXMLNode`, or a content handler that receives an XML document in a request for which `xmlFormat` is set to enhanced.

criteria

String List Optional. Pattern strings identifying the nodes that the iterator is to return. A pattern string may take either the form `<localName>` or the form `<prefix>:<localName>`.

When a pattern takes the first form, it identifies an element whose local name is `<localName>` and that belongs to the default XML namespace. When a pattern takes the second form, it identifies an element whose local name is `<localName>` and whose XML namespace is given by the prefix `<prefix>`. If the input parameter `nsDecls` declares this prefix, the namespace URI of the element must match the URI declared for the prefix. If the prefix is not declared in `nsDecls`, the prefix is matched against prefixes found in the XML.

`<prefix>` and `<localName>` can each optionally take the value "*" (asterisk) to match any namespace or local name. A "*" prefix also matches elements residing in the default namespace.

If you do not specify *criteria*, all element node children of the root element are returned.

nsDecls

Document Optional. Namespaces associated with any namespace prefixes used in *criteria*. Each entry in *nsDecls* represents a namespace prefix/URI pair, where a key name represents a prefix and the value of the key specifies the namespace URI.

For example, to define the URIs associated with two prefixes called GSX and TxMon, you would set *nsDecls* as follows:

```

nsDecls
├── GSX http://www.gsx.com
└── TxMon http://www.acutrak/txmonitor

```

movingWindow

String Optional. Flag indicating whether the NodeIterator is to iterate using a moving window, as described above. In moving-window mode, the entire document preceding the node most recently returned by `getXMLNodeIterator` is discarded. Subsequent attempts to return preceding portions of the document will return either the repeating text `*PURGED*` or the proper data, depending on whether the data falls within an area that the server was able to discard. When iterating with a moving window, the current node should be queried and completely examined prior to requesting the next node.

Set to:

- `true` to use the NodeIterator in moving-window mode.
- `false` to use the NodeIterator in normal mode. This is the default.

Note:

If *node* is an enhanced XML node, set *movingWindow* to `false`.

Output Parameters

iterator

com.wm.app.b2b.util.NodeIterator NodeIterator for use with the service [pub.xml:getNextXMLNode](#).

pub.xml:getXMLNodeType

WmPublic. Returns information about an XML node.

Input Parameters

rootNode

com.wm.lang.xml.Document XML node about which you want information.

Output Parameters

<i>systemID</i>	String Conditional. System identifier, as provided by the DTD associated with <i>rootNode</i> . If <i>rootNode</i> does not have a system identifier, this value is null.
<i>publicID</i>	String Conditional. Public identifier, as provided by the DTD associated with <i>rootNode</i> . If <i>rootNode</i> does not have a public identifier, this value is null.
<i>rootNamespace</i>	String URI of the XML namespace to which <i>rootNode</i> 's root element belongs.
<i>rootNSPrefix</i>	String Conditional. Namespace prefix of root element in <i>rootNode</i> , if any.
<i>rootLocalName</i>	String Conditional. Local name (excluding the namespace prefix) of the root element in <i>rootNode</i> , if any.

pub.xml:loadEnhancedXMLNode

WmPublic. Retrieves an XML document via HTTP or HTTPS, parses it using the enhanced XML parser, and produces an `org.w3c.dom.Node` object.

An DOM node is a special representation of an XML document that can be consumed by any program that uses standard DOM APIs. The `pub.xml:xmlNodeToDocument` service and the `pub.xml:data.domeNodetoXMLData` service can accept a DOM object as input.

Input Parameters

url **String** The URL of the document you want to load. This string *must* begin with `http:` or `https:`. For example:

```
http://www.rubicon.com/orders/orders.html
```

—OR—

```
https://localhost:5555/WmPublic/index.html
```

You can include a query string (for example, a collection of "name=value" pairs) with the string that you specify. However, you might want to use the data variable for this type of information instead. It is usually a more practical place for "name=value" data, because it allows you to link individual variables in the query string.

method **String** Optional. Set this value to specify the HTTP method (GET or POST) that you want the target server to execute on the resource specified in *url*. This value determines the way in which `pub.xml:loadEnhancedXMLNode` submits data values (if any) to the resource identified in *url*.

- If you set `method` to `get`, `pub.xml:loadEnhancedXMLNode` appends the values you specify in `data` to the value in `url`. (Note that only certain data elements are valid when you use the GET method). The default is `get`.
- If you set `method` to `post`, `pub.xml:loadEnhancedXMLNode` sends the values in `data` in the body of the HTTP or HTTPS request.

auth

Document Optional. Authentication and authorization information that `pub.xml:loadEnhancedXMLNode` will use if the requested resource is protected.

Note:

If you include your data with the string in `url`, do not specify a value in `data`.

Key	Description
<i>type</i>	String Type of authentication <code>pub.xml:loadEnhancedXMLNode</code> will use to submit this request. Leave this field blank, as the only option currently available is basic HTTP authentication.
<i>user</i>	String User name that <code>pub.xml:loadEnhancedXMLNode</code> will submit if the requested resource is protected. The user name must have authority to access the resource specified in <code>url</code> . This value defaults to the value of <code>watt.net.httpUser</code> in the server's configuration file (<code>server.cnf</code>).
<i>pass</i>	String Password associated with the user name specified in <code>user</code> . If the user does not require a password, leave <code>pass</code> empty. This value defaults to the value of <code>watt.net.httpPass</code> in the server's configuration file (<code>server.cf</code>).

data

Document Optional. The data that you want `pub.xml:loadEnhancedXMLNode` to submit with the request. Specify data using one or more of the following elements.

Note:

When you use more than one element to submit data, `args` is appended first, `table` is appended second, and `string` is appended last.

Key	Description
-----	-------------

args

Document Optional. Specifies name=value pairs that `pub.xml:loadEnhancedXMLNode` is to submit to the resource in *url*.

You can use *args* to submit data via either the POST or GET method.

To specify data using *args*, create one element for each name=value pair that you want to submit, where the key represents the name portion of the pair and the value represents the value portion of the pair.

Note that when you use *args*, `pub.xml:loadEnhancedXMLNode` will automatically:

- URL-encode name=value pair, so you do not need to URL-encode the values you specify in *args*.
- Insert the "&" character between pairs, so you do not need to include it in *args*.
- Prefix the entire query string with the "?" character if it submits the data in *args* via a GET. You do not need to include this character in *args*.

When you submit data using the *args* variable, Integration Server automatically sets the value of the Content-Type header to `application/x-www-form-urlencoded`. If you want to explicitly specify a different Content-Type, you must submit your data using the *string* or *bytes* variable.

table

String Table Optional. Specifies data that `pub.xml:loadEnhancedXMLNode` will use to construct a query string to submit to the resource specified in *url*.

table is similar to *args*, but it allows you to submit unnamed values in a query string, not just name=value pairs.

To specify data using *table*, create one row for each value that you want to submit, where:

- The contents of column 0 represent the name portion of the pair (leave this column null to submit an unnamed value, and...

- The contents of column 1 represent the value portion of the pair.

When you submit data using the *table* variable, the Integration Server automatically sets the value of the Content-Type header to `application/x-www-form-urlencoded`. If you want to explicitly specify a different Content-Type, you must submit your data using the *string* or *bytes* variable.

Note that when you use *table*, `pub.xml:loadEnhancedXMLNode` will automatically:

- URL-encode name=value pair, so you do not need to URL-encode the values you specify in *table*.
- Insert the "&" character between the pairs (or unnamed values) that it constructs, so you do not need to include it in *table*.
- Prefix the entire query string with the "?" character if it submits the data in *table* via the GET method. You do not need to include this character in *table*.

string

String Optional. Text that you want `pub.xml:loadEnhancedXMLNode` to submit to the resource in *url*.

You can use *string* to submit data via either the POST or GET method.

If you use *string* to specify your data, make sure that you specify the string *exactly* as you want it presented in the HTTP request. (If you are using the GET method, make sure you URL-encode the contents of *string*). When performing a POST the *string* is submitted to the resource as the body of the document.

bytes

byte[] Optional. Data that `pub.xml:loadEnhancedXMLNode` is to submit to the resource in *url*. You can use *bytes* only to submit data via the POST method.

Note:

When you use *bytes* and another element (*args*, *table*, or *string*) to submit data with `pub.xml:loadEnhancedXMLNode`, the service

appends the data from the *args*, *table*, or *string* element to *url*. The service appends *args* to *url* first, *table* second, and *string* last. The service encodes the data from the *bytes* element in the body of the post.

stream

java.io.InputStream Optional. Data that `pub.xml:loadEnhancedXMLNode` is to submit to the resource in *url*. You can use *stream* only to submit data via the POST method.

Note:

When you use *stream* and another element (*args*, *table*, or *string*) to submit data with `pub.xml:loadEnhancedXMLNode`, the service appends the data from the *args*, *table*, or *string* element to *url*. The service appends *args* to *url* first, *table* second, and *string* last. The service encodes the data from the *stream* element in the body of the post. If *stream* is specified, *bytes* is ignored.

encoding

String Optional. Name of a registered IANA character set.

headers

Document Optional. Fields that you want to explicitly override in the HTTP request header issued by `pub.xml:loadEnhancedXMLNode`.

Specify one element for each header field that you want to set, where the element's name represents the name of the header field, and the element's value represents the value of that header field.

If *headers* is not set, `pub.xml:loadEnhancedXMLNode` will use its default header values.

Note:

You do not need to type a colon after the field name because `pub.xml:loadEnhancedXMLNode` will automatically insert the colon when it inserts this field into the request header.

If you want to assign specific values to header fields used by `pub.xml:loadEnhancedXMLNode`, keep the following points in mind:

- When you specify the value of a header field, you override whatever default value webMethods Integration Server is configured to use for HTTP requests. For example, if you set the User-Agent header field to `B2B/3.0`, the server uses that value instead of the default value specified by the `watt.net.userAgent` parameter.

- The `pub.xml:loadEnhancedXMLNode` service automatically determines the value of the Content-Length header field. You cannot specify a value for Content-Length.
- Be aware that when you submit data using the `args` or `table` elements, `pub.xml:loadEnhancedXMLNode` automatically sets the Content-Type header field to `application/x-www-form-urlencoded`. You cannot override this setting using the `headers` variable. If you want to explicitly specify a content type in headers, make sure to use the `string` or `bytes` element to submit your data, not `args` or `table`.
- Certain header fields are automatically derived from other input parameters assigned to `pub.xml:loadEnhancedXMLNode`. For example, the Authorization header field is automatically derived from your `auth` parameter setting. Except for the Content-Length header field and the Content-Type header field (which, as described above, you cannot override when submitting data via `args` or `table`), a value that you specify in headers overrides the value that `pub.xml:loadEnhancedXMLNode` might otherwise derive from other parameter settings.
- The `pub.xml:loadEnhancedXMLNode` service does not validate data that you specify in `headers`. It simply passes it on to the target server in the request header. *Make sure you specify header field names and their values correctly.* For a complete list of valid request header fields, see <http://www.w3.org> for the latest HTTP specification published by the W3C.
- To specify request headers in `headers`, create a string element for each header that you want to specify, where:
 - The name of the element defines the name header field (for example, User-Agent, If-Modified-Since, Mail_Address), and...
 - The value of the element specifies the value you want assigned to that field.

encoding

String Optional. Character set in which the returned document is encoded. The parser requires this value in order to interpret a document correctly. Set to:

- `autoDetect` to determine the document's character set from the document, where UTF-8 is the default character set for XML.
- The name of a registered IANA character set to decode the document using that character set (for example, ISO-8859-1).

failOnHTTPError

String Optional. Determines whether `pub.xml:loadEnhancedXMLNode` will fail (throw an exception) if the requested URL is not loaded correctly based on an HTTP status code. This parameter allows for customized error handling of the load failure. Set to:

- `true` to throw a service exception if the URL is not loaded as indicated by an HTTP status code between 400 and 599, inclusive.
- `false` to ignore HTTP errors. If there is an error, `pub.xml:loadEnhancedXMLNode` returns `status` and `statusMessage`. This is the default.

inputProcessing

Document. Optional. Contains a set of input parameters that instruct Integration Server how to read the XML document. The fields are comparable to those in the `javax.xml.stream.XMLInputFactory` class.

