

WebSphere Message Broker



Troubleshooting

Version 6 Release 0

WebSphere Message Broker



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Version 6 Release 0

Note

Before using this information and the product it supports, read the information in the Notices appendix.

This edition applies to version 6, release 0, modification 0, fix pack 4 of IBM® WebSphere® Message Broker, with Message Brokers Toolkit version 6, release 0, modification 2, and to all subsequent releases and modifications until otherwise indicated in new editions.

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About this topic collection

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Troubleshooting and support

This section contains information about the various techniques that you can use to diagnose problems with WebSphere Message Broker.

- “Making initial checks”
- “Dealing with problems” on page 11
- “Using logs” on page 139
- “Using trace” on page 142
- “Using dumps and abend files” on page 154
- “Recovering after failure” on page 161
- “Contacting your IBM Support Center” on page 156

You can also read the general troubleshooting guidance in the following topics:

- Troubleshooting overview
- Searching knowledge bases
- Getting fixes
- IBM Software Support
- “IBM Support Assistant (ISA)” on page 158

For information that is specific to debugging message flow applications, see Testing and debugging message flow applications.

Making initial checks

Before you start problem determination in detail, consider whether there is an obvious cause of the problem, or an area of investigation that is likely to give useful results. This approach to diagnosis can often save a lot of work by highlighting a simple error, or by narrowing down the range of possibilities.

This section contains a list of questions to consider. As you go through the list, make a note of anything that might be relevant to the problem. Even if your observations do not suggest a cause straight away, they might be useful later if you have to carry out a systematic problem determination exercise.

- “Has WebSphere Message Broker never run successfully before?” on page 4
- “Did you log off Windows while WebSphere Message Broker components were active?” on page 4
- “Are the Linux and UNIX environment variables set correctly?” on page 4
- “Are there any error messages or return codes that explain the problem?” on page 5
- “Can you reproduce the problem?” on page 5
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- “Have you made any changes since the last successful run?” on page 7
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- “Is there a problem with a database?” on page 8
- “Is there a problem with the network?” on page 8
- “Does the problem affect all users?” on page 8

- “Have you recently changed a password?” on page 9
- “Have you applied any service updates?” on page 9
- “Do you have a component that is running slowly?” on page 9
- “Additional checks for z/OS users” on page 9

Has WebSphere Message Broker never run successfully before?

If so, determine whether your problem is caused by incorrect installation and setup, or whether it was caused by something else.

If it has *not* run successfully before, complete the following steps.

1. Check your setup

It is possible that you have not set up WebSphere Message Broker correctly.

UNIX On UNIX operating systems and Linux, check that you have set up the command environment correctly; see Setting up a command environment for more information.

2. Verify the installation

Check the Installation Guide for information about how you can verify a basic configuration on your system. On Linux (x86 platform) and Windows, you can use the Default Configuration wizard and the Samples Preparation wizard to help you with basic configuration and verification.

For more detailed configuration information, refer to Configuring WebSphere Message Broker.

Did you log off Windows while WebSphere Message Broker components were active?

Windows On Windows, logging off when WebSphere Message Broker components (a broker, the Configuration Manager, or the User Name Server) are active can cause a problem. You might see messages, including BIP2070, BIP2642, BIP1102, and BIP1103 in the Windows Event log if this is the case.

When you log off, any queue managers that support these WebSphere Message Broker components are stopped unless they are defined to run as Windows services. The components all run as Windows services and remain active, but they find that the queue manager and queue manager objects that are associated with them are no longer available.

1. If you log off, restart the queue manager that supports the Configuration Manager or the User Name Server, and the component re-establishes the connection to the queue manager.
2. To avoid this problem, set the queue managers that are used by the broker, Configuration Manager and User Name Server to run as Windows services, so that logging off Windows does not cause this problem.

Are the Linux and UNIX environment variables set correctly?

UNIX On Linux and UNIX systems, the basic settings are made by the `mqsiprofile` command, which is located in the following directory:

`install_dir/bin`

See Setting up a command environment for information about setting up the command environment; see Creating a broker on Linux and UNIX systems for instructions about creating a broker on your operating system.

Are there any error messages or return codes that explain the problem?

You can find details of error messages and return codes in several places:

- **BIP messages and reason codes**

WebSphere Message Broker error messages have the prefix BIP. If you receive any messages with this prefix (for example, in the UNIX, Linux, or z/OS syslog), see Diagnostic messages for an explanation.

Windows In the Windows Event log, references to BIP messages are identified by the source name "WebSphere Broker v6000", where v6000 can be replaced by a number representing the exact service level of your installation, for example 6001.

WebSphere Message Broker messages that have a mixture of identifiers such as BIPV600, BIPV500, WMQIv210, MQSIv202, and MQSIv201 indicate a mixed installation, which does not work properly.

- **Other messages**

For messages with a different prefix, such as AMQ or CSQ for WebSphere MQ, or SQL for DB2, see the appropriate messages and codes documentation for a suggested course of action to help resolve the problem.

Messages that are associated with the startup of WebSphere Message Broker, or were issued while the system was running before the error occurred, might indicate a system problem that prevented your application from running successfully.

A large or complex WebSphere Message Broker broker domain might require some additional configuration of the environment beyond what is recommended in Installing complementary products. The need for such configuration changes is typically indicated by warning or error messages that are logged by the various components, including WebSphere MQ, the databases, and the operating system. These messages are normally accompanied by a suggested user response.

Can you see all of your files and folders?

If you are using Windows Explorer to view your files and you cannot see all of your files and folders, such as the broker workpath directory, this is because Windows Explorer, by default, hides some files and folders.

To show all files in Windows Explorer:

1. Click **Tools** → **Folder options**. The Folder Options dialog box opens.
2. Click the **View** tab and select **Show hidden files and folders**.

Can you reproduce the problem?

If you can reproduce the problem, consider the conditions under which you can do so:

- **Is the problem caused by a particular message flow?** If so, use the debugger facility of the workbench and user tracing to identify the problem.

- **Is the problem caused by a command?** On distributed operating systems, you issue commands at the system command line.

z/OS On z/OS, you can issue commands from the console, the syslog, or by submitting a batch job. You enter customization commands from an OMVS session. Console commands that you enter from the console or syslog might be converted to uppercase, depending on the system configuration. This can cause some commands, such as **mqsicchangetrace**, to fail, especially if these commands contain parameters that must be lowercase. An error message indicating that the execution group is not available might be caused by the execution group name being in the wrong case. The same thing can happen on message flows.

- **Does a problem command work if it is entered by another user ID?**

If the command works when it is entered by another user ID, check the environment of each user. Paths, especially shared library paths, might be different. On Windows, UNIX systems, and Linux verify that all users have set up their command environment correctly; refer to sample profile for more information.

Windows On Windows, the environment for the broker is determined by the system settings, not by a particular user's variables. However, the user's variables affect non-broker commands.

UNIX On LinuxUNIX systems, only the service ID that is specified when the broker was created can start a broker.

Windows On Windows, any authorized user can start a broker.

Has the message flow run successfully before?

Sometimes a problem appears in a message flow that has previously run successfully. To identify the cause of the problem, answer the following questions:

- **Have you made any changes to the message flow since it last ran successfully?**

If so, it is likely that the error exists somewhere in the new or modified part of the flow. Examine the changes and see if you can find an obvious reason for the problem.

- **Have you used all the functions of the message flow before?**

Did the problem occur when you used part of the message flow that had never been invoked before? If so, it is likely that the error exists in that part. Try to find out what the message flow was doing when it failed by using user tracing, trace nodes, and the workbench's debugger function.

If you have run a message flow successfully on many previous occasions, check the current queue status and the files that were being processed when the error occurred. It is possible that they contain some unusual data value that invokes a rarely-used path in the message flow.

- **Does the message flow check all return codes?**

Has your system been changed, perhaps in a minor way, but your message flow does not check the return codes it receives as a result of the change? For example:

- Does your message flow assume that the queues that it accesses can be shared? If a queue has been redefined as exclusive, can your message flow deal with return codes indicating that it can no longer access that queue?
- Have any security profiles been changed? A message flow could fail because of a security violation.

- **Does the message flow expect particular message formats?**

If a message with an unexpected message format has been put onto a queue (for example, a message from a queue manager on a different operating system) it might require data conversion or a different form of processing. Also, check whether you have changed any of the message formats that are used.

- **Does the message flow run on other WebSphere Message Broker systems?**

Is there something different about the way that your system is set up that is causing the problem? For example, have the queues been defined with the same maximum message length or priority? Are there differences in the databases used, or their setup?

- **Are you using any user-defined extensions?**

There might be translation or compilation problems with loadable implementation library (LIL) files. Before you look at the code, examine the output from the translator, the compiler or assembler, and the linkage editor, to see if any errors have been reported. Fix any errors to make the user-defined extension work.

If the documentation shows that each of these steps was completed without error, consider the coding logic of the message flow, message set, or user-defined extension. Do the symptoms of the problem indicate which function is failing and, therefore, which piece of code is in error? See *User-defined extensions overview* for more information.

- **Can you see errors from WebSphere Message Broker or external resources, such as databases?**

Your message flow might be losing errors because of incorrect use of the failure terminals on built-in nodes. If you use the failure terminals, make sure that you handle errors adequately. See *Handling errors in message flows* for more information about failure terminals.

Have you made any changes since the last successful run?

When you are considering changes that might have been made recently, think not only about WebSphere Message Broker, but also about the other programs with which it interfaces, the hardware, device drivers, and any new applications.

- **Have you changed your initialization procedure?**

On z/OS, have you changed any data sets or library definitions? Has the operating system been initialized with different parameters? Check for error messages generated during initialization.

- **Has the profile of the user who is running the commands on Linux or UNIX systems been changed?**

If so, this might mean that the user no longer has access to the required objects and commands.

- **Has any of the software on your system been upgraded to a later release?**

Check that the upgrade completed successfully, and whether the new software is compatible with WebSphere Message Broker (check the product `readme.html` file).

- **Do your message flows deal with the errors and return codes that they might get as a result of any changes that you have made?**

Check that your message flow can handle all possible error situations.

Is there a problem with descriptive text for a command?

On Linux and UNIX systems, be careful when including special characters (back slash (\) and double quote (") characters) in descriptive text for some commands.

If you use either of these characters in descriptive text, precede them with a back slash, \; that is, enter \\ or \" if you want \ or " in your text.

Is there a problem with a database?

If you have database problems, make the following checks:

- Check that the database is started.
- Check your ODBC.ini file on Linux or UNIX systems (if you are using the default ODBC.ini file, this is located at *install_dir/odbc/.odbc.ini*).
For a broker database, the basic configuration is correct if the broker can be created. If the broker can be created, but not started, use ODBC tracing to investigate the cause.
- Check the number of database connections: on DB2 for AIX, using local mode connections, the maximum is 10.
- For messages indicating that imbdfdb2v6.lil (the 32-bit XA support LIL) failed to load, ensure that a supported database is installed.

Is there a problem with the network?

WebSphere Message Broker uses WebSphere MQ for inter-component communication. If components are on separate queue managers, they are connected by message channels, although communications between the workbench and the Configuration Manager use MQI channels.

There can be communication problems between any of these:

- Brokers
- The User Name Server
- The Configuration Manager
- The workbench

If any two components are on different queue managers, make sure that the channels between them are working. Use the WebSphere MQ **display chstatus** command to see if messages are flowing.

Use the **ping** command to check that the remote computers are connected to the network, or if you suspect that the problem might be with the network itself. For example, use the command **ping brokername**, where *brokername* is a computer name. If you get a reply, the computer is connected. If you don't get a reply, ask your network administrator to investigate the problem. Further evidence of network problems might be messages building up on the transmission queues.

Does the problem affect all users?

On distributed systems, problems can be caused by different users having different environments. Check whether there is a different user ID in an incoming message, or a different user ID issuing a command (or acting as the broker's service ID).

Have you recently changed a password?

If you have changed the password at the operating system level for the user ID that is used either as the ServiceUserId or the DataSourceUserId for any of the WebSphere Message Broker components, this might cause a problem. If so, perform the following steps:

- Change the properties of the affected component to reflect the password change. Use the **mqsichangebroker**, **mqsichangeconfigmgr**, and **mqsichangeusernameserver** commands to change the properties of the WebSphere Message Broker components.

If you are using a Cloudscape database on Windows and you change a password, use the **mqsichangedbimgr** command to update the Windows service that runs the Derby Network Server.

- Ensure that your passwords do not contain reserved keywords. For example, "IBM", which is a reserved keyword in DB2.

Have you applied any service updates?

If an APAR or PTF has been applied to WebSphere MQ for z/OS, or a fix pack or interim fix has been applied to a distributed operating system, check that no error message was produced. If the installation was successful, check with the IBM Support Center for any known error with the service update.

- If a service update has been applied to any other product, consider the effect that it might have on WebSphere Message Broker.
- Ensure that you have followed any instructions in the service update that affect your system. For example, you might need to redefine a resource.
- If you are not sure whether a service update has been applied to your system, check the memo.ptf file. This file contains the service level and details of the maintenance supplied.
- To view the memo.ptf file on Windows, click **Start** → **Programs** → **WebSphere Business Integration Message Broker** → **Service level**.

Do you have a component that is running slowly?

If a particular component, or the system in general, is running slowly, complete the following steps:

- Check whether tracing is on. This could be WebSphere Message Broker user tracing or service tracing, ODBC tracing, WebSphere MQ tracing, or native database tracing. If it is, turn the tracing off.
- Clear out any old abend files from your errors directory. If you do not clear the directory of unwanted files, you might find that your system performance degrades due to significant space being used up.
- On Windows, use the workpath **-w** parameter of the **mqsicreatebroker** command to create the errors directory in a hard drive partition that does not contain WebSphere Message Broker or Windows.
- Increase your system memory.

Additional checks for z/OS users

On WebSphere Message Broker for z/OS, you might find that:

- The console has unexpected messages; look for an explanation in Diagnostic messages or other relevant messages and codes documentation.

- RRS is not started; issue the command **D A,RRS**.
- The queue manager is not available; issue the WebSphere MQ command **DISPLAY THREAD(*)**.
- DB2 is not working; issue the DB2 command **DISPLAY THREAD**.
- The User Name Server is not working.

The cause of your problem on z/OS could be in any of the following areas. Check each of these, starting with whichever seems the most likely, based on the nature of your problem.

- The queue manager address space
- A queue manager in your queue-sharing group
- The channel initiator address space
- Batch or TSO address space
- The z/OS system (including ARM, RRS, or the Coupling Facility)
- The network (including APPC or TCP/IP)
- Another system, for example a queue manager on another operating system or a WebSphere MQ client
- The external security manager product, for example RACF or ACF2
- DB2

Understanding interactions between the runtime components

There are three runtime components: the broker, the Configuration Manager and the execution group. These components communicate with each other by exchanging command requests inside WebSphere MQ messages to perform actions, such as deploying a message flow. After completion of the command request, responses are sent back to the originating component, indicating whether the request was successful.

On WebSphere Message Broker for z/OS, you see extra information messages issued by z/OS runtime components that allow you and IBM Service personnel to determine the interactions between the various runtime components, including the Configuration Manager, broker and execution group.

When the broker receives command requests from the Configuration Manager, the broker issues a message that identifies the command request. When this request completes, a message is issued that indicates whether the command is successful. Each command request that the broker receives results in at least one matching command request being sent to an execution group, and a corresponding message being issued. Every response from an execution group that results from these command requests will result in a message being issued. These messages can be turned on and off and are to be used by the IBM Service team.

When an execution group receives command requests from the broker, the execution group issues information messages that identify the command request. For actions that are contained within a command request, an information message is issued that identifies the action to be performed and the resource upon which the action is to take effect. When the request completes, the execution group issues a message that indicates that the message has been processed.

When a Configuration Manager receives a command request and when this request completes, information messages are issued.

Loading IBM and user-defined nodes and parsers

When an execution group starts, it loads all available IBM and user-defined nodes and parsers. For each library that is loaded, two messages are issued. One is issued before the library is loaded and one is issued after the library has been loaded.

Dealing with problems

Before you start:

Make initial checks and check any relevant logs, trace and dumps to see if you can rectify the problem.

This section describes some of the typical problems that can occur, and what actions you can take to resolve them. It contains the following topics:

- “Resolving problems when creating resources”
- “Resolving problems that occur when you start resources” on page 17
- “Resolving problems that occur when migrating or importing resources” on page 31
- “Resolving problems when stopping resources” on page 47
- “Resolving problems when deleting resources” on page 48
- “Resolving problems when developing message flows” on page 51
- “Resolving problems when deploying message flows or message sets” on page 67
- “Resolving problems that occur when debugging message flows” on page 80
- “Resolving problems when developing message models” on page 87
- “Resolving problems when using messages” on page 93
- Resolving problems with memory handling
- “Resolving problems when you use the workbench” on page 104
- “Resolving problems when using databases” on page 111
- “Resolving problems when using publish/subscribe” on page 120
- “Resolving problems with performance” on page 126
- “Resolving problems when developing Configuration Manager Proxy applications” on page 131
- “Resolving problems with user-defined extensions” on page 132
- “Resolving problems when uninstalling” on page 137

Resolving problems when creating resources

This topic contains advice for resolving problems that can occur when you are creating resources.

Problems when creating a broker:

- “Checklist for configuring databases” on page 12
- “Message BIP8146E is issued when creating a broker” on page 13
- “Message BIP1511 is issued when creating a broker” on page 13
- “Message BIP0874 is issued when saving the topology editor after creating or deleting a broker” on page 13
- “Messages BIP2321, BIP2322, BIP8040 are issued when creating a broker” on page 14

- “You cannot create files when creating a broker on AIX” on page 14
- “The Configuration Manager does not remove references to a deleted broker’s queue manager” on page 14
- “The JCL BIPGEN fails when you create a component on z/OS” on page 15
- “The mqsicreatebroker command hangs if the DB2 profile has not been run” on page 15
- “The mqsicreatebroker command core dumps when it is run using an Oracle data source” on page 15
- “Your DataFlowEngine terminates with an abend when you create a Version 6.0 broker on HP-UX using Oracle” on page 15

Problems when creating other resources:

- “Error message BIP8075 is issued when creating a Configuration Manager” on page 16
- “Error message BIP2624 is issued when creating an execution group” on page 16
- “You do not know what authorities are set as part of the mqsicreateaclentry command” on page 16

Checklist for configuring databases

1. Ensure the ODBC database definitions have been fully configured as per the documented instructions: Configuring databases. Remember the following points:
 - a. Edit the final stanza in the ODBC file; the *[ODBC]* stanza.
 - b. You must configure the 32 bit *odbc.ini* settings even if all your Execution Groups are 64 bit. The exception is on the HP-UX platform where all broker processes are 64 bit, and therefore only the 64 bit ODBC definition file needs to be configured.
 - c. Ensure the ODBC drivers used are as specified in the online docs and the sample *odbc.ini* files. This is particularly important when migrating from an earlier release, when different driver names may have been used. The *odbc.ini* file used with the earlier release may need to be updated to reflect new ODBC driver names and to include new settings.
2. Check the environment settings, referring to Configuring databases for details. Remember the following points:
 - a. Run the *mqsiprofile* command.
 - b. Set the required database environment variables (for example: run *db2profile* for DB2).
 - c. If using a 64 bit DB2 database instance, add *<DB2 instance directory>/sql1lib/lib32* to the start of the library search path environment variable (for all 32 bit brokers, that is, all broker platforms except HP-UX).
 - d. If the broker needs to access an Informix user database, add *\$INFORMIX/lib:\$INFORMIX/lib/esql:\$INFORMIX/lib/cli* to the library search path environment variable (see the Informix product documentation for more information). You must ensure that any WebSphere Message Broker libraries appear *before* any Informix libraries in the library search path.
 - e. If using a 64 bit Oracle instance, add *\$ORACLE_HOME/lib32* to the start of the library search path environment variable (for all 32 bit brokers, that is, all broker platforms except HP-UX).

