

webMethods EntireX

EntireX RPC Server for z/VSE Batch

Version 10.5

October 2019

This document applies to webMethods EntireX Version 10.5 and 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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1 About this Documentation

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Document Conventions

Convention	Description
Bold	Identifies elements on a screen.
Monospace font	Identifies service names and locations in the format <code>folder.subfolder.service</code> , 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 (...).

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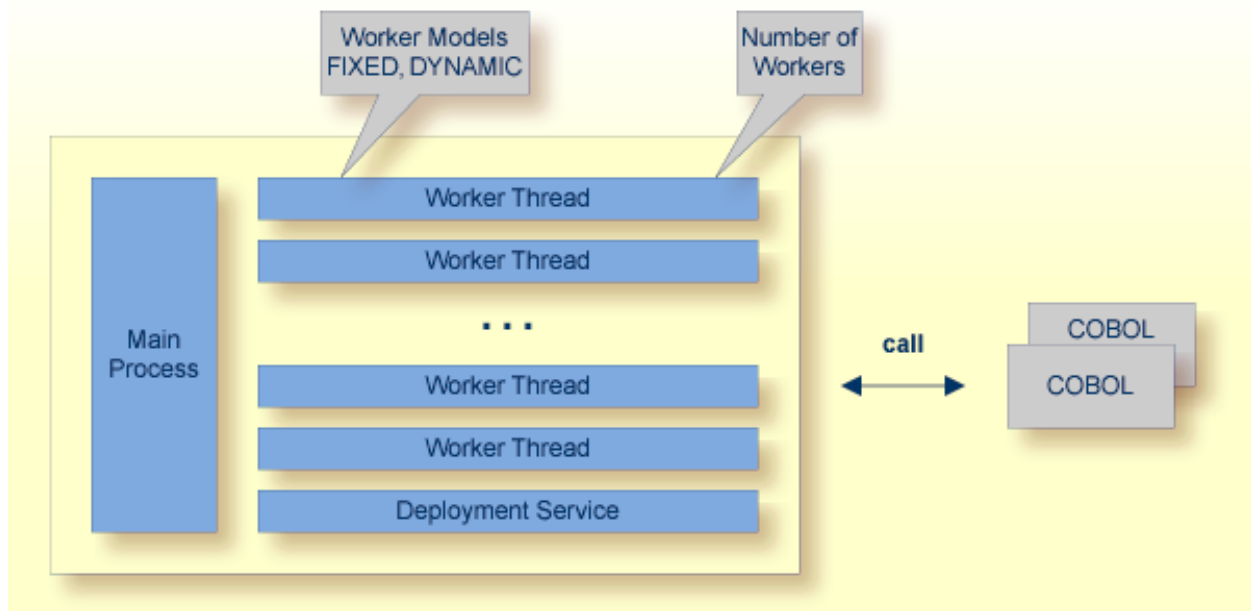
Software AG products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR). Where applicable, appropriate steps are documented in the respective administration documentation.

2 Introduction to the RPC Server for Batch

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- Inbuilt Services 7
- Usage of Server Mapping Files 8

The EntireX RPC Server for z/VSE Batch allows standard RPC clients to communicate with RPC servers on the operating system z/VSE under Batch. It supports the programming language COBOL and works together with the *COBOL Wrapper* and *IDL Extractor for COBOL*.

Worker Models



RPC requests are worked off inside the RPC server in worker threads, which are controlled by a main thread. Every RPC request occupies during its processing a worker thread. If you are using RPC conversations, each RPC conversation requires its own thread during the lifetime of the conversation. The RPC server provides two worker models:

- **FIXED**
The *fixed* model creates a fixed number of worker threads. The number of worker threads does not increase or decrease during the lifetime of an RPC server instance.
- **DYNAMIC**
The *dynamic* model creates worker threads depending on the incoming load of RPC requests.

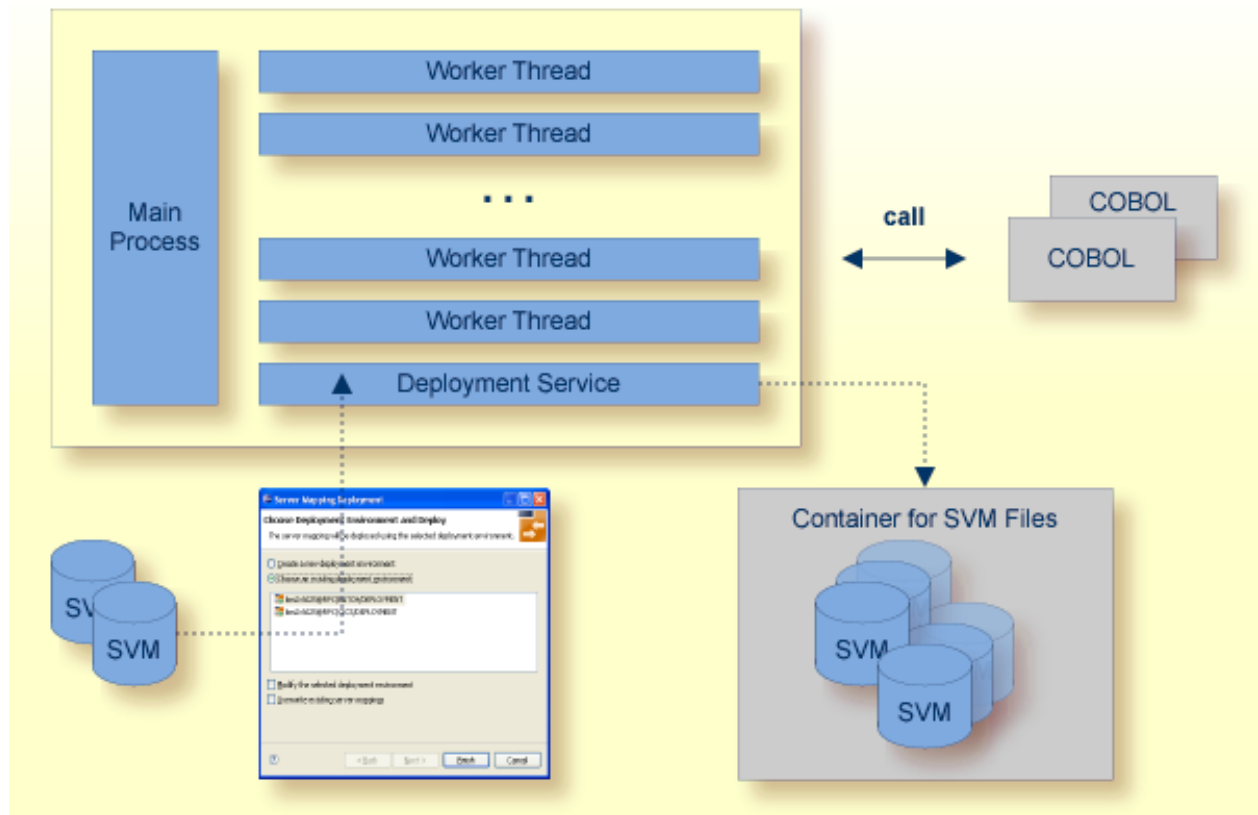
For configuration and technical details, see parameter `workermodel` under *Administering the RPC Server for Batch*.

