webMethods EntireX

Release Notes

Version 9.5 SP1

November 2013

This document applies to webMethods EntireX Version 9.5 SP1.

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 What was New in Version 9.5

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Workbench Enhancements

Support of Eclipse 4.3

Eclipse version 4.3 is now supported.

IDL Extractor for COBOL

Before you use the IDL Extractor for COBOL, make sure you have installed all the available fixes for the EntireX Eclipse plug-ins.

RPC Server Changes and Enhancements

Automatic Syncpoint Handling

The CICS and IMS RPC servers automatically issue a `SYNCPOINT` under certain circumstances. See *Automatic Syncpoint Handling* in the respective RPC server documentation.

The configuration parameter `SYNCPOINT` is now deprecated.

Broker Enhancements

- Under z/OS, the new attribute `TRACE-DD` means you can write trace data for a broker that is up and running, using a GDG (generation data group) data set. See `TRACE-DD` and *Flushing Trace Data to a GDG Data Set*.

  This avoids a broker shutdown and restart during production.

Internationalization

Simplified ICU Conversion

For *ICU Conversion* under *Introduction to Internationalization*, SAGTRPC detects single-byte codepages automatically and converts them quickly and efficiently in one step from source to target encoding. This means that for single-byte codepages, SAGTRPC is the same as SAGTCHA, which simplifies the internationalization approach ICU Conversion:

- For *ACI-based Programming* there is no change: configure SAGTCHA as in previous versions of EntireX.
- For *RPC-based Components* and *Reliable RPC*, always configure SAGTRPC: complex codepages such as multibyte, double-byte, EBCDIC stateful, Hebrew 803, as well as Arabic shaping are always handled correctly, and for single-byte scenarios, throughput has been enhanced.

There is no need to reconfigure ICU conversion in your existing environment; your settings for ICU conversion will continue to work. Moreover, if SAGTRPC is defined in your environment but not really needed because all your RPC components use single-byte codepages only, broker throughput should increase and you should get better response times.

For conversion, set the service-specific or topic-specific broker attribute `CONVERSION` in the attribute file.

See also *Configuring ICU Conversion* under *Configuring Broker for Internationalization* in the platform-specific administration documentation and *What is the Best Internationalization Approach to use?* under *Internationalization with EntireX*.

On-error Trace for ICU Conversion

For *ICU Conversion* under *Introduction to Internationalization*, both SAGTCHA and SAGTRPC provide an on-error trace. See `TRACE` option of the service-specific or topic-specific broker attribute `CONVERSION` in the attribute file.

Brainstorm Ideas

Brainstorm is a one-stop portal for all Software AG customers to submit feature requests, vote on ideas that have been posted by other customers and get your voice heard. All product categories are moderated by product managers, and ideas get responded to and updated on a regular basis. Here is a selection of Brainstorm ideas that have been implemented in EntireX. The number in square brackets is the Brainstorm ID.

- Writing trace data for a running broker under z/OS, using a GDG (generation data group) data set. This avoids a broker shutdown and restart during production. See *Flushing Trace Data to a GDG Data Set*. [1035388]
- A new configuration property `entirex.wmqbridge.deadletterqueue` is provided for the WebSphere MQ Listener to specify the name of a queue that will receive messages that cannot be processed succesfully. See *Configuring the WebSphere MQ Side* under *Administering the EntireX WebSphere MQ Listener*. [1072327]

Increased Platform Support

EntireX is now supported under the following additional platforms. See ***List of Components per Platform*** for full list.

- z/OS 2.1
- AIX Power 6.1 (64-bit)

Documentation Enhancements

- **SVM File Handling**
  Documentation of SVM file handling has been enhanced for all supported RPC servers. See *Handling SVM Files* in the respective sections of the documentation.
- **CVM File Handling**
  Documentation of CVM file handling has been enhanced. See *Handling CVM Files* in the Natural Wrapper documentation.
- **Supported RPC Protocols**
  New section lists the RPC protocols supported by the different EntireX and Natural versions. See ***Supported RPC Protocols***
- **Supported Transport Methods**
  Enhanced table showing the transport methods supported by the various EntireX Broker stubs. See *Transport: Broker Stubs and APIs*.
- **CICS RPC Server and SSL**
  See *Using SSL or TLS with the RPC Server*.
- **CICS RPC Server and User Exits**
  See COBUEX02 and RPCUEX01 (a previously undocumented feature) under *RPC User Exits*.

- **IBM LE Runtime Options**
  For some RPC server features, additional runtime options for IBM's Language Environment need to be set. See *IBM LE Runtime Options* in the respective section of the documentation.
- **Conversion Error Messages**
  All error messages of class 1003 have been reworked and several new messages have been added. See *Message Class 1003 - Conversion* under *Error Messages and Codes*.
- **Internationalization**
  The internationalization documentation has been reworked to reflect the changes described above. See *What is the Best Internationalization Approach to use?* under *Internationalization with EntireX*.
- **Migration**
  How to migrate data from earlier versions to EntireX 9.0. This section has been thoroughly reworked. See *Migrating EntireX Data from Earlier Versions*.
- **Software AG Update Manager**
  With the Software AG Update Manager under UNIX and Windows you can install fixes for components of EntireX Workbench and webMethods EntireX Adapter for Integration Server. See *Installing Fixes from the Software AG Update Manager*.

Other Changes and Enhancements

SSL Support with LDAP Server

SSL connections are now supported by the LDAP server. A new configuration parameter `protocol` is provided in the xds.ini file, and a new value `ldaps` is provided for security-specific broker attribute `AUTHENTICATION-TYPE`. See

- *Configuration of Authorization Rule Agent using System Management Hub* in the UNIX|Windows administration section of the documentation
- *Saving the Data of Administration Service in LDAP* in the UNIX|Windows administration section of the documentation
- `AUTHENTICATION-TYPE` under *Broker Attributes* in the administration documentation
- *Support of Self-signed Certificates* under *SSL or TLS and Certificates with EntireX*

Encyrption Level for Java-based Components using URL-style Broker ID

You can now specify the encryption level for EntireX Java-based components using a URL-style broker ID. See *URL-style Broker ID* under *EntireX Broker ACI Programming*.

Error Messages from Java-based Components

In earlier releases, error messages issued by Java-based EntireX components were prefixed with "Broker Error" even if the error was not Broker-related. This has been changed to "Error".

New Configuration Parameters for WebSphere MQ

- **Message Priority**
  A new configuration property `entirex.wmqbridge.priority` is provided for the EntireX WebSphere MQ RPC Server and the WebSphere MQ Listener to specify a message priority that is different from the default. See *Configuring the WebSphere MQ Side* in the EntireX WebSphere MQ RPC Server and WebSphere MQ Listener documentation.
- **Dead-letter Queue Support**
  A new configuration property `entirex.wmqbridge.deadletterqueue` is provided for the WebSphere MQ Listener to specify the name of a queue that will receive messages that cannot be processed succesfully. See *Configuring the WebSphere MQ Side* under *Administering the EntireX WebSphere MQ Listener*.

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High Availability

Under High Availability we understand an environment with engineered redundancy which, if any one component fails, guarantees the integrity of the system as a whole. To achieve high availability, EntireX uses existing third-party clustering technology.

See also *High Availability in EntireX*.

Configuration Enhancements

Multiple enhancements have been made to simplify configuration of many EntireX components:

- Simplified Configuration for DIV Persistent Store
- RPC Parameters
- Dynamic Memory Management
- Specifying poolsize using Java System Property
- RPC Security

Simplified Configuration for DIV Persistent Store

The persistent store handler for Data In Virtual (DIV) has been enhanced. Set `PSTORE-VERSION=4` to use the new handler, which requires much less configuration data. See `PSTORE-VERSION`.

RPC Parameters

New parameters are available to simplify configuration of RPC servers:

- `marshalling`
  For Batch RPC Server and IMS RPC Server, new parameter *`marshalling`* is used together with server mapping files (SVMs) and replaces the complex parameter `runoption`, which is now deprecated.
- `workermodel`
  For Batch RPC Server, new parameter *`workermodel`* replaces parameters `minworker`, `maxworker` and `endworker`, which are now deprecated.

  Examples:

`Workermodel=(SCALE, 1,5,fastshrink)`	replaces `MinWorker=1; MaxWorker=5; EndWorker=Immediately`
`Workermodel=(SCALE, 3,10,slowshrink)`	replaces `MinWorker=3; MaxWorker=10; EndWorker=Timeout`

`Workermodel=(FIX, 4)`	replaces `MinWorker=4; MaxWorker=4; EndWorker=Never`

A new configuration file is provided to reflect these new parameters. See member `CONFIG` in the source library EXP951.SRCE. All deprecated parameters are still supported, but may be dropped in a future version; there is currently no need to adapt your configuration file, although this is recommended.

Dynamic Memory Management

Dynamic memory management is a feature to handle changing Broker workload without any restart of the Broker task. It increases the availability of the Broker by using various memory pools for various Broker resources and by being able to use a variable number of pools for the resources. This feature was available in previous versions of EntireX but is now activated by default. See *Dynamic Memory Management* under *Broker Resource Allocation* in the general administration documentation and `DYNAMIC-MEMORY-MANAGEMENT` under *Broker Attributes* in the administration documentation.

Specifying poolsize using Java System Property

Parameter `poolsize` for specifying the maximum number of socket connections with Java-based EntireX applications can now be set using the new Java property `entirex.socket.poolsize`. See *Socket Parameters for TCP and SSL Communication* under *Writing Advanced Applications - EntireX Java ACI*.

