

WebSphere MQ Integrator



# Questions and Answers

*Version 1.5*

**Note!**

Before using this information and the product it supports, be sure to read the general information under “Notices” on page 105.

**Sixth edition (April 2002)**

This edition applies to IBM® WebSphere MQ Integrator Version 2.1 and to all subsequent releases and modifications until otherwise indicated in new editions.

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## About this book

This document provides answers to questions that you might have when you begin to work with IBM WebSphere MQ Integrator Version 2.1. It helps you to understand and overcome some of the problems you might find in setting up and populating a broker domain.

The format is mainly of the form Question and Answer, but other forms of information are also used where appropriate.

New questions and chapters are added from time to time, and redundant questions are removed. However, questions are never renumbered, so there are some gaps in the numbering sequences.

There is a bibliography and an index at the back of the book.

For a more comprehensive information about problem determination, see *WebSphere® MQ Integrator Problem Determination Guide*.

Visit the IBM Software Support Web site:

<http://www.ibm.com/software/support>

and click *My Software Support* for access to further support information. You will need to register to access the information.

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## Who this document is for

This document is for new users of WebSphere MQ Integrator Version 2.1.

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## What you need to know to understand this document

You must be familiar with the concepts of WebSphere MQ Integrator Version 2.1 and the concepts and facilities of the Control Center.

All references in this book to Windows NT® are also applicable to Windows® 2000 unless otherwise stated. WebSphere MQ Integrator components that are installed and operated on Windows NT can also be installed and operated on Windows 2000.

WebSphere MQ Integrator for z/OS™ also runs on OS/390® V2R8, V2R9, and V2R10. All references in this book to z/OS are also applicable to these releases of OS/390 unless otherwise stated. Customization and configuration differences between the z/OS and OS/390 operating systems are transparent to the user.

The term *UNIX*® is used to refer to the AIX®, HP-UX, and Solaris operating systems, where their behavior is common.

The term *local error log* is used within this document to mean the Event Log on Windows NT and the *syslog* on UNIX and z/OS systems.

The term *home directory* or `<wmqi_root>` is used to refer to the directory into which WebSphere MQ Integrator is installed. In WebSphere MQ Integrator Version 2.1 it defaults to:

- On AIX:  
    `/usr/opt/wmqi`
- On HP-UX:  
    `/opt/wmqi`
- On Solaris:  
    `/opt/wmqi`
- On Windows NT:  
    `C:\Program Files\IBM\WebSphere MQ Integrator 2.1`
- On z/OS:  
    `/usr/lpp/wmqi`

Check your release documentation for the defaults on earlier releases.

The following abbreviations are used, mainly in the Index:

<b>ACL</b>	Access Control List
<b>CC</b>	Control Center
<b>CM</b>	Configuration Manager
<b>CWF</b>	Custom Wire Format
<b>HFS</b>	Heirarchical File System
<b>MQe</b>	MQSeries Everyplace
<b>MRM</b>	Message Repository Manager
<b>QoS</b>	Quality of Service
<b>UNS</b>	User Name Server

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## Summary of changes

This section describes changes in this edition of *WebSphere MQ Questions and Answers*. Changes since the previous edition of the book are marked by vertical lines to the left of the changes.

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### Changes for this edition (IH01-05)

- The title has been changed from *Problem Determination* to *Questions and Answers* to avoid possible confusion with the book *WebSphere MQ Integrator Problem Determination Guide*.
- A link to the IBM Software Support Web site has been added to “About this book” on page v.
- Questions and answers have been added to, changed in, or deleted from:
  - Chapter 2, “System administration” on page 7
  - Chapter 3, “Using the Control Center” on page 27
  - Chapter 4, “Running applications” on page 51
  - Chapter 8, “SCADA” on page 73
  - Chapter 9, “Debugger” on page 75
  - Chapter 11, “z/OS installation, customization, and operation” on page 87
- The “Bibliography” on page 109 has been extended to give details of all books referred to.

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### Changes for the fifth edition (IH01-04)

- IBM MQSeries<sup>®</sup>, already an important part of the WebSphere software platform for e-business, is being more tightly associated with WebSphere and is to be known as WebSphere MQ, to reflect the fundamental part that it plays in dynamic e-business. MQSeries Integrator, now called WebSphere MQ Integrator, is the first product to change its name; others will follow with new releases. References to WebSphere MQ products, resources, and concepts within this book continue to refer to MQSeries to reflect existing product names.
- Some parts of the New Era of Networks component of WebSphere MQ Integrator have been renamed to NNSY or Nnsy; other parts retain the term NEON. References to NEON do not refer to NEON Systems Inc.
- An index has been added at the back of the book.
- Chapter 11, “z/OS installation, customization, and operation” on page 87 has been added.
- Chapter 12, “Message aggregation” on page 99 has been added.
- There is new or modified information in:
  - Chapter 2, “System administration” on page 7.
  - Chapter 3, “Using the Control Center” on page 27.
  - Chapter 4, “Running applications” on page 51.
  - Chapter 7, “MQSeries Everyplace” on page 69.
- Some obsolete questions have been removed.
- The book has been refreshed for the release of:
  - WebSphere MQ Integrator for AIX Version 2.1
  - WebSphere MQ Integrator for HP-UX Version 2.1

## Changes

- WebSphere MQ Integrator for Sun Solaris Version 2.1
- WebSphere MQ Integrator for Windows NT and Windows 2000 Version 2.1
- WebSphere MQ Integrator for z/OS Version 2.1

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## Changes for the fourth edition (IH01-03)

Major changes for this edition include:

- The document layout has been improved, with a separate chapter per topic, and all the questions listed before the answers, for easier searching.
- New chapters have been added:
  - Chapter 7, “MQSeries Everyplace” on page 69
  - Chapter 8, “SCADA” on page 73
  - Chapter 9, “Debugger” on page 75
  - Chapter 10, “HP-UX installation and uninstallation” on page 85
- New questions have been added to:
  - Chapter 2, “System administration” on page 7
  - Chapter 3, “Using the Control Center” on page 27
  - Chapter 4, “Running applications” on page 51
- The book has been refreshed for release of:
  - MQSeries Integrator for AIX Version 2.0.2
  - MQSeries Integrator for HP-UX Version 2.0.2
  - MQSeries Integrator for Sun Solaris Version 2.0.2
  - MQSeries Integrator for Windows NT Version 2.0.2



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## Part 1. Frequently asked questions

This document provides the answers to some common questions raised by users of WebSphere MQ Integrator 2.1. The questions are presented in the following chapters:

- Chapter 1, "Windows NT and Windows 2000 installation and uninstallation" on page 3.
- Chapter 2, "System administration" on page 7.
- Chapter 3, "Using the Control Center" on page 27.
- Chapter 4, "Running applications" on page 51.
- Chapter 5, "Sun Solaris installation and uninstallation" on page 65.
- Chapter 6, "AIX installation and uninstallation" on page 67.
- Chapter 7, "MQSeries Everyplace" on page 69
- Chapter 8, "SCADA" on page 73
- Chapter 9, "Debugger" on page 75
- Chapter 10, "HP-UX installation and uninstallation" on page 85
- Chapter 11, "z/OS installation, customization, and operation" on page 87
- Chapter 12, "Message aggregation" on page 99



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## Chapter 1. Windows NT and Windows 2000 installation and uninstallation

These questions are answered in this chapter:

- During installation, I get message BIP8622 'DB2 install may have failed'. What should I do? See "Question 1.1".
- I want to install on a Backup Domain Controller. Are there any special considerations? See "Question 1.2" on page 4.
- When I installed WebSphere MQ Integrator Version 2.1, I selected the wrong database type for my NNSY rules and formats. What can I do to correct this? See "Question 1.3" on page 4.
- I received the following message during installation: BIP8630 - OCX Registration using aaaaaaa.ocx failed. What's wrong? See "Question 1.4" on page 4.
- I've installed the Control Center but when I start it I get a message about DLLs missing and none of the functions work. What's wrong? See "Question 1.5" on page 4.
- I have done an uninstallation of WebSphere MQ Integrator, and I selected the option to uninstall including data. There are some files remaining on my system. Why? See "Question 1.6" on page 5.
- I'm following the verification instructions in Chapter 5 of the *WebSphere MQ Integrator for Windows NT and Windows 2000 Installation Guide*. Why can't I get the Postcard application to run? See "Question 1.7" on page 5.

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### Answers to Windows NT installation and uninstallation questions

**Question 1.1:** During installation, I get message BIP8622 'DB2 install may have failed'. What should I do?

**Answer 1.1:** Look for the two files <winnt>\mqsi2db2.log and <winnt>\mqsi2db2.iss (where <winnt> is the path in which Windows NT is installed: the default is C:\WINNT). (The second file might not have been created.)

The contents of these logs will help you to establish why DB2<sup>®</sup> installation failed. The two most common reasons for DB2 installation failure are:

1. Space problems. The WebSphere MQ Integrator install does not check that sufficient space is available for DB2 installation. The amount of space required for DB2 installation is approximately 250 megabytes (MB), plus an additional 150 MB of temporary space required (in the directory pointed to by the TEMP environment variable). If you are installing DB2 as part of WebSphere MQ Integrator installation, DB2 is installed into X:\SQLLIB where X is the drive to which you are installing WebSphere MQ Integrator.
2. Problems creating a new user. When you install, you are asked to enter a user ID and password for the DB2 Administrator. If this user ID does not exist, DB2 should create one for you but this action does not always complete.

You can overcome both of these problems by installing DB2 independently when WebSphere MQ Integrator installation has completed. To do this, locate and run the setup.exe program in the DB2 directory on the WebSphere MQ Integrator CD.

## Windows NT and 2000 installation and uninstallation

**Question 1.2:** I want to install on a Backup Domain Controller. Are there any special considerations?

**Answer 1.2:** WebSphere MQ Integrator requires access to a database for the configuration repository and the message repository, and to a database for broker data. The configuration and message repositories must be created in a DB2 database, the broker database can be created in DB2, Microsoft® SQL Server, Oracle, or Sybase. You must check if there is a suitable database already installed on this system before you start to install any components of the product.

1. If a suitable database already exists on this system, you do not have to take any special action.
2. If there is not a suitable database already installed on this system, you can ask for DB2 be installed when you install WebSphere MQ Integrator. During DB2 installation, you are asked to provide a user ID and password for the database administrator. You must specify this user ID in the form domain\userid, where domain is the security domain of the primary domain controller and the user ID must have been defined to that domain, and have membership of the domain **Administrators** group.

For details of suitable databases for use with WebSphere MQ Integrator, check the *WebSphere MQ Integrator for Windows NT and Windows 2000 Installation Guide*.

**Question 1.3:** When I installed WebSphere MQ Integrator Version 2.1, I selected the wrong database type for my NNSY rules and formats. What can I do to correct this?

**Answer 1.3:** You must uninstall WebSphere MQ Integrator and install the program again, specifying the correct database for your rules and formats.

**Question 1.4:** I received the following message during installation:

```
BIP8630 - OCX Registration using aaaaaa.ocx failed
```

What's wrong?

**Answer 1.4:** This error message reports an inconsistency between the database support you selected for NNSY rules and formats, and the database it refers to. There are two possible causes for this inconsistency:

1. You selected the wrong database type for your NNSY rules and formats. The database object control extension (OCX) (used primarily by NNSY Visual Tester) references the database support DLLs which turn resolve references to the DLLs provide by the database product. This error message indicates that the resolution cannot be made. If you intend to use a database for NNSY rules and formats, you must uninstall WebSphere MQ Integrator and reinstall it, specifying the correct database.
2. You selected the correct database, but you have not yet installed the database product on this system. When you do install the database product, you must use regsvr32.exe to register the failed OCXs manually in the Windows NT registry.

**Question 1.5:** I've installed the Control Center but when I start it I get a message about DLLs missing and none of the functions work. What's wrong?

**Answer 1.5:** Check that you have got the right level of prerequisite software for the Control Center. You need the MQSeries Client for Java™, installed from SupportPac™ MA88, which you can download from the MQSeries Web site at

## Windows NT and 2000 installation and uninstallation

<http://www.ibm.com/software/ts/mqseries>

When you install the MQSeries Client for Java, an entry is created in the Windows NT registry, and the CLASSPATH system environment variable is updated to include the path of the installed Java classes. These classes are required by the Control Center, and it will not operate correctly without this update.

**Question 1.6:** I have done an uninstallation of WebSphere MQ Integrator, and I selected the option to uninstall including data. There are some files remaining on my system. Why?

**Answer 1.6:** When you uninstall WebSphere MQ Integrator, the files that were installed are removed first. The uninstallation program then checks any remaining files in the directory structure that it can recognize from the file's position in the directory structure, and the file extension. It deletes any empty directories. However, in your normal day-to-day work with the product you will probably have created working files that are not recognized, or that cannot be distinguished from files or directories that the product might have created. There might also be files supplied by Independent Software Vendors (ISVs) for additional plug-in nodes. The uninstallation program does not destroy these files. You can delete these files and directories manually when you are sure that you do not need to keep the data they contain.

**Question 1.7:** I'm following the verification instructions in Chapter 5 of the *WebSphere MQ Integrator for Windows NT and Windows 2000 Installation Guide*. Why can't I get the Postcard application to run?

**Answer 1.7:** The message flow is not processing the message correctly. This can be for a number of different reasons. The most likely reason during configuration is that the messages are stuck on the input queue because there is no error handling defined for this message flow, and no backout queue defined for the Postcard message flow input queue. See the answers given to questions "Question 4.2" on page 53 and "Question 4.3" on page 53.



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## Chapter 2. System administration

These questions are answered in this chapter:

- When I create my Configuration Manager, the following error message is displayed: security properties not found. How do I correct this? See “Question 2.1” on page 9.
- When I create my Configuration Manager, the following error message is displayed: Can't get saved uuid state: java.io.FileNotFoundException. What's wrong? See “Question 2.2” on page 9.
- The broker's queue manager was stopped before the broker, and the **mqsistop** command is hanging. How can I recover? See “Question 2.3” on page 9.
- The Configuration Manager starts successfully, but when I try to access it from the Control Center, why does it terminate unexpectedly, or fail to respond? See “Question 2.4” on page 9.
- When I start a broker, the Configuration Manager, or the User Name Server, on Windows NT, a dialog is displayed. It shows the following error message: <ServiceName> - DLL initialization failure Initialization of the dynamic link library c:\windows\system32\user32.dll failed. The process is terminating abnormally. What does this mean? See “Question 2.5” on page 10.
- I deleted my Configuration Manager and recreated it. When I view objects in the Control Center, why do I see objects I created or checked out from the old Configuration Manager? See “Question 2.6” on page 10.
- When I delete Configuration Manager using the **mqsdeleteconfigmgr** command, I see error message BIP8052. What's wrong? See “Question 2.7” on page 11.
- I'm trying to use the MQSeries **endmqm** command to stop a broker queue manager. Why doesn't it stop? See “Question 2.8” on page 11.
- I deleted my broker database, and now I can't delete my broker. Why do I receive error message BIP8040W? See “Question 2.9” on page 11.
- I've followed the security authorizations recommended in the *WebSphere MQ Integrator Administration Guide*, but my Configuration Manager does not appear to be authorized. What's wrong? See “Question 2.10” on page 11.
- There seem to be several ways of activating trace. Which method do I use for what? See “Question 2.11” on page 11.
- When I use the DB2 Control Center, why do I see that the configuration repository and message repository databases sometimes remain in 'inconsistent' state even when I have stopped the Configuration Manager? I have observed this with the broker database too. See “Question 2.12” on page 12.
- My execution group works with a small number of flows, but when I add more flows or instances I see message BIP2322 with SQL1040N. Why does this happen and what can I do about it? See “Question 2.13” on page 12.
- When I run **mqscreatebroker**, or when a message flow that includes a database node runs, why do I get SQL error SQL0805N NULLID.SQLLF000? See “Question 2.15” on page 14.
- I have created the Configuration Manager specifying the local system name for the Windows NT security domain, and the same identifier for the service user ID. When I start the Configuration Manager, why is the following message generated? BIP8026W: Unable to start the component. The component could

## System administration

not be started using the service userid that was supplied when the component was created. This also happens with the User Name Server when I run that on Windows NT. See "Question 2.16" on page 14.

- How do I clear old trace information from my trace files? See "Question 2.18" on page 15.
- When I use the **mqscreateconfigmgr** command, it fails with an error that tells me that queue SYSTEM.BKR.CONFIG already exists. What's wrong? See "Question 2.19" on page 15.
- I'm running WebSphere MQ Integrator Version 2 on Windows NT. Can I use the VC++ debug program to determine what a broker is doing? See "Question 2.20" on page 15.
- When I create an Execution Group, why do I get several BIP2624 messages that indicate MQRC=2012 (MQRC\_ENVIRONMENT\_ERROR), and no MQSeries messages are processed? See "Question 2.22" on page 17.
- I have written my own plug-in node. How can I be sure it has loaded on Sun Solaris? See "Question 2.23" on page 17.
- How can I delete a broker from my broker domain? See "Question 2.24" on page 17.
- Can I configure more than one broker on a single system? See "Question 2.25" on page 18.
- I am finding it difficult to manage all the MQSeries queues and channels that are required for my UNIX broker. Is there any application that can help? See "Question 2.26" on page 18.
- Why do I get the message BIP8135E Unable to create files. Operating System return code 1 when issuing the mqscreatebroker command on WebSphere MQ Integrator for AIX? See "Question 2.28" on page 19.
- When I try to create a broker with a Sybase12 database using the Merant 3.70 driver and ODBC, why do I get this message: BIP2322E: Database error: SQL State '60'; Native Error Code '0'; Error Text '[MERANT][ODBC Sybase ASE driver]Connection login time has expired.' with the diagnostic information: SQL State '60' SQL Native Error Code '0' SQL Error Text '[MERANT][ODBC Sybase ASE driver]Connection login time has expired.'? See "Question 2.29" on page 19.
- On z/OS, my broker fails to start and I get the diagnostic ICH408I written to the SDSF SYSLOG. What is wrong with my setup? See "Question 2.30" on page 19.
- On z/OS, my broker fails to start and I get the diagnostic BIP2048E written to the SDSF SYSLOG. What is wrong with my setup? See "Question 2.31" on page 20.
- On z/OS, my broker gets abend code 047 when I try to start it and I get a system dump written to the SDSF SYSLOG. What is wrong with my setup? See "Question 2.32" on page 21.
- On Windows NT I have issued the command **mqsi.... con**. Why has the command failed with the error "Failed to open trace file C:/Program Files/IBM/WebSphere MQ Integrator 2.1/log/con.mqsistart.trace.bin.0 with error The system cannot find the file specified". See "Question 2.33" on page 21.
- I have had a complete disk failure on my broker system. I have decided I no longer need this broker. How do I then delete this broker from the "Topology" view in my Control Center? See "Question 2.34" on page 21.
- How can I remove a broker from the Control Center when I cannot deploy to the broker? See "Question 2.35" on page 22.
- For performance, can I use more than one User Name Server? See "Question 2.36" on page 22.



- What are the steps for backing up the WebSphere MQ Integrator directories, on z/OS, and restoring them on another system (or the same system in a different directory)? See “Question 2.37” on page 23.
- Why do I get “Link failure: IEW2141E Symbol too long” when I implement a C language z/OS plug-in? See “Question 2.38” on page 23.
- Can WebSphere MQ Integrator V2.1 coexist with earlier versions, or with WebSphere Business Integrator, on the same machine? See “Question 2.40” on page 24.
- Can I generate the broker topology using a script? See “Question 2.41” on page 24.
- Can I assign execution groups using a script? See “Question 2.42” on page 24.
- Can I graphically export and import message sets using the Control Center, or must I still use command line functions? See “Question 2.43” on page 24.
- Are COBOL language Exits supported in NNSY nodes? See “Question 2.44” on page 24.
- Why won’t my brokers run on my Solaris 8 system? See “Question 2.45” on page 24.
- When I try to run a broker on AIX, why does the execution group terminate with memory allocation errors? See “Question 2.46” on page 24

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## Answers to system administration questions

**Question 2.1:** When I create my Configuration Manager, the following error message is displayed:

```
security properties not found
```

How do I correct this?

**Answer 2.1:** This message is for information only, and is not generated by MQSeries or WebSphere MQ Integrator. The condition it is reporting is not an error. You can safely ignore this message.

**Question 2.2:** When I create my Configuration Manager, the following error message is displayed:

```
Can't get saved uuid state: java.io.FileNotFoundException
```

What’s wrong?

**Answer 2.2:** This message is for information only, and is not generated by MQSeries or WebSphere MQ Integrator. The condition it is reporting is not an error. You can safely ignore this message.

**Question 2.3:** The broker’s queue manager was stopped before the broker, and the **mqsisstop** command is hanging. How can I recover?

**Answer 2.3:** The broker is waiting for the MQSeries connection to drop. Issue the MQSeries stop queue manager command (**endmqm**) again, specifying the ‘immediate’ option: this forces the connection to be dropped and the broker will stop.

**Question 2.4:** The Configuration Manager starts successfully, but when I try to access it from the Control Center, why does it terminate unexpectedly, or fail to respond?

## System administration

**Answer 2.4:** The Configuration Manager cannot operate correctly because it cannot access the MQSeries Java Bindings classes package `com.ibm.mq`. The most likely cause of this error is that the CLASSPATH system environment variable has an entry for the VisualAge® for Java MQSeries Connector classes package (which has the same name as the MQSeries Java Bindings classes package, but is not MQSeries Java Bindings enabled) which is earlier in the path. The Configuration Manager therefore accesses the wrong classes and generates a `java.lang.NoSuchFieldError` which is not written to the Windows NT Event log. The Configuration Manager might stop with a BIP1004 message to the Event log, or might continue to run without accepting requests.

To resolve this problem you must stop the Configuration Manager, update your CLASSPATH variable to insert the MQSeries Java Bindings classes package path before the VisualAge for Java package path, and restart the Configuration Manager.

**Question 2.5:** When I start a broker, the Configuration Manager, or the User Name Server, on Windows NT, a dialog is displayed. It shows the following error message:

```
<ServiceName> - DLL initialization failure Initialization of the
dynamic link library c:\windows\system32\user32.dll failed.
The process is terminating abnormally.
```

What does this mean?

**Answer 2.5:** This error message is issued by Windows NT when it fails to start a service because it has insufficient storage.

This is an operating system problem: information on how to recover from this problem is available in the Microsoft Developer Network (MSDN). You can access MSDN on the Web at:

<http://msdn.microsoft.com>

Use the search facility of the MSDN and enter 'user32 AND init' as the key. This will display a hit on 'Err Msg: DLL Initialization Failure: Initialization of the Dynamic Link Library User32.dll Failed', ID: Q179071. This article makes further reference to article ID: Q142676 which contains information about how you can correct the problem identified in the message.

**Question 2.6:** I deleted my Configuration Manager and recreated it. When I view objects in the Control Center, why do I see objects I created or checked out from the old Configuration Manager?

**Answer 2.6:** When you create new objects, or check out objects from the Configuration Manager, these objects are stored on your local system.

When you delete the Configuration Manager specifying the flags `-n -m` (to delete the configuration repository and message repository) and recreate it, the data in the configuration repository is deleted but any data on your local Windows NT system is not. You must delete this information manually if you do not want it.

Your local information is stored within the `\Tool` subdirectory under the WebSphere MQ Integrator home directory. Look for files in the path:

```
repository\private\<<ConfigMgrMachine>\<QueueManagerName>
```

where `<ConfigMgrMachine>` is the name of the system where the Configuration Manager ran, and where `<QueueManagerName>` is the name of the queue

manager your Configuration Manager used. Remove the contents of this directory and all its subdirectories and their contents.

If you did not specify the flags `-n` `-m` when you deleted the Configuration Manager, the configuration repository, the message repository, and your local data are all preserved.

**Question 2.7:** When I delete Configuration Manager using the `mqsdeleteconfigmgr` command, I see error message BIP8052. What's wrong?

**Answer 2.7:** The error BIP8052 indicates that the queue `SYSTEM.BROKER.SECURITY.REPLY`, one of the MQSeries queues created specifically for the Configuration Manager's use, cannot be deleted and the action fails.

This is probably because the queue is currently in use. Make sure that your User Name Server is stopped, then retry the `mqsdeleteconfigmgr` command after a short interval.

**Question 2.8:** I'm trying to use the MQSeries `endmqm` command to stop a broker queue manager. Why doesn't it stop?

**Answer 2.8:** In certain circumstances, attempting to stop a broker queue manager will not cause the queue manager to stop. This can happen if you have configured any message flows with multiple threads (you have set the message flow property 'Additional Instances' to a number greater than zero). If you want to stop the broker's queue manager, you are recommended to stop the broker using `mqsistop` specifying the `-q` flag. (The `-q` flag is not available on z/OS.) This issues `endmqm` on your behalf in a controlled fashion that shuts down the broker and the queue manager cleanly.

**Question 2.9:** I deleted my broker database, and now I can't delete my broker. Why do I receive error message BIP8040W?

**Answer 2.9:** The `mqsdeletebroker` command checks for the broker database tables and raises this error because the database is not there.

You can work around this problem by creating a dummy database with the same name as the database you deleted. You must also recreate the ODBC connection. Reissue `mqsdeletebroker`, and then delete the dummy database.

**Question 2.10:** I've followed the security authorizations recommended in the *WebSphere MQ Integrator Administration Guide*, but my Configuration Manager does not appear to be authorized. What's wrong?

**Answer 2.10:** The authorizations described are correct for almost every situation. There are one or two cases where the requirements of the Configuration Manager in your particular environment mean that the service user ID must also be added to the Windows NT group **Administrators**.

**Question 2.11:** There seem to be several ways of activating trace. Which method do I use for what?

**Answer 2.11:** Here's a summary of what you can trace, and how you can activate it.

## System administration

To trace this.....	Use this.....
Control Center activity	<b>mqsilcc</b> command
Configuration Manager activity	<b>mqsichangetrace</b> command specifying <i>ConfigMgr</i>
User Name Server activity	<b>mqsichangetrace</b> command specifying <i>UserNameServer</i>
Broker activity	<b>mqsichangetrace</b> command specifying <i>broker name</i>
Message flow	Either <ul style="list-style-type: none"> <li>• <b>mqsichangetrace</b> command specifying <i>broker name</i> and <b>-f</b> OR</li> <li>• <i>User Trace</i> → <i>Normal</i> or <i>User Trace</i> → <i>Debug</i> from the menu displayed when you right click on a message flow in the Control Center Operations View.</li> </ul>
Activity within a message flow	Trace node connected in the message flow at the point at which you want to trace
Execution group	Either <ul style="list-style-type: none"> <li>• <b>mqsichangetrace</b> command using broker name and <b>-e</b> option OR</li> <li>• <i>User Trace</i> → <i>Normal</i> or <i>User Trace</i> → <i>Debug</i> from the menu displayed when you right click on the execution group in the Control Center Operations View.</li> </ul>
WebSphere MQ Integrator commands ( <b>mqsicreatebroker</b> and so on)	MQSI_UTILITY_TRACE environment variable

You can find a description of all the trace facilities in the *WebSphere MQ Integrator Administration Guide*. The trace functions available through the Control Center, and the Trace node, are described in the *WebSphere MQ Integrator Administration Guide*.