Inbuilt Services

The RPC Server for Batch provides the following service for ease-of-use:

Deployment Service

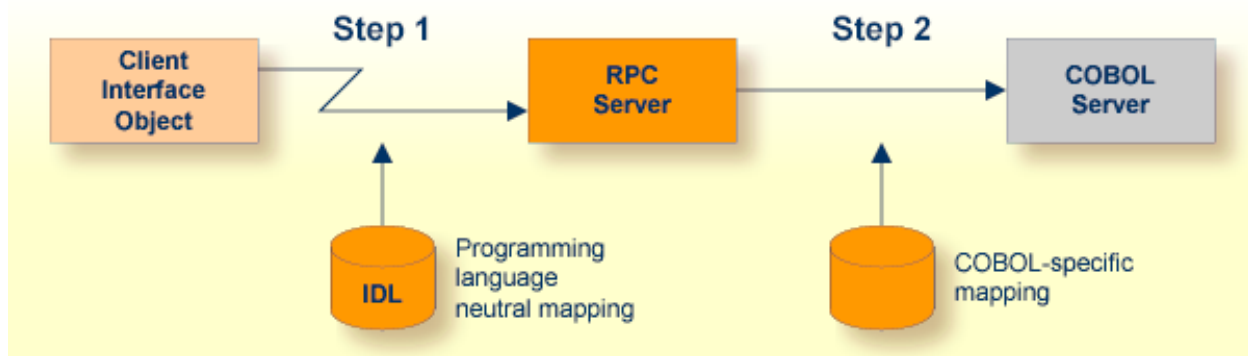
The Deployment Service allows you to deploy server-side mapping files (Designer files with extension .svm) interactively using the *Server Mapping Deployment Wizard*. On the RPC server side, the server-side mapping files are stored in a server-side mapping container (VSAM file). See [Server-side Mapping Files in the RPC Server](#) and [Deployment Service](#) for configuration information.



Usage of Server Mapping Files

There are many situations where the RPC Server for Batch requires a server mapping file to correctly support special COBOL syntax such as `REDEFINES`, `SIGN LEADING` and `OCCURS DEPENDING ON` clauses, `LEVEL-88` fields, etc.

Server mapping files contain COBOL-specific mapping information that is not included in the IDL file, but is needed to successfully call the COBOL server program.



The RPC server marshals the data in a two-step process: the RPC request coming from the RPC client (Step 1) is completed with COBOL-specific mapping information taken from the server mapping file (Step 2). In this way the COBOL server can be called as expected.

The server mapping files are retrieved as a result of the IDL Extractor for COBOL extraction process and the COBOL Wrapper if a COBOL server is generated. See *When is a Server Mapping File Required?*

There are *server-side* mapping files (*Software AG Designer* files with extension `.svm`) and *client-side* mapping files (*Designer* files with extension `.cvm`). See *Server Mapping Files for COBOL* and *How to Set the Type of Server Mapping Files*.

If you are using server-side mapping files, you need to customize the server-side mapping container with parameter `svm`. See *Configuring the RPC Server*.



Note: Server mapping files are used for COBOL only.

3 Administering the RPC Server for Batch

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The EntireX RPC Server for z/VSE Batch allows standard RPC clients to communicate with RPC servers on the operating system z/VSE under Batch. It supports the programming language COBOL and works together with the *COBOL Wrapper* and *IDL Extractor for COBOL*.

Customizing the RPC Server

The name of the delivered example configuration file is `RPCPARM.CFG` (see sublibrary EXP960). The configuration file contains the configuration for the RPC Server for Batch. The following settings are important:

- connection information such as broker ID, server address (class, name, service)
- location and usage of server-side mapping container, see [Usage of Server Mapping Files](#)
- scalability parameters
- trace settings
- etc.

For more information see [Configuring the RPC Server](#).