RPC Security

The Batch, CICS, IMS, UNIX, Windows, Micro Focus and .NET RPC Servers now provide logic to detect the security setup of the broker kernel automatically. This means the RPC server option `KERNELSECURITY` (`KSEC` under CICS) is now deprecated. The parameter is currently still supported for reasons of compatibility.

EntireX and the Cloud

Amazon Elastic Compute Cloud (Amazon EC2) is a web service that provides resizable compute capacity in the cloud. It is designed to make web-scale computing easier for developers. EntireX supports Amazon EC2 on the following platforms:

- Windows Server 2008 Standard and Enterprise editions (64-bit)
- Red Hat Enterprise Linux Server 6

See ***Platform Coverage*** for full list of supported platforms.

Security Enhancements

- Additional Authorization Call to EntireX Security
- Support of UsernameToken

Additional Authorization Call to EntireX Security

An additional authorization check is now performed for a user against a specified application in a RACF security environment. This prevents, for example, a password being revoked for a user who does not have access at all to a particular application. See `APPLICATION-NAME`.

Support of UsernameToken

The XML/SOAP RPC Server uses `UsernameToken` security for a Web service if the configuration contains the attribute `usernameToken` in <xmm>. The XML/SOAP RPC Server supports two kinds of `UsernameToken`:

- `PasswordText`
- `PasswordDigest`

See *XML/SOAP RPC Server with UsernameToken* in the UNIX and Windows administration documentation.

Workbench Enhancements

- IDL Tester
- COBOL Wrapper
- Natural Wrapper
- IDL Extractor for XML Document
- IDL Extractor for XML Schema
- IDL Extractor for WSDL
- IDL Extractor for Integration Server

- XML Mapping Editor

IDL Tester

In earlier versions, the IDL Tester cluttered up your projects with multiple Java assets. These assets are now generated into your temp directory and are removed automatically when the Designer is shut down. The Java Wrapper can still generate test classes into a Java project if required.

COBOL Wrapper

You can now customize the names for the generated COBOL client interface objects. See *Customize Automatically Generated Client Names* under *Generate COBOL Source Files from Software AG IDL Files*.

You can also customize the names for the generated COBOL server. See *Customize Automatically Generated Server Names* under *Generate COBOL Source Files from Software AG IDL Files*.

For IDL unbounded arrays (see `array-definition` under *Software AG IDL Grammar* in the *IDL Editor* documentation under *Software AG IDL Grammar* in the *IDL Editor* documentation) which are mapped to COBOL tables with the `DEPENDING ON` clause (see *Tables with Variable Size - `DEPENDING ON` Clause*), index variables in the `LINKAGE SECTION` of client interface objects and server skeletons are generated unsigned, that is, with the data format `PIC 9(8) BINARY` instead of `PIC 9 S(8) BINARY`. See `ODOTAB-A1-11` in the example below.

```
IDL:
1 ODOTAB-A1    (A1/V11)

Generated LINKAGE SECTION:
02 ODOTAB-A1-11                          PIC 9(8) BINARY.
02 ODOTAB-A1X OCCURS 1 TO 11 DEPENDING ON ODOTAB-A1-11.
 03 ODOTAB-A1                            PIC X(1).
```

Natural Wrapper

The Natural Wrapper allows you to customize the names for the generated Natural client interface objects and to enable/disable - for each IDL program - the generation of Natural client test programs. See *Step 2: Customize Natural Client Names* under *Using the Natural Wrapper for the Client Side within NaturalONE*

The Natural Wrapper also generates RPC servers; you can customize the names for these. See *Using the Natural Wrapper for the Server Side within NaturalONE*.

There are no longer any restrictions in IDL program names; these can be longer than eight characters or even contain characters not allowed in Natural names. The names are adapted during wrapping.

These features require some support from the Natural RPC server used for generation. See *Pre-requisites for Natural Wrapper* in the respective section of the Release Notes.

IDL Extractor for XML Document

The **Options for Target Programming Language** page has been redesigned. Generated names for IDL library and IDL programs depend on the selected target programming language and correspond to the customized name feature of the ***Natural Wrapper*** and ***COBOL Wrapper***. Option combinations that do not match the selected target programming language are disabled and cannot be selected. See Step 5: Specify Options for Target Programming Language.

IDL Extractor for XML Schema

The **Options for Target Programming Language** page has been redesigned. Generated names for IDL library and IDL programs depend on the selected target programming language and correspond to the customized name feature of the ***Natural Wrapper*** and ***COBOL Wrapper***. Option combinations that do not match the selected target programming language are disabled and cannot be selected. See Step 5: Specify Options for Target Programming Language.

IDL Extractor for WSDL

The **Options for Target Programming Language** page has been redesigned. Generated names for IDL library and IDL programs depend on the selected target programming language and correspond to the customized name feature of the ***Natural Wrapper*** and ***COBOL Wrapper***. Option combinations that do not match the selected target programming language are disabled and cannot be selected. See *Step 6: Specify Options for Target Programming Language* in the IDL Extractor for WSDL documentation.

IDL Extractor for Integration Server

The **Select the Integration Server Package to Extract** page has been redesigned. Generated names for IDL library and IDL programs depend on the selected target programming language and correspond to the customized name feature of the ***Natural Wrapper*** and ***COBOL Wrapper***. Option combinations that do not match the selected target programming language are disabled and cannot be selected. See Step 3: Select the Integration Server Package to Extract.

XML Mapping Editor

SOAP mapping with mapping parameter `Generate Array Envelope Element` has been changed: The generation for simple type arrays also respects the setting of this parameter. To enable the old behavior (arrays of type simple always get a wrapping element) add the following line to `eclipse.ini`:

```
-Dentirex.xmlmappingeditor.enableSimpleTypeWrapping=false
```

New ACI Version 10

With this new ACI version you can define a variable-sized `BROKER-ID`, the so-called `LONG-BROKER-ID`. The ACI structure contains the new field `LONG-BROKER-ID-LENGTH`. If the value of this field is non-zero, specify the value of the `LONG-BROKER-ID` directly after the ACI control block. The `LONG-BROKER-ID` overrides any `BROKER-ID` value.

With the `LONG-BROKER-ID` you can now specify numeric IPv6 addresses. See *`LONG-BROKER-ID-LENGTH`* under *Broker ACI Fields*.

Brainstorm Ideas

Brainstorm is a one-stop portal for all Software AG customers to submit feature requests, vote on ideas that have been posted by other customers and get your voice heard. All product categories are moderated by product managers, and ideas get responded to and updated on a regular basis. Here is a selection of Brainstorm ideas that have been implemented in EntireX. The number in square brackets is the Brainstorm ID.

- Fewer unwanted Java artifacts created when testing IDL files [1033097]. See *EntireX IDL Tester*.
- Job names and CICS transaction names in SMF records [10102119]. See *`APPLICATION-NAME`* in the ACI Programming documentation under *Information Reply Structures* under *Broker CIS Data Structures* in the ACI Programming documentation.
- Improved default handling for preserving whitespace in XML and Web services scenarios [10382004]. See Whitespace Handling under *Writing Advanced Applications with the XML/SOAP Wrapper*.
- Re-architectured alias and short-name handling [1039561]. See, for example, *Step 2: Customize Natural Client Names* under *Using the Natural Wrapper for the Client Side within NaturalONE*.
- Arabic shaping with UTF-8 [1042468]. The conversion routines of EntireX now support Arabic shaping (based on code pages Windows-1256 and IBM420). See *Arabic Shaping* under *Introduction to Internationalization*.
- CICS RPC Server User Exits [1046480]. See *User Exits* under *Introduction to the CICS RPC Server*.
- Authorization call (align Top Secret and RACF handling) [1046522]. See `APPLICATION-NAME` and `FACILITY-CHECK` under *Broker Attributes* in the administration documentation.

Documentation Enhancements

In addition to documentation for the new features listed on this page, the following topics have also been addressed:

- **Common Integration Scenarios**
  Common integration scenarios are described, with cookbooks and links to the relevant sections of the documentation. See, for example, *Calling COBOL from Integration Server*.
- **RPC Servers**
  The documentation for *Batch*, *CICS* and *IMS* RPC Servers has been thoroughly reworked; documentation for other RPC servers has also been enhanced.
- **High Availability**
  Under High Availability we understand an environment with engineered redundancy which, if any one component fails, guarantees the integrity of the system as a whole. To achieve high availability, EntireX uses existing third-party clustering technology. A new documentation section provides an introduction to clustering technology and describes how to set up in EntireX the redundant RPC servers and brokers you will need to achieve high availability. See *High Availability in EntireX*.
- **EntireX and Web Services**
  The introduction to EntireX support for Web services has been enhanced and provides links to the relevant sections of the documentation. See *EntireX and Web Services*.

Other Changes and Enhancements

- IDMSETB
- Support of IPv6
- New API RPC-CNTX
- Deploying Packages in Integration Server
- EXXMSG - Command-line tool for Displaying Error Messages
- Modified Codepage Handling with CICS ECI RPC Server and IMS Connect RPC Server
- CICS RPC Server
- Job Names and Transaction IDs in SMF Records
- Whitespace Handling in the XML/SOAP Runtime
- Administration Service Commands

- License Key Handling under z/OS

IDMSETB

A new broker stub is provided to support IDMS/DC. See *IDMSETB* under *Administration of Broker Stubs under z/OS* under *Administration of Broker Stubs under z/OS* in the z/OS administration documentation and *Using the COBOL Wrapper for IDMS/DC with Call Interfaces (z/OS)* in the COBOL Wrapper documentation.

