MICRO FOCUS

Orbix Mainframe 6.3.1

Release Notes

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Contents

Orbix Mainframe 6.3.1 Release Notes

Product Information

Orbix Mainframe 6.3.1 is an implementation of the Common Object Request Broker Architecture (CORBA) for z/OS and z/OS UNIX System Services. It complies with the following Object Management Group (OMG) standards:

- CORBA 2.6
- GIOP 1.2, 1.1, and 1.0
- C++ Language Mapping (formal/99-07-41)

The Orbix Mainframe Artix Transport component complies with the following W3C specifications:

- SOAP 1.1
- HTTP 1.0 and 1.1
- WSDL 1.1

The Artix Transport also complies with the Web Services Interoperability Organization specification *Basic Profile Version 1.0* and the OASIS *Web Services Security UsernameToken Profile 1.0* specification for credentials checking in SOAP headers.

More information on Orbix Mainframe, including all the latest documentation updates for Orbix Mainframe and other platforms, can be found at:

https://www.microfocus.com/documentation/orbix/orbixmf631

Differences between the z/OS product and the other products are noted in this document.

New Features

The following features are new in Orbix Mainframe 6.3.1:

Support for Enterprise COBOL 6.2.0 and Enterprise COBOL 6.3.0

Orbix Mainframe now supports Enterprise COBOL 6.2.0 and Enterprise COBOL 6.3.0.

IBM's Enterprise COBOL 4.2.0 was the last COBOL version to support the prelinker. In order to support Enterprise COBOL 6.2.0 and Enterprise

COBOL 6.3.0, demonstration JCL is provided showing how to compile and bind COBOL programs.

See "Supported Platforms and Compilers" for information on supported compiler versions.

Please see the following demonstrations in your installation for example of how to compile and bind programs with a more recent Enterprise COBOL version:

Batch

orbixhlq.DEMO.CBL.BLD.JCLLIB(SIMPBDCB)
orbixhlq.DEMO.CBL.BLD.JCLLIB(SIMPBDSB)

CICS

orbixhlq.DEMO.CICS.CBL.BLD.JCLLIB(SIMPBDCB)
orbixhlq.DEMO.CICS.CBL.BLD.JCLLIB(SIMPBDSB)

IMS

orbixhlq.DEMO.IMS.CBL.BLD.JCLLIB(SIMPBDCB)
orbixhlq.DEMO.IMS.CBL.BLD.JCLLIB(SIMPBDSB

Note that each of the JCL members above compiles and binds the program into a PDSE file.

When running the demonstrations:

Batch

PDSE: *orbixhlq*.DEMO.CBL.BD.LOADLIB

Use the PDSE in the STEPLIB concatenation of the JCL that runs the demonstration.

CICS

PDSE: *orbixhlq*.DEMO.CICS.CBL.BD.LOADLIB

Use the PDSE in the DFHRPL concatenation of the JCL for the CICS region.

IMS

PDSE: *orbixhlq*.DEMO.IMS.CBL.BD.LOADLIB

Use the PDSE in the STEPLIB concatenation of the JCL that runs the IMS message processing region.

Support for Enterprise PL/I 5.3.0

Orbix Mainframe now supports Enterprise PL/I 5.3.0.

See "Supported Platforms and Compilers" for information on supported compiler versions.

See "Fixed Bugs" for information on RPI 1119958 which describes Enterprise PL/I compiler warning messages related to Enterprise PL/I 5.3.0 support.

Support for z/OS 2.4

Orbix Mainframe now supports z/OS 2.4.

See "Supported Platforms and Compilers" for information on supported compiler versions.

Support for CICS TS 5.5

Orbix Mainframe now supports CICS TS 5.5.

See "Supported Platforms and Compilers" for information on supported compiler versions.

Support for IMS 15

Orbix Mainframe now supports IMS 15.

See "Supported Platforms and Compilers" for information on supported compiler versions.

Support for TLS 1.1, TLS 1.2 and TLS 1.3

Orbix Mainframe has added support for TLS 1.1, TLS 1.2 and TLS 1.3.

By default, the following protocols will be enabled (if not explicitly set in the `mechanism_policy:protocol_version` configuration variable):

- TLS 1.3
- TLS 1.2
- TLS 1.1
- TLS 1.0

Notes When Using TLS v1.3

Be aware of the following when using TLS v1.3:

- TLS v1.3 supports only these cipher suites:
  - TLS_AES_128_GCM_SHA256
  - TLS_AES_256_GCM_SHA384
  - TLS_CHACHA20_POLY1305_SHA256

  Be sure to configure at least one of these cipher suites when using TLS v1.3.
- If TLS v1.3 is configured as part of a range of protocols but no TLS v1.3 supported cipher suites are configured, TLS v1.3 is effectively "turned off" and will not be used.
- If TLS v1.3 is configured as part of a range of protocols, be sure to configure non-TLS v1.3 cipher suites in addition to the TLS v1.3 cipher suites. A handshake failure can occur if the correct set of cipher suites is not configured.
- TLS v1.3 has the following certificate requirements:
  - An RSA key size of 2048 or greater
  - An ECC key size of 256 or greater
- Ensure you have the correct RACF authority to use a certificate with an RSA key size of 2048 or greater with TLS v1.3. If not, handshake failures can occur.

- If using a certificate with an ECC key, signed by a Certificate Authority that uses an RSA key, handshake failures can occur when using protocol TLS v1.1 or older, as SystemSSL will want to negotiate cipher suites that are not supported by Orbix Mainframe. A certificate with an ECC key signed by a Certificate Authority that also uses an ECC key will not encounter this issue with TLS v1.1 or older.