**Question 2.12:** When I use the DB2 Control Center, why do I see that the configuration repository and message repository databases sometimes remain in 'inconsistent' state even when I have stopped the Configuration Manager? I have observed this with the broker database too.

**Answer 2.12:** This status has no adverse effect on the system or the integrity of the data in the database, and appears to be caused by DB2. Check with IBM DB2 support to see if a fix for this problem is available.

**Question 2.13:** My execution group works with a small number of flows, but when I add more flows or instances I see message BIP2322 with SQL1040N. Why does this happen and what can I do about it?

**Answer 2.13:** The DB2 message

"SQL1040N The maximum number of applications is already connected to the database. SQLSTATE=57030"

indicates that the value of the DB2 database configuration parameter *maxappls* has been reached. DB2 has rejected the attempt to connect.

If this database is one of the defined broker databases, implying a broker thread connection request has failed, the broker will probably not be functioning correctly.

In general, you can recover from this situation:

1. Stop all brokers that connect to the affected database.
2. Increase the value of the *maxappls* configuration parameter. (See Chapter 3 "The broker", section "Broker database connections" in the *WebSphere MQ Integrator Administration Guide* to determine a realistic value for this parameter.)
3. Restart the DB2 database.

On AIX, you can instead use TCP/IP mode to connect to DB2, thereby avoiding the limit of 10 connections. Follow these **AIX DB2 TCPIP Loopback Setup Instructions** to use TCP/IP mode:

The important names below are:

### DATABASE

The physical name of the database.

### DBALIAS

A database alias name created by this procedure which you should then use in all other references to the local database (for example, specify this alias name on the **mqsicreatebroker** command).

### HOSTNAME

The name of your computer.

- Step 1. Remove the broker from the Topology pane in the Control Center.
- Step 2. Delete your broker following all the steps defined in the *WebSphere MQ Integrator Administration Guide* for **mqsdeletebroker**.
- Step 3. Log on as user ID of the instance owner, usually `db2inst1`.
- Step 4. Configure DB2 to use TCP/IP and to start the TCP/IP listener. On the server machine, log in as the DB2 instance owner, and issue the following commands:
 

```
db2set DB2COMM=tcPIP
db2stop
db2start
```
- Step 5. If you have a DB2 Connection port defined in `/etc/services`, go to step 8. If not, edit the services file to include DB2 connection and interrupt ports if they don't already exist. The names need to be unique, and the port numbers should be unused (that is, not already defined in the services file).
 

```
db2svc1          3700/tcp          # DB2 Connection Service
db2isvc1         3701/tcp          # DB2 Interrupt Service
```
- Step 6. Update the DB2 configuration, the name after `svcname` should match the name of the DB2 connection port service that you placed in `/etc/services`. Alternatively you can specify a port number directly.
 

```
db2 update dbm cfg using svcname db2svc1
```
- Step 7. Stop and restart the database.
 

```
db2stop
db2start
```
- Step 8. Catalog a new TCP/IP node. You should receive message DB20000I to say the command completed successfully.
 

```
db2 catalog tcPIP node NODENAME remote HOSTNAME server db2svc1
```

You could use "local" as your node name - it just needs to be unique. The name after "server" should match the name of the DB2 connection port service that you placed in `/etc/services`
- Step 9. Catalog the database with a new ALIAS name.
 

```
db2 catalog database DATABASE as DBALIAS at node NODENAME
```
- Step 10. Stop and start DB2.

## System administration

```
db2 terminate
db2stop
db2start
```

Step 11. Log on with the broker service user ID.

Step 12. To enable WebSphere MQ Integrator brokers to use the database, you must update the ODBC configuration file (`/var/wmqi/odbc/.odbc.ini`) to contain definitions for the database. Edit the file and add the following lines. At the top of file add a definition for the database alias name:

```
DBALIAS=IBM DB2 ODBC Driver
```

Add a new stanza for the database alias:

```
[DBALIAS]
Driver=INSTHOME/sqllib/lib/db2.o
Description=Broker Database Alias
Database=DBALIAS
```

Note: The path identified by the Driver definition is specific to your installation, so you must replace the *INSTHOME* with the path to your DB2 Instance directory. See the *WebSphere MQ Integrator Administration Guide* for more information about ODBC connections.

Step 13. Create a new broker using the DBALIAS

```
mqsicreatebroker BrokerName -i mqsiuid -a mqsipw
-q BrokerQueueManager -n DBALIAS
```

Step 14. Start the broker and redefine the broker in your topology.

Step 15. Deploy the broker and test the flows.

**Question 2.15:** When I run `mqsicreatebroker`, or when a message flow that includes a database node runs, why do I get SQL error SQL0805N NULLID.SQLLF000?

**Answer 2.15:** To correct this, you need to open a DB2 Command Line Processor window and issue a bind to the database.

On UNIX systems, enter:

```
connect to db
```

```
bind ~/sqllib/bnd/@db2cli.lst grant public CLIPKG 5
```

```
connect reset
```

where db is the database name.

On Windows NT systems, enter:

```
connect to db
```

```
bind x:\sqllib\bnd\@db2cli.lst blocking all grant public
```

```
connect reset
```

where x: identifies the drive onto which you installed DB2, and db is the database name.

**Question 2.16:** I have created the Configuration Manager specifying the local system name for the Windows NT security domain, and the same identifier for the service user ID. When I start the Configuration Manager, why is the following message generated?

BIP8026W: Unable to start the component.  
The component could not be started using the service  
userid that was supplied when the component was created.

This also happens with the User Name Server when I run that on Windows NT.

**Answer 2.16:** The configuration you have specified is not supported by Windows NT. When you start the component created with this combination of parameters, a Windows NT system call incorrectly retrieves the SID (Security IDentifier) of the machine rather than that of the account.

If you want to use your local account domain as the domain from which users and groups are drawn, you must specify a different user ID for the service user ID.

For example, if you specify NTSecurityDomainName (-d) as NYBROKER on local system \\NYBROKER, the service user ID (-i) cannot be nybroker.

You must delete your Configuration Manager (or User Name Server, or both) and recreate it using another user ID that has the correct authorizations.

**Question 2.18:** How do I clear old trace information from my trace files?

**Answer 2.18:** If the component you are tracing has stopped, you can delete its trace files from the log subdirectory of the WebSphere MQ Integrator home directory.

If you are tracing an execution group, you can use the -r flag of the **mqsichangetrace** command (the -r flag can only be specified if you specify the -e flag).

**Question 2.19:** When I use the **mqsicreateconfigmgr** command, why does it fail with an error that tells me that queue SYSTEM.BKR.CONFIG already exists?

**Answer 2.19:** A previous **mqsideleteconfigmgr** command has failed to delete the channel SYSTEM.BKR.CONFIG. To correct this situation, you must manually delete the channel using either MQSeries Explorer or the MQSeries **runmqsc** command, and reissue the **mqsicreateconfigmgr** command.

The message incorrectly identifies SYSTEM.BKR.CONFIG as a queue not a channel: this is a known problem.

**Question 2.20:** I'm running WebSphere MQ Integrator Version 2 on Windows NT. Can I use the VC++ debug program to determine what a broker is doing?

**Answer 2.20:** Yes, you can. Follow these instructions:

1. Left click on *Start* —> *Programs* —> *Accessories* — *Notepad*. This starts an edit session that you will need to capture the data.
2. Right click your task bar and left click *TaskManager*. This starts the Windows NT task manager and displays the active tasks.
3. In the task manager window, select the tab marked *Processes*.
4. Left click twice on the column head **ImageName**. The processes are now ordered alphabetically (from A to Z).
5. Locate the items named **DataFlowEngine** in the list of processes and select one (there might be more). The DataFlowEngine is a process within the broker that runs message flows.

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You can correlate the process identifiers (PIDs) shown by the Task Manager with those identified in start up messages in the Windows NT event viewer (Application view). These messages all have the number BIP2201 and include the PID. For example:

```
Execution group started: process '285'...
```

If the event log has a large number of entries you can define the entries you want to see by selecting *View* → *Filter Events*, and entering 2201 in the Event ID field in the Filter dialog.

6. Right click the chosen DataFlowEngine line and left click *Debug* in the popup menu. A warning dialog is displayed to indicate that results of using the debug program can be unpredictable. The action taken by the debug program in the circumstances described here is normally safe and you can click **Yes** to dismiss the dialog and continue. However, because you can stop the broker using the debug program, you are strongly advised not to use the debug program in a business critical environment.

The Visual Studio debug program is now initialized (this might take a little while).

7. In the debug program window, click *View* → *DebugWindows* → *Call Stack*. The call stack window is displayed but not initialized.

In the debug program window, click *Debug* → *Break*. Do not select any other debug options. The data in the call stack window now changes to display the call stack of the thread in the DataFlowEngine running at this time.

8. Repeat the following procedure for each thread in the process:
  - a. Click *Debug* → *Threads*. The threads dialog is displayed.
  - b. Left click the thread, left click *SetFocus* then left click **OK**. The thread dialog is dismissed.
  - c. Position the mouse at the top left hand corner of the call stack window. Press and hold the left mouse button and drag the mouse towards the bottom right hand corner to select all the text. With the text highlighted, press Ctrl-C to copy the text to the clipboard.
  - d. Change focus to the Notepad window and select *Edit* → *Paste*. Press Enter twice to copy the call stack window data into the Notepad window.
  - e. In the Notepad window, select *File* → *Save*, choose a suitable file path and name, and left click **Save**.
9. When you have collected the information for each thread, return to the debug program. Select *Debug* → *Go*. This causes the broker to resume operation.
10. When you are ready, stop the broker using the **mqsistop** command. When this has completed, end the Visual Studio session.

If you are investigating the broker because it does not stop in response to the stop command, you can click *Debug-StopDebugging* in the debug program window to stop the DataFlowEngine process. The control process will then automatically restart the DataFlowEngine process.

However, you must be aware that this can cause locks against any databases that are accessed at the time of termination.

At the end of this procedure your Notepad file will contain the call stack information for each thread.

Although it is possible to resume and re-stop the broker, and step it through the source code line by line, you cannot obtain useful variable information because the debug program is unable to decipher the memory image.



**Question 2.22:** When I create an Execution Group why do I get several BIP2624 messages that indicate MQRC=2012 (MQRC\_ENVIRONMENT\_ERROR), and no MQSeries messages are processed?

**Answer 2.22:** It is probable that you have created the broker to run as an MQSeries trusted application (that is, the broker runs in the same process as the MQSeries queue manager), but that the user ID you specified does not have the required authority.

If you request the trusted application option on the `mqsicreatebroker` command by specifying the flag `-t`:

- On Windows NT, you must specify a user ID that is a member of MQSeries group `mqm` following flag `-i`.
- On HP-UX and Sun Solaris, you must specify the user ID `mqm` following flag `-i`.
- On AIX, the `-t` flag is ignored. The broker does not run as a trusted application on AIX.

**Question 2.23:** I have written my own plug-in node. How can I be sure it has loaded on Sun Solaris?

**Answer 2.23:** Sun Solaris provides a utility, `p1dd`, that lists all the shared objects loaded by a process. It is a useful tool for checking which libraries have been loaded, and where they have been loaded from.

To check the objects loaded by the process in the broker that runs message flows, known as the DataFlowEngine, you need to determine the process ID it is running under.

To get the process id of the running DataFlowEngine, enter:

```
$ ps -ef | grep DataFlowEngine
```

Use the output of this command to identify the correct process ID, and substitute this into the `p1dd` command:

```
$ /usr/proc/bin/p1dd "process id"
```

All the shared libraries loaded by this DataFlowEngine process are listed, including your plug-in.

You can use the `p1dd` command to diagnose a configuration problem in the system. Because its output identifies where a shared library has been loaded from, it can reveal an incorrect setting of `LD_LIBRARY_PATH`.

**Question 2.24:** How can I delete a broker from my broker domain?

**Answer 2.24:** You must complete several steps to complete the deletion of the broker from your broker domain. In some cases, the order in which you complete these steps is important.

The process is described in detail in *WebSphere MQ Integrator Using the Control Center*. This list summarizes the main tasks and indicates the order in which you are recommended to complete them.

1. If you have never deployed to the broker:
  - a. Delete the broker from the Topology view in the Control Center.

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- b. Stop the broker using the **mqsistop** command on the system on which you created it (if it is running).
  - c. Delete the broker using the **mqsdeletebroker** command on the system on which you created it.
2. If you have deployed to the broker you must ensure that the deletion messages are processed by the physical broker:
  - a. Delete the broker from the Topology view in the Control Center.
  - b. Ensure the broker is running.
  - c. Deploy the change to the broker domain by selecting *File* → *Deploy* → *Complete Configuration (all types)* → *Normal*. You cannot deploy only the Topology in this situation. The broker being deleted accepts and responds to the deletion messages. Change to the Log view and refresh the contents of the log to check that the deploy has been successful.
  - d. Stop the broker using the **mqsistop** command on the system on which you created it.
  - e. Delete the broker using the **mqsdeletebroker** command on the system on which you created it.

**Question 2.25:** Can I configure more than one broker on a single system?

**Answer 2.25:** You can create multiple brokers on a single system subject to the following:

1. Each broker must be supported by a separate MQSeries queue manager.
2. Your licence must cover the creation of multiple brokers.

**Question 2.26:** I am finding it difficult to manage all the MQSeries queues and channels that are required for my UNIX broker. Is there any application that can help?

**Answer 2.26:** You have created a heterogeneous MQSeries environment because you are running your broker on UNIX, and the Configuration Manager and the WebSphere MQ Integrator GUI programs are running on Windows NT. This environment needs a complex network of channels and transmission queues to support communications between the different queue managers.

The MQSeries Explorer service on Windows NT provides an option to show and manage local and remote queue managers. If you use this application you can control all the queue managers in your broker domain from one MQSeries Explorer application.

To set up the environment that enables you to use MQSeries Explorer (the commands shown assume your broker's queue manager is called **BROKER\_QM**):

1. Complete the following tasks on the broker's queue manager:
  - a. Define a queue manager listener. The default listener is on TCP/IP port 1414. See the *MQSeries Intercommunication* book for further details.
  - b. Define the **SYSTEM.ADMIN.SVRCONN** server connection channel:

```
$ runmqsc BROKER_QM
DEFINE CHANNEL (SYSTEM.ADMIN.SVRCONN) CHLTYPE (SVRCONN)
```

See the *MQSeries System Administration* book for more information about this command.

- c. Start the command server.

```
$ strmqcsv
```

See the *MQSeries System Administration* book for more information about this command.

2. Complete the following tasks in the Windows NT MQSeries Explorer:
  - a. Select the Show Queue Manager dialog.
  - b. Enter the broker's queue manager name `BROKER_QM`.
  - c. Enter the TCP/IP host name of the system on which the broker is running.

**Question 2.28:** Why do I get the message

BIP8135E Unable to create files. Operating System return code 1

when issuing the `mqsicreatebroker` command on WebSphere MQ Integrator for AIX?

**Answer 2.28:** The user id that you create for WebSphere MQ Integrator testing should have a primary group of `mqm`, and have `mqbrkrs` as one of the group set (see example below):

Change / Show Characteristics of a User

Type or select values in entry fields.

Press Enter AFTER making all desired changes.

```
[TOP]                                [Entry Fields]
* User NAME                          peterc
  User ID                             [202]                               #
  ADMINISTRATIVE USER?                false                               +
  Primary GROUP                       [mqm]                               +
  Group SET                            [mqm,system,mqbrkrs,sys> +
```

**Question 2.29:** When I try to create a broker with a Sybase12 database using the Merant 3.70 driver and ODBC, why do I get this message:

BIP2322E: Database error: SQL State '60'; Native Error Code '0';  
Error Text '[MERANT][ODBC Sybase ASE driver]Connection login time has expired.'

with the diagnostic information

```
SQL State '60' SQL Native Error Code '0'
SQL Error Text '[MERANT][ODBC Sybase ASE driver]Connection login time has expired.'
```

**Answer 2.29:** You might not be using the correct default Sybase port number (generally 4100). If you are unsure which port to use, check the value found in `<sybase home>/interfaces`. This is *not* the same as the default value (5000) in the `.odbc.ini` file.

**Question 2.30:** On z/OS, my broker fails to start and I get the diagnostic

```
ICH408I USER(MA10USR ) GROUP(TSOUSER ) NAME(OTHER, A N (ANO) 484
 /argo/MA10BRK/ENVFILE
-
--TIMINGS (MINS.)--
----PAGING COUNTS---
-JOBNAME STEPNAME PROCSTEP RC EXCP CPU SRB CLOCK SERV PG
 PAGE SWAP VIO SWAPS
CL(DIRSRCH ) FID(01D7D3E2E3F1F9002D0800000000003)
INSUFFICIENT AUTHORITY TO LOOKUP
ACCESS INTENT(--X) ACCESS ALLOWED(OTHER ---)
```

written to the SDSF SYSLOG. What is wrong with my setup?

**Answer 2.30:** The started task ID under which the broker will run needs to be in a RACF® or USS group that has `rxw` permissions on the broker directory. As an

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example, consider a broker that is created under directory /argo/MA00BRK. It runs under started task ID MA00USR. Issuing `ls -al` from / to find the permission bit settings on /argo reveals:

```
drwxrwx--- 5 BPXROOT ARG0USR      8192 Jul 30 13:57 argo
```

Issuing `id MA00USR` to find the group membership of started task ID MA00USR reveals:

```
uid=14938(MA00USR) gid=5(TSOUSER) groups=229(ARG0USR)
```

This means that the started task ID MA00USR potentially has `rwX` permissions on subdirectories to /argo because these are set for both the user and the group associated with MA00USR. If the permissions are not set correctly, you will get the type of diagnostic in your question.

**Question 2.31:** On z/OS, my broker fails to start and I get the diagnostic

```
+(MA00BRK) 0 BIP2048E: An Exception was caught while issuing database SQL command connect.
+(MA00BRK) 0 BIP2321E: Database error: ODBC return code '-1'.
+(MA00BRK) 0 BIP2322E: Database error: SQL State '58004'; Native Error 285
```

written to the SDSF SYSLOG. What is wrong with my setup?

**Answer 2.31:** The SQL State value of 58004 reveals that "a system error occurred". This might be due to a DB2 authorization problem. The ID under which the broker runs (the started task ID) needs the following DB2 authorizations to be granted:

- DELETE, INSERT, SELECT and UPDATE authorization on the Broker tables
- EXECUTE authorization on plan DSNACLI
- SELECT authorization on table SYSIBM.SYSSYNONYMS
- SELECT authorization on table SYSIBM.SYSTABLES
- SELECT authorization on table SYSIBM.SYSDATABASE

Batch job BIP\$DB05 grants the necessary authorizations on the Broker tables, so this is unlikely to be the cause of the problem. The other authorizations must, however, be performed manually, for example using a SPUFI script.

If the started task ID does not have execute privilege on the plan, you will get the errors in your question. If ODBC tracing is turned on, you will also see the following entries in the `traceodbc` file for the broker:

```
SQLAllocConnect( hEnv=1, phDbc=&1c6bacec )
SQLAllocConnect( )
----> SQL_ERROR

SQLError( hEnv=1, hDbc=0, hStmt=0, pszSqlState=&19ca445c,
pfNativeError=&19ca4458, pszErrorMsg=&1c3d9e50, cbErrorMsgMax=1024,
pcbErrorMsg=&19ca4444 )
SQLError( pszSqlState="58004", pfNativeError=-99999,
pszErrorMsg="{DB2 for OS/390}{ODBC Driver} SQLSTATE=58004 ERRLOC=2:170:6
RRS "CREATE THREAD" failed using DB2 system:DFLO and Plan:DSNACLI
RC=08 and REASON=00f30034 ", pcbErrorMsg=159 )
----> SQL_SUCCESS

SQLError( hEnv=1, hDbc=0, hStmt=0, pszSqlState=&19ca445c,
pfNativeError=&19ca4458, pszErrorMsg=&1c3d9e50, cbErrorMsgMax=1024,
pcbErrorMsg=&19ca4444 )
SQLError( pszSqlState="42505", pfNativeError=-922,
pszErrorMsg="{DB2 for OS/390}{ODBC Driver}
DSNT408I SQLCODE = -922, ERROR: AUTHORIZATION FAILURE: PLAN ACCESS ERROR.
REASON 00F30034
```

```

DSNT418I SQLSTATE = 42505 SQLSTATE RETURN CODE
DSNT415I SQLERRP = DSNAP03 SQL PROCEDURE DETECTING ERROR
ERRLOC=2:170:8", pcbErrorMsg=371 )
----> SQL_SUCCESS

```

If the started task ID does not have SELECT privilege on tables SYSIBM.SYSSYNONYMS and SYSIBM.SYSTABLES, you will see the following type of entry in the traceodbc file:

```

SQLTables( hStmt=1, szTableQualifier=NULL Pointer, cbTableQualifier=0,
szTableOwner="MA15USR", cbTableOwner=-3, szTableName=NULL Pointer,
cbTableName=0, szTableType=NULL Pointer, cbTableType=0 )
SQLTables( )
----> SQL_ERROR

```

**Question 2.32:** On z/OS, my broker gets abend code 047 when I try to start it, and I get the diagnostic

```

+BIPIMAIN: ---> DRV14 Start
IEA995I SYMPTOM DUMP OUTPUT 463
SYSTEM COMPLETION CODE=047
TIME=10.53.47 SEQ=00419 CPU=0000 ASID=008E
PSW AT TIME OF ERROR 078D0000 98D09E52 ILC 2 INTC 6B
ACTIVE LOAD MODULE ADDRESS=18D08828 OFFSET=0000162A
NAME=SPECIALNAME
61819987 968995A2 A3618499 89A58599 */argoinst/driver*
F1F46D82 96858261 A4A29961 93979761 *14_boeb/usr/lpp/*
A6949889 61828995 61828997 89948189 *wmqi/bin/bipimai*
95 *n *
DATA AT PSW 18D09E4C - 58109948 0A6B5820 B8E95020
GPR 0-3 00000000 0000003C 00000000 00000000
GPR 4-7 18D10300 18D115F0 00000013 00000004
GPR 8-11 18D111CF 18D101D0 18D0BBBE 18D0ABBF
GPR 12-15 98D09BC0 18D101D0 98D09E22 00000000
END OF SYMPTOM DUMP

```

written to the SDSF SYSLOG. What is wrong with my setup?

**Answer 2.32:** System completion code 047 means that an unauthorized program issued a restricted Supervisor Call (SVC) instruction. The diagnostic also indicates that the program in error was bipimain. When installing WebSphere MQ Integrator, it is necessary to issue the command `extattr +a bipimain` from the bin directory of the installation path to give program bipimain APF authorization.

**Question 2.33:** On Windows NT I have issued the command `mqsicon`. Why has the command failed with this error:

```

Failed to open trace file
C:/Program Files/IBM/WebSphere MQ Integrator 2.1/log/con.mqsistart.trace.bin.0
with error The system cannot find the file specified.

```

**Answer 2.33:** You should not use any of these Windows reserved words as broker names : CON, PRN, AUX, CLOCK\$, NUL, COM1 - COM9, LPT1 - LPT9 (lower/upper/mixed case are all equally invalid). See MSDN article ID: Q216654 for more details of the restriction (or search for reserved AND con).

**Question 2.34:** I have had a complete disk failure on my broker system. I have decided I no longer need this broker. How do I then delete this broker from the "Topology" view in my Control Center?

**Answer 2.34:** There are several problems here. Consider these two scenarios:

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### Scenario 1

Ideally, the broker should be deleted from the Topology, and the Topology redeployed before the actual broker is deleted (with **mqsdeletebroker**). Clearly, that is not possible in this case.

### Scenario 2

Even if the actual broker was deleted (**mqsdeletebroker**) before the Topology was updated, a redeploy of the Topology will detect this. This is because the broker's control queues will no longer exist on the broker's queue manager and so the redeploy can detect the missing queues. This will fail in case of a crashed system, since it is impossible to start the remote queue manager, or even the channels connecting to it.

All deploys to the crashed system will therefore result in messages being left on the transmission queue for the remote queue manager. So from the perspective of the Control Center, the symptom of the failing deploy is of a remote queue manager which is not responding. There is no way of knowing why the deploy is failing.

To force the deletion of this broker, do the following:

1. Create a new queue manager with the same name as that used by the deleted broker.
2. Start this new queue manager.
3. Connect the new queue manager to the Configuration Manager's queue manager. That is, create its transmission queue, and its sender and receiver channels.
4. Start these channels.
5. Do a force deploy of everything.

The force deploy then enters the second scenario above, and the broker will get deleted.

**Question 2.35:** How can I remove a broker from the Control Center when I cannot deploy to the broker?

**Answer 2.35:** When deleting a broker, you should always follow the process detailed in the answer to "Question 2.24" on page 17 (which is also documented under **mqsdeletebroker** in the *WebSphere MQ Integrator Administration Guide*).

If this process fails for any reason, usually because you can't deploy to the broker, the broker can be manually deleted from the Configuration Repository as follows:

1. Start a DB2 command line session.
2. Connect to the Configuration Repository database.
3. Delete the entries from the CBROKER table where the broker name matches the broker being deleted:  

```
delete from cbroker where cname = 'broker name'
```
4. Delete the broker using the **mqsdeletebroker** command on the system on which you created it.

**Question 2.36:** For performance, can I use more than one User Name Server?

**Answer 2.36:** A single User Name Server should be used for the whole broker domain. However, for performance or resilience reasons you might, with care, want to create more than one. See the topic "Employing topic-based security" in *WebSphere MQ Integrator Introduction and Planning* for details.

**Question 2.37:** What are the steps for backing up the WebSphere MQ Integrator directories, on z/OS, and restoring them on another system (or the same system in a different directory)?

**Answer 2.37:** The easiest way is as follows:

1. Tar up the code using the command

```
tar -cvozf wmqi.tar.z /usr/lpp/wmqi
```

where `/usr/lpp/wmqi` is the install path.

2. Use ftp to send the tar file to the new file system in binary mode by entering these commands:

```
ftp machine_name
binary
cd USS_path_for_storing_tar_file
put wmqi.tar.z
quit
```

3. Untar the file using the command:

```
tar -xvozf wmqi.tar.z
```

Because the initial tar command used the absolute path `/usr/lpp/wmqi` you need write access to the root directory in order to untar the package. To avoid this, use a relative path instead. Look up the tar command in the *z/OS UNIX System Services Command Reference* for more details. If you don't want to use ftp, consider using OGET/OPUT to transfer your files via shared DASD.