<u>Key</u>	<u>Description</u>
<i>isValidating</i>	<p>String Optional. Determines whether Integration Server performs DTD validation. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to perform DTD validation. ■ <code>false</code> to disable DTD validation. This is the default.
<i>isNamespaceAware</i>	<p>String Optional. Determines whether Integration Server provides namespace processing for XML 1.0 support while parsing the XML document. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to enable namespace processing. This is the default. ■ <code>false</code> to disable namespace processing.
<i>isCoalescing</i>	<p>String Optional. Determines whether Integration Server coalesces adjacent character data while parsing the XML document. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to coalesce adjacent character data. ■ <code>false</code> to indicate that Integration Server does not coalesce adjacent character data. This is the default.
<i>isReplacingEntityReferences</i>	<p>String Optional. Determines whether, while parsing the XML document, Integration Server replaces internal entity references with replacement text and treats them as characters. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to replace entity references. ■ <code>false</code> to indicate entity references will not be replaced. This is the default.

*isSupporting
ExternalEntities*

String Optional. Determines whether Integration Server resolves external parsed entities while parsing the XML document. Set to:

- `true` to resolve external parsed entities.
- `false` to indicate Integration Server does not resolve external parsed entities.

The JVM in which Integration Server runs determines the default.

supportDTD

String Optional. Determines whether Integration Server supports DTDs while parsing the XML document. Set to:

- `true` to support DTDs while parsing the XML document.
- `false` to disable support of DTDs while parsing the XML document. This is the default.

partitionSize

String Optional. Specifies the size, measured in bytes, of the partitions on the heap where the enhanced XML parser stores parsed document information. Specify a suffix of “k” to indicate kilobytes or “m” to indicate megabytes. For example, 10k or 10m.

If you do not specify a value, Integration Server uses the default partition size value specified on the **Settings > Enhanced XML parsing** page in Integration Server Administrator.

Output Parameters

node

org.w3c.dom.Node Conditional. XML node representing the returned XML document.

The `pub.xml:loadEnhancedXMLNode` service returns *node* only when Integration Server parses the XML document successfully.

status

String Conditional. The HTTP status code returned by the target server if an HTTP error occurs when loading the requested URL.

The `pub.xml:loadEnhancedXMLNode` service returns *status* when an HTTP error occurs and `failOnHTTPError` is set to `false`.

statusMessage

String Conditional. The HTTP status message returned by the target server if an HTTP error occurs when loading the requested URL.

The `pub.xml:loadEnhancedXMLNode` service returns *statusMessage* when an HTTP error occurs and `failOnHTTPError` is set to `false`.

Usage Notes

If `pub.xml:loadEnhancedXMLNode` does not receive a response within the timeout period specified in the server's `watt.net.timeout` parameter, it will throw an exception. For information about the `watt.net.timeout` parameter, see *webMethods Integration Server Administrator's Guide*.

Use the `pub.xml:loadXMLNode` service to load an XML document and convert it to an XML node using the legacy XML parser. For more information about the legacy XML parser and the enhanced XML parser, see *webMethods Integration Server Administrator's Guide*.

Keep the following information in mind when specifying a *partitionSize*

- The *partitionSize* is a hint for the enhanced XML parser so that it can estimate the amount of heap space needed to parse the document. Often, it not possible to determine the size of an inbound XML document before parsing.
- As a general rule, Software AG recommends a *partitionSize* that is 1/2 the size of the unparsed XML document.
 - A *partitionSize* that is considerably larger than 1/2 the size of the unparsed XML document causes the enhanced XML parser to consume more heap space than necessary but might also improve throughput. However, this can impact the overall performance of Integration Server.
 - A *partitionSize* that is considerably smaller than 1/2 the size of the unparsed XML document causes the enhanced XML parser to create a large number of partitions to parse the document. While this might use less heap space, it may reduce the throughput of the parser.
 - A *partitionSize* that is three times smaller or three times larger than 1/2 the size of the unparsed XML document will likely have little impact on the performance.
- At run time, the enhanced XML parser overrides a *partitionSize* that consumes all of the available heap space.
- At run time, if the *partitionSize* results in an initial heap allocation that exceeds the single document limit set in the **Maximum heap allocation for any single document** field the limit for all documents set in the **Maximum heap allocation for all documents combined** field, the enhanced XML parser reduces the partition size automatically. For more information about heap allocation limits for the enhanced XML parser, see *webMethods Integration Server Administrator's Guide*.
- If you do not specify *partitionSize*, the enhanced XML parser uses the default specified in the **Default partition size** field on the **Settings > Enhanced XML parsing** page in Integration Server Administrator.

pub.xml:loadXMLNode

WmPublic. Retrieves an XML document via HTTP or HTTPS, parses it using the legacy XML parser, and produces an XML node.

An XML node is a special representation of an XML document that can be consumed by the Integration Server. Most webMethods services that operate on XML documents require an XML node as input.

Input Parameters

url

String The URL of the document you want to load. This string *must* begin with `http:` or `https:`. For example:

```
http://www.rubicon.com/orders/orders.html
```

—OR—

```
https://localhost:5555/WmPublic/index.html
```

You can include a query string (for example, a collection of "name=value" pairs) with the string that you specify. However, you might want to use the data variable for this type of information instead. It is usually a more practical place for "name=value" data, because it allows you to link individual variables in the query string.

method

String Optional. Set this value to specify the HTTP method (GET or POST) that you want the target server to execute on the resource specified in *url*. This value determines the way in which `pub.xml:loadXMLNode` submits data values (if any) to the resource identified in *url*. The default is `get`.

- If you set `method` to `get`, `pub.xml:loadXMLNode` appends the values you specify in `data` to the value in *url*. (Note that only certain data elements are valid when you use the GET method).
- If you set `method` to `post`, `pub.xml:loadXMLNode` sends the values in `data` in the body of the HTTP or HTTPS request.

auth

Document Optional. Authentication and authorization information that `pub.xml:loadXMLNode` will use if the requested resource is protected.

Note:

If you include your data with the string in *url*, do not specify a value in *data*.

Key	Description
<i>type</i>	String Type of authentication <code>pub.xml:loadXMLNode</code> will use to submit this request. Leave this field blank, as the only option currently available is basic HTTP authentication.
<i>user</i>	String User name that <code>pub.xml:loadXMLNode</code> will submit if the requested resource is protected.

The user name must have authority to access the resource specified in *url*.

This value defaults to the value of `watt.net.httpUser` in the server's configuration file (`server.cnf`).

pass

String Password associated with the user name specified in *user*. If the user does not require a password, leave *pass* empty.

This value defaults to the value of `watt.net.httpPass` in the server's configuration file (`server.cf`).

data

Document Optional. The data that you want `pub.xml:loadXMLNode` to submit with the request. Specify data using one or more of the following elements.

Note:

When you use more than one element to submit data, *args* is appended first, *table* is appended second, and *string* is appended last.

Key	Description
<i>args</i>	<p>Document Optional. Specifies name=value pairs that <code>pub.xml:loadXMLNode</code> is to submit to the resource in <i>url</i>.</p> <p>You can use <i>args</i> to submit data via either the POST or GET method.</p> <p>To specify data using <i>args</i>, create one element for each name=value pair that you want to submit, where the key represents the name portion of the pair and the value represents the value portion of the pair.</p> <p>Note that when you use <i>args</i>, <code>pub.xml:loadXMLNode</code> will automatically:</p> <ul style="list-style-type: none"> ■ URL-encode name=value pair, so you do not need to URL-encode the values you specify in <i>args</i>. ■ Insert the "&" character between pairs, so you do not need to include it in <i>args</i>. ■ Prefix the entire query string with the "?" character if it submits the data in <i>args</i> via a GET. You do not need to include this character in <i>args</i>.

When you submit data using the *args* variable, the Integration Server automatically sets the value of the Content-Type header to `application/x-www-form-urlencoded`. If you want to explicitly specify a different Content-Type, you must submit your data using the *string* or *bytes* variable.

table

String Table Optional. Specifies data that `pub.xml:loadXMLNode` will use to construct a query string to submit to the resource specified in *url*.

table is similar to *args*, but it allows you to submit unnamed values in a query string, not just name=value pairs.

To specify data using *table*, create one row for each value that you want to submit, where:

- The contents of column 0 represent the name portion of the pair (leave this column null to submit an unnamed value, and...
- The contents of column 1 represent the value portion of the pair.

When you submit data using the *table* variable, the Integration Server automatically sets the value of the Content-Type header to `application/x-www-form-urlencoded`. If you want to explicitly specify a different Content-Type, you must submit your data using the *string* or *bytes* variable.

Note that when you use *table*, `pub.xml:loadXMLNode` will automatically:

- URL-encode name=value pair, so you do not need to URL-encode the values you specify in *table*.
- Insert the "&" character between the pairs (or unnamed values) that it constructs, so you do not need to include it in *table*.
- Prefix the entire query string with the "?" character if it submits the data in *table* via the GET method. You do not need to include this character in *table*.

<i>string</i>	<p>String Optional. Text that you want <code>pub.xml:loadXMLNode</code> to submit to the resource in <i>url</i>.</p> <p>You can use <i>string</i> to submit data via either the POST or GET method.</p> <p>If you use <i>string</i> to specify your data, make sure that you specify the string <i>exactly</i> as you want it presented in the HTTP request. (If you are using the GET method, make sure you URL-encode the contents of <i>string</i>). When performing a POST the <i>string</i> is submitted to the resource as the body of the document.</p>
<i>bytes</i>	<p>byte[] Optional. Data that <code>pub.xml:loadXMLNode</code> is to submit to the resource in <i>url</i>. You can use <i>bytes</i> only to submit data via the POST method.</p> <p>Note: When you use <i>bytes</i> and another element (<i>args</i>, <i>table</i>, or <i>string</i>) to submit data with <code>pub.xml:loadXMLNode</code>, the service appends the data from the <i>args</i>, <i>table</i>, or <i>string</i> element to <i>url</i>. The service appends <i>args</i> to <i>url</i> first, <i>table</i> second, and <i>string</i> last. The service encodes the data from the <i>bytes</i> element in the body of the post.</p>
<i>stream</i>	<p>java.io.InputStream Optional. Data that <code>pub.xml:loadXMLNode</code> is to submit to the resource in <i>url</i>. You can use <i>stream</i> only to submit data via the POST method.</p> <p>Note: When you use <i>stream</i> and another element (<i>args</i>, <i>table</i>, or <i>string</i>) to submit data with <code>pub.xml:loadXMLNode</code>, the service appends the data from the <i>args</i>, <i>table</i>, or <i>string</i> element to <i>url</i>. The service appends <i>args</i> to <i>url</i> first, <i>table</i> second, and <i>string</i> last. The service encodes the data from the <i>stream</i> element in the body of the post. If <i>stream</i> is specified, <i>bytes</i> is ignored.</p>
<i>encoding</i>	<p>String Optional. Name of a registered IANA character set.</p>
<i>headers</i>	<p>Document Optional. Fields that you want to explicitly override in the HTTP request header issued by <code>pub.xml:loadXMLNode</code>.</p>

Specify one element for each header field that you want to set, where the element's name represents the name of the header field, and the element's value represents the value of that header field.

If *headers* is not set, `pub.xml:loadXMLNode` will use its default header values.

Note:

You do not need to type a colon after the field name because `pub.xml:loadXMLNode` will automatically insert the colon when it inserts this field into the request header.