Enhanced Cipher Suites

Orbix Mainframe has added support for the following new cipher suites:

- RSA_WITH_AES_128_CBC_SHA256
- RSA_WITH_AES_256_CBC_SHA256
- DHE_DSS_WITH_AES_128_CBC_SHA256
- DHE_RSA_WITH_AES_128_CBC_SHA256
- DHE_DSS_WITH_AES_256_CBC_SHA256
- DHE_RSA_WITH_AES_256_CBC_SHA256
- RSA_WITH_AES_128_GCM_SHA256
- RSA_WITH_AES_256_GCM_SHA384
- DHE_RSA_WITH_AES_128_GCM_SHA256
- DHE_RSA_WITH_AES_256_GCM_SHA384
- DHE_DSS_WITH_AES_128_GCM_SHA256
- DHE_DSS_WITH_AES_256_GCM_SHA384
- TLS_AES_128_GCM_SHA256
- TLS_AES_256_GCM_SHA384
- TLS_CHACHA20_POLY1305_SHA256
- ECDHE_ECDSA_WITH_RC4_128_SHA
- ECDHE_ECDSA_WITH_3DES_EDE_CBC_SHA
- ECDHE_ECDSA_WITH_AES_128_CBC_SHA
- ECDHE_ECDSA_WITH_AES_256_CBC_SHA
- ECDHE_RSA_WITH_RC4_128_SHA
- ECDHE_RSA_WITH_3DES_EDE_CBC_SHA
- ECDHE_RSA_WITH_AES_128_CBC_SHA
- ECDHE_RSA_WITH_AES_256_CBC_SHA
- ECDHE_ECDSA_WITH_AES_128_CBC_SHA256
- ECDHE_ECDSA_WITH_AES_256_CBC_SHA384
- ECDHE_RSA_WITH_AES_128_CBC_SHA256
- ECDHE_RSA_WITH_AES_256_CBC_SHA384
- ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
- ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
- ECDHE_RSA_WITH_AES_128_GCM_SHA256
- ECDHE_RSA_WITH_AES_256_GCM_SHA384

Supported Platforms and Compilers

The following sections show the different platforms and compilers that Orbix Mainframe 6.3.1 includes support for.

Operating Systems

Orbix Mainframe 6.3.1 is available on the following operating systems:

Operating System	Version	Certified On
z/OS	2.3	21st February 2018
z/OS	2.4	2nd June 2020
z/OS	2.5	February 2022

CICS

Orbix Mainframe 6.3.1 is available on the following versions of CICS:

CICS Version	Certified On
CICS TS 5.3	2nd August 2017
CICS TS 5.4	4th April 2018
CICS TS 5.5	22nd September 2020
CICS TS 5.6	February 2022

IMS

Orbix Mainframe 6.3.1 is available on the following versions of IMS:

IMS Version	Certified On
IMS 15	16th April 2018

Compilers

Orbix Mainframe 6.3.1 supports the following versions of compilers:

Compiler	Version	Certified On
ANSI C++	2.3	21st February 2018
ANSI C++	2.4	2nd June 2020
ANSI C++	2.5	February 2022
Enterprise COBOL	4.2	4th April 2018
Enterprise COBOL	6.2	22nd September 2020

Compiler	Version	Certified On
Enterprise COBOL	6.3	22nd September 2020
Enterprise PL/I	5.3	18th June 2020

Note:

- The supported Enterprise COBOL and Enterprise PL/I compiler versions require more memory resources than prior versions. Users of these versions should review their compiler JCL and ensure the REGION size is set to an appropriate value.

Restrictions

This section discusses the following topics:

Features Unavailable in Orbix Mainframe

Orbix Mainframe 6.3 includes much of the functionality available in Orbix 6.3 on other platforms. Programming and administrative information for those platforms generally applies to z/OS UNIX System Services also. However, the following items are not yet available:

Feature	Comment
Configuration Repository (CFR)	No CFR service is provided. Only file-based configuration domains are supported in this release. A remote CFR cannot be used to share configuration information with other platforms.
C++/Java Code generation toolkit	IDLgen tool is not provided
itconfigure utility	Not provided
System log stream	The `system_log_stream` plug-in is not provided. However, the `wto_log_stream` plug-in can be used to issue event messages to the console log.
Activator	This installation contains a z/OS UNIX System Services activator but no z/OS activator
TLS	TLS on z/OS requires IBM's System SSL software. Instructions are provided that explain how to generate certificates using RACF, for use with the product demonstrations
Compression plug-in	Not provided
Events	Not provided

Feature	Comment
Notification	Not provided
Trader	Not provided
Multicast transport	Not provided
Shared memory transport	Not provided
Management service	Not provided. See "Orbix Management" for more information.
Security service	Not provided. See "iSF Integration" for more information.
Firewall Proxy Service	Not provided
JMS notification bridge	Not provided

The itadmin Tool

The `itadmin` tool provided on z/OS supports a subset of the full functionality provided on other Orbix 6.3 platforms. Notably, any options as specified in the `itadmin` grammar files can not be abbreviated, despite what the help text may indicate. In a Unix System Services Orbix environment, the tool can be invoked as a single command-line utility, or within a command shell, but not from Tcl scripts or in transactions. The `itadmin` tool can also be run in batch mode using the sample JCL provided in *`orbixhlq`*`.JCLLIB(ORXADMIN)`.