3. Check that the userid you use to access the database has sufficient permissions on the broker database to connect and to create tables and indices as described in Authorizing access to the databases.
4. Ensure that the Broker's service userid has read permissions on the database client lib directories and files.
5. If you are using Oracle, you must also run the mqsi_setupdatabase command (for details see mqsi_setupdatabase command).

Message BIP8146E is issued when creating a broker

- **Scenario:** The mqsicreatebroker command fails with the message BIP8146E: Unable to retrieve the SQL primitives supported by the Database.
- **Explanation:** The command has failed to successfully connect and retrieve database properties information.
- **Solution:** If this is the case:
 - Check that the userid being used to access the database has sufficient permissions to connect to the database and to create tables.
 - Check that the ODBC configuration has been performed in accordance with Enabling connections to the databases

Message BIP1511 is issued when creating a broker

- **Scenario:** Error message BIP1511E is displayed when you create a new broker in the Topology editor, as follows:

```
BIP1511E: Queue manager 'QM1' cannot be associated with broker 'BR1'; it is already associated with broker 'BR1'
```
- **Explanation:** A queue manager cannot be associated with the specified broker because it is already associated with that broker name. The problem occurs because you performed an incorrect sequence of actions when you originally deleted the broker, and you are now trying to re-create a broker of the same name.
- **Solution:** Delete the broker before attempting to re-create it, as follows:
 1. Stop the broker using the mqsisistop command.
 2. Delete the broker from the topology.
 3. Check that the deletion was successful, and that the broker has disappeared from the list in the workbench.
 4. If you are using publish/subscribe and the network of connected brokers has been modified as a result of the deletion, issue a delta deploy of the topology.
 5. Delete the broker using the mqsideletebroker command.

Do not try to re-create the broker until the deleted topology has been deployed successfully. If the broker is no longer shown in the workbench, you can then re-create the broker, as follows:

1. Create the broker using the mqsicreatebroker command.
2. Create the broker in the topology.
3. Deploy the topology.

Message BIP0874 is issued when saving the topology editor after creating or deleting a broker

- **Scenario:** Message BIP0874E is displayed when you are saving the topology editor after creating or deleting a broker, and the broker is not created or deleted.

- **Explanation:** This problem occurs because you are no longer authorized to modify the topology.
- **Solution:** Ask your WebSphere Message Broker administrator to give your user ID full access to the broker topology.

If you close the editor and save the topology changes, you do not receive any error messages.

Messages BIP2321, BIP2322, BIP8040 are issued when creating a broker

- **Scenario:** The mqsicreatebroker command fails with the above set of messages.
- **Explanation:** The command has failed to successfully connect and retrieve database properties information.
- **Solution:** Make the following checks:
 1. That the environment has been setup correctly for database access. In particular, if using a 64 bit DB2 or Oracle instance, ensure the 32 bit database client libraries directory is at the front of the library search path.
 2. That the Broker's service userid has read access to the database client libraries.
 3. For all broker platforms except HP-UX, that the 32 bit ODBC file is configured, as the broker is a 32 bit application.

You cannot create files when creating a broker on AIX

- **Scenario:** When you run the mqsicreatebroker command on WebSphere Message Broker for AIX, the following message is displayed:

BIP8135E Unable to create files. Operating System return code 1

- **Explanation:** The user ID that you create for WebSphere Message Broker testing must have a primary group of mqm, and have mqbrkrs as one of the group set. The following example shows an AIX SMIT panel listing the **Change / Show Characteristics of a User:**

```

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> +

```

The Configuration Manager does not remove references to a deleted broker's queue manager

- **Scenario:** The broker definition is incorrect, so you cannot add a new broker.
- **Explanation:** This can occur if you delete a broker component without removing it from the Message Brokers Toolkit first. If your broker definition is incorrect, you cannot instruct the Configuration Manager to add a new broker with the same queue manager to the broker domain because the Configuration Manager reports that the queue manager is already associated with the broker that you deleted.

If your broker definition is incorrect, you cannot redeploy. If you delete a broker component then try to deploy to it, any subsequent deploy to that broker fails because the Configuration Manager reports that it is already deploying to the broker that you have deleted.

- **Solution:** Delete the queue manager for the deleted broker, then deploy. When you deploy, the Configuration Manager recognizes that the queue manager does not exist and cleans up the broker's definition. You can now associate the queue manager with another broker or redeploy the broker.

The JCL BIPGEN fails when you create a component on z/OS

- **Scenario:** The BIPGEN job fails when you are copying the component profile (BIPBPROF, BIPCPROF, or BIPUPROF) from the PDSE to the file system.
- **Explanation:** There might not be enough space in the file system, the component profile might not exist, or you might not have the appropriate authority.
- **Solution:** Make the following checks:
 - That the file system has sufficient space. You can check how much space is used and how much is free in a file system using the OMVS command `df -P /pathname`. 100 MB is 3 276 800 512 byte sectors.
 - That the profile file exists in the PDSE.
 - That you have the appropriate authority to write to the file system.

The mqsicreatebroker command hangs if the DB2 profile has not been run

- **Scenario:** The `mqsicreatebroker` command hangs if the DB2 profile has not been run. If you stop the command, this could result in a partial broker setup. This partially-created broker might be shown by the `mqsilist` command and the registry but none of the broker tables will have been created.
- **Explanation:** This error can occur if the environment has not been set up correctly.
- **Solution:** Remove any partial setup and ensure that the environment is set up correctly by following the instructions in *Configuring WebSphere Message Broker*. Run the DB2 profile before reissuing the `mqsicreatebroker` command.

The mqsicreatebroker command core dumps when it is run using an Oracle data source

- **Scenario:** The `mqsicreatebroker` command core dumps when it is run using an Oracle data source
- **Explanation:** This problem occurs when the Oracle libraries fail to load.
- **Solution:** If you can run the Oracle `sqlplus` utility, your basic Oracle environment is correct. However, the default Oracle libraries are 64 bit versions and these are not compatible with the broker.
 - Check your `LD_LIBRARY_PATH` setting in the environment when you create the broker.

The broker requires the 32 bit Oracle libraries and these are normally found in `<ORACLE_HOME>/lib32` for a 64 bit Oracle installation. It is possible on some operating systems to install a 32 bit only version of Oracle; if you have this variant of Oracle installed, the libraries are in `<ORACLE_HOME>/lib`
 - Check that the Broker's service userid has read access to the Oracle client libraries.
 - Check that the 32 bit ODBC definition file has been configured for the broker (all platforms except HP-UX).

Your DataFlowEngine terminates with an abend when you create a Version 6.0 broker on HP-UX using Oracle

- **Scenario:** Your DataFlowEngine (DFE) terminates with an abend when you create a Version 6.0 broker on HP-UX using Oracle.

- **Explanation:** This problem occurs when DB2 is installed on the same computer as Oracle.
- **Solution:** Remove the DB2 lib files that are used by WebSphere Message Broker. For example, issue the following commands:

```
mv install dir/lib/imbdfdb2v6.lib install dir/lib/imbdfdb2v6.blank
mv install dir/lib/imbdfdb2.lib install dir/lib/imbdfdb2.blank
```

Error message BIP8075 is issued when creating a Configuration Manager

- **Scenario:** On a Windows system, the `mqsicreateconfigmgr` command fails with message BIP8075 and a Java exception `unsatisfiedLinkException`.
- **Explanation:** The Configuration Manager cannot find the JAR files that it needs to connect to the configuration database. If you have installed additional software since installing the broker, or have made manual updates to your CLASSPATH, these might cause the `mqsicreateconfigmgr` command to fail.
- **Solution:** Ensure that the DB2 JAR files, especially `db2java.zip`, are in your CLASSPATH.

Error message BIP2624 is issued when creating an execution group

- **Scenario:** When you create an execution group, you get several BIP2624 messages (MQRC=2012 (MQRC_ENVIRONMENT_ERROR)), and no WebSphere MQ messages are processed.
- **Explanation:** You have created the broker to run as a WebSphere MQ trusted application (that is, the broker runs in the same process as the WebSphere MQ queue manager), but the user ID that you specified does not have the required authority.
- **Solution:** If you request the trusted application option on the `mqsicreatebroker` command by specifying the `-t` parameter, perform the appropriate steps for your operating system:

Windows Windows

Using the `-i` parameter on the `mqsicreatebroker` command, specify a service user ID that is a member of WebSphere MQ group `mqm`.

AIX AIX

The `-t` parameter is ignored. The broker does not run as a trusted application on AIX.

UNIX Other UNIX systems

Specify the user ID `mqm` on the `-i` parameter on the `mqsicreatebroker` command.

You do not know what authorities are set as part of the mqsicreateaclentry command

- **Scenario:** You do not know what authorities are set on the queue manager as part of the `mqsicreateaclentry` command.
- **Solution:** Use the WebSphere MQ `dspmqaout` command to check which authorities have been set on a queue manager by the `mqsicreateaclentry` command. Ensure that the following authorities are set:
 - `inq`
 - `set`
 - `connect`
 - `altusr`

- chg
- dsp
- setall

Resolving problems that occur when you start resources

This topic contains advice for dealing with some common problems that can arise when you start resources:

- “Resolving problems that occur when you start a broker” on page 18
 - “The broker and execution group are not running after you use the Default Configuration wizard” on page 18
 - “The broker or Configuration Manager fails to start because there is not enough space in the Java TMPDIR directory” on page 18
 - “The broker fails to start when it is installed on HP-UX with Oracle and DB2” on page 18
 - “Error message BIP2048 is issued on z/OS when your broker fails to start” on page 19
 - “Diagnostic message ICH408I is issued on z/OS when your broker fails to start” on page 19
 - “Abend code 047 is issued with a diagnostic message” on page 20
 - “Abend code 047 is issued in bin/bipimain” on page 20
 - “Database error message BIP2322 is issued when you start or stop a broker on Linux or UNIX” on page 21
 - “Error message BIP2228 is issued when you try to start a second broker on Linux or UNIX” on page 21
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 - “Error messages BIP2604 or BIP2624 are issued when you start a broker or a new message flow” on page 22
 - “When you start the broker through the DataFlowEngine, it cycles continually” on page 22
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- “Starting the Configuration Manager” on page 23
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 - “Error messages BIP1708 and BIP8283 are issued when you start a Configuration Manager on Windows” on page 24
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 - “A “Not Found” error is issued when you click a link to the Samples Gallery or a specific sample” on page 27
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- “Abend code 0C1 is issued when you try to start the DataFlowEngine on z/OS” on page 29
- “Error message BIP2604 with return code MQRC_CONNTAG_IN_USE is issued during the start of a message flow on z/OS” on page 29
- “You cannot start the User Name Server” on page 30
- “A device allocation error is issued” on page 30
- “The create command fails and error message BIP8022 is issued” on page 31

Resolving problems that occur when you start a broker

This topic contains advice for dealing with some common problems that can arise when you start a broker:

The broker and execution group are not running after you use the Default Configuration wizard:

- **Scenario:** You have used the Default Configuration wizard to create a default configuration, and the alerts in the Broker Administration perspective show that your broker and execution group are not running.
- **Explanation:** At this stage, nothing has been deployed to the broker or execution group so they are displayed as not running. After you have deployed to the broker, the correct state of the broker and execution group is displayed.

The broker or Configuration Manager fails to start because there is not enough space in the Java TMPDIR directory:

- **Scenario:** The broker or Configuration Manager fails to start and you see an error message indicating that there is insufficient space.
- **Explanation:** The broker and Configuration Manager use Java JAR files. When the broker or Configuration Manager starts, the Java Run_time extracts the JAR files into a temporary directory, Java TMPDIR. On Linux, UNIX and z/OS systems, the TMPDIR directory is usually /tmp; on Windows systems, it is c:\temp. If this directory is not large enough to hold the JAR files, the broker or Configuration Manager does not start.
- **Solution:** Use one of the following methods to specify the location of this temporary JAR directory:
 - use the environment variable TMPDIR
 - set the system property java.io.tmpdir

Allow at least 50 MB of space in this directory for broker components and 10 MB of space for Configuration Manager components. You might need more space if you deploy large user-defined nodes or other JARs to the broker component.

The broker fails to start when it is installed on HP-UX with Oracle and DB2:

- **Scenario:** Oracle 9i, or 10g, and DB2 V8 are installed on the same HP-UX system and the broker is using an Oracle broker database. The broker fails to start, and an abend file shows that a segmentation violation has occurred because symbols in the Oracle libraries are resolved in a DB2 library.
- **Explanation:** This problem is due to a coexistence issue between Oracle and DB2 on HP-UX.
- **Solution:** To use an Oracle broker database and have DB2 installed on the same HP-UX system, disable the *install_dir/lib/imbdfdb2.lil* file. The easiest way to do this is to rename the imbdfdb2.lil file.

When you disable this file, it stops the broker invoking DB2 libraries that the HP-UX operating system then uses to resolve the Oracle symbols.

Error message BIP2048 is issued on z/OS when your broker fails to start:

- **Scenario:** The following message is written to the SDSF SYSLOG on z/OS when your broker fails to start:

```
(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 Code '-99999'
```
- **Explanation:** The SQL State value of 58004 reveals that a system error occurred. This might be due to a DB2 authorization problem.
- **Solution:** 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 database tables
 - EXECUTE authorization on plan DSNACLI
 - SELECT authorization on table SYSIBM.SYSSYNONYMS
 - SELECT authorization on table SYSIBM.SYSTABLES
 - SELECT authorization on table SYSIBM.SYSDATABASE

Ensure that the broker user ID (or the group of which it is a member) has been granted the necessary authorizations.

If the started task ID does not have execute authorization on the DSNACLI plan, you get the errors listed in the scenario. If ODBC tracing is turned on, you 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:DFL0 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 = DSNAET03 SQL PROCEDURE DETECTING ERROR ERRLOC=2:170:8", pcbErrorMsg=371 )
----> SQL_SUCCESS
```

If the started task ID does not have SELECT authorization on tables SYSIBM.SYSSYNONYMS, SYSIBM.SYSDATABASE and SYSIBM.SYSTABLES, and if ODBC tracing is turned on, you 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
```

Diagnostic message ICH408I is issued on z/OS when your broker fails to start:

- **Scenario:** The following diagnostic message is written to the SDSF SYSLOG on z/OS when your broker fails to start:

```

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(01D7D3E2E3F1F9002D08000000000003)
INSUFFICIENT AUTHORITY TO LOOKUP
ACCESS INTENT(--X) ACCESS ALLOWED(OTHER ---)

```

- **Explanation:** The started task ID, under which the broker runs, needs to be in an RACF or USS group that has rwx permissions on the broker directory. As an example, consider a broker that is created under directory /argo/MA00BRK. It runs under started task ID MA00USR. Issuing the `ls -al` command from the root directory / to find the permission bit settings on /argo reveals:

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

If you issue the `id MA00USR` command to find the group membership of started task ID MA00USR you see:

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

These results show 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 that is associated with MA00USR. If the permissions are not set correctly, you see the type of diagnostic message shown in the scenario.

- **Solution:** Make sure that the started task ID, under which the broker runs, is in an RACF or USS group that has rwx permissions on the broker directory.

Abend code 047 is issued with a diagnostic message:

- **Scenario:** On z/OS, your broker generates abend code 047 when you try to start it, and the following diagnostic message is written to the SDSF SYSLOG:

```

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

```

- **Explanation:** System completion code 047 means that an unauthorized program issued a restricted Supervisor Call (SVC) instruction. The diagnostic message also indicates that the program in error was bipimain.
- **Solution:** When you install WebSphere Message Broker, issue the command `extattr +a bipimain` from the bin directory of the installation path to give APF authorization to program bipimain.

Abend code 047 is issued in bin/bipimain:

- **Scenario:** You get abend code 047 in bin/bipimain.
- **Explanation:** If you see this abend code, check the APF authorization.

If your broker fails to start, submit a job to run the broker procedure. For example:

```
//MQP1BRK JOB 1,MSGCLASS=H
//S1 EXEC PROC=MQP1BRK
```

If this works, the started task user ID is probably unable to access resources.

- **Solution:** To help identify the cause of the problem, carry out the following procedure:
 1. Submit the CVP job to run with the user ID of the broker started task, and resolve any problems that arise.
 2. Submit the CVP job using the started task user ID, by putting `user=xxxxx,password=yyyy` on the job card temporarily or by using a surrogate facility of the External Security Manager. To set up the surrogate facility with RACF, create a SURROGAT class profile and give access to either the user only or a group only. For example, use the following RACF commands:

```
RDEFINE SURROGAT MQP1BRK.SUBMIT OWNER(mqp1brk) AUDIT(ALL(READ))
PE MQP1BRK.SUBMIT CLASS(SURROGAT) ID(myid) ACC(READ)
```

When you issue these commands, it allows myid to put `USER=MQP1BRK` in the job card of a job, which then runs under the MQP1BRK user ID.

Database error message BIP2322 is issued when you start or stop a broker on Linux or UNIX:

- **Scenario:** The following error message is displayed when you start or stop a broker on a Linux or UNIX system:

```
BIP2322E: Database Error. DataDirect ODBC driver License file not found
```
- **Explanation:** When you start or stop a broker from a user ID other than the one that created the broker (that is, not the service user ID), a problem might occur where WebSphere Message Broker cannot find the necessary DataDirect license file (*install_dir/wmqi/IVUK.LIC*).
- **Solution:** Insert a link to the DataDirect license file into the `/usr/local/lib` directory.

Error message BIP2228 is issued when you try to start a second broker on Linux or UNIX:

- **Scenario:** Error message BIP2228, which mentions `semctl` in the syslog, is displayed when you try to start a second broker on Linux or UNIX.
- **Explanation:** This error usually indicates a permissions problem with a semaphore used by WebSphere Message Broker. A semaphore is created when the first broker starts after a reboot (or after an initial installation), and only members of the semaphore creator's primary group can access this semaphore. This problem is a consequence of the UNIX System V IPC primitives that are used by WebSphere Message Broker.

The BIP2228 message is logged by any broker that is started by a user who is not a member of the semaphore creator's primary group. The broker tries to access the semaphore, but fails with a permissions-related error. The broker then terminates with the BIP2228 message.

- **Solution:** Avoid this problem by ensuring that all user IDs used to start WebSphere Message Broker have the same primary group. If this is impractical, ensure that all user IDs are members of each others' primary groups. Contact your IBM Support Center for further assistance.

MQIsdp client connection is refused by the broker:

- **Scenario:** When a new MQIsdp client tries to connect to the broker, its connection is refused.
- **Explanation:** MQIsdp Client ID fields must be unique. If a client sends a CONN packet that contains the same Client ID as a currently-connected client, the behavior is undefined.
- **Solution:** Ensure that Client IDs are unique.

Error messages BIP2604 or BIP2624 are issued when you start a broker or a new message flow:

- **Scenario:** The following messages are written to the USS syslog on z/OS when your execution group, or a newly deployed or started message flow, fails to start:


```
(PMQ1BRK.default)[8]BIP2624E: Unable to connect to queue manager 'PMQ5':
      MQCC=2; MQRC=2025; message flow node 'ComIbmMQConnectionManager'
(PMQ1BRK.default)[8]BIP2604E: Node failed to open WebsphereMQ queue
      'INPUT1' owned by queue manager 'PMQ5': completion code 2; reason code 2025
```
- **Explanation:** The WebSphere MQ return code of 2025 indicates that the maximum number of concurrent connections has been exceeded. On z/OS, a possible cause of this problem is the setting for IDBACK in the WebSphere MQ CSQ6SYSP macro.
- **Solution:** Refer to the *WebSphere MQ for z/OS System Setup Guide* on the WebSphere MQ library Web page for information about setting the IDBACK variable.