Configuring the RPC Server

The following rules apply:

- In the configuration file:
 - Comments must be on a separate line.
 - Comment lines can begin with `'*`, `'/` and `';`.
 - Empty lines are ignored.
 - Headings in square brackets [`<topic>`] are ignored.
 - Keywords are not case-sensitive.
- Underscored letters in a parameter indicate the minimum number of letters that can be used for an abbreviated command.

For example, in `brokerid=localhost`, `brok` is the minimum number of letters that can be used as an abbreviation, that is, the commands/parameters `broker=localhost` and `brok=localhost` are equivalents.

Parameter	Default	Values	Req/ Opt
<code>brokerid</code>	localhost	<p>Broker ID used by the server. See <i>Using the Broker ID in Applications</i>.</p> <p>Example: <code>brokerid=myhost.com:1971</code></p>	R
<code>class</code>	RPC	<p>Server class part of the server address used by the server. The server address must be defined as a service in the broker attribute file (see <i>Service-specific Attributes</i>). Case-sensitive, up to 32 characters. Corresponds to CLASS.</p> <p>Example: <code>class=MyRPC</code></p>	R
<code>codepage</code>		<p>The codepage tells the broker the encoding of the data. The application must ensure the encoding of the data matches the codepage. The RPC server itself does not convert your application data. The application's data is shipped and received as given. Often, the codepage must also match the encoding used in the RPC server environment for file and terminal IO, otherwise unpredictable results may occur.</p> <p>By default, no codepage is transferred to the broker. It is assumed the broker's locale string defaults match. See <i>Locale String Mapping</i> If they do not match, provide the codepage here. Example:</p> <pre>codepage=ibm-273</pre> <p>Enable character conversion in the broker by setting the service-specific attribute CONVERSION to "SAGTRPC". See also <i>Configuring ICU Conversion</i> under <i>Configuring Broker for Internationalization</i> in the platform-specific Administration documentation. More information can be found under <i>Internationalization with EntireX</i>.</p>	
<code>compresslevel</code>	N	<p>Enforce compression when data is transferred between broker and server. See <i>Data Compression in EntireX Broker</i>.</p> <pre>compresslevel= 0 1 2 3 4 5 6 7 8 9 Y N</pre> <p>0-9 0=no compression 9=max. compression</p> <p>N No compression. Y Compression level 6.</p> <p>Example: <code>compresslevel=6</code></p>	O

Parameter	Default	Values	Req/Opt				
<u>deployment</u>	NO	<p>Activates the deployment service, see Deployment Service. Required to use the Server Mapping Deployment Wizard. See <i>Server Mapping Deployment Wizard</i> in the Designer documentation.</p> <p>YES Activates the deployment service. The RPC server registers the deployment service in the broker.</p> <p>NO The deployment service is deactivated. The RPC server does not register the deployment service in the broker.</p> <p>Example: deployment=yes</p>	O				
<u>etblnk</u>	BKIMB	<p>Define the broker stub to be used. See <i>Administering Broker Stubs under z/VSE</i> for available stubs.</p> <p>Example: ETBL=BKIMB</p>	O				
<u>logon</u>	YES	<p>Execute broker functions LOGON/LOGOFF in worker threads. Must match the setting of the broker attribute AUTOLOGON. Reliable RPC requires logon set to YES. See <i>Reliable RPC</i>.</p> <p>NO No logon/logoff functions are executed.</p> <p>YES Logon/logoff functions are executed.</p> <p>Example: logon=no</p>	O				
<u>marshalling</u>	COBOL	<p>The RPC Server for Batch can be configured to support either COBOL or C. See also Locating and Calling the Target Server.</p> <p>marshalling=(LANGUAGE=<u>COBOL</u> C)</p> <table border="1"> <tr> <td>COBOL</td> <td>Server supports COBOL. The COBOL servers are called directly without a server interface object. So-called server mapping files are used to call the COBOL server correctly if one is available. See Usage of Server Mapping Files.</td> </tr> <tr> <td>C</td> <td>Server supports C. The modules are called using a server interface object built with the C Wrapper.</td> </tr> </table>	COBOL	Server supports COBOL. The COBOL servers are called directly without a server interface object. So-called server mapping files are used to call the COBOL server correctly if one is available. See Usage of Server Mapping Files .	C	Server supports C. The modules are called using a server interface object built with the C Wrapper.	O
COBOL	Server supports COBOL. The COBOL servers are called directly without a server interface object. So-called server mapping files are used to call the COBOL server correctly if one is available. See Usage of Server Mapping Files .						
C	Server supports C. The modules are called using a server interface object built with the C Wrapper.						
<u>password</u>	no default	<p>The password for secured access to the broker.</p> <p>Example: password=MyPwd</p>	O				