If you want to assign specific values to header fields used by `pub.xml:loadXMLNode`, keep the following points in mind:

- When you specify the value of a header field, you override whatever default value webMethods Integration Server is configured to use for HTTP requests. For example, if you set the User-Agent header field to `B2B/3.0`, the server uses that value instead of the default value specified by the `watt.net.userAgent` parameter.
- The `pub.xml:loadXMLNode` service automatically determines the value of the Content-Length header field. You cannot specify a value for Content-Length.
- Be aware that when you submit data using the *args* or *table* elements, `pub.xml:loadXMLNode` automatically sets the Content-Type header field to `application/x-www-form-urlencoded`. You cannot override this setting using the *headers* variable. If you want to explicitly specify a content type in headers, make sure to use the *string* or *bytes* element to submit your data, not *args* or *table*.
- Certain header fields are automatically derived from other input parameters assigned to `pub.xml:loadXMLNode`. For example, the Authorization header field is automatically derived from your *auth* parameter setting. Except for the Content-Length header field and the Content-Type header field (which, as described above, you cannot override when submitting data via *args* or *table*), a value that you specify in headers overrides the value that `pub.xml:loadXMLNode` might otherwise derive from other parameter settings.
- The `pub.xml:loadXMLNode` service does not validate data that you specify in *headers*. It simply passes it on to the target server in the request header. *Make sure you specify header field names and their values correctly.* For a complete list of valid request header fields, see <http://www.w3.org> for the latest HTTP specification published by the W3C.
- To specify request headers in *headers*, create a string element for each header that you want to specify, where:

- The name of the element defines the name header field (for example, User-Agent, If-Modified-Since, Mail_Address), and...
- The value of the element specifies the value you want assigned to that field.

encoding

String Optional. Character set in which the returned document is encoded. The parser requires this value in order to interpret a document correctly. Set to:

- `autoDetect` to determine the document's character set based on document type, where:
 - ISO-8859-1 is used for HTML.
 - UTF-8 is used for XML.
- The name of a registered IANA character set to decode the document using that character set (for example, ISO-8859-1).

If you do not specify an *encoding* value, `pub.xml:loadXMLNode` decodes the returned document using the following defaults:

If the document is...	It is decoded using...
HTML	ISO-8859-1
XML	UTF-8

expandDTD

String Optional. Flag indicating whether or not `pub.xml:loadXMLNode` is to process references to parameter entities in the returned document's DTD. Set to:

- `true` to expand references to parameter entities to their full definition.
- `false` to ignore references to parameter entities. This is the default.

Note:

You might want or need to use this variable in cases when you have a syntactically correct document that causes a parse error because it violates a definition in an external parameter-entity reference. By setting *expandDTD* to false, you can bypass the external definition so that `pub.xml:loadXMLNode` can parse the document successfully.

isXML

String Optional. Flag indicating whether the returned document is XML or HTML. `pub.xml:loadXMLNode` must know this in order to parse a document correctly. Set to:

- `autoDetect` to parse the document based on its type. When you use this option, `pub.xml:loadXMLNode` senses the document's type based on its `<!DOCTYPE... \>` or `<?XML... \>` tag. If it cannot determine a document's type, it parses it as HTML. This is the default.

- `true` to parse the document as XML.
- `false` to parse the document as HTML.

Note:

If you know what type of document `pub.xml:loadXMLNode` will receive, Software AG recommends that you explicitly set `isXML` instead of using `autoDetect`. It will cut processing time, because the server will not have to examine the document to determine its type. The default value is `autoDetect`.

loadAs

String Optional. Flag that specifies the form in which you want `pub.xml:loadXMLNode` to make the parsed document available to subsequent services. Set to:

- `bytes` to make the document available as a byte array. This is the default.

Use this option if the document will be used as input to a service that operates on whole documents (for example, [pub.xml:queryXMLNode](#)).

- `stream` to make the document available as an `InputStream`.

Use this option if the document will be used as input to a service that can process a document incrementally (for example, [pub.xml:getXMLNodeIterator](#)).

failOnHTTPError

String Optional. Determines whether `pub.xml:loadXMLNode` will fail (throw an exception) if the requested URL is not loaded correctly based on an HTTP status code. This parameter allows for customized error handling of the load failure. Set to:

- `true` to throw a service exception if the URL is not loaded as indicated by an HTTP status code between 400 and 599, inclusive.
- `false` to ignore HTTP errors. If there is an error, the HTML page returned by the web server will be sent to the parser. This is the default.

expandGeneralEntities

String Optional. Flag indicating whether `pub.xml:pub.xml:loadXMLNode` should expand references to general entities in the returned document's DTD. Set to:

- `true` to expand references to general entities to their full definition. This is the default.
- `false` to ignore references to general entities.

Output Parameters

node **com.wm.lang.xml.Node** XML node representing the returned HTML or XML document.

Usage Notes

If `pub.xml:loadXMLNode` does not receive a response within the timeout period specified in the server's `watt.net.timeout` parameter, it will throw an exception. For information about the `watt.net.timeout` parameter, see *webMethods Integration Server Administrator's Guide*.

If `expandGeneralEntities` is not specified, Integration Server uses the value in `watt.core.xml.expandGeneralEntities`. If `watt.core.xml.expandGeneralEntities` is not set, the references to general entities are always expanded.

Use the [pub.xml:loadEnhancedXMLNode](#) service to load an XML document and convert it to an XML node using the enhanced XML parser. For more information about the legacy XML parser and the enhanced XML parser, see *webMethods Integration Server Administrator's Guide*.

pub.xml:queryXMLNode

WmPublic. Queries an XML node.

The *fields* parameter specifies how data is extracted from the node to produce an output variable. This output variable is called a "binding," because the *fields* parameter binds a certain part of the document to a particular output variable. At run time, this service must include at least one *fields* entry. The service must include at least one entry in *fields*. The result of each query you specify in *fields* is returned in a variable whose name and type you specify.

Input Parameters

node The XML node or enhanced XML node that you want to query. This parameter supports the following types of input:

- **com.wm.lang.xml.Node** XML node that you want to query. An XML node can be produced by [pub.xml:loadXMLNode](#), [pub.xml:xmlStringToXMLNode](#) or an XML content handler.
- **enhanced XML node** The enhanced XML node that you want to query. An enhanced XML node can be produced by [pub.xml:loadEnhancedXMLNode](#), [pub.xml:xmlStringToEnhancedXMLNode](#), or an XML content handler that receives a document with an `xmlFormat` is set to enhanced. If you supply an enhanced XML node, you must use XQL to query the node.

nsDecls **Document** Optional. Namespaces associated with any namespace prefixes used element to specify elements in *fields/query*. Each entry in *nsDecls*

represents a namespace prefix/URI pair, where a key name represents a prefix and the value of the key specifies the namespace URI.

For example, to define the URIs associated with two prefixes called GSX and TxMon, you would set *nsDecls* as follows:



fields

Document List Optional. Parameters describing how data is to be extracted from *node*. Each document in the list contains parameters for a single query, as follows:

Key	Description														
<i>name</i>	String Name to assign to resulting value.														
<i>resultType</i>	String Object type that the query is to yield. The following shows the allowed values for <i>resultType</i> . <table border="1" data-bbox="857 890 1472 1318"> <thead> <tr> <th>Underlying Value</th> <th>Corresponding Data Type</th> </tr> </thead> <tbody> <tr> <td>Object</td> <td>Object</td> </tr> <tr> <td>Object[]</td> <td>Object List</td> </tr> <tr> <td>Record</td> <td>Document</td> </tr> <tr> <td>Record[]</td> <td>Document List</td> </tr> <tr> <td>String</td> <td>String</td> </tr> <tr> <td>String[]</td> <td>String List</td> </tr> </tbody> </table>	Underlying Value	Corresponding Data Type	Object	Object	Object[]	Object List	Record	Document	Record[]	Document List	String	String	String[]	String List
Underlying Value	Corresponding Data Type														
Object	Object														
Object[]	Object List														
Record	Document														
Record[]	Document List														
String	String														
String[]	String List														
<i>query</i>	String Query identifying the data to be extracted from <i>node</i> .														
<i>queryType</i>	String Query language in which <i>query</i> is expressed. Valid values are WQL and XQL. If the content of <i>node</i> is an enhanced XML node, you must set <i>queryType</i> to XQL. For information about WQL syntax, see the <i>webMethods Integration Server Built-In Services Reference</i> .														
<i>onnull</i>	String Code indicating what you want queryXMLNode to do when the result is null. Set to one of the following:														

- `continue` to indicate that all result values are acceptable for this query (including null).
- `fail` to indicate that the service should fail if the result of this query is null and continue in all other cases.
- `succeed` to indicate that the service should continue if the result of this query is null and fail in all other cases.

fields

Document List Parameters that support recursive execution of bindings. Each *fields* list defines bindings for one level of the output with the top level being the pipeline and the first level down being contents of a document or document list in the pipeline.

Output Parameters

Document Results from the queries specified in *fields*. This service returns one element for each query specified in *fields*. The specific names and types of the returned elements are determined by the *fields/name* and *field/resultType* parameters of the individual queries.

Usage Notes

If `pub.xml:queryXMLNode` fails, it throws a server exception. Common reasons for `pub.xml:queryXMLNode` to fail include:

- A variable that has no query string assigned to it.
- A syntax error in a query string.
- A query fails the “Allows Nulls” test.
- The node variable does not exist or it is null.

pub.xml:xmlNodeToDocument

`WmPublic`. Converts an XML node to a document (an `IData` object).

If you want to convert an XML node to an `XMLData` document, use `pub.xmldata.domNodetoXMLData`.

This service transforms each element and attribute in the XML node to an element in an `IData` object. For example:

This service would convert this XML document...

```
<?xml version="1.0" ?>
```

```

<tns:AcctInfo>
  xmlns:tns="http://localhost/DerivedAddress/schema.xsd"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" >
  <name>Midwest Extreme Sports</name>
  <rep>Laura M. Sanchez</rep>
  <acctNum type=platinum>G97041A</acctNum>
  <phoneNum cc=011>216-741-7566</phoneNum>
  <address country=USA>
    <street1>10211 Brook Road</street1>
    <city>Cleveland</city>
    <state>OH</state>
    <postalCode>22130</postalCode>
  </address>
  <address country=USA xsi:type="tns:DerivedAddress">
  <street1>10211 Brook Road</street1>
    <city>Cleveland</city>
    <state>OH</state>
    <postalCode>22130</postalCode>
    <landMark>Besides Ohio River-Bank Square</landMark>
    <telNo>001222555</telNo>
  </address>
  <serialNum>19970523A</serialNum>
  <serialNum>20001106G</serialNum>
  <serialNum>20010404K</serialNum>
</tns:AcctInfo>

```

To an IData that looks like this...

document	
@version	1.0
AcctInfo	
name	Midwest Extreme Sports
rep	Laura M. Sanchez
accNum	
@type	Platinum
*body	G97041A
phoneNum	
@cc	011
*body	216-741-7566
address[0]	
@country	USA
street1	10211 Brook Road
city	closed
state	OH
postalCode	22130
address[1]	
@country	USA
street1	10211 Brook Road
city	closed
state	OH
postalCode	22130
landmark	Ohio River-Bank Square
*doctype	DerivedAddress.documentLocation:docTypeRef_tns_DerivedAddress
serialNum	19970523A

Note that:

- The XML version attribute is converted to an element named `@version`.
- The resulting document is given the same name as the XML document's root element (`AcctInfo` in the example above) and is a child of the `document` variable that this service returns.
- Simple elements (such as `<name>` and `<rep>` in the example above) are converted to `String` elements.
- Complex elements (that is, elements with children, such as `<address>` in the example above) and simple elements that have attributes (such as `<acctNum>` and `<phoneNum>`) are converted to documents (`IData` objects). Note that keys derived from attributes are prefixed with a "@" character to distinguish them from keys derived from elements. Also note that when a simple element has an attribute, its value is placed in an element named `*body`.
- Repeated elements (such as `<serialNum>`) can be collected into arrays using the `makeArrays` and/or `arrays` parameters. See `makeArrays` and `arrays` below for additional information about producing arrays.
- While creating a document, the `pub.xml.xmlNodeToDocument` service assigns a value of `emptyString` to the fields that are empty in the document.
- The `*doctype` field is used to specify the IS document type to which the `IData` object should conform. The `*doctype` field in the `IData` object contains the full namespace name of the IS document type corresponding to the document type referred by the `xsi:type` attribute in the XML string.