When you start the broker through the DataFlowEngine, it cycles continually:

- **Scenario:** When you start the broker through the DataFlowEngine, it continually cycles, starts and stops, and the following errors appear in the log:
 - BIP2801E: Unable to load implementation file '/opt/IBM/DistHub/v2/lib/libdhnBIO.so', rc=The file access permissions do not allow the specified action.
 - BIP2110E: Message broker internal program error.
- **Explanation:** The permissions on /opt/IBM have a value of 700, meaning that the Broker ID cannot read the disthub files.
- **Solution:** Set the permissions on /opt/IBM to 755, which is rwxr-xr-x.

The broker terminates with an abend on startup on AIX:

- **Scenario:** The broker terminates with an abend on startup. Error message BIP2228 is issued, stating that the /usr/java131 directory cannot be found. In addition, a number of abend files are generated.
- **Explanation:** The Java Runtime Environment (JRE) is a prerequisite on AIX and must be installed in a directory named /usr/java131 in order to start a broker.
- **Solution:** Make sure that you install the JRE in the /usr/java131 directory before you start a broker. Alternatively, create a symbolic link between the /usr/java131 directory and the directory where the JRE was installed.

You have changed your logon password and cannot start your Configuration Manager or broker:

- **Scenario:** You have changed your logon password and when you start the Configuration Manager or broker, you see the following error message:


```
BIP8026E: Unable to start the component.
      The component could not be started using the service userid that was supplied when
      the component was created. Ensure that the service userid and password are still
```

valid. Ensure that the service userid has permission to access all of the products directories, specifically the 'bin' and 'log' directories. Check for system messages (on Windows NT this would be the application event log).

- **Solution:** Change properties of your broker, Configuration Manager, and possibly DB2 services by performing the following steps:

1. Change your broker using the command:

```
mqsichangebroker brokername -i ServiceUserID -a ServicePassword -p DataSourcePassword
```

For example, to change your logon password to user1pwd for user ID user1 on the broker called WBRK_BROKER, you would use the command:

```
mqsichangebroker WBRK_BROKER -i user1 -a user1pwd -p user1pwd
```

2. Change your Configuration Manager using the command:

```
mqsichangeconfigmgr -i ServiceUserID -a ServicePassword -p DataBasePassword
```

For example, to change your logon password to user1pwd for user ID user1 on the Configuration Manager, you would use the command:

```
mqsichangeconfigmgr -i user1 -a user1pwd -p user1pwd
```

3. Change the logon properties on your DB2 services:
 - a. Click **Start** → **Settings** → **Control Panel** → **Administrative Tools** → **Services**
 - b. Right-click **DB2 services**, click **Properties**, and click the **Log On** tab.
 - c. Change your account and password to reflect the database passwords used in the commands above.
 - d. Stop and start your services.
 - e. Restart your computer.
4. Restart your components.

Starting the Configuration Manager

This topic contains advice for dealing with some common problems that can arise when you start the Configuration Manager:

A migrated Configuration Manager does not start:

- **Scenario:** You have migrated a Configuration Manager to WebSphere Message Broker Version 6.0. You are unable to start the Version 6.0 Configuration Manager for the first time and the following event messages appear repeatedly in the Windows Application Log: 2001, 1223, 1224, 1228, 1205, 1007.
- **Explanation:** This error can occur if a large domain is being migrated; for example, the Configuration Manager manages a number of brokers, each of which has one thousand persistent subscriptions. The error is due to the **APP_CTL_HEAP_SZ** parameter on the DB2 Universal Database being too small for the size of the domain that is being migrated.
- **Solution:** Increase the size of the **APP_CTL_HEAP_SZ** parameter by performing these steps:
 1. Stop the migrated Configuration Manager by issuing the mqsistop Configmgr command in the Command Console.

When the Configuration Manager has stopped, a message appears in the Windows Event Viewer's Application Log, with a source identifier of WebSphere Broker v6000 and event identifier of 2002.
 2. For the database of the previous version of the Configuration Manager, complete the following steps at a DB2 Universal Database command prompt:
 - a. Connect to the database by issuing the command:

```
db2 connect to cm_db user db_userid using db_password
```

- b. Determine the current value of the **APP_CTL_HEAP_SZ** parameter by issuing the command:


```
db2 get db dfg for cm_db | find "APP_CTL_HEAP_SZ"
```

 The output looks like this:


```
Max appl. control heap size (4KB) (APP_CTL_HEAP_SIZE) = 128
```
 - c. Increase the value of the **APP_CTL_HEAP_SZ** parameter by issuing the command:


```
db2 update db cfg for cm_db using APP_CTL_HEAP_SZ higher_value
```
 - d. Issue the following command to force all applications to disconnect from the database to allow the changes to become effective:


```
db2 force application all
```
 - e. To force the change to be effective immediately, stop and restart the DB2 Universal Database by issuing the commands:


```
db2stop
db2start
```
3. Start the migrated Configuration Manager by issuing the **mqsistart ConfigMgr** command in the Command Console.

When the Configuration Manager has started successfully, the following event messages appear in the system's local error log with the source identifier WebSphere Broker v6000: 2001, 1223, 1224, 1228, 8255, 8280, and 1003.

If the error log still contains the original six event identifiers repeatedly (2001, 1223, 1224, 1228, 1205, and 1007), repeat steps 1 to 3, increasing the value that is assigned to the **APP_CTL_HEAP_SZ** parameter.

Error messages BIP1708 and BIP8283 are issued when you start a Configuration Manager on Windows:

- **Scenario:** Error messages BIP1708 and BIP8283 are issued when you start a Configuration Manager on Windows:

BIP8283E: *Configuration_Manager_name*) User Name Services are disabled.

The Configuration Manager communicates with the User Name Server in order to procure user and group information for configuring topic ACLs. No action unless you want to manage topic ACLs. If you want to manage topic ACLs you must reconfigure the Configuration Manager by providing a queue manager name for the User Name Server.

BIP1708E: *Configuration_Manager_name*) User Name Services are disabled.

The Configuration Manager communicates with the User Name Server in order to procure user and group information for configuring topic ACLs. No action unless you want to manage topic ACLs. If you want to manage topic ACLs you must reconfigure the Configuration Manager by providing a queue manager name for the User Name Server.

- **Explanation:** These two errors are issued if the Windows component File and Printer Sharing for Microsoft Networks is not installed on this system, or was uninstalled after you installed WebSphere Message Broker. The Configuration Manager uses APIs that are provided by the File and Printer Sharing component to implement user access authorizations.
- **Solution:** Install the Windows File and Printer Sharing component. If you do not want to use this component to allow users to share printers or files on this system, disable the component. The Configuration Manager requires the component to be installed, but does not need the component to be enabled to complete its access checks.

Starting other resources

This topic contains advice for dealing with some common problems that can arise when you start resources other than a broker or the Configuration Manager:

Resources terminate during startup:

- **Windows** **Scenario:** The following error message is displayed when you start a broker, the Configuration Manager, or the User Name Server on Windows:
ServiceName - DLL initialization failure Initialization of the dynamic link library c:\windows\system32\user32.dll failed.
The process is terminating abnormally.
- **Explanation:** This error is issued by Windows when it fails to start a service because it has insufficient storage.
- **Solution:** 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>.

Resources hang at startup on Windows:

- **Windows** **Scenario:** You try to start the Configuration Manager or a broker on Windows, but nothing happens in the Event log to show that a connection has started.
- **Explanation:** This problem is usually caused by processes having only one thread. To see if this is the case, check the Windows Task Manager. If either of the processes `bipconfigmgr.exe` or `dataflowengine.exe` has started, check the number of threads owned by the process. If the process has only one thread, you are likely to encounter this problem.
- **Solution:**
 1. Shut down the broker using the `mqsistop` command and end the process from within the Task Manager.
 2. From the Windows **Start** button, click **Settings** → **Control Panel**
 3. Double-click **Administrative Tools**
 4. Double-click **Services** to open the Services window. From the list of available services, locate and right-click on the broker or Configuration Manager resource you are attempting to start (the service name will begin with IBM WebSphere Message Broker component). Click on **Properties** from the pop-up menu.
 5. Make a note of the **This Account** setting. Contact the system administrator to obtain the password associated with **This Account**, as these settings will be lost as you make changes.
 6. Select **System Account** as the **Log On As** option, and select **Allow Service to Interact with Desktop**. These selections allow you to see any hidden dialog messages. Click **OK** to accept the changes.
 7. Restart the resource that is failing and report any subsequent error messages and dialog box messages to your IBM Service Representative.
 8. When your IBM Service Representative has resolved this problem for you, make sure that you restore the **This Account**, **Password**, and **Confirm Password** entries to those that you used when you created the broker.

Error message BIP8048 is issued when you start a component:

- **Scenario:** Error message BIP8048 is issued when you start a component.
- **Explanation:** This message indicates that WebSphere MQ is not responding as expected when it tries to start the queue manager. This could be because the

strmqm executable file is not present on UNIX or Linux systems, or the amqmdain executable file is not present on Windows, or permissions are incorrect.

- **Solution:** Check that your WebSphere MQ installation is fully functional:
 - On Windows, start the "IBM MQSeries" service.
 - On UNIX or Linux, issue the **strmqm** command to start the queue manager that is associated with this component.

If the check fails, your WebSphere MQ installation is incomplete. This is typically because you have previously installed WebSphere Application Server, which installs an embedded WebSphere MQ component that does not support WebSphere Message Broker.

Uninstall WebSphere Application Server, then install the full WebSphere MQ product that is provided with WebSphere Message Broker.

You experience problems with the default configuration:

- **Scenario:** You have run the Default Configuration wizard but there are problems with the default configuration.
- **Solution:** Use the Default Configuration wizard to remove the default configuration.

If the Default Configuration wizard does not remove the default configuration completely, a Wizard failure window will open with instructions on where to find the wizard's log. Perform the following steps:

1. Follow any advice that is given in the Default Configuration wizard log and retry each step.
2. If this fails, restart the computer and run the Default Configuration wizard again.
3. If the wizard still does not remove the default configuration, remove each component manually by performing the following steps in the order shown:
 - a. Issue the following commands to find out which components are installed:
 - mqsilist (lists the broker components: broker and Configuration Manager)
 - dspmq (lists WebSphere MQ components: the queue manager)
 - db2 list db directory (lists DB2 databases)
 - b. In the Message Brokers Toolkit, delete the connection file LocalDomain.configmgr from the project LocalProject.
 - c. In the Message Brokers Toolkit, delete the project LocalProject.
 - d. Stop the default Configuration Manager by issuing the following command in the Command Console:
mqsistop WBRK6_DEFAULT_CONFIGURATION_MANAGER
 - e. Stop the default broker by issuing the command:
mqsistop WBRK6_DEFAULT_BROKER
 - f. Delete the default broker by issuing the command:
mqsdeletebroker WBRK6_DEFAULT_BROKER -w
The **-w** parameter deletes all files related to this broker from the associated workpath.
 - g. Delete the default Configuration Manager by issuing the command:
mqsdeleteconfigmgr WBRK6_DEFAULT_CONFIGURATION_MANAGER
-w -q -n

The **-q** parameter deletes the queue manager, so do not use this parameter if you have not already deleted the broker. The **-w** parameter deletes all files related to the Configuration Manager from the associated workpath and the **-n** parameter deletes the configuration repository.

h. Remove the database by issuing the following commands:

- On Linux:
db2 disconnect DEFBKDB6
db2 drop DEFBKDB6
- On Windows:
mqsideletedb DEFBKDB6

Do not use these commands unless you have already deleted the broker. The database must never be deleted before the broker.

i. If you need to remove the queue manager manually, issue the following commands:

```
endmqslr -w -m WBRK6_DEFAULT_QUEUE_MANAGER  
endmqm -i WBRK6_DEFAULT_QUEUE_MANAGER  
dltmqm WBRK6_DEFAULT_QUEUE_MANAGER
```

4. If you are still experiencing problems after removing the default configuration manually, contact your IBM Support Center.

A "Not Found" error is issued when you click a link to the Samples Gallery or a specific sample:

- **Scenario:** You see a "Not Found" error when you click a link to the Samples Gallery or to a specific sample, indicating that a URL is invalid.
- **Explanation:** The Samples Gallery and the sample applications are available only if you are viewing the information center from within the Message Brokers Toolkit. If you are viewing a standalone information center, you cannot access these resources.
- **Solution:** If you want to access the Samples Gallery, ensure that you are viewing the information center from within the Message Brokers Toolkit.

The Quick Tour displays as a blank window:

- **Scenario:** The Quick Tour displays as a blank window.
- **Explanation:** The Quick Tour requires Adobe Flash Player (was Macromedia Flash Player) Version 7, and is displayed as a blank window if the Adobe Flash Player plug-in is not installed or is at the wrong level on the default browser.
- **Solution:** Download the Adobe Flash Player using one of the following methods:
 - Follow the link at the bottom of the Quick Tour page.
 - Select the specific Adobe Flash Player for your operating system and browser from the Adobe Flash Player download page.

If the Quick Tour is not displayed correctly through the information center, you can view it by opening this file in a browser that has the Adobe Flash Player installed: `evtoolkit\ eclipse\ plugins\ com.ibm.etools.mft.quicktour.doc_6.0.0\ quick_tour\ quick_tour.html`.

Error message BIP0832 is issued on startup:

- **Scenario:** The following error message is displayed on startup:

BIP0832E: A class java.io.FileNotFoundException exception occurred which reported the following message: [filepath] (The process cannot access the file because it is being used by another process). Resolve the reason of error and try again.

- **Explanation:** An invalid WebSphere MQ Java Client trace output file has been specified on the Enqueue preferences screen.
- **Solution:**
 1. Open the Enqueue preferences screen by clicking **Windows** → **Preferences**, then clicking **Enqueue** on the left.
 2. In the **To file** field, specify a valid output file (one that is not read-only or already in use).

Your execution groups restart repeatedly:

- **Scenario:** Your execution groups restart repeatedly. The syslog might show an error, such as BIP2060.
- **Explanation:** The problem might be caused by:
 - The broker environment variables incorrectly defined
 - Incorrect Loadable Implementation Library directory permissions
 - Incorrect database permissions
 - Invalid user-written LILs
- **Solution:** Check:
 - Environment variables as described in Environment variables after installation
 - File and directory permissions as described in Checking the permission of the installation directory
 - Group memberships as described in Execution groups and Adding an execution group to a broker

You cannot tell whether startup is complete on z/OS:

- **Scenario:** You cannot tell whether startup has completed on your z/OS system.
- **Solution:** To determine if startup is complete:

1. Check the messages in the syslog. The following example shows a syslog entry for a startup of a broker with one execution group:

```
S STU3053
$HASP100 STU3053 ON STCINRDR
IEF695I START STU3053 WITH JOBNAME STU3053 IS ASSIGNED TO USER STU3
, GROUP STCGROUP
$HASP373 STU3053 STARTED
+(broker53) 0 BIP9141W: The component was started.
+(broker53) 0 BIP2001I: The WebSphere Business Integration Message Broker
service has started
process ID 33554919.
+(broker53.default) 0 BIP2201I: Execution Group started: process '67109
442
196'; thread '0'; additional information 'broker53', '76eb7f2d-e800-00
00-0080-974c271866d2', 'default', 'true', 'Q4A3', 'false', 'ARG5D651',
'ARG053', '*****', 'false', 'f9c27f2d-e800-0000-0080-974c271866d2'
, '/local/argo/driver/drv3', '/local/argo/tgrp53/broker53'.
+(broker53.default) 0 BIP9137I: A work manager has been registered by R
443
RMS registration services, work manager name is BIP.STU30532.006710919
6.IBM.UA .
```

2. Display the address spaces. The following example shows the display of a broker with one execution group:

```

D OMVS,U=STU3
BPX0040I 18.49.59 DISPLAY OMVS 446
OMVS 000E ACTIVE OMVS=(68,05)
USER JOBNAME ASID PID PPID STATE START CT_SECS
STU3 STU30531 0069 33554696 33554919 HR 18.49.15 2.217
LATCHWAITPID= 0 CMD=bipbroker broker53
STU3 STU30532 03FD 67109196 67109222 HR 18.49.23 19.816
LATCHWAITPID= 0 CMD=DataFlowEngine broker53 76eb7f2d-e800-00
STU3 STU3053 0036 33554768 83886483 HRI 18.49.08 .653
LATCHWAITPID= 0 CMD=bipservice Q4A3BRK AUTO
STU3 STU30532 03FD 67109222 33554696 1W 18.49.23 19.816
LATCHWAITPID= 0 CMD=bipimain DataFlowEngine broker53 76eb7f2
STU3 STU3053 0036 83886483 1 1WI 18.49.08 .653
LATCHWAITPID= 0 CMD=/local/argo/driver/drv3/bin/bipimain bip
STU3 STU30531 0069 33554919 33554768 1W 18.49.15 2.217
LATCHWAITPID= 0 CMD=bipimain bipbroker broker53

```

The infrastructure main program bipimain is the first process in every address space. It starts bipservice, bipbroker, DataFlowEngine, or bipuns as the second process in the same address space. For each execution group, an additional address space is started. In this example, only one execution group is available.

Abend code 0C1 is issued when you try to start the DataFlowEngine on z/OS:

- **Scenario:** The first two WebSphere Message Broker address spaces start successfully, but the third address space (the DataFlowEngine) fails to start. The result is an 0C1 abend.
- **Explanation:** The DataFlowEngine address space is generated by the admin agent. If the region size is too small, either because an insufficient region size was specified in the procedure, or because the region size was overridden by the z/OS IEFUSI exit, the DataFlowEngine address space might fail to start, and fails with an 0C1 abend.
- **Solution:**
 1. Use the IPCS command on the dump (move the dump from the file system to a traditional MVS data set if required):
`verbx vsmdata,'noglobal',jobname(vcp0brk2)'`

where *vcp0brk2* is the name of the failing job.
 2. Find the string 'VSM LOCAL DATA AREA AT ADDRESS '. The field ELIM gives the available region size and must be greater than 0C800000. If the field SMFEL is not ffffffff, the IEFUSI exit has changed the allowable region size. This value must also be greater than 0C80000.
 3. If you have an IEFUSI exit, check that the exit does not limit the broker address spaces. For example, a commonly-used field is OUCBSUBN. This can be STC or OMVS for the broker and indicates how the address space was started.

Error message BIP2604 with return code MQRC_CONNTAG_IN_USE is issued during the start of a message flow on z/OS:

- **Scenario:** Error message BIP2604 is issued with return code MQRC_CONNTAG_IN_USE during the start of a message flow on z/OS:
BIP2604E: Node failed to open WebSphere Business Integration queue [queue name] owned by queue manager [queue manager name]

This message is output every 30 minutes.

- **Explanation:** On z/OS, WebSphere MQ supports serialized access to shared resources, such as shared queues, through the use of a connection tag (serialization token) when an application connects to a queue manager that participates in a queue sharing group.

In this case, a message flow node fails to connect to the indicated WebSphere Message Broker queue manager that is associated with the input queue, because the serialization token that it passed is already in use within the queue sharing group.

This message is for information only. It indicates that serialization is occurring when two or more message flow input nodes try to connect to a queue manager to get messages from a shared queue.

- **Solution:** Check whether another instance of the message flow, or a flow using the same serialization token, is already running. If this is the case, no further action is needed. Otherwise contact your IBM Support Center.