Support of IPv6

SSL and TCP/IP transport is now supported in IPv4 and IPv6 networks. Mixed IPv4 and IPv6 scenarios are also supported. See `IPV6`.

New API RPC-CNTX

Using API RPC-CNTX you can provide a context for Natural RPC client applications without setting a STEPLIB or copying APIs from SYSEXT to user libraries. See *Interface `RPC-CNTX` for the Natural RPC Client Programmer*.

Deploying Packages in Integration Server

The deploying of packages in Integration Server has been enhanced in this release.

EXXMSG - Command-line tool for Displaying Error Messages

`EXXMSG` is a command-line tool that displays the text of an EntireX error message for a supplied error number. It is available on all platforms.

See *EXXMSG - Command-line Tool for Displaying Error Messages*.

Modified Codepage Handling with CICS ECI RPC Server and IMS Connect RPC Server

The CICS ECI RPC Server and IMS Connect RPC Server now use only the encoding specified with the parameter `entirex.bridge.targetencoding` when communicating with the EntireX Broker. This behavior is new in this version. Make sure you have enabled conversion in the Broker attribute file so the data can be converted correctly. This is typically achieved by setting service-specific attribute `CONVERSION` to "`SAGTCHA`".

See `entirex.bridge.targetencoding` under *Configuring the CICS ECI Side* | *Configuring the IMS Connect Side* in the IMS Connect RPC Server documentation in the respective RPC server documentation.

CICS RPC Server

A user exit is provided to influence/control the logic of the CICS RPC Server. See *User Exits*.

Job Names and Transaction IDs in SMF Records

Broker ACI field `APPLICATION-NAME` has been enhanced to improve logging and accounting. If the program that issued the broker call is running on a mainframe system, the eight-byte job name is used as application name. If the job name is shorter than eight bytes, it is padded with underscore characters. If the z/OS program issuing the broker call is running in a TP monitor (except IDMS/DC), a dash sign is set as ninth byte. The following eight bytes from position 10-17 contain monitor-dependent data. See *`APPLICATION-NAME`* in the ACI Programming documentation for details.

Whitespace Handling in the XML/SOAP Runtime

The default handling for preserving whitespace in XML and Web services scenarios has been enhanced. The XML/SOAP Runtime trims whitespace in values by default. The whitespace handling is also determined by defining attribute `xml:space` (see XML specification) on element(s). The attribute `xml:space` has the higher priority and is inherited from children of the element recursively. See Whitespace Handling under *Writing Advanced Applications with the XML/SOAP Wrapper*.

Administration Service Commands

The administration service monitors and controls all local brokers; remote brokers can also be monitored. The administration service is addressed via the System Management Hub or the administration service command-line utility `etbsrv`. To run the commands from utility `etbsrv`, System Management Hub is not required. This feature was designed to be used in a clustering environment, but can also be used in a standard environment.

See also *Administration Service Commands* in the UNIX|Windows administration section of the documentation.

License Key Handling under z/OS

Under z/OS, the EntireX Broker no longer starts up if the license key is invalid.

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List of Components per Platform

	z/OS 1.12, 1.13, 2.1, see (9) below	z/VSE Version 4.3, 5.1	BS2000/OSD 6.0, 7.0, 8.0, 9.0	z/VM 5.4, 6.1	SUSE Linux Enterprise Server 11 for IBM System z (64-bit)	Red Hat Enterprise Linux 6 for IBM System z (64-bit)	Solaris UltraSPARC 10, 11 (64-bit)	HP-UX 11i v3 for Itanium 2 (64-bit)	AIX Power 6.1, 7.1 (64-bit)	OpenVMS 8.3-1H1, 8.4 for Itanium (64-bit)	IBM i 6.1, 7.1	SUSE Linux Enterprise Server 11 for x86-64 (64-bit)	Red Hat Enterprise Linux 5 and 6 for x86-64 (64-bit), and version 6 for Amazon EC2 (64-bit)	Windows 32-bit, see (7) below	Windows 64-bit, see (8) below
EntireX Broker	x[4]	x[6]	x		x	x	x	x	x			x	x	x	x
EntireX Workbench												x	x	x	x
EntireX RPC															
Batch RPC Server	x	x	x												
CICS RPC Server	x	x													
IMS RPC Server	x														
COBOL Server/Client	x	x	x												
Micro Focus RPC Server					x	x	x	x	x			x	x	x	x
PL/I Server/Client	x														
C RPC Server/Client			x[5]		x	x	x	x	x		x	x	x	x	x
Java RPC Server/Client	x[3]				x	x	x	x	x			x	x	x	x
XML/SOAP RPC Server/Client	x[3]				x	x	x	x	x			x	x	x	x
WebSphere MQ RPC Server	x[3]				x	x	x	x	x			x	x	x	x
WebSphere MQ Listener	x[3]				x	x	x	x	x			x	x	x	x
DCOM RPC Client [1]														x	
.NET RPC Server/Client [1]														x	x
RPC-ACI Bridge	x[3]				x	x	x	x	x			x	x	x	x
CICS ECI RPC Server	x[3]				x	x	x	x	x			x	x	x	x
IMS Connect RPC Server	x[3]				x	x	x	x	x			x	x	x	x
EntireX ACI															
Broker Stubs	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Java ACI	x				x	x	x	x	x			x	x	x	x
ActiveX Control														x	
System Management Hub					x	x	x	x	x			x	x	x	x
Broker Agent	x				x	x	x	x	x			x	x	x	
JMS Support					x	x	x	x	x			x	x	x	x

	z/OS 1.12, 1.13, 2.1, see (9) below	z/VSE Version 4.3, 5.1	BS2000/OSD 6.0, 7.0, 8.0, 9.0	z/VM 5.4, 6.1	SUSE Linux Enterprise Server 11 for IBM System z (64-bit)	Red Hat Enterprise Linux 6 for IBM System z (64-bit)	Solaris UltraSPARC 10, 11 (64-bit)	HP-UX 11i v3 for Itanium 2 (64-bit)	AIX Power 6.1, 7.1 (64-bit)	OpenVMS 8.3-1H1, 8.4 for Itanium (64-bit)	IBM i 6.1, 7.1	SUSE Linux Enterprise Server 11 for x86-64 (64-bit)	Red Hat Enterprise Linux 5 and 6 for x86-64 (64-bit), and version 6 for Amazon EC2 (64-bit)	Windows 32-bit, see (7) below	Windows 64-bit, see (8) below
Attach Manager	x[(2)]				x	x	x	x	x			x	x	x	x

In accordance with the license agreement you concluded with Software AG, your EntireX license includes either full functionality or specific EntireX components.

Notes:

(1) Application wizard for Visual Studio .NET 2010 also provided in installation kit.

(2) The attach services supplied with Broker Services are still supported in this version but may be replaced in the future.

(3) Batch only. These components included as a TAR file in the z/OS installation kit and must be copied to your z/OS UNIX environment. See *Installing EntireX Java Components under z/OS UNIX* in the z/OS installation documentation.

(4) Batch only. “Broker” here refers to the broker kernel, also known as broker nucleus. In all versions of EntireX under z/OS, the EntireX broker kernel runs in batch mode only, either as a job or a started task. It does not run under TSO, CICS, Com-plete or any other online environment.

(5) Only servers are supported; a server example is delivered.

(6) Batch only. “Broker” here refers to the broker kernel, also known as broker nucleus. In all versions of EntireX under z/VSE, the EntireX broker kernel runs in batch mode only. It does not run in any online environment.

(7) Windows 32-bit Platforms:
- Windows 7 Professional/Ultimate/Enterprise (x86)
- Windows 8 (x86)

(8) Windows 64-bit Platforms:
- Windows 7 Professional/Ultimate/Enterprise (x86-64)
- Windows 8 (x86-64)
- Windows Server 2008 Standard/Enterprise (x86-64, Amazon EC2)
- Windows Server 2012 (x86-64)

(9) Please note that IBM's planned end-of-support date for z/OS version 1.12 is 30 September 2014.

Platform and Version Support

Software AG provides EntireX support for the operating/teleprocessing system versions supported by their respective manufacturers. In general, when an operating/teleprocessing system provider stops supporting a version of an operating/teleprocessing system, Software AG will stop supporting that operating/teleprocessing system version.

Software AG plans to provide support for previous versions of EntireX and predecessor products of EntireX as follows:

End-of-Maintenance Dates for Previous Versions of EntireX

With this release of EntireX, product versions not listed below are no longer supported.

Product Release	Platform	Release Date	End-of-Maintenance Date
EntireX Communicator 7.1	IBM i Series 6.1	April 2010	
	IBM i Series 7.1	November 2012	
EntireX Communicator 7.2	z/VSE 4.3	July 2008	31 May 2014
	z/VSE 5.1	November 2011	
EntireX Communicator 7.3	z/VM 5.4	September 2008	31 December 2014
	z/VM 6.1	October 2009	30 April 2013
	z/VM 6.2	December 2011	
webMethods EntireX 8.0	OpenVMS IA-64	December 2008	
webMethods EntireX 8.1	BS2000/OSD	December 2009	
webMethods EntireX 8.2	z/OS, UNIX, Windows	December 2010	30 June 2014
	HP-UX 11i v3 for PA RISC	December 2010	31 December 2016
webMethods EntireX 9.0	z/OS, UNIX, Windows	June 2013	30 June 2016
webMethods EntireX 9.5	z/OS, UNIX, Windows	November 2013	

If you have access to Empower, you can also see the detailed and most recent information in the EntireX Roadmap.