**Question 2.38:** Why do I get "Link failure: IEW2141E Symbol too long" when I implement a C language z/OS plug-in?

**Answer 2.38:** The link problem is probably caused by using the binder instead of the pre-linker / linker. You can force your link to use the pre-linker / linker by setting the `_CC_STEPS` / `_CXX_STEPS` / `_C89_STEPS` variable (when using `cc` / `cxx` / `c89` respectively) to `-1`:

- if using `cc`, execute the following statement before you run your makefile:

```
export _CC_STEPS=-1
```

- otherwise, add the following 2 lines to your makefile:

```
_CC_STEPS=-1
.EXPORT : _CC_STEPS
```

More information about `_CC_STEPS` / `_CXX_STEPS` / `_C89_STEPS` can be found in the *z/OS C/C++ User's Guide*.

**Question 2.39:** Why do I get message BIP1835E when deploying a message set?

**Answer 2.39:** You might receive this message because the message set you are deploying produces a message set dictionary larger than the internal limit of 4 MB. This might be because you have many large message definitions defined to the same message set. Avoid this problem by splitting the message definitions into several smaller message sets.

The size of an exported message set is not a good indication of the size of the message set dictionary that is generated at deploy time, because the exported message set is stored as XML, which can be very verbose. The dictionary has a much more compact internal format.

## System administration

**Question 2.40:** Can WebSphere MQ Integrator V2.1 co-exist with earlier versions, or with WebSphere Business Integrator, on the same machine?

**Answer 2.40:** No.

**Question 2.41:** Can I generate the broker topology using a script?

**Answer 2.41:** No.

**Question 2.42:** Can I assign execution groups using a script?

**Answer 2.42:** No.

**Question 2.43:** Can I graphically export and import message sets using the Control Center, or must I still use command line functions?

**Answer 2.43:** You have to use command line functions.

**Question 2.44:** Are COBOL language Exits supported in NNSY nodes?

**Answer 2.44:** Yes. The ID11 SupportPac *WebSphere MQ for z/OS - Writing New Era of Networks COBOL User Exits* tells you how. New Era of Networks Rules and Formatter Support for WebSphere MQ Integrator for z/OS allows user exits to be defined to customize the actions of the formatter.

The exit programs execute under UNIX System Services, and so some programming restrictions apply. The restrictions, which include threading and data access aspects, particularly apply to user exits written in COBOL. The ID11 SupportPac describes how to develop such user exits in COBOL, and includes a set of sample programs that illustrate the techniques that you can use.

**Question 2.45:** Why won't my brokers run on my Solaris 8 system?

**Answer 2.45:** This might be because you have not set the environment variables LANG and LC\_ALL. On UNIX systems always set your shell's locale before starting brokers. For example:

```
export LANG=en_US
export LC_ALL=en_US
```

or any locale of your choice.

It can even be NULL:

```
export LANG=
export LC_ALL=
```

**Question 2.46:** When I try to run a broker on AIX, why does the execution group terminate with memory allocation errors?

**Answer 2.46:** This might be because you need to extend the size of the AIX address space available to the DataFlowEngine process, by increasing the number of 256 MB memory segments available to it. This can be done by "patching" the executable with the following commands:

```
cp DataFlowEngine DataFlowEngine_512
/usr/bin/echo "\040\0\0\0" | dd of=DataFlowEngine_512 bs=4 count=1
seek=19 conv=notrunc
```



```
| cp DataFlowEngine DataFlowEngine_768
| /usr/bin/echo "\060\0\0\0" | dd of=DataFlowEngine_768 bs=4 count=1
| seek=19 conv=notrunc
|
| cp DataFlowEngine DataFlowEngine_1024
| /usr/bin/echo "\0100\0\0\0" | dd of=DataFlowEngine_1024 bs=4 count=1
| seek=19 conv=notrunc
|
```

| These commands create DataFlowEngine\_512, DataFlowEngine\_768, and  
| DataFlowEngine\_1024, which are versions of the DataFlowEngine which use two  
| segments (512 MB), three segments (768 MB), and four segments (1 GB)  
| respectively.

| To use one of these modified DataFlowEngine executables, make a copy of the  
| original and then rename your chosen new executable to be DataFlowEngine.

| On MQSeries Integrator for AIX V2.0.1, the default address space for the  
| DataFlowEngine was one 256 MB segment. This has been increased on subsequent  
| releases to two segments (512 MB).



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## Chapter 3. Using the Control Center

*Note that Debugger questions are listed separately at Chapter 9, “Debugger” on page 75.*

These questions are answered in this chapter:

- I am using the Promote Property dialog to converge multiple message flow properties to a single, promoted property. When I drop the property I am promoting onto the existing promoted property, why is a brand new promoted property created instead of an entry under the existing promoted property? See “Question 3.1” on page 31.
- I have a large number of message flows. How do I find all those that contain a node that uses a particular ESQL expression (or particular message, or particular database table, and so on)? See “Question 3.2” on page 31.
- I have deployed new message flows. Why don’t they appear in the Operations view of the Control Center? See “Question 3.3” on page 31.
- I have turned on user trace using the `mqsichangetrace` command. Why does the Control Center still show trace as being off? See “Question 3.4” on page 31.
- Why does the ESQL I enter in a Compute node disappear? See “Question 3.5” on page 32.
- Can I access the content of a NNSY message in any nodes other than the NNSY nodes? See “Question 3.6” on page 32.
- Can the Trace node print out the entire message content without all the elements being specified in the ESQL expression? See “Question 3.7” on page 32.
- How do I define a repeating field in my MRM message? See “Question 3.8” on page 32.
- How can I define a Repeating field or structure, whose number of repeats depends on another field in my MRM message definition? See “Question 3.9” on page 33.
- How can I define the length of a String using the value of another element? See “Question 3.10” on page 33.
- I created a message set and some elements within it, and checked in everything. I exited the workspace without saving it to a file. When I restart the Control Center, I select the Messages View and add back the message set I created. Why don’t I see the elements in it? See “Question 3.12” on page 33.
- What must I check out before I am allowed to edit my MRM message definition as I want? See “Question 3.13” on page 33.
- I have a custom message format that consists of comma-separated values. Can WebSphere MQ Integrator Version 2 handle this? See “Question 3.15” on page 33.
- What is the default type of a message if a type is not specified either in the MQRFH2 header or in the MQInput node of the message flow? See “Question 3.16” on page 34.
- I deployed some data. Why do the messages in the Control Center Log view tell me the broker does not exist when it does? See “Question 3.17” on page 34.
- When I deploy from the Control Center, why do I receive BIP1536, BIP2086, BIP4046, BIP2230, BIP7017 messages in the Configuration Manager’s Windows NT Event log? See “Question 3.18” on page 34.

## Using the Control Center

- From the Messages view, I have selected a message set, and imported my C header or COBOL copybook. Why does the import give unexpected results? See “Question 3.19” on page 34.
- When I have imported a workspace file with message set(s) into a new repository, I see all elements including the message set, simple types, and so on, with the blue icon that indicates they are not checked in yet. But when I create a message set it always appears with the checked out icon, and simple types are always checked in. Why is this? See “Question 3.20” on page 35.
- What is the difference between Import and Export on the Control Center *File* menu, and the command `mqsimpexpmsgset`? Are they interchangeable? See “Question 3.21” on page 35.
- What happens to my workspace after doing an Import in the Control Center? See “Question 3.22” on page 35.
- What kind of files can I import using the Control Center import function? See “Question 3.23” on page 35.
- Why does importing brokers never seem to work? See “Question 3.24” on page 36.
- I import a file that contains many topics, but when I import it into another workspace, the topics are not visible. Why are they not imported? Also, why does import sometimes rename a topic or change its Access Control List, and other times it does not? See “Question 3.25” on page 36.
- How does the Control Center decide which resources get imported? See “Question 3.26” on page 36.
- When I use a topic’s properties dialog to update the topic’s Access Control List, why don’t I see the complete list of principals? See “Question 3.28” on page 36.
- I change the name of a topic, but when I exit the Control Center and restart it, why does the topic show its old name? See “Question 3.29” on page 37.
- Why are the File and Help pull-down menus sometimes disabled? See “Question 3.30” on page 37.
- I used the Lock action followed by a Check In action. Why are my coworker’s changes lost? See “Question 3.32” on page 37.
- Why does Check In seems to be very slow? See “Question 3.33” on page 37.
- I’m using the Control Center. Why can’t I see the objects I had expected to see from the view selected? See “Question 3.34” on page 37.
- What is ‘pdf’ format ? See “Question 3.36” on page 38.
- “Question 3.37” on page 38: I’m working on a message set in the Message Sets view. What is the difference between **Delete** and **Remove**?
- I have created an XML message that looks like this:

```
<?xml version = "1.0" standalone="no"?><!DOCTYPE doc [<!ELEMENT doc (#PCDATA)*>]><doc><I1>100</I1></doc>
```

 I apply the following ESQL transform: `SET OutputRoot.XML.doc.I1 = 112233`; This generates the following XML message (after serialization):

```
<?xml version = "1.0" standalone="no"?><!DOCTYPE doc [<!ELEMENT doc (#PCDATA)*>]<I1>112233<I1>><doc><I1>100</I1></doc>
```

 The new value for I1 has been put inside the DOCTYPE, and has not replaced the value of 100 as I expected. What is happening? See “Question 3.38” on page 38.
- I’m sending a simple XML message into a simple message flow. The message is: `<doc><I1>100</I1></doc>`. The compute node in the message flow contains the following ESQL: `SET OutputRoot.XML.abc = InputBody`; I expect the following output message to be created: `<abc><doc><I1>100</I1></doc></abc>` The compute node is generating error message BIP5005 and is not implementing the ESQL. What is wrong with the ESQL statement? See “Question 3.39” on page 39.

- If I use a NeonRules node to reformat a message, why do some fields of some reformatted messages seem to disappear? See “Question 3.40” on page 39.
- Why do I get error messages when I try to freeze (message BIP1838), finalize (message BIP1840), or deploy (message BIP4041) my message set? See “Question 3.41” on page 39.
- How do I use a SELECT statement in an IN clause in ESQL? See “Question 3.42” on page 40.
- Can I Cut, Copy, and Paste message flows in the Message Flows view in the Control Center? See “Question 3.43” on page 40.
- How do I set up default values for a destination list in a Compute node? See “Question 3.45” on page 40.
- I’ve deleted a resource by mistake. Can I recover it? See “Question 3.46” on page 41
- When I try to import a C or COBOL copybook, I receive an error message indicating that the file does not exist (BIP1830) or that the file cannot be accessed (BIP1888). The file does exist and I can access it: what is the problem? See “Question 3.47” on page 41.
- When I check in a compound type, I receive error message BIP1827, which indicates that an invalid copybook name for the property **Structure Copy Book Name** exists in the compound type. Why is the name invalid? See “Question 3.48” on page 42.
- When using the C or COBOL Importer in a Control Center-only install, why do I get error BIP1888, BIP1890, or BIP1830? See “Question 3.49” on page 42.
- Can I use a single database statement without a semicolon? See “Question 3.50” on page 42.
- I have a message flow which uses a WHILE loop to iterate though a large XML array. Why does this take so long to process? See “Question 3.51” on page 42.
- Why is the Control Center log always empty when I refresh it? See “Question 3.52” on page 43.
- I have specified an MQSeries security exit when I invoke the Control Center, and the class I am supplying is in the correct location under Tool\, so why do I get a BIP1362 message? See “Question 3.53” on page 43.
- On z/OS, why do I get messages BIP2070 and BIP2068 in the log when trying to deploy? See “Question 3.55” on page 43.
- I have deleted my broker using **mqsdeletebroker** and deleted it from the Control Center Topology. Why is the Control Center is still deploying to the deleted broker? See “Question 3.56” on page 43.
- Why do I keep getting “BIP1511E: Queue manager ‘QM1’ cannot be associated with broker ‘BR1’; already associated with broker ‘BR1’.” when I try to create a new broker in the Topology pane? See “Question 3.57” on page 44.
- Does the COBOL Importer support the COPY statement? See “Question 3.58” on page 45.
- Does the COBOL Importer import data type Usage POINTER? See “Question 3.59” on page 45.
- Does the COBOL Importer import the VALUE phrase? See “Question 3.60” on page 45.
- What is different about property sets in Version 2.1? See “Question 3.61” on page 45.
- Is a property set something new? See “Question 3.62” on page 45.
- What property sets can I choose for my message set? See “Question 3.63” on page 45.

## Using the Control Center

- How do I register a property set for my message set? See “Question 3.64” on page 45.
- How do I see which property sets apply to my message set? See “Question 3.65” on page 45.
- Can I de-register a property set? See “Question 3.66” on page 46.
- When I create a new component, Why can't I see any properties tabs, even though I have already registered them? See “Question 3.67” on page 46.
- When I create a new component using Paste, why can I see properties tabs for that component, when “Question 3.67” on page 46 says that they do not appear for a new component? See “Question 3.68” on page 46.
- When working with a type of Type Composition Sequence, and I wish to add a second instance of a child element, why do I get an error telling me that there is a C (or COBOL) language name duplication when I check it in? See “Question 3.69” on page 46.
- When working with a type of Type Composition Sequence, I wish to add a second instance of a child element. Why do I get an error telling me that there is a COBOL language name duplication when I check it in? See “Question 3.70” on page 47.
- When working with an external message set, I am prevented from checking in an external type because a CWF property is invalid. But I find that I cannot edit that property because it is external. This renders my message set effectively useless. See “Question 3.71” on page 47.
- I have just installed a Control Center. Why don't I get a popup window with selection items like 'check out' and 'create broker' when I click the topology icon and right-click? See “Question 3.72” on page 47.
- What is the difference between simple types and base types in the MRM, and when and how should I use these? See “Question 3.73” on page 48.
- How do I reference MRM simple types and base types in ESQL? See “Question 3.74” on page 48.
- How do I avoid parsing the whole of my CWF message? See “Question 3.75” on page 49.
- I have deployed an execution group to a z/OS broker for the first time. Why have I received no reply in the Control Center, or a reply indicating that no response was received from the execution group? See “Question 3.76” on page 49.
- I want to archive my entire output message, including the MsgId assigned by MQSeries. How can I do this? See “Question 3.77” on page 49.
- Can I assign a flow containing an unsupported node to an execution group on a z/OS broker? See “Question 3.78” on page 50.
- Do I have to recreate the broker if, in the Control Center, I accidentally delete a broker from the Configuration Manager? See “Question 3.79” on page 50.
- On z/OS should I set the data conversion parameters to "yes" for the MQ sender channels between the Windows NT Configuration Manager and the z/OS broker? See “Question 3.80” on page 50.
- I want to run all Configuration Manager databases on the same platform to get a better availability and better recovery/restart, but they're on DB2 6.1. See “Question 3.81” on page 50.
- Is the naming of z/OS runtime brokers from the Control Center case-sensitive? See “Question 3.82” on page 50.

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## Answers to Control Center questions

**Question 3.1:** I am using the Promote Property dialog to converge multiple message flow properties to a single, promoted property. When I drop the property I am promoting onto the existing promoted property, why is a brand new promoted property created instead of an entry under the existing promoted property?

**Answer 3.1:** When you drop the message flow node property onto an existing promoted property, the Control Center validates that the data type of the property you are dropping matches the data type of the existing promoted property. If the data types are not compatible then a new promoted property is created at the top of the right hand pane. Make sure that you only converge properties that have the same data type.

**Question 3.2:** I have a large number of message flows. How do I find all those that contain a node that uses a particular ESQL expression (or particular message, or particular database table, and so on)?

**Answer 3.2:** Add all your message flows to your workspace. Use the Control Center *File* → *Export* operation to export these to an XML export file. Then use a text editor of your choice to search the XML export file for the string in question. When you have found an occurrence of the string, look back through the file. The first `<MessageProcessingNode>` element you find identifies the node in the message flow via its 'xmi.label' property. The first `<MessageProcessingNodeType>` element you find identifies the message flow itself, again via its 'xmi.label' property. You must not edit this file to update its contents: you must use the Control Center to make any modifications.

**Question 3.3:** I have deployed new message flows. Why don't they appear in the Operations view of the Control Center?

**Answer 3.3:** First check the Log view. Refresh the Log view by clicking the icon on the menu bar. You will see a set of messages for each broker that you deployed to.

If the messages are not present, the broker has not responded to the deploy request. Check that the broker is up and running and that all MQSeries queue managers and channels between the Configuration Manager and the broker are up and running.

If the messages are present, check for errors that have caused your changes to fail.

If there are no errors present, the deploy has been successful. Return to the Operations view and refresh it by clicking the icon on the menu bar.

If your changes are not present, you have either:

1. Failed to check in your changes before you deployed.
2. Issued the wrong type of deploy (for example, you deployed *Topology* instead of *All Types*).

**Question 3.4:** I have turned on user trace using the `mqsichangetrace` command. Why does the Control Center still shows trace as being off?

## Using the Control Center

**Answer 3.4:** This is a current limitation. The request to activate trace using the `mqsichangetrace` command is sent directly to the broker, and is therefore not recorded by the Configuration Manager.

If you always use the Control Center to switch on trace, the icons will correctly match the state on the broker.

**Question 3.5:** Why does the ESQL I enter in a Compute node disappear?

**Answer 3.5:** The ESQL for a Compute node is created in two sections, separated by the following comment line:

```
-- Enter SQL below this line. SQL above this line might be regenerated,  
causing any modifications to be lost.
```

The ESQL that is generated automatically by actions that you take (selecting Mappings or radio buttons) appears above this comment. You can make changes to this ESQL, but any changes that you make above the line will be discarded if the ESQL is regenerated. All new statements that you add above the line are also discarded.

You are recommended to enter ESQL below the comment line, where it is preserved if automatic regeneration occurs.

For full details of the circumstances that cause ESQL to be automatically regenerated, check the Compute node description in the Control Center online help.

**Question 3.6:** Can I access the content of an NNSY message in any nodes other than the NNSY nodes?

**Answer 3.6:** Yes. The content of an NNSY message (input format) can be accessed by every node, and in WebSphere MQ Integrator V2.1 it can be modified using the NEONMSG parser.

The content can be accessed using an ESQL path reference of the following format:  
Body.<FieldName>

where the <FieldName> is the name of the field defined in the New Era of Networks Rules and Formatter Support GUI input format.

**Question 3.7:** Can the Trace node print out the entire message content without all the elements being specified in the ESQL expression?

**Answer 3.7:** Yes, any part of the message tree can be printed out by specifying the parent element. For example:

- `${Body}` will print out the entire Body of the message
- `${Root}` will print out the entire contents of the message including MQMD headers and the properties of the message.

For more information about how to interpret the trace node output, see the *WebSphere MQ Integrator Administration Guide*.

**Question 3.8:** How do I define a repeating field in my MRM message?



**Answer 3.8:** Use the Control Center to check out the compound type corresponding to the message, and the element in the compound type that you want to define as repeating. Click on the element in the compound type, and click on the Connection tab. In this tab is a field called Repeat. Change this to Yes. Click on the Custom Wire Format tab and you will now see extra fields Repeat Count Type (Count or Value Of), Repeat Count, and Repeat Count Value Of.

**Question 3.9:** How can I define a Repeating field or structure, whose number of repeats depends on another field in my MRM message definition?

**Answer 3.9:** You can make a repeating structure or a repeating element refer to a numeric value in another element if the referred-to element is in the same structure, is before the repeating element, and is of logical type integer.

Check out the Compound type corresponding to the message, and the repeating element in the compound type. Click on the repeating element in the compound type, and click on the Custom Wire Format tab. Select 'Value Of' in the Repeat Count Type field, and select the name of the element you want to define the Repeat Count Value Of field (available from the drop down list).

**Question 3.10:** How can I define the length of a String using the value of another element?

**Answer 3.10:** You can make a string element refer to a numeric value in another element, if the referred-to element is in the same structure, is before the string element, and is of logical type integer.

Check out the Compound type corresponding to the message. Click on the string element in the compound type. Click on the Custom Wire Format tab. Select 'Value Of' into the Length Type field, and select the name of the element you want to depend on in the Length Value Of field.

**Question 3.12:** I created a message set and some elements within it, and checked in everything. I exited the workspace without saving it to a file. When I restart the Control Center, I select the Messages View and add back the message set I created. Why don't I see the elements in it?

**Answer 3.12:** You must explicitly add message set elements to the workspace, unless you have saved the workspace file. The elements are saved in the configuration repository if you have checked them in.

**Question 3.13:** What must I check out before I am allowed to edit my MRM message definition as I want?

**Answer 3.13:** If you want to edit the basic properties of a component, check out the component. If you want to edit, for example, the repeat information or the custom wire format information for a component, these are properties of the relationship between the component and its parent type (not of the component itself). Working under the Types folder, check out the parent type; then you will be able to edit the 'Connection Tab' fields and the 'Custom Wire format' fields.

A full list of check out requirements appears in *WebSphere MQ Integrator Administration Guide*.

**Question 3.15:** I have a custom message format that consists of comma-separated values. Can WebSphere MQ Integrator Version 2 handle this?

## Using the Control Center

**Answer 3.15:** This can be modelled as a tagged/delimited string in WebSphere MQ Integrator Version 2.1.

**Question 3.16:** What is the default type of a message if a type is not specified either in the MQRFH2 header or in the MQInput node of the message flow?

**Answer 3.16:** If no details of the message are specified, the default Message Type is BLOB.

**Question 3.17:** I deployed some data. Why do the messages in the Control Center Log view tell me the broker does not exist when it does?

**Answer 3.17:** Check that you have specified the correct queue manager associated with the broker. If it is correct, it is possible that the deployment message cannot be delivered because the queue to which it is sent (SYSTEM.BROKER.ADMIN.QUEUE) could not be found on the target queue manager (this returns an MQSeries reason code of 2085). If that queue has been accidentally deleted, the broker environment has been damaged, and you must repair it by following the recovery instructions in Chapter 3 of the *WebSphere MQ Integrator Administration Guide*.

**Question 3.18:** When I deploy from the Control Center, why do I receive BIP1536, BIP2086, BIP4046, BIP2230, BIP7017 messages in the Configuration Manager's Windows NT Event log?

**Answer 3.18:** The BIP1536 message indicates that the Configuration Manager had a problem registering its internal subscriptions on broker status change topics, which it tries to do each time you deploy a complete configuration. The cause of the problem is given by the message BIP7017, which indicates that you are running with a User Name Server configured but that the broker you are deploying to does not have the Configuration Manager service user ID in its user cache.

This might be because the User Name Server is not started, or the MQSeries channels between it and the broker are not started, or because the user ID is not present in the User Name Server's domain.

If you correct the problem, the subscriptions will be correctly registered the next time you deploy.

**Note:** The user ID is incorrectly reported in the BIP7017 message. This is a known problem.

**Question 3.19:** From the Messages view, I have selected a message set, and imported my C header or COBOL copybook. Why does the import gives unexpected results?

**Answer 3.19:** Check that your header is valid C, or your copybook is valid COBOL, for example using a compiler. Check also that your headers do not use any C or COBOL reserved words: you cannot use C reserved words in a COBOL header, nor COBOL reserved words in a C header.

The importer is not a complete language syntax checker, and the effects of the importer on a invalid input file are unpredictable.

When importing COBOL copybooks it is important to remember that COBOL statements are constrained to a 72 character width limit. Attempts to exceed this limit violate the COBOL specification and will result in concatenation of adjacent COBOL statements.

If the import generates message BIP1812 at any time, you must stop and restart the Configuration Manager.

**Question 3.20:** When I have imported a workspace file with message set(s) into a new repository, I see all elements including the message set, simple types, and so on, with the blue icon that indicates they are not checked in yet. But when I create a message set it always appears with the checked out icon, and simple types are always checked in. Why is this?

**Answer 3.20:** When elements are imported into a new repository, the message set and simple types are imported just as other elements. They are not checked in until the user chooses the *File* → *Check In* → *All (Save to Shared)* menu item or checks them in one by one. Afterwards, the blue icons will have disappeared.

**Question 3.21:** What is the difference between Import and Export on the Control Center *File* menu, and the command `mqsiiimpexpmsgset`? Are they interchangeable?

**Answer 3.21:** *File* → *Export* exports the resources in your workspace as an XML file. It can be used for configuration repository resources (message flows, execution groups, topics, and broker objects). Before you use *File* → *Export*, you are recommended to remove all message sets from your Message Sets view in your workspace, unless you are specifically exploiting individual message set components (for example, a specific element).

*File* → *Import* imports resources from an XML file that has been previously exported with *File* → *Export*.

The command `mqsiiimpexpmsgset` with the `-e` switch exports one entire message set as an XML file, from the shared configuration repository.

The command `mqsiiimpexpmsgset` with the `-i` switch imports one message set into the shared repository, from an XML file previously exported with `mqsiiimpexp`.

The two formats are not interchangeable.

**Question 3.22:** What happens to my workspace after doing an Import in the Control Center?

**Answer 3.22:** When you do *File* → *Import*, your current workspace is replaced (after being saved) with the workspace, or subsections of the workspace (defined by the options you select on the Import dialog), contained in the file you are importing. This allows you to see what resources were imported. You can selectively check in resources you need and delete others.

**Question 3.23:** What kind of files can I import using the Control Center import function?

**Answer 3.23:** You can only import files that have been exported by the Control Center *File* → *Export* function.

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**Question 3.24:** Why does importing brokers never seem to work?

**Answer 3.24:** The Control Center *File* → *Import* function only imports brokers if you select Topology on the Import dialog, and if you have checked out the Topology root. You must check out the Topology resource to be able to create or delete brokers. This applies to creation by importing too.

**Question 3.25:** I import a file that contains many topics, but when I import it into another workspace, the topics are not visible. Why are they not imported? Also, why does import sometimes rename a topic or change its Access Control List, and other times it does not?

**Answer 3.25:** *File* → *Import* follows the same rules that apply to manual creation or update of a new topic: the parent of the new topic must be checked out, or it must be new. Ensure that the TopicRoot is checked out when you perform the import action.

If you have any topics in the workspace, these also need to be checked out in order to have child topics created for them by import.

A topic also needs to be checked out in order to have its ACL list updated, or its name changed, during import.

**Question 3.26:** How does the Control Center decide which resources get imported?

**Answer 3.26:** When you use *File* → *Import* function, you select the types of resources you want imported on the Import dialog (one or more of Topology, Topics, Message Flows). The Control Center examines the import file for resources of the type or types you specify, and imports only those resources that are new (that do not currently exist in the configuration repository), and those resources that you have checked-out.

The new resources are written to the local repository but are not checked into the configuration repository. The resources that are imported because they are checked-out are also written to the local repository. The checked-out resources are overwritten by the imported resources, but are not checked in to the configuration repository.