You cannot start the User Name Server:

- **Windows Scenario:** You have created the User Name Server, specified the local system name for the Windows security domain, and used the same identifier for the service user ID. When you start the User Name Server, the following error message is issued:

BIP8026E: Unable to start the component.

The component could not be started using the service userid that was supplied when the component was created. Ensure that the service userid and password are still valid. Ensure that the service userid has permission to access all of the products directories, specifically the 'bin' and 'log' directories. Check for system messages (on Windows NT this would be the application event log).

- **Explanation:** The configuration that you have specified is not supported by Windows. When you start the component that is created with this combination of parameters, a Windows system call incorrectly retrieves the SID (Security Identifier) of the computer rather than that of the account.
- **Solution:** To use your local account domain as the domain from which users and groups are drawn, specify a different user ID for the service user ID.
For example, if you specify NTSecurityDomainName (on the **-d** parameter on the mqsicreatebroker command) as NYBROKER on local system \\NYBROKER, the service user ID on the **-i** parameter on the mqsicreatebroker command cannot be nybroker.
Delete your User Name Server and re-create it using another user ID that has the correct authorizations.

A device allocation error is issued:

- **Scenario:** A device allocation error is issued.
- **Explanation:** A likely cause of this problem is that you do not have the correct permissions set on the component file system for the started task ID.
- **Solution:** Check the syslog; if the problem is caused by having incorrect permissions set for the started task ID, you often see an RACF authorization failure message, as shown in the following example.

```

ICH408I USER(TASKID1 ) GROUP(TSOUSER ) NAME(FRED (FRED) 959
/argo/MA11BRK/ENVFILE
CL(DIRSRCH ) FID(01D7C7E2E3F0F8000F16000000000003)
INSUFFICIENT AUTHORITY TO LOOKUP
ACCESS INTENT(--X) ACCESS ALLOWED(OTHER ---)
IEE132I START COMMAND DEVICE ALLOCATION ERROR
IEA989I SLIP TRAP ID=X33E MATCHED. JOBNAME=*UNAVAIL, ASID=00A8.
D J,BPXAS
IEE115I 11.13.04 2001.212 ACTIVITY 601

```

In this example, the started task ID does not have access to the file system component. The ICH408I message shows:

- The file that the task is trying to access
- The user ID that is trying to access the file
- The permissions that the ID is expecting to have (INTENT in the message)
- The permissions that the ID actually has (ALLOWED in the message)

You can use this information to correct the permissions and then reissue, in this example, the start broker request. This type of message is produced if the user who is issuing the command (which might be to start the broker, or to submit JCL to start one of the utility jobs) does not have the correct file system permissions for the file system component. Use the ICH408I information to rectify the problem.

Another possible reason for authorization failures is inconsistencies in the RACF definitions for a user ID in the MVS image and the OMVS segment. You should also check with your system administrator that the RACF ID that is used on MVS has a corresponding OMVS image created.

The create command fails and error message BIP8022 is issued:

- **Scenario:** Error message BIP8022 is displayed when you use the **mqsicreateconfigmgr**, **mqsicreateusername**server, or **mqsicreatebroker** command on Windows 2000 or Windows XP, even if the supplied user name and password are correct.
- **Explanation:** The Microsoft component "Shared File and Printer Services" is required.
- **Solution:** Rectify this error by installing the "Share File and Printer for Microsoft network" service on the Windows system.

Resolving problems that occur when migrating or importing resources

This topic contains advice for dealing with some common problems that can occur when you import or migrate resources:

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Resolving problems when migrating or importing message flows and message sets

This topic contains advice for dealing with some common problems that can occur when you import or migrate message flows and message sets:

The `mqsimigratemsgflows` command gives unexpected results:

- **Scenario:** You have imported your Version 2.1 or Version 5.0 message flows into the workbench using the `mqsimigratemsgflows` command, but the results are not what you were expecting.
- **Explanation:** The `mqsimigratemsgflows` command creates a report called `mqsimigratemsgflows.report.txt` in the directory from which you ran the command (typically the `/eclipse` directory). Read the report for details of the actions taken by the command, and for actions that you need to take to correct errors or inconsistencies.

Message flows that refer to a migrated user-defined node have connection errors:

- **Scenario:** After migration, all message flows that refer to a migrated user-defined node have errors indicating that connections cannot be made.
- **Explanation:** One possible cause is that the original user-defined node had space characters as part of one or more terminal names. The spaces are rendered as ‘X20’ erroneously.
- **Solution:** Edit the user-defined node `.msgnode` file, which is available in the same project as the flows that you have migrated. Correct any terminal names that are at fault. Ensure that the names are exactly as the broker node implementation expects.

Message flows that have been migrated from Version 2.1 cannot resolve subflows:

- **Scenario:** You have migrated a set of message flows from Version 2.1 to Version 6.0 and an error message is issued indicating that: *Subflow message flow name* cannot be located.
- **Explanation:** The subflow in the message flow has not been migrated correctly. The message flow was exported from Version 2.1 without the subflow, or it was exported into a different file to the subflow.
- **Solution:** Export everything from Version 2.1 into one large export file, then migrate the export file to Version 6.0. Alternatively, if the subflow has been imported but the message flow still shows the error, right-click the node that is causing the error and click **Locate subflow**.

A broker has been migrated from Version 2.1 to Version 6.0 and some message flows are now stopped:

- **Scenario:** You have migrated a broker from Version 2.1 to Version 6.0 and some message flows are now stopped.
- **Explanation:** This error can be caused by invalid ESQL in the deployed message flows that was not detected on the Version 2.1 broker.
- **Solution:** Remove the affected message flows from the execution group, then redeploy them. This provides more information about the error to help you to resolve it.

After migration, message flows cannot locate a user-defined node:

- **Scenario:** After migration, message flows cannot locate a user-defined node.
- **Explanation:** One possible cause is that the flows do not have the correct reference internally to a user-defined node.
- **Solution:** Invoke the **Locate subflow** pop-up menu from the node that cannot be located. Using the Browse dialog box, locate the user-defined node (which is in the same project as migrated flows). The message flow should now link to the user-defined node correctly and the task list entry is removed when you save the flow.

Deployment of message flows fails after migration from Version 2.1:

- **Scenario:** After migration from Version 2.1 to Version 6.0, the deployment of message flows fails and a BIP2493 error message is displayed.
- **Solution:** Modify the ESQL so that it references a list rather than a scalar value. A list is denoted by an empty set of square brackets ("[]"), as in the example:

```
InputRoot.XML.Field1[]
```

Warnings are displayed for message flows that you have imported from Version 2.1:

- **Scenario:** Warning messages are displayed for message flows that you have imported from Version 2.1 to Version 6.0, such as Unresolvable message field reference `Body.RootTag.ID`.
- **Explanation:** Version 6.0 warns of any field reference that it cannot resolve. These warnings do not cause any problems with deploying or running the message flows.
- **Solution:** You can remove a large number of warning messages by performing the following steps:
 1. Reference any MRM message sets in the message flow projects **Property** pane. This action removes any warnings for messages that are defined in the message sets.
 2. Run the Database Definition File wizard to define all the databases that are used by the message flows.

The `mqsimigratemsgsets` command gives unexpected results:

- **Scenario:** You have imported your Version 2.1 or Version 5.0 message sets into the workbench using the `mqsimigratemsgsets` command, but the results are not what you were expecting.
- **Explanation:** The `mqsimigratemsgsets` command creates a report called `mqsimigratemsgsets.report.txt` in the directory from which you ran the command (typically the `/eclipse` directory). Read the report for details of the actions taken by the command, and for actions that you need to take to correct errors or inconsistencies.

You get import problems with imported message sets:

- **Scenario:** Your message set works with Version 2.1, but when you import it into Version 6.0, you get import problems or task list errors.
- **Explanation:** Within Version 2.1, message sets were checked at several different levels. A message set was not checked completely until it was deployed to a broker. If your Version 2.1 message set was never deployed to a broker, the checks will not have been completed, and as a result you might not have been informed about problems with the message set. Version 6.0 ensures that message sets are checked completely whenever they are saved. This action ensures that you are informed about problems with the message sets as soon as possible. As

a result, Version 2.1 message sets might contain errors that are reported as soon as you import the message sets into Version 6.0.

- **Solution:** Fix the problems using either Version 2.1, remembering to deploy the message set to be sure that the checks are complete, or Version 6.0.

Comparison of MRM message trees does not give the same results as Version 2.1:

- **Scenario:** When you compare MRM message tree fields, the results seen in Version 6.0 are different from those seen in Version 2.1.
- **Explanation:** When two message tree fields are compared, typically this action compares the field and all of its subtree. Under certain conditions in Version 2.1, the MRM did not compare the subtree, but only the field value itself. Therefore, when the same comparison is done in Version 6.0, the comparison fails. Consider an example message:

```
<TestCase>
  <Folder1>Value1
    <Field1>Value2
  </Folder1>
  <Folder2>Value1
    <Field1>Value3
  </Folder2>
</TestCase>
```

Now consider the following ESQL:

```
IF InputRoot.XML.TestCase.Folder1 = InputRoot.XML.TestCase.Folder2 THEN
  SET OutputRoot.XML.Result = 'Same';
ELSE
  SET OutputRoot.XML.Result = 'Different';
END IF;
```

When Folder1 and Folder2 are compared, the value of the fields are compared first. In this example, both fields have a value of 'Value1'; therefore, the comparison is successful and it continues. The code navigates to the first child in both Folder1 and Folder2. These fields are now compared for name, type, and value. In both folders, the name 'Field1' is the same, but the child in Folder1 has a value of 'Value2', and the child in Folder2 has a value of 'Value3'. The comparison therefore evaluates to FALSE.

If these fields had compared successfully, the comparison checks recursively through children of this field, and then siblings. Therefore, when message tree fields are compared with this ESQL code, the whole of the subtree has to match in field names, types, and values, and the hierarchy must be identical. If any discrepancy is found, the comparison returns FALSE.

- **Solution:** To compare only the values of Folder1 and Folder2, use the FIELDVALUE function. For example, for the message shown above:

```
IF FIELDVALUE(InputRoot.XML.TestCase.Folder1) =
  FIELDVALUE(InputRoot.XML.TestCase.Folder2) THEN
  SET OutputRoot.XML.Result = 'Same';
ELSE
  SET OutputRoot.XML.Result = 'Different';
END IF;
```

This comparison returns TRUE.

A message flow that contains an EVAL statement no longer deploys:

- **Scenario:** The ESQL module for a node in the message flow includes an EVAL statement of the following form:

```
SET char = EVAL(FIELDNAME(InputRoot.XML.Testcase));
```

- **Explanation:** In Version 6.0, the parameter that is passed into the EVAL statement must be enclosed within single quotes so that it is identifiable as a character string that defines an ESQL expression. In Version 2.1, the single quotes were not required.
- **Solution:** Rework your ESQL to include single quotes to enclose the entire character string. For example, to correct the SET statement shown above:

```
SET char = EVAL('FIELDNAME(InputRoot.XML.Testcase);');
```

Comparing an empty XML tag with NULL fails:

- **Scenario:** The ESQL module for a node in the message flow includes a test of a field in an XML message in the XMLNS domain. The statement tests the field against IS NULL; for example:

```
IF InputRoot.XMLNS.soap:Envelope.soap:Header.soap:Tag IS NULL THEN ...
```

This statement returns FALSE, even if the field is empty.

- **Explanation:** In an XML message, all fields are regarded as character fields and cannot be tested against IS NULL or IS NOT NULL. In Version 5.0, this test returned the expected result. In Version 6.0, the XMLNS parser has been corrected to fail the comparison between an empty tag, <Tag></Tag> or <Tag/>, and NULL.
- **Solution:** Rework your ESQL to compare the field to the empty string:

```
IF InputRoot.XMLNS.soap:Envelope.soap:Header.soap:Tag = '' THEN ...
```

This comparison returns TRUE if the field has no content.

An exception is thrown when you CAST a CHAR to TIME or TIMESTAMP:

- **Scenario:** When you CAST a CHARACTER variable to a TIME or TIMESTAMP, the operation fails; an exception is thrown, and message BIP2521E is issued.
- **Explanation:** Version 6.0 applies stricter rules to the format of character strings that are supplied as input to the CAST function. The format of the input string must be of the form hh:mm:ss.SSSSSS or yyyy-MM-dd hh:mm:ss.SSSSSS respectively. If the character string is not of this format, an exception is thrown. Version 2.1 and Version 5.0 accepted any valid separator between time components. For example, in previous versions an input character string of yyyy-MM-dd-hh:mm:ss.SSSSSS was acceptable.
- **Solution:** Modify the CAST statement to use a valid CHARACTER string. For example, your current statement might be of this form:

```
SET result = CAST(inputChar AS TIMESTAMP);
```

You can add the format to the statement:

```
SET result = CAST(inputDateChar AS TIMESTAMP FORMAT 'yyyy-MM-dd-hh.mm.ss.SSSSSS');
```

Alternatively, you can use a function to perform the CAST. Change the SET statement:

```
SET result = CharToTimeStamp(inputChar);
```

Create a schema-level function:

```
CREATE FUNCTION CharToTimeStamp(inputChar CHAR) RETURNS TIMESTAMP
BEGIN
  DECLARE returnTS TIMESTAMP
  CAST(inputChar TO TIMESTAMP FORMAT 'yyyy-MM-dd-hh.mm.ss.SSSSSS');
  RETURN returnTS;
END;
```

| **An exception is thrown when you compare a TIMESTAMP with CHAR '-1':**

- | • **Scenario:** When you compare a TIMESTAMP value, for example Properties.ExpirationTime, with a CHAR value that starts with the - (minus) character, the operation fails; an exception is thrown, and message BIP2461E is issued.
- | • **Explanation:** When you compare values, implicit CASTs are performed if the two values are not of the same type. For example, if you compare the TIMESTAMP field Properties.ExpirationTime with '-1' to determine if it is not set, Version 6.0 rejects the comparison and throws an exception.
| Version 2.1 and Version 5.0 incorrectly CAST the CHAR value to a valid
| TIMESTAMP; for example:
| CAST ('-1' AS GMTTIMESTAMP)
| The result of this CAST was 0000-01-01 00:00:00. The comparison was performed
| and no exception was thrown.
- | • **Solution:** CAST the TIMESTAMP value to CHAR before you perform the
| comparison. For example:
| IF CAST(InputRoot.Properties.ExpirationTime AS CHAR) = '-1' THEN

| **ESQL DECIMAL values no longer have leading or trailing zeros:**

- | • **Scenario:** Code in an ESQL module in a node in a message flow that you have
| migrated from Version 2.1 uses DECIMAL values, which were padded with
| leading and trailing zeros based on precision and scale. The padding no longer
| appears.
- | • **Explanation:** New DECIMAL classes, which trim insignificant zeros when a
| variable is constructed, were introduced in Version 5.0 and are used in Version
| 6.0.
- | • **Solution:** Download the Toolkit ESQL Statement Analyser plug-in SupportPac
| (IA9I) for further information about this change. You can also use the
| SupportPac to identify the occurrence of leading or trailing zeros and learn
| about possible modifications to your ESQL code.

| **Rounding of ESQL DECIMAL values has changed:**

- | • **Scenario:** Code in an ESQL module in a node in a message flow that you have
| migrated from Version 2.1 uses DECIMAL values, which are rounded by the
| ROUND function. The values now returned by ROUND are different to those
| returned in Version 2.1.
- | • **Explanation:** The behavior of the ROUND function was changed in Version 5.0
| and is retained in Version 6.0; ROUND uses what is typically known as *bankers*
| or *half-even symmetric* rounding rules.
- | • **Solution:** Further details are available in ESQL DECIMAL data type. Download
| the Toolkit ESQL Statement Analyser plug-in SupportPac (IA9I) for information
| and help in identifying the occurrence of the ROUND function. The SupportPac
| also suggests possible modifications to your ESQL code.

| **Labeled statements in ESQL generate errors:**

- | • **Scenario:** Code in an ESQL module in a node in a message flow that you have
| migrated from Version 2.1 includes labeled statements, such as loops and
| compound statements. When migrated to Version 6.0, errors are generated.
- | • **Explanation:** END statements for labeled statements in Version 6.0 must include
| the matching label. Version 2.1 accepted END statement without labels, but
| unpredictable behavior could result, for example if you had coded a LEAVE
| statement in a nested loop.

- **Solution:** Modify the ESQL code to add the matching label to every END statement.

The task list shows unresolved reference warnings for ESQL code:

- **Scenario:** Code in an ESQL module in a node in a message flow that you have migrated from Version 2.1 includes references to pre-defined message fields, or to database tables and columns. For example, an ESQL statement might include a message reference in the following format:

```
InputRoot.MRM.myField1
```

When migrated to Version 6.0, warnings are generated that identify unresolved references.

- **Explanation:** In Version 2.1, ESQL code was not validated against defined messages. Database tables and column references could also not be validated against database definitions. In Version 6.0, validation can be performed for messages and databases, and the warnings are generated if you have not made available the definitions for the validation to be completed.
- **Solution:** If you want references to message and database definitions to be validated, you must associate these definitions with the message flow project.
 - To make message set definitions available, click **Project** → **Properties** and select **Project References**. Select the message set project in which the referenced messages are defined.
 - To make database definitions available, click **File** → **New** → **Database Definition Files** and complete the wizard to define the database tables and columns in the current message flow project.

If the database definitions already exist in another project, click **Project** → **Properties**, select **Project References** and add the reference to the relevant message flow project.

You do not have to make these definitions available; you can deploy your message flows even if these warnings are displayed.

Some references cannot be resolved; for example if you declare a reference variable, and set it to point to a message tree field, and use the reference variable in place of a correlation name in the ESQL code, validation cannot be performed.

If you do not associate the definitions with your message flow project, or you use reference variables, and you prefer not to see these warnings, you can suppress them in one of the following ways:

1. Click **Filters...** and select the types of messages that you want to filter out, and the resources to which the filters apply. The warnings no longer appear in the task list, but are still shown in the ESQL Editor.
2. Click **Window** → **Preferences** and expand **Broker Development** and **ESQL**. Select **Validation** and change the relevant ESQL Validation settings to Ignore.

Deploying a message flow fails with BIP2935E:

- **Scenario:** When you deploy a message flow that includes a node that you have customized with ESQL, the deploy fails with error message BIP2935E. The message states An expression which evaluates to a scalar variable or a field is required here.
- **Explanation:** An ESQL DECLARE statement declares a reference variable, but does not set the variable to point at a specific message tree field. For example, the DECLARE statement might be in the following format:

```
DECLARE myRef REFERENCE TO InputRoot.XML.testCase.Field[];
```

This statement is accepted in Version 2.1. However in Version 6.0, you must include an indication of the specific field for the reference.

- **Solution:** Modify the DECLARE statement in your ESQL code to identify a specific field. For example:

```
DECLARE myRef REFERENCE TO InputRoot.XML.testCase.Field[1];
```

or

```
DECLARE myRef REFERENCE TO InputRoot.XML.testCase.Field;
```

Deploying a message flow fails with BIP2912E:

- **Scenario:** When you deploy a message flow that includes a node that you have customized with ESQL, the deploy fails with a sequence of error messages; BIP2087E, BIP4041E, BIP4001E, and BIP2912E.
- **Explanation:** If you defined a RETURNS clause for an ESQL function, Version 6.0 checks that an expression is specified on the RETURN statement, and that it matches the type that you specified in the RETURNS clause (TRUE, FALSE, UNKNOWN). If the RETURN statement does not match, errors are reported. Version 2.1 and Version 5.0 do not fail the deploy if you do not include a value, or if a mismatch exists.
- **Solution:** Modify the RETURN statement in your ESQL code to match the RETURNS clause. The behavior of the Main function RETURN statement in each of the different ESQL nodes is shown below.