Orbix Management

Orbix Mainframe provides full support for the Orbix Management API and thus enables you to instrument servers running on the mainframe. This includes instrumentation of all servers at the ORB level, and an additional instrumentation for the Naming Service. Because the Administrator Management Service is not provided with Orbix Mainframe, this service must be running on an off-host Orbix deployment and must be contactable by the managed servers on the mainframe.

See the Orbix Mainframe Management User's Guide for more details on Administrator, managing Orbix Mainframe services from another platform, and instrumenting your own servers using the C++ Management API.

See the Orbix 6.3 Management User's Guide for more details on the use of the off-host components of Administrator.

iSF Integration

Orbix Mainframe provides restricted support for integration with the Orbix Security Framework (ISF); this allows Orbix Mainframe to interoperate within a secure iSF-enabled location domain.

Because the iSF Security Service is not provided with Orbix Mainframe, this service must be running on an off-host Orbix deployment and must be contactable by the Orbix Mainframe applications.

z/OS Restrictions

The following z/OS restrictions apply:

- "Text Files"
- "Environment Variables"
- "Floating Point Format"
- "NFS-mounted HFS"

Text Files

Text files containing IDL, configuration, licences, and IOR files might contain data that is too long to fit within the record length of a particular data set.

In such cases, Orbix Mainframe 6.3 uses a continuation column format similar to that used by the MVS Assembler:

Example 1 A Stringified Object Reference in a `LRECL=80` Dataset

```
IOR:000000000000001949444c3a457874656e6465645479706554657373
43a312e30000\
000000000000100000000000007e000102000000000d36332e36352e31
33332e353600\
0007520000001b3a3e0231310c00000000400024600000 41c6080000000
000000000000\
000000300000000000000080000000049545f4100000001000000 1c0000
000010020417\
000000010001000100010100000000010001010900000006000000060000
000000011
```

For fixed-record-length data sets, the last eight columns of a record (that is, columns 72–80, which might contain JCL sequence numbers inserted by the ISPF editor) are ignored, and column 71 is used as a continuation column. If this is blank, the data on the line logically ends at its last non-blank character. If the column is not blank, the data on the line is considered to continue in the first column of the next record.

So, in Example 1, the string is considered to be one long line consisting of `IOR:` followed by 348 hexadecimal digits. The backslashes used in the continuation column are not part of the reference.

This applies only to `RECFM=FB` data sets. VB data sets are also supported for text files and the data in columns 72–80 is not ignored.

A utility program, `orxcopy`, is provided to copy and format records between data sets and HFS files, or between data sets of different record lengths or types. This can be run as follows from the z/OS UNIX System Services shell:

```
orxcopy asp63.cfg "//'TEST.CONFIG(DEFAULT@)'"
orxcopy "//'TEST.DEMO.IORS(TYPETEST)'" typetest_objref.txt
```

You can also run this utility in batch, using sample JCL provided in the `ORXCOPY` member of *orbixhlq*`.JCLLIB`.

Environment Variables

Environment variables documented in the CORBA Administrator's Guide apply on z/OS. However, these variables are usually checked only after

certain DD cards, and can contain PDS names as well as path names. For example:

Locating IDL configuration file:

1. Check the `IT_IDL_CONFIG_FILE` environment variable. On z/OS, this can point to a data set:

   ```
   $ export IT_IDL_CONFIG_FILE="//HLQ.ORBIX63.CONFIG(IDL)"
   ```

2. Check the `IT_IDL_CONFIG_PATH` environment variable. On z/OS, this list can include a data set:

   ```
   $ export IT_IDL_CONFIG_PATH="/tmp/my.cfg://
   HLQ.ORBIX63.CONFIG(IDL)"
   ```

3. Check `DD:ITCONFIG(IDL)`. This is z/OS-specific.
4. Check *`ITProductDir`*`/asp/6.3/etc/idl.cfg`, where *`ITProductDir`* is the value of environment variable `IT_PRODUCT_DIR` or defaults (on z/OS) to `/opt/iona`.

Floating Point Format

Only the native 390 format of Floating Point is supported.

NFS-mounted HFS

External attributes are not honored for HFS files that have been NFS-mounted on z/OS. Therefore, if you wish to run Orbix services (for example, locator, activator, node daemon, and so on), you must ensure that your HFS is locally mounted.

Migration Issues

Orbix Mainframe 6.3.1 represents a binary compatible upgrade from its predecessor versions (6.3.0, 6.2 and 6.2 service packs). However, there have been some changes made in this release that are worthy of note in this context:

- "Orbix Procedures and sample JCL"
- "Binary Compatibility"
- "Configuration"
- "COBOL Copylib"
- "Support for New TLS Protocols and Cipher Suites"

Orbix Procedures and sample JCL

The procedures and sample JCL supplied for building and running Orbix applications have undergone some minor enhancements in this release. Note particularly:

- A new PROC to compile and bind COBOL programs,
- New DEMO JCL members that illustrate how to compile and bind COBOL demos using this new PROC.

It is recommended that you use the new PROCs and modify any custom JCL accordingly. In particular, please review the changes to the ORXVARS

procedure, where a number of new variables have been added to minimize the duplication of installation specific information in your Orbix system.

The sample JCL to create certificates in RACF has been updated. The JCL can create certificates with RSA keys, or certificates with ECC keys.

Binary Compatibility

Orbix Mainframe 6.3.1 maintains binary compatibility with its predecessors in terms of link-time and runtime dependencies.

