

webMethods EntireX

Installing EntireX under IBM i

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.

Copyright © 1997-2019 Software AG, Darmstadt, Germany and/or Software AG USA, Inc., Reston, VA, USA, and/or its subsidiaries and/or its affiliates and/or their licensors.

The name Software AG and all Software AG product names are either trademarks or registered trademarks of Software AG and/or Software AG USA, Inc. and/or its subsidiaries and/or its affiliates and/or their licensors. Other company and product names mentioned herein may be trademarks of their respective owners.

Detailed information on trademarks and patents owned by Software AG and/or its subsidiaries is located at <http://softwareag.com/licenses>.

Use of this software is subject to adherence to Software AG's licensing conditions and terms. These terms are part of the product documentation, located at <http://softwareag.com/licenses/> and/or in the root installation directory of the licensed product(s).

This software may include portions of third-party products. For third-party copyright notices, license terms, additional rights or restrictions, please refer to "License Texts, Copyright Notices and Disclaimers of Third-Party Products". For certain specific third-party license restrictions, please refer to section E of the Legal Notices available under "License Terms and Conditions for Use of Software AG Products / Copyright and Trademark Notices of Software AG Products". These documents are part of the product documentation, located at <http://softwareag.com/licenses> and/or in the root installation directory of the licensed product(s).

Use, reproduction, transfer, publication or disclosure is prohibited except as specifically provided for in your License Agreement with Software AG.

Document ID: EXX-INSTALL_OS400-105-20220422

Table of Contents

1 About this Documentation	1
Document Conventions	2
Online Information and Support	2
Data Protection	3
2 Installing EntireX under IBM i	5
Features Currently not Supported	6
Installation Steps	6
Verifying the Installation of the Broker Stubs	8
Upgrading from Version 5.3, 6.1 and 6.2	11

1 About this Documentation

- Document Conventions 2
- Online Information and Support 2
- Data Protection 3

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 (...).

Online Information and Support

Product Documentation

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

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

Product Training

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

Tech Community

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

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

Product Support

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

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

Data Protection

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

2 Installing EntireX under IBM i

▪ Features Currently not Supported	6
▪ Installation Steps	6
▪ Verifying the Installation of the Broker Stubs	8
▪ Upgrading from Version 5.3, 6.1 and 6.2	11

This chapter describes how to install the Broker stub under IBM i.

See *Platform Coverage* in the EntireX Release Notes for full platform information. See also *EntireX Installation Overview* for topics that apply to multiple operating systems.

The implementation on IBM i is based on the UNIX code, therefore, use the UNIX parameters for the IBM i environment, see *Setting up Broker Instances*. However, some features provided under UNIX are not supported under IBM i, see *Features Currently not Supported* below.



Note: The EntireX RPC Server for IBM i of EntireX version 7.1.1 running under IBM i (AS/400) is no longer supported. We strongly recommend using the new *RPC Server for AS/400* or the EntireX Adapter. See also *Connection Parameters for AS/400 Connections*.

Features Currently not Supported

Secure Sockets Layer (SSL) is currently not supported.

Installation Steps



Note: *vrsp* stands for the current version, release, service pack, and optionally a patch level.

The installation comprises the following steps:

- [Step 1: Create a Product Library](#)
- [Step 2: Copy the Installation Data Set to Disk](#)
- [Step 3: Verify the Contents of the *SAVF File](#)
- [Step 4: Restore the *SAVF File](#)

Step 1: Create a Product Library

We recommend that you keep the EntireX Broker environment in an IBM i library named *EXX*.

If this library does not yet exist, create it with the IBM i command `CRTLIB EXX`.

Step 2: Copy the Installation Data Set to Disk

The product is delivered in a data set with the name `../OS400/EXA $vrsp$` and is stored on your EntireX installation DVD. The data set must be transferred to a `*SAVF` file on your machine. To do this, use the command `CRTSAVF` to create the empty save file `EXA $vrsp$` in a library of your choice. Then use FTP to transfer the unzipped PC data set to the save file using the FTP option “binary”.