The document type referred by the `*doctype` field should either be created by importing an XSD file (XML schema) or generated while consuming WSDL for a provider or consumer web service descriptor. You should also select the **Register document types with schema type** option in the New Document Type wizard when generating a document type from an XML schema.

Input Parameters

<i>node</i>	<p>XML node that is to be converted to a document (<code>IData</code> object).</p> <p>This parameter supports the following types of input:</p> <ul style="list-style-type: none"> ■ com.wm.lang.xml.Node ■ org.w3c.dom.Node
<i>attrPrefix</i>	<p>String Optional. Prefix that is to be used to designate keys containing attribute values. The default is "@". For example, if you set <i>attrPrefix</i> to <code>ATT_</code> and <i>node</i> contained the following element:</p> <pre style="background-color: #f0f0f0; padding: 5px;"> <tx currency=dollars> <acct>cash</acct> <amt>120.00</amt> </tx> </pre> <p><code>xmlNodeToDocument</code> would convert the <code>currency</code> attribute as follows:</p>

tx	
ATT_currency	dollars
acct	cash
amt	120.00

arrays

String List Optional. Names of elements that are to be generated as arrays, regardless of whether they appear multiple times in *node*. For example, if *arrays* contained the following values for the XML document shown in the example in the description for this service:

```
rep
address
```

`xmlNodeToDocument` would generate element `rep` as a String List and element `address` as a Document List.

Important:

If you include namespace prefixes in the element names that you specify in *arrays*, you must define the namespaces associated with those prefixes in *nsDecls*.

makeArrays

String Optional. Flag indicating whether you want `xmlNodeToDocument` to automatically create an array for every element that appears in *node* more than once. Set to:

- `true` to automatically create arrays for every element that appears more than once in *node*. This is the default.
- `false` to create arrays for only those elements specified in *arrays* or defined as arrays in the document type specified in *documentTypeName*.

Important:

You must set *makeArrays* to `false` when using *documentTypeName* to define the structure of an element. Otherwise, an exception will be thrown at run time.

collect

Document Optional. Elements that are to be placed into a new, named array (that is, a "collection"). Within *collect*, use key names to specify the names of the elements that are to be included in the collection. Then set the value of each key to specify the name of the collection in which you want that element placed. For example, if you wanted to place the `<name>` and `<rep>` elements in an array called `originator`, you would set *collect* as follows:

Key	Value
<i>name</i>	originator
<i>rep</i>	originator

If the set of elements in a collection are all simple elements, a String List is produced. However, if the set is made up of complex elements,

or a combination of simple and complex elements, a Document List is produced. When this is the case, each member of the array will include a child element called **name* that contains the name of the element from which that member was derived.

You may optionally include namespace prefixes in the element names that you specify in *collect*; however, if you do, you must define the namespaces associated with those prefixes in *nsDecls*.

Important:

You cannot include an element in more than one collection.

nsDecls

Document Optional. Namespace prefixes to use for the conversion. This parameter specifies the prefixes that will be used when namespace-qualified elements are converted to key names in the resulting IData object. For example, if you want elements belonging to a particular namespace to have the prefix GSX in the resulting IData (for example, *GSX:acctNum*), you would associate the prefix GSX with that namespace in *nsDecls*. (This is important because incoming XML documents can use any prefix for a given namespace, but the key names expected by a target service or MAP step on the Integration Server will have a fixed prefix.)

Namespace prefixes in *nsDecls* also define the prefixes used by the *arrays*, *documents*, *documentTypeName*, and *collect* parameters.

Each entry in *nsDecls* represents a namespace prefix/URI pair, where a key name represents a prefix and the value of the key specifies the namespace URI.

For example, to define the URIs associated with two prefixes called GSX and TxMon, you would set *nsDecls* as follows:

```
nsDecls
  GSX http://www.gsx.com
  TxMon http://www.acutrak/txmonitor
```

documents

String List Optional. Names of any simple elements that are to be generated as documents (IData objects) instead of Strings. The document produced for each element specified in *documents* will have the same name as the source element from which it is derived. It will contain a String element named **body* that holds the element's value.

For example, if *documents* contained the Strings *name* and *rep* and the source document contained the following:

```
.
.
.
<name>Midwest Extreme Sports</name>
<rep>Laura M. Sanchez</rep>
.
```

```

.
.

```

`xmlNodeToDocument` would produce the following:



Note:

If you include namespace prefixes in the element names that you specify, you must define the namespaces associated with those prefixes in *nsDecls*.

documentTypeName

String Optional. Fully qualified name of the document type that specifies the structure that is to be imposed on the resulting document. You can use this parameter to explicitly specify the order and dimensionality of elements. It is an alternative to using *makeArrays* and *arrays* to specify which elements are to be generated as arrays.

For example, if you had the XML document shown in the example in this service's description, and you wanted the `<name>` and `<rep>` elements to be generated as String lists, you would define them as String Lists fields in a document type and then specify that document type in *documentTypeName*.

Note:

The document type specified in *documentTypeName* does not need to specify every element that will appear in the resulting document. It only needs to specify the elements whose structure you want to explicitly set. However, if you include namespace prefixes in the element names that you specify, you must define the namespaces associated with those prefixes in *nsDecls*.

This service always converts XML nodes to String or Document object fields. It does not generate constrained objects (for example, Floats or Integers), even if the fields in the specified document are defined as constrained objects.

If you are using derived type processing, you must provide this parameter.

Important:

When you use *documentTypeName*, set *makeArrays* to false and do not set *arrays* and *documents*. Otherwise, `xmlNodeToDocument` will throw an exception at run time.

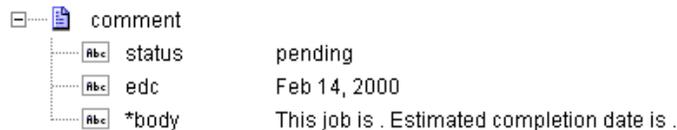
mixedModel

String Optional. Flag specifying how mixed-content elements (elements containing both text values and child elements) are to be converted. The following is an example of a mixed-content element:

```
<comment>
This job is <status>pending</status>. Estimated
completion date is <edc>Feb 14, 2000</edc>.
</comment>
```

Set to:

- `true` to place top-level text in an element named `*body`. This setting would produce the following IData for the `<comment>` element shown above:



Important:

When you set `mixedModel` to `true`, you must also use `documentTypeName` to specify a document type that describes the structure of the IData that you want `xmlNodeToDocument` to produce. Within the document type, mixed-content elements must be defined as documents that include a `String` field named `*body`.

- `false` to omit top-level text and include only the child elements from mixed-content elements. This setting would produce the following IData for the `<comment>` element shown above:



`preserveUndeclaredNS`

String Optional. Flag indicating whether or not Integration Server keeps undeclared namespaces in the resulting document (IData). An undeclared namespace is one that is not specified as part of the `nsDecls` input parameter.

Set to:

- `True` to preserve undeclared namespaces in the resulting document. For each namespace declaration in the XML document that is not specified in the `nsDecls` parameter, Integration Server adds the `xmlns` attribute as a `String` variable to the document (IData). Integration Server gives the variable a name that begins with `"@xmlns"` and assigns the variable the namespace value specified in the XML document. Integration Server preserves the position of the undeclared namespace in the resulting document.
- `False` to ignore namespace declarations in the XML document that are not specified in the `nsDecls` parameter. This is the default.

preserveNSPositions **String** Optional. Flag indicating whether or not Integration Server maintains the position of namespaces declared in the *nsDecls* parameter in the resulting document.

Set to:

- True to preserve the position of namespaces declared in *nsDecls* in the resulting document. For each namespace specified in the *nsDecls* parameter, Integration Server adds the *xmlns* attribute to the document (IData) as a String variable named "@xmlns:NSprefix" where "NSprefix" is the prefix name specified in *nsDecls*. Integration Server assigns the variable the namespace value specified in the XML document. This variable maintains the position of the *xmlns* attribute declaration within the XML document.
- False to not maintain the position of the namespace declarations specified in *nsDecls* in the resulting document. This is the default.

useNamespacesOfDocumentType **String** Optional. Flag indicating whether or not Integration Server uses the namespaces defined in the document type specified for the *documentTypeName* input parameter when creating a document from an XML string.

Set to:

- True to use the namespaces defined in the document type specified in *documentTypeName* and those in *nsDecls* when creating elements in the output document.
- False to use the namespaces defined in the *nsDecls* parameter only. This is the default.

Output Parameters

document **Document** Document (IData object) representation of the nodes and attributes in node.

Usage Notes

If the IS document type in *documentTypeName* accurately represents the content model for the complex type from which it was created (the **Model type** property value is not "Unordered"), when Integration Server converts an XML node to a document (IData), Integration Server matches up the contents of an element in the XML node with the content model of the IS document type. If a mismatch occurs and Integration Server is unable to map the XML node contents to the IS document type, Integration Server appends the remaining data to the resulting document (IData). Integration Server stops attempting to map the XML node content to a field in the IS document type. This mismatch does not result in an error at the time the document is created. However, the document would fail validation by the `pub.schema.validate` service.

The `watt.server.soap.decodeElementWithPrefix` server configuration parameter determines whether or not the `pub.xml.xmlNodeToDocument` service considers namespace and/or prefix declarations when decoding namespace qualified elements to corresponding fields in an IS document type.

- When `watt.server.soap.decodeElementWithPrefix` is set to `true`, the `pub.xml.xmlNodeToDocument` service does not consider namespace and/or prefix declarations. The service will map namespace qualified elements in the XML string to fields in an IS document type even if the field names do not include a prefix.
- When `watt.server.soap.decodeElementWithPrefix` is set to `false`, the `pub.xml.xmlNodeToDocument` service considers namespace and/or prefix declarations. The service does not map namespace qualified elements in the XML input to fields in an IS document type if the field names do not include a prefix. The `pub.xml.xmlNodeToDocument` service does not populate non-prefixed fields. Instead the service adds new fields that use the `prefix:name` structure and populates those fields with values from the XML instance.

Following are examples of XML documents and the documents (IData objects) that `xmlNodeToDocument` would produce.

XML Document

```
<myDoc>
<e1>e1Value</e1>
</myDoc>
```

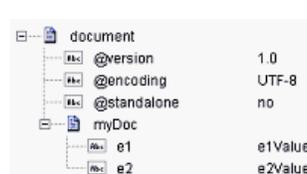
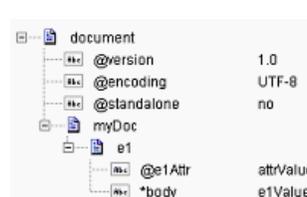
```
<?xml version="1.0" encoding="UTF-8"
standalone="no"?>
<myDoc>
<e1>e1Value</e1>
</myDoc>
```

```
<?xml version="1.0" encoding="UTF-8"
standalone="no"?>
<myDoc>
<e1 e1Attr="attrValue">e1Value</e1>
</myDoc>
```

```
<?xml version="1.0" encoding="UTF-8"
standalone="no"?>
<myDoc>
<e1>e1Value</e1>
<e2>e2Value</e2>
</myDoc>
```

```
<?xml version="1.0" encoding="UTF-8"
standalone="no"?>
<myDoc>
<e1>e1Value1</e1>
<e2>e2Value</e2>
<e1>e1Value2</e1>
</myDoc>
```

Output from xmlNodeToDocument

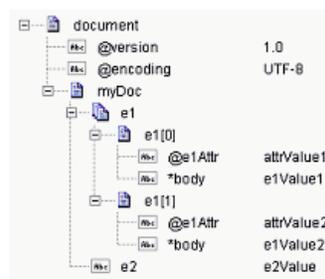


XML Document

```
<?xml version="1.0"
encoding="UTF-8"?>
<myDoc>
<e1 e1Attr="attrValue1">e1Value1</e1>

<e2>e2Value</e2>
<e1 e1Attr="attrValue2">e1Value2</e1>
</myDoc>
```

Output from xmlNodeToDocument

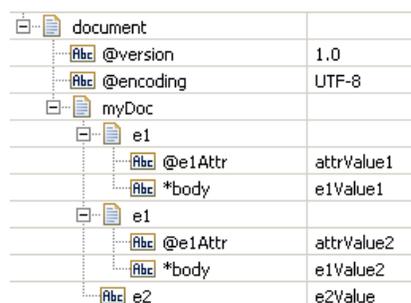


Note:

This example assumes that *makeArrays* is set to true. Note that *e1* was created as a document list, which holds both *<e1>* elements from the XML document.

```
<?xml version="1.0"
encoding="UTF-8"?>
<myDoc>
<e1 e1Attr="attrValue1">e1Value1</e1>

<e2>e2Value</e2>
<e1 e1Attr="attrValue2">e1Value2</e1>
</myDoc>
```



Note:

This example assumes that *makeArrays* is set to false and that *watt.server.xml.xmlNodeToDocument*. *keepDuplicates* is set to true (the default). Note that both *<e1>* elements from the source XML are retained.

```
<?xml version="1.0"
encoding="UTF-8"?>
<myDoc>
<e1 e1Attr="attrValue1">e1Value1</e1>

<e2>e2Value</e2>
<e1 e1Attr="attrValue2">e1Value2</e1>
</myDoc>
```



Note:

This example assumes that *makeArrays* is set to false and that *watt.server.xml.xmlNodeToDocument*. *keepDuplicates* is set to false. Note that only the last *<e1>* element in the source XML was retained in the resulting document.