Configuration

Orbix configuration is compatible across both the Orbix Mainframe 6.3.1 release and its predecessors. This means that you can reuse your Orbix Mainframe 6.2 or 6.3 configuration domain to run 6.3.1 applications.

COBOL Copylib

The COBOL copylib member IORFD has been updated to avoid compiler message MSGIGYP3178, as well as a status code of 04 when reading an IOR from a file. When compiling an Orbix Mainframe COBOL application with COBOL 6.2.0 or later, be sure to pull in the updated IORFD if it is used in your program.

Support for New TLS Protocols and Cipher Suites

Review the following Orbix Mainframe configuration settings:

```
policies:mechanism_policy:protocol_version
policies:mechanism_policy:ciphersuites
```

Prior to Orbix Mainframe 6.3.1, protocols SSL v3 and TLS v1 were supported. You may wish to update the protocol, or range of protocols, to include more modern protocols. For example, to still provide support for TLS v1 but to also expand support to use TLS v1.1, TLS v1.2, and TLS v1.3, the configuration might look like:

```
policies:mechanism_policy:protocol_version =["TLS_V1",
"TLS_V1_3"];
```

Orbix Mainframe 6.3.1 has added support for several new cipher suites. You may wish to update the cipher suite, or set of cipher suites, to include more modern cipher suites. For example, to configure a set of cipher suites that supports the protocol range of TLS v1 through TLS v1.3, the configuration might look like:

```
policies:mechanism_policy:ciphersuites =
["TLS_AES_256_GCM_SHA384", "RSA_WITH_AES_256_CBC_SHA256",
"RSA_WITH_AES_256_CBC_SHA", "RSA_WITH_AES_128_CBC_SHA",
"RSA_WITH_AES_128_CBC_SHA256"];
```

Be aware of the certificate requirements for the various TLS protocols. When configuring support for newer TLS protocols, you should review your current certificates and ensure they can be used with that new protocol. You should also review the configured set of cipher suites to ensure they are suitable for the certificates being used.

z/OS-Specific Features

This section discusses the following z/OS-specific features:

Codeset Negotiation

Orbix supports codeset negotiation as specified in CORBA 2.3.1/1.3.7.

Orbix Mainframe adds support for negotiating EBCDIC codeset IBM-1047 for character data, so unnecessary conversions can be avoided between z/OS clients and servers. Wide character data is also supported, but the native z/OS `wchar` format cannot be used as a transmission codeset. Orbix Mainframe always converts wide character data to one of the supported representations (UCS-2, UCS-4, UTF-16) for transmission.

SAF Plug-in

This Orbix Mainframe plug-in provides optional Principal-based access control, similar to that found in the Orbix 2.3 for OS/390 products. A server can accept or reject incoming requests based on a `CORBA::Principal` value in the request header. The value is treated as a z/OS user ID and access is checked against an operation-specific SAF profile name. Access can therefore be controlled on a per-operation basis, or (using generic profiles) on a per-server basis. More detail can be found in *orbixhlq*`.DOC(SAF)`.

TLS Plug-in

This Orbix Mainframe plug-in enables TLS applications to use a PKI system for authenticating each side of a TLS connection. For more details, see the SSL Prerequisites section in the Orbix Mainframe Installation Guide.

IMS and CICS Server Adapters

The IMS server adapter and CICS server adapter components of Orbix Mainframe provide a simple way to integrate distributed CORBA and EJB clients on various platforms with existing and new IMS and CICS transactions running on z/OS. These server adapters enable you to develop and deploy Orbix COBOL and PL/I servers in IMS and CICS. The server adapters can execute in a z/OS or z/OS UNIX System Services address space. You can use the server adapters to integrate IMS and CICS servers with distributed CORBA clients running on various platforms. They also facilitate the integration of existing IMS and CICS transactions, not developed using Orbix, with distributed CORBA clients, without the need for changes to the existing programs.

The IMS server adapter can be configured to use either OTMA or APPC to communicate with IMS. Similarly, the CICS server adapter can be configured to use APPC or EXCI to communicate with CICS. Both server adapters also provide distributed transactional support using OTS and RRS. The server adapters can also be run using the TLS plug-in shipped with Orbix Mainframe, to provide SSL-secured communication with client applications.

While providing the same functionality as previous versions of the IMS and CICS server adapters, this version has been rewritten and incorporates significant performance improvements over previous versions. If you are migrating from a previous version, see the IMS Adapters Administrator's Guide and CICS Adapters Administrator's Guide.

IMS and CICS Client Support

This support allows an IMS or CICS transaction to act as a CORBA client and communicate with a CORBA server. This is enabled by deploying the Orbix Mainframe client adapter on z/OS or z/OS UNIX System Services, and an Orbix Mainframe IFR server.

The Orbix Mainframe client program running inside IMS or CICS uses a custom-built IMS/CICS micro-kernel runtime. This supports APPC or cross memory transport client calls to the client adapter, which then forward these client requests as GIOP messages over IIOP to the target server. The server can be implemented in C++, Java, COBOL, or PL/I, and it can run in z/OS batch, inside IMS or CICS, or on another host platform.

The client adapter uses APPC or cross memory transport to communicate with IMS or CICS. Like the server adapters, the client adapters can also be run using the TLS plug-in shipped with the Orbix Mainframe, to provide SSL-secured communication with client applications. For more detailed information see the IMS Adapters Administrator's Guide and CICS Adapters Administrator's Guide.