Node	RETURN TRUE;	RETURN FALSE;	RETURN UNKNOWN (if BOOLEAN type) or RETURN NULL;	RETURN;
Compute	Propagate to Out terminal	Stop propagation	Stop propagation	Deploy failure (BIP2912E: Type mismatch on RETURN)
Database	Propagate to Out terminal	Stop propagation	Stop propagation	Deploy failure (BIP2912E: Type mismatch on RETURN)
Filter	Propagate to True terminal	Propagate to False terminal	Propagate to Unknown terminal	Deploy failure (BIP2912E: Type mismatch on RETURN)

For more information, see the RETURN statement.

Deploying a message flow fails with BIP2493E:

- **Scenario:** When you deploy a message flow that includes a node that you have customized with ESQL, the deploy fails with a sequence of error messages; BIP4001E and BIP2912E.
- **Explanation:** An EXISTS statement in an ESQL function specifies a parameter that is not a list. Version 6.0 checks that the expression returns a list; Version 2.1 and Version 5.0 do not fail the deploy if you do not specify a list. For example:

```
EXISTS(SELECT * from Environment.Variable.LocalError);
```

The statement above is accepted by Version 2.1 and Version 5.0, but not by Version 6.0, which checks that the expression returns a list. The expression must be one of the following types:

- A LIST operator
- A field reference that includes the array indicator []
- A SELECT statement that returns a list

- **Solution:** Modify the EXISTS statement in your ESQL code to specify a valid expression. For example:

```
EXISTS(SELECT * from Environment.Variable.LocalError[]);
```

For more information, see the EXISTS function.

An MRM parent field has NULL value:

- **Scenario:** You have an MRM message tree with the following structure, or similar:

```
MRM
  - StructureA
    - SubstructureB
      - FieldC = 'Value 1'
```

If you compare the field reference InputRoot.MRM.StructureA or InputRoot.MRM.StructureA.SubStructureB against IS NULL, TRUE is returned. In Version 2.1, FALSE was returned.

- **Explanation:** A comparison of a parent field and the value NULL now correctly returns TRUE; a parent field has an implicit value of NULL.
- **Solution:** Modify your ESQL code to test the existence of the parent field and its children with the EXISTS or the CARDINALITY function.

MRM XML messages include a namespace on the root tag:

- **Scenario:** You have migrated your message flow from Version 5.0 and the MRM XML message that it generates includes a namespace on the root tag.
- **Explanation:** When an MRM message that is defined in a namespace is generated, the namespace is included in the root tag in Version 6.0. For example, the root tag in the generated message in Version 5.0 might be:

```
<claim_std_msg>
```

In Version 6.0, if the root tag is in the named namespace, the root tag in the generated message might be:

```
<claim:claim_std_msg xmlns:claim="http://lni/orca/claim"></claim:claim_std_msg>
```

- **Solution:** You do not have to make any changes; the output message is correctly generated.

MRM XML messages include invalid x'00' NUL bytes:

- **Scenario:** You have migrated your message flow from Version 2.1 and the MRM XML message that it generates includes invalid x'00' NUL bytes.
- **Explanation:** You might have set a value to x'00', but the value might also occur if you have copied a field from another format of message, such as MRM CWF. Null-terminated fields include x'00' as the last byte. In Version 2.1 (Fix Pack 6 and earlier) the MRM XML parser incorrectly truncated null-terminated strings, but in later releases the truncation does not occur and invalid x'00' characters are included in output messages. For further details, see Constructing XML output messages.
- **Solution:** Modify the ESQL code in your message flow to trim all x'00' values from the data before it is written as an output message. If you take the input string from an MRM CWF message, you can set the CWF Padding Character and String Justification properties to trim NUL values from the start or end of the data.

MRM CWF fields are not padded with zeros and have unexpected justification:

- **Scenario:** You have migrated your message flow from Version 2.1 and DECIMAL values in MRM CWF messages have different contents.
- **Explanation:** In Version 2.1, DECIMAL fields in ESQL incorrectly retain insignificant leading or trailing zeros. For example, consider the value 161, which is used during the creation of a DECIMAL that has precision and scale of

(10, 0). In Version 2.1, the DECIMAL variable takes the value 0000000161. If you used this value to populate a field in an MRM CWF message tree, that is 10 characters long, no padding or justification is applied because both field and value are 10 bytes long. This behavior implies that the field has been right-justified and padded with zeros even if the field has default properties of left-justified and padded with spaces.

In Version 6.0, insignificant zeros are not maintained, and a value of 161 in a DECIMAL (10,0) field is correctly stored as 161. If you use the DECIMAL to populate the MRM CWF field in this version, the field is padded and justified according to the properties defined for that field.

- **Solution:** If your message flow or application is dependent on the contents of the MRM CWF field set to 0000000161, modify the physical format properties of the field to set right-justification and padding with zeros. Alternatively, download the Toolkit ESQL Statement Analyser plug-in SupportPac (IA9I) for information about changes to DECIMAL variables. The SupportPac also suggests possible modifications to your ESQL code.

A TDS message of length zero is written from a fixed length structure:

- **Scenario:** You have defined a TDS message with the Data Element Separation property set to Fixed Length. An output message of length zero is created from the message tree.
- **Explanation:** This problem is encountered when the following conditions are met:
 - The MRM-TDS parser is used to create the bit stream from the message tree.
 - The output message has the Data Element Separation property set to Fixed Length.
 - All elements have properties Min Occurs and Max Occurs set to 0.

Elements with Max Occurs set to 0 are not visible to the parser and are therefore not written to the output bit stream.

If these conditions arose in Version 2.1 and Version 5.0, the parser wrote the fixed length elements as self-defining elements, and therefore created an output bit stream, even though the output did not match the message definition. Version 6.0 does not generate an invalid bit stream, and therefore the bit stream is of zero length under these conditions.

- **Solution:** Set the Max Occurs property to a number greater than 0 for all elements that you expect to appear in the bit stream. If you reset Max Occurs but the message tree contains no corresponding elements, define default values for those elements.

Data patterns in TDS messages are rejected:

- **Scenario:** You have defined a TDS message with the Data Element Separation property set to Use Data Pattern. The Message Brokers Toolkit has generated errors against the message definition.
- **Explanation:** Version 6.0 validates the expressions that you specify in the data patterns. Version 2.1 and Version 5.0 did not perform this validation.
- **Solution:** Check all the patterns that have been marked as invalid, and correct them. A typical cause of an invalid pattern is that special characters have not been escaped. For example, a pattern might include [+ -] to indicate that a character should be either + or -. However, you can also use square brackets to indicate a range, such as [0-9], in which the hyphen character is considered part of the expression. Using the hyphen to indicate a minus sign is therefore not valid expression syntax. You must escape the minus character with the escape character backslash to use it in this way, for example [+ \-].

For more information about data patterns and migration, see Message set migration notes.

Duplicate global elements are not allowed:

- **Scenario:** You have migrated a message set from Version 2.1 and the Message Brokers Toolkit displays an error message that states that two global elements cannot be declared with the same name and namespace.
- **Explanation:** The message set that you have migrated includes prefixed identifiers. The `mqsimigratemsgsets` command removes prefixed identifiers, and creates either a local element (if the element is a member of exactly one compound type) or a global element (if the element is a member of more than one compound type). This action has resulted in the creation of more than one global element with the same name and the command generates the warning BIP0195W in the report to highlight these potential problems.
- **Solution:** To correctly migrate elements with prefixed identifiers, you must specify the parameter `-pl` on the `mqsimigratemsgsets` command. Rerun the command with the `-pl` parameter. Check the report and the contents of the message set that has been created.

Data Element Separation set to Tagged Fixed Length generates errors:

- **Scenario:** You have migrated a message set from Version 2.1 and the Message Brokers Toolkit displays an error message that states that Data Element Separation set to Tagged Fixed Length is invalid if the parent structure has Data Element Separation set to Fixed Length.
- **Explanation:** Version 6.0 validates the structure of the message set more rigorously than Version 2.1. The value set for Data Element Separation in the child structure, Tagged Fixed Length, is not permitted if the value for the parent structure is Fixed Length. This combination is restricted because structures of Tagged Fixed Length can repeat any number of times, but structures of Fixed Length must have exact content length.
- **Solution:** Review the structure of your message set. You must modify the Data Element Separation property; change the parent structure to have a value that can contain a variable length structure, for example Tagged Fixed Length, or change the child structure to have the value Fixed Length.

For more information, see Restrictions for nesting complex types.

MQRFH2 NameValueData empty tags are written in the short form:

- **Scenario:** XML generated from an MQRFH2 header contains empty tags for NameValueData fields in the form `<Tag/>`.
- **Explanation:** Version 6.0 generates the short form of empty XML tags. Version 2.1 and Version 5.0 generated the long form of empty XML tags, for example `<Tag></Tag>`.
- **Solution:** The XML specification indicates that both forms of the empty tag must be tolerated by XML applications, so the changed behavior in Version 6.0 is consistent with that specification and should not cause problems in your XML applications. However, some JMS applications might be affected by empty tags in the short form; refer to the documentation for your JMS provider.

Execution groups retain many open queue handles:

- **Scenario:** You have migrated message flows that access WebSphere MQ queues to Version 6.0 from Version 2.1. The execution groups to which you have deployed the message flows maintain far more open handles than they did in Version 2.1

- **Explanation:** When a message flow opens a WebSphere MQ queue, for example in the MQInput or MQOutput node, the queue is held open until the message flow is redeployed or removed from the execution group, or until the broker is stopped. In Version 2.1, the execution group queue cache is shared between threads in the message flow, even though queue handles are unique to a thread. When the number of queue handles reaches a threshold, older queue handles are considered for closing. The default threshold in Version 2.1 is 30.

In Version 6.0, each thread maintains its own queue cache, and the new default threshold per thread is 240. Therefore an execution group maintains far more open queue handles than in the previous version, particularly if it has started a large number of threads. (The same behavior is also true for Version 5.0, therefore message flows migrated from Version 5.0 are unaffected in this way when you migrate them.)

- **Solution:** To release the queue handles that are no longer in use, stop and restart the message flow. If you choose, you can reduce the default value with the following command:

```
mqsichangeproperties broker -e execgroup -o ComIbmMQConnectionManager -n queueCacheMaxSize -v new_value
```

You cannot set a value less than 10; if you do, the value reverts back to the default value 240. The new value is used for each thread in the execution group (not for the execution group itself).

If you change the value with the mqsichangeproperties command, you must stop and restart the broker for the new value to take effect.

Resolving problems when migrating or importing other resources

This topic contains advice for dealing with some common problems that can arise when you import or migrate resources other than message flows.

Error messages are issued after you migrate a Version 2.1 broker:

- **Scenario:** When you migrate a broker from Version 2.1 to Version 6.0, the following error messages are issued: BIP2238, BIP2239, BIP2280, BIP2281, and BIP2308.
- **Explanation:** These error messages are issued when there are clashes between Version 6.0 and Version 2.1 LIL files.
- **Solution:** These error messages do not indicate a problem, therefore you can ignore them. To suppress them, use the `-I` parameter of the `mqsichangebroker` command to change the LILPATH used by the broker. If all the Version 2.1 LILs are removed from the LILPATH, the error messages do not appear.

The `mqsimigratecomponents` command fails with database error BIP2322:

- **Scenario:** The `mqsimigratecomponents` command fails with database error BIP2322: The 'CREATE TABLE' command is not allowed within a multi-statement transaction in the 'BROKER1' database.
- **Explanation:** If you are using the `mqsimigratecomponents` command with a Sybase database, you must modify the database to enable the Data Definition Language (DDL) that the command uses.
- **Solution:** Take the following steps:
 1. Log on to ISQL using a system administrator account.
 2. Issue the following series of commands:

```
1> use master
2> go
1> sp_dboption "BROKER1","ddl in tran",TRUE
2> go
```

```

Database option 'ddl in tran' turned ON for database 'BROKER1'.
Run the CHECKPOINT command in the database that was changed.
(return status = 0)
1> use BROKER1
2> go
1> checkpoint
2> go

```

where *BROKER1* is the name of the Sybase broker database.

The File → Import menu provides only the option to import a compressed file inside an existing project:

- **Scenario:** You have a compressed file that contains message set projects and message flow projects. When you click **File → Import**, you have only the option to import the compressed file inside an existing project, but you want to re-create the message set projects and message flow projects.
- **Solution:** When you export and import files, do not export or import the root directory, which is created for you because of the project file. When you export your message flow and message set projects:
 1. Click **Create only selected directories**.
 2. Clear the project root folder.
 3. Select the files and subdirectories as required. The project root folder is selected, but is displayed as gray.

Then, when you import the compressed file:

1. Deselect the root (/) folder.
2. Select the files and subfolders as required. The project root folder is selected, but is displayed as gray.

The source directory name contains spaces:

- **Scenario:** You want to use the `mqsimigratemsgflows` or `mqsimigratemsgsets` command, but your source directory contains embedded spaces.
- **Solution:** Put the directory name in double quotes. For example:
`mqsimigratemsgflows -p MYFLOW01 -d "E:\Program Files\My message flows"`

Importing database files after the first import results in unexpected behavior:

- **Scenario:** Importing database files after the first import results in unexpected behavior. If you re-import a table, the mapping file displays a broken reference to any mappings that were created below the table. If you import additional tables for mapping, in the task list you see unresolvable table reference warnings for references to previously imported tables. Content assist in the ES_QL editor has suggestions for only some of the imported tables.
- **Explanation:** Performing multiple imports on the same database generates new schema files for the connection (.conxmi), database (.dbxmi), schema (.schxmi) and selected tables (.tblxmi). Your schema files might not be synchronized if you are trying to import into the same location. Because new files are created, links to previously imported table files are broken.
- **Solution:** Either create a new location for the import, or delete all the related schemas for the database and then import into the same location. Any mappings that you have are preserved when you select the tables again.

The import action in the **Add Database Table Schemas** dialog box is not identical to the action in the Data perspective. Do not use these two import actions interchangeably to the same target folder because unexpected behavior might occur.

Migration to the Version 6.0 Configuration Manager repository is unsuccessful:

- **Scenario:** Migration to the Version 6.0 Configuration Manager repository is unsuccessful.
- **Explanation:** If migration to the internal repository cannot be completed successfully, the internal repository remains empty, but it is primed with an empty topology. The Configuration Manager attempts to start up after a failed migration attempt and reports any problems in the system log.
- **Solution:** To migrate DB2-based configuration data, take the following steps:
 1. Stop the Configuration Manager.
 2. Delete the whole Configuration Manager using the **mqsdeleteconfigmgr** command, specifying the **-n** parameter, which causes the configuration repository to be deleted.
 3. Re-create the Configuration Manager using the **mqscreateconfigmgr** command, specifying the DB2 database for migration.

A migrated Configuration Manager does not start:

- **Scenario:** You have migrated a Configuration Manager to Version 6.0. You cannot start the Version 6.0 Configuration Manager for the first time and the following event messages appear repeatedly in the Windows Application Log: 2001, 1223, 1224, 1228, 1205, 1007.
- **Explanation:** This error can occur if a large domain is being migrated; for example, the Configuration Manager manages a number of brokers, each of which has one thousand persistent subscriptions. The error is due to the DB2 Universal Database **APP_CTL_HEAP_SZ** parameter being too small for the size of the domain that is being migrated.
- **Solution:** Increase the size of the **APP_CTL_HEAP_SZ** parameter by taking these steps:
 1. Stop the migrated Configuration Manager by issuing the **mqsistop Configmgr** command in the Command Console.
When the Configuration Manager has stopped, a message appears in the Windows Event Viewer's Application Log with a source identifier of WebSphere Broker v6000 and event identifier 2002.
 2. For the database of the previous version of the Configuration Manager, complete the following steps at a DB2 Universal Database command prompt:
 - a. Connect to the database by issuing the command:

```
db2 connect to cm_db user db_userid using db_password
```
 - b. Determine the current value of the **APP_CTL_HEAP_SZ** parameter by issuing the command:

```
db2 get db dfg for cm_db | find "APP_CTL_HEAP_SZ"
```

The output looks like this:

```
Max appl. control heap size (4KB) (APP_CTL_HEAP_SIZE) = 128
```
 - c. Increase the value of the **APP_CTL_HEAP_SZ** parameter by issuing the command:

```
db2 update db cfg for cm_db using APP_CTL_HEAP_SZ higher_value
```
 - d. Issue the following command to force all applications to disconnect from the database to allow the changes to become effective:

```
db2 force application all
```
 - e. To force the change to be effective immediately, stop and restart the DB2 Universal Database by issuing these commands:

```
db2stop  
db2start
```

3. Start the migrated Configuration Manager by issuing the **mqsistart ConfigMgr** command in the Command Console.

When the Configuration Manager has started successfully, the following event messages appear in the system's local error log with the source identifier WebSphere Broker v6000: 2001, 1223, 1224, 1228, 8255, 8280, and 1003.

If the error log still contains the original six event identifiers repeatedly (2001, 1223, 1224, 1228, 1205, and 1007), repeat steps 1 to 3, increasing the value that is assigned to the **APP_CTL_HEAP_SZ** parameter.

You redefined a broker in a migrated Configuration Manager and used the Configuration Manager Proxy to modify the broker reference's UUID:

- **Scenario:** During the migration of a Configuration Manager from one computer to another, you attempted to redefine a broker in the new Configuration Manager and use the Configuration Manager Proxy to modify the broker reference's unique identifier (UUID).
- **Explanation:** This procedure is not valid for migration. To migrate a Configuration Manager from one machine to another, use one of the following methods:
 - Use the **mqsibackupconfigmgr** command to back up the Configuration Manager on the source computer, and use the **mqsirestoreconfigmgr** command on the target computer to move the Configuration Manager.
 - Specify the source computer's DB2 data source on the **mqsicreateconfigmgr** command.
- **Solution:** Delete the Configuration Manager on the target computer and follow the instructions given in the appropriate topic:
 - Migrating a Configuration Manager from Version 2.1
 - Migrating a Configuration Manager from Version 5.0

The New Message Definition File menu option does not appear after you have migrated your workspace from Version 5.1:

- **Scenario:** The option to create a new message definition file does not appear after you have migrated your workspace from Version 5.1.
- **Explanation:** This problem occurs only when migrating from Version 5.1; it does not affect migration from Version 2.1 or Version 5.0.
- **Solution:** You can open the Message Definition File wizard by clicking **New → Other** and expanding the Message Brokers folder.

Alternatively, to be able to use the **New Message Definition File** menu option, open *workspace/.metadata/.plugins/org.eclipse.ui.workbench/workbench.xml* and replace the key:

```
<new_wizard_action id="com.ibm.etools.msg.importer.wizards.GenMsgDefinitionWizard />
```

with

```
<new_wizard_action id="com.ibm.etools.msg.importer.framework.wizards.GenMsgDefinitionWizard />
```

You can now see and use the **New Message Definition File** menu option.

You encounter problems when you try to connect to a migrated Configuration Manager from Message Brokers Toolkit Version 6.0:

- **Scenario:** You encounter problems when you try to connect to a migrated Configuration Manager from Message Brokers Toolkit Version 6.0.

- **Explanation:** This problem can occur if you have configured MCA users on the WebSphere MQ channels to the Configuration Manager.
- **Solution:** Configure access control lists (ACLs) for users who are running Message Brokers Toolkit Version 6.0. Follow the instructions in Considering security for the workbench.