The workspace from the export file is imported in addition to the resources of the type you selected. For example, if you select only topics in the Import dialog, but the workspace in the export file also contains some message flows, then references to these message flows will appear in the Message Flows view after import. You can remove these additional resources by right clicking on each one and selecting *Remove*.

**Question 3.28:** When I use a topic's properties dialog to update the topic's Access Control List, why don't I see the complete list of principals?

**Answer 3.28:** A principal that is defined in the security domain of the User Name Server might not appear in a topic's properties dialog for several reasons.

1. Ensure that the principal is not already in the topic's ACL. Principals currently in the ACL do not appear in the dialog.
2. If you have just added a new principal to the security domain, it takes time for a new principal to be propagated from the User Name Server to the Configuration Manager (the refresh time limit you set when you create the

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User Name Server determines how long this can take). Wait for this time to expire, then either exit and restart the Control Center, or use the *View* → *Refresh from Shared* operation to refresh the list of principals. You will now see your new principal in the list.

**Question 3.29:** I change the name of a topic, but when I exit the Control Center and restart it, why does the topic show its old name?

**Answer 3.29:** The name of a topic is stored in two places: in the topic itself, and in the topic's parent. If you want to rename a topic, you must ensure that the change can be made in both places. To do this, you must check out both the parent topic and the child topic, rename the child, and then check in both the parent and child topics.

If this situation has occurred, you can resolve this by checking out both the parent topic and the child topic, giving the child topic a temporary name, then renaming it back to the new name you wanted. Check both topics in, and you will find that change has been made.

**Question 3.30:** Why are the File and Help pull-down menus sometimes disabled?

**Answer 3.30:** These menu items are only available when a pane in the current view is selected. For example, in the Message Flows view, either the Message Flow Types, the Message Flow Definition, or the description pane must be selected. A blue border indicates which pane is selected.

If you never see a blue border on a selected pane, it might have been turned off from the Control Center Preferences. To turn on the blue border, go the File pull-down menu and click on Preferences to display the dialog. Make sure the 'Highlight selected pane' check box under 'Pane behavior' in 'General' preferences is checked.

**Question 3.32:** I used the Lock action followed by a Check In action. Why are my coworker's changes lost?

**Answer 3.32:** When you check out an object, the most recent version of that object is copied to your workspace. But when you lock an object, the most recent version is not always copied to your workspace. If you had examined that object earlier, for example by looking at its properties, your workspace contains a version of that object. That version might become out of date when, for example, a coworker checks out the object, changes it, and then checks it back in. The Lock action applies a lock to the object, but does not update the version of that object in your workspace. If you want to update the version of the object in your workspace, use the Check out action.

**Question 3.33:** Why does Check In seems to be very slow?

**Answer 3.33:** The Control Center makes a special test to ensure that all new resources are checked in together, and the number of checks that it has to do depends on your selection for check in. If you have a large number of related new objects, such as message flows, execution groups, and brokers, the tests can take some time. Use the *File* → *Check In* → *All (Save to Shared)* function to obtain better performance.

**Question 3.34:** I'm using the Control Center. Why can't I see the objects I had expected to see from the view selected?

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**Answer 3.34:** You are probably not authorized to view these objects. Check that your Windows NT logon user ID is a member of the correct WebSphere MQ Integrator security group for the task you are performing. For details of roles and security, see *WebSphere MQ Integrator Administration Guide*.

**Question 3.36:** What is 'pdf' format ?

**Answer 3.36:** Pdf means Portable Data Format, a native format understood by the MRM parser. It is used by the product IFS (which includes the MRM component). It is not to be confused with Portable Document Format (PDF) defined by Adobe Acrobat. You can continue to use this format but you are not expected to create new messages.

**Question 3.37:** I'm working on a message set in the Message Sets view. What is the difference between **Delete** and **Remove**?

**Answer 3.37:** The action **Delete** deletes the highlighted resource, and all references to it, from the shared repository. It is a drastic action, which cannot be reversed. The delete action fails if the resource, or any resource that directly references it, is checked out.

The action **Remove** removes the highlighted resource from its current context: from the workspace folder or from a parent type within a workspace folder. It does not immediately remove it from the shared repository.

For example, if you remove a checked in type from the Types folder, you are removing the type only from the workspace. It still exists in the shared repository. You can use *Add to Workspace* to add it back into the workspace at any time. More importantly, if you remove a child element from a new or checked-out type, the type is updated, and when you check in the type it is updated in the shared repository. The child element continues to exist, and you can add it to other types. If you try to remove a child from a checked-in type, the action fails.

**Question 3.38:** I have created an XML message that looks like this:

```
<?xml version="1.0" standalone="no"?><!DOCTYPE doc  
[<!ELEMENT doc (#PCDATA)*>]><doc><I1>100</I1></doc>
```

I apply the following ESQL transform:

```
SET OutputRoot.XML.doc.I1 = 112233;
```

This generates the following XML message (after serialization):

```
<?xml version="1.0" standalone="no"?><!DOCTYPE doc  
[<!ELEMENT doc (#PCDATA)*>]<I1>112233</I1>><doc><I1>100</I1></doc>
```

The new value for I1 has been put inside the DOCTYPE, and has not replaced the value of 100 as I expected. What is happening?

**Answer 3.38:** The XML in your message contains two doc elements:

1. The doctype element
2. The xmlElement that represents the body of the message

The parser has found the first instance of an element called doc and has created a child I1 with the value 112233. If you want to assign a new value to the element I1 within the message body element doc, you must explicitly identify the second doc element, like this:

```
SET OutputRoot.XML.(XML.tag)doc.I1 = 112233;
```

**Question 3.39:** I'm sending a simple XML message into a simple message flow. The message is:

```
<doc><I1>100</I1></doc>
```

The compute node in the message flow contains the following ESQL:

```
SET OutputRoot.XML.abc = InputBody;
```

I expect the following output message to be created:

```
<abc><doc><I1>100</I1></doc></abc>
```

The compute node is generating error message BIP5005 and is not implementing the ESQL. What is wrong with the ESQL statement?

**Answer 3.39:** The error is generated because you are assigning an element of one type (root) to an element of another type (xmlElement). The parser does not do this implicit cast for you, but you can do this yourself in the ESQL to achieve the result you want, using either of the following two casts:

```
SET OutputRoot.XML.(XML.Element)abc = InputBody;  
OR  
SET OutputRoot.XML.(XML.tag)abc = InputBody;
```

**Question 3.40:** If I use a NeonRules node to reformat a message, why do some fields of some reformatted messages seem to disappear?

**Answer 3.40:** The NeonRules node code is not working correctly in this area. You can overcome this known problem as follows:

1. Use the NNSY Formatter GUI program to define an output format that provides an unmodified copy of the affected input message.
2. Use the NNSY Rules GUI program to modify the Subscription that handles the affected message to ensure that the first action taken is to perform a transform of the input format to the newly defined output format.

This action has no effect on the final outcome of the subscription, but it alters the operation of the NeonRules node such that the correct result is achieved.

**Question 3.41:** Why do I get error messages when I try to freeze (message BIP1838), finalize (message BIP1840), or deploy (message BIP4041) my message set?

**Answer 3.41:** The most likely explanation is that your message set is incomplete. This can be due to the following:

1. If you have added the language bindings, you used the C or COBOL importer to create the message set, and the names of any of your elements are reserved words in COBOL, the COBOL language name property of these elements will not have been populated during the import. The language name property is a mandatory field.

To correct this, you can check out the offending elements, make the update, and check in the elements.

You should now be able to freeze or finalize the message set.

2. Do any of the messages within the message set contain an element that is defined of a compound type that in turn contains no elements (that is, there is an empty type nested in any messages), and has the type composition *not* set to 'Empty'?

This causes your message set to appear incomplete. You can overcome this problem by defining a dummy element in the empty type.

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If you have defined a message that is itself empty, the message is not considered to be incomplete.

You might also encounter an 'incomplete message set' error message when you try to export a message set using the `mqsiiimpexpmsgset` command.

**Question 3.42:** How do I use a SELECT statement in an IN clause in ESQL?

**Answer 3.42:** The use of SELECT within the IN clause is not supported by ESQL. However, you can construct ESQL to achieve the same result using supported constructs.

For example, if you want a statement something like:

```
FOR ANY Body.COSTCENTER[] AS C (C IN (SELECT centernum FROM Database.costcenter))
```

You can use the following ESQL:

```
FOR ANY Body.COSTCENTER[] AS C (EXISTS (SELECT * FROM Database.costcenter
AS D WHERE D.centernum = C))
```

**Question 3.43:** Can I Cut, Copy, and Paste message flows in the Message Flows view in the Control Center?

**Answer 3.43:** You can use these edit options to assist in organization of message flows (for example, to move a message flow from one category to another).

However, the *Edit* → *Copy* operation does not make a new copy of the message flow, it only creates a new reference to the original message flow. Therefore deleting the original or the copy will delete both. The *Edit* → *Copy* operation copies the flow to the clipboard, and you can then use *Paste* to create a new message flow.

**Question 3.45:** How do I set up default values for a destination list in a Compute node?

**Answer 3.45:** You can set up default values for your destination list using the defaults element structure. All DestinationData elements will then have these default values unless you explicitly override them.

You must first select a Compute Mode value that includes the destination list (this can be Destination, Destination and Message, Exception and Destination, or All). The Compute Mode property is on the Advanced tab of the Compute node properties.

The sample ESQL to set up default values (assuming a queue manager QM1 and a queue Q1) is shown below. You can use your own values for the queue and queue manager names, and for the options.

```
SET OutputDestinationList.Destination.MQDestinationList.Defaults
.queueName = Q1;
```

```
SET OutputDestinationList.Destination.MQDestinationList.Defaults
.queueManagename = QM1;
```

```
SET OutputDestinationList.Destination.MQDestinationList.Defaults
.transactionMode = yes;
```

```
SET OutputDestinationList.Destination.MQDestinationList.Defaults
.persistenceMode = automatic;
```



```
SET OutputDestinationList.Destination.MQDestinationList.Defaults  
.newMsgId = yes;
```

```
SET OutputDestinationList.Destination.MQDestinationList.Defaults  
.newCorrelId = yes;
```

```
SET OutputDestinationList.Destination.MQDestinationList.Defaults  
.segmentationAllowed = yes;
```

You can override any of these default values in a specific DestinationData item if you wish, for example:

```
SET OutputDestinationList.Destination.MQDestinationList.DestinationData[3]  
.queueName = Q3;
```

**Question 3.46:** I've deleted a resource by mistake. Can I recover it?

**Answer 3.46:** You cannot recover a deleted resource. However, if you have exported the resource definition into an export file (using *File* → *Export* in the Control Center, or the command **mqsiiimpexpmsgset** (for message sets only), you can import the export file, and Cut and Paste the resource to restore the definition.

Any changes you had made to the resource after you exported it are lost.

**Question 3.47:** When I try to import a C or COBOL copybook, I receive an error message indicating that the file does not exist (BIP1830) or that the file cannot be accessed (BIP1888). The file does exist and I can access it: what is the problem?

**Answer 3.47:** When you use the C or COBOL importer, the file name that you specify in the Control Center import dialog (either directly or using **Browse**), is passed exactly as it is specified to the Configuration Manager, which then attempts to import the file.

If the Control Center and the Configuration Manager are running under different user accounts, or they are running on different machines, or both, it is possible that:

1. The two user accounts have different levels of authority.
2. The two systems have different visibility of network devices, drives, and so on.

You must ensure that the Configuration Manager user account has read access to the same relative path for the import file as the Control Center.

If the Configuration Manager does not have visibility of the path, then a file not found message (BIP1830E) is returned. If the Configuration Manager has visibility but has insufficient authority, an authorization error message (BIP1888E) is returned.

The import only succeeds if:

1. The relative path from both the Control Center machine and the Configuration Manager machine are the same. Therefore if the Control Center and Configuration Manager are running on different machines, a UNC path specification must be used, specifying the machine name and share name leading to the path, instead of a mapped drive letter. (If both machines use the same mapped drive letter for the relevant machine and share name in question, the mapped drive letter can be used.)
2. Both machines must have read access for the path and the import file.

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**Note:** UNC (Universal or Uniform Naming Convention) is a PC format for specifying the location of resources on a local-area network (LAN). It uses the following format:

```
\\server-name\share-name\shared-resource-pathname
```

For example, to access the file `test.txt` in the share directory `examples` on the shared server `srvr1`, you must specify:

```
\\srvr1\examples\test.txt
```

**Question 3.48:** When I check in a compound type, I receive error message BIP1827, which indicates that an invalid copybook name for the property **Structure Copy Book Name** exists in the compound type. Why is the name invalid?

**Answer 3.48:** If you have a COBOL language binding, the COBOL plug-in in the Control Center automatically populates the field **Structure Copy Book Name** on the *COBOL Language* tab of the compound type. This name is always generated, even if it is never used.

This error message is generated when the COBOL plug-in has generated a copy book name that matches a name already in use for another compound type. You can correct this by selecting the *COBOL Language* tab for your compound type and change the name displayed. You can now check in the compound type.

**Question 3.49:** When using the C or COBOL Importer in a Control Center-only install, why do I get error BIP1888, BIP1890, or BIP1830?

**Answer 3.49:** The path you specify for the file to be imported must be relative to the Configuration Manager, rather than the Control Center. For example, if you specify `C:\wmqi\files\myheader.h`, this must be on the C drive of your Configuration Manager's machine. If it is not, you will get error BIP1830 as the file does not exist. If you specify `P:\wmqi\files\myheader.h`, the Configuration Manager will search the drive mapped as 'P' for the file. If there is no P drive defined to the Configuration Manager's machine, the result will be BIP1890 (Invalid Path). If the P drive is defined, but your local user does not have access to it, then the result will be BIP1888.

**Question 3.50:** Can I use a single database statement without a semicolon?

**Answer 3.50:** For backward compatibility, the runtime accepted a single database statement in a Database (or Warehouse, Update, Insert, Delete) node without a semicolon. This is deprecated and the tooling complains if you do this.

**Question 3.51:** I have a message flow which uses a WHILE loop to iterate through a large XML array. Why does this take so long to process?

**Answer 3.51:** A likely cause is that you are using the `CARDINALITY()` function to determine the size of the array in the WHILE statement. This is not recommended, since with large arrays the cost of determining the number of elements is proportional to the size of the array. The `CARDINALITY` function will be invoked each time the WHILE statement is executed. Because the message has many elements, there will be a significant overhead when running the loop in this way.

Unless you have a message in which the number of elements of the array grows dynamically, you should determine the size of the array before entering the while loop. Use code similar to the following:

```

DECLARE i,c INTEGER;
SET i = 1;
SET c=CARDINALITY(OutputRoot.XML.MyMessage.Array[ ]);
WHILE i <= c DO
    . . .
    . . . loop processing
    . . .
END WHILE;

```

**Question 3.52:** Why is the Control Center log always empty when I refresh it?

**Answer 3.52:** Check the properties of the SYSTEM.BKR.CONFIG channel on the Configuration Manager queue manager. The MCA user ID should be blank. The default value of the MCAUSER attribute is a blank. If you specify a non-blank user name as the MCAUSER attribute of the server connection channel, all programs connecting to the queue manager using this channel run with the identity of the named user. For almost all requests, this does not matter, but it is important when accessing the database for log refresh. If the MCA user ID is non-blank, reset it to blank and restart the Control Center.

**Question 3.53:** I have specified an MQSeries security exit when I invoke the Control Center, and the class I am supplying is in the correct location under Tool\, so why do I get a BIP1362 message?

**Answer 3.53:** Check that your exit follows these rules:

- Implements the MQSecurityExit interface
- Is defined as a public class
- Has a public method with the following signature:

```

public byte[] securityExit(MQChannelExit    channelExitParms,
                          MQChannelDefinition channelDefinition,
                          byte[]           agentBuffer)

```

- Returns an array of bytes (that is, byte[]) to the caller

**Question 3.55:** On z/OS, why do I get the following messages in the log when trying to deploy?

```

+(MQ05BRK) 0 BIP2070E: A problem was detected with MQSeries while issuing MQPUT for MQSeries queue SYSTEM.BROKER.ADMIN.REPLY, MQSeries queue manager QM_01. MQCC=2, MQRC=2030.
+(MQ05BRK) 0 BIP2068E: The broker was unable to put an internal configuration message to message queue SYSTEM.BROKER.ADMIN.REPLY.

```

**Answer 3.55:** This might be because the transmission queue is not large enough for the messages issued by WebSphere MQ Integrator. For details on how to increase the size of that queue see your MQSeries documentation.

**Question 3.56:** I have deleted my broker using `mqsdeletebroker` and deleted it from the Control Center Topology. Why is the Control Center still deploying to the deleted broker?

**Answer 3.56:** The problem is caused by getting the order of operations wrong when deleting a broker or by recreating a broker of the same name before the previous deletion has been completed.

One scenario which could lead to this is:

1. `mqsdeletebroker`
2. `mqscreatebroker` with the same name on the same queue manager

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3. Delete from topology
4. Deploy everything

This is wrong because the new broker is a different entity from the old one. It might have been given the same user-friendly name as the deleted one, but that does not alter fact that this is a different broker.

So, when deploy is initiated, a message is sent to the new broker telling it that the old broker no longer exists. The new broker replies saying that it understands that the old broker has gone away. However, the Control Center configuration never gets the acknowledgement from the old broker that it is removing itself from the broker domain.

Repeatedly deploying while in this state will keep on trying to delete the old broker. A force deploy will not help here. All a force deploy does is to ensure that a deploy of the current configuration is initiated. It cannot ensure that brokers will accept the information deployed to them.

The solution is:

1. Stop and delete the actual broker (**mqsistop** and **mqsdeletebroker**)
2. Delete the broker from the topology
3. Deploy everything
4. Check the deploy was successful and the broker has disappeared from the Operations view in the Control Center

You should never try recreating the actual brokers (**mqscreatebroker**) until you are confident that they have removed from the Control Center's Operations view. Also, you must not reuse broker names or queue managers until you are confident that they are not in use elsewhere.

**Question 3.57:** Why do I keep getting "BIP1511E: Queue manager 'QM1' cannot be associated with broker 'BR1'; already associated with broker 'BR1'." when I try to create a new broker in the Topology pane?

**Answer 3.57:** This is a special case of "Question 3.56" on page 43. The problem is caused by getting the order of operations wrong when deleting and recreating the actual broker (using **mqsdeletebroker** and **mqscreatebroker**) and deleting and creating of the broker in the topology.

To overcome this, you need to force the deletion of the broker to be accepted before attempting to recreate it. Do this as follows:

1. Stop and physically delete the actual broker using **mqsistop** and **mqsdeletebroker**
2. Delete the broker from the topology
3. Deploy everything
4. Check the deploy was successful and the broker has disappeared from the Operations view in the Control Center

The broker has now been correctly deleted. It is important that you do not attempt the recreation of the actual broker until the deleted topology has been successfully deployed. After the broker is no longer shown in the operations view, follow the normal steps for creating a broker:

1. Create the actual broker using **mqscreatebroker**
2. Create the broker in the topology

3. Deploy the topology

Remember that the correct order for broker deletion is:

1. Delete the broker from the topology
2. Deploy everything
3. Delete the actual broker (**mqsideletebroker**)

**Question 3.58:** Does the COBOL Importer support the COPY statement?

**Answer 3.58:** The COBOL Importer does support the COPY statement. The copybook which is the target of the COPY statement must be in the same directory as the source copybook. A COPY statement inside the target copybook will be ignored. The COPY...REPLACING construct is not supported.

**Question 3.59:** Does the COBOL Importer import data type Usage POINTER?

**Answer 3.59:** No, if the importer finds Usage POINTER on a field in a COBOL structure it will reject the whole structure.

**Question 3.60:** Does the COBOL Importer import the VALUE phrase?

**Answer 3.60:** Yes, in general, Values are imported. But the importer ignores Value clauses containing the reserved words: SPACE, HIGH-VALUE, HIGH-VALUES, LOW-VALUE, LOW-VALUES.

**Question 3.61:** What is different about property sets in Version 2.1?

**Answer 3.61:** In previous versions of the product, all property sets were automatically made available with every message set. Starting with version 2.1, a message set is created with only the basic property sets. If further property sets are required (such as wire format layers or language bindings) these can be added as described below.

**Question 3.62:** Is a property set something new?

**Answer 3.62:** Property sets are not new, but now you can choose the ones you want for your message set, and ignore the others.

**Question 3.63:** What property sets can I choose for my message set?

**Answer 3.63:** The optional property sets available are C language properties, COBOL language properties, CWF (Custom Wire Format) properties, XML properties, or TDF (Tagged Delimited Format) properties. You can choose to have more than one instance of CWF, XML, or TDF.

**Question 3.64:** How do I register a property set for my message set?

**Answer 3.64:** Highlight your message set, right click and select Add, then choose your property set. You are prompted to give a name to CWF, XML, or TDF property sets. This process is also known as registering a property set.

**Question 3.65:** How do I see which property sets apply to my message set?

**Answer 3.65:** To see the property sets you have chosen for a message set, highlight that message set and observe the tabs on the right hand side of the Message Sets pane.

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To see the properties as they apply to a component, such as an Element, highlight that Element and observe the tabs on the right hand side of the Message Sets pane.

To see the properties as they apply to a relationship between components, such as an Element within its Type, highlight that Element in its position within the Type and observe the tabs on the right hand side of the Message Sets pane. Within a tab, properties which apply to a relationship appear in the upper part of the tab, and properties which apply to the component itself appear in the lower part of the tab.

**Question 3.66:** Can I de-register a property set?

**Answer 3.66:** No.

**Question 3.67:** When I create a new component, Why can't I see any properties tabs, even though I have already registered them?

**Answer 3.67:** The GUI will not display properties tabs until after your new component is checked in (but see the exception described in "Question 3.68"). You can then check it out and work on the properties as you require. This is because there is new functionality in the message repository. Formerly, a newly-created component acquired default values for its properties as soon as you created it on the GUI. In WebSphere MQ Integrator 2.1, default values for properties are acquired only after the component is checked in, so nothing is displayed until then.

**Question 3.68:** When I create a new component using Paste, why can I see properties tabs for that component, when "Question 3.67" says that they do not appear for a new component?

**Answer 3.68:** Copy/Paste copies an existing component, and under certain conditions creates a new component with the same values in its properties. (The Pasted component is not very useful without this "exception".)

**Question 3.69:** When working with a type of Type Composition Sequence, and I wish to add a second instance of a child element, why do I get an error telling me that there is a C (or COBOL) language name duplication when I check it in?

**Answer 3.69:** This arises if your message set has the C (or COBOL) language plug-in registered. (The following remarks apply also to Member COBOL language name.) Consider these two cases:

1. A checked-out type of Type Composition Sequence has a checked-in internal child element Child1. You wish to add a second instance of Child1 to the parent type. You can do this using Add, but when you check-in, you are told that there is a C language name duplication. You highlight your 'old' instance of Child1, navigate to the C language tab and edit the Member C language name to something else. You try check-in again and all is OK.
2. A checked-out external type of Type Composition Sequence has a checked-in, externally connected, external child element Child1. You wish to add a second instance of Child1 to the parent type. You can do this using Add, but when you check-in, you are told that there is a C language name duplication. You highlight your 'old' instance of Child1, navigate to the C language tab and discover that you cannot edit the Member C language name to something else because the connection is external. You cannot edit "new" Child1 because it

does not yet display the Member C language name property, because it is still new. That is, you cannot add a second instance of a Child to an external Type/Child

There are two ways to tackle the problems:

1. Suspend the 'old' Child1. Add the 'new' Child1 and check-in the type. Checkout the type. Edit the 'new' Child1 Member C language name to something different. Un-suspend the 'old' Child1. Check-in the type.
2. To preserve maximum flexibility, always have all Member C language names different from the default.

**Question 3.70:** When working with a type of Type Composition Sequence, I wish to add a second instance of a child element. Why do I get an error telling me that there is a COBOL language name duplication when I check it in?

**Answer 3.70:** This happens if your message set has the COBOL language plug-in registered. See "Question 3.69" on page 46.

**Question 3.71:** When working with an external message set, I am prevented from checking in an external type because a CWF property is invalid. But I find that I cannot edit that property because it is external. This renders my message set effectively useless.

**Answer 3.71:** *This can also happen with other types of plug-in.*

The property fields are validated by the GUI at check-in time. However, on first check-in of a new component there is no validation because there are no plug-in properties yet. Default value properties are added after first check-in by the back end. Some of these defaults, if checked out then checked in again, do not pass the check-in validation. For example, a string field with Length count null.

You should not continue with the questionable default values, or work with other parts of the message set, because you might Finalize the message set, and then base another on it. You will only discover the difficulty when you find that a type, not previously checked out, cannot be worked with effectively because of the questionable default values.

To work around the problem, suspend the offending item and replace it with something else. However, you will have to give it a different name and identifier.

To avoid the problem, checkout every component of your message set, and then check everything in again before you Finalize or Deploy any message set. Then you can be sure that your message set has only valid properties.

**Question 3.72:** I have just installed a Control Center. Why don't I get a popup window with selection items like 'check out' and 'create broker' when I click the topology icon and right-click?

**Answer 3.72:** This is caused by having incorrect authorization. Ensure that your user ID is in the correct Windows security groups. For example, you might have added your user ID to the local WebSphere MQ Integrator groups (such as mqbrops), but if the domain level groups exist (such as Domain\_mqbrops), these are used in preference. Once the correct authorization is present for your user ID, the popup window to checkout the topology and create the broker will appear when you right-click.

## Using the Control Center

**Question 3.73:** What is the difference between simple types and base types in the MRM, and when and how should I use these?

**Answer 3.73:** Simple types and base types can both be used in the representation of mixed content in the MRM. For example, they can be used in representing constructs such as the following two cases:

1. `<b>The following text is in <i>italics</i> and this line is in bold.</b>`
2. `<parentElt>parentValue<childElt>childValue</childElt><parentElt>`

In the first case, `b` is a compound element of a compound type (say `CT`). `CT` consists of a simple type of type string, a simple element of type string (`i`), followed by another simple type of type string. The two simple types and the simple element are added to the compound type `CT` in the specified order, and then an element, `b`, of this type is created.

In the message instantiation, the first simple type child has a value of 'The following text is in ', simple element `i` has a value of 'italics' and the second simple type child has a value of ' and this line is in bold.'. The parent element `b` has no 'value' as such.

In wire formats like XML, which are tagged- rather than length-delimited, a compound type should not have adjacent simple type children, because the parser will not be able to distinguish between these in a message instantiation. It will not be able to determine where one simple type value ends and the next begins; simple type children need to be interspersed with tagged children or simple elements.