Current Version of EntireX per Operating System

This table shows the latest version of EntireX per platform. In most cases, earlier versions of EntireX are also supported. See *Platform and Version Support* for full list.

Operating System	EntireX Version
z/OS V1.12, V1.13, V2.1	9.5
z/VSE V4.3, V5.1	7.2.3
BS2000/OSD 6.0, 7.0, 8.0, 9.0	8.1 SP1
z/VM 5.4, 6.2	7.3
OpenVMS 8.3-1H1, 8.4 for Itanium (64-bit)	8.0
SUSE Linux Enterprise Server 11 for IBM System z (64-bit)	9.5
Red Hat Enterprise Linux 5 for IBM System z (64-bit)	9.5
Red Hat Enterprise Linux 6 for IBM System z (64-bit)	9.5
Red Hat Enterprise Linux 6 for Amazon EC2 (64-bit)	9.5
Solaris SPARC 10, 11 (64-bit)	9.5
HP-UX 11i v2 for PA-RISC HP-UX 11i v3 for PA-RISC	8.2
HP-UX 11i v2 for Itanium 2	8.1
HP-UX 11i v3 for Itanium 2	9.5
AIX 6.1 (64-bit)	8.2
AIX 7.1 (64-bit)	9.5
IBM i Series	7.1
SUSE Linux Enterprise Server 10 for x86 (32-bit)	8.1
SUSE Linux Enterprise Server 10 for AMD64 and EM64T (x86-64)	8.1
SUSE Linux Enterprise Server 11 for x86 (32-bit)	8.2
SUSE Linux Enterprise Server 11 for AMD64 and EM64T (x86-64)	9.5
Red Hat Enterprise Server Linux 5 for x86 (32-bit)	8.2
Red Hat Enterprise Server Linux 5 for AMD64 and EM64T (x86-64)	9.5
Red Hat Enterprise Server Linux 6 for AMD64 and EM64T(x86-64)	9.5
Windows XP Professional (32-bit, x86) Windows Vista (32-bit, x86) Windows Server 2003 Standard and Enterprise editions (32-bit, x86)	8.2
Windows Server 2008 Standard and Enterprise editions (32-bit, x86)	9.0
Windows 7 Professional, Ultimate and Enterprise editions (32-bit, x86) Windows 8 (32-bit, x86) Windows Server 2008 Standard and Enterprise editions (32-bit, x86)	9.5

Operating System	EntireX Version
Windows 7 Professional, Ultimate and Enterprise editions (64-bit, x86-64) Windows 8 (64-bit, x86-64) Windows Server 2008 Standard and Enterprise editions (64-bit, x86-64 and Amazon EC2) Windows Server 2012 (64-bit, x86-64)	

Supported RPC Protocols

RPC Protocol[1]	Feature[2]	EntireX	EntireX Adapter for Integration Server	PI Adapter for EntireX	Natural			More Information
					Mainframe	ONE	Open Systems	
2000	IDL unbounded arrays	5.4	7.1	4.1.0	4.1.3	8.1	6.1.1 PL13	Unbounded arrays are arrays with variable upper bounds, see `array-definition` under *Software AG IDL Grammar* in the *IDL Editor* documentation. For the programming language COBOL they can be defined with an upper maximum and mapped to COBOL data items with the `DEPENDING ON` clause. See *Tables with Variable Size - `DEPENDING ON` Clause*.
	IDL types PU, NU	5.4	7.1	4.1.0	4.1.3	8.1	6.1.1 PL13	The data types packed and unpacked decimal unsigned support the programming languages COBOL and PL/I. See *IDL Data Types* under *Software AG IDL File*.
	IDL structs	5.4	7.1	4.1.0	4.1.3	8.1	6.1.1 PL13	An IDL struct describes a user-defined type for reusability. For RPC server with a CICS channel container interface, it describes the layout of container. See `structure-definition` under *Software AG IDL Grammar* in the *IDL Editor* documentation.
	IDL aligned attribute	5.4	7.1	4.1.0	n/a	n/a	n/a	The aligned attribute is relevant for the programming languages COBOL and PL/I. For other languages it is not relevant, so for Natural RPC clients, including Natural RPC clients generated with the *Natural Wrapper*, send the aligned attribute to the target RPC server. See `attribute-list` under *Software AG IDL Grammar* in the *IDL Editor* documentation.

RPC Protocol[1]	Feature[2]	EntireX	EntireX Adapter for Integration Server	PI Adapter for EntireX	Natural			More Information
					Mainframe	ONE	Open Systems	
	IDL parameters with more than 3 indices (all indices up to the parent on level 1 counted)	5.4	7.1	4.1.0	n/a	n/a	n/a	See `array-definition` under *Software AG IDL Grammar* in the *IDL Editor* documentation.
	IDL library or IDL program longer than 8 characters	5.4	7.1	4.1.0	4.2.6	8.1	6.3.7	Long IDL library and program names are a challenge for languages such as COBOL and Natural, which restrict program names to 8 characters. These long IDL names are nevertheless supported by EntireX. If a Natural server is wrapped with *Natural Wrapper* or extracted with *IDL Extractor for Natural* with a long IDL program name, this forces a CVM file and protocol 2030. See *When is a CVM File Required?* in the *Natural Wrapper* documentation. If a COBOL server is wrapped with *COBOL Wrapper* or extracted with *IDL Extractor for COBOL* with a long IDL program name, this forces an SVM file but no increase of protocol level. See *Handling SVM Files* in the respective sections of the documentation. See also `library-definition` under *Software AG IDL Grammar* in the *IDL Editor* documentation and `program-definition` under *Software AG IDL Grammar* in the *IDL Editor* documentation.
	Reliable RPC	8.0	7.2	4.1.1	4.2.5	8.1	6.3.6	*Reliable RPC*.
	CICS Channel Container	8.2.2	7.1	4.1.0	n/a	n/a	n/a	Natural RPC clients generated with *Natural Wrapper* can call COBOL programs using CICS with channel

RPC Protocol[1]	Feature[2]	EntireX	EntireX Adapter for Integration Server	PI Adapter for EntireX	Natural			More Information
					Mainframe	ONE	Open Systems	
								container calling convention. See *CICS with Channel Container Calling Convention* (COBOL Wrapper | Extractor).
	Mixed case RPC passwords	8.2.2	8.2.2	no	4.1.4	8.1	6.1.1 PL21	Allow RPC passwords with lowercase characters. See *Natural Security* under *Common Features of Wrappers and RPC-based Components*.
2010	Natural optional parameters	n/a	n/a	n/a	4.1.3	8.1	6.1.1 PL13	Optional parameters are a special Natural feature. See Natural documentation.
2020	IDL types U, UV	7.3	7.1	4.1.1	4.2.1	8.1	6.2.1	The Unicode data types support all programming languages with separate Unicode and character types such as COBOL, Natural and C. See *IDL Data Types* under *Software AG IDL File*.
	Up to 99 IDL Levels	7.3	7.1	4.1.1	4.2.1	8.1	6.2.1	IDL levels are used in conjunction with parameter grouping. Parameters are either scalar or a member of the immediately preceding group that has been assigned a lower level number. See `simple-parameter-definition` under *Software AG IDL Grammar* in the *IDL Editor* documentation.
2030	Natural Redefine and other features	8.2	8.2	no	4.2.7 and 8.2.2	8.2.4	6.3.9	Supported by *IDL Extractor for Natural* on server side. See *When is a CVM File Required?* in the *Natural Wrapper* documentation for full list of features.
2040[3]	Increased precision for IDL types N, NU, P, PU	no	no	no	8.2.2	no	no	The total number of digits (before and after the decimal point) is increased from 29 to 31. The number of digits after the decimal point can be 31. See Natural documentation.

n/a = not applicable

no = not supported

Notes:

1. To enable communication it is not required that both partners (RPC client and RPC server) support the same level of RPC protocol. There is a handshake to negotiate the highest protocol level supported by both ends. The RPC protocols 1110 thru 1140 (which are not documented here) may occur in communications as well if older RPC components are used.
2. To enable communication the feature used must be supported by both partners (RPC client and RPC server), otherwise communication is not possible.
3. Although EntireX, EntireX Adapter for Integration Server and PI Adapter for EntireX do not support RPC protocol 2040, communication with Natural is possible if the feature used (see Note 2) is supported by both partners (RPC client and RPC server).

Functionality Dropped in Version 9.5

- **Location Transparency**
  Location transparency is no longer supported in this version.
- **Windows Server 2008 (32-bit)**
  Windows Server 2008 (32-bit) is no longer supported. We suggest you upgrade to the 64-bit or a more recent Windows version. See *List of Components per Platform* for full list.
- **JBoss**
  Application server JBoss is no longer supported.