Parameter	Default	Values	Req/ Opt
<code>restartcycles</code>	15	<p>Number of restart attempts if the broker is not available. This can be used to keep the RPC Server for Batch running while the broker is down for a short time. A restart cycle will be repeated every 60 seconds.</p> <p>When the number of specified cycles is reached and a connection to the broker is not possible, the RPC Server for Batch stops.</p> <p>Example: <code>restartcycles=30</code></p> <p>The server waits up to 30 minutes before it terminates due to a missing broker connection.</p>	O
<code>runoption</code>	no default	<p>This parameter is for special purposes. It provides the RPC Server for Batch with additional information. The runoptions are normally set to meet the platform's requirements. Set this parameter only if a support representative provides you with an option and asks you to do so. The parameter can be defined multiple times.</p> <p>Example: <code>runoption=<option></code> <code>runoption=<option></code></p>	O
<code>servername</code>	SRV1	<p>Server name part of the server address used by the server. The server address must be defined as a service in the broker attribute file. See <i>Service-specific Attributes</i>. Case-sensitive, up to 32 characters. Corresponds to <code>SERVER</code> of the broker attribute file.</p> <p>Example: <code>servername=mySrv</code></p>	R
<code>service</code>	CALLNAT	<p>Service part of the server address used by the server. The server address must be defined as a service in the broker attribute file. See <i>Service-specific Attributes</i>. Case-sensitive, up to 32 characters. Corresponds to <code>SERVICE</code> attribute of the broker attribute file.</p> <p>Example: <code>service=MYSERVICE</code></p>	R
<code>svm</code>	ERXSVM	<p>Usage and location of server-side mapping files; see Server-side Mapping Files in the RPC Server. If no <code>svm</code> parameter is given, the RPC server tries to open the server-side mapping container using DLBL name <code>ERXSVM</code>. If this DLBL name is not available, no server-side mapping files are used. If you use server-side mapping files, the server-side mapping container must be installed and</p>	O

Parameter	Default	Values	Req/ Opt
		<p>configured; see <i>Step 3: Customize the Startup JCL - RUNRPC.J</i> under <i>Installing the z/VSE EntireX RPC Servers</i>. There are also client-side mapping files that do not require configuration here; see <i>Server Mapping Files in the Designer</i> in the Designer documentation.</p> <p><code>svm = no d1b1name</code></p> <p><code>no</code> No server-side mapping files are used.</p> <p><code>d1b1name</code> DLBL name of the server-side mapping container in the startup JCL of the RPC Server for Batch.</p> <p>Example: <code>svm=MYSVM</code></p> <p>For the example above, define the DLBL name <code>MYSVM</code> in the startup JCL of the RPC Server for Batch as</p> <pre>// DLBL ← MYSVM, 'ENTIREX.SVMDEV.KSDS', 0, VSAM, CAT=VSESPUC</pre> <p>See also Usage of Server Mapping Files.</p>	
<u>timeout</u>	60	<p>Timeout in seconds, used by the server to wait for broker requests. See broker ACI control block field <code>WAIT</code> for more information. Also influences restartcycles and worker model DYNAMIC.</p> <p>Example: <code>timeout=300</code></p>	O
<u>tracelevel</u>	None	<p>Trace level for the server. See also Activating Tracing for the RPC Server.</p> <pre>tracelevel = None Standard Advanced ← Support</pre> <p><code>None</code> No trace output.</p> <p><code>Standard</code> For minimal trace output.</p> <p><code>Advanced</code> For detailed trace output.</p> <p><code>Support</code> This trace level is for support diagnostics and should only be switched on when requested by Software AG support.</p> <p>Example: <code>tracelevel=standard</code></p>	O

Parameter	Default	Values	Req/ Opt								
<code>userid</code>	ERX-SRV	<p>The user ID for access to the broker. The default ERX-SRV will be used if this parameter is omitted or specified without a value: "userid=".</p> <p>Example: userid=MyUid</p>	O								
<code>workermodel</code>	SCALE,1,3,slowshrink	<p>The RPC Server for Batch can be configured to</p> <ul style="list-style-type: none"> ■ use a DYNAMIC worker model, which adjusts the number of worker threads to the current number of client requests: <pre>workermodel=(SCALE,from,thru [,slowshrink fastshrink])</pre> ■ use a FIXED number of worker threads: <pre>workermodel=(FIXED,number)</pre> <table border="1"> <tr> <td>FIXED</td> <td>A fixed <i>number</i> of worker threads is used by the RPC Server for Batch.</td> </tr> <tr> <td>SCALE</td> <td>The number of worker threads is adjusted to the current number of client requests. With the <i>from</i> value, the minimum number of active worker threads can be set. This allows you to define a certain number of threads - not used by the currently executing RPC request - to wait for new RPC client requests to process. In this way the RPC server is ready to handle many RPC client requests arriving at the same time. The <i>thru</i> value restricts the maximum number of all worker threads concurrently.</td> </tr> <tr> <td>slowshrink</td> <td>Default. The RPC server stops all worker threads not used in the time specified by the <code>timeout</code> parameter, except for the number of workers specified as minimum value.</td> </tr> <tr> <td>fastshrink</td> <td>The RPC server stops worker threads immediately as soon as it has finished its conversation, except for</td> </tr> </table>	FIXED	A fixed <i>number</i> of worker threads is used by the RPC Server for Batch.	SCALE	The number of worker threads is adjusted to the current number of client requests. With the <i>from</i> value, the minimum number of active worker threads can be set. This allows you to define a certain number of threads - not used by the currently executing RPC request - to wait for new RPC client requests to process. In this way the RPC server is ready to handle many RPC client requests arriving at the same time. The <i>thru</i> value restricts the maximum number of all worker threads concurrently.	slowshrink	Default. The RPC server stops all worker threads not used in the time specified by the <code>timeout</code> parameter, except for the number of workers specified as minimum value.	fastshrink	The RPC server stops worker threads immediately as soon as it has finished its conversation, except for	O
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Parameter	Default	Values	Req/ Opt						
		<table border="1"> <tr> <td></td> <td></td> <td>the number of workers specified as minimum value.</td> </tr> <tr> <td colspan="3">Example: workermodel=(SCALE,2,5)</td> </tr> </table>			the number of workers specified as minimum value.	Example: workermodel=(SCALE,2,5)			
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Example: workermodel=(SCALE,2,5)									

Locating and Calling the Target Server

The IDL library and IDL program names that come from the RPC client are used to locate the RPC server. See *library-definition* and *program-definition* under *Software AG IDL Grammar* in the IDL Editor documentation. This two-level concept (library and program) has to be mapped to the RPC Server for Batch environment. Different mechanisms are used depending on the language:

- COBOL
- C

COBOL

The approach used to derive the z/VSE module name for the RPC server depends on whether server mapping is used or not. See *Usage of Server Mapping Files* for an introduction.