In the second case, `parentElt` is a compound element of a compound type (say `CT2`). `CT2` is given a base type of type string when it is created. `CT2` has to be created using the 'Create... Compound type' option, not the 'Create with Smart Guide... Compound Type' option, because the first of these does not allow you to specify a base type for your compound type. `CT2` also has a child added to it – the simple element of type string called 'childElt'.

In the message instantiation, the element 'parentElt' has a value - 'parentValue' - of the same type as its base type, that is, string. It also has a child, 'childElt', which has a string value of 'childValue'.

These examples show that base type is used when it is required that the compound element itself has a specific value.

It is possible for a compound type to have both a base value and simple value children. However, in this case, the compound type's first child should not be a simple type child, because this will lead to ambiguity: the base type value and the simple type value will both occupy the same position in the message instantiation, and the parser will not be able to distinguish between them.

**Question 3.74:** How do I reference MRM simple types and base types in ESQL?

**Answer 3.74:** Simple type children of compound types are referenced as anonymous children of the compound element of that compound type.

For instance, in Case 1 of "Question 3.73", the string 'The following text is in ' is accessed using `b.*[1]` and the string ' and this line is in bold.' is accessed as `b.*[3]`. Thus, if element `b` is the top level in message `MSG` in the MRM, access



the strings using: `InputBody.b.*[1]` and `InputBody.b.*[3]` respectively. Reference the value of element `i` either using: `InputBody.b.i` or `InputBody.b.*[2]`.

If a compound element is of a compound type which has a base type which is non-null, then that implies that the compound element has a value of that base type. Thus the value of the base type is referenced via the compound element itself.

For instance, in Case 2 in “Question 3.73” on page 48, suppose `parentElt` is the top level element in message `MSG` in the `MRM`. Then the following ESQL:

```
SET OutputRoot.MRM.parentElt = UPPER(InputBody.parentElt);
```

results in the following output message fragment:

```
<MRM><MSG><parentElt>PARENTVALUE<childElt>....etc...
```

The above examples assuming that the elements’ XML names are identical to their identifiers, for example the element represented with tag `<b>` has identifier `b`.

**Question 3.75:** How do I avoid parsing the whole of my CWF message?

**Answer 3.75:** If you are modelling a CWF message, but you only wish to parse some of it, you can model the remainder as a single `STRING` element, with the ‘Length Unit’ set to ‘End of Bitstream’. This effectively tells the parser (and anyone maintaining the message definition) that the rest of the message is of no interest to the application, and need not be parsed.

**Question 3.76:** I have deployed an execution group to a z/OS broker for the first time. Why have I received no reply in the Control Center, or a reply indicating that no response was received from the execution group?

**Answer 3.76:** Check the `SYSLOG` on the z/OS system where your broker is running which will indicate what errors have occurred. The execution group might have tried to start up, but encountered problems early in its initialization. This problem is commonly caused by one of the following:

- TZ environment variable incorrectly set. A `BIP9220` message is written to the `SYSLOG`. Correct the TZ setting in your CIF file and re-customize the broker. For details on correct settings refer to *z/OS UNIX System Services Command Reference*.
- A loadable implementation library has failed to load. One or more `BIP230x` messages will have been written to the `SYSLOG` indicating the library that failed to load. Check that the settings for `LILPATH` and `LIBPATH` in your CIF file are correct, remembering to take into account any dependent libraries that are required.

**Question 3.77:** I want to archive my entire output message, including the `MsgId` assigned by `MQSeries`. How can I do this?

**Answer 3.77:** You can do this from V2.1 onwards. Connect a Compute node to the output terminal of your `MQOutput` node. The `MQOutput` node places the `MsgId` in the `LocalEnvironment` portion of the message tree. See the topic “Enabling support for message aggregation” in the *WebSphere MQ Integrator Programming Guide*. The Compute node can retrieve this and use it to overwrite the `MQMD` `MsgId`. Then connect a Warehouse node to the output node of the Compute node. This then archives the message.

## Using the Control Center

| **Question 3.78:** Can I assign a flow containing an unsupported node to an  
| execution group on a z/OS broker?

| **Answer 3.78:** Yes. Neither the Control Center nor the Configuration Manager has  
| knowledge of the target broker platform.

| **Question 3.79:** Do I have to recreate the broker if, in the Control Center, I  
| accidentally delete a broker from the Configuration Manager?

| **Answer 3.79:** Yes.

| **Question 3.80:** On z/OS should I set the data conversion parameters to "yes" for  
| the MQ sender channels between the Windows NT Configuration Manager and the  
| z/OS broker?

| **Answer 3.80:** No. The channels do not need to do data conversion. Data  
| conversion is handled within the broker. Perform conversion at the application  
| wherever possible, to avoid unnecessary multiple conversions and possibly reduce  
| the number of places conversion routines need to be installed.

| **Question 3.81:** I want to run all Configuration Manager databases on the same  
| platform to get a better availability and better recovery/restart, but they're on DB2  
| 6.1.

| **Answer 3.81:** The Configuration Manager database is only supported on the  
| Windows NT and Windows 2000 platforms.

| **Question 3.82:** Is the naming of z/OS run-time brokers from the Control Center  
| case-sensitive?

| **Answer 3.82:** Yes. The name of the broker in the Control Center should be upper  
| case if the broker is created in upper case.

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## Chapter 4. Running applications

These questions are answered in this chapter:

- Messages that are received at a message flow are immediately directed to the failure terminal on the MQInput node (if it is connected) or are rolled back. Why is this happening? See “Question 4.1” on page 52.
- Why don’t messages seem to be read from the queue defined in the MQInput node of my message flow? See “Question 4.2” on page 53.
- I am sending messages into my message flow, and they are removed from the input queue. Why does nothing ever appear at the other end of the message flow? See “Question 4.3” on page 53.
- When I published a message, why did I receive an error response message with reason text MQRCCF\_FILTER\_ERROR? See “Question 4.4” on page 55.
- My receiving application is expecting single quotation marks around attribute values relating to XML elements in the message body. Why is WebSphere MQ Integrator propagating double quotes? See “Question 4.5” on page 55.
- My Compute node adds a new header to a message. Why doesn’t this appear in the output message? See “Question 4.6” on page 56.
- Why do all of my Filter node expressions evaluate to NULL? See “Question 4.8” on page 56.
- I have specified an output file in my Trace node. Why is no file being produced? See “Question 4.9” on page 57.
- I see the term ‘dictionary’ mentioned in various WebSphere MQ Integrator messages. What is a dictionary? See “Question 4.10” on page 57.
- Why does the MRM Custom Wire Format (CWF) message that is issued by WebSphere MQ Integrator appear to be incomplete? See “Question 4.11” on page 57.
- I have defined an MRM message. Why do I get error "ParserException BIP5195E: Invalid element length" in the user trace when the message flow is executed? See “Question 4.12” on page 57.
- If I specify certain symbols when I use filters in a subscription, the filter does not work. Sometimes my subscription messages end up on the dead letter queue, and I see a number of error messages in the local error log that report MQRFH2 parsing errors. What is wrong? See “Question 4.13” on page 58.
- Why is my MRM CWF message being propagated to a failure terminal and generating error messages BIP5285, BIP5125, and BIP5181 or messages BIP5285, BIP5125, and BIP5288? See “Question 4.14” on page 58.
- Can I use a central application database that is accessible to all my brokers? See “Question 4.15” on page 58.
- I have created my own message processing node, and have defined it to have an error terminal that I have called ‘failure’. Why is this terminal catching exceptions? See “Question 4.16” on page 58.
- What should I do when DataFlowEngine processes terminate abnormally? See “Question 4.17” on page 58.
- How does the WebSphere MQ Integrator 2.1 message repository manager (MRM) handle Extended Decimal? See “Question 4.18” on page 59.
- Why do I get SQL1248N error when I am accessing DB2 in globally coordinated (XA) transaction from my message flow? See “Question 4.19” on page 60.

## Running applications

- I have just recompiled an existing C plug-in against WebSphere MQ Integrator 2.1. Why do any nodes or parsers it supports no longer seem to be available to the broker? See “Question 4.20” on page 60.
- I am attempting to use a globally coordinated message flow on a UNIX system. Why does the MQSeries queue manager reports error AMQ7604? See “Question 4.21” on page 60.
- Is the worldwide standard XML structure ROSETTANET supported? See “Question 4.23” on page 61.
- How often does the broker have to get information from the DB2 database? See “Question 4.24” on page 61.
- Using MQRFH2 can I identify DTD as a Message Domain, and include a Message Set and Message Type? See “Question 4.25” on page 61.
- Why is it only possible to add the Tagged/Delimited Format on the message set level, and not on the element level? See “Question 4.26” on page 61.
- Is there any guidance available on representing formats within the MRM? See “Question 4.27” on page 62.
- Why do I get errors, after using the DTD importer to build message sets, when I manipulate the message with ESQL in a compute node? See “Question 4.28” on page 62.
- Why do I get message IEW2141 when attempting to compile and link a C language plug-in node on z/OS? See “Question 4.29” on page 63.
- Where can I define a destination list in a Java custom node? See “Question 4.30” on page 63.
- Can I add properties to a custom Java node once it has been created in the Control Center, other than deleting it and recreating it? See “Question 4.31” on page 63.
- How can I create an “empty” message in a custom Java node? I see only a copy constructor in the javadoc. This is for a node that generates messages based on input message contents but not on input message *format*. See “Question 4.32” on page 63.
- How can I modify the CLASSPATH order so that my jar files appear earlier? See “Question 4.33” on page 63.

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## Answers to running applications questions

**Question 4.1:** Messages that are received at a message flow are immediately directed to the failure terminal on the MQInput node (if it is connected) or are rolled back. Why is this happening?

**Answer 4.1:** When a message is received by MQSeries, an error is signalled if the following are all true:

1. The MQInput Node requests that the message content is converted (the ‘convert’ property is set).
2. The message consists solely of an MQMD followed by the body of the message.
3. The format as specified in the MQMD is set to MQFMT\_NONE.

This error causes the message to be directed to the failure terminal.

In general, there is no need to request MQSeries to convert the message content because WebSphere MQ Integrator processes messages in any code page and encoding supported by MQSeries. Turning the convert property off ensures that messages are flowed from the MQInput node to successive nodes.

**Question 4.2:** Why don't messages don't seem to be read from the queue defined in the MQInput node of my message flow?

**Answer 4.2:** If the message flow has been deployed successfully, and messages are not being processed, it is probably because there is an error in the message flow that prevents the message being processed.

If your message flow is processing messages in a unit of work (UOW) and getting the message under syncpoint, an error in your message flow causes the UOW to be backed out. This results in that message being reinstated on the input queue, and therefore being processed again. If the error condition persists, the message will continue to be passed through the message flow and backed out, causing a processing loop.

The message will continue to be processed until the MQMD BackoutCount equals or exceeds the value of the backout threshold (BOTHRESH) attribute of the input queue. WebSphere MQ Integrator will then attempt backout processing, by attempting to propagate the message, in this order, to:

1. The failure terminal of the MQInput node
2. The queue's backout re-queue queue (BOQNAME)
3. The dead-letter queue (DLQ)

If none of these exist, the message cannot safely be handled without the risk of it being lost, and the message flow will continue to try to backout the processing in this way. This situation will manifest itself with appropriate errors in the event log, and the first message in the input queue will indicate that its BackoutCount (stored in the MQMD) is being continually incremented.

To correct this situation you can define one of the backout queues mentioned above. If the condition preventing the message from being processed has cleared, you can temporarily increase the value of the backout threshold attribute to force the message through normal processing.

**Question 4.3:** I am sending messages into my message flow, and they are removed from the input queue. Why does nothing ever appear at the other end of the message flow?

**Answer 4.3:** There are several possible causes for this. Work through the suggestions given until you can identify the situation that is causing your failure.

**Answer 4.3a:** Check your message flow in the Control Center. You might have accidentally wired up the MQInput node 'failure' terminal instead of the 'out' terminal. The 'out' terminal is the middle terminal of the three, not the top one. Messages directed to an unconnected 'out' terminal are discarded.

**Answer 4.3b:** If the 'out' terminal of the MQInput node is correctly wired up, check in the local error log for the broker for a message indicating that message processing has been terminated due to problems. Additional messages will give more detailed information.

**Note:** If the failure terminal of the MQInput node has been wired, for example, to an MQOutput node, these messages will not appear. Wiring a node to a failure terminal of any node indicates that you have designed the message flow to deal with all error processing. If you connect a failure terminal to an MQOutput node, your message flow ignores any errors that occur.

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**Answer 4.3c:** If the 'out' terminal of the MQInput node is correctly wired up, and the local error log does not contain any error messages, turn user tracing on for the message flow.

From the Operations view of the Control Center, select the message flow, and right-click. (You might have to refresh the view by clicking on the refresh icon.) Select *User Trace* —> *Normal* from the popup menu.

This action produces a user trace entry from every node that the message visits, and only those nodes. On the distributed platforms, you can retrieve the trace entries using the **mqsireadlog** command, format them using the **mqsiformatlog** command, and view the formatted records to check the path of the message through the message flow. See the *WebSphere MQ Integrator Administration Guide* for more information about these commands. For z/OS you must edit and submit the job BIPJLOG in the COMPONENTPDS to execute **mqsireadlog** and **mqsiformatlog** to process traces. See the *WebSphere MQ Integrator for z/OS Customization and Administration Guide* for more information about the utility commands.

**Answer 4.3d:** If the user trace shows that the message isn't taking the path through the message flow that you expect, increase the user trace level to 'Debug' by selecting the message flow in the Control Center Operations view, right-clicking, and selecting *User Trace* —> *Debug* from the popup menu.

Send your message into the message flow again. Debug level trace produces much more detail about why the message is taking the route that it is taking, and you will be able to determine the reasons for the actions taken by the message flow.

**Answer 4.3e:** If the MQPUT to the output queue defined on the MQOutput node is not successful (for example, the queue is full or put disabled), the final destination of a message depends on:

1. If the failure terminal of the MQOutput node is connected.
2. If the message is being processed transactionally (which in turn depends on the transaction mode (TM) setting of the MQInput node, the MQOutput node, and the input and output queues).
3. If the message is persistent or nonpersistent (TM automatic only).

**Note:** All messages are treated as persistent if TM is yes, and as nonpersistent if TM is no.

In general:

1. If a path is not defined for a failure (neither the catch nor the failure terminal of the MQInput node is connected):
  - a. Non-transactional messages are discarded.
  - b. Transactional messages are rolled back to the input queue for retry.
    - 1) If the backout count of the message is less than the backout threshold (BOTHRESH) of the input queue, the message is retried and resent to the out terminal.
    - 2) When the backout count equals or exceeds the backout threshold, the message is placed on the backout queue (identified by the BOQNAME attribute of the input queue) if specified, or to the DLQ if there is no backout queue defined or the MQPUT to the backout queue fails. If the MQPUT to the DLQ fails, or there is no DLQ defined, the message flow

will loop continuously trying to put the message to the DLQ. You can recover from this by following the instructions given in the answer to question 4.2.

2. If a path is defined for the failure (if both terminals are wired, the message is propagated through the catch terminal), that path defines the destination of the message.

**Answer 4.3f:** If your message flow uses transaction mode = yes and the messages are not appearing on an output queue, check the path of the message flow. If the message flow has paths that are not failures, but that do not end in an output queue (or other persistent store), the message flow has not failed and the message is not backed out, nor put to an alternative destination (for example, the catch terminal, the DLQ, the queue's backout queue).

Check that all possible paths reach a final output node and do not reach a dead end. For example, check:

1. You have connected the unknown terminal of a Filter node to another node in the message flow.
2. You have connected both the true and false terminals of a Filter node to another node in the message flow.

**Answer 4.3g:** If user trace shows that MQPUT is failing in the output node with MQCC=2 and MQRC = 2142 (MQRC\_HEADER\_ERROR), and the message flow is running within a broker on AIX but the messages that fail have originated from a system with a different encoding (for example, Windows NT), there is a known MQSeries problem. An E-fix to correct this problem is provided on the WebSphere MQ Integrator CD: check the information in the Readme.txt file and apply the fix to MQSeries for AIX.

**Question 4.4:** When I published a message, why did I receive an error response message with reason text MQRCCF\_FILTER\_ERROR?

**Answer 4.4:** A broker returns a response message to a Publication with reason text MQRCCF\_FILTER\_ERROR when subscriptions have been registered that specify filter expressions (for Content Based Routing) and an error has been encountered when the broker attempts to filter the published message. This can occur, for example, if a message is published that includes unsupported data types, or if the message body is corrupted.

**Question 4.5:** My receiving application is expecting single quotation marks around attribute values relating to XML elements in the message body. Why is WebSphere MQ Integrator propagating double quotes?

**Answer 4.5:** If your application propagates XML messages that contain attribute values surrounded by single quotation marks, for example:

```
<age dt='i4'>23</age>
```

any message processing within the message flow resets these to double quotation marks to give, for example:

```
<age dt="i4">23</age>
```

If the application that receives these messages from your message flow is sensitive to these quotation marks, it will not perform as expected. You must modify your application logic to be less sensitive to the type of quotes received.

## Running applications

Quotation marks are not altered by read-only actions such as filtering.

**Question 4.6:** My Compute node adds a new header to a message. Why doesn't this appear in the output message?

**Answer 4.6:** The generated MQSeries message contains one or more MQSeries headers followed by the body of the message. The order of each of these components is dictated by the order of the parser elements immediately under the root element of the parse tree. You must ensure that any new header is injected before the body of the message.

For example, a common error is to set a Compute node with ESQL something like:

```
-- copy the input message in its entirety
  SET OutputRoot = InputRoot;

-- Start building a new header
-- assuming that the DLH was not already in the input message
  SET OutputRoot.MQDLH.Reason=1234;
```

The result of these two statements is to construct a Dead Letter Header (DLH) after the body of the existing message, and not before the body, where MQSeries expects it.

To correct this, the ESQL statements must be broken up to copy the existing headers first, then define the new header, and finally to copy the body.

Sample ESQL for this would be:

```
DECLARE I INTEGER;
SET I=1;
WHILE I < CARDINALITY(InputRoot.*()) DO
  SET OutputRoot.*(I) = InputRoot.*(I);
  SET I=I+1;
END WHILE;

SET OutputRoot.MQDLH.Reason=1234;
SET OutputRoot.XML = InputBody;
```

The customizer for the Compute node provides a button to copy the message headers. Selecting this automatically generates the WHILE loop shown in the example above.

**Question 4.8:** Why do all of my Filter node expressions evaluate to NULL?

**Answer 4.8:** The message flow is probably not interpreting the message in the way that you are expecting. Modify your message flow to introduce a Trace node directly after the MQInput node, and configure the Trace node with the following trace pattern:

```
{Root}
```

You can configure the Trace node to write either to a file, or to the User Trace log. You should see a complete dump of what the message flow thinks your message looks like.

If the body of your message is represented something like the following:

```
(0x10000000)NONE = (
  (0x30000000)BLOB = X'abcdefabcdef'
)
```



it has been interpreted as a BLOB message because the format of the message is not known. You need to configure your MQInput node with a suitable default value for 'Message Domain', and possibly 'Message Set', 'Message Type', and 'Message Format'. (See the 'Default' tab in the MQInput node customizer.)

It is a good idea to use a Check node immediately after your MQInput node (and at other points in your message flow) to verify that the message conforms to what is expected. For example, if you are writing a message flow that always processes XML messages, put a Check node after the MQInput node to check that the message domain is equal to 'XML'.

**Question 4.9:** I have specified an output file in my Trace node. Why is no file being produced?

**Answer 4.9:** Check that you have set the 'Destination' property of the Trace node to 'file'.

**Question 4.10:** I see the term 'dictionary' mentioned in various WebSphere MQ Integrator messages. What is a dictionary?

**Answer 4.10:** When you create a message set containing message definitions using the Control Center, and check these in, the definitions are stored persistently in the message repository. When these persistent definitions are deployed to a broker to enable message flows at the broker to parse messages, the message set definition is taken from the message repository managed by the Configuration Manager and passed to the broker. The set of message sets held persistently at the broker is called the message dictionary. The term is also used to apply to a single message set definition held at the broker.

**Question 4.11:** Why does the MRM Custom Wire Format (CWF) message that is issued by WebSphere MQ Integrator appear to be incomplete?

**Answer 4.11:** Make sure that none of the resources in your message have the 'Suspended from Use' property (on the Connection tab) set to 'Yes'. If you have de-scoped any resources in a message set that is based on a previous, finalized message set, the Custom Wire Format (CWF) information for these resources is not transferred to your brokers at deploy time. You can re-scope elements by setting their 'Suspended from Use' property to 'No'.

**Question 4.12:** I have defined an MRM message. Why do I get error

"ParserException BIP5195E: Invalid element length"

in the user trace when the message flow is executed?

**Answer 4.12:** This message means that you have added a element of type STRING to the compound type making up the message, but you have not defined the length of the string in the instance of the element. To do this, use the Control Center to check out the compound type and the element, click on the element in the compound type and click on the Custom Wire Format tab. You need to fill in the properties that this element will have when it is part of the compound type; for example, in the above case, make sure that the Length Count is set. Then check in all the compound types and elements, and redeploy from the Assignments view.

## Running applications

**Question 4.13:** If I specify certain symbols when I use filters in a subscription, the filter does not work. Sometimes my subscription messages end up on the dead letter queue, and I see a number of error messages in the local error log that report MQRFH2 parsing errors. What is wrong?

**Answer 4.13:** The MQRFH2 header employs standard XML encoding and thus its parser interprets some characters in a special way. If you want to include these in your filters you must use the appropriate escape character for these symbols to ensure they are parsed correctly.

*Table 1. Symbols in subscription filters*

Symbol	Escape character
<	&lt;
>	&gt;
"	&quot;
'	&apos;
&	&amp;

For example, if you want to use:

```
<Filter>Body.e_ALERT_BODY.eqnum<6</Filter>
```

you must specify:

```
<Filter>Body.e_ALERT_BODY.eqnum&lt;6</Filter>
```

**Question 4.14:** Why is my MRM CWF message being propagated to a failure terminal and generating error messages BIP5285, BIP5125, and BIP5181 or messages BIP5285, BIP5125, and BIP5288?

**Answer 4.14:** These errors report an inconsistency between the length of the message being processed, and the length of the message defined in the message repository. You must ensure that the length of the CWF definition is accurate. Check and correct the definition in the Control Center Messages view.

**Question 4.15:** Can I use a central application database that is accessible to all my brokers?

**Answer 4.15:** The brokers require an ODBC connection to the databases referenced in the message flows. If you can set up your ODBC connections to access a single database, you can use this in all brokers.

**Question 4.16:** I have created my own message processing node, and have defined it to have an error terminal that I have called 'failure'. Why is this terminal catching exceptions?

**Answer 4.16:** A message processing node terminal called 'failure' is a special case. In the current implementation of plug-in nodes, the existence of a failure terminal means that exceptions in the message flow will be caught and propagated to the failure terminal. If you want a simple error handling terminal, you must use another terminal name, for example 'error'.

**Question 4.17:** What should I do when DataFlowEngine processes terminate abnormally?

**Answer 4.17:** When DataFlowEngine processes (Execution Groups) terminate abnormally they are automatically restarted by the bipbroker process. If a DataFlowEngine process fails it will be restarted three times during each five minute interval. The first five minute interval begins when the Execution Group is first started. The broker database table BROKERAEG contains a column labelled 'RetryInterval'. This column defines the restart time in minutes. Each row in this table represents an Execution Group. The row is populated on the first deploy of an Execution Group and RetryInterval defaults to five.

If the Execution Group is removed from the broker configuration, deployed, then later re-added and redeployed from the Control Center, the row will be recreated and RetryInterval will be set to its default value (5). You can change this column's value. Restart the broker after changing the value.

**Question 4.18:** How does the WebSphere MQ Integrator 2.1 message repository manager (MRM) handle Extended Decimal?

**Answer 4.18:**

*MRM Designtime:* In the MRM repository, an extended decimal field may be:

- signed or unsigned.
- have sign trailing/leading and internal/separate.
- be right- or left-justified.
- be padded with character zero written '0' or "0", or SPACE or null or U+30 (ASCII zero), or any hex value in the form 0xYYYY.

In the following, the word 'worker' means 'parser and writer'.

*MRM Parser handling:*

- If the field has a leading sign, the worker will look for it only in the first character of the input.
- If the field has a leading sign, the worker will insert it only in the first character of the output.
- If the field has a trailing sign, the worker will look for it only in the last character of the input.
- If the field has a trailing sign, the worker will insert it only in the last character of the output.

Any number that does not have a negative sign will be taken as being positive.

There is no provision for a floating sign (for example, eight bytes padded with space and having a leading external sign. The value 12345 will be output as '+ 12345', not '+12345'.

The user can specify a justification and padding character which is non-COBOL-compliant, but no warnings are given.

The user can specify a justification (left-) and padding character (0) which leads to a change in the number, such as 12345 in an eight-byte field which would be output as 12345000, but no warnings are given.

The user can specify a choice of padding character (such as \$ ) which would be invalid COBOL, but no warnings are given.

Extended Decimal input and output is validated like this:

- Sign must be in the place defined at Designtime.

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- Sign, if separate, must be + or -.
- Remainder of input field must be a character digit, or contiguous padding.
- An invalid state causes a converter general exception.
- The Virtual Decimal Point value is applied to input after validation and before it is added to the tree.
- The Virtual Decimal Point value is negatively applied to output after validation and before it is put to the stream.

**Question 4.19:** Why do I get SQL1248N error when I am accessing DB2 in globally coordinated (XA) transaction from my message flow?

**Answer 4.19:** The error message

```
Database error: SQL State '42705'; Native Error Code '-1248';  
Error Text '[IBM][CLI Driver] SQL1248N Database "" not defined  
with the transaction manager. SQLSTATE=42705
```

occurs when a message flow processing node attempt to access a DB2 database, but MQSeries has not been correctly configured. Either the name of the XA Resource Manager was not specified, or it was incorrectly specified. Similarly, the data source name (DSN) specified in the message flow processing node might be correct, but not one intended for use in an XA environment.

Check the configuration of your MQSeries queue manager, referring to the *WebSphere MQ Integrator Administration Guide* and MQSeries manuals for as necessary.

**Question 4.20:** I have just recompiled an existing C plug-in against WebSphere MQ Integrator 2.1. Why do any nodes or parsers it supports no longer seem to be available to the broker?

**Answer 4.20:** As described in *WebSphere MQ Integrator Programming Guide* under "Important Changes for WebSphere MQ Integrator 2.1", certain interface structures now need to be initialized to enable version control support. If these structures are not correctly initialized, then the broker can only assume that the plug-in was compiled against an earlier release, and it will behave as if it was passed a structure of the previous format. This will cause the `cnlDefineNodeClass()` and `cpilDefineParserClass()` functions to fail with `CCI_MISSING_IMPL_FUNCTION`, and that node or parser will not be available to the broker runtime. This might cause the deployment of a message flow containing the plug-in node to fail, or a failure to locate the plug-in parser on receipt of an input message.