Resolving problems when stopping resources

This topic contains advice for dealing with some common problems that can arise when stopping resources:

- “You cannot stop the broker”
- “You cannot stop the broker queue manager”
- “The execution group terminates abnormally”

You cannot stop the broker

- **Scenario:** You issue the `mqsistop` command to stop the broker, but the system freezes and does not stop any of the execution groups.
- **Explanation:** One possible cause is that a message flow is being debugged and it is currently stopped at a breakpoint. WebSphere Message Broker regards this as a message in flight situation, and refuses to stop the broker through the normal command.
- **Solution:** Click **Stop debugging** from the workbench. After that operation has completed, the broker stops.

If it is not possible to stop debugging, end all execution group processes that are associated with that broker to allow the broker to stop. Your messages are backed out. Click **Stop debugging** after the broker restarts.

You cannot stop the broker queue manager

- **Scenario:** You are trying to use the WebSphere MQ `endmqm` command to stop a broker queue manager on a distributed system, but it does not stop.
- **Explanation:** In certain circumstances, attempting to stop a broker queue manager does 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).
- **Solution:** If you want to stop the broker’s queue manager, stop the broker using the `mqsistop` command specifying the `-q` parameter. (The `-q` parameter is not available on z/OS.) This issues the WebSphere MQ `endmqm` command on your behalf in a controlled fashion that shuts down the broker and the queue manager cleanly.

The execution group terminates abnormally

- **Scenario:** Your execution group processes terminate abnormally.
- **Explanation:** When execution group processes terminate abnormally, they are restarted automatically by the `bipbroker` process. If an execution group process fails, it is 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 `BROKERAEEG` contains a column labeled `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 deployment of an execution group and `RetryInterval` defaults to 5.

If you remove the execution group from the broker configuration, deploy the broker configuration, and then later add the execution group and redeploy the broker configuration. The row is re-created and RetryInterval is set to its default value of 5.

- **Solution:** To change the default value:
 1. Stop the broker.
 2. Change the RetryInterval's value in the database table.
 3. Restart the broker.

Resolving problems when deleting resources

This topic contains advice for dealing with some common problems that can arise when deleting resources:

Problems when deleting a broker:

- "You cannot delete your broker after deleting your broker database"
- "The workbench is deploying to a deleted broker"
- "You cannot delete a broker following a disk failure, or the Configuration Manager contains references to a deleted broker" on page 49
- "The `mqsideletebroker` command hangs if the DB2 profile has not been run" on page 50

Problems when deleting other resources:

- "Error message BIP8052 is issued when you delete the Configuration Manager" on page 50
- "You cannot delete a project from your workspace" on page 50
- "You are unable to remove a domain from the Domains navigator" on page 51

You cannot delete your broker after deleting your broker database

- **Scenario:** You deleted your broker database, and now you cannot delete your broker, and get warning message BIP8040.
- **Explanation:** The `mqsideletebroker` command checks for the broker database tables and issues warning message BIP8040 because the database is not there.
- **Solution:** You can work around this problem by creating a dummy database with the same name as the database that you deleted. You must also re-create the ODBC connection. Reissue the `mqsideletebroker` command and delete the dummy database.

The workbench is deploying to a deleted broker

- **Scenario:** You used the `mqsideletebroker` command to delete a broker. You deleted it from the topology, but the workbench is still deploying to the deleted broker.
- **Explanation:** This problem occurs because you have either performed an incorrect sequence of actions when you deleted the broker, or you have re-created a broker of the same name before the previous deletion has completed.
- **Solution:** These steps explain how to delete a broker correctly. If a step completed successfully when you tried to delete your broker previously, you do not need to repeat it.
 1. Delete the broker from the topology.

2. In the Event Log editor, look in a response message from the Configuration Manager that states that the broker has updated its configuration and all references to the broker have been removed from the configuration repository. If you see an error, correct the problem that is reported and perform a delta deploy of the topology, which asks the broker to tidy up its resources.
3. After the broker resources have been tidied and the broker has been removed from the Configuration Manager repository, stop the broker using the **mqsistop** command.
4. Delete the broker using the **mqsdeletebroker** command.

If the deployment step fails because the broker has already been deleted using the **mqsdeletebroker** command, or it is otherwise unable to respond, remove all references to the broker from the Configuration Manager repository. You can do this by removing the broker from the topology using the Message Brokers Toolkit. Ensure that the broker's SYSTEM.BROKER.ADMIN.QUEUE queue has been deleted and initiate a further topology deploy.

Alternatively, you can use the Configuration Manager Proxy API "TopologyProxy.removeDeletedBroker(String)" to programmatically purge all references to the broker:

1. Start the Configuration Manager Proxy API Exerciser sample (which is available on the **Start** menu in Windows).
2. Connect to the Configuration Manager.
3. Right-click the topology object and click **Remove references to a previously deleted broker**.

The broker should now have disappeared from the workbench.

Do not try to re-create a broker using the **mqscreatebroker** command until you are confident that it has been removed from the workbench. Similarly, do not reuse broker or queue manager names until you are confident that they are not in use elsewhere.

You cannot delete a broker following a disk failure, or the Configuration Manager contains references to a deleted broker

- **Scenario:** You have had a complete disk failure on your broker system. You have decided that you no longer need the broker that was on that system, so now you want to delete this broker from the topology.
- **Explanation:** Under normal circumstances, the broker is deleted from the topology, and the topology is redeployed before the broker is deleted using the **mqsdeletebroker** command. Even if the broker was deleted using the **mqsdeletebroker** command before the topology was updated, a redeploy of the topology detects that the broker has been deleted. This happens because the broker's control queues no longer exist on the broker's queue manager and the redeploy can detect the missing queues.

However, when a system crashes, it is impossible to start the remote queue manager, or even the channels that connect to it. All deployments to the crashed system result in messages being left on the transmission queue for the remote queue manager. So, from the perspective of the workbench, the symptom of the failing deployment is a remote queue manager that is not responding.

- **Solution:** To force the deletion of the lost broker from the topology:
 1. Create a new queue manager with the same name as that used by the broker that you have lost.

2. Start the 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 the channels.
 5. Remove the broker from the Topology editor and save the topology. The Configuration Manager detects that the broker's queues no longer exist and it removes the broker from the configuration repository.
- **Alternative solution:** References to deleted brokers can be removed programmatically from the Configuration Manager's repository using the Configuration Manager Proxy API. Use the API "TopologyProxy.removeDeletedBroker(String)" to do this. You can also do this by using the Configuration Manager Proxy API Exerciser sample:
 1. Start the Configuration Manager Proxy API Exerciser sample (which is available on the **Start** menu in Windows).
 2. Connect to the Configuration Manager.
 3. Click the PubSubTopology object to select it, then right-click and click **Remove references to a previously deleted broker**.
 4. Enter the name of the broker that you want to delete.

CAUTION:

Do not remove a working broker using this facility. By removing references to a broker from the Configuration Manager repository, you will make it unmanageable.

The mqsideletebroker command hangs if the DB2 profile has not been run

- **Scenario:** The `mqsideletebroker` command hangs if the DB2 profile has not been run.
- **Solution:** Run the DB2 profile before re-issuing the `mqsideletebroker` command.

Error message BIP8052 is issued when you delete the Configuration Manager

- **Scenario:** Error message BIP8052 is displayed when you delete the Configuration Manager using the `mqsideleteconfigmgr` command.
- **Explanation:** Error message BIP8052 indicates that the queue SYSTEM.BROKER.SECURITY.REPLY, one of the WebSphere MQ queues that are 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.
- **Solution:** Make sure that your Configuration Manager is stopped, then retry the `mqsideleteconfigmgr` command after a short interval.

You cannot delete a project from your workspace

- **Scenario:** You cannot delete a project from your workspace. You get error messages indicating that the containing directory cannot be deleted, or the project file is missing.
- **Explanation:** If you attempt to delete a project, and the directory that contains the project is in use, or you have any files that are contained within the project open externally to the workbench, some of the resources in the project are not deleted, but others, including the project file, might be deleted.
- **Solution:** Before attempting to delete a project, make sure that you have no files open externally, and that you do not have an open command prompt located in

the directory. To recover from this problem, manually delete any remaining files and directories from your workspace directory, then click **Delete** from the project in the workbench.

You are unable to remove a domain from the Domains navigator

- **Scenario:** You are unable to remove a domain from the Domains navigator.
- **Explanation:** It is not possible to remove a domain from the Domains navigator.
- **Solution:** Ensure that you have disconnected from the domain, and then delete the associated domain connection from the Broker Administration perspective. The domain targeted by this domain connection is then removed from the Domains navigator.

Resolving problems when developing message flows

This topic contains advice for dealing with some common problems that can arise when developing message flows:

“Resolving migration problems when developing message flows” on page 53

- “Your migrated message flow project contains .msgnode files” on page 53
- “You do not know whether you need to migrate the Version 2.1 IBM primitives” on page 53
- “An error message is issued when you save a message flow that contains MQe nodes” on page 53
- “MRM field is seen as NULL in Version 5.0 or later versions of the product” on page 53

“Resolving ESQL problems when developing message flows” on page 54

- “A Routine not defined error message is issued in ESQL when you move a routine” on page 54
- “The product fails to respond when you paste ESQL statements from Adobe Acrobat” on page 54
- “You do not know how message flows handle the code page of ESQL files” on page 54
- “You do not know the naming restrictions for ESQL procedures and functions” on page 54
- “Error message BIP5431 is issued and the broker fails” on page 55
- “You are unable to call Java from ESQL” on page 55
- “Error message BIP3203 is issued: Format expression is not a valid FORMAT expression for converting expression to type” on page 55
- “Error message BIP3204 is issued: Input expression does not match FORMAT expression. Parsing failed to match” on page 55
- “Error message BIP3205 is issued: The use of a FORMAT expression is not allowed when converting” on page 55

“Resolving mapping and message reference problems when developing message flows” on page 56

- “Resources that are referenced by the mapping file cannot be resolved” on page 56
- “Errors are issued when you import table schemas into the Message Mapping editor” on page 56
- “Warnings or errors are issued for message references” on page 56

- “There is a \$db:select out of scope error when you map from a database source” on page 57
- “Target is not referencing a valid variable warning when you set the value of a target” on page 57
- “There are missing or unexpected targets in a message map” on page 57
- “Error message BIP6118 is issued: The remaining bitstream is too small contain the indicated structure.” on page 58
- “Error message BIP4680 is issued: Unsupported message domain encountered in mapping node.” on page 58

“Resolving implementation problems when developing message flows” on page 58

- “Messages are directed to the failure terminal of an MQInput node” on page 58
- “Error message BIP2211 is issued in z/OS by the MQInput node” on page 59
- “Messages enter the message flow but do not exit” on page 59
- “Your execution group is not reading messages from the input queues” on page 61
- “The DataFlowEngine terminates while processing messages” on page 61
- “Your execution group hangs, or terminates with a core dump” on page 62
- “Your XMLTransformation node is not working after deployment and errors are issued indicating that the style sheet could not be processed” on page 62
- “Output messages are not sent to expected destinations” on page 62
- “You experience problems when sending a message to an HTTP node’s URL” on page 63
- “QoS1 and QoS2 SCADA messages are not being processed” on page 65
- “Error message BIP5347 is issued on AIX when you run a message flow that uses a message set” on page 63

“Resolving trace problems when developing message flows” on page 65

- “You cannot determine which node is being referenced in your trace file” on page 65
- “You cannot see any alerts when you change user trace” on page 65

“Resolving appearance problems when developing message flows” on page 66

- “The task list does not update when you make corrections to your files” on page 66
- “You rename a flow that contains errors, but the task list entries remain” on page 66
- “Terminals on a subflow get out of sync as changes are made” on page 66

“Resolving other problems when developing message flows” on page 66

- “The values of your promoted properties are lost after editing” on page 66
- “The Message Flow editor experiences problems when opening a message flow, and opens in error mode” on page 66
- “You get an exception when saving changes to a .tblxmi file” on page 66

- “You do not know when to use the MQeMbMsgObject object” on page 67

Resolving migration problems when developing message flows

This topic contains advice for dealing with some common migration problems that can arise when developing message flows:

Your migrated message flow project contains .msgnode files:

- **Scenario:** After migrating message flows, you see some .msgnode files in the root directory of the Eclipse project, and do not know what to do with them.
- **Explanation:** This happens because one or more Version 2.1 export files contained user-defined nodes (UDNs). It is likely that the flows that you just migrated are using these UDNs.
- **Solution:** If you are the author of these UDNs:
 1. Create a user-defined node project.
 2. Move the files into that project.
 3. Complete the development process for the UDNs.

If you are not the author of the UDNs, delete the Version 2.1 export files. The author, or vendor, should provide the Version 6.0 UDNs in the form of an Eclipse feature and plug-in. The plug-in should contain icons, translation, palette definition, infopops, help, and so on.

You do not know whether you need to migrate the Version 2.1 IBM primitives:

- **Scenario:** You do not know whether you need to migrate the message flow IBM primitives.
- **Explanation:** You do not need to migrate these primitives. The Version 2.1 primitives are supplied with WebSphere Message Broker Version 6.0. The Version 2.1 export file does not contain IBM primitives.

An error message is issued when you save a message flow that contains MQe nodes:

- **Scenario:** An error message is issued when you save a message flow that contains MQe nodes.
- **Explanation:** You should not use message flows that contain MQeInput and MQeOutput nodes in WebSphere Message Broker Version 6.0. It is still possible to use them to deploy from Version 6.0 to previous versions.
- **Solution:** Override the error and save the message flow. When you deploy the message flow to a previous version of the broker, it works as before. When you deploy the message flow to a Version 6.0 broker, create a suitable configuration to deal with it, as described in *Configuring after MQe message flow deployment*.

MRM field is seen as NULL in Version 5.0 or later versions of the product:

- **Scenario:** You might encounter this problem if you migrate a message flow from Version 2.1 to Version 5.0 or later, and all of the following are true:
 1. An MRM message is being manipulated.
 2. In ESQL an MRM message tree field is tested against IS NULL and returns TRUE, whereas in Version 5.0 it returned FALSE.
 3. The MRM message tree field is a parent field that has children associated with it.
- **Explanation:** Version 5.0 or later versions of the product give the correct behavior. Consider the following example:

```

SET OutputRoot.MRM.A.B.C.D = 'ddd';
SET OutputRoot.MRM.A.B.C.E = 'eee';
IF OutputRoot.MRM.A IS NULL THEN
    SET Environment.Variables.Result = 'NULL';
ELSE
    SET Environment.Variables.Result = 'NOT NULL';
END IF;

```

In Version 2.1 the `Environment.Variables.Result` field has the value of 'NOT NULL' and in Version 5.0 or later it has the value of NULL.

The same is true if `OutputRoot.MRM.A.B` or `OutputRoot.MRM.A.B.C` were tested against NULL. The reason for this is that these fields are MRM parent fields, and this means that they do not have a value themselves.

Therefore, it follows that these fields are implicitly NULL, and if tested against 'IS NULL' return TRUE.

Note, however, that if you use XML parent nodes both Version 2.1 and Version 5.0, or later, versions of the product return 'NOT NULL' for the `Environment.Variables.Result` field.

Resolving ESQL problems when developing message flows

This topic contains advice for dealing with some common ESQL problems that can arise when developing message flows:

A Routine not defined error message is issued in ESQL when you move a routine:

- **Scenario:** A Routine not defined error message is displayed in ESQL when you move a routine from one schema to another.
- **Explanation:** If a routine that was referenced by code in one schema is moved to another schema, where it is still visible, a false error is generated stating that the routine cannot be resolved.
- **Solution:** Clean the project by clicking **Project** → **Clean**.

The product fails to respond when you paste ESQL statements from Adobe Acrobat:

- **Scenario:** When you copy and paste certain ESQL statements from Adobe Acrobat into the ESQL editor, WebSphere Message Broker stops responding.
- **Explanation:** This problem occurs when you paste text directly from Adobe Acrobat into either the ESQL editor or the Java editor.
- **Solution:** To work around this problem, either enter the text manually, or copy and paste it to a text editor (such as Notepad) and then perform another copy and paste action from there.

You do not know how message flows handle the code page of ESQL files:

- **Scenario:** You do not know how message flows handle the code page of ESQL files.
- **Solution:** The code page of an ESQL file is the code page of the workbench on which the file is created. You must deploy a message flow using an ESQL file on a workbench with the same code page setting as the ESQL file. When multiple ESQL files are involved in a single compiled message flow (.cmf) file, all these ESQL files must be in the same code page.

See Editor preferences and localized settings for more information.

You do not know the naming restrictions for ESQL procedures and functions:

- **Scenario:** You do not know the restrictions for choosing names for ESQL modules or schema scope ESQL and mapping procedures and functions.
- **Solution:** Module and schema scope procedures and functions cannot have names starting with IBM_WBIMB_ because IBM_ is reserved for IBM use, and IBM_WBIMB_ is reserved for WebSphere Message Broker.

Error message BIP5431 is issued and the broker fails:

- **Scenario:** Error message BIP5431 is displayed and the broker fails.
- **Explanation:** When setting output message properties, you have specified an incorrect physical format name for the message format.
- **Solution:** The name that you specify for the physical layer must match the name that you have defined for it. The default physical layer names are CWF1, XML1 and TDS1.

You are unable to call Java from ESQL:

- **Scenario:** Your Java class files are not being found.
- **Explanation:** When creating the class files, you have not placed them in the correct location within the system CLASSPATH.
- **Solution:** See the CREATE PROCEDURE statement for further information.

Error message BIP3203 is issued: Format expression is not a valid FORMAT expression for converting expression to type:

- **Scenario:** Your format expression contains an unrecognized character for the given conversion.
- **Explanation:** Your format expression for a numerical conversion was used to convert to or from a *DATE*, *TIME*, *TIMESTAMP*, *GMTTIME* or *GMTTIMESTAMP* variable. Another possible explanation is that your format expression for a DateTime conversion was used to convert to or from an *INTEGER*, *DECIMAL* or *FLOAT* variable.
- **Solution:** Replace the format expression with one from the applicable types. For more information about valid data types and expressions, see the ESQL reference topic.

Error message BIP3204 is issued: Input expression does not match FORMAT expression. Parsing failed to match:

- **Scenario:** You have used an input string that does not match the given format expression.
- **Explanation:** Your given format expression contains data that does not match the current element of the format expression.
- **Solution:** Either rewrite the format expression to match the input data, or modify the input data to match the format expression. For more information about valid data types and expressions, see the ESQL reference topic.

Error message BIP3205 is issued: The use of a FORMAT expression is not allowed when converting:

- **Scenario:** You have used a format expression when it is not applicable, for example when converting from decimal to integer.
- **Explanation:** The use of format expressions is limited to casting between datetime and string values or numerical and string values. Your format expression cannot be applied in this case.

- **Solution:** Either remove the FORMAT clause, or change the parameters. For more information about valid data types and expressions, see the ESQL reference topic.

Resolving mapping and message reference problems when developing message flows

This topic contains advice for dealing with some common mapping and message reference problems that can arise when developing message flows:

Resources that are referenced by the mapping file cannot be resolved:

- **Scenario:** You have imported some message flows into the workbench that contain mappings. An error is issued, indicating that the resources that are referenced by the mapping file cannot be resolved.
- **Explanation:** Mappings can use resources that exist in other projects. For example, a mapping reference to a message set might exist in a different project. If the reference cannot be resolved, it probably means that the reference to the other project has been lost.
- **Solution:** To reference a project:
 1. Right-click the project with the error, and click **Properties**.
 2. Under Project References, a list of the projects in your workspace is displayed. Select the required projects to reference the resources in these projects.
 3. Click **OK**.