1. If the RPC client sends a client-side type of server mapping with the RPC request, this server mapping is used first.
2. If no server mapping is available from step 1 above, and if server-side type of server mapping is used, the IDL library and IDL program names are used to form a key to locate the server mapping in the server-side mapping container. If a server mapping is found, this is then used.
3. If a server mapping is available from step 1 or 2 above, the z/VSE module name of the RPC server is derived from this mapping. In this case the IDL program name can be different to the z/VSE module name if it is renamed during wrapping process (see *Customize Automatically Generated Server Names*) or during the extraction process in the *COBOL Mapping Editor*.
4. If no server mapping is used at all, the IDL program name is used as the z/VSE module name of the RPC server (the IDL library name is ignored).

» To use the RPC Server for Batch with COBOL

- 1 Make sure that all z/VSE modules called as RPC servers
 - are compiled with IBM's Language Environment (see [LE/VSE V1R4 Programming Guide](#) for more information)

- use COBOL calling conventions
 - can be called dynamically ("fetched") from any Language Environment program
 - are accessible through the RPC Server for Batch JCL LIBDEF chain.
- 2 Configure the parameter `marshalling` for COBOL, for example:

```
marshalling=COBOL
```

- 3 Configure the parameter `svm` depending on whether server-side mapping files are used or not. See *Usage of Server Mapping Files*.

See also *Scenario I: Calling an Existing COBOL Server* or *Scenario II: Writing a New COBOL Server*.

C

The approaches needed to derive the names for the RPC Server for Batch are more complex for C, for the following reasons:

- the limitation of characters per (physical) member name
- the maximum length of 128 characters per IDL library name. See *Rules for Coding Library, Library Alias, Program, Program Alias and Structure Names* in the IDL Editor documentation.

You need to restrict yourself to short IDL library names.

➤ To use the RPC Server for Batch with C

- Configure the parameter `marshalling` for C, for example

```
marshalling=C
```

See *Using the C Wrapper for the Server Side (z/OS, UNIX, Windows, BS2000, IBM i)*.

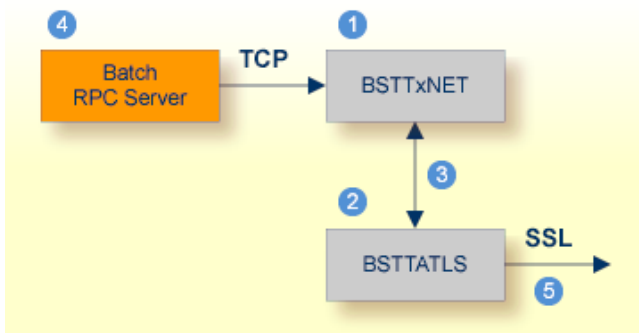
Using SSL/TLS with the RPC Server

RPC servers can use Secure Sockets Layer/Transport Layer Security (SSL/TLS) as the transport medium. The term "SSL" in this section refers to both SSL and TLS. RPC-based servers are always SSL clients. The SSL server can be either the EntireX Broker, Broker SSL Agent, or Direct RPC in webMethods Integration Server (IS inbound). For an introduction see *SSL/TLS and Certificates with EntireX* in the Platform-independent Administration documentation.

Establishing an SSL connection on z/VSE requires BSI's Automatic Transport Layer Security (ATLS). This facility is similar to z/OS Application Transparent - Transport Layer Security (AT-TLS). ATLS is supported by the BSI stack only.

Using BSI's Automatic Transport Layer Security (ATLS)

Together with SSL parameters (to provide certificates), define ATLS rules for socket interception in the ATLS daemon startup job `BSTTATLS` ②. If the rules match, the socket connection is turned into an SSL connection ⑤. Refer to your IBM documentation for further information. For an overview, refer to the IBM Redbook *Enhanced Networking on IBM z/VSE*; for a more detailed description, refer to *BSI SSL Installation, Programming and User's Guide*.



- ① BSI TCP/IP Stack, either BSTTINET (IPv4) or BSTT6NET (IPv6).
- ② ATLS rules are defined manually. See Sample ATLS Daemon Configuration below.
- ③ BSTTATLS is associated with a TCP/IP stack.
- ④ Application using TCP connection.
- ⑤ BSTTATLS intercepts outbound TCP connection and converts it to SSL connection. For inbound, SSL connections can also be intercepted and converted to TCP connections.

➤ To set up SSL with ATLS

- 1 To operate with SSL, certificates need to be provided and maintained. Depending on the platform, Software AG provides default certificates, but we strongly recommend that you create your own. See *SSL/TLS Sample Certificates Delivered with EntireX* in the EntireX Security documentation.
- 2 Set up the RPC Server for Batch for a TCP/IP connection. On mainframe platforms, use *Transport-method-style Broker ID*. Example:

```
ETB024:1699:TCP
```

- 3 Configure ATLS to turn the TCP/IP connection to an SSL connection, see above.
- 4 Make sure the SSL server to which the RPC Server for Batch connects is prepared for SSL connections as well. The SSL server can be EntireX Broker, Broker SSL Agent, or Direct RPC in webMethods Integration Server (IS inbound). See:
 - *Running Broker with SSL/TLS Transport* in the platform-specific Administration documentation
 - Broker SSL Agent in the UNIX and Windows Administration documentation
 - *Support for SSL/TLS* in the EntireX Adapter documentation (for Direct RPC)

Starting the RPC Server

➤ To start the RPC Server for Batch

- Run the job `RPCRPC.J`.