If this problem continues to occur after having initialized these structures as described in *WebSphere MQ Integrator Programming Guide*, then you might find that the `CNI_VFT` or `CPI_VFT` structures have been overwritten by an extraneous initialization (for example, using the `memset()` function after the declaration of the structure variable) by your plug-in. This will overwrite the structure version identification, and cause the same symptom.

**Question 4.21:** I am attempting to use a globally coordinated message flow on a UNIX system. Why does the MQSeries queue manager reports error AMQ7604?

**Answer 4.21:** On the distributed operating system platforms, MQSeries acts as the Transaction Manager for globally coordinated (XA) transactions. If you cannot determine the cause of the problem from the description of the AMQ7604 message (and any other messages that might have been issued by MQSeries), then you should check whether this is occurring because of a UNIX permissions or

file-ownership problem. At some point following the installation of WebSphere MQ Integrator, the command `mqssetupdatabase` will have been used to enable the system environment for the databases you wish to use. However, this might have been done using an UNIX login environment which might have created the `/var/wmqi/lib` directory with incorrect attributes.

You should check that this directory has owner=mqm and group=mqbrkrs, and with identical permissions to the other directories located in `/var/wmqi`. If this is not the case, then modify the attributes of the `/var/wmqi/lib` directory, stop all brokers, restart their respective MQSeries queue managers and restart those brokers.

**Question 4.23:** Is the worldwide standard XML structure ROSETTANET supported?

**Answer 4.23:** ROSETTANET messages are XML messages, so they can be parsed by the MRM-XML parser or the Generic XML parser. There is no special support in MRM V2 to support ROSETTANET, but you can choose to define the messages to the MRM.

**Question 4.24:** How often does the broker have to get information from the DB2 database?

**Answer 4.24:** It depends on the type of configuration data being used. Once a message flow is running, its definition is cached and the broker database is not read again until it is redeployed or the broker is restarted, except:

- If a message flow is processing MRM messages, the dictionary needs to be read from the broker database to parse the message. But once this has been done, it is in a shareable cache and the cache is only invalidated if the dictionary is redeployed.
- If a message flow is processing New Era of Networks rules or formats, the rules or formats need to be read from the New Era of Networks database. Once this has been done, it is in a shareable cache.
- If a message flow publishes a message, and the publication is specified as retained, the publication is written to the broker database.
- If a Database node node intentionally accesses the database.

**Question 4.25:** Using MQRFH2 can I identify DTD as a Message Domain, and include a Message Set and Message Type?

**Answer 4.25:** No.

**Question 4.26:** I want to define messages, which are tagged delimited but contain a fixed number of fixed length fields. For example:

```
#name:Albert__Einstein____; => field1: 10 field2: 15  
#address:Anystreet_____42__; => field3: 20 ; field4: 4
```

Why is it only possible to add the Tagged/Delimited Format on the message set level, and not on the element level? For the fixed length fields I have to define a tag length even though there is no tag!

**Answer 4.26:** The term 'Tagged/Delimited' gives up to FOUR options of modeling messages:

- No Tags or delimiters
- TAGGED

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- DELIMITED
- TAGGED and DELIMITED

Any part of the message from (at the highest level) the entire message to (at the lowest level) a single element can have an associated Compound Type. Anything other than a simple element *must* have a Compound Type.

In the Compound Type there is a Tagged/Delimited tab in the Control Center. On this tab, it is possible to specify 'Data Element Separation'.

The drop-down list has a number of choices; some specify Tagged, others do not. If your message (or this particular part of your message) does not contain tags, select an option without tags. One of the options is 'Fixed Length'. Here you need not specify a Tag, or a Delimiter. You must in this case specify a length for each element in the Compound Type.

So in the above, you can have an outer compound type CT0 containing 2 compound elements, CE1 and CE2, say. CT0 would specify Tagged Delimited for Data Element Separator. The group indicator would be '#', the delimiter would be ';#', and the group terminator would be ';'. Define the two compound elements like this:

- Define the CE1 compound element as compound type CT1. Within the Tagged Delimited tab of element CE1, specify a tag whose value is 'name'. Compound element type CT1 needs to specify Fixed Length for Data Element Separator. CT1 should contain 2 elements - namefield1 and namefield2.
  - Within the Tagged/Delimited tab of element namefield1 specify a length of 10. Do *not* specify a value for tag.
  - Within the Tagged/Delimited tab of element namefield2 specify a length of 15. Do *not* specify a value for tag.
- Define the CE2 compound element of CT0 in a similar way to CE1.

**Question 4.27:** Is there any guidance available on representing formats within the MRM?

**Answer 4.27:** See SupportPac ID05: *WebSphere MQ Integrator - Tagged/Delimited message examples*. This SupportPac introduces the message designer to possible ways of using WebSphere MQ Integrator to model Tagged/Delimited messages belonging to existing message standards such as SWIFT, using the MRM message model.

**Question 4.28:** Why do I get errors, after using the DTD importer to build message sets, when I manipulate the message with ESQL in a compute node? I created the two messages sets as usual, and added an XML physical layer (called XML). I cleared the "Root Tag Name" field in the XML tab of the message set, and then imported the DTDs (selecting Order for DTD1 and GOrder for DTD2 to be imported as messages). When each message was created I added types and so on into the workspace. I set the message name to be Order and GOrder respectively (rather than m\_Order and m\_GOrder expected by anyone looking at the DTD).

The message flow reads the message using the format set up by DTD1, uses a compute node to drag and drop fields onto the message format set up by DTD2, traces the result (which looks correct), and outputs using MQOUTPUT. This fails with an error message.

**Answer 4.28:** The DTD importer generates Compound Types with type composition 'sequence'. This is correct, because that type composition allows embedded Compound Types, which this message contains.

Type composition 'sequence' must have the output message elements built in the order in which the elements are defined in the MRM message. This restriction does not apply if the type composition is 'Unordered Set', but that type composition does not allow embedded Compound Types.

**Question 4.29:** Why do I get this IEW2141 message when attempting to compile and link a C language plug-in node on z/OS:

```
IEW2141E 1726 SYMBOL BEGINNING 'CODE' IS TOO LONG.
IT CONTAINS MORE THAN 1024 CHARACTERS.
```

**Answer 4.29:** When compiling on z/OS you need to use the pre-linker to avoid the 1024 character limit. You can force your link to use the pre-linker / linker by setting the `_CC_STEPS` variable to -1:

```
export _CC_STEPS=-1
```

Alternatively, you can add these two lines to your make-file to export it:

```
_CC_STEPS=-1
.EXPORT : _CC_STEPS
```

**Question 4.30:** Where can I define a destination list in a Java custom node?

**Answer 4.30:** The destination list is called the local environment, which is a member of the `MbMessageAssembly` object.

**Question 4.31:** Can I add properties to a custom Java node once it has been created in the Control Center, other than deleting it and recreating it?

**Answer 4.31:** No. The Plug-in Node wizard only creates the entry in the Control Center; it does not edit them.

**Question 4.32:** How can I create an "empty" message in a custom Java node? I see only a copy constructor in the javadoc. This is for a node that generates messages based on input message contents but not on input message *format*.

**Answer 4.32:** The copy constructor is used because some context information is copied from the incoming message. Detach the parts of the message tree you don't want.

**Question 4.33:** I have a custom node that I converted to Java which uses `lotusxsl` (hence `xml4j`). But WebSphere MQ Integrator puts its version of `xml4j` in the `CLASSPATH` ahead of mine, and being quite old does not contain some methods my custom node needs. How can I modify the `CLASSPATH` order so that my jar files appear earlier?

**Answer 4.33:** The WebSphere MQ Integrator Configuration Manager and the Control Center need the version of `xml4j` that it supplies, so it puts its classes *before* the user's `CLASSPATH`. To use a different version of `xml4j` for your custom Java node, try installing the broker on a different system to the Configuration Manager and the Control Center, and put your `xml4j` in your broker's `CLASSPATH`.





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## Chapter 5. Sun Solaris installation and uninstallation

These questions are answered in this chapter:

- How can I check if I have the correct prerequisite software installed on Sun Solaris? See “Question 5.1”.
- How can I obtain prerequisite Sun Solaris patches? See “Question 5.2”.

---

### Answers to Sun Solaris installation and uninstallation questions

**Question 5.1:** How can I check if I have the correct prerequisite software installed on Sun Solaris?

**Answer 5.1:** Sun Solaris software is normally installed as a set of packages. Updates to the packages are supplied as patches.

To check what packages are installed on a system, type:

```
$ pkginfo
```

To check what patches have been applied, type:

```
$ showrev -p
```

Compare the output of these commands with the prerequisite list documented in the *WebSphere MQ Integrator for Sun Solaris Installation Guide*, and check for last minute updates listed in the `Readme.txt`.

**Question 5.2:** How can I obtain prerequisite Sun Solaris patches?

**Answer 5.2:** One of the following sources will be able to provide these:

- Your local site support.
- Your Sun service center.
- The Sun download site at:  
<http://access1.sun.com/>

## Sun Solaris installation and uninstallation

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## Chapter 6. AIX installation and uninstallation

These questions are answered in this chapter:

- How can I check if I have the correct prerequisite software installed on AIX? See “Question 6.1”.
- How can I obtain prerequisite AIX patches? See “Question 6.2”.

---

### Answers to AIX installation and uninstallation questions

**Question 6.1:** How can I check if I have the correct prerequisite software installed on AIX?

**Answer 6.1:** AIX software is normally installed as a set of packages. Updates to the packages are supplied as patches.

To check what packages are installed on the system, and at what level, type:

```
$ ls1pp -l
```

Compare the output of this command with the prerequisite list documented in the *WebSphere MQ Integrator for AIX Installation Guide*, and check for last minute updates listed in the `Readme.txt`.

**Question 6.2:** How can I obtain prerequisite AIX patches?

**Answer 6.2:** One of the following sources will be able to provide these:

- Your local site support.
- Your IBM Support Center.
- The AIX download site at:

```
http://www.rs6000.ibm.com
```

## AIX installation and uninstallation

---

## Chapter 7. MQSeries Everyplace

These questions are answered in this chapter:

- When should I use the MQeMbMsgObject rather than the base MQeMsgObject? See “Question 7.1”.
- How do I put subscription requests to SYSTEM.BROKER.CONTROL.QUEUE with MQSeries Everyplace™? See “Question 7.2”.
- When I attempt to put a message to a WebSphere MQ Integrator message flow using MQSeries Everyplace, why is an exception thrown? See “Question 7.3” on page 70.
- Why do remote gets, to retrieve MQSeries Everyplace output messages from the broker, result in a performance degradation? See “Question 7.4” on page 70.
- When I publish a message using MQSeries Everyplace, why don't I receive a response message even though I specified a reply-to-queue and queue manager? See “Question 7.5” on page 70.
- Why can't I access any user-defined fields from my MQSeries Everyplace message in WebSphere MQ Integrator? See “Question 7.6” on page 71.
- Regardless of what I specify in the MQSeries Everyplace input node dialog, why are my settings are ignored? See “Question 7.7” on page 71.
- Is there a checklist for using MQSeries Everyplace with WebSphere MQ Integrator? See “Question 7.8” on page 71.
- When I set up to run the MQSeries Everyplace sample scenario, why do I get an error message with the text `com.ibm.broker.mqimqe.examples.rule.AttributeRule` when creating the server queue manager? See “Question 7.9” on page 71

---

### Answers to MQSeries Everyplace questions

**Question 7.1:** When should I use the MQeMbMsgObject rather than the base MQeMsgObject?

**Answer 7.1:** Existing MQSeries Everyplace applications can run unchanged in a WebSphere MQ Integrator environment. Any messages from these applications (which will be of type MQeMsgObject - or a subclass) can pass through WebSphere MQ Integrator unchanged. WebSphere MQ Integrator is not able to parse the contents of these messages. However, the full 'dumped-data' representation of the messages is available within the broker. It is not recommended to operate on this data.

If you need to parse or modify the data contained within an MQSeries Everyplace message, you must use an MQeMbMsgObject. These provide a parallel with standard MQSeries messages (fields, such as correlation ID, can be set and there is a field that can be parsed using any WebSphere MQ Integrator parser).

**Question 7.2:** How do I put subscription requests to SYSTEM.BROKER.CONTROL.QUEUE with MQSeries Everyplace?

**Answer 7.2:** Publish/Subscribe is handled differently with MQSeries Everyplace messages. To subscribe on a given topic, you must put a message with message type set to TYPE\_SUB to any MQSeries Everyplace bridge queue. This message is

## MQSeries Everyplace

not propagated to the message flow but causes the requested subscription request to be made to the publish/subscribe engine.

**Question 7.3:** When I attempt to put a message to a WebSphere MQ Integrator message flow using MQSeries Everyplace, why is an exception thrown?

**Answer 7.3:** Ensure you are putting to the correct queue manager. Consider the following scenario:

- Broker BK1 is running on MQSeries queue manager QM1.
- The broker's MQSeries Everyplace queue manager (as specified in the MQeInput node attributes dialog) is MQe1.
- The client application is running on MQSeries Everyplace queue manager MQe2.
- The input queue for the message flow (as defined in the MQSeries Everyplace input node properties dialog) is called MQeWMQInput.
- The output queue is specified as MQeWMQIoutput (on MQSeries Everyplace queue manager MQe1).

Firstly, it is important to realize that the broker will create the input bridge queue on deployment; it is the user's responsibility to define the output queues and define channels to remote queue managers, if appropriate.

To successfully put to MQeWMQInput, the queue manager should be specified as QM1 - not MQe1. That is, you put the messages as if they were destined for the MQSeries queue manager, not the broker's MQSeries Everyplace queue manager.

For this to work, a route to the broker's MQSeries Everyplace queue manager, MQe1, AND the MQSeries queue manager, QM1 must be defined in the client queue manager MQe2 - see the supplied examples. The broker creates the listener on MQSeries Everyplace queue manager MQe1 and defines a route from MQe1 to QM1.

The output message is put to whichever queue and queue manager is specified in the MQeOutput node properties dialog. A common case is where the user puts to QM1/MQeWMQInput but gets from MQe1/MQeWMQIoutput.

**Question 7.4:** Why do remote gets, to retrieve MQSeries Everyplace output messages from the broker, result in a performance degradation?

**Answer 7.4:** This is because a remote waitForMessages() call necessarily results in a polling action: the client queue manager attempts to get a message repeatedly until one is available on the remote queue or a timeout is reached. An alternative is to either specify a remote queue in the MQSeries Everyplace output node such that a 'local' get is sufficient on the client side or, preferably, define a store-and-forward queue on the broker's queue manager and a home-server queue on the client. This provides a further level of de-coupling and allows the arrangement to work in the event of the client queue manager becoming unavailable.

**Question 7.5:** When I publish a message using MQSeries Everyplace, why don't I receive a response message even though I specified a reply-to-queue and queue manager?

**Answer 7.5:** Publication responses are not supported for the MQSeries Everyplace and MQIsdp transports.

**Question 7.6:** Why can't I access any user-defined fields from my MQSeries Everyplace message in WebSphere MQ Integrator?

**Answer 7.6:** There is no MQSeries Everyplace parser at present. The MQ\_Data field (of MQSeries Everyplace type 'arrayOfBytes') in the MQeMbMsgObject provides the recommended method of making data available to WebSphere MQ Integrator. This byte array can be parsed by any of the WebSphere MQ Integrator parsers.

**Question 7.7:** Regardless of what I specify in the MQSeries Everyplace input node dialog, why are my settings are ignored?

**Answer 7.7:** Ensure you have not selected the "use config file" check box. Selection of this option causes settings to be read from the specified config file and most other options in the dialog box to be ignored.

**Question 7.8:** Is there a checklist for using MQSeries Everyplace with WebSphere MQ Integrator?

**Answer 7.8:**

1. Create both MQSeries Everyplace queue managers (broker and client).
2. Define routes to the broker's MQSeries Everyplace queue manager **and** to the MQSeries queue manager on the client queue manager.
3. Either:
  - Define output queues on server queue manager.
  - or:
  - Define a route from the server MQSeries Everyplace queue manager to the target queue manager of the output node.
4. Ensure you have **not** defined input queues; WebSphere MQ Integrator creates them for you.
5. Ensure you have correctly filled in the fields in the input and output nodes.
6. Ensure you are putting to the MQSeries queue manager name - not the broker's MQSeries Everyplace queue manager name.
7. Ensure you have set all compulsory fields in the message object.
8. Ensure you are using the correct message object for your purposes.
9. Ensure you have set the message type correctly.
10. Ensure you are using the correct channel type.
11. Ensure the broker is running and that the message flow successfully deployed.
12. Don't try to cast received messages back to MQeMbMsgObjects; use the static fields of the MQeMbMsgObject to assist you in extracting your data from the MQeMsgObject you have.

**Question 7.9:** I am setting up to run the MQSeries Everyplace sample scenario. Why do I get an error message with the text `com.ibm.broker.mqimqe.examples.rule.AttributeRule` when creating the server queue manager?

**Answer 7.9:** Check that you have correctly referenced `<wmqi_root>\classes\mqimqe.jar` in the CLASSPATH.





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## Chapter 8. SCADA

These questions are answered in this chapter:

- When a new MQIsdp client attempts to connect to the broker, why is its connection refused? See “Question 8.1”.
- When a new MQIsdp client connects to the broker, why is a different client disconnected? See “Question 8.2”.
- I published a variety of QoS 0, 1 and 2 messages to the broker. Before the broker could publish them to interested subscribers, there was a system failure. Upon restarting, why were the QoS 1 and 2 messages received but the QoS 0 messages lost? See “Question 8.3”.
- What errors are returned when deploying a message flow containing a SCADA node on z/OS? See “Question 8.4”.

---

### Answers to SCADA questions

**Question 8.1:** When a new MQIsdp client attempts to connect to the broker, why is its connection refused?

**Answer 8.1:** MQIsdp Client ID fields must be unique. If a client sends a CONN packet containing the same Client ID as a currently connected client, the behavior is undefined. It is the user’s responsibility to ensure Client IDs are unique. See the MQIsdp protocol specification in the *WebSphere MQ Integrator Programming Guide* for further information.

**Question 8.2:** When a new MQIsdp client connects to the broker, why is a different client disconnected?

**Answer 8.2:** MQIsdp Client ID fields must be unique. If a client sends a CONN packet containing the same Client ID as a currently connected client, the behavior is undefined. It is the user’s responsibility to ensure Client IDs are unique. See the MQIsdp protocol specification in the *WebSphere MQ Integrator Programming Guide* for further information.

**Question 8.3:** I published a variety of QoS 0, 1, and 2 messages to the broker. Before the broker could publish them to interested subscribers, there was a system failure. Upon restarting, why were the QoS 1 and 2 messages received but the QoS 0 messages lost?

**Answer 8.3:** This is the correct behavior. QoS 1 and 2 messages are not acknowledged until safely stored in a database table. A client can be assured that upon the successful completion of the QoS 1 and QoS 2 protocol handshakes, the messages are safely stored.

QoS 0 messages are not acknowledged and they are not stored in a database. In the event of a system failure, they are lost.

See the *WebSphere MQ Integrator Programming Guide* for a discussion of the three Quality of Service types.

**Question 8.4:** What errors are returned when deploying a message flow containing a SCADA node on z/OS?

|

**Answer 8.4:** None. The node is tolerated and ignored.

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## Chapter 9. Debugger

These questions are answered in this chapter after the section “Debugger problem determination hints” on page 76.

- After a debugging a message flow, the session ended abnormally and I still have the “MF\_debug\_” deployed to the broker’s execution group. Is this going to affect the operation of the flow, and can I put the execution group back to its original state? See “Question 9.1” on page 79.
- I edit properties of the message MQMD in the Message Content pane. Why does this cause unexpected behavior in the Debugger? See “Question 9.2” on page 79.
- Can the Debugger be used to debug the EQL statements written in nodes like the Compute node? See “Question 9.3” on page 79.
- Can I debug message flows that contain User plug-in nodes? See “Question 9.4” on page 79.
- How does the Debugger cope with multiple debugging sessions? See “Question 9.5” on page 80.
- When an exception is thrown, why can’t I see the whole exception list? See “Question 9.6” on page 80.
- Previously I had a working WebSphere MQ Integrator V2.0.1 system with brokers and message flows deployed. Why can’t I use the Debugger once I have upgraded and installed V2.0.2? See “Question 9.7” on page 80.
- How do I view the trace file for the Debugger, and where is it? See “Question 9.8” on page 80.
- Someone stopped the broker while I was debugging a flow; what do I do now? See “Question 9.9” on page 80.
- The broker ended (or someone ended it) while I was debugging; what do I do now? See “Question 9.10” on page 80.
- I am not able to stop my broker. I issue the command to stop the broker, but the system freezes and never actually stops any of the DataFlowEngines. How can I stop the broker? See “Question 9.11” on page 81.
- I was debugging, but something happened, and now my message flow seems to be stuck. When I put a new message in, nothing happens. What’s wrong? See “Question 9.12” on page 81.
- Why are the Step Into and Return buttons active even when nested flows are not present? See “Question 9.13” on page 81.
- What does a breakpoint mean when exceptions are thrown? See “Question 9.14” on page 81.
- I have a node that throws multiple exceptions, but when I stop at a breakpoint in the “backward” direction, I only see one. Where are the others? See “Question 9.15” on page 81.
- What is the stack pane showing me? See “Question 9.16” on page 81.
- What happens when I set a breakpoint in a nested flow, and I have used that nested flow many times in my main flow? See “Question 9.17” on page 82.
- When I’m debugging a flow and I return to the design view, I can see an additional flow that I could add to my workspace. It has a name that ends in \_debug\_. What is this flow? See “Question 9.18” on page 82.

## Debugger

- When I have two or more connections to a single output terminal of a node and I am stopped at a breakpoint in front of the node, what does "Step Over" do? See "Question 9.19" on page 82.
- When I Step Over an embedded flow, what happens if I have previously set a breakpoint in that flow? See "Question 9.20" on page 82.
- After I select "Start Debugging", I get an endlessly cycling progress bar entitled "Waiting for communication". Why do I never get the message "Debug session started" in the information pane? See "Question 9.21" on page 82.
- I tried to refresh the Assignments view while I was debugging. When I went back to the debug pane, why did I find that I was no longer debugging? See "Question 9.22" on page 83.
- After I have done some debugging and I exit the Control Center, I am asked if I want to save my changes. Should I? See "Question 9.23" on page 83.
- I am debugging a flow and I continue after encountering a breakpoint. However, nothing seems to happen and after about a minute a progress bar pops up indicating that the Debugger is waiting for communication. What is happening? See "Question 9.24" on page 83.
- Why can't I seem to debug an empty message flow? See "Question 9.25" on page 83.
- I changed the properties of my assigned flow before I debugged it. Why weren't my changes reflected in the debug version of the flow? See "Question 9.26" on page 83.
- I created a new broker, assigned a message flow to its execution group, and then tried immediately to debug. Why did nothing happen? See "Question 9.27" on page 83.
- The Debugger keeps putting up a popup that tells me that XML parsing errors have occurred. What does that mean? See "Question 9.28" on page 83.
- Can the Debugger be used on the z/OS platform? See "Question 9.29" on page 84.
- Is a debug message flow a copy of the original message flow? See "Question 9.30" on page 84.
- If I don't stop the Debugger before going back to the design view and then modify items, why does deploying a new configuration cause errors? See "Question 9.31" on page 84.

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## Debugger problem determination hints

This section provides guidance on making the best use of the Debugger facilities of the Control Center.

### Initial questions

Check these items when a debugging session has failed:

1. Did the instrumented flow deploy correctly?
  - The standard "deploy initiated" message should have popped up when "Start debugging" was initiated.
  - Check the console to ensure XXX\_debug\_ was deployed to the chosen execution group (where XXX represents the name of the original flow).
  - Check the Control Center log pane for deploy problems.
  - Immediately after a successful deploy, you should see a progress bar popup indicating that the Debugger is waiting for communication. If that progress

- bar does not pop up, or if it does pop up but remains up for more than a few seconds, there is some problem with deploy.
- After communication has been established, the Debugger information panel should say "Debug Session Started." If it fails to say that, there is a problem.
  - You must deploy the broker topology you start debugging.
2. Are you in the correct security groups?
    - To debug a flow, you must be in the mqbrdevt, mqbrasgn, and mqbrops groups.
  3. Is the Debugger stuck waiting for a long (or infinite) operation?
    - When the Debugger is waiting for communication from the broker during a debug session (as opposed to during deploy), it will wait 60 seconds and then put up a popup progress bar indicating that it is still waiting. You have an opportunity to select Cancel on this bar, which stops the Debugger.
    - If the Debugger is waiting, it could be due to a very long database operation, or due to the flow being stuck for other reasons.
    - If you are certain that the Debugger will never hear back from the broker, use the Cancel button.
  4. Is there a conflict with a local port?
    - On the Settings panel, there is a choice of which ports to use for the data and error channels. The reason this is exposed to you is that there is a small chance that the default ports could conflict with some local application.
    - If there is a conflict, change one or both of these ports, and save the new choices.
  5. Have you checked the Windows NT application event log?
    - If the deploy failed, there is often useful information in the event log.
    - If the Debugger has a problem during message processing, it usually writes an event into the Windows NT event log. The error message might be useful in diagnosing the problem.
  6. Are there fire-wall problems?
    - The Debugger uses sockets to communicate with the Control Center. If the test machine on which the broker is running is behind a fire-wall, the Control Center running the debug session has to be behind the same fire-wall.
  7. Are the MRM or NEON message sets accessible to the broker?
    - When you use MRM messages, you must assign the MRM message set to the broker.
    - When you use NNSY, the NEON configuration file must properly point to the message definitions.
    - If the broker does not know the message format, it cannot parse the messages.
    - The usual symptom of this is a blank message screen in the Debugger during a debug session.

## Tracing and Debug Mode

The Debugger runtime uses its own tracing API, and produces a trace file separate from the main WebSphere MQ Integrator trace file. The name and location of the trace file, as well as the level of trace (none, normal, and debug) are controlled via the Settings panel in the Control Center. The file that is produced is already in XML format, and therefore does not need to be processed with **mqsireadlog**. You can use **mqsiformatlog** to view the contents in readable form.

## Debugger

In addition, there is some tracing available via a "debug" mode of operation of the Control Center. If **mqsilcc.bat** (which is located in the \Tool subdirectory) is invoked with a single parameter of "1", it comes up with a DOS window, in which some trace information mainly concerning communication between the Control Center and the broker might eventually be typed. If this window contains any exception information (null pointer exceptions, and so on), the Debugger is probably hung in a bad state.

## Dealing with Errors

If the debug session goes wrong, one or more of the following corrective actions can usually restore a clean state. They are listed in order of severity of action.