Functionality Dropped in Version 9.0

- **Operating System Support**
  The following operating systems are no longer supported:
  - Linux 32-bit versions. We therefore recommend you migrate to the corresponding 64-bit OS version.
  - Windows XP, Windows Vista, Windows 2003.
  - HP-UX PA-Risc (64-bit). Applies to EntireX 9.0 only. EntireX will continue to be supported on this platform with version 8.2 until December 2016.
- **RPC Parameters**
  Configuration of RPC servers has been simplified, and the following parameters are now deprecated on some platforms:
  - `runoption`
    For Batch RPC Server and IMS RPC Server the complex parameter `runoption` is replaced by the new parameter *`marshalling`*, which is set by default to `COBOL`. `marshalling` is used together with server mapping files (SVMs).
  - `minworker`, `maxworker`, `endworker`
    For Batch RPC Server, parameters `minworker`, `maxworker` and `endworker` are replaced by new parameter *`workermodel`*.

    See examples under *RPC Parameters* in section *What was New in Version 9*.
  - `kernelsecurity`
    The RPC server option `kernelsecurity` (`KSEC` under CICS) is deprecated. EntireX RPC servers now provide logic to detect the security setup of the broker kernel automatically. Applies to Batch, CICS, IMS, UNIX, Windows, Micro Focus and .NET RPC Servers.

  Support for these parameters is currently still provided for compatibility reasons.

- **Broker Attributes**
  The Broker attributes `NET-RESTART`, `NET-RETRY-LIMIT` and `NET-RETRY-TIME` are no longer supported.
- **DCOM Wrapper Proxy Objects**
  The generation of DCOM Wrapper proxy objects is no longer supported.
- **ACI for .NET**
  The EntireX Broker ACI for .NET is no longer supported.
- **Broker Stubs**
  Entire Net-Work is no longer supported for Broker stubs used on UNIX or Windows.

Functionality to be Dropped in Future Releases

The following features and platforms are not planned to be supported in future versions.

- **Broker Services**
  Broker Services have been partially retired since EntireX version 8.0. They will be fully retired with the next EntireX version after EntireX 9.6. This affects in particular the following components:
  - **Broker Services WebSphere MQ Support**
    Retired since version 8.0. There was no direct replacement for the Broker Services WebSphere MQ support. However, WebSphere MQ is supported with the *EntireX WebSphere MQ RPC Server* and the *EntireX WebSphere MQ Listener*. For scenarios using the Broker Services WebSphere MQ support, both of these might be a more modern and easier-to-use alternative.
  - **Broker Services APPC Adapter**
    Retired since version 8.0. There was no replacement for the Broker Services APPC Adapter. We recommend using the standard EntireX functionality in the future. Possible migration paths can vary and should be determined based on your projects.
  - **Broker Services Attach Service**
    There will be no replacement for the Broker Services Attach Service. Most of the RPC server implementations support multiple worker models for load balancing purposes. See for example *Worker Models* in the respective section of the documentation. For Natural RPC servers, the Natural RPC Server front-end provides similar functionality.
- **Administration using System Management Hub and SNMP Support**
  Administration with SMH is planned to be dropped in a future version of EntireX. The required SMH functionality will be replaced by other means. SNMP will no longer be supported when SMH is dropped.
- **BKIMBTSO**
  Broker stub BKIMBTSO is deprecated and will not be delivered after EntireX version 9.5. The functionality is covered by stub BROKER. The current release still includes BKIMBTSO for compatibility reasons. This means you do not need to change existing link jobs for version 9.5, but this will be necessary in the next version. Also, default transport method for BKIMBTSO

was TCP; default for BROKER is NET. Any necessary configuration changes for the transport default will be described in the Release Notes of the next version.

- **Broker Agents**
  The Broker SSL Agent and Broker TCP Agent will be removed in a future version.
- **ACI for Natural**
  The LDAs NATDEF12 and NATDEF21 are deprecated and will no longer be delivered in the future.

  The LDAs NATDEF12 and NATDEF21, which define API version 2 only, are consolidated into the LDA NATDEF in the Natural library SYSETB. If there were duplicate field names in NATDEF12 and NATDEF21, they are defined as REDEFINES in NATDEF. NATDEF12 and NATDEF21 are deprecated and will not be delivered in future releases. Use NATDEF in your application for Broker control block definition. Also, some of the fields in NATDEF are marked as deprecated. Do no use these in your application either.
- **IDL Compiler Native Batch Interface**
  The IDL Compiler native batch interface for the C Wrapper and .NET Wrapper is deprecated and will be dropped in the future. For the C Wrapper, use the Eclipse batch interface instead. See *Using the C Wrapper in Command-line Mode*.

  Customer-written templates for the IDL Compiler are also deprecated, and support for these templates will be dropped in a future version.
- **COBOL Wrapper**
  The Generic RPC Services Module (see *Generic RPC Services Module*) COBSRVIB and COBSRVID delivered on mainframe will be removed. Instead, use the modules generated by the EntireX Workbench. The CICS module COBSRVIC in source as well as load format will stay.
- **RPC Parameters**
  Support for all RPC parameters listed as "deprecated" under ***Functionality Dropped in Version 9.0*** may be dropped in a future version. We recommend you use the alternatives provided.
- **Broker ActiveX Control**
  The EntireX Broker ActiveX Control will be removed in a future version.
- **PL/I MVS Compiler**
  Support for IBM compiler PL/I for MVS & VM will be dropped in a future version. Support for compiler Enterprise PL/I for z/OS will continue.
- **Partner Broker ID**
  Partner Broker ID will not be supported in a future version.
- **Microsoft Visual Studio Wizard for EntireX .NET Wrapper**
  The Visual Studio Wizard for .NET Wrapper as a plug-in for Microsoft Visual Studio 2010 will be removed in a future version. This functionality will continue to be provided by the EntireX Workbench.

- **Microsoft Visual Studio Wizard for EntireX DCOM Wrapper**
  The Microsoft Visual Studio Wizard for EntireX DCOM Wrapper as a Software AG plug-in will be removed in a future version. This functionality will continue to be provided by the EntireX Workbench.
- **EntireX Wrapper for Enterprise JavaBeans**
  The possibility to enable Java-based components to access an EntireX RPC server using Enterprise JavaBeans will be removed with the EntireX Wrapper for Enterprise JavaBeans in a future version.

4 EntireX Prerequisites

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- Supported LDAP Servers 50

This chapter describes the product prerequisites for the following EntireX platforms:

Note: Software AG supports third-party technology, for example operating system versions, products or functionality, only for as long as this technology is officially supported by the third-party vendor.

z/OS Prerequisites

Note: z/OS 1.12 or higher is required for all components. For information regarding Software AG product compatibility with IBM platforms and any IBM requirements for Software AG products, see *Product Compatibility for IBM Platforms* on the Software AG website.

Component	Prerequisites
EntireX Broker	■ **Transport Options** ■ TCP-based communications: IBM TCP Stack ■ SSL-based communications: IBM GSK ■ NET-based communications: Entire Net-Work. See **note below**. ■ **EntireX Security** SAF-compatible security system for host z/OS compatible Broker kernel: ■ Resource classes/types and profiles as required by the installed security system. This can require a machine IPL in the case of RACF. ■ If you are using the trusted SAF user ID feature with the CICS TP monitor, set ADAGSET macro parameter `SAF=YES` when installing the Adabas/CICS link module.
CICS RPC Server Batch RPC Server IMS RPC Server	■ If applicable, see prerequisites for **COBOL Wrapper** and **PL/I Wrapper**. ■ Same prerequisites as **Broker Stubs**. ■ IBM Assembler for CICS RPC Server.
Broker Stubs	■ **Transport Options** See Broker prerequisites above. ■ **Lowest Supported Applications Environment Versions** ■ For CICS applications: CICS TS 3.1 ■ For IMS-based applications: IMS 8 ■ For Com-plete based applications: Com-plete 6.5; stub COMETB requires APS331 SP5 ■ For Natural-based applications: NAT 4.2.6

Component	Prerequisites
Workbench	■ **COBOL Wrapper** ■ To compile the sources generated by the EntireX Workbench component COBOL Wrapper: Compiler supported by the COBOL Wrapper: standard COBOL compiler, for example IBM Enterprise COBOL for z/OS 4.2. ■ For client side, see prerequisites for **Broker stubs**. ■ For server side, an RPC server. See prerequisites for relevant RPC server above. ■ **PL/I Wrapper** ■ To compile the sources generated by the EntireX Workbench component PL/I Wrapper: Compiler supported by the PL/I Wrapper, for example PL/I for MVS & VM V1R1.1, or the newer Enterprise PL/I for z/OS V4.R1. ■ For client side, see prerequisites for **Broker stubs**. ■ For server side, an RPC server. See prerequisites for relevant RPC server above. ■ **IDL Extractor for Natural** To extract from z/OS, a standard Natural RPC server is required with one of the following Natural versions. The scope of the generation depends on the version: ■ Natural 4.2.7.4 is required for improved handling if IDL extractions fails. ■ Natural 4.2.7 or higher is required to make use of the following features: ■ during runtime to support a redesigned interface including support for `REDEFINE`s, map to suppress etc. ■ Optional replacing of special characters ("@") in parameter names by underscore ■ Natural 4.2.6.2 or higher is required for object extractions to make use of the features (introduced with EntireX 8.1 SP2). ■ Optional replacing of special characters ("#", "$", "&", "/") in parameter names by underscore ■ Hints (comments) in extracted IDL per parameter for restrictions and usage where appropriate. ■ Support for Natural V-arrays (Natural syntax: A100/1:V). They are mapped to IDL unbounded arrays. ■ Combinations of Natural X-array dimensions together with Natural V-array dimensions (Natural syntax: A100/1:*,1:V) are supported. They are mapped to IDL unbounded arrays. ■ Natural 4.2.6.1 or lower can be used, but if extracted from objects there is no support of the features supported by Natural 4.2.6.2 (see above). ■ **Natural Wrapper** To generate a client interface object, a standard Natural RPC server is required with one of the following Natural versions. The scope of the generation depends on the version: ■ Natural 4.2.7.11 or higher or Natural 8.2.2.6 or higher is required to disable/enable the generation of Natural client test programs. See *Step 4a: Customize Natural Client Names*