GIOP Principal Support

In addition to the facilities already available to transmit a GIOP user principal with a request in GIOP 1.0 and GIOP 1.1, support has been added in this release to transmit a principal via GIOP 1.2, using a service context. This is enabled by setting the configuration variable `policies:giop:interop:policy:enable_principal_service_context` to `true`.

The service context ID used can be selected with the configuration variable `policies:giop:interop_policy:principal_service_context_id`, if

the default service context ID `0x49545F44` is not correct for your environment. This support enables components like the client adapter, IMS server adapter, and CICS server adapter to send and receive principals over GIOP 1.2. It is no longer necessary for these components to set the GIOP version to 1.1 if both the client and server can use a service context to send and receive the principal.

A facility to obtain the principal from a current variable has also been added. This current is called the GIOP current and the principal can be obtained in both binary and text format. The portable interceptor demonstration described in both the IMS Adapters Administrator's Guide and CICS Adapters Administrator's Guide demonstrates how this can be used.

itmfaloc

A new plug-in, `itmfaloc`, is now shipped with Orbix Mainframe. This is a URL resolver that allows an itmfaloc URL to be used instead of a stringified interoperable object reference (IOR). This facilitates the task of locating IMS and CICS adapter objects. Using an itmfaloc URL is similar to calling `itadmin mfa resolve`, but an itmfaloc URL exposes this functionality to Orbix applications directly. Any Orbix Mainframe application can use itmfaloc URLs. Also, any Orbix Mainframe utilities (such as `itadmin`) can use itmfaloc URLs. See the IMS Adapters Administrator's Guide and CICS Adapters Administrator's Guide for more details on the operation of itmfaloc URLs.

Type Information Store

Orbix Mainframe 6.3.1 allows IMS and CICS adapters to use either the IFR or the type information store to obtain interface details dynamically. The type information store is a new file-based mechanism. You can have the Orbix IDL compiler generate type information files that the adapter then uses to marshal and unmarshal types on-the-wire. Type information files are an alternative to using the IFR. The use of type information files allows the adapter to run in standalone mode. It also addresses potential versioning issues with IDL.

WTO Announce Plug-In

For external monitoring and automation purposes, the following messages can be written when an Orbix Mainframe server starts up and later ends on z/OS:

```
+ORX2001I ORB orbname STARTED (app-id)
+ORX2002I ORB orbname ENDED (app-id)
```

These messages can be enabled in any server without code changes, by configuring the `orb_plugins` list for the server to include the name `wto_announce`.

WTO Event Log Stream Plug-In

The WTO Event Log Stream enables all event log messages to be directed to the operator console; this log stream can be used with the `local_log_stream`, which is used to write messages to `stdout/stderr`.

The format of the WTO message is as follows:

```
"ORXL[event_id][severity_code]" "subsystem" "text"
```

The components of the WTO message can be explained as follows:

event_id	The event ID.
severity_code	The severity of the event being logged. Valid values are: • I— information message • W— warning message • S— error message • E— fatal error message
subsystem	Identifies the component from which the event originated.
text	Event details, textual information describing the event.

The following are examples of WTO messages:

```
+ORXL020I IT_LOCATOR  Locator daemon started,
domain name: default_domain.location
+ORXL031I IT_LOCATOR  Locator daemon stopped,
domain name: default_domain.location
```

Due to the WTO 126-character limit per message, the Orbix event message might be truncated.

These messages can be enabled in any server, without code changes, by configuring the orb_plugins list for the server to include the name `wto_log_stream`, and by configuring the event_log:filters list as necessary.

Operator STOP Command

Orbix servers can use the `IT_TerminationHandler` programming interface to handle signals and stop cleanly. On z/OS, such servers can be stopped using the UNIX shell command, `kill`, or using the operator `STOP` command; for example:

```
P EXTSRV,A=0040
```

Note:

All Orbix services (locator, node daemon, mainframe adapters, and so on) use a termination handler. This means that a graceful shutdown of a service can be initiated using the STOP command. Optional mechanisms for shutdown are provided on a service-specific basis (for example, itadmin mfa stop for the server adapter).

ORBARGS DD Statement

Orbix Mainframe makes extensive use of the JCL `PARM` keyword. `PARM` has a limit of 100 characters of data. Any `PARM` setting with more than 100 characters of data will cause a JCL error.

If `PARM` contains `-ORB` arguments, such as `-ORBname iona_utilities.cicsa`, the PARM data can be shortened by moving the `-ORB` arguments from the `PARM`

to a file pointed to by the ORBARGS DD statement. This may resolve the excessive PARM length JCL error. The following is a JCL example:

```
//REG   EXEC PROC=ADMIN
//PARM='mfa resolve Simple/SimpleObject > DD:IOR'
//IOR DD DSN=&ORBIX..DEMO.IORS(SIMPLE),DISP=SHR
//ORBARGS DD *
-ORBname iona_utilities.cicsa
/*
```

The -ORBname iona_utilities.cicsa does not have to appear in the PPARM symbolic parameter of the ORXADMIN procedure, where PPARM forms part of the data in the PARM. This saves 29 characters of PARM data.

The following rules apply when using the ORBARGS DD name:

- Use it only for arguments of the form -ORBxxx *yyy*. Do not use it for other arguments.
- Code only one -ORBxxx argument per line.
- Up to a maximum of 16 lines can be coded.
- Each line must be of the form -ORBxxx *yyy*, where *xxx* represents the -ORB argument, and *yyy* represents the value for that argument.
- If multiple lines are coded, an invalidly coded line invalidates all others.
- If the same argument is coded both in the RPARM and ORBARGS, the RPARM takes precedence.
- ORBARGS can be used with DD * or with DD DSN= pointing to a fixed block data set with a logical record length of 80 bytes.