XML Document

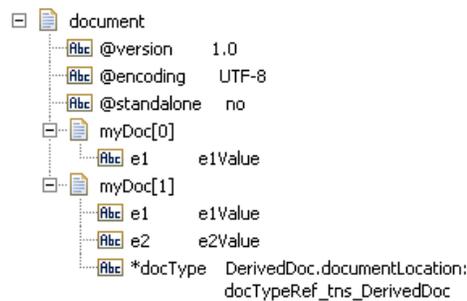
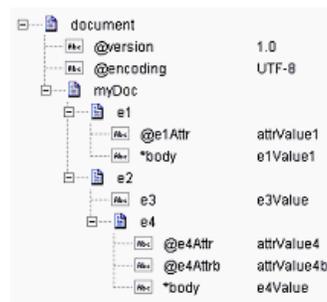
```
<?xml version="1.0"
encoding="UTF-8"?>
<myDoc>
<e1 e1Attr="attrValue1">e1Value1</e1>

<e2>
<e3>e3Value</e3>
<e4 e4Attr="attrValue4"
e4Attrb="attrValue4b">e4Value
</e4>
</e2>
</myDoc>
```

```
<?xml version="1.0" encoding="UTF-8"
standalone="no"?>
<tns:AcctInfo>
xmlns:tns="http://localhost/Derived
Address/schema.xsd"
xmlns:xsi="http://www.w3.org/2001/
XMLSchema-instance" >
<myDoc> <e1>e1Value</e1>
</myDoc>
<myDoc xsi:type="tns:DerivedDoc">

<e1>e1Value</e1>
<e2>e1Value</e2>
</myDoc>
</tns:AcctInfo>
```

Output from xmlNodeToDocument



pub.xml:xmlStringToEnhancedXMLNode

WmPublic. Converts an XML document (represented as a String, byte[], or InputStream) to an org.w3c.dom.Node object using the enhanced XML parser.

An DOM node is a special representation of an XML document that can be consumed by any program that uses standard DOM APIs. The pub.xml:xmlNodeToDocument service accepts a DOM object as input.

Input Parameters

xmldata **String** Optional. String containing the XML document to convert to an XML node.

Note:

If you specify *xmldata*, do not specify *\$filedata* or *\$filestream*.

\$filedata **byte[]** Optional. byte[] containing the XML document to convert to an XML node.

Note:

If you specify *\$filedata*, do not specify *xmldata* or *\$filestream*.

\$filestream

java.io.InputStream Optional. InputStream containing the XML document to convert to an XML node.

Note:

If you specify *\$filestream*, do not specify *xmldata* or *\$filedata*.

encoding

String Optional. Character encoding in which text is represented. Specify UTF-8 for XML files and ISO-8859-1 for HTML files. To have the parser attempt to detect the type of encoding, specify `autoDetect` (the default, if *encoding* is not specified).

inputProcessing

Document. Optional. Contains a set of input parameters that instruct Integration Server how to read the XML document. The fields are comparable to options in the `javax.xml.stream.XMLInputFactory` class.

Key	Description
<i>isValidating</i>	<p>String Optional. Determines whether Integration Server performs DTD validation. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to perform DTD validation. ■ <code>false</code> to disable DTD validation. This is the default.
<i>isNamespaceAware</i>	<p>String Optional. Determines whether Integration Server provides namespace processing for XML 1.0 support while parsing the XML document. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to enable namespace processing. This is the default. ■ <code>false</code> to disable namespace processing.
<i>isCoalescing</i>	<p>String Optional. Determines whether Integration Server coalesces adjacent character data while parsing the XML document. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to coalesce adjacent character data. ■ <code>false</code> to indicate that Integration Server does not coalesce adjacent character data. This is the default.
<i>isReplacingEntityReferences</i>	<p>String Optional. Determines whether, while parsing the XML document, Integration Server replaces internal entity references with replacement text and treats them as characters. Set to:</p>

- `true` to replace entity references.
- `false` to indicate entity references will not be replaced. This is the default.

*isSupporting
ExternalEntities*

String Optional. Determines whether Integration Server resolves external parsed entities while parsing the XML document. Set to:

- `true` to resolve external parsed entities.
- `false` to indicate Integration Server does not support external parsed entities.

The JVM in which Integration Server runs determines the default.

supportDTD

String Optional. Determines whether Integration Server supports DTDs while parsing the XML document. Set to:

- `true` to support DTDs while parsing the XML document.
- `false` to disable support of DTDs while parsing the XML document. This is the default.

partitionSize

String Optional. Specifies the size, measured in bytes, of the partitions on the heap where the enhanced XML parser stores parsed document information. Specify a suffix of “k” to indicate kilobytes or “m” to indicate megabytes. For example, 10k or 10m.

If you do not specify a value, Integration Server uses the default partition size value specified on the **Settings > Enhanced XML parsing** page in Integration Server Administrator.

Output Parameters

node

org.w3c.dom.Node XML node representing the returned XML document. This object can be used as input to webMethods services that consume XML nodes in the form of a DOM object.

Usage Notes

The input parameters *xmldata*, *\$filedata*, and *\$filestream* are mutually exclusive. Specify only one of the preceding parameters. Integration Server checks the parameters in the following order, using the value of the first parameter that has a specified value: *\$filedata*, *\$filestream*, and *xmldata*.

Use the [pub.xml:xmlStringToXMLNode](#) service to convert an XML document to an XML node using the legacy XML parser. For more information about the legacy XML parser and the enhanced XML parser, see *webMethods Integration Server Administrator's Guide*.

Keep the following information in mind when specifying a *partitionSize*

- The *partitionSize* is a hint for the enhanced XML parser so that it can estimate the amount of heap space needed to parse the document. Often, it not possible to determine the size of an inbound XML document before parsing.
- As a general rule, Software AG recommends a *partitionSize* that is 1/2 the size of the unparsed XML document.
 - A *partitionSize* that is considerably larger than 1/2 the size of the unparsed XML document causes the enhanced XML parser to consume more heap space than necessary but might also improve throughput. However, this can impact the overall performance of Integration Server.
 - A *partitionSize* that is considerably smaller than 1/2 the size of the unparsed XML document causes the enhanced XML parser to create a large number of partitions to parse the document. While this might use less heap space, it may reduce the throughput of the parser.
 - A *partitionSize* that is three times smaller or three times larger than 1/2 the size of the unparsed XML document will likely have little impact on the performance.
- At run time, the enhanced XML parser overrides a *partitionSize* that consumes all of the available heap space.
- At run time, if the *partitionSize* results in an initial heap allocation that exceeds the single document limit set in the **Maximum heap allocation for any single document** field the limit for all documents set in the **Maximum heap allocation for all documents combined** field, the enhanced XML parser reduces the partition size automatically. For more information about heap allocation limits for the enhanced XML parser, see *webMethods Integration Server Administrator's Guide*.
- If you do not specify *partitionSize*, the enhanced XML parser uses the default specified in the **Default partition size** field on the **Settings > Enhanced XML parsing** page in Integration Server Administrator.

pub.xml:xmlStringToXMLNode

WmPublic. Converts an XML document (represented as a String, byte[], or InputStream) to an XML node.

An XML node is a special representation of an XML document that can be consumed by the Integration Server. Most webMethods services that operate on XML documents require an XML node as input.

Input Parameters

<i>xmldata</i>	<p>String Optional. String containing the XML document to convert to an XML node.</p> <p>Note: If you specify <i>xmldata</i>, do not specify <i>\$filedata</i> or <i>\$filestream</i>.</p>
<i>\$filedata</i>	<p>byte[] Optional. <code>byte[]</code> containing the XML document to convert to an XML node.</p> <p>Note: If you specify <i>\$filedata</i>, do not specify <i>xmldata</i> or <i>\$filestream</i>.</p>
<i>\$filestream</i>	<p>java.io.InputStream Optional. <code>InputStream</code> containing the XML document to convert to an XML node.</p> <p>Note: If you specify <i>\$filestream</i>, do not specify <i>xmldata</i> or <i>\$filedata</i>.</p>
<i>encoding</i>	<p>String Optional. Character encoding in which text is represented. Specify UTF-8 for XML files and ISO-8859-1 for HTML files. To have the parser attempt to detect the type of encoding, specify <code>autoDetect</code> (the default, if <i>encoding</i> is not specified).</p>
<i>expandDTD</i>	<p>String Optional. Flag indicating whether references to parameter entities in the XML document's DTD are to be processed. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to expand references to parameter entities to their full definition. ■ <code>false</code> to ignore references to parameter entities. This is the default.
<i>isXML</i>	<p>String Optional. Flag specifying whether the input document is XML or HTML. (<code>xmlStringToXMLNode</code> must know this so that it can parse the document correctly.) Set to:</p> <ul style="list-style-type: none"> ■ <code>autoDetect</code> to parse the document based on its type. When you use this option, <code>xmlStringToXMLNode</code> detects the document's type based on its <code><!DOCTYPE... \></code> or <code><?XML... \></code> tag. If it cannot determine a document's type, it parses it as HTML. This is the default. ■ <code>true</code> to parse the document as XML. ■ <code>false</code> to parse the document as HTML.
<i>expandGeneralEntities</i>	<p>String Optional. Flag indicating whether <code>pub.xml:xmlStringToXMLNode</code> should expand references to general entities in the XML document's DTD. Set to:</p> <ul style="list-style-type: none"> ■ <code>true</code> to expand references to general entities to their full definition. This is the default.

- `false` to ignore references to general entities.

validateXML

String. Optional. Flag indicating whether Integration Server validates the incoming XML document to determine whether it is well-formed XML before converting the XML document. Set to:

- `true` to validate the incoming XML. If validation fails, the service ends with a `ServiceException`.
- `false` to skip validation. This is the default.

Output Parameters

node

com.wm.lang.xml.Node XML node representation of the XML document in *xmlData*. This object can be used as input to *webMethods* services that consume XML nodes.

Usage Notes

The input parameters *xmlData*, *\$filedata*, and *\$filestream* are mutually exclusive. Specify only one of the preceding parameters. Integration Server checks the parameters in the following order, using the value of the first parameter with a specified value: *\$filedata*, *\$filestream*, and *xmlData*.

If *expandGeneralEntities* is not specified, Integration Server uses the value in `watt.core.xml.expandGeneralEntities`. If `watt.core.xml.expandGeneralEntities` is not set, the references to general entities are always expanded.

Use the [pub.xml:xmlStringToEnhancedXMLNode](#) service to convert an XML document to an XML node using the enhanced XML parser. For more information about the legacy XML parser and the enhanced XML parser, see *webMethods Integration Server Administrator's Guide*.