1. Stop debugging
  - If the Control Center isn't hung, using the Stop Debugging button usually cleans up a bad debug session.
  - The original flow is redeployed (if deploys are working).
  - Any message in flight at the time is processed in the usual way.
  - Depending on how badly constructed the original flow is, the message might be put on an output queue, the dead letter queue, or on the backout re-queue queue.
2. End the Control Center
  - If the Debugger becomes hung, the Control Center can be ended via the Windows NT Task Manager. When this happens, the deployed instrumented flow begins to function like the original un-instrumented flow, and processes messages in the normal way.
  - You can then restart the Control Center, and reassign and deploy the original flow.
  - You can then try debugging again.
3. Stop the Broker
  - If the broker becomes stuck for some reason, it can be stopped (**mqsistop**) and started (**mqsistart**). If the **mqsistop** command does not complete, you might need to manually end the DataFlowEngine process. Note that there is one DataFlowEngine process for each execution group, and it can be difficult to know which one to end, so this is a "last resort" technique.
  - Note that if you have set the input queue backout re-queue value to the name of the input queue itself, the message is automatically reentered. If the Control Center is still running, it might automatically begin debugging again.
  - In most cases, if the broker is stopped when the Control Center is active, you receive a popup message that indicates that a "Stop debugging" should be issued.
4. Delete the Broker
  - If the broker is damaged, you might need to delete it and create it again.
  - The main symptom of a damaged broker is the inability to deploy message flows.
5. Delete the Configuration Manager
  - As a last resort, delete the Configuration Manager and create it again, having backed up message flows first.

---

## Answers to Debugger questions

**Question 9.1:** After a debugging a message flow, the session ended abnormally and I still have the "MF\_debug\_" deployed to the broker's execution group. Is this going to affect the operation of the flow, and can I put the execution group back to its original state?

**Answer 9.1:** The orphaned message flow should behave as the flow would have done normally, and the debug nodes will have no effect on message processing. If you have a small number of nodes in the flow, corrective action will make no noticeable difference to the flow, apart from its name. However, if you have a large flow (that is, more than 15 nodes or several sub-flows), you are advised to take corrective action because the performance of message processing might be affected. A full redeploy of the broker causes the replacement of the orphaned flow with the original message flow. If this has no effect, removing the flow, deploying and then re-adding the flow and deploying restores the original state of the broker as it was before the debugging session. (This should only happen rarely.)

**Question 9.2:** I edit properties of the message MQMD in the Message Content pane. Why does this cause unexpected behavior in the Debugger?

**Answer 9.2:** If you edit the content of the MQMD, you must remember that these fields take a certain range of values, and an understanding of these is necessary before editing the properties. Unless you explicitly specify the value of these fields, they take default values and certain fields will not have been specified in the message. So the values in the fields which were not explicitly set in the message are default values, and it is suggested you don't change these unless you are aware of their importance or the possible range of values.

**Question 9.3:** Can the Debugger be used to debug the ESQL statements written in nodes like the Compute node?

**Answer 9.3:** The Debugger is a *message flow* debugger and is not intended to be a *code* debugger. However, you can use the Debugger to highlight incorrect logic within a Compute node, for example. If the ESQL is syntactically correct, the flow should deploy to the Debugger (but see "Answer 9.21" on page 82) but it might not have the desired effect on the message when processing. If the Compute node you have implemented is not behaving as expected, the Debugger is useful in displaying the actions of the node through the Message Content pane.

The best course of action is to place breakpoints before and after the node in question, and view the contents of the message on both sides. In this way the action of the node can be determined, and with an understanding of what the node should do will enable you to discover the incorrect logic in the ESQL.

You might also want to try the **Check message flow...** function in the Control Center.

**Question 9.4:** Can I debug message flows that contain User plug-in nodes?

**Answer 9.4:** You should be able to debug any message flow that you can deploy. If the plug-in compiles, and the flow containing it deploys cleanly, the Debugger can be used. In addition, you can debug a flow that has not yet been deployed to the broker. It must be assigned to an execution group and checked in, and then the action of Start Debugging will initiate the first deploy of the message flow. This debug deploy fails if a standard deploy would have failed.

## Debugger

**Question 9.5:** How does the Debugger cope with multiple debugging sessions?

**Answer 9.5:** The answer to this question comes in two parts. Firstly, if you want to run debugging sessions in multiple Control Centers on the same workstation, you must first adjust the communication port numbers in the Debugger options pane. These ports are used to make connections between the debug plug-in and the Control Center, and they must not conflict in different Control Centers on the same workstation. In addition, separate ports are used for normal message data and for unexpected errors in each Control Center. If a different user wants to use a separate workstation to start a debugging session, the port numbers do not need to be edited. This user cannot debug any flow that is already being debugged, nor can they make changes to this flow in the designer pane. The flow is locked by the Configuration Manager, but the user can debug any other flow in the execution group, design and assign new flows, and edit other flows in this execution group. There is a maximum number of debugging sessions in each execution group (at present this is set to 10).

**Question 9.6:** When an exception is thrown, why can't I see the whole exception list?

**Answer 9.6:** You cannot view the whole exception list until the message has rolled back through the flow to a catch terminal. If you set a breakpoint on the catch terminal, you will be able to view the whole exception list.

**Question 9.7:** Previously I had a working MQSeries Integrator V2.0.1 system with brokers and message flows deployed. Why can't I use the Debugger once I have upgraded to WebSphere MQ Integrator Version 2.1?

**Answer 9.7:** The Debugger uses debug plug-in nodes, therefore it is necessary to delete and recreate your Configuration Manager. Remember when doing this to use `mqsdeleteconfigmgr` without the `-n -m` options to ensure you don't lose any configuration information. This is necessary when migrating if you want to use any of the new nodes supplied, and needs to be done if you want to debug message flows.

To be able to debug flows, follow the guidelines on Upgrading your version 2.0.1 Configuration Manager in Chapter 12 of the *WebSphere MQ Integrator Administration Guide*. Your configuration information is preserved, and you will be able to debug message flows as intended.

**Question 9.8:** How do I view the trace file for the Debugger, and where is it?

**Answer 9.8:** The trace file is located in `<wmqi_root>\log` and is called `VDB_Trace.log` — but if that file exists (for example, from a previous run), the files are named `VDB_Trace.log.1`, `VDB_Trace.log.2`, `VDB_Trace.log.3`, and so on. Use `mqsireadlog` to view the trace.

**Question 9.9:** Someone stopped the broker while I was debugging a flow; what do I do now?

**Answer 9.9:** As soon as the broker is back up, issue a "stop debugging" command from the tool bar, and then reopen the flow for debugging.

**Question 9.10:** The broker ended (or someone ended it) while I was debugging; what do I do now?



**Answer 9.10:** When the broker restarts, issue a "stop debugging" command from the tool bar, and reopen the flow for debugging. If the broker was ended while you were stopped at a breakpoint, the message that popped the breakpoint will be backed-out of the flow. It is advisable to set the "Backout re-queue name" property of your input queue to either the name of the queue itself, or some other queue (such as the dead letter queue). Otherwise, the backed-out message will cause your message flow to be stuck.

**Question 9.11:** I am not able to stop my broker. I issue the command to stop the broker, but the system freezes and never actually stops any of the DataFlowEngines. How can I stop the broker?

**Answer 9.11:** One possible cause is that you or someone else is debugging a flow and is currently stopped at a breakpoint. WebSphere MQ Integrator regards this as a "message in flight" situation, and will refuse to stop the broker through the normal command. The best action is to issue a "Stop debugging" command from the tool bar (or ask the person doing the debugging to do this). After that operation has completed, the broker stops. If this is not possible, ending all DataFlowEngine processes associated with that broker will allow the broker to stop, but your messages will be backed-out (see above) and you will still have to issue a "Stop debugging" command later when the broker restarts.

**Question 9.12:** I was debugging, but something happened, and now my message flow seems to be stuck. When I put a new message in, nothing happens. What's wrong?

**Answer 9.12:** Perhaps a message was backed out and you have not set the "Backout re-queue name" property of your input queue. Set that property to a valid queue name (such as the name of the input queue itself) and your flow might become unstuck.

**Question 9.13:** Why are the Step Into and Return buttons active even when nested flows are not present?

**Answer 9.13:** These buttons simply act as Step Over when there are no nested flows to step into or out of.

**Question 9.14:** What does a breakpoint mean when exceptions are thrown?

**Answer 9.14:** When an exception is thrown, the exception runs "backwards" through the flow, stopping at breakpoints that have been set. When stopped at the breakpoint, the message pane shows the most recent exception that was thrown. You can then use the Go button to proceed backwards through the flow to the next breakpoint, although that breakpoint will show the same exception. Step Over, Step-into, and Step-out are not enabled during exception processing.

**Question 9.15:** I have a node that throws multiple exceptions, but when I stop at a breakpoint in the "backward" direction, I only see one. Where are the others?

**Answer 9.15:** Only the most recent exception is shown in the backwards direction. To see the complete exception tree, set a breakpoint at a catch terminal further back in the flow (such as on the input node or on a try-catch node). When the exception is processed by that node, the flow will stop at the breakpoint you set, and you can see all the exceptions listed.

**Question 9.16:** What is the stack pane showing me?

## Debugger

**Answer 9.16:** When you are stopped at a breakpoint, the stack pane shows the current level of nesting of the current flow. If you are in Flow C which is nested in Flow B which is nested in Flow A, the stack pane shows {C,B,A} in sequence (top to bottom). Flow C is selected by default, but you can click on the other two flows, which causes them to be displayed in the flow pane. However, only flow C shows that you are stopped at a breakpoint.

**Question 9.17:** What happens when I set a breakpoint in a nested flow, and I have used that nested flow many times in my main flow?

**Answer 9.17:** The breakpoint is set only in the specific instance of the nested flow where it was set. It is not set, nor will it pop, in any other instance of that nested flow. You can, of course, go in and set breakpoints in all instances of a nested flow if you choose.

**Question 9.18:** When I'm debugging a flow and I return to the design view, I can see an additional flow that I could add to my workspace. It has a name that ends in `_debug_`. What is this flow?

**Answer 9.18:** It is the instrumented flow that the Debugger is using to track messages. Do not add this flow to your workspace. It will be deleted when you stop debugging.

**Question 9.19:** When I have two or more connections to a single output terminal of a node and I am stopped at a breakpoint in front of the node, what does "Step Over" do?

**Answer 9.19:** WebSphere MQ Integrator processes multiple connections serially through each connection, pushing the message to completion along the first path before commencing the second, and so on. As such, Step Over stops at the first connection, but does not stop at the second, because that connection is followed at a potentially much later time. Therefore, if you want to stop at all of the multiple connections, you must put actual breakpoints on all of them.

**Question 9.20:** When I Step Over an embedded flow, what happens if I have previously set a breakpoint in that flow?

**Answer 9.20:** You will stop at the breakpoint, even though you Stepped Over the flow. This is analogous to the behavior most debuggers exhibit when you step over a function call where that function has a breakpoint set within it — you will stop at the breakpoint.

**Question 9.21:** After I select "Start Debugging", I get an endlessly cycling progress bar entitled "Waiting for communication". Why do I never get the message "Debug session started" in the information pane?

**Answer 9.21:** If the flow has nodes with ESQL statements, the flow might not deploy even if the statements are syntactically correct. This can occur, for example, because of multiple declarations or un-initialized variables (that is, semantic problems that the syntax parser will not pick up). See the *WebSphere MQ Integrator ESQL Reference* manual for full details on this. It is advisable always to check your Log and Operations views to confirm that the debug version of your flow has deployed (it will have the same name as the original flow, with the suffix `_debug_` added).

If the flow does not deploy properly, the Debugger cannot establish communication with the flow, and hence the endless progress bar. Select Cancel on the bar to clean up and return to a good state, then fix your errors and try again. As a check, you should see if your flow can deploy without the Debugger.

**Question 9.22:** I tried to refresh the Assignments view while I was debugging. When I went back to the debug pane, why did I find that I was no longer debugging?

**Answer 9.22:** Although you are allowed to switch panes while debugging, you should refrain from performing any actions on the other panes other than the Operations and Log views, which you can refresh at any time.

**Question 9.23:** After I have done some debugging and I exit the Control Center, I am asked if I want to save my changes. Should I?

**Answer 9.23:** If all you have done in this session is debugging, and have made no other changes to your workspace, you can choose "No," although there is no harm in choosing "Yes." If you have done other things unrelated to debugging, you must decide if you want those changes saved.

**Question 9.24:** I am debugging a flow and I continue after encountering a breakpoint. However, nothing seems to happen and after about a minute a progress bar pops up indicating that the Debugger is waiting for communication. What is happening?

**Answer 9.24:** There are two possibilities. First, the message flow might have encountered a time-extensive operation, such as a huge database query, which you will simply have to wait for. The second possibility is that the broker ended or some other extraordinary condition occurred, and therefore communication was lost. In the latter case, you should select Cancel on the progress bar to stop the debug session.

**Question 9.25:** Why can't I seem to debug an empty message flow?

**Answer 9.25:** Empty message flows cannot be deployed and hence cannot be debugged.

**Question 9.26:** I changed the properties of my assigned flow before I debugged it. Why weren't my changes reflected in the debug version of the flow?

**Answer 9.26:** The Debugger currently does not support changes to these properties.

**Question 9.27:** I created a new broker, assigned a message flow to its execution group, and then tried immediately to debug. Why did nothing happen?

**Answer 9.27:** Before you debug, your broker has to be deployed. After changing your topology, you must deploy the changes before attempting any debugging.

**Question 9.28:** The Debugger keeps putting up a popup that tells me that XML parsing errors have occurred. What does that mean?

**Answer 9.28:** This message usually means your XML message is not well-formed XML. In this case the Debugger cannot display the message on the message panel,

## Debugger

but breakpoints still work, and when you proceed, your message will still be processed (unaltered) by the message flow.

One common cause of this problem is the presence of control characters in your strings. The XML standard does not permit most control characters (even if escaped) in strings, with the exception of line-feed carriage-return, and horizontal-tab. This problem should not happen if you are using other message formats, such as MRM or NEON, because those message formats generally do permit control characters in strings. Therefore, the Debugger will not give an error message in that case, and will display the message in the message panel. Note that control characters cannot be displayed, however, and any changes you attempt to make to strings with embedded control characters will be ignored.

**Question 9.29:** Can the Debugger be used on the z/OS platform?

**Answer 9.29:** Yes — from WebSphere MQ Integrator Version 2.1.

**Question 9.30:** Is a debug message flow a copy of the original message flow?

**Answer 9.30:** A new flow is created, instrumented, assigned to the execution group in place of the original, and then deployed when you start the debug session. When you stop the debug session the original is reassigned in place of the debug version and then redeployed.

**Question 9.31:** If I don't stop the Debugger before going back to the design view and then modify items, why does deploying a new configuration cause errors?

**Answer 9.31:** The Debugger does not support this action. Consider what happens when you start a debugging session:

1. You open a message flow
2. You then Start Debugging

This deploys an instrumented copy of the message flow you wish to debug to the same execution group as the original message flow. That is, the original flow is removed from the execution group and an instrumented version is added, checked in and then deployed to the broker. Verify this by refreshing the operations view of the Control Center, or run `mqsilist -e`. This shows that the original message flow, 'mf' for example, has been replaced by an instrumented version of 'mf' called 'mf\_debug\_'. (Instrumented means that a debug node has been added between each of the nodes.) If you set this to be a breakpoint, then when a message reaches this debug plug-in, a communication with the Debugger is undertaken to communicate the message to the control center.

Changing into design mode, and then changing the properties of the message flow nodes while still debugging, is not consistent with this implementation. The message flow is no longer assigned to the execution group as it was before the debug session, and when you attempt to deploy the configuration changes you are trying to redeploy the instrumented flow ('mf\_debug\_').

The correct procedure is:

1. Stop debugging
2. Make the changes
3. Deploy the changes
4. If necessary, open a new debug session to see the effect of the changes

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## Chapter 10. HP-UX installation and uninstallation

These questions are answered in this chapter:

- How can I check if I have the correct prerequisite software installed on HP-UX? See “Question 10.1”.
- How can I obtain prerequisite HP-UX software patches? See “Question 10.2”.

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### Answers to HP-UX installation and uninstallation questions

**Question 10.1:** How can I check if I have the correct prerequisite software installed on HP-UX?

**Answer 10.1:** HP-UX software is normally installed as a set of packages. Updates to the packages are supplied as patches.

To check what packages are installed on the system, and at what level, type:

```
$ swlist
```

For more detailed information about software installed and patches, type:

```
$ swremove
```

Compare the output of this command with the prerequisite list documented in the *WebSphere MQ Integrator for HP-UX Installation Guide*, and check for last minute updates listed in the `Readme.txt`.

**Question 10.2:** How can I obtain prerequisite HP-UX software patches?

**Answer 10.2:** Any one of the following sources will be able to provide these:

- Your local site support
- Your IBM Support Center
- The HP-UX download site at:  
<http://devresource.hp.com/devresource/Docs/DocLibrary.html>

## HP-UX installation and uninstallation

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## Chapter 11. z/OS installation, customization, and operation

These questions are answered in this chapter:

- How can I check if I have the correct mandatory requisite software service levels installed on z/OS? See “Question 11.1” on page 88.
- How can I obtain mandatory requisite z/OS software service fixes? See “Question 11.2” on page 88.
- Is Java required only for the support of Java-based plug-in nodes? See “Question 11.3” on page 89.
- Does WebSphere MQ Integrator V2.1 running on z/OS and zSeries™ handle ASCII? See “Question 11.4” on page 89.
- Is the Component HFS a separate path from the Installation HFS path? See “Question 11.5” on page 89.
- Does the WebSphere MQ Integrator broker use DB2-LOB-datatypes for its tables? See “Question 11.6” on page 89.
- How do I distribute the Installation HFS to multiple z/OS machines? See “Question 11.7” on page 89.
- Do I need the BINDS job for DB2? See “Question 11.8” on page 89.
- Is there any SMPE cross-zone requirement for WebSphere MQ Integrator? See “Question 11.9” on page 90.
- Why am I getting a GIM23901E error from the apply job? See “Question 11.10” on page 90.
- Can I specify a DB2 plan name in the configuration file to be executed by the broker? See “Question 11.11” on page 90.
- How many WebSphere MQ Integrator Started Tasks do I need to have? See “Question 11.12” on page 90.
- Does the WebSphere MQ Integrator Started Task ID need to be a logon user? See “Question 11.13” on page 90.
- How do I make sure dumps are big enough to be useful? See “Question 11.14” on page 90.
- Why does the home directory for Started Task user ID need 8 GB of disk space for dump and other diagnostic data? See “Question 11.15” on page 91.
- How can I predict the Primary and Secondary sizes needed for broker tables? See “Question 11.16” on page 91.
- Are the component directory and home directory the same for the started task? See “Question 11.17” on page 91.
- What information do I put in for the time zone parameter for EST Zone in the US? See “Question 11.18” on page 91.
- Why am I receiving a return code 9 on the BIPCVPS step? See “Question 11.19” on page 91.
- What security access and permissions do the z/OS broker and execution group need? See “Question 11.20” on page 92.
- What permissions and authorities do I need so that I can set up all the z/OS broker and execution group permissions myself? See “Question 11.21” on page 93.
- The broker HFS was created by the wrong user ID, and is in the wrong group. How do I correct this? See “Question 11.22” on page 93.

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- Do I have to alter the extended attributes of the programs in the install or broker directories? See “Question 11.23” on page 93.
- How do I know which spawned MVS™ address space is handling which Control Center defined execution group? See “Question 11.24” on page 93.
- Can I issue modify commands through a batch job? See “Question 11.25” on page 94.
- Can I secure the SDSF entered commands; that is, limit the users who can issue the commands? See “Question 11.26” on page 94.
- When the broker on z/OS takes a dump (either type) will a SYS1 LOGREC record also be written? See “Question 11.27” on page 94.
- How should I get trace output to a PDS? See “Question 11.28” on page 94.
- How can I redirect the output from a Trace node to a sequential data set or SYSOUT data set? See “Question 11.29” on page 94.
- How can I see output for failed execution groups on z/OS? See “Question 11.30” on page 94.
- How do I find out the meaning of BPX messages? See “Question 11.31” on page 94.
- Why do I get abend U4039 in CEEPLPKA starting a broker? See “Question 11.32” on page 95.
- Why does my execution group fail to start (file load fails)? See “Question 11.33” on page 95.
- What does the RM limit mean, and how should I reply in such a case? See “Question 11.34” on page 95.
- Why do I get message BIP2060E when I try to deploy a message flow, which runs successfully on Windows NT and contains a Java Plug-in Node (the SwitchNode example)? See “Question 11.35” on page 96.
- If there is no way to start the broker (because DFE is dumping and restarting), how do I turn trace on or off when asked to do so by IBM Support? See “Question 11.36” on page 96.
- I have a broker running on Windows NT or UNIX. Can I connect to a database on z/OS? See “Question 11.37” on page 96.

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## Answers to z/OS installation and uninstallation questions

**Question 11.1:** How can I check if I have the correct mandatory requisite software service levels installed on z/OS?

**Answer 11.1:** Ask your SMP/E administrator to query the SMP/E zones for the prerequisite PTFs. You can also refer to the *WebSphere MQ Integrator for z/OS Program Directory*, the Readme, and the PSP for latest levels.

**Question 11.2:** How can I obtain mandatory requisite z/OS software service fixes?

**Answer 11.2:** Any one of the following sources will be able to provide these:

- Your IBM Support Center
- The IBMLink™ site at:  
<http://www.ibm.link.ibm.com>
- The IBM Service Update Facility site at:  
<http://www.ibm.com/servers/eserver/zseries/zos/suf>



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**Question 11.3:** "Java 1.3" is listed as a requirement for WebSphere MQ Integrator for z/OS. Is Java required only for the support of Java-based plug-in nodes, or is it required by the base components of WebSphere MQ Integrator?

**Answer 11.3:** Java 1.3 is required internally. Publish/Subscribe is written in Java and used both to support the Pub/Sub function and internally in the control functions. Java is required even if neither Publish/Subscribe nor plug-in nodes are in use.

**Question 11.4:** Does WebSphere MQ Integrator V2.1 running on z/OS and zSeries handle ASCII? Can incoming messages encoded in ASCII be transformed and sent to MQSeries in ASCII? Can incoming messages encoded in EBCDIC be transformed, and the output sent to MQSeries in ASCII (and ASCII to EBCDIC)?

**Answer 11.4:** WebSphere MQ Integrator can accept input in the supported ASCII and EBCDIC code pages, and can generate output in a similar way.

Internally, all messages are converted to Unicode. The ICU<sup>1</sup> tables provided with WebSphere MQ Integrator convert to and from Unicode. WebSphere MQ Integrator V2.1 for z/OS can accept and generate ASCII input as well as EBCDIC.

**Question 11.5:** Is the Component HFS a separate path from the Installation HFS path?

**Answer 11.5:** Yes, by convention and recommendation. In order to retain the configured elements of a component during a product reinstallation (when the entire Installation HFS may be recreated or replaced) the Component HFS should be elsewhere.

In conventional UNIX file structures, the products are placed in the `/usr/lpp/` file system and then protected from update except by system administrators. The operational files (the Component HFS) are in `/var/` and are enabled for update by the product administrators.

The MQSeries structure is an example: the product is in `/usr/lpp/mqm` and the component (queue manager) parts are in `/var/mqm/qmgrs/`. So for WebSphere MQ Integrator the product is in `/usr/lpp/WMQI` and the brokers are in `/var/WMQI/brokers/`. (These examples are for AIX; other UNIX platforms use similar, but different, names.) However, there is no requirement to follow these particular names if others suit your environment better.

**Question 11.6:** Does the WebSphere MQ Integrator broker use DB2-LOB-data types for its tables?

**Answer 11.6:** Yes.

**Question 11.7:** How do I distribute the Installation HFS to multiple z/OS machines?

**Answer 11.7:** Copy the HFS and ship it to the other machines. (You can use a `.tar` file.)

**Question 11.8:** Do I need the BINDS job for DB2?

---

1. ICU — International Components for Unicode

## z/OS installation, customization, operation

**Answer 11.8:** The only bind you need is done as part of the DB2 CLI installation. WebSphere MQ Integrator uses dynamic SQL, so no specific bind of the product code is needed.

**Question 11.9:** Is there any SMPE cross-zone requirement for WebSphere MQ Integrator?

**Answer 11.9:** No. Parts from other products are included during the apply phase using the linkage editor's AutoCall support.

**Question 11.10:** Why am I getting this GIM23901E error from the apply job:

```
GIM23901E:  
LINK-EDIT PROCESSING FAILED FOR MODULE BIP00054 IN LMOD BIP00054 IN THE  
SMPLTS LIBRARY.  
THE RETURN CODE WAS 12. THE SEQUENCE NUMBER WAS 000117.
```

and the following Linkedit messages BIP0078 and BIP0054:

```
IEW2641S 4B02 MODULE EXCEED THE LENGTH LIMITATIONS OF THE TARGET FORMAT.  
IEW2008I 0F03 PROCESSING COMPLETED. RETURN CODE = 12.
```

**Answer 11.10:** This happens when you use an existing SMPLTS data set, or you create one without using the installation jobs provided. Create SMPLTS as a PDS/E and not a PDS.

**Question 11.11:** Can I specify a DB2 plan name in the configuration file to be executed by the broker, to separate production resources from development resources as well as protecting them?

**Answer 11.11:** In this situation run one customization for the test broker, and one for the production broker, using different database names and table owners. This is the same as if you customize two production brokers.

The CIF file contains:

- key DB2\_DATABASE: DB2 Database Name, set into dsnaoini and registry key DataBaseName
- key DB2\_TABLE\_OWNER: CURRENTSQLID, prefix used to create and access the DB2 tables. This is set into dsnaoini and registry key DataSourceUserId.

The keys DB2\_SUBSYSTEM and DB2\_LOCATION are identical in this case.

**Question 11.12:** How many WebSphere MQ Integrator Started Tasks do I need to have?

**Answer 11.12:** There is one started task per broker. An active broker has at least two associated address spaces: one for the control process, another for the admin agent. After deploying a message flow there is also an address space per execution group.

**Question 11.13:** Does the WebSphere MQ Integrator Started Task ID need to be a logon user?

**Answer 11.13:** No.

**Question 11.14:** How do I make sure dumps are big enough to be useful?

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**Answer 11.14:** Set the OMVS parameter MAXCORESIZE to at least 500 MB. You can change this dynamically, but you must also change it in BPXPRMxx, otherwise the change will be lost at the next IPL.

**Question 11.15:** Why does the home directory for Started Task user ID need 8 GB of disk space for dump and other diagnostic data?

**Answer 11.15:** The space is needed to ensure dumps can be captured, and multiple broker started task IDs can share the same space.