Component	Prerequisites
	and Save Remotely (Optional) | *Step 4b: Customize Natural Client Names and Save Locally (Optional)*. ■ Natural 4.2.7.8 or higher or Natural 8.2.2.2 or higher is required to adapt the names for the Natural client interface objects (subprograms (NSNs) with their parameter data areas (PDAs)). See See *Step 4a: Customize Natural Client Names and Save Remotely (Optional)* | *Step 4b: Customize Natural Client Names and Save Locally (Optional)*. ■ Natural 4.2.7.4 or higher is required if a *CVM File* is used in addition to an IDL file to support features introduced with EntireX 8.2 such as multiple Natural subprogram interfaces, `REDEFINE`s or map to suppress. See *Redesigning the Extracted Interface* in the IDL Extractor for Natural documentation. ■ Natural 4.2.6.2 or higher generates Natural client interface objects, separate Natural parameter data areas (PDAs) and Natural client test programs. ■ Natural 4.2.5.5 to Natural 4.2.6.1 generates Natural client interface objects only. To generate a server skeleton, a standard Natural RPC server is required with Natural version 4.2.7.11 or higher or Natural 8.2.2.6 or higher. See *Using the Natural Wrapper for the Server Side*.
Attach Manager	■ **Transport Options** ■ TCP-based communications: IBM TCP Stack ■ NET-based communications: Entire Net-Work. See **note below**. The attach services supplied with Broker Services are still supported in this version but may be replaced in the future.

Additional Notes for z/OS

- **Entire Net-Work**
  - EntireX works with any supported version of Entire Net-Work. We recommend you use the latest version, which for z/OS is currently 6.3. The Adabas version we recommend is 8.2.
  - Adabas Cross-Memory Services are required if you are using NET transport or using Adabas as your persistent store. We recommend using at least the version delivered with EntireX (WAL825). See *Installing Adabas Components for EntireX under z/OS* in the z/OS installation documentation.

UNIX Prerequisites

Component	Prerequisites
EntireX Broker	■ Supported transport methods: SSL and/or TCP/IP.
EntireX Workbench	■ **General Prerequisites** ■ Eclipse SDK 3.6 or 4.3. ■ Web Services Stack plug-ins version 9 (to install EntireX Workbench in standalone mode). ■ **C Wrapper** ■ For other target platforms, see prerequistites for that platform, for example UNIX | BS2000/OSD. ■ **COBOL Wrapper** ■ See prerequisites for target platform, for example z/OS | UNIX | Windows | IBM i. ■ For Micro Focus COBOL, Micro Focus Server Express 5.1 and Net Express 5.1 or compatible development environment. ■ **Wrapper for EJB** ■ J2EE 1.5. See *Application Server Prerequisites*. ■ Ant 1.6.1. ■ XDoclet 1.2.1. ■ **IDL Extractor for Natural** ■ To extract from UNIX, a standard Natural RPC server is required with one of the following versions. The scope of the extraction depends on the version: ■ Natural 6.3.11 or higher is required for improved handling if IDL extractions fails. ■ Natural 6.3.10 or higher is required for optional replacing of special characters ("@") in parameter names by underscore for object extractions. ■ Natural 6.3.9 or higher is required during runtime to support a redesigned interface including support for `REDEFINE`s, suppress etc. ■ Natural 6.3.8 or higher is required for object extractions to make use of the following features (introduced with EntireX 8.1 SP2): ■ Optional replacing of special characters ("#", "$", "&", "/") in parameter names by underscore ■ Hints (comments) in extracted IDL per parameter for restrictions and usage where appropriate. ■ Support for Natural V-arrays (Natural syntax: A100/1:V). They are mapped to IDL unbounded arrays.

Component	Prerequisites
	■ Combinations of Natural X-array dimensions together with Natural V-array dimensions (Natural syntax: A100/1:*,1:V) are supported. They are mapped to IDL unbounded arrays. ■ Natural 6.3.7 or lower can be used, but if extracted from objects, there is no support of the features supported by Natural 6.3.8 (see above). ■ To extract from other platforms, a Natural RPC server for the respective platform must be available, see prerequisites for target platform, for example z/OS | Windows | BS2000/OSD | IBM i. ■ **Natural Wrapper** ■ To generate a client interface object, a standard Natural RPC server is required with one of the following versions. The scope of the generation depends on the version: ■ Natural 6.3.13 or higher is required to disable/enable the generation of Natural client test programs. See *Step 4a: Customize Natural Client Names and Save Remotely (Optional)* | *Step 4b: Customize Natural Client Names and Save Locally (Optional)*. ■ Natural 6.3.12 or higher is required to adapt the names for the Natural client interface objects (subprograms (NSNs) with their parameter data areas (PDAs)). See *Step 4a: Customize Natural Client Names and Save Remotely (Optional)* | *Step 4b: Customize Natural Client Names and Save Locally (Optional)*. ■ Natural 6.3.11 or higher is required if a *CVM File* is used in addition to an IDL file to support features introduced with EntireX 8.2 such as multiple Natural subprogram interfaces, `REDEFINE`s or map to suppress. See *Redesigning the Extracted Interface* in the IDL Extractor for Natural documentation. ■ Natural 6.3.8 or higher generates Natural client interface objects, separate Natural parameter data areas (PDAs) and Natural client test programs. ■ Natural 6.3.7 generates Natural client interface objects only. ■ To generate a server skeleton, a standard Natural RPC server is required with Natural version 6.3.13 or higher. See *Using the Natural Wrapper for the Server Side*. ■ To generate into another platform, a Natural RPC server for the respective platform must be available, see prerequisites for target platform, for example z/OS | Windows | BS2000/OSD. ■ To generate with the default RPC environment installed in a UNIX NaturalONE environment, the scope of the generation depends on the version: ■ NaturalONE 8.2.6 or higher is required to generate Natural RPC server skeletons (subprograms (NSNs) with their parameter data areas (PDAs)) and adapt their names, see *Step 2: Customize Natural Server Names*. ■ NaturalONE 8.2.6 or higher is required to disable/enable the generation of Natural client test programs. See *Step 2: Customize Natural Client Names*. ■ NaturalONE 8.2.5 or higher is required to adapt the names for the Natural client interface objects (subprograms (NSNs) with their parameter data areas (PDAs)). See *Step 2: Customize Natural Client Names*. ■ NaturalONE 8.1.5 or higher or NaturalONE 8.2.4 or higher is required if a *CVM File* is used in addition to an IDL file to support features introduced with EntireX 8.2

Component	Prerequisites
	such as multiple Natural subprogram interfaces, `REDEFINE`s or map to suppress. See *Redesigning the Extracted Interface* in the IDL Extractor for Natural documentation. ■ NaturalONE 8.1.1 or higher or NaturalONE 8.2.1 or higher is required to generate Natural client interface objects, separate Natural parameter data areas (PDAs) and Natural client test programs. See *Step 2: Customize Natural Client Names*. ■ **PL/I Wrapper** ■ See prerequisites for target platform, for example z/OS. ■ **XML/SOAP Wrapper, Web Services Wrapper** ■ JAXP-capable XML parser. Delivered with Web Services Stack.
EntireX RPC	■ **General Prerequisites** ■ For Java-based RPC servers: Java 7 (recommended). ■ If you are using SSL, see *Using SSL* under *Setting the Transport Methods* under *Writing Advanced Applications - EntireX Java ACI* for details. ■ **EntireX XML/SOAP Listener (formerly XML Servlet)** ■ Servlet Engine supporting Java Servlet API 2.2 or higher. ■ **XML/SOAP Wrapper Runtime** ■ JAXP-capable XML parser. Delivered with Web Services Stack. ■ **Micro Focus RPC Server** ■ Micro Focus Server 5.1 or compatible COBOL runtime environment.
WebSphere MQ RPC Server	■ To run the WebSphere MQ RPC Server or WebSphere MQ Listener, you need either the base Java classes or a full installation of WebSphere MQ. For WebSphere MQ version 7.0, 7.1 or 7.5 you need at least the JAR file `com.ibm.mq.jar`. Note that this file name is subject to change in a future version of WebSphere MQ. Check your IBM documentation for details.
EntireX ACI	■ **Broker Stubs** ■ For Natural-based applications, all Natural versions supported by Software AG are valid. ■ Supported transport methods: SSL and/or TCP/IP. ■ **Java ACI** ■ Java 7 (recommended). ■ If you are using SSL, see *Using SSL* under *Setting the Transport Methods* under *Writing Advanced Applications - EntireX Java ACI* for details.
EntireX administration with System	■ The corresponding version of System Management Hub from the webMethods suite.

Component	Prerequisites
Management Hub	

The products listed here have been thoroughly tested and are known to work. In most cases, more recent versions of the required components should also work.

Additional Notes for UNIX

- **Entire Net-Work**
  Entire Net-Work is no longer supported as transport method under UNIX. We recommend you use transport method TCP/IP.
- We strongly recommend you install the latest operating system and compiler patches.