Errors are issued when you import table schemas into the Message Mapping editor:

- **Scenario:** When you try to import and add table schemas in the Message Mapping editor, you encounter errors like:


```
/flow2/schema1/SAMPLE.conxmi cannot be loaded.  
The following error was reported: schema1/SAMPLE.conxmi
```
- **Explanation:** This error usually means that you have the same database files under the same broker schema name in another project. The relative paths are the same, so the Message Mapping editor cannot resolve this ambiguity and does not know which table to add.
- **Solution:** There are two courses of action:
 - If the table file already exists in the workspace, and this is what you want to use for mapping, reuse the file by clicking the **Add database table schemas from workspace** option in the Add Database Table Schemas dialog box.
 - If you want a different copy of the tables, rename the broker schema.

Warnings or errors are issued for message references:

- **Scenario:** Warnings or errors are issued for message references, yet you are certain that your references are correct.
- **Explanation:** This is never the case with messages that are using the XML parser. For these message references, direct validation is not performed because the references could be used for generic XML.

There is an ESQL editor preference that allows you to choose to ignore message reference mismatches, or to have them be reported as a warning or an error. By default, this type of problem is reported as a warning, so that you can still deploy the message flow.
- **Solution:** To use the validation feature, ensure that you have set up a project reference from the project that contains the ESQL to the project that contains the message set.

If you are using reference in a subroutine, take the following steps:

1. Create a reference to the tree and the parser in the module's main procedure.
2. Associate the reference to the correlation name, for example InputRoot or Root. Alternatively, create the OutputRoot.*parser* node, where *parser* is the name of the parser that you want to use.
3. Pass the reference as a parameter to an ESQL subroutine that identifies the XSD type of the reference.

This practice is beneficial because the passed reference supports content assistance and validation for ESQL. The message type content properties open, or open defined are not used in validation, and the assumption is that this property is closed.

There is a \$db:select out of scope error when you map from a database source:

- **Scenario:** You have specified a database as the data source and when you save the map file, there is an error saying \$db:select out of scope
- **Explanation:** A \$db:select expression must be within the scope of the \$db:select entry in the Map Script column of the Spreadsheet pane, meaning that it must be a descendant of the select statement. If a \$db:select expression is out of scope the Message Mapping editor moves the \$db:select entry to a position where the \$db:select expression is in scope. The \$db:select expression can remain out of scope if it is positioned above the \$db:select entry in the Map Script column of the Spreadsheet pane.
- **Solution:** Delete the out of scope \$db:select expression or move the \$db:select entry in the Map Script column. You can drag-and-drop the element out of the 'for' row, and then drag-and-drop the \$db:select entry in the Map Script column higher in the message, above the out of scope \$db:select expression. Ensure that the out of scope \$db:select expression is now a descendant of the \$db:select entry. See Mapping a target element from database tables topic for more information about database selects.

Target is not referencing a valid variable warning when you set the value of a target:

- **Scenario:** You have set the value for a target to a variable, such as a WebSphere MQ constant, and when you save the map file there is a warning saying The target "\$target" is not referencing a valid variable
- **Explanation:** The variable that you have referenced is not recognized. For example, you might have entered an expression of the form \$mq: followed by a WebSphere MQ constant, but the constant is not recognized. This might be because the variable has been entered incorrectly or it is not supported. Alternatively, you might be referencing a new variable or constant that can be resolved only at run time. If this is the case you can ignore the warning.
- **Solution:** Try one of the following to solve the problem:
 - Check that the variable has been entered correctly
 - If you are using WebSphere MQ constants, use **Edit** → **Content Assist** to select from the list of available WebSphere MQ constants.

There are missing or unexpected targets in a message map:

- **Scenario:** In your message map, warning messages are displayed that indicate a target element is missing, or a target element is at an unexpected location. As a result the output message generated by the message map might be incorrect.

- **Explanation:** If target elements are missing from the Spreadsheet pane when you edit and save the message map, a warning is displayed that a target is missing. This situation can occur if you use the Populate wizard and do not select all the required elements, or if you create mappings using drag-and-drop and do not create mappings for all the required fields. If target elements in the Spreadsheet pane are in an unexpected order, a warning that the element is unexpected at that location is displayed. This situation can occur if you drag-and-drop elements to new locations in the Spreadsheet pane.
- **Solution:** To solve the problem:
 - Use **Populate** on the parent element to add any missing target elements to the Spreadsheet pane.
 - Drag-and-drop any target elements that are in an unexpected location to the correct location. Use the message tree in the Target pane as a guide to the expected structure of the output message.

Error message BIP6118 is issued: The remaining bitstream is too small contain the indicated structure.:

- **Scenario:** You have used an unsupported message domain for a target message in your message map.
- **Explanation:** The message domain that is associated with a target message is determined by the **Message Domain** property of your message set. Mapping nodes generate a target message that matches the message domain of the message set. Using a message domain that is not supported by the message mapper can result in an output message with a structure that is not valid for the chosen parser.
- **Solution:** To solve the problem change the target message domain for your message set.

Error message BIP4680 is issued: Unsupported message domain encountered in mapping node.:

- **Scenario:** You have used an unsupported message domain for a target message in your message map, for example BLOB.
- **Explanation:** The message domain that is associated with a target message is determined by the **Message Domain** property of your message set. Mapping nodes generate a target message that matches the message domain of the message set. Using a message domain that is not supported by the message mapper can result in an output message with a structure that is not valid for the chosen parser.
- **Solution:** To solve the problem change the target message domain for your message set.

Resolving implementation problems when developing message flows

This topic contains advice for dealing with some common problems that can arise when running message flows:

Messages are directed to the failure terminal of an MQInput node:

- **Scenario:** Messages that are received at a message flow are directed immediately to the failure terminal on the MQInput node (if it is connected) or are rolled back.
- **Explanation:** When a message is received by WebSphere MQ, an error is signalled if the following conditions are all true:

- The MQInput node requests that the message content is converted (the Convert property is set to yes on the node).
- The message consists solely of an MQMD followed by the body of the message.
- The message format, as specified in the MQMD, is set to MQFMT_NONE.

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

- **Solution:** In general, there is no need to request WebSphere MQ to convert the message content, because WebSphere Message Broker processes messages in any code page and encoding that is supported by WebSphere MQ. Set the Convert property to no to ensure that messages flow from the MQInput node to successive nodes in the message flow.

Error message BIP2211 is issued in z/OS by the MQInput node:

- **Scenario:** The following error message is issued by the MQInput node, indicating an invalid attribute:
 BIP2211: (Invalid configuration message containing attribute value [attribute value] which is not valid for target attribute [target attribute name], object [object name]; valid values are [valid values])
- **Explanation:** On z/OS, WebSphere MQ supports serialized access to shared resources, such as shared queues, through the use of a connection tag (serialization token) when an application connects to the queue manager that participates in a queue sharing group. In this case, an invalid attribute has been specified for the z/OS serialization token.
- **Solution:** Check that the value that is provided for the z/OS serialization token conforms to the rules as described in the *WebSphere MQ Application Programming Reference* on the WebSphere MQ library Web page.

Messages enter the message flow but do not exit:

- **Scenario:** You are sending messages into your message flow, and they are removed from the input queue, but nothing appears at the other end of the message flow.
- **Explanation:** There are several possible causes for this. Look at the following suggestions until you can identify the situation that is causing your failure:
 1. Check your message flow in the workbench.
 You might have connected the MQInput node failure terminal to a successive node instead of the out terminal. The out terminal is the *middle* terminal of the three. Messages directed to an unconnected out terminal are discarded.
 2. If the out terminal of the MQInput node is connected correctly to a successive node, check the broker's local error log for an indication that message processing has been terminated due to problems. Additional messages give more detailed information.
 If the failure terminal of the MQInput node has been connected (for example, to an MQOutput node), these messages do not appear.
 Connecting 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.
 3. If the out terminal of the MQInput node is connected correctly to a successive node, and the local error log does not contain any error messages, turn user tracing on for the message flow:
 - a. Switch to the Broker Administration perspective.

- b. In the Domain view, select the message flow, and right-click. (You might have to refresh the view by clicking the **Refresh** icon.)
- c. Click **User Trace** → **Normal**.

This action produces a user trace entry from only the nodes that the message visits.

On distributed systems, 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.

z/OS For z/OS, edit and submit the BIPJLOG job in COMPONENTPDS to execute the `mqsireadlog` and `mqsiformatlog` commands to process traces.

4. If the user trace shows that the message is not taking the expected path through the message flow, increase the user trace level to Debug by selecting the message flow, right-clicking it, and clicking **User Trace** → **Debug**.

Resend your message into the message flow. Debug-level trace produces much more detail about why the message is taking a particular route, and you can then determine the reasons for the actions taken by the message flow.

Do not forget to turn tracing off when you have solved the problem, otherwise performance will be adversely affected.

5. If the MQPUT command to the output queue that is defined on the MQOutput node is not successful (for example, the queue is full or **put** is disabled), the final destination of a message depends on:
 - Whether the failure terminal of the MQOutput node is connected.
 - Whether the message is being processed transactionally (which in turn depends on the transaction mode setting of the MQInput node, the MQOutput node, and the input and output queues).
 - Whether the message is persistent or nonpersistent. When **transaction mode** is set to the default value of Automatic, message transactionality is derived from the way that it was specified at the input node). All messages are treated as persistent if **transaction mode=yes**, and as nonpersistent if **transaction mode=no**.

In general, if a path is not defined for a failure (that is, neither the catch terminal nor the failure terminal of the MQInput node is connected):

- Non-transactional messages are discarded.
- Transactional messages are rolled back to the input queue for retry:
 - If the backout count of the message is less than the backout threshold (BOTHRESH) of the input queue, the message is retried and re-sent to the out terminal.
 - When the backout count equals or exceeds the backout threshold, one of the following might happen:
 - The message is placed on the backout queue, if one is specified (using the BOQNAME attribute of the input queue.)
 - The message is placed on the dead-letter queue, if there is no backout queue defined or if the MQPUT to the backout queue fails.
 - If the MQPUT to the dead-letter queue fails, or if there is no dead-letter queue defined, then the message flow loops continuously trying to put the message to the dead-letter queue.
- If a path is defined for the failure, then that path defines the destination of the message. If both the catch terminal and the failure terminal are connected, the message is propagated through the catch terminal.

6. If your message flow uses **transaction mode=yes** on the MQInput node properties, 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), then either:
 - The message flow has not failed and the message is not backed out.
 - The message flow is put to an alternative destination (for example, the catch terminal, the dead-letter queue, or 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 that you have:
 - Connected the unknown terminal of a Filter node to another node in the message flow.
 - Connected both the true and false terminals of a Filter node to another node in the message flow.

Your execution group is not reading messages from the input queues:

- **Scenario:** Your execution group has started, but is not reading messages from the specified input queues.
- **Explanation:** A started execution group might not read messages from the input queues of the message flows because previous errors might have left the queue manager in an inconsistent state.
- **Solution:** Complete the following steps:
 1. Stop the broker.
 2. Stop the WebSphere MQ listener.
 3. Stop the WebSphere MQ channel initiator.
 4. Stop the WebSphere MQ queue manager.
 5. Restart the WebSphere MQ queue manager.
 6. Restart the WebSphere MQ channel initiator.
 7. Restart the WebSphere MQ listener.
 8. Restart the broker.

The DataFlowEngine terminates while processing messages:

- **Scenario:** While processing a series of messages, the DataFlowEngine process size grows steadily without levelling off. This might cause the DataFlowEngine process to terminate if it cannot allocate any more memory and restart. The error message BIP2106 might be logged indicating the out of memory condition.

In addition, if you are using DB2 on distributed systems, you might get the message:

SQL0954C Not enough storage is available in the application heap to process the statement.

z/OS

On z/OS, an SQLSTATE of HY014 might be returned with an SQL code of -99999, indicating that the DataFlowEngine process has reached the DB2 z/OS process limit of 254 prepared SQL statement handles.

- **Explanation:** When a database call is made from within a message flow node, the flow constructs the appropriate SQL, and this is sent using ODBC to the database manager. As part of this process, the SQL statement is prepared using the SQLPrepare function, and a statement handle is acquired so that the SQL statement can be executed.

For performance reasons, after the statement is prepared, the statement and handle are saved in a cache to reduce the number of calls to the SQLPrepare

function. If the statement is already in the cache, the statement handle is returned so that it can be re-executed with newly bound parameters.

The statement string is used to perform the cache lookup. By using hardcoded SQL strings that differ slightly for each message, the statement is not found in the cache, and an SQLPrepare function is always performed (and a new ODBC cursor is opened). When using PASSTHRU statements, use parameter markers so that the same SQL prepared statement can be used for each message processed, with the parameters being bound at runtime. This approach is more efficient in terms of database resources and, for statements that are executed repeatedly, it is faster.

However, it is not always possible to use parameter markers, or you might want to dynamically build the SQL statement strings at runtime. This potentially leads to many unique SQL statements being cached. The cache itself does not grow that large because these statements themselves are generally not big, but many small memory allocations can lead to memory fragmentation.

- **Solution:** If you encounter these types of situations, disable the caching of prepared statements by setting the MQSI_EMPTY_DB_CACHE environment variable to any value. When this environment variable has been created, the prepared statements for that message flow are emptied at the end of processing for each message. There might be a slight performance degradation because every SQL statement is prepared.

Your execution group hangs, or terminates with a core dump:

- **Scenario:** While processing a message, an execution group either hangs with high CPU usage, or terminates with a core dump. The stack trace from the core dump or abend file is large, showing many calls on the stack. Messages written to the system log might indicate "out of memory" or "bad allocation" conditions. The characteristics of the message flow in this scenario often include a hard-wired loop around some of the nodes.
- **Explanation:** When a message flow thread executes, it requires storage to perform the instructions that are defined by the logic of its connected nodes. This storage comes from the execution group's heap and stack storage. The execution of a message flow is constrained by the stack size, the default value of which differs depending on the operating system.
- **Solution:** If a message flow that is larger than the stack size is required, you can increase the stack size limit and then restart the brokers that are running on the system so that they use the new value. For information on setting the stack size for your operating system, see System considerations for message flow development.

Your XMLTransformation node is not working after deployment and errors are issued indicating that the style sheet could not be processed:

- **Scenario:** Your XMLTransformation node is not working after deploying resources, and errors are displayed indicating that the style sheet could not be processed.
- **Solution:**
 - If the broker cannot find the style sheet or XML files that are required, migrate the style sheets or XML files with relative path references.
 - If the contents of a style sheet or XML file are damaged and therefore no longer usable (for example, if a file system failure occurs during a deployment), redeploy the damaged style sheet or XML file.

Output messages are not sent to expected destinations:

- **Scenario:** You have developed a message flow that creates a destination list in the LocalEnvironment tree. The list might contain queues for the MQOutput node, labels for a RouteToLabel node, or URLs for an HTTPRequest node. However, the messages are not reaching these destinations, and there are no error messages.
- **Solution:**
 - Check that you have set **Compute mode** to a value that includes the LocalEnvironment in the output message, for example All. The default setting of **Compute mode** is Message, and any changes that you make to LocalEnvironment are lost.
 - Check your ESQL statements. The content and structure of LocalEnvironment are not enforced, so the ESQL editor (and content assist) does not provide any guidance for field references, and you might have specified one or more of these references incorrectly.

Some example procedures to help you set up destination lists are provided in Populating Destination in the LocalEnvironment tree. You can use these procedures unchanged, or modify them for your own requirements.

You experience problems when sending a message to an HTTP node's URL:

- **Scenario:** Sending a message to an HTTP node's URL causes a timeout, or the message is not sent to the correct message flow.
- **Explanation:** The following rules are true when URL matching is performed:
 - There is one-to-one matching of HTTP requests to HTTPInput nodes. For each HTTP request, only one message flow receives the message. This is true even if two message flows are listening on the same URL. Similarly, you cannot predict which MQInput node that is listening on a particular queue will receive a message.
 - Messages are sent to wildcard URLs only if no other URL is matched. This means that a URL of /* receives all messages that do not match any other URL.
 - Changing a URL in an HTTPInput node does not automatically remove the entry from the HTTP listener. For example, if a URL /A is used first, then changed to a URL of /B, the URL of /A is still used to listen on, even though there is no message flow to process the message. This incorrect URL does get removed after the broker has been stopped and restarted twice.
- **Solution:** To find out which URL the broker is currently listening on, look at the file wsplugin6.conf in the following location:
 - On Windows: C:\Documents and Settings\All Users\Application Data\IBM\MQSI\components\broker_name\config
 - On UNIX: /var/mqsi/components/broker_name/config

If problems persist, empty wsplugin6.conf, restart the broker, and redeploy the message flows.

Error message BIP5347 is issued on AIX when you run a message flow that uses a message set:

- **Scenario:** Error message BIP5347 (Mti1mbParser2: RM has thrown an unknown exception) is issued on AIX in either of these circumstances:
 - When you are deploying a message set
 - When you are running a message flow that uses a message set
- **Explanation:** BIP5347 is usually caused by a database exception, and it is issued when an execution group tries to load an MRM dictionary from the broker database for use by a message flow. This process involves two steps:

1. The execution group accesses the broker database and issues a SELECT call to retrieve the dictionary and wire format descriptors.
2. The execution group stores the dictionary in the memory that a message flow would use to process an MRM message.

BIP5347 is usually issued during step 1. This problem can appear to be intermittent; if you restart the execution group, the message is sometimes processed correctly.

BIP5347 usually occurs on AIX, where it is caused by the default limitation of ten shared memory connections to DB2.

BIP5347 might also be caused by the presence of a datetime value constraint in the message set, which causes the error each time the message set is deployed.

- **Solution:** To identify the cause of the error, capture a service level debug trace to confirm that the database exception is occurring.
 - If the database exception is caused by the connection limitation on AIX, the following message appears in the service level debug trace:


```
SQL1224N A database agent could not be started to service a request, or was terminated as a result of a database system shutdown or a force command.
```

See the solution for this problem in “DB2 error message SQL1224N is issued when you connect to DB2” on page 113.

- If the error is caused by the presence of a datetime value constraint, a message similar to the following message appears in the service level debug trace (the exact message depends on the datetime constraint in the message set):

```
Unable to parse datetime internally, 9, 2001-12-17T09:30:47.0Z,
yyyy-MM-dd'T'HH:mm:ss.SZZZ
```

This error occurs because the MRM element in question has a datetime value that is not compatible with the datetime format string, so the dictionary is rejected. To solve this problem, ensure that the datetime value is compatible with the datetime format string.

Error message BIP2130 is issued with code page value of -1 or -2:

- **Scenario:** The following error message is issued:


```
BIP2130: Error converting a character string to or from codepage [code page value]
```

where [code page value] is either -1 or -2. You have not, however, specified a code page of either -1 or -2 in your message tree. You have, however, used one of the WebSphere MQ constants MQCCSI_EMBEDDED or MQCCSI_INHERIT.

- **Explanation:** The WebSphere MQ constants MQCCSI_EMBEDDED and MQCCSI_INHERIT are resolved when the whole of the message tree is serialized to produce the WebSphere MQ bitstream. This happens when the message is put on the WebSphere MQ transport. Until that time, these values exist in the message tree as either -1 (for MQCCSI_EMBEDDED) or -2 (for MQCCSI_INHERIT). If any parts of the message tree are serialized independently, such as with a ResetContentDescriptor node or ESQLEASBITSTREAM function, this error occurs.
- **Solution:** You do not need to set MQCCSI_EMBEDDED or MQCCSI_INHERIT in the message tree’s CodedCharSetId field. You can achieve the same result by explicitly setting the required CodedCharSetId to the previous header’s CodedCharSetId value. For example, you would need to replace:


```
SET OutputRoot.MQRFH2.(MQRFH2.Field)CodedCharSetId = MQCCSI_INHERIT;
```


| with

| SET OutputRoot.MQRFH2.(MQRFH2.Field)CodedCharSetId = InputRoot.MQMD.CodedCharSetId;

| where the MQMD folder is the header preceding the MQRFH2 header.