LTERM Propagation

The OTMA IMS server adapter can propagate into IMS a logical terminal (LTERM) field that originates from the client application. It can also subsequently return the LTERM value obtained from IMS back to the client.

Multiple Configuration Domains and Non-default Locales

Improvements have been made in the following areas:

- Support for deploying in a non-default locale (that is, a locale other than IBM-1047)
- Support for deploying multiple configuration domains
- Support for running Orbix Mainframe services in non-default locales and within multiple configuration domains

Load Balancing and Fault Tolerance

Improvements have been made in the following areas:

- Refactored node daemon and process monitoring—The node daemon has been refactored in Orbix 6.*x*, to remove the need for "ping" messages between the node daemon and the servers being monitored. This in turn has greatly enhanced process monitoring of high-availability components.

- ATLI2—The inclusion of this next-generation transport layer provides much greater scalability and throughput at the network level. More consistent and reliable connection handling code means faster detection of remote host failure for high-availability components.

OTMA Conversational Support

The IMS adapter component of Orbix Mainframe now provides a facility to run conversational transactions, using the OTMA plug-in. See the IMS Adapters Administrator's Guide for more information.

Known Problems

The following are the list of current known problems for Orbix Mainframe 6.3.1:

TCP/IP

Orbix Mainframe servers will perform a graceful shutdown if the TCP/IP stack fails unexpectedly. The servers must be manually restarted to resume service after the stack becomes available.

Also, servers are limited to approximately 2000 concurrent TCP/IP connections, and might not deal properly with new incoming connections above that limit. Until this is fixed, it can be mitigated by setting configuration variable:

```
plugins:iiop:incoming_connections:hard_limit =
"2000";
```

TCP/IP Configuration and IPv6

Deployment of Orbix Mainframe 6.3.*x* with a TCP/IP stack that has been configured with an IPv6 address is not yet supported. In the meantime, it is required that you only configure an IPv4 address for the local host on your system, regardless of whether you are running a dual-mode stack or not. Support for an IPv4/IPv6 TCP/IP configuration, and for the optional use of IPv6 communication with Orbix Mainframe will be available in a forthcoming patch release.

wchar/wstring in COBOL and PL/I

COBOL and PL/I programs using IDL types `wchar` and `wstring` might get unexpected results. This will be fixed in a future release.

Client Principal value in COBOL and PL/I

COBOL and PL/I servers running in batch mode cannot retrieve the client principal if present. This value is set to blanks.

Management Information

This version of the IMS/CICS adapter mapping client read statistics operation does not return values for the total number of client connections and the total number of exceptions. These values are returned as zero. This functionality may be added in a future release.

Object References

Object references are supported in COBOL and PL/I client programs running inside IMS or CICS.

Server-side object references are currently not supported in COBOL and PL/I server programs running inside IMS or CICS. This means that the IDL interfaces implemented in such servers must contain neither the IDL `object` keyword nor an interface name in any IDL operation arguments/return values.

IFR Cache File

The server adapters' `ifr:cache` setting must be configured to point to a UNIX System Services file pathname. This feature does not work correctly if a regular z/OS data set is used. This will be fixed in a future release.

ITDOMAIN DD

The `ITDOMAIN DD` statement can be used to specify the configuration domain, but cannot be used in JCL that updates settings in the configuration as it may conflict with a service currently running and using the `ITDOMAIN DD` statement. An error opening the configuration file will occur.

To avoid this issue, use an `ORBARGS DD` statement in place of the `ITDOMAIN DD` statement. The `ORBARGS` DD points to a file that contains a `-ORB`*`domain_name`* statement specifying the configuration domain. An example of this is shown in *`orbixhlq`*`.JCLLIB(DEPLOY2)`.

To enhance usability, most of the Orbix Mainframe JCL makes use of the ITDOMAIN DD statement.

Close Connection Log Messages

Orbix Mainframe servers will issue IT_ATLI2_IP warning messages if the TCP/IP socket is closed unexpectedly on the client side. This can occur if the client crashes, but it could also occur if the client application does not close its connection properly before it shuts down. This is the case with some other ORB implementations.

Note

All warning and error messages displayed in these cases are benign.

@ Sign in Italian and German Code Pages

Some of the JCL shipped in *orbixhlq*.JCLLIB contains characters that are variant in the Italian and German code pages, IBM-280 and IBM-273 respectively. As a result, the $SECOND JCL in Orbix Mainframe was enhanced to convert the JCL in *orbixhlq*.JCLLIB which includes the default domain name, DEFAULT@. However the @ is a variant in both of these code pages and as a result, the member name created by the conversion job is not valid when running Orbix Mainframe in these locales when the system and compiler are running in a different locale. In this scenario, you will need to do the following:

1. In orbixhlq.JCLLIB(DEPLOY1) and orbixhlq.JCLLIB(DEPLOY2), change the deployed domain name by updating the SYSUT2 DD name in the MAKECON step.

   Note:
   You will also need to update the ORBARGS member in orbixhlq.CONFIG to use the same name.

2. In all other JCL that requires a domain name, update the DOMAIN variable towards the top of the JCL to reflect your new name. For example,
   SET DOMAIN='DEFAULT@' might become SET DOMAIN="SECURE"

> **Note:** Any JCL that references a dataset with the @ sign embedded in the file name will also need to be updated, for example, PREPSOAP in *orbixhlq*.JCLLIB.