Additional Notes for HP-UX 11.31 (11i v3)

It is required to install the following manufacturer's patch before you start the installation: PHCO_36900.

Additional Notes for Linux (x86 and IBM System z)

If the system is configured to run in parallel boot mode, the installed rc scripts will not work by default. To work around this problem on SUSE Enterprise Server, simply set `RUN_PARALLEL=no` in file /etc/sysconfig/boot.

During installation of EntireX, the Software AG Installer will ask whether you want to install using sudo authentication or run a script after installation. If you want to install using sudo, and you are installing on a SUSE Linux Enterprise Server or Red Hat Enterprise Linux Server system, you cannot use the option `Defaults env_reset`. Open the sudo configuration file /etc/sudoers and explicitly set the `Defaults env_reset` option with "!" (that is, `Defaults !env_reset`).

If you use the option `Defaults env_reset` instead of following the instructions above, you will have to use su authentication during installation.

If you are installing on a SUSE Linux Enterprise Server or Red Hat Enterprise Linux Server 6 system, install glibc, libgcc, pam and ncurses RPM from your operating system distribution, using the vendor instructions. For Red Hat Enterprise Linux Server 6 system, additionally install compat-libstdc++.

If you are using the EntireX Workbench on SUSE Linux Enterprise Server 11 (x86-64), install the RPM package pango-devel (64-bit) from your operating system distribution. Follow the instructions provided by the vendor.

Additional Notes for Linux x86

Please note that IBM Java or the GCJ Java should not be used with our products for Linux x86 platforms. Use only Oracle or Blackdown Java for our products on Linux x86. (Our products only support IBM Java on AIX and Linux for IBM System z).

Windows Prerequisites

Component	Prerequisites
EntireX Broker	■ Supported transport methods: SSL and/or TCP/IP.
EntireX Workbench	■ **General Prerequisites** ■ Java 7 (recommended) ■ Eclipse SDK 3.6 or 4.3. ■ Web Services Stack plug-ins 8.2 (to install EntireX Workbench in standalone mode). ■ **C Wrapper** ■ For target platform Windows, Microsoft Visual Studio 2010. ■ For other target platforms, see prerequistites for that platform, for example UNIX | BS2000/OSD. ■ **COBOL Wrapper** ■ See prerequisites for target platform, for example z/OS | UNIX | Windows | IBM i. ■ For Micro Focus COBOL, Micro Focus Server Express 5.1 and Net Express 5.1 or compatible development environment. ■ **DCOM Wrapper** C++ Compiler from Microsoft Visual Studio 2010. ■ For generated interface objects: Microsoft Visual Studio .NET 2010 C/C++ runtime environment. ■ To run DCOM components that were generated with the DCOM Wrapper, the Mini Runtime must be installed. See *Mini Runtime* under *Post-installation Steps under Windows*. ■ **DCOM Wrapper and .NET Wrapper Plug-ins for Microsoft Visual Studio** Microsoft Visual Studio 2010 ■ **.NET Wrapper** ■ .NET Framework 4.0. ■ C# Compiler from Microsoft Visual Studio 2010. ■ **Wrapper for EJB** ■ J2EE 1.5. See ***Application Server Prerequisites***. ■ Ant 1.6.1. ■ XDoclet 1.2.1. ■ **IDL Extractor for Natural** ■ Natural 6.3.11 or higher is required for improved handling if IDL extractions fails. ■ To extract from Windows, a standard Natural RPC server is required with one of the following versions. The scope of the extraction depends on the version:

Component	Prerequisites
	■ Natural 6.3.10 or higher is required for optional replacing of special characters ("@") in parameter names by underscore for object extractions. ■ Natural 6.3.9 or higher is required during runtime to support a redesigned interface including support for `REDEFINE`s, map to suppress etc. ■ Natural 6.3.8 or higher is required for object extractions to make use of the features (introduced with EntireX 8.1 SP2): ■ Optional replacing of special characters ("#", "$", "&", "/") in parameter names by underscore ■ Hints (comments) in extracted IDL per parameter for restrictions and usage where appropriate. ■ Support for Natural V-arrays (Natural syntax: A100/1:V). They are mapped to IDL unbounded arrays. ■ Combinations of Natural X-array dimensions together with Natural V-array dimensions (Natural syntax: A100/1:*,1:V) are supported. They are mapped to IDL unbounded arrays. ■ Natural 6.3.7 or lower can be used, but if extracted from objects, there is no support of the features supported by Natural 6.3.8 (see above). ■ To extract from other platforms, a Natural RPC server for the respective platform must be available, see prerequisites for target platform, for example z/OS | UNIX | BS2000/OSD | IBM i. ■ **Natural Wrapper** ■ To generate a client interface object, a standard Natural RPC server is required with one of the following versions. The scope of the generation depends on the version: ■ Natural 6.3.13 or higher is required to disable/enable the generation of Natural client test programs. See See *Step 4a: Customize Natural Client Names and Save Remotely (Optional)* | *Step 4b: Customize Natural Client Names and Save Locally (Optional)*. ■ Natural 6.3.12 or higher is required to adapt the names for the Natural client interface objects (subprograms (NSNs) with their parameter data areas (PDAs)). See *Step 4a: Customize Natural Client Names and Save Remotely (Optional)* | *Step 4b: Customize Natural Client Names and Save Locally (Optional)*. ■ Natural 6.3.11 or higher is required if a *CVM File* is used in addition to an IDL file to support features introduced with EntireX 8.2 such as multiple Natural subprogram interfaces, `REDEFINE`s or map to suppress.See *Redesigning the Extracted Interface* in the IDL Extractor for Natural documentation. ■ Natural 6.3.8 or higher generates Natural client interface objects, separate Natural parameter data areas (PDAs) and Natural client test programs. ■ Natural 6.3.7 generates Natural client interface objects only. ■ To generate a server skeleton, a standard Natural RPC server is required with Natural version 6.3.13 or higher. See *Using the Natural Wrapper for the Server Side*.

Component	Prerequisites
	■ To generate into another platform, a Natural RPC server for the respective platform must be available, see prerequisites for target platform, for example z/OS | UNIX | BS2000/OSD. ■ To generate with the default RPC environment installed in a Windows NaturalONE environment, the scope of the generation depends on the version: ■ NaturalONE 8.2.6 or higher is required to generate Natural RPC server skeletons (subprograms (NSNs) with their parameter data areas (PDAs)) and adapt their names, see *Step 2: Customize Natural Server Names*. ■ NaturalONE 8.2.6 or higher is required to disable/enable the generation of Natural client test programs. See *Step 2: Customize Natural Client Names*. ■ NaturalONE 8.2.5 or higher is required to adapt the names for the Natural client interface objects (subprograms (NSNs) with their parameter data areas (PDAs)). See *Step 2: Customize Natural Client Names*. ■ NaturalONE 8.1.5 or higher or NaturalONE 8.2.4 or higher is required if a *CVM File* is used in addition to an IDL file to support features introduced with EntireX 8.2 such as multiple Natural subprogram interfaces, `REDEFINE`s or map to suppress. See *Redesigning the Extracted Interface* in the IDL Extractor for Natural documentation. ■ NaturalONE 8.1.1 or higher or NaturalONE 8.2.1 or higher is required to generate Natural client interface objects, separate Natural parameter data areas (PDAs) and Natural client test programs. See *Step 2: Customize Natural Client Names*. ■ **PL/I Wrapper** See prerequisites for target platform, for example z/OS. ■ **XML/SOAP Wrapper, Web Services Wrapper** JAXP-capable XML parser. Delivered with Web Services Stack.
EntireX RPC	■ **General Prerequisites** ■ For Java-based RPC servers: Java 7 (recommended). ■ If you are using SSL, see *Using SSL* under *Setting the Transport Methods* under *Writing Advanced Applications - EntireX Java ACI* for details. ■ **EntireX XML/SOAP Listener (formerly XML Servlet)** ■ Servlet Engine supporting Java Servlet API 2.2 or higher. ■ **XML/SOAP Wrapper Runtime** ■ JAXP-capable XML parser. Delivered with Web Services Stack. ■ **Micro Focus RPC Server** ■ Micro Focus Server 5.1 or compatible COBOL runtime environment.
WebSphere MQ RPC Server	■ To run the WebSphere MQ RPC Server or WebSphere MQ Listener, you need either the base Java classes or a full installation of WebSphere MQ. For WebSphere MQ version 7.0, 7.1 or 7.5 you need at least the JAR file `com.ibm.mq.jar`. Note that this file name is subject to change in a future version of WebSphere MQ. Check your IBM documentation for details.

Component	Prerequisites
EntireX ACI	■ **Broker Stubs** ■ For Natural-based applications, all Natural versions supported by Software AG are valid. ■ Supported transport methods: SSL and/or TCP/IP. ■ **Java ACI** ■ Java 7 (recommended). ■ If you are using SSL, see *Using SSL* under *Setting the Transport Methods* under *Writing Advanced Applications - EntireX Java ACI* for details.
EntireX administration with System Management Hub	■ The corresponding version of System Management Hub from the webMethods suite.

The products listed above have been thoroughly tested and are known to work. In most cases, more recent versions of the required components should also work.

Additional Notes for Windows

- **Entire Net-Work**
  Entire Net-Work is no longer supported as transport method under Windows. We recommend you use transport method TCP/IP.