Stopping the RPC Server

➤ To stop the RPC Server for Batch

- Use the following console command:

```
task_id STOP
```

Or:

Use the command-line utility `ETBCMD`.

Activating Tracing for the RPC Server

➤ To activate tracing for the RPC Server for Batch

- 1 Set the parameter `tracelevel`.
- 2 Temporarily change the trace level with the operator command

```
port_number TRACELEVEL=tracelevel
```

See description of [tracelevel](#) parameter for supported trace levels.

The TRACELEVEL command without `tracelevel` option will report the currently active trace.

4 Deployment Service

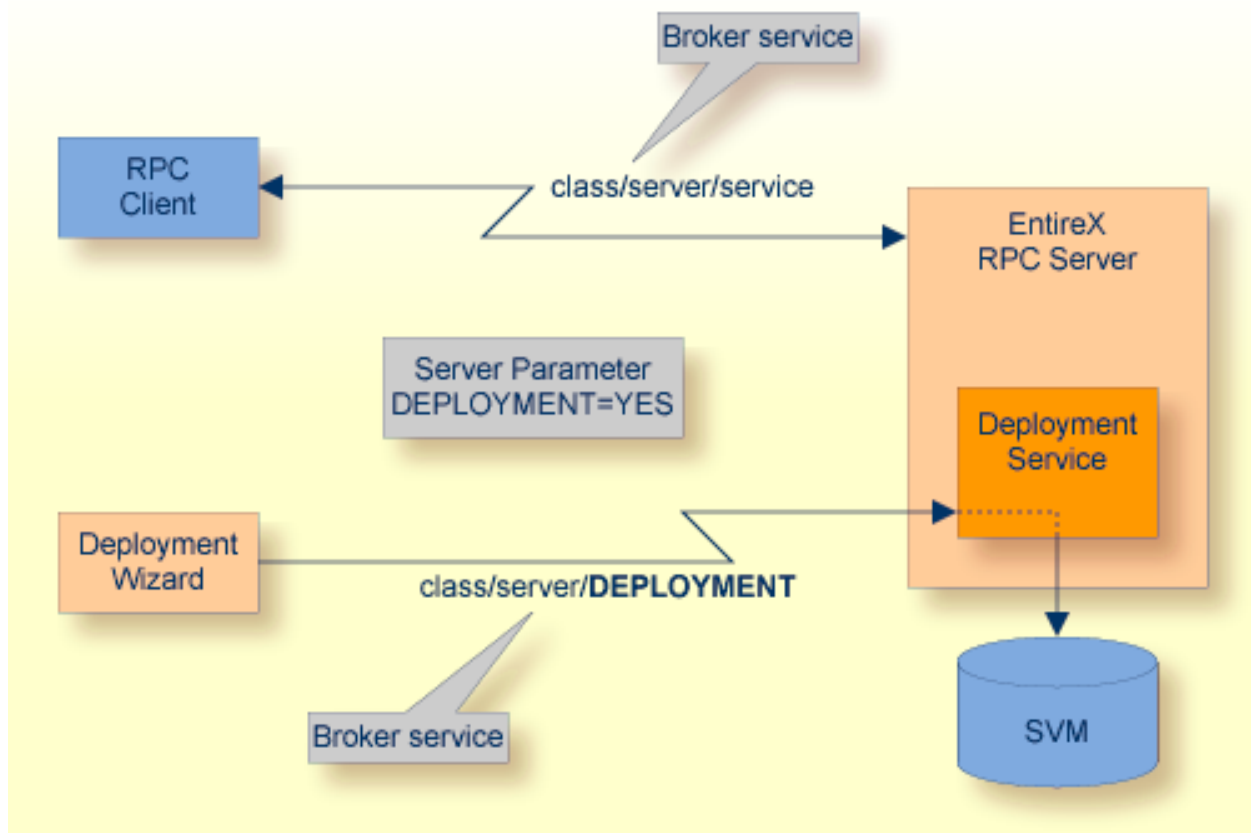
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Introduction

The deployment service is the (server-side) counterpart to the deployment wizard; see *Server Mapping Deployment Wizard*. It is a built-in service of the EntireX RPC server, which can be enabled/disabled by EntireX RPC server configuration settings.

Usage can be restricted to certain users or group of users, using EntireX Security; see *Authorization of Client and Server* in the EntireX Security documentation.

You need to configure the deployment service only when server-side mapping files are used. There are also client-side server mapping files that do not need configuration here; see *Server Mapping Files for COBOL* in the Designer documentation.



Scope

The deployment service is used in conjunction with the

- IDL Extractor for COBOL to deploy server-side mapping files with the deployment wizard;
- COBOL Wrapper for RPC server generation to deploy server-side mapping files with the deployment wizard.

See also [Deploying Server-side Mapping Files to the RPC Server](#).

The deployment service uses the same class and server names as defined for the EntireX RPC server, and `DEPLOYMENT` as the service name, resulting in `class/server/DEPLOYMENT` as the broker service. Please note `DEPLOYMENT` is a service name reserved by Software AG. See broker attribute `SERVICE`.