Step 3: Verify the Contents of the *SAVF File

To verify the content of the `*SAVF` file `EXA $vrsp$` , use the command `DSPSAVF`. This command will display the following objects:

Object	Type	Description
EXA	*SRVPGM	EntireX Broker ACI (stub).
EXXZCOMP	*SRVPGM	EntireX Compression Version 7.1.1.
TRANPOT	*SRVPGM	EntireX TCP/IP Transport Version 7.1.1.
X_SECUEXIT	*SRVPGM	EntireX Security Version 7.1.1 (to use, rename it).
ZLIB	*SRVPGM	zlib compression.
BCOC, BCOCBL, BCOCRPG	*PGM	Client example programs in C, COBOL and RPG.
BCOS, BCOSBL, BCOSRPG	*PGM	Server example programs in C, COBOL and RPG.
EXABCOC	*PGM	Start BCOC client sample program (edit first; read the note under Test Procedures).
EXABCOCSEC	*PGM	Start BCOC client sample program with Security (edit first; read the note under Test Procedures).
EXABCOS	*PGM	Start BCOS server sample program (edit first; read the note under Test Procedures).
EXABCOSSEC	*PGM	Start BCOS server sample program with Security (edit first; read the note under Test Procedures).
CRT_CBLMOD	*PGM	Compile a COBOL source to an ILE module.
CRT_CMOD	*PGM	Compile a C source to an ILE module.
CRT_RPGMOD	*PGM	Compile an RPG source to an ILE module.
EXABNDPGM	*PGM	Sample: Bind user main program with the EXA service program (the Broker ACI).
EXASETENV	*PGM	Sample: Set environment variables for EXA.
EXACRTLOG	*PGM	Create a physical LOG file.
BCOC, BCOCBL, BCOCRPG	*MODULE	Client example modules in C, COBOL and RPG.
BCOS, BCOSBL, BCOSRPG	*MODULE	Server example modules in C, COBOL and RPG.
EXASRC	*FILE (PF-SRC)	Example source file (sample programs and procedures).
H_EXA	*FILE (PF-SRC)	Include files for sample C programs. Rename to H before use.
QCBLLSRC	*FILE (PF-SRC)	COBOL copybooks for sample COBOL programs.

Object	Type	Description
QRPGLESRC	*FILE (PF-SRC)	RPG copybooks for sample RPG programs.
QSRVSRC	*FILE (PF-SRC)	Export definitions for data and procedures.

Step 4: Restore the *SAVF File

To restore the *SAVF file use the command RSTLIB:

```
RSTLIB SAVLIB(EXAvrsp) DEV(*SAVF) SAVF(EXAvrsp) RSTLIB(EXX)
```

After you have restored the save file, the product library EXX should at least contain the objects listed in step 3.

Software AG recommends you not putting user objects in this library. Copy modified samples to the user libraries. CL samples mentioned here may change, therefore check all associated program objects for the latest version.

The EntireX Broker ACI for IBM i is now installed and ready to be bound to a user-developed application environment.

Verifying the Installation of the Broker Stubs

This package contains test programs (BCOS, BCOC) and example programs for binding (LINKPGM).

Test Programs

There are two types of programs to test the connection to the remote Broker.

- BCOS, BCOSCBL and BCOSRPG

These programs act as servers. When they have been registered with the remote Broker, they wait for incoming calls from the client programs BCOC, BCOCBCL and BCOCRPG, respectively, and respond immediately.

- BCOC, BCOCBCL and BCOCRPG

These programs act as clients. They attach in non-conversational mode to one service and send data to the registered server programs BCOS, BCOSCBL and BCOSRPG, respectively.

The file EXASRC contains the sources of the programs listed above; they are available in C, COBOL (...CBL) and RPG (...RPG).

Prerequisite for the test is a running remote Broker. To proceed, you need to know the Broker ID (*brokerid*), the port number (*portno*) and, optionally, the API (ACI) version of your Broker kernel (*APIversion*).

1. In two interactive sessions, set the *CURLIB to library EXX.
2. Check that the log file in library EXX exists. If it does not exist, create it using the example program EXACRTLOG.
3. In session 1, execute the command:

```
Call BCOS ('-b brokerid: portno ' '- APIversion ')
```

4. In session 2, execute the command:

```
Call BCOC ('-b brokerid: portno ' '- APIversion ')
```

The steps above use the C samples, the samples for COBOL and RPG (see the program names above) can be used with the same parameters. The COBOL and RPG samples have less screen output than the C sample.