**Question 11.16:** How can I predict the Primary and Secondary sizes needed for broker tables?

**Answer 11.16:** The space needed depends on what features you are using (message flows, custom nodes, database nodes, pub/sub, pub/sub with security and so on). Start with the default sizes; they will be adequate for many of the tables. Then monitor table usage: when a table fills or nearly fills, check what percentage of your flows, user IDs and so on you have defined, and increase the table size accordingly.

**Question 11.17:** Are the component directory and home directory the same for the started task?

**Answer 11.17:** No, they are not the same. You install from SMP/E into the installation directory, also called "home" or "Installation HFS". During customization parts are moved into the component directory and tailored for that particular component (broker or user name server).

The home directory contains the runtime executables and LILs. This is where WebSphere MQ Integrator runs from. The component directory contains the registry (environment file), which is data specific to that component. The component directory also has an output subdirectory that is used for broker logs and trace.

**Question 11.18:** What information do I put in for the time zone parameter for EST Zone in the US?

**Answer 11.18:** This information is contained in the book *z/OS UNIX System Services Command Reference*. The format for the TZ Variable is:

```
standardHH[:MM[:SS]] [daylight[HH[:MM[:SS]]]  
[,startdate[/starttime],enddate[/endtime]] ]
```

You can let most of this default unless you have specific needs. The minimum that you need is to set TZ=EST5 where EST is the standard local standard time zone for Eastern US and 5 is the time offset westwards from the universal reference time. You can include minutes and seconds should you need to.

Daylight savings time defaults to an offset of one hour. The startdate and enddate (Julian days) and related starttime and endtime default to standard American Daylight Savings rules, starting at 02:00 on the first Sunday in April and ending 02:00 on the last Sunday in October.

**Question 11.19:** Why am I receiving a return code 9 on the BIPCVPS step?

**Answer 11.19:** BPXBATCH is an LE application, and it needs the LE runtime modules before the shell gets control to execute /etc/profile (which puts SYS1.SCEERUN in

## z/OS installation, customization, operation

STEPLIB). All the other steps have SYS1.SCEERUN as part of the steplib. Update the JCL to include a STEPLIB DD for SCEERUN after the BPXBATCH SH statement:

```
BPXBATCH SH -  
/argoinst/dr17mart/brokers/MQ01/bin/mqsichecksetup  
/*  
//STEPLIB DD DSN=SYS1.SCEERUN,DISP=SHR
```

If the library SYS1.SCEERUN is not in the linklist, it needs to be provided to every step where an LE application is running. This STEPLIB has been added to the BIPCVPS step in BIP\$JCVP.

**Question 11.20:** What security access and permissions do the z/OS broker and execution group need?

**Answer 11.20:** Additional address spaces such as the Admin Agent (for example MQ9TBRK1) and Execution Group (for example MQ9TBRK2) run under the started task user ID (MQ9TBRK). You do not need to set up authorities for each one of these. The broker started task (MQ9TBRK) needs access to:

- Component directory
- Started Task home directory
- Installation directory
- DB2
- MQSeries queues

The Started Task should have the following authorities:

### DB2

- The started task user ID must be authorized to connect to DB2
- The started task user ID needs EXECUTE authority to the DSNACLI plan, or equivalent
- DB2 authorizations for the started task user ID and the table owner ID
- SELECT privilege on the SYSIBM.SYSTABLES, SYSIBM.SYSSYNONYMS, and SYSIBM.SYSDATABASE
- SELECT, UPDATE, INSERT, DELETE privileges on all broker system tables
- DB2\_TABLE\_OWNER must be a valid authorization ID of the started task user ID
- EXECUTE authority on the DSNACLI plan, or equivalent for the started task user ID

### MQSeries

- The broker and the User Name Server need to be able to connect to the queue manager.
- The broker's internal queues: SYSTEM.BROKER.\* queues should be protected.

Access should typically be restricted to the broker and User Name Server Started Task user IDs, and to WebSphere MQ Integrator administrators.

- If you are using Publish/Subscribe, subscribers need to PUT to the SYSTEM.BROKER.CONTROL.QUEUE queue.
- You can control which applications can use queues used by message flows. Applications need to be able to PUT and GET to queues defined in any nodes.

## WMQI COMPONENTS

- No PDSE access is required.
- The directory authorizations required are:
  - READ/EXECUTE access to the executables in /bin (the directory where WebSphere MQ Integrator for z/OS is installed by SMP/E).
  - READ/WRITE/EXECUTE access to the component directory for the broker.
  - READ/WRITE access to the Started Task's home directory.
- In UNIX System Services, the Started Task user ID and the WebSphere MQ Integrator administrator user ID must both be members of the group (or groups) having access to the installation and component directories, because they both need privileges over these. Consequently, the owner of these directories will need to give the appropriate permissions to this group.

**Question 11.21:** What permissions and authorities do I need so that I can set up all the z/OS broker and execution group permissions myself?

**Answer 11.21:** In the z/OS environment it is normal for the Security (RACF) administrator to enable the needed access; you will need to find and talk with the correct people in your enterprise. The person responsible for UNIX System Services permissions is not usually the same as the person who handles MVS access controls.

**Question 11.22:** The broker HFS was created by the wrong user ID, and is in the wrong group. How do I correct this?

**Answer 11.22:** Use either the **chown** or **chgrp** UNIX commands with the **-R** (recursive) option. These are standard Posix commands; details can be found in the book *MVS/ESA™: OpenEdition® MVS Command Reference*. The **chown** or **chgrp** commands can only be used by the file owner or a superuser.

**Question 11.23:** Do I have to alter the extended attributes of the programs in the install or broker directories? So far I have not altered these attributes; they are currently set to '-s-'.

**Answer 11.23:** Authorizing the bipmain program is the only extended attribute which needs modifying. See the topic "Customizing a broker" in Chapter 2 of *WebSphere MQ Integrator for z/OS Customization and Administration Guide*.

**Question 11.24:** How do I know which spawned MVS address space is handling which Control Center defined execution group?

**Answer 11.24:** Message BIP9137I contains this information:

```
+(EP01BK.EP01EG02) 0 BIP9137I: A work manager has been registered
by RR 142 MS registration services,
work manager name is BIP.EP01BK2.0000000153.IBM.UA .
```

```
+(EP01BK.default) 0 BIP9137I: A work manager has been registered
by RRM 188 S registration services,
work manager name is BIP.EP01BK4.0000000161.IBM.UA .
```

In these example messages, the execution groups EP01EG02 and default are run in address spaces EP01BK2 and EP01BK4 respectively.

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**Question 11.25:** Can I issue modify commands through a batch job?

**Answer 11.25:** You can specify all commands directly in your JCL. For example:

```
//      d omvs,u=
```

**Question 11.26:** Can I secure the SDSF entered commands; that is, limit the users who can issue the commands?

**Answer 11.26:** The authorization of operator commands is controlled by RACF class OPERCMDS. An authorized user can enter any WebSphere MQ Integrator commands. There is no authorization based on specific commands.

**Question 11.27:** When the broker on z/OS takes a dump (either type) will a SYS1 LOGREC record also be written?

**Answer 11.27:** Yes.

**Question 11.28:** How should I get trace output to a PDS? In the TRACE collect and format job on MVS, can the output be directed to a standard sequential file or PDS, or must it be delivered to a USS file? If it must be delivered to USS, how should I get the output to a PDS?

**Answer 11.28:** The output is delivered to a USS file. You can use **OCOPY** to get the output to a PDS.

**Question 11.29:** How can I redirect the output from a Trace node to a sequential data set or SYSOUT data set? I want my applications to use specific Trace nodes, and redirect the output to different SYSUT = \* data sets in the execution group address space. This is because application programmers might not have access to production UNIX or OMVS Systems, but they would be able to browse SYSOUT for an address space and or a data set.

**Answer 11.29:** The output from a trace node can be directed to any location in the HFS, but not to the MVS file system or to SYSOUT. You should give the application programmers access to the area in the HFS to which the trace output is diverted. If this is separate from the broker component HFS, access can be controlled to allow the programmer access to no more data than would available from a Sequential File or SYSOUT.

**Question 11.30:** How can I see output for failed execution groups on z/OS?

**Answer 11.30:** A WebSphere MQ Integrator V2 execution group is started using spawn rather than submitting a job, so no job output is available.

In failure cases:

- The execution group is restarted by the Broker AdminAgent (not by manually submitting the daemon job as in Version 1)
- Output is written to the console and the MVS syslog
- Trace output might be available, depending on trace options

**Question 11.31:** How do I find out the meaning of BPX messages like this:

```
+BPXM046I BPXBATCH FAILED BECAUSE EXEC (BPX1EXC) OF  
/USR/LPP/WMQI/bin/bipimain  
FAILED WITH RETURN CODE 00000081 REASON CODE 0594003D.
```

**Answer 11.31:** BPX is the prefix for USS messages. See the book *z/OS: UNIX System Services Messages and Codes* for details.

Your specific message shows that BPXBATCH encountered an error when trying to issue an EXEC (BPX1EXEC) callable service to the program name specified. An incorrect program name may have been specified. Look up the return code and reason code to determine why the BPX1EXEC callable service (EXEC) failed. Verify the program name exists in the path specified. The reason code 0594003D indicates that a directory does not exist.

**Question 11.32:** Why do I get abend U4039 in CEEPLPKA starting a broker?

**Answer 11.32:** This error is caused by problems with the library concatenations. This might be because:

- SCEERUN is not in the LINKLIST or job STEPLIB
- The wrong Java version is used
- The Java PATH and/or CLASSPATH are incorrect

**Question 11.33:** Why does my execution group fail to start (file load fails)?

**Answer 11.33:** If the region size of the execution group address space is too small, the execution group start up fails. The region size used is either the size of the broker started task address space (the default), or the size set by the IEFUSI exit. The started task then restarts the execution group.

The symptom of this problem is that a file (lib or lil) fails to be loaded. To avoid this problem, the region size must be big enough: at least 375 MB, or more if there are many message flows deployed. Try to run the broker with the REGION parameter set to 0 MB.

If the broker always stops loading the DFE at the same point (for example, loading the imbdfjps.lil), a storage exit is probably overriding the defaults region size (the started task regions size). Check the exit IEFUSI: if this is the cause, there are two ways to solve this:

- update the IEFUSI to not touch OMVS work
- add an entry in the SMFPRMxx member to tell it what exits OMVS should use

If you have less than eight subsystems defined in the SMFPRMxx member, you could also do this with a **set smf** command while the image is up.

**Question 11.34:** When I run broker MQFTBRK3 I get this open reply:

```
JOB MQFTBRK3 - 74 CRG100A JOB MQFTBRK3, ASN 0213 IS APPROACHING IT"S RM LIMIT.  
REPLY YES TO REMOVE THE LIMIT, NO TO ENFORCE IT
```

What does the RM limit mean, and how should I reply in such a case?

**Answer 11.34:** An unauthorized Resource Manager (RM) attempted to register as a RM. The request exceeds the address space threshold limit for unauthorized RMs. You should determine if the limit should be enforced, or if it should be removed for this address space, and make the appropriate reply.

There is a setting for the number of RMs in the system, and there are PTFs available to increase this limit. See these hits on RETAIN<sup>®</sup>:

- PMR 24258,025,724 explains exactly the problem experienced

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- APAR OW29903 introduced new function including message CRG100A. It also references APAR OW46805 which contains fixes to increase the limit. The PTFs are:
  - R605 PSY UW75165 UP00/11/21
  - R606 PSY UW75166 UP00/11/21
  - R608 PSY UW75167 UP00/11/21
  - R703 PSY UW75168 UP00/11/21

**Question 11.35:** Why do I get message BIP2060E when I try to deploy a message flow, which runs successfully on Windows NT and contains a Java Plug-in Node (the SwitchNode example)? I have already copied the appropriate jar file to the lib library on z/OS.

**Answer 11.35:** This is caused by faulty Java paths in the mqsicomp.cif file. Correct the Java paths, and the deploy should then work.

**Question 11.36:** If there is no way to start the broker (because DFE is dumping and restarting), how do I turn trace on or off when asked to do so by IBM Support?

**Answer 11.36:** You need to create two keys to generate a TRACE for IBM Support:

### To switch trace on

The keys have to be placed into the directory /registry/. Create them using these commands:

- print -n debug > executionGroupUserTraceOverrideLevel
- print -n debug > executionGroupTraceOverrideLevel

Start the broker, then as soon the broker gets to the point where it goes down or dumps CANCEL the broker as fast as possible. Then zip-up all the data in the Component directory (including all subdirectories) and send this to IBM Support.

### To switch trace off

The keys have to be placed into the directory /registry/. Create them using these commands:

- print -n none > executionGroupUserTraceOverrideLevel
- print -n none > executionGroupTraceOverrideLevel

**Question 11.37:** I have a broker running on Windows NT or UNIX. Can I connect to a database on z/OS?

**Answer 11.37:** Yes. For example, to define the connection to the z/OS database using a TCP/IP connection:

1. Start DB2 Client Configuration Assistant and click **Add**
2. In the new window, click **Manually configure a connection to a database**, then click **Next**
3. Click **TCP/IP**
4. Select **The database physically resides on a host or AS/400 system**, click **Connect directly to the server**, then click **Next**
5. At **Host name** type the host name (or IP address) of the server, at **Port number** type the port number the DB2 subsystem is listening on, then click **Next**



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6. At **Database name** type the DB2 *location* name (not the database name) you are connecting to on the server. This can be found from the DSNL004I message issued when the DB2 subsystem starts. Click **Next**
7. Select **Register this database for ODBC**, click **As a system data source**, then click **Next**
8. At **System name** type the IP address of the host, and at **Operating system** click **MVS/ESA, OS/390**, then click **Next**
9. Select **Configure security options (Optional)**
10. Click **Host or AS/400 authentication (DCS)**, then click **Next**
11. Ignore the last panel (Host or AS/400 Options) if it does not apply to you, then click **Finish**
12. Now click **Test Connection** and enter your user ID and password

If all settings are correct, you will receive a message confirming successful connection to the server database. The z/OS database will now be shown in the DB2 Control Center.

You can create brokers as usual, but the `DataSourceUserId` (-u option) and the `DataSourcePassword` (-p option) must be a valid user ID and a valid password with appropriate access to the z/OS DB2 subsystem.

When creating message flows, define the data source in your nodes as usual.



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## Chapter 12. Message aggregation

You should refer to Chapter 6 "Aggregation of messages" in the book *WebSphere MQ Integrator Using the Control Center* for a full discussion of message aggregation, including the topic "Dealing with exceptions".

These questions are answered in this chapter:

- A message was propagated from the timeout terminal of my AggregateReply node. It has a ComIbmAggregateReplyBody folder, but nothing underneath it. Where are my replies? See "Question 12.1".
- I have the timeout property set on my AggregateReply node, and I know that not all of my replies are arriving within that interval. Why do I never see messages sent to the timeout terminal? See "Question 12.2" on page 100.
- Why are some of my replies are being sent to the unknown terminal of my AggregateReply node? See "Question 12.3" on page 100.
- What value should I choose for the "unknown timeout" attribute on an AggregateReply node? See "Question 12.4" on page 100.
- Why do I have a message propagated to the unknown terminal of my AggregateReply node? It is not one of my messages, but contains the text "ComIbmAggregateControlNode". See "Question 12.5" on page 101.
- As part of my message aggregation flow, I want to send two requests. I have an MQInput node, connected to an AggregateControl node, connected to my first MQOutput node, connected to my second MQOutput node, connected to an AggregateRequest node. After the first reply arrives, the AggregateReply node thinks that the aggregation is complete and propagates it to the out terminal. Moments later the second reply arrives and is sent to the unknown terminal. Why is it only recognizing the one request? See "Question 12.6" on page 101.
- I have just tried my message aggregation flow for the first time and I get an exception thrown and my transaction rolled back at the input node. There is no other useful information anywhere. What happened? See "Question 12.7" on page 101.
- I have my aggregate timeout set to 60 seconds, so why does it takes 65 seconds before the timeout happens? See "Question 12.8" on page 101.
- I have the catch terminal on my AggregateReply node wired up to my error processing logic, but not all of the exceptions thrown are caught there. Why are some of them caught at the input node, causing my message to be rolled back? See "Question 12.9" on page 101.
- My message aggregation flow worked fine in development, so when I deployed multiple copies of the flow on my production broker why did it start behaving strangely? See "Question 12.10" on page 101.

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### Answers to message aggregation questions

**Question 12.1:** A message was propagated from the timeout terminal of my AggregateReply node. It has a ComIbmAggregateReplyBody folder, but nothing underneath it. Where are my replies?

**Answer 12.1:** The broker has waited for the specified timeout time but no replies were received. There are no replies underneath that folder because the broker never received any.

## Message aggregation

**Question 12.2:** I have the timeout property set on my AggregateReply node, and I know that not all of my replies are arriving within that interval. Why do I never see messages sent to the timeout terminal?

**Answer 12.2:** The timeout processing relies on receiving the control message from the corresponding AggregateControl node. Make sure that the control message is passed.

**Question 12.3:** Why are some of my replies are being sent to the unknown terminal of my AggregateReply node?

**Answer 12.3:** There are three situations that can cause messages to be unknown:

**Rogue message are arriving on the in terminal of the AggregateReply node.**

If this is happening, you probably have a design problem in your flow that is causing messages to go to the wrong place, or some security problem with your queues that allows third parties to put messages there.

**Valid replies are arriving early.**

Early means that the reply arrives before the corresponding AggregateRequest node has committed its work. This can only happen if you do PUTs from your MQOutput node out of syncpoint. To ensure transactionality, set "Transaction Mode = Yes" on your MQInput nodes and "Transaction Mode = Automatic" on your MQOutput nodes. If you are using a transport that doesn't support transactions, then you can cope with early replies by setting the "unknown timeout" attribute of the AggregateReplyNode.

**Valid replies are arriving late.**

Late means that the aggregation has already timed-out and been propagated to the timeout terminal. After this point, the outstanding replies will be unknown to the broker.

**Question 12.4:** What value should I choose for the "unknown timeout" attribute on an AggregateReply node?

**Answer 12.4:** If you guard your message flow from receiving early replies by making it transactional, then you can set "unknown timeout" to 0 (zero), effectively disabling that feature. Leaving this feature enabled when there are no early replies might reduce the performance of the broker.

If you do receive early replies, then the ideal unknown timeout time (T) depends on these factors:

- The amount of time between the request being sent, and the fanout flow returning to the input node and committing the work performed by the AggregateRequest node. Call this time N.
- The amount of time between the request being sent, and the reply arriving at the AggregateReply node. Call this time M.

The value of T is N minus M. You should aim for the request to be committed just before the unknown timeout interval has passed. M and N vary depending on the CPU load, the backend system, and many other factors, so you should be generous with T, but making it too large might increase the time between a fanout being triggered and the corresponding fan-in completing; it will not affect the overall throughput of the flows, however.

**Question 12.5:** Why do I have a message propagated to the unknown terminal of my AggregateReply node? It is not one of my messages, but contains the text "ComIbmAggregateControlNode".

**Answer 12.5:** You have connected the control terminal of an AggregateControl node to the in terminal of an AggregateReply node. This connection should instead be made to the control (input) terminal of the AggregateReply node.

**Question 12.6:** As part of my message aggregation flow, I want to send two requests. I have an MQInput node, connected to an AggregateControl node, connected to my first MQOutput node, connected to my second MQOutput node, connected to an AggregateRequest node. After the first reply arrives, the AggregateReply node thinks that the aggregation is complete and propagates it to the out terminal. Moments later the second reply arrives and is sent to the unknown terminal. Why is it only recognizing the one request?

**Answer 12.6:** You have your two output nodes connected in series. The AggregateRequest node will only know about the message put by the second output node. Change your flow so that the output nodes are parallel to each other, both connected between your AggregateControl node and your AggregateRequest node.

**Question 12.7:** I have just tried my message aggregation flow for the first time and I get an exception thrown and my transaction rolled back at the input node. There is no other useful information anywhere. What happened?

**Answer 12.7:** You have probably tried to send the aggregated reply message from the out or timeout terminal of an AggregateRequest node to an MQOutput node. The aggregated reply message does not have the required structure to be turned into a bit stream and put to a queue. You should pass the message through a Compute node to build up a valid message containing the information you want, and then send that message to your MQOutput node.

**Question 12.8:** I have my aggregate timeout set to 60 seconds, so why does it takes 65 seconds before the timeout happens?

**Answer 12.8:** When the broker is busy, and CPU and disk usage is high, the operating system does not schedule threads in a way that can guarantee your timeout will happen at an exact time. The timeout will not happen before the 60 seconds are up, and the broker will process the timeout as soon as it is able to. If your timeout interval is critical, you should consider reducing the timeout time (perhaps to 55 seconds) to allow for this possible delay.

**Question 12.9:** I have the catch terminal on my AggregateReply node wired up to my error processing logic, but not all of the exceptions thrown are caught there. Why are some of them caught at the input node, causing my message to be rolled back?

**Answer 12.9:** Exceptions thrown downstream of an AggregateReply node might be caught at the AggregateReply node or at the input node. Connect both of these catch terminals to the same error processing logic.

**Question 12.10:** My message aggregation flow worked fine in development, so when I deployed multiple copies of the flow on my production broker why did it start behaving strangely?

## Message aggregation

**Answer 12.10:** Each aggregation flow consisting of one AggregateReply node, one or more AggregateControl nodes, and one or more AggregateRequest nodes, is identified by an Aggregate Name property. This property must have a unique value for each aggregation flow in your broker.

When you deploy multiple copies of an aggregation flow within a broker, you are effectively duplicating this property without ensuring its uniqueness. Instead of using multiple copies of the flow, you should increase the number of additional instances (using the Operations panel of the Control Center). This will allow the aggregation flow to scale without breaking the uniqueness rule.

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## Part 2. Appendixes





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## Appendix. Notices

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## Bibliography

- *WebSphere MQ Integrator Problem Determination Guide*, GC34-5920

This describes tools and techniques that can help you find the causes of problems, and suggest actions for solving them.

- *WebSphere MQ Integrator Introduction and Planning*, GC34-5599

This provides an overview of the product, and introduces the concepts and the facilities that are available.

- The operating system specific installation guides:

*WebSphere MQ Integrator for AIX Installation Guide*, GC34-5841

*WebSphere MQ Integrator for HP-UX Installation Guide*, GC34-5907

*WebSphere MQ Integrator for Sun Solaris Installation Guide*, GC34-5842

*WebSphere MQ Integrator for Windows NT and Windows 2000 Installation Guide*, GC34-5600

*WebSphere MQ Integrator for z/OS Program Directory*, GI10-2536, and *WebSphere MQ Integrator for z/OS Customization and Administration Guide*, SC34-5919

These books describe the tasks you need to complete to install WebSphere MQ Integrator Version 2 on the appropriate operating system, and to verify your installation. They also provide details about servicing and uninstalling the product.

- *WebSphere MQ Integrator Messages*, GC34-5601  
This book documents the error and information messages generated by the product.
- *WebSphere MQ Integrator Using the Control Center*, SC34-5602  
This book introduces the Control Center, and provides detailed instruction on how to use it. It contains a full working example of a message set and message flow definition and deployment.
- *WebSphere MQ Integrator ESQL Reference*, SC34-5923  
This book describes how to use the ESQL expressions that are necessary for configuring message nodes in WebSphere MQ Integrator Version 2.

- *WebSphere MQ Integrator Programming Guide*, SC34-5603

This book is for application programmers who are writing or updating applications to use the facilities provided by WebSphere MQ Integrator Version 2.

- *WebSphere MQ Integrator Administration Guide*, SC34-5792

This book is a reference book for WebSphere MQ Integrator Version 2 system administrators. It also provides guidance information for configuring and maintaining a broker domain.

- *MQSeries Intercommunication*, SC33-1872

This book describes the concepts of message queuing. It then explains how to plan, define, and manage the message channels that allow application data to be moved across various points in a network.

- *MQSeries System Administration*, SC33-1873

This book, which is intended for system administrators and operators, supports day-to-day management of local and remote MQSeries objects.

- *MQSeries Programmable System Management*, SC33-1482

This book describes the facilities available on MQSeries products for: Monitoring instrumentation events in a network of connected systems that use IBM MQSeries products in different operating system environments; Writing programs using the MQSeries Programmable Command Formats (PCFs) to administer IBM MQSeries systems either locally or remotely; Extending the facilities available to a queue manager, using installable services.

- *z/OS C/C++ User's Guide*, SC09-4767

This book is intended for users of the IBM z/OS C/C++ compiler with the z/OS Language Environment product. It provides you with information about implementing (compiling, linking, and running) programs that are written in C and C++. It contains guidelines for preparing C and C++ programs to run on the z/OS operating system.

- *z/OS UNIX System Services Command Reference*, SA22-7802

| This book presents the information you need to  
| use a z/OS system with the shell and utilities  
| feature as well as TSO/E (Time Sharing Option  
| Extensions) commands for using z/OS UNIX  
| System Services (z/OS UNIX). It describes how  
| to use the shell commands, utilities, and TSO/E  
| commands.

- | • *z/OS: UNIX System Services Messages and Codes*,  
| SA22-7807

| This book presents the information you need to  
| use IBM z/OS UNIX System Services (z/OS  
| UNIX). It provides information to help you  
| identify and isolate problems that may occur in  
| the shell or the debugger. It also helps you  
| correct errors you make in entering commands  
| or using them correctly. The shell and utilities  
| messages are listed in alphanumeric order.  
| Only those messages with explanations are  
| included. This book also contains both reason  
| and return codes listed alphabetically and by  
| value. In addition, the /usr/sbin/init exit  
| status codes are included.

- | • *MVS/ESA: OpenEdition MVS Command Reference*,  
| SC23-3014

| This book presents the information you need to  
| use an IBM MVS/ESA system with the  
| OpenEdition Shell and Utilities feature as well  
| as TSO/E (Time Sharing Option Extensions)  
| commands for using OpenEdition services.  
| These features provide an application program  
| interface (API) and a shell interface based on  
| open systems standards.

- | • SupportPac ID05: *WebSphere MQ Integrator -  
| Tagged/Delimited message examples*

| This SupportPac<sup>2</sup> aims to introduce the  
| message designer to possible ways of using  
| WebSphere MQ Integrator V2.1 to model  
| Tagged/Delimited messages belonging to  
| existing message standards such as SWIFT and  
| other message standards, using the MRM  
| message model.

- | • SupportPac ID11: *WebSphere MQ for z/OS -  
| Writing New Era of Networks COBOL User Exits*

| This SupportPac<sup>2</sup> describes how to develop  
| user exits in COBOL, and includes a set of  
| sample programs that illustrate the techniques  
| that can be used.

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2. SupportPacs are available by following links from the  
MQSeries product family Web site at:

<http://www.ibm.com/software/ts/mqseries>

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