Enabling the Deployment Service

» To enable the deployment service

- 1 For an RPC Server for Batch, the server-side mapping container (VSAM file) must be installed and configured. See *Step 1: Define a Server-side Mapping Container - VSAMDEF.J (Optional)* under *Installing the z/VSE EntireX RPC Servers*.
- 2 Set the RPC server parameter `deployment=yes`. See `deployment` under [Configuring the RPC Server](#).
- 3 Define in the broker attribute file, under the RPC service, an additional broker service with `DEPLOYMENT` as the service name and values for class and server identical to those used for the RPC service. For example, if your RPC service is named

```
CLASS = RPC    SERVER = SRV1    SERVICE = CALLNAT
```

the deployment service requires the following additional service definition in the broker attribute file:

```
CLASS = RPC    SERVER = SRV1    SERVICE = DEPLOYMENT
```

- 4 Optional. If you need to restrict the use of the deployment service to a selected group of users, use EntireX Security and define security rules for the `class/server/DEPLOYMENT` broker service. The service name `DEPLOYMENT` is a constant.
 - For a z/OS broker, see *Resource Profiles in EntireX Security*.

- For a UNIX or Windows broker, see *Authorization Rules*.
- Not applicable to a BS2000 or z/VSE broker.

Disabling the Deployment Service

➤ To disable the deployment service

- Set the RPC Server for Batch parameter `deployment=no`. See [deployment](#) under *Configuring the RPC Server*.

The RPC Server for Batch will not register the deployment service in the broker.

5 Server-side Mapping Files

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Server mapping enables the RPC server to correctly support special COBOL syntax such as `REDEFINES`, `SIGN LEADING` and `OCCURS DEPENDING ON` clauses, `LEVEL-88` fields, etc. If one of these elements is used, the IDL Extractor for COBOL automatically extracts a server mapping file in addition to the IDL file (interface definition language). Also, the COBOL Wrapper may generate a server mapping file for RPC server generation. The server mapping is used at runtime to marshal and unmarshal the RPC data stream. There are client-side mapping files (Designer files with extension `.cvm`) and server-side mapping files (Designer files with extension `.svm`). If you have not used server-side mapping, we recommend you use client-side mapping. See *Server Mapping Files for COBOL* in the Designer documentation.

See also *Source Control of Server Mapping Files* | *Comparing Server Mapping Files* | *When is a Server Mapping File Required?* | *Migrating Server Mapping Files* in the Designer documentation.

Server-side Mapping Files in the RPC Server

Under `z/VSE`, server-side mapping corresponds to lines of Designer files with extension `.svm`. See *Server Mapping Files for COBOL*. The mapping information is stored as records within one VSAM file, the server-side mapping container. This container contains all server-side mapping entries from all Designer files with extension `.svm`. The unique key of the VSAM file file consists of the first 255 bytes of the record: for the type (1 byte), for the IDL library (127 bytes) and for the IDL program (127 bytes).

If *one* server requires a server-side mapping file, you need to provide this to the RPC server:

- Development environments: to deploy new server-side mapping files, see [Deploying Server-side Mapping Files to the RPC Server](#).
- Production environments: provide a server-side mapping container (VSAM file) containing all required server-side mapping files to the RPC server. See configuration parameter `svm`.

If *no* server requires server-side mapping, you can execute the RPC server without server mapping files:

- Development environments: you can disable the deployment service. See [Disabling the Deployment Service](#).
- Production environments: there is no need to provide a server-side mapping container (VSAM file) to the RPC server. See configuration parameter `svm`.

Deploying Server-side Mapping Files to the RPC Server

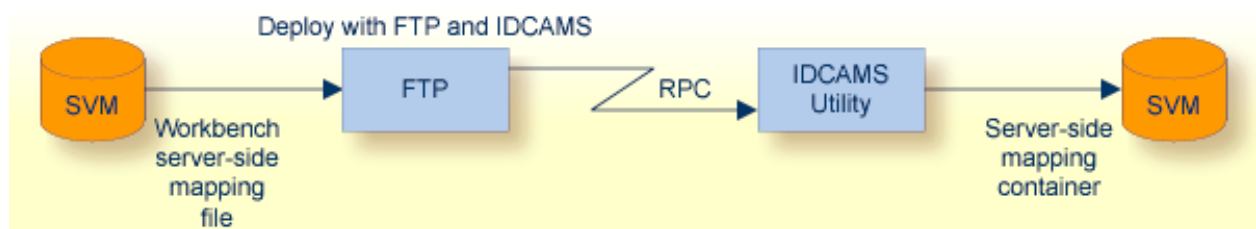
The following approaches are available to deploy a server-side mapping file (Designer file with extension .svm; see *Server Mapping Files for COBOL*):

- Server Mapping Deployment Wizard
- FTP and IDCAMS


➤ To deploy a server-side mapping file with the Server Mapping Deployment Wizard

- 1 Make sure your RPC server is active and that the Deployment Service of the RPC server is properly configured. See [Deployment Service](#).
- 2 From the context menu of your IDL file, choose **COBOL > Deploy/Synchronize Server Mapping** and call the Server Mapping Deployment Wizard. See *Server Mapping Deployment Wizard* in the Designer documentation.

➤ To deploy a server-side mapping file using FTP and IDCAMS



- 1 Make sure the server-side mapping container (VSAM file) is installed. See *Step 1: Define a Server-side Mapping Container - VSAMDEF.J (Optional)* under *Installing the z/VSE EntireX RPC Servers*.
- 2 Allocate a target sequential file on your mainframe.
- 3 Allow write access to the VSAM file mentioned above and usage of IDCAMS tools.
- 4 Transfer the server-side mapping file to the target host, using FTP. You have to switch to text mode and the codepage of the FTP service must be the same as the codepage (locale string) of the RPC server used.
- 5 Install the server mapping contained in the server-side mapping file into the server-side mapping container (VSAM file) with an appropriate IDCAMS job.