With Broker Kernel API Version 6 and the Broker ID Localhost, the screen output of BCOC will look similar to this:

```
CLIENT: ETB Version 2
CLIENT: Number of repeats (10)
CLIENT: Broker ID Localhost:3930
CLIENT: Broker ID pcbal2:6099
CLIENT: Using default class ACLASS
CLIENT: Using default server ASERVER
CLIENT: Using default service ASERVICE
CLIENT: Maximum stub ACI version: 7
CLIENT: Maximum kernel ACI version: 6
CLIENT: Kernel Version 6.2.1.00 Platform UNIX

CLIENT: Using ACI version: 6
Request issued (9, 2037)
Request issued (8, 2037)
Request issued (7, 2037)
Request issued (6, 2037)
Request issued (5, 2037)
Request issued (4, 2037)
Request issued (3, 2037)
Request issued (2, 2037)
Request issued (1, 2037)
Request issued (0, 2037)
CLIENT: Test successfully performed
Press ENTER to end terminal session.
```

The screen output of BCOS will look similar to this:

```

SERVER: ACI Version 6
SERVER: Number of repeats (10)
SERVER: Broker ID Localhost:3930
SERVER: Using default class ACLASS
SERVER: Using default server ASERVER
SERVER: Using default service ASERVICE
SERVER: Maximum stub ACI version: 7
SERVER: Maximum kernel ACI version: 6
SERVER: Kernel Version 6.2.1.00 Platform UNIX

SERVER: Using ACI version: 6
Incoming data (2037, 9)
Incoming data (2037, 8)
Incoming data (2037, 7)
Incoming data (2037, 6)
Incoming data (2037, 5)
Incoming data (2037, 4)
Incoming data (2037, 3)
Incoming data (2037, 2)
Incoming data (2037, 1)
Incoming data (2037, 0)
SERVER: Test successfully performed
Press ENTER to end terminal session.

```

If it does, the test with the remote Broker was successful.

Test Procedures

To perform the test programs, you can also modify and use the sample procedures located in the source file EXASRC:

Procedure	Description	Programs called.
EXABCOC	Client test procedure	BCOC, BCOCBCL, BCOCRPG.
EXABCOCSEC	Client test procedure with Security parameters	BCOC only.
EXABCOS	Server test procedure	BCOS, BCOSCBL, BCOSRPG.
EXABCOSSEC	Server test procedure with Security parameters	BCOS only.



Note: By default, all procedures call the “C” flavor of the client and server programs, i.e. BCOC and BCOS.

To call the relevant COBOL (BCOCBCL, BCOSCBL) or RPG (BCOCRPG, BCOSRPG) programs, you must modify the procedures listed above accordingly. After having adjusted the Broker ID, Broker Version and Security parameters, you must compile the sources and bind the created modules to executable *PGM programs. For compiling, use the procedure CRT_CMOD, CRT_CBLMOD or CRT_RPGMOD. For binding, use the procedure EXABNDPGM.

All sample programs incorporate the ACI Broker control block definitions during compilation. The relevant include file and copybooks are located in:

Include source file	Copy member	Description
H	ETBCDEF	C ACI definitions for BCOS and BCOC.
	ETBCINF	Broker API definitions for Command/Info Services using C. See <i>Broker Command and Information Services</i> .
QCBLLSRC	COBDEF	COBOL ACI definitions for BCOSCBL and BCOCBBL.
	COBINF	Broker API definitions for Command/Info Services using COBOL. See <i>Broker Command and Information Services</i> .
QRPGLESRC	RPGDEF	RPG ACI definitions for BCOSRPG and BCOCRPG.

Upgrading from Version 5.3, 6.1 and 6.2

Step 1: Make a Backup

Make a backup of the existing version in library EXX.

Step 2: Install Latest EntireX ACI Version

Perform the steps listed in [Installation Steps](#) above.

All program and sample files in the library EXX will be replaced.

Step 3: Bind the Application with latest ACI Version

All application server programs that use the Broker stub (ACI) must be rebound with the server program EXA.

To perform this step, you can use the command CRTPGM (see CL example EXABNDPGM).

Using command DSPPGMREF (Display Program Reference) you can display the service programs that are currently referenced to your application.

If you use Natural RPC, you must rebound the Natural Broker Wrapper program NXWRAPPR located in your library NXW_{vrs}.

Related Literature

- *EntireX Administration under IBM i*

- *EntireX RPC Server Return Codes*
- *Using the C Wrapper*
- *Using the COBOL Wrapper*
- *Using EntireX RPC for RPG under IBM i*
- *Using EntireX RPC for CL under IBM i*