49 XMLData Folder

■ Summary of Elements in this Folder	1102
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You can use the services in the `xmldata` folder to convert a DOM node to an XMLData formatted document, convert XMLData to an XML String, and retrieve and set instance data from XMLData.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.xmldata.domNodeToXMLData	WmPublic. Converts a DOM node and its child nodes to a document in the XMLData format and optionally validates each node.
pub.xmldata:getAttributes	WmPublic. Retrieves the attributes from an XMLData document.
pub.xmldata:getGroupObjects	WmPublic. Queries the object tags and objects in a group of unknown structure to return information about the tags in the group.
pub.xmldata:getGroupValues	WmPublic. Queries the object tags and objects in a group of unknown structure to return information about the tags in the group.
pub.xmldata:getInstanceTag	WmPublic. Retrieves the value of a specified instance tag for a particular element in an XMLData document.
pub.xmldata:getNamespaceTags	WmPublic. Retrieves the namespace declarations for a particular element in an XMLData document.
pub.xmldata:queryXMLNode	WmPublic. Queries an XML node and returns the results in the XMLData format in which field names are fully qualified with an <code>ncName</code> and a namespace.
pub.xmldata:setAttribute	WmPublic. Sets the value for a specific attribute in an XMLData document.
pub.xmldata:setInstanceTag	WmPublic. Sets the value of an instance tag for a particular element in an XMLData document.
pub.xmldata:setNamespaceTag	WmPublic. Sets the namespace declaration for a particular element in an XMLData document.
pub.xmldata:xmlDataToXMLString	WmPublic. Converts an XMLData document to an XML string.

pub.xmldata.domNodeToXMLData

WmPublic. Converts a DOM node and its child nodes to a document in the XMLData format and optionally validates each node.

This service converts each element and attribute in the DOM node to the XMLData format. Note that XMLData is an IData document arranged in a particular format that is described by an XML document type.

A DOM node tree is a special representation of an XML document that can be consumed by any program that uses standard DOM APIs. For example, the `pub.xml:xmlStringtoXMLNode` and `pub.xmlStringToEnhancedXMLNode` services produce a DOM tree. A DOM node tree contains parsed XML content.

Input Parameters

<i>node</i>	org.w3c.dom.Node DOM node that is to be converted to an XMLData (Document). Note that <code>com.wm.lang.xml.Node</code> is a DOM node.
<i>conformsTo</i>	<p>String Optional. Fully-qualified name of the XML document type on Integration Server against which to validate the DOM node. Specify a value for <i>conformsTo</i> only if you want to do the following:</p> <ul style="list-style-type: none"> ■ Validate the DOM node as part of converting it to XMLData. Integration Server validates a DOM node in the tree as part of converting the tree node to and XMLData-formatted Document. ■ Use the XML document type to direct the conversion of the DOM node. That is, the structure of the XML document type determines the structure of the resulting XMLData.

Note:

You must specify an XML document type for *conformsTo* if you intend to modify the generated XMLData using the mapping tools available in the pipeline.

Note:

One or more XML document types are created from a single XML schema definition. To create an XMLData-formatted Document using the XML document types created from an XML Schema definition, you need specify only one of the XML document types or XML fields created from the schema. Integration Server locates the related XML document types, using the complete collection of XML document types and XML fields created from the schema during conversion and validation.

If you do not specify an XML document type for *conformsTo*, Integration Server does not validate the input nodes as part of the conversion. Additionally, the service formats the resulting XMLData in a generic way instead of in a manner that matches an XML document type.

<i>maxErrors</i>	String Optional. Number of errors to be collected. Default value is 1. When the number of errors found is equal to <i>maxErrors</i> , the validation processor stops validation and returns the result. If <i>maxErrors</i> is set to -1, the validation processor returns all errors.
------------------	---

The service uses the *maxErrors* input parameter only when a *conformsTo* value is specified.

ignoreContent **String** Optional. Flag that specifies whether the validation processor will validate simple content where simple content is content keys of the type String, String List, or String Table.

Set to:

- `true` to ignore content (that is, do not validate the content of keys of the type String, String List, or String Table). Integration Server validates the structure and key names of the XML document only.
- `false` to validate content. This is the default.

The service uses the *ignoreContent* input parameter only when a *conformsTo* value is specified.

failIfInvalid **String** Optional. Flag that indicates whether the service should fail and throw an exception if the object is invalid. Set to:

- `true` to indicate that the service should fail if the object is invalid.
- `false` to indicate that service should signal success and return errors to the pipeline if object is invalid. This is the default.

The service uses the *ignoreContent* input parameter only when a *conformsTo* value is specified.

Output Parameters

isValid **String** Conditional. Flag that indicates whether or not validation of the DOM node was successful. A value of:

- `true` indicates that the validation was successful.
- `false` indicates that the validation was unsuccessful.

The service returns the *isValid* parameter only if *conformsTo* specifies an XML document type.

errors **Document List** Conditional. Errors encountered during validation. Each document will contain the following information:

Key	Description
<i>pathName</i>	String Location of the error in XQL.
<i>errorCode</i>	String Error code (for example, VV-001).
<i>errorMessage</i>	String Error message (for example, Missing Object).

The service returns the *errors* parameter only if *conformsTo* specifies an XML document type.

xmlDataDocument **Document** An XMLData-formatted document that represents the elements and attributes in the DOM node.

Usage Notes

If the *conformsTo* input parameter specifies an XML document type or an XML field, the `pub.xmldata:domNodetoXMLData` service does the following:

- Uses the XML document type (and any other XML document types and XML fields created from the same XML schema definition) to direct the structure of the XMLData.
- Validates each DOM node in the tree before converting it to XMLData.

You can use the `pub.schema:validate` service to validate XMLData.

When validating XML, Integration Server uses the Java regular expression compiler.

When validating XML, Integration Server uses the W3C recommendation *XML Schema Part 2: Datatypes*. If you want to validate XML for illegal values, set *ignoreContent* to `false` and the `watt.core.validation.w3cConformant` configuration parameter to `true`. For information about setting this configuration parameter, see *webMethods Integration Server Administrator's Guide*.

pub.xmldata:getAttributes

WmPublic. Retrieves the attributes from a an XMLData document.

If an XML Schema definition contains a complex type definition with an *anyAttribute* declaration, the XML document type created from the schema contains a corresponding **anyAttribute* field. As the purpose of the *anyAttribute* declaration to act as a placeholder or wildcard, the XML document type cannot have a more specific representation. Use the `pub.xmldata:getAttributes` service to retrieve the attribute and attribute value included in an XML document at run time. That is, use the service to find the unknown attributes that are not declared in the XML document type. To set the attribute value in the XMLData, you must use the `pub.xml:setAttribute` service.

Input Parameters

xmlDataAttributes **Document** The **attributes* from which you want to retrieve a list of attributes. The **attributes* field is an XMLData document.

If an element of complex type defines or carries attributes, Integration Server places the attributes in an **attributes* document that is of type XMLData.

ncName **String** Optional. The NCName (non-colonized name), of the attribute. The NCName is also called the local name. If you do not specify a value

for *ncName*, the service returns all attributes belonging to the namespace specified in the *namespace* input parameter.

namespace

String Optional. The namespace URI for the attribute. If you do not specify a value, the service looks for attributes that do not belong to a namespace.

Output Parameters

results

Document List A list of XMLData documents that contain the attributes that match the supplied *ncName* and *namespace* values.

If no attributes match the supplied *ncName* and *namespace* values, the service returns an empty (zero length) list.

Key	Description
<i>ncName</i>	String The NCName of the attribute.
<i>namespaceName</i>	String The namespace URI for the attribute.
<i>value</i>	String The value of the attribute.

pub.xmldata:getGroupObjects

WmPublic. Queries the object tags and objects in a group of unknown structure to return information about the tags in the group.

The structure of a group is unknown when:

- The conversion from XML to XmlData is not directed by an XML document type.
- The `complexContent` model for a group is `anyType`.
- A content model contains `any` or `substitutionGroup` particles.

The service returns information for a specific tag or set of tags in a group. (A group consists of tags and objects.) This is in contrast to `pub.xmldata:getGroupValues` which returns information about the values in a group.

The service takes a group as input and, for output, produces a list of descriptive information Documents about each tag in the group that meets the provided query criteria. A tag is comprised of a particle-id, a local name, and an optional namespace. The object associated with a tag can be an array if the tag is defined as holding repeating values (`maxOccurs > 1`).

Input Parameters

query

Document. Document containing the group to query and the query parameters.

Key	Description
<i>groupValue</i>	Document The group to be queried in an XmlData document.
<i>ncName</i>	String Optional. The NCName (non-colonized name) of the tags you want to query in the group. The NCName is also called the local name. If you do not specify a value for <i>ncName</i> , the service queries all tags belonging to the namespace specified in the <i>namespace</i> input parameter.
<i>namespace</i>	String Optional. The namespace URI for the tag you want to query in the group. If you specify an empty String, the service queries only tags that do not belong to a namespace. If you do not specify a <i>namespace</i> , the service looks for a tags that belong to any namespace. If no <i>ncName</i> and no <i>namespace</i> is specified, the service queries all tags.
<i>particleID</i>	String Optional. The sequential number for the particle in a group that you want to query. A value of 1 refers to the first instance of the field with <i>ncName#namespace</i> name.

Output Parameters

results **Document List.** Query results. Returns one document for each tag in the input group that meets the query parameters.

Key	Value
<i>ncName</i>	String NCName portion of the tag.
<i>namespace</i>	String Namespace portion of the tag.
<i>particleID</i>	String ParticleId portion of the tag
<i>tagType</i>	String Type of tag. The <i>tagType</i> is one of the following: <ul style="list-style-type: none"> ■ any ■ group ■ element ■ substitution
<i>object</i>	Object. The object associated with the tag.
<i>objectType</i>	String The base object type. The <i>objectType</i> is one of the following:

- String
- Document
- Object

hasRepeatingValues **String** Indicates if the object is an array. A value of:

- true indicates the object is an array.
- false indicates the object is not an array.

size **String** The size of the array.

Usage Notes

Together, the *ncName*, *namespace*, and *particleId* identify a particular field in the XmlData group.

pub.xmldata.getGroupValues

WmPublic. Queries the contents of a group with unknown structure to return information about the values in the group.

The contents of a group can be unknown when the instance content corresponds to an *anyType*, *substitutionGroup*, or content created without using document type-directed conversion. A group consists of tags and values.

The `pub.xmldata.getGroupValues` service accepts a group as input along with an optional set of query parameters. The service produces a set of descriptive information documents about each value in the group. Because each tag can have repeating values, the length of the result list could be many times the number of tags present in the provided group. However, the result can be thought of as a flattened list of the objects associated with the tags.

Input Parameters

query **Document** Group from which to obtain values and any query parameters to identify the particular field or fields for which you want to obtain values.

Key	Value
<i>groupValue</i>	Document The group to be queried.
<i>ncName</i>	String Optional. The NCName (non-colonized name), of the tag you want to query in the group. The NCName is also called the local name. If you do not specify a value for <i>ncName</i> , the service queries all tags belonging to the namespace specified in the <i>namespace</i> input parameter.

<i>namespace</i>	String Optional. The namespace URI for the tag you want to query in the group. If you specify an empty <i>String</i> , the service queries tags that do not belong to any namespace. If you do not specify a <i>namespace</i> and a <i>ncName</i> , the service returns information about all tags.
<i>particleId</i>	String Optional. The sequential number for the particle in a group that you want to query. A value of 1 refers to the first instance of the field with <i>ncName#namespace</i> name.
<i>objectIndex</i>	String Optional. Index of an object in the group. You can supply <i>objectIndex</i> instead of supplying <i>ncname</i> , <i>namespace</i> , and <i>particleId</i>).

Output Parameters

results **Document List** IData array containing the results of the query for group values. The array contains one document for each value. Because an object can contain multiple values, the length of the list might be longer than the number of tags contained in the group. All the values from all of the tags are combined into a single list, representing the list of values as they appeared in the input XML.

This service simplifies obtaining values for content when the object tags are a mixture of any and substitution tags. The returned array has the corresponding tags for the value as it appeared in the original XML rather than the as it appears in the document type object model.