 **Note:** If you omit the keyword `REPLACE` or define `NOREPLACE` in the `SYSIN` data stream of IDCAMS instead, existing server mapping information is not overwritten. This protects server-side mapping records from being overwritten by duplicates.

Undeploying Server-side Mapping Files from the RPC Server

Use the Server Mapping Deployment Wizard to undeploy a server-side mapping file (Designer file with extension .svm). See *Server Mapping Files for COBOL*.

➤ To undeploy a server-side mapping file with the Server Mapping Deployment Wizard

- 1 Make sure your RPC server is active and that the Deployment Service of the RPC server is properly configured. See [Deployment Service](#).
- 2 Make sure your IDL file is within a Designer directory (folder) without the related server-side mapping file (.svm).
- 3 From the context menu of your IDL file, choose **COBOL > Deploy/Synchronize Server Mapping** and call the Server Mapping Deployment Wizard. See *Server Mapping Deployment Wizard* in the Designer documentation. Because there is no related server-side mapping file in the Designer, all server mapping information related to the IDL file in the RPC server will be removed.

Change Management of Server-side Mapping Files

Under z/VSE, change management for a VSAM file (server-side mapping container, see [Server-side Mapping Files in the RPC Server](#)) is similar to change management for a database. The complete VSAM file can be backed up at any time, for example by using IDCAMS. All updates to the VSAM file done after a backup must be kept.

All Designer server-side mapping files (.svm) added since the last backup should be available. See *Server Mapping Files for COBOL* in the Designer documentation.

List Deployed Server-side Mapping Files

Use IDCAMS to list the contents of the server-side mapping container. See [Server-side Mapping Files in the RPC Server](#).


```

* $$ JOB JNM=VSAMPRNT,CLASS=0,DISP=D
* $$ LST CLASS=A,DISP=K
/* ----- */
/* PRINT CONTENT OF AN SVM VSAM CLUSTER */
/* ----- */
// JOB VSAMPRNT
// DLBL ERXSVM,'ENTIREX.SVMDEV.KSDS',0,VSAM,CAT=VSESPUC
// EXEC IDCAMS,SIZE=AUTO
// PRINT INFILE(ERXSVM) CHAR
/*
/ &
* $$ EOJ

```

Check if a Server-side Mapping File Revision has been Deployed

Server-side mapping records in the server-side mapping container correspond to lines of Designer files with extension .svm. See *Server Mapping Files for COBOL* in the Designer documentation. The records contain a creation timestamp at offset 276 (decimal) in the format *YYYYMMDDHHIISSST*. Precision is 1/10 of a second. The creation timestamp can be checked.

The timestamp can be found on the same offset in the records in the server-side mapping container (VSAM file). See [Server-side Mapping Files in the RPC Server](#).

Access Control: Secure Server Mapping File Deployment

For deployment with the *Server Mapping Deployment Wizard*, use EntireX Security if the broker is running on platforms z/OS, UNIX, Windows or z/VSE. See [Enabling the Deployment Service](#).

For IBM deployment tool IDCAMS, use RACF to secure deployment.

Ensure that Deployed Server-side Mapping Files are not Overwritten

For IDCAMS, use the `NOREPLACE` option to disallow overwriting of duplicate server-side mapping records in the server-side mapping container (VSAM file); see [Server-side Mapping Files in the RPC Server](#). See also [Deploying Server-side Mapping Files to the RPC Server](#).

Is There a Way to Smoothly Introduce Server-side Mapping Files?

All EntireX RPC servers can be executed without server-side mapping files. See [Server-side Mapping Files in the RPC Server](#). There is no need to install the server-side mapping container if the following conditions are met:

- You do not use features that require server mapping; see *When is a Server Mapping File Required?*
- Server-side type of COBOL mapping is switched on in the Designer. If you have not used server-side mapping, we recommend you use client-side mapping. See *Server Mapping Files for COBOL*.

You can also call COBOL servers generated or extracted with previous versions of EntireX mixed with a COBOL server that requires server-side mapping. All EntireX RPC servers are backward compatible.

6 Scenarios

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COBOL Scenarios

Scenario I: Calling an Existing COBOL Server

› To call an existing COBOL server

- 1 Use the IDL Extractor for COBOL to extract the Software AG IDL and, depending on the complexity, also a server mapping file. See *When is a Server Mapping File Required?* in the Designer documentation.
- 2 Build an EntireX RPC client using any EntireX wrapper. For a quick test you can:
 - use the IDL Tester; see *EntireX IDL Tester* in the Designer documentation
 - generate an XML mapping file (XMM) and use the XML Tester for verification; see *EntireX XML Tester* in the XML/SOAP Wrapper documentation

See *Client and Server Examples for z/VSE Batch* in the COBOL Wrapper documentation for COBOL RPC Server examples.

Scenario II: Writing a New COBOL Server

› To write a new COBOL server

- 1 Use the COBOL Wrapper to generate a COBOL server skeleton and, depending on the complexity, also a server mapping file. See *When is a Server Mapping File Required?* in the Designer documentation. Write your COBOL server and proceed as described under *Using the COBOL Wrapper for the Server Side*.
- 2 Build an EntireX RPC client using any EntireX wrapper. For a quick test you can:
 - use the IDL Tester; see *EntireX IDL Tester* in the Designer documentation
 - generate an XML mapping file (XMM) and use the XML Tester for verification; see *EntireX XML Tester* in the XML/SOAP Wrapper documentation

See *Client and Server Examples for z/VSE Batch* in the COBOL Wrapper documentation for COBOL RPC Server examples.