Error Deploying IFR in Polish Code Page

If you have installed and configured Orbix Mainframe 6.3.*x* to run in the Polish code page, IBM-870, the IFR fails to deploy with errors of OBJECT_NOT_EXIST and SERVANT_NOT_FOUND.

The workaround for this issue is to use a type information file instead. This issue will be resolved in a future release.

ORXIDL Procedure

The PDK library, *orbixhlq*.INCLUDE.ORBIX@PD.IDL, has been omitted from the SYSLIB concatenation in the ORXIDL procedure. This means that if an IDL compiler includes a file from the PDK, the IDL compiler will be unable

to find it. The workaround for this issue is to manually update the ORXIDL procedure as follows:

```
//SYSLIB   DD
DISP=SHR,DSN=&ORBIX..INCLUDE.OMG.IDL
//         DD
DISP=SHR,DSN=&ORBIX..INCLUDE.ORBIX.IDL
//         DD
DISP=SHR,DSN=&ORBIX..INCLUDE.ORBIX@XT.IDL
//         DD
DISP=SHR,DSN=&ORBIX..INCLUDE.ORBIX@PD.IDL
```

This will be fixed in a future release.

C++ Compiler Options in Unix System Services

The C++ compiler options shipped in the *InstallDir*/asp/6.3/demos/cxx_demo.mk file in the Unix System Services (USS) installation include a TARGET(ZOSV1R7) option.

Although the C++ product demonstrations will work using this option, you may not want to use it when compiling your own C++ applications in USS. This is because it restricts the program's functionality to features that were available no later than z/OS V1R7. You should therefore remove this option by editing the CXXFLAGS variable in this Make file. This may be addressed in a future release.

Orbix Version Utility

The ORXVERSN utility is used to establish the *major.minor* version of your Orbix installation, and to obtain a list of any patches that apply to the Orbix libraries in your installation.

To locate this information, this utility performs a DLL load of each Orbix library. One of these Orbix libraries (ORXISFC5) has a static dependency on a system library that may not necessarily be available on your system. If the system library can not be found, the ORXVERSN utility abends, and a CEE dump is generated. The following message excerpt appears in SYSOUT:

```
CEE3501S The module IXM4C54 was not found.
```

To work around this problem, perform one of the following:

- Make the IBM XML Toolkit for z/OS V1.7 runtime libraries (SIXMLOD1) available to your Orbix environment when running this utility.
- If you have no plans to use the iSF security feature with Orbix Mainframe (this is the only Orbix component that uses the XML toolkit), you can remove the Orbix library (ORXISFC5) from the *orbixhlq*.LOADLIB load library. However, it is recommended that you make a backup before deleting this module from your system.

iSF Centralized Authorization

There is a known issue in Orbix Mainframe 6.3 with the centralized authorization feature of iSF. A character set encoding bug prevents the Orbix Mainframe application from being able to parse the XML ACL information that it retrieves from the off-host iSF security service. Thus, you

can only use the local authorization option for now. Please contact technical support for a status on a fix for this issue.

Log Message Display Issues Caused by Special Characters in Certificate Fields

When creating certificates that contain special characters such as '*' or '#' in certificate fields such as the Common Name, certain Orbix Mainframe log messages may not display correctly. In particular, the log messages that display the certificate information may not display correctly.

TLS v1.3 Handshakes Resource Use

TLS v1.3 handshakes consume more system resources to process than earlier protocols. Whether this results in slower handshakes will depend on your particular hardware and system load. A consideration is that certificates with ECC keys may handshake more quickly than certificates that use RSA keys.

Fixed Bugs

The following bugs are fixed in previous releases of Orbix Mainframe version 6.3.*x*

Bug ID	Description
70429	Add iSF authorization support for the Orbix Services on the mainframe.
70600	The product does not install properly when using an HLQ of length 19 characters. The Orbix dataset naming convention for demo files has been changed from `DEMOS` to `DEMO`, thus allowing a 19 character HLQ.
70937	The Accounting DLL always reports a `reply len` of zero.
70970	Require an adapter to refuse any new requests when shutdown has been initiated, but continue to work on existing ones that are already being processed.
70977	Adapters using the object publishing mechanism cannot write their IORs out to a physical sequential (PS) file.
70995	Document new object publisher configuration settings.
71106	COBOL IMS client receives `UNKNOWN_INTERFACE` exception when trying to contact batch server.
71120	The IDL compiler `-Mcreate` option seems to exit after processing `so -Icreate` option never gets processed.
71154	Document `itadmin` restriction on z/OS—abbreviated options are not supported (for example, the `-o` option in `ns bind`).
71170	The Naming Service S0C1 abends when an IBM JDK ORB (packaged with WebSphere) client invokes on it.
71172	The Adapter abends when an ACF2 outage occurs; provide a logout retry mechanism to recover from this scenario instead of a crash.