Key	Value
<i>objectIndex</i>	String The offset of the object in the list group objects in the provided <i>groupValue</i> . This is the tag to which the value belongs. If a tag has more than one value, then more than one item in the results array will have the same <i>objectIndex</i> .
<i>ncName</i>	String NCName portion of the value tag. If the <i>tagType</i> is a substitution or any tag, the value tag will not have the same NCName as the object tag.
<i>namespace</i>	String Namespace portion of the value tag. If the <i>tagType</i> is a substitution or any tag, the value tag will not have the same namespace as the object tag.
<i>particleId</i>	String ParticleID portion of the value tag. If the <i>tagType</i> is a substitution or any tag, the <i>particleId</i> is 1.

<i>index</i>	String The offset into the repeating values for the object that corresponds to <i>objectIndex</i> .
<i>tagType</i>	String Type of tag. The <i>tagType</i> is one of the following: <ul style="list-style-type: none">■ <code>group</code>■ <code>element</code>
<i>value</i>	Object Value associated with the tag at the returned <i>index</i> .
<i>valueType</i>	String The base value type. The <i>valueType</i> is one of the following: <ul style="list-style-type: none">■ <code>simple</code> indicates a String value.■ <code>group</code> indicates that the value is an IData that does not contain attributes, nor does it contain a repeating top-level group.■ <code>complex</code> indicates the value contains attributes and/or a repeating top-level group.■ <code>none</code> indicates an empty model.
<i>complexContent</i>	Object Conditional. The <i>complexContent</i> for the returned <i>value</i> . The <i>complexContent</i> is returned for complex values only.
<i>repeatingComplexContent</i>	String Conditional. Indicates if the top-level group value is an array (. A value of: <ul style="list-style-type: none">■ <code>true</code> indicates the object is an array.■ <code>false</code> indicates the object is not an array. The <i>repeatingComplexContent</i> variable is returned only for complex values (that is, when <i>valueType</i> is <code>complex</code>).
<i>complexContentType</i>	String Conditional. The type of complex content. The <i>complexContentType</i> can be one of the following: <ul style="list-style-type: none">■ <code>simple</code>■ <code>group</code>■ <code>none</code>
<i>attributes</i>	Document Conditional. An IData containing the attribute and values.

The *attributes* variable is returned only for complex values (that is, when *valueType* is complex).

pub.xmldata:getInstanceTag

WmPublic. Retrieves the value of a specified instance tag from a field in XMLData document.

An element in an XML document may contain information that is unique to that particular instance document, including instance (xsi) assertions such as type, nil, or schemaLocation. Because instance information cannot be asserted in an XML schema definition, an XML document type cannot contain fields for the instance information. It is impossible for the XML Schema definition and the XML document types generated from that schema to know where the instance assertions might be specified in an instance document. When an XML instance document is parsed and converted to XMLData, specifically an XMLData-formatted document, Integration Server places the instance information in **instance* field under the parent of the field that contains the instance information. That is, Integration Server stores the instance information in an **instance* field that is a child of the field that corresponds to the element that contains the instance information in the XML document. Use the `pub.xmldata:getInstanceTag` service to retrieve the instance information from the XMLData created from the XML document. After you retrieve the instance information, you can manipulate or use the instance information in the pipeline. To set the value of the instance information in the XMLData, use the `pub.xml:setInstanceTag` service.

Input Parameters

<i>xmlDataParent</i>	Document The XMLData document that is a parent of the field for which to retrieve the instance tag value.
<i>ncName</i>	String The NCName (non-colonized name), of the field for which you want to retrieve an instance tag value. The NCName is also called the local name.
<i>namespace</i>	String Optional. The namespace URI for the field for which you want to retrieve an instance tag value. If you do not specify a value, the service looks for tags that do not belong to a namespace.
<i>particleId</i>	String The sequential number for the particle in a model group for which you want to retrieve an instance tag value. A value of 1 refers to the first instance of the field with <i>ncName#namespace</i> name in a model group.
<i>index</i>	String Optional. If the field for which you want to retrieve a tag value is a repeating field (<i>minOccurs</i> > 0), specify the index for the occurrence for which you want to retrieve a tag value. A value of 0 refers to the first instance of a repeating field.
	Note: Repeating elements are represented as arrays in XMLData.
<i>tagName</i>	String Name of the instance tag for which you want to retrieve a value, such as type, nil, schemaLocation.

Note:
Tag names are case-sensitive.

Output Parameters

tagValue **String** Value of the tag.

Usage Notes

Together, the *ncName*, *namespace*, *particleId*, and *index* identify a particular field in the XMLData document.

pub.xmldata:getNamespaceTags

WmPublic. Retrieves the namespace declarations, specifically the prefix and namespace URI, associated with a particular field in an XMLData Document.

An element in an XML document may contain information that is unique to that particular instance document, including namespace declarations and instance assertions such as type, nil, or schemaLocation. A namespace declaration associates a prefix with a namespace URI. Because namespace declarations cannot be asserted for an element in an XML schema definition, an XML document type cannot contain fields for the namespace declarations. It is impossible for the XML Schema definition and the XML document types generated from that schema to know where the namespace declarations might be specified in an instance document. When an XML instance document is parsed and converted to XMLData, specifically an XMLData-formatted document, Integration Server places the namespace declarations in a *namespace field under the parent of the element that contains the namespace declaration. That is, Integration Server stores the namespace declarations in an *namespace field that appears as a child of the field that corresponds to the element containing the namespace declaration in the XML document. Use the pub.xmldata:getNamespaceTag service to retrieve the namespace declarations for a particular field from the XMLData created from the XML document. After you retrieve the namespace declaration, you can manipulate the namespace declarations in the pipeline. To set the value of a namespace declaration for a particular field in the XMLData, use the pub.xml:setNamespaceTag service.

Input Parameters

xmlDataParent **Document** The XMLData document that is a parent of the field for which to retrieve the namespace tag and value.

ncName **String** The NCName (non-colonized name), of the field for which you want to retrieve an namespace declaration. The NCName is also called the local name.

<i>namespace</i>	String Optional. The namespace URI for the field for which you want to retrieve the namespace declaration. If you do not specify a namespace, the service looks for a field that does not belong to a namespace.
<i>particleId</i>	String The sequential number for the particle in a model group for which you want to retrieve a namespace declaration. A value of 1 refers to the first instance of the field with <i>ncName#namespace</i> name in a model group.
<i>index</i>	String Optional. If the field for which you want to retrieve a namespace declaration is a repeating field (<i>minOccurs</i> > 0), the index for the occurrence for which you want to retrieve the namespace declaration. A value of 0 refers to the first instance of a repeating field.

Note:

Repeating elements are represented as arrays in XMLData.

Output Parameters

<i>results</i>	Document List A document (IData) containing namespace declarations for the specified field. A namespace declaration consists of a prefix and a namespace URI.
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Key	Description
<i>tagName</i>	String Prefix specified in the namespace declaration. The <i>tagName</i> parameter contains an empty string if this is the default namespace declaration.
<i>tagValue</i>	String The namespace URI associated with the namespace declaration.

Usage Notes

Together, the *ncName*, *namespace*, *particleId*, and *index* identify a particular field in the XMLData.

pub.xmldata:queryXMLNode

WmPublic. Queries an XML node and returns the results in the XMLData format in which field names are fully qualified with an *ncName* and a namespace.

The *fields* parameter specifies how data is extracted from the node to produce an output variable. This output variable is called a "binding" because the *fields* parameter binds a certain part of the document node to a particular output variable. At run time, this service must include at least one *fields* entry and at least one entry in *fields*. The result of each query you specify in *fields* is returned in a variable whose name and type you specify.

Each *fields* list defines bindings for one level of the output with the top-level *fields* being the pipeline and the first level down *fields* being contents of a document or document list in the pipeline. As such, the top-level *fields* parameter is not namespace qualified but the lower-level *fields* are.

Input Parameters

- node* The XML node or enhanced XML node that you want to query. This parameter supports the following types of input:
- **com.wm.lang.xml.Node** XML node that you want to query. An XML node can be produced by [pub.xml:loadXMLNode](#), [pub.xml:xmlStringToXMLNode](#), or an XML content handler.
 - **enhanced XML node** The enhanced XML node that you want to query. An enhanced XML node can be produced by [pub.xml:loadEnhancedXMLNode](#), [pub.xml:xmlStringToEnhancedXMLNode](#), or an XML content handler that receives a document with an `xmlFormat` is set to `enhanced`. If you supply an enhanced XML node, you must use XQL to query the node.
- nsDecls* **Document** Optional.
- Namespaces associated with any namespace prefixes used to specify elements in *fields/query*. Each entry in *nsDecls* represents a namespace prefix/URI pair, where a key name represents a prefix and the value of the key specifies the namespace URI.
- nsDecls* is not used for creating output fields.
- For example, to define the URIs associated with two prefixes called `GSX` and `TxMon`, you would set *nsDecls* as follows:
- Instead of defining prefix/namespace pairs in *nsDecls*, you can specify a namespace for each field using the *namespace* parameter that is an immediate child of the *fields* variable, (i.e., *fields/namespace*)
- defaultNamespace* **String** Optional. The namespace to use as the default for each *namespace* parameter. An empty string indicates no default namespace.
- You can override the default namespace by specifying a namespace for a field in the *fields/namespace* parameter.
- fields* **Document List** Optional. An array of documents where each document defines a field to be created in the output. Each document contains parameters that describe how data is to be extracted from *node*. That is, each document in the list contains parameters for a single query.

Key	Value
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name **String** Optional. Name to assign to the value resulting from the query. That is, the name of a field output by the service.

Typically, this *name* field is used for top-level fields because top-level fields produced by this service equate to named pipeline variables. However, the *name* field may also be used to name the *attributes document.

resultType **String** Object type that the query is to yield. The following shows the allowed values for *resultType*.

<u>Underlying Value</u>	<u>Corresponding Data Type</u>
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Object	Object
Object[]	Object List
Record	Document
Record[]	Document List
String	String
String[]	String List
String[][]	String Table

query **String** Query identifying the data to be extracted from *node*.

The query must use the prefix-qualified form for tag names (even though the output is formatted as XmlData). If prefix-qualified names are used, the *nsdecls* parameter must also be set.

queryType **String** Query language in which *query* is expressed. Valid values are WQL and XQL.

If the content of *node* is an enhanced XML node, you must set *queryType* to XQL.

For information about WQL syntax, see the *webMethods Service Development Help*.

childTags **String** Type of tags generated in the child fields produced by this field. Specify one of the following:

- `element` to indicate element tags are created. This is the default.
- `attribute` to indicate attribute tags are created. An attribute tag will not have a `particleId`.

onnull

String Optional. Code indicating what you want queryXMLNode to do when the result is null. Set to one of the following:

- *continue* to indicate that all result values are acceptable for this query (including null).
- *fail* to indicate that the service should fail if the result of this query is null and continue in all other cases.
- *succeed* to indicate that the service should continue if the result of this query is null and fail in all other cases.

fields

Document List Parameters that support nested execution of bindings. Each *fields* list defines bindings for one level of the output with the top level being the pipeline and the first level down being contents of a document or document list in the pipeline. For example, the output variable described by *fields/fields* is a Document or Document list in the pipeline.

The *fields/fields* variable and any further nested *fields* variables contain the same input parameters as the top-level fields (*name*, *query*, *resultType*, etc.) with the addition of the following input parameters needed to identify a particular field in the XMLData formatted document.

The *ncName*, *namespace*, and *particleId* inputs are only supported from the second level and down because the top-level item cannot be an xmldata-formatted tag.

ncName

String Optional. The NCname for the output field.

namespace

String Optional. The namespace portion of the output field. An empty string indicates no namespace.

This *namespace* value overrides the *defaultNamespace* value.

particleID

String Optional. The particleId portion of the output field.

Output Parameters

Document Results from the queries specified in *fields*. This service returns one element for each query specified in *fields*. The specific names and types of the returned elements are determined by the *fields/name* and *field/resultType* parameters of the individual queries.