BS2000/OSD Prerequisites

Component	Prerequisites
EntireX Broker	■ BS2000/OSD V6.0, V7.0, V8.0, V9.0 ■ WAL814 or above
Batch RPC Server	■ BS2000/OSD V6.0, V7.0, V8.0, V9.0 ■ WAL814 or above ■ If applicable, see prerequisites for C Wrapper | COBOL Wrapper.
Broker Stubs	■ BS2000/OSD V6.0, V7.0, V8.0, V9.0 ■ WAL814 or above
Workbench	■ **General Prerequisites** ■ EntireX Workbench version 9.0. ■ For the client side, see prerequisites for Broker stubs. ■ For the server side, an RPC server. See prerequisites for relevant RPC server above. ■ **COBOL Wrapper** To compile the applications generated by the EntireX Workbench component COBOL Wrapper: the IDL types U or UV require a compiler that supports COBOL data type NATIONAL, for example COBOL2000 V01.4B00, otherwise any ILCS-enabled COBOL compiler on BS2000/OSD. ■ **C Wrapper** To compile the applications generated by the EntireX Workbench component C Wrapper: any ILCS-enabled C/C++ compiler on BS2000/OSD ■ **IDL Extractor for Natural** To extract from BS2000/OSD, a standard Natural RPC server is required with one of the following Natural versions. The scope of the generation depends on the version: ■ Natural 4.2.7.4 is required for improved handling if IDL extractions fails. ■ Natural 4.2.7 or higher is required to make use of the following features: ■ during runtime to support a redesigned interface including support for `REDEFINE`s, map to suppress etc. ■ optional replacing of special characters ("@") in parameter names by underscore for object extractions ■ Natural 4.2.6.2 or higher is required for object extractions to make use of the following features (introduced with EntireX 8.1 SP2): ■ Optional replacing of special characters ("#", "$", "&", "/") in parameter names by underscore

Component	Prerequisites
	■ Hints (comments) in extracted IDL per parameter for restrictions and usage where appropriate. ■ Support for Natural V-arrays (Natural syntax: A100/1:V). They are mapped to IDL unbounded arrays. ■ Combinations of Natural X-array dimensions together with Natural V-array dimensions (Natural syntax: A100/1:*,1:V) are supported. They are mapped to IDL unbounded arrays. ■ Natural 4.2.6.1 or lower can be used, but if extracted from objects there is no support of features supported by Natural 4.2.6.2 (see above). ■ **Natural Wrapper** To generate a client interface object, a standard Natural RPC server is required with one of the following Natural versions. The scope of the generation depends on the version: ■ Natural 4.2.7.11 or higher or Natural 8.2.2.6 or higher is required to disable/enable the generation of Natural client test programs. See *Step 4a: Customize Natural Client Names and Save Remotely (Optional)* | *Step 4b: Customize Natural Client Names and Save Locally (Optional)*. ■ Natural 4.2.7.8 or higher or Natural 8.2.2.2 or higher is required to adapt the names for the Natural client interface objects (subprograms (NSNs) with their parameter data areas (PDAs)). See See *Step 4a: Customize Natural Client Names and Save Remotely (Optional)* | *Step 4b: Customize Natural Client Names and Save Locally (Optional)*. ■ Natural 4.2.7.4 or higher is required if a *CVM File* is used in addition to an IDL file to support features introduced with EntireX 8.2 such as multiple Natural subprogram interfaces, `REDEFINE`s or map to suppress. See *Redesigning the Extracted Interface* in the IDL Extractor for Natural documentation. ■ Natural 4.2.6.2 or higher generates Natural client interface objects, separate Natural parameter data areas (PDAs) and Natural client test programs. ■ Natural 4.2.5.5 to Natural 4.2.6.1 generates Natural client interface objects only. To generate a server skeleton, a standard Natural RPC server is required with Natural version 4.2.7.11 or higher or Natural 8.2.2.6 or higher. See *Using the Natural Wrapper for the Server Side*.

Additional Notes for BS2000/OSD

- **Entire Net-Work**
  EntireX works with any supported version of Entire Net-Work. We recommend you use the latest version, which for BS2000/OSD is currently WCP 6.2.1.
- The Adabas version we recommend is ADA 8.1.4.

z/VSE Prerequisites

Component	Prerequisites

Broker Kernel	Product requirements:
	■ z/VSE Version 3.1 or above
	■ Adabas SVC 7.4.4 or above
	■ If you are using Entire Net-Work, Version 5.9.1 or above
	■ If you are using ADASVC transport, Adabas Limited Load libraries (WAL744). These are provided on the installation medium. If you are using Adabas SVC 8.1.x, zap AD744008 is required.
	Installation data sets:
	■ The installation data sets require 60 MB on a 3390 disk.
	System Resource Requirements
	■ The minimum partition size for running EntireX Broker is 45 MB, using the parameter values as supplied. Increasing any of the values in the ETB*nnn*.ATR member e.g. `NUM-LONG-BUFFERS`, `NUM-CONVERSATION` will impact the required partition size accordingly. A realistic partition size would be 65 MB.
	Performance
	■ Please note that with any kind of tracing switched on, performance will be adversely affected due to the extra work load.
	■ We recommend you set job priorities in the following order (highest first):
	  ■ POWER
	  ■ VTAM
	  ■ TCP-IP
	  ■ BROKER

Broker Stubs	■ z/VSE Version 3.1 or above ■ Adabas SVC 7.4.4 or above ■ WAL744 (if you are using SVC 8.1.x, zap AD744008 is required) ■ CSI's TCP/IP for z/VSE Version 1.5E ■ If BKIMB or BKIMC is used, IBM Language Environment 1.4.4
Security	To run a Broker application in a secure environment, the following prerequisites must be met:

Component	Prerequisites
	■ The security system in the EntireX Broker kernel must be activated with the attribute definition `SECURITY=YES`. ■ The kernel security exit USRSEC delivered with the Broker must be accessible. ■ IBM Basic Security Manager must be enabled. **Note:** EntireX Broker will not start if `SECURITY=YES` is specified and USRSEC cannot be loaded or if IBM Basic Security Manager is not activated.
Batch RPC Server	■ z/VSE Version 3.1 or above ■ Adabas SVC 7.4.4 or above ■ WAL744 (if you are using SVC 8.1.x, zap AD744008 is required) ■ CSI's TCP/IP for z/VSE Version 1.5E ■ IBM Language Environment 1.4.4
CICS RPC Server	■ z/VSE Version 3.1 or above ■ CICS TS 1.1.1 ■ Adabas SVC 7.4.4 or above ■ WAL744 (if you are using SVC 8.1.x, zap AD744008 is required) ■ CSI's TCP/IP for z/VSE Version 1.5E ■ IBM Language Environment 1.4.4
Relay Manager	■ z/VSE Version 3.1 or above ■ CSI's TCP/IP for z/VSE Version 1.5E ■ IBM Language Environment 1.4.4

IBM i Prerequisites

Component	Prerequisites
Broker Stubs	■ IBM i 6.1, 7.1. ■ Controller that supports TCP/IP protocol. ■ Any IBM i ILE-enabled programming language. ■ TCP/IP connection to an EntireX Broker kernel on a Windows, z/OS or UNIX platform. ■ About 16 MB of disk space for the Broker stub installation and about 50 MB for the RPC server installation. ■ Each process that includes the Broker stub occupies one additional MB of virtual memory.

Component	Prerequisites
EntireX Workbench	■ **COBOL Wrapper** To compile the applications generated by the EntireX Workbench component COBOL Wrapper: standard COBOL compiler defined by the operating system. ■ **IDL Extractor for Natural** To extract from IBM i, the Natural RPC server must be prepared to work together with the IDL Extractor for Natural. See *Natural RPC Server Configuration for the IDL Extractor for Natural* in the IBM i administration documentation. If extracted from objects, there is no support of the IDL Extractor for Natural features introduced with EntireX 8.1 SP2 and EntireX 8.2.

OpenVMS Prerequisites

Component	Prerequisites
Broker Stubs	■ HP Integrity Server ■ OpenVMS 8.3-1H1, Update V8.0 ■ OpenVMS 8.4, Update V6.0 ■ HP TCP/IP Services for OpenVMS ■ HP SSL V1.4-334

z/VM

Component	Prerequisites
Broker Stubs	■ **Supported z/VM Version** z/VM version 5.4, 6.1. ■ **Adabas Version** Adabas version 8.1.3 or above and Entire Net-Work 6.1.2 or above. **Note:** Maximum message size with NET transport when using the Broker stub under z/VM is 32 KB. ■ **Virtual Storage** The z/VM Broker stub runs within an IBM Language Environment enclave. This means that if the calling program is not an IBM Language Environment, program an enclave will be automatically created, invisible to the application. However, you must allow sufficient virtural storage to allow the Language Environment enclave to be created. A storage size of 16 MB is recommended. ■ **ESIZE** When using SYSETB under z/VM you must allow sufficient ESIZE. We recommend setting ESIZE=64 KB.

Application Server Prerequisites

The Web application components of EntireX (XML/SOAP Listener, XML/SOAP Runtime, Wrapper for EJB runtime) support J2EE 1.5. They should therefore run on any Java application server that supports J2EE 1.5.

The EntireX components have been tested on the application server provided with the Software AG Runtime.

Supported LDAP Servers

The following LDAP servers are currently supported by EntireX:

- IBM Tivoli Directory Server 6
- Microsoft Active Directory Domain Services
- Novell eDirectory 8
- OpenLDAP 2
- Apache Directory Server 1.5