Bug ID	Description
71296	Problems with the Adapter object publishing mechanism for the imsraw/cicsraw interfaces.
71456	The Adapter should always display descriptive error messages in IMS OTMA transport.
71794	IDL compiler generates incorrect PL/I data structure when an IDL struct member has a name greater than 31 characters long.
71809	Uninformative internal error codes.
71872	Please highlight in the documentation that Web consumer (client) support is not available with the Artix Transport for Orbix Mainframe feature.
71888	Incomplete patch delivered with bug fix 71554.
71999	Make the output of `IORDUMP` locale sensitive.
72001	Document the usage of the `IORDUMP` utility in the native z/OS environment.
72060	IDL compiler generates invalid PL/I code for inherited IDL operations.
72068	The Orbix Client Adapter reuses stale object references, where it should refresh such references dynamically.
ORBM-312	Per-invocation memory leak in the Client Adapter.
ORBM-314	IDL compiler -O flag problems in USS have been resolved.
ORBM-325	Determine correct Server adapter reply message length for CICS EXCI.
ORBM-327	Transport layer fixes for IPv6.
ORBM-341	Re-enable the 'publish_all_iors' configuration setting. **Note:** This hotfix is superseded by ORBM-351.
ORBM-343	Fix adapter hang (with large typeinfo files). **Note:** This hotfix is superseded by ORBM-352.
ORBM-344	Enhance orxcopy (when copying typeinfo files).
ORBM-351	Create new patch to supersede patch for ORBM-341 (server adapter "publish-all-iors" support with new config).
ORBM-352	Create new patch to supersede patch for ORBM-343 (server adapter hang).
ORBM-353	Orbix Locator 0C4 due to handshake errors.
ORBM-356	Support AES & SHA1 cipher suites on Orbix Mainframe.

Bug ID	Description
ORBM-358	Orbix iSF code does not work with XML4C57.
ORBM-364	Increase logging around "reloadMapfile" operation.
ORBM-381	EXCI transport memory leak.
ORBM-395	Resolved an issue with information missing from Exception returned to Client.
ORBM-401	SeqSet can result in invalid data
ORBM-402	Orbix Adapter spins CPU if TCP is down.
ORBM-405	Implement a timeout for call to otma_openx().

The following bugs are fixed in Orbix Mainframe version 6.3.0. The numbers with each issue are the Reported Problem Incident number followed by the Customer Incident Numbers (in parentheses).

Bug ID	Description

RPI 1119958
(3223938)
	Support for PL/I 5.3 has been added.
	The Enterprise PL/I 5.3.0 compiler is more strict than earlier versions, and may issue these warning messages against code generated by the Orbix Mainframe PL/I IDL compiler in the 'M' include file:
	`IBM2654I W INITIAL attribute for BASED on ADDR has no effect on the base variable.`
	`IBM2659I W Generated code would be better if all the INITIAL attributes in the declare for variable name were changed to VALUE.`
	You can choose to ignore either warning, and the application should continue to work as it did when compiled with an earlier version of PL/I.
	A HotFix can be applied to the Orbix Mainframe PL/I IDL compiler to address the IBM2654I warning. After applying the HotFix, rerun the PL/I IDL compiler to generate new PL/I include files. Then rebuild the application with Enterprise PL/I 5.3.0.
	Warning IBM2659I is not addressed by a HotFix. The warning suggests that the 'M' include file use **defined constants** (with the `VALUE` keyword) instead of initialized variables when generating the PL/I structure that defines the constants from the IDL file. There is a risk in doing so. If the application code currently uses a variable from the constants structure in a PL/I built-in function such as ADDR, the application program would fail to compile if this were changed to a defined constant.

The following bugs are fixed in Orbix Mainframe version 6.3.1. The numbers with each issue are the Reported Problem Incident number followed by the Customer Incident Numbers (in parentheses).

Bug ID	Description
RPI 1121033 (3235045)	Support for Enterprise COBOL 6.2.0 and Enterprise COBOL 6.3.0 has been added.

Enhancement Requests

The following enhancement requests are included in version 6.3.*x*:

ER ID	Description
70974	Add Adapter configuration setting to enable display timings information to be directed to either `SYSPRINT` or to the Orbix event log.
70989	Enhance object publishing mechanism to the Naming Service so that naming contexts are created on-demand (if configured).
71136	The `IT_IMSInternal` interface (IDL and C++ stub header file) need to be included as part of the Orbix Plug-in Developer's Kit (PDK).
71492	Remove any PL/I for MVS VM built object code from the product; in particular, please address the `ORX3SPM` link-time module
71554	Provide an additional configuration setting to instruct the Adapter to shutdown if there is a failure with object publishing to the Naming Service.
71814	Remove nasty IMS internal failure log message by using the `otma_openx()` OTMA callable interface operation to specify a blank DRU exit name.
72014	Provide support for the use of the Enterprise PL/I V3.7 compiler
72077	Include a utility to provide version and patch information for each Orbix runtime module
ORBM-267	Remove pre-linker dependency when building Orbix applications for IMS/CICS

Sample Code

There are a number of demonstrations provided in your installation. Details on building and running the demonstrations are provided in the following locations:

- *orbixhlq*.DEMO.CICS.COBOL.README
- *orbixhlq*.DEMO.CICS.PLI.README
- *orbixhlq*.DEMO.COBOL.README
- *orbixhlq*.DEMO.CPP.README
- *orbixhlq*.DEMO.IMS.COBOL.README
- *orbixhlq*.DEMO.IMS.PLI.README
- *orbixhlq*.DEMO.PLI.README

- *orbixhlq*.DEMO.ARTIX.README
- *InstallDir*/asp/6.3/demos/README.txt

Other Resources

The following additional resources are available:

- The most up-to-date versions of Orbix technical documentation are available at: https://supportline.microfocus.com/productdoc.aspx
- The Orbix Knowledge Base is a database of articles that contain practical advice on specific development issues, contributed by developers, support specialists, and customers. This is available at: http://community.microfocus.com/microfocus/corba/orbix/w/knowledge_base/
- Contact Micro Focus technical support at: http://www.microfocus.com