Usage Notes

The `pub.xmldata:queryXMLNode` is different from the `pub.xml:queryXMLNode` service which returns the results in the legacy infoset format in which fields are qualified with a prefix and a namespace name. The `pub.xmldata:queryXMLNode` service uses the `NCName`, `namespace`, and `particleID` to qualify the output format. Use the `pub.xmldata:queryXMLNode` service when you are working with XMLData-encoded infoset. Use the `pub.xml:queryXMLNode` service when you are working with the legacy-encoded infoset.

pub.xmldata:setAttribute

WmPublic. Sets the value for a specific attribute in an XMLData document.

While the primary purpose of this service is to set the value of an attribute that is the runtime replacement for an anyAttribute declaration, you can use this service to set the value of any of the attributes in an XMLData document.

Input Parameters

<i>xmlDataAttributes</i>	Document The <i>*attributes</i> document of type XMLData in which you want to set the value of an attribute.
<i>ncName</i>	String The NCName (non-colonized name) of the attribute whose value you want to set. The NCName is also called a local name.
<i>namespace</i>	String Optional. The namespace URI for the attribute whose value you want to set. Leave <i>namespace</i> blank if the attribute does not belong to a namespace.
<i>value</i>	String The value that you want to assign to the attribute.

Output Parameters

None.

pub.xmldata:setInstanceTag

WmPublic. Sets the value of an instance tag for a specific field in an XMLData document.

Input Parameters

<i>xmlDataParent</i>	Document The XMLData document that is a parent of the field for which to set the instance tag value.
<i>ncName</i>	String The NCName (non-colonized name), of the field for which you want to set an instance tag value. The NCName is also called the local name.
<i>namespace</i>	String Optional. The namespace URI for the field for which you want to set an instance tag value. If the field does not belong to a namespace, do not specify a value for the <i>namespace</i> input parameter.
<i>particleID</i>	String The sequential number for the particle in a model group for which you want to set an instance tag value. A value of 1 refers to the first instance of the field with <i>ncName#namespace</i> name.
<i>index</i>	String Optional. If the field for which you want to set a tag value is a repeating field (<i>minOccurs</i> > 0), the index for the occurrence for which you want to set a tag value. A value of 0 refers to the first instance of a repeating field. If you specify the array index that is greater than the current size of the array, the array size increases and missing entries are null. Note: Repeating elements are represented as arrays in XMLData.
<i>tagName</i>	String Name of the instance tag for which you want to set a value, such as <i>type</i> , <i>nil</i> , <i>schemaLocation</i> . Note: Tag names are case-sensitive.
<i>tagValue</i>	String Value to assign to the instance tag. If you specify a null value, the service removes the tag and its value from the XMLData.

Output Parameters

None.

pub.xmldata:setNamespaceTag

WmPublic. Sets the namespace declaration for a particular field.

Input Parameters

<i>xmlDataParent</i>	Document The XMLData document that is a parent of the field for which to set a namespace declaration.
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<i>ncName</i>	String The NCName (non-colonized name), of the field for which you want to set a namespace declaration. The NCName is also called the local name.
<i>namespace</i>	String Optional. The namespace URI for the field for which you want to set a namespace declaration. If the field does not belong to a namespace, do not specify a value for the <i>namespace</i> input parameter.
<i>particleID</i>	String The sequential number for the particle in a model group for which you want to set a namespace declaration. A value of 1 refers to the first instance of the field with <i>ncName#namespace</i> name.
<i>index</i>	String Optional. If the field for which you want to set a namespace declaration is a repeating element (<code>minOccurs > 0</code>), the index for the occurrence for which you want to set a tag value. A value of 0 refers to the first instance of a repeating field. If you specify the array index that is greater than the current size of the array, the array size increases and missing entries are null. If you specify an index that is beyond the end of the array, the service increases the size of the array and the intervening indexes have a null value.
	Note: Repeating elements are represented as arrays in XMLData.
<i>tagName</i>	String The prefix to associate with the namespace declaration. Specify an empty string to associate a value with the default namespace declaration, that is, specify: ""
<i>tagValue</i>	String The namespace URI to associate with the prefix in <i>tagName</i> . If you specify a null value, the service removes the namespace declaration from the XMLData.

Output Parameters

None.

pub.xmldata:xmlDataToXMLString

WmPublic. Converts an XMLData document to an XML string.

The `pub.xmldata:xmlDataToXMLString` service recurses through a given document formatted as XMLData, building an XML representation from the elements within it. Key names are turned into XML elements and attributes, and the key values are turned into the contents of those elements.

Input Parameters

xmlDataDocument **Document** XMLData document that is to be converted to XML.

encode

String Optional. Flag indicating whether to HTML-encode the data. Set this parameter to true if your XML data contains special characters, including the following: < > & " '

Set to:

- true to HTML-encode the data.

For example, the string expression 5 < 6 would be converted to <expr>5 < 6</expr>, which is valid.

- false to not HTML-encode the data. This is the default.

For example, the string expression 5 < 6 would be converted to <expr>5 < 6</expr>, which is invalid.

Output Parameters

xmlString

String XML String produced from *xmlDataDocument*.

50 XSLT Folder

■ Summary of Elements in this Folder	1122
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You use the elements in the XSLT folder to transform XML into a byte array, file, or XML node, and to maintain the XSLT stylesheet cache.

Summary of Elements in this Folder

The following elements are available in this folder:

Element	Package and Description
pub.xslt.Transformations:transformSerialXML	WmXSLT. Uses an XSLT stylesheet to transform XML, then stores the transformed XML in a byte array, file, or XML node.
pub.xslt.Cache:removeAllTemplates	WmXSLT. Clears the XSLT stylesheet cache.
pub.xslt.Cache:removeTemplate	WmXSLT. Removes one stylesheet from the XSLT stylesheet cache.

The WmXSLT package also comes with sample services that show you how to use the public services.

pub.xslt.Transformations:transformSerialXML

WmXSLT. Uses an XSLT stylesheet to transform XML, then stores the transformed XML in a byte array, file, or XML node.

To optimize performance, the service stores the XSLT stylesheet in a cache so the stylesheet will be instantly available to the service for later runs.

Input Parameters

<i>stylesheetSystemId</i>	String URI (simple file path or URL) for the XSLT stylesheet to use.
<i>systemId</i>	String URL of the XML to transform. If you specify this parameter, do not specify the <i>filename</i> , <i>bytes</i> , or <i>xmlStream</i> parameter.
<i>filename</i>	String Fully qualified name of the file that contains the XML to transform. The file must be located on the local machine. If you specify this parameter, do not specify the <i>systemId</i> , <i>bytes</i> , or <i>xmlStream</i> parameter.
<i>bytes</i>	byte[] XML to transform. If you specify this parameter, do not specify the <i>systemId</i> , <i>filename</i> , or <i>xmlStream</i> parameter.
<i>xmlStream</i>	Input stream XML to transform. If you specify this parameter, do not specify the <i>systemId</i> , <i>filename</i> , or <i>bytes</i> parameter.
<i>xslParamInput</i>	Document Optional. Name/value pairs to pass to the stylesheet. See the <i>webMethods Service Development Help</i> for instructions on setting up a stylesheet to work with this parameter.

- resultType* **String** Tells Designer what to transform the XML into. Must be one of these values:
- `bytes` to transforms the XML into a byte array.
 - `file` to transforms the XML into a file. If you specify `file`, you must also specify the `outFileName` parameter.
 - `xmlNode` to transforms the XML into an XML node.
- outFileName* **String** Fully qualified name of the file in which to store the transformed XML. The file must be located on the local machine. Use this parameter only if you specified `file` on the *resultType* parameter.
- useCompiling Processor* **Boolean**. Optional. Specifies whether to use the Xalan compiling processor (XSLTC), which creates and uses compiled stylesheets or *translets*. Set to:
- `true` to use the `org.apache.xalan.xsltc.trax.TransformerFactoryImpl` class as a transformer factory.
 - `false` to use the transformer factory that is specified on the home page of the WmXSLT package. This is the default.
- If no translet currently exists for the stylesheet, the processor creates one. If a translet exists and the stylesheet has changed since the translet was created, the processor replaces the existing translet with a new one. If the stylesheet has not changed since the translet was created, the processor reuses the existing translet.
- If the *stylesheetSystemId* input parameter specifies a simple file path, the service writes the translet to the same folder in which the stylesheet for your XSLT service resides.
- If the *stylesheetSystemId* input parameter specifies a URL, the service writes the translet to memory. As a result, the translet will not survive Integration Server restart.
- loadExternalEntities* **String** Optional. Specifies whether or not to load external entities (file URIs, HTTP URLs, and so on) referenced in the XML that the service receives or in the XSLT stylesheet the service uses to transform the XML. Set to:
- `true` to load content from all external entities that are referenced in the XSLT stylesheet or in the XML. This is the default.
 - `false` to not load content from external entities that are referenced in the XSLT stylesheet or in the XML. Use this setting to prevent attacks from external entities by blocking those entities.

Important:

To help prevent an external entity attack in a production environment, set `loadExternalEntities` to `false` in each instance of the `transformSerialXML` service.

Output Parameters

<i>bytes</i>	byte[] Byte array that contains the transformed XML. The service places the byte array in the pipeline so that subsequent services can use it. This value is present only if you specified <code>bytes</code> in the <i>resultType</i> input parameter.
<i>node</i>	com.wm.lang.xml.Node Node that contains the transformed XML. The service places the XML node in the pipeline so that subsequent services can use it. This value is present only if you specified <code>xmlNode</code> in the <i>resultType</i> input parameter.
<i>xslParamOutput</i>	Document Document that contains name/value pairs that were returned by the stylesheet. The service places the document in the pipeline so that subsequent services can use it. This value is present only if you add name/value pairs to it within your stylesheet. See the section on passing name/value pairs from the stylesheet to the pipeline in <i>webMethods Service Development Help</i> for instructions on setting up your stylesheet to work with this parameter.

Example

You want to transform an XML document named `cdCatalog.xml` into an HTML document using an XSLT stylesheet named `cdCatalog.xsl`. You would pass the `transformSerialXML` service these values:

Input Parameters

<i>stylesheetSystemId</i>	<code>http://localhost:5555/WmXSLT/samples/xdocs/cdCatalog.xsl</code>
<i>systemId</i>	<code>http://localhost:5555/WmXSLT/samples/xdocs/cdCatalog.xml</code>
<i>resultType</i>	<code>bytes</code>

The service transforms the XML stream into a byte array containing an HTML document and puts the byte array in the pipeline. You could convert the byte array into a `String` using the Integration Server built-in service `pub.string.bytesToString`, then display the `String` using a dynamic server page (DSP). For information about using DSPs, see *Dynamic Server Pages and Output Templates Developer's Guide*.

Usage Notes

If *loadExternalEntities* is set to false, you can have the service load, read, and transform content from a trusted external entity by doing one of the following:

- Place the trusted external entity file in the Integration Server installation directory or subdirectories.
- Include the trusted external entity in the list of trusted entities identified in the server parameter `watt.core.xml.allowedExternalEntities`. For more information about this parameter, see *webMethods Integration Server Administrator's Guide*.

If *loadExternalEntities* is not specified in the service signature, Integration Server checks the value of the server parameter `watt.core.xml.expandGeneralEntities`. If this parameter is set to `false`, the `transformSerialXML` service blocks all external entities that are not included in the list of trusted entities specified in `watt.core.xml.allowedExternalEntities`. For more information about `watt.core.xml.expandGeneralEntities`, see *webMethods Integration Server Administrator's Guide*.

pub.xslt.Cache:removeAllTemplates

WmXSLT. Clears the XSLT stylesheet cache.

Input Parameters

None.

Output Parameters

message **String** Indicates whether the service was able to clear the cache.

pub.xslt.Cache:removeTemplate

WmXSLT. Removes one stylesheet from the XSLT stylesheet cache.

Input Parameters

stylesheetSystemId **String** URI for the XSLT stylesheet to remove from the cache.

Output Parameters

message **String** Indicates whether the service was able to remove the stylesheet from the cache.