QoS1 and QoS2 SCADA messages are not being processed:

- **Scenario:** The message flow that handles SCADA messages is not processing QoS1 and QoS2 messages.
- **Explanation:** The broker database, in which these messages are stored, is causing deadlock.
- **Solution:** If you are using DB2 as your broker database, turn off DB2 next key locking to avoid these deadlock problems. Issue the following command in a DB2 command window to make this change:

```
db2set DB2_RR_TO_RS=YES_OVERRIDE_RI
```

Restart the DB2 database manager for this change to take effect.

Resolving trace problems when developing message flows

This topic contains advice for dealing with some common trace problems that can arise when developing message flows:

You cannot determine which node is being referenced in your trace file:

- **Scenario:** You have generated a service trace file for your message flow, to trace the path of a message. However, you cannot determine which node is being referenced in the trace file.
- **Explanation:** In the trace file you might see text such as:

```
Video_Test#FCMComposite_1_1 ComIbmMQInputNode , Video_Test.VIDEO_XML_IN
```

The elements in the text have the following meanings:

Video_Test

is the name of the message flow

FCMComposite_1_1

is the internal name for the node

ComIbmMQInputNode

is the type of node

VIDEO_XML_IN

is the node label, and is the name you see in your flow

The number at the end of the internal name is incremented; for example, FCMComposite_1_4 would be the fourth node you added to your flow. In the example, this section of the trace is referring to the first node in the message flow.

You cannot see any alerts when you change user trace:

- **Scenario:** You cannot see any alerts for an execution group or message flow in the Alerts viewer when you use the **mqsichangetrace** command to change the user trace setting.
- **Explanation:** No alert is generated when an execution group runs user trace at normal or debug level. Alerts are generated only for message flow trace. For message flow trace, the workbench is not notified of trace changes that are initiated by the **mqsichangetrace** command.
- **Solution:** To see the alert, refresh the message flow, or disconnect and then reconnect to the domain.

Resolving appearance problems when developing message flows

This topic contains advice for dealing with some common appearance problems that can arise when developing message flows:

The task list does not update when you make corrections to your files:

- **Scenario:** The task list does not update any modifications that you make to an ESQL or mapping file. You have made corrections to the files, and while there are no error flags in the file or file icon, the error remains as a task list item.
- **Solution:** To work around this problem, set the following environment variable:

```
JITC_COMPILEOPT=SKIP{org/eclipse/ui/views/tasklist/TaskListContentProvider}
{resourceChanged}
```

You rename a flow that contains errors, but the task list entries remain:

- **Scenario:** When you rename a message flow in the workbench for which there are error icons (red crosses) displayed on nodes and connections, those error icons are removed when changes are made. However, the task list entries remain.
- **Solution:** Refresh the Message Flow editor by closing and reopening it.

Terminals on a subflow get out of sync as changes are made:

- **Scenario:** You have a message flow that contains subflow nodes. The name or number of terminals on the subflow gets out of sync when changes are made on the subflow itself. The same problem can happen with promoted properties.
- **Solution:** Refresh the Message Flow editor by closing and reopening it. Close the Message Flow editor that contains subflows while the subflows are being changed.

Resolving other problems when developing message flows

This topic contains advice for dealing with problems that can arise when developing message flows, that are not covered in the specific categories listed in "Resolving problems when developing message flows"

The values of your promoted properties are lost after editing:

- **Scenario:** You edited a message flow using the Message Flow editor, and the values of your promoted properties are lost.
- **Explanation:** The values of promoted properties for nodes with more than a single subflow definition (that is, two identically named subflows in the same project reference path) are lost if the flow is edited and saved.
- **Solution:** To avoid this problem, ensure that each subflow in your project has a different name.

The Message Flow editor experiences problems when opening a message flow, and opens in error mode:

- **Scenario:** You attempt to open an existing message flow in the Message Flow editor and it opens in read-only error mode, displaying a list of parsing or loading errors. The message flow is not open and a message is displayed indicating that the message flow file is not valid.
- **Explanation:** The message flow file is unreadable or is corrupted, and the Message Flow editor cannot render the model graphically.
- **Solution:** Contact IBM Customer Support for assistance with the corrupted file.

You get an exception when saving changes to a .tblxmi file:

- **Scenario:** You are using the Database Table editor to make changes to a .tblxmi file, but you repeatedly get exceptions when you try to save the changes.
- **Explanation:** When you make changes to a .tblxmi file using the Database Table editor, the editor successfully saves the changes for the first save only. Subsequent saves after additional changes fail with an exception.
- **Solution:** To stop this from happening, close the Database Table editor after each save, and reopen it when you want to continue making changes.

You do not know when to use the MQeMbMsgObject object:

- **Scenario:** You do not know when to use the MQeMbMsgObject object rather than the base MQeMsgObject object.
- **Explanation:** Any messages from existing WebSphere MQ Everyplace applications (which are of type MQeMsgObject, or a subclass) can pass through WebSphere Message Broker unchanged. WebSphere Message Broker cannot parse the contents of these messages. However, the full representation of the data that has been dumped is available within the broker. Do not operate on this data.
- **Solution:** If you need to parse or modify the data contained within a WebSphere MQ Everyplace message, use an MQeMbMsgObject object. This is similar to standard WebSphere MQ messages: you can set fields such as correlation ID, and there is a field that can be parsed using any WebSphere Message Broker parser.

Resolving problems when deploying message flows or message sets

1. To debug problems when deploying, check the following logs:

- The broker domain Event log
- The local error log (the Windows Event log or the syslog)
- The WebSphere MQ logs

These logs might be on separate computers, and must be used in conjunction with the workbench output to ensure that the deployment was successful.

Use the mqsilist command to check that the deployment was successful, or look in the Windows Event or broker domain Event log.

2. Use this checklist when you have deployment problems:

- Make sure that the remote queue manager is running.
- Make sure that channels are running.
- Display the channel status to see if the number of system messages sent increases.
- Check the channel from the remote end.
- Check the queue manager name.
- Determine whether the channel is a cluster channel.

Resolving common problems when deploying message flows

The topic below contains advice for dealing with some common problems that can arise when deploying message flows or message sets.

“Resolving problems that occur when preparing to deploy message flows:” on page 68

- “Migrated message flows are not available to add to a broker archive file” on page 68

- “An error is issued when you add a dictionary to a broker archive file” on page 69
- “You cannot drag a broker archive file to a broker” on page 69
- “You cannot deploy a message flow that uses a plug-in message flow” on page 69
- “The compiled message flow (.cmf) file has not been generated” on page 69

“Resolving problems that occur during deployment of message flows” on page 70

- “The message flow deploys on the test system, but not elsewhere” on page 70
- “Your deployment indicates that the broker does not exist” on page 70
- “The Configuration Manager is trying to deploy to a broker that does not exist” on page 71
- “The Configuration Manager reports that it is out of memory” on page 71
- “A correlation name error is issued when you deploy to a Version 2.1 broker” on page 72
- “Error messages are issued when you deploy to z/OS” on page 72
- “Expected serialization of input is not occurring for a shared queue that serves multiple instances of a message flow on z/OS” on page 72
- “MQe nodes do not work as expected after deployment to a Version 6.0 broker” on page 73
- “Error messages are issued when you deploy” on page 74
- “Error message BIP2432 is issued when you deploy from a Version 6.0 Configuration Manager to a Version 2.1 broker” on page 73
- “Error message BIP5347 is issued on AIX when you deploy a message set” on page 73

“Resolving problems that occur when canceling deployment of message flows:” on page 78

- “When canceling a deployment, **mqsilist** shows a message flow in an execution group but the tooling does not” on page 78

“Resolving problems that occur after deployment of message flows:” on page 78

- “You are not notified of the result of a deploy” on page 78
- “You do not receive confirmation that the deployment was successful” on page 79
- “You cannot see any deployed message flows or message sets” on page 79
- “A deleted broker remains in the domains navigator” on page 79
- “Your XMLTransformation node does not work after deployment” on page 80

Resolving problems that occur when preparing to deploy message flows:

This topic contains advice for dealing with some common problems that can arise when preparing to deploy message flows or message sets.

Migrated message flows are not available to add to a broker archive file:

- **Scenario:** You have migrated your Version 2.1 and Version 5.0 message flows and message sets into the workbench using `mqsimigratemsgflows` and `mqsimigratemsgsets` commands, but the message flows are not available to add to a broker archive (bar) file.
- **Solution:** Migrated message flows and message sets are displayed in the workbench as a closed project. To make the message flows and message sets available to be added to a bar file:
 1. Open the project by right-clicking it and clicking **Project** → **Open Project**
 2. Clean the project by right-clicking it and clicking **Clean**. This shows any errors, and makes the project resources available to be added to a bar file.

An error is issued when you add a dictionary to a broker archive file:

- **Scenario:** An error is issued when you add a dictionary to a broker archive (bar) file.
- **Explanation:** After you create a bar file and add a message set project to it, two files are created in the bar file: `messageset.user.txt` and `messageset.service.txt`. The `user.txt` file contains user log information, such as warning message BIP0177W, which states that the dictionary that you have created is not compatible with versions prior to WebSphere Message Broker Version 6.0.
- **Solution:** Use the information in the `user.txt` file to diagnose the error. The `service.txt` file contains rudimentary dictionary information as used by the broker, and can be used by the IBM Support Center to diagnose problems.

You cannot drag a broker archive file to a broker:

- **Scenario:** You cannot drag a broker archive (bar) file to a broker.
- **Explanation:** Bar files can be deployed only on an execution group. When you use drag and drop, you cannot drop the bar file onto a broker in the Broker Topology editor or in the Domains navigator.
- **Solution:** Drop the bar file onto an execution group in the Domains navigator, or select an execution group in the deploy dialog.

You cannot deploy a message flow that uses a plug-in message flow:

- **Scenario:** You have created a message flow that contains an input node in a user-defined node project. However, you cannot deploy a message flow that uses this plug-in message flow.
- **Explanation:** Validation, compilation, and deployment do not recognize that a plug-in message flow contains an input node.
- **Solution:** To work around the problem, add a dummy input node to the flow that you intend to deploy.

The compiled message flow (.cmf) file has not been generated:

- **Scenario:** The compiled message flow file (.cmf) has not been generated. Therefore, it is not added to the broker archive file and cannot be deployed.
- **Explanation:** When you create mapping files, the overall file path length must not exceed 256 characters, due to a Windows file system limitation. If you try to add a message flow to a BAR file with mapping or ESQL files, that have a path length that exceeds 256 characters, the compiled message flow is not generated and cannot be deployed.
- **Solution:** To ensure that the path length does not exceed 256 characters, make sure that the following names are as short as possible:
 - The installation path
 - Any project names and broker schema names

- Any ESQL and mapping file names

Resolving problems that occur during deployment of message flows

This topic contains advice for dealing with some common problems that can arise during deployment of message flows or message sets.

- “The message flow deploys on the test system, but not elsewhere”
- “Your deployment indicates that the broker does not exist”
- “The Configuration Manager is trying to deploy to a broker that does not exist” on page 71
- “The Configuration Manager reports that it is out of memory” on page 71
- “A correlation name error is issued when you deploy to a Version 2.1 broker” on page 72
- “Error messages are issued when you deploy to z/OS” on page 72
- “Expected serialization of input is not occurring for a shared queue that serves multiple instances of a message flow on z/OS” on page 72
- “MQe nodes do not work as expected after deployment to a Version 6.0 broker” on page 73
- “Error message BIP2432 is issued when you deploy from a Version 6.0 Configuration Manager to a Version 2.1 broker” on page 73
- “Error message BIP5347 is issued on AIX when you deploy a message set” on page 73
- “Error messages are issued when you deploy” on page 74

The message flow deploys on the test system, but not elsewhere:

- **Scenario:** The message flow that you have developed deploys on the test system, but not elsewhere.
- **Solution:** Carry out the following checks:
 - Ensure that you have verified the installation on the target system by creating and starting a broker, and deploying a single execution group. These actions show that WebSphere Message Broker and the broker database are in place.
 - Ensure that the broker archive (bar) file’s broker.xml file contains references to the correct resources for the new system.
 - Ensure that any referenced message sets are deployed.
 - If database resources or user-defined nodes are not accessible or authorized from the target system, the deploy fails. On distributed systems, ensure that your databases are defined as ODBC sources so that they can be accessed from WebSphere Message Broker. Also, set the broker’s environment to allow access to the databases. (You might need to run a profile on Linux or UNIX systems.)
 - Any user-defined extensions that you are using in your message flow might not load if they cannot be found, or are not linked correctly. Consult the documentation for your operating system for details of tools that can help you to check your user-defined extension binaries.

Your deployment indicates that the broker does not exist:

- **Scenario:** You have initiated deployment, but get an error indicating that the broker does not exist.
- **Explanation:** During the first stage of deployment, the Configuration Manager sends a configuration data stream to the SYSTEM.BROKER.ADMIN.QUEUE queue of each target broker. When the configuration data has been sent to all

relevant brokers, control is returned to you. If an error is detected during this first stage of deployment, the deployment is abandoned; no configuration data is sent to any broker and an error message is written to the log.

- **Solution:** Check that you have specified the correct queue manager to be associated with the broker. If the queue manager is correct, it is possible that the deployment message cannot be delivered because the queue to which it was sent (SYSTEM.BROKER.ADMIN.QUEUE) could not be found on the target queue manager. This problem returns a WebSphere MQ reason code of 2085.

If that queue has been deleted, the broker environment has been damaged, so you must repair it.

The Configuration Manager is trying to deploy to a broker that does not exist:

- **Scenario:** The Configuration Manager is trying to deploy to a broker that does not exist.
- **Explanation:** This problem can occur for a number of reasons:
 - You deleted a broker component without first removing it from the Message Brokers Toolkit.
 - You mistyped the name of the broker in the Message Brokers Toolkit, creating a reference to a broker that does not physically exist.
 - You did not follow the correct procedure for deleting a broker.
 - The broker appears not to exist due to connectivity problems.

- **Solution:**

1. Verify that the broker does not exist by using the `mqsilist` command to list resources on the computer where the broker should exist.
2. Check your configuration to ensure that the broker does not exist on a different computer in the domain.
3. If you are confident that the broker does not exist, and you want to remove the reference that is still in the Message Brokers Toolkit, follow the steps in *Deleting a broker and Removing a broker from a broker domain*.
4. Remove completely all references to the broker from the Configuration Manager repository by removing the broker from the topology using the Message Brokers Toolkit. Ensure that the broker's SYSTEM.BROKER.ADMIN.QUEUE queue has been deleted, and initiate a further topology deployment.

Alternatively, use the Configuration Manager Proxy API

`TopologyProxy.removeDeletedBroker(String)` to programmatically purge all references to the broker:

- a. Start the Configuration Manager Proxy API Exerciser sample (which is available on the **Start** menu in Windows).
- b. Connect to the Configuration Manager.
- c. Right-click the topology object and click **Remove references to a previously deleted broker**.

See *Viewing and managing a broker domain using the Configuration Manager Proxy API Exerciser* for more information.

The Configuration Manager reports that it is out of memory:

- **Scenario:** The broker archive file is not deployed because the Configuration Manager claims to be out of memory, as indicated by error message BIP1111.
- **Explanation:** The most likely cause of this problem is that the Java Virtual Machine (JVM), which the Configuration Manager uses to perform the deployment logic, has run out of temporary storage space.

- **Solution:** Change the `maxJVMHeapSize` parameter on the Configuration Manager to increase the amount of memory that is allocated to the Configuration Manager's JVM:

```
mqsistop ConfigMgr
mqsichangeconfigmgr -j [newJVMHeapSizeMb]
mqsistart ConfigMgr
```

where *ConfigMgr* is the name of your Configuration Manager and *newJVMHeapSizeMb* is the size in megabytes to allocate; the minimum value is 64.

Retry the deploy operation. If the problem still occurs, further increase the value of the `maxJVMHeapSize` parameter.

A correlation name error is issued when you deploy to a Version 2.1 broker:

- **Scenario:** The following error message is issued when you deploy a broker archive file to a Version 2.1 broker:
The correlation name 'CREATE' is not valid.
Those in scope are: Environment, InputLocalEnvironment, OutputLocalEnvironment, InputRoot, InputBody, InputProperties, OutputRoot, InputExceptionList, OutputExceptionList, InputDestinationList, OutputDestinationList.
- **Explanation:** This error message indicates that you have attempted to deploy a message flow that contains a Mapping node to a Version 2.1 broker. Mapping nodes are not supported on Version 2.1 brokers.
- **Solution:** This error can also be issued when you deploy a message flow that is in the same message flow project as another message flow that contains a Mapping node to a Version 2.1 broker. Move the message flow that contains the Mapping node into a different project, and try the deployment again.

Error messages are issued when you deploy to z/OS:

- **Scenario:** The following messages are written to the log when you deploy to z/OS:
+(MQ05BRK) 0 BIP2070E: A problem was detected with WebSphere MQ while issuing MQPUT for WebSphere MQ queue SYSTEM.BROKER.ADMIN.REPLY, WebSphere MQ 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.
- **Explanation:** The transmission queue is not large enough for the messages that are issued by WebSphere Message Broker.
- **Solution:** Refer to the WebSphere MQ documentation for details on how to increase the size of the transmission queue.

Expected serialization of input is not occurring for a shared queue that serves multiple instances of a message flow on z/OS:

- **Scenario:** Expected serialization of input is not occurring for a shared queue that serves multiple instances of a message flow on z/OS.
- **Explanation:** On z/OS, WebSphere MQ supports serialized access to shared resources, such as shared queues, through the use of a connection tag (serialization token) when an application connects to the queue manager that participates in a queue sharing group.

This problem can occur for a number of reasons:

- You have assigned different serialization tokens to the input nodes of the flows that get messages from the shared queue.
- The message flows are running in the same execution group. Serialization can only be effected between flows that are running in different execution groups,

either on the same broker, or on different brokers whose queue managers participate in the same queue sharing group.

- The queue managers on which the brokers are running are not participating in a queue sharing group, or not participating in the same queue sharing group.
- **Solution:** Carry out the following checks:
 - Check that the same z/OS serialization token has been configured for the MQInput nodes in each flow that use the shared queue.
 - Check that the message flows are running in different execution groups.
 - Check that the broker queue managers are part of the same queue sharing group, and that no errors are reported from the queue managers in the z/OS system log (SDSF log).

MQe nodes do not work as expected after deployment to a Version 6.0 broker:

- **Scenario:** A message flow that contains MQe nodes works on a broker at a previous version, but does not work as expected when you deploy the message flow to a Version 6.0 broker.
- **Explanation:** When you deploy to a Version 6.0 broker, the MQe nodes are converted into MQ nodes. You can use MQeInput and MQeOutput nodes to deploy from WebSphere Message Broker Version 6.0 to previous versions.
- **Solution:** Do not use message flows that contain MQeInput and MQeOutput nodes in WebSphere Message Broker Version 6.0.
 1. Redesign your message flow to use MQ nodes instead of MQe nodes.
 2. Configure an external MQe gateway.

As a route to migration, you can deploy the message flow, and create a suitable configuration to deal with it, as described in *Configuring after MQe message flow deployment*. See full migration details in *Migrating a message flow that contains WebSphere MQ Everyplace nodes*.

Error message BIP2432 is issued when you deploy from a Version 6.0 Configuration Manager to a Version 2.1 broker:

- **Scenario:** Error message BIP2432 is issued when you deploy from a Version 6.0 Configuration Manager to a Version 2.1 broker.
- **Explanation:** This error is caused by the Version 6.0 Configuration Manager sending Version 6.0 ESQL to the Version 2.1 broker.
- **Solution:** When you add ESQL to a bar file that is being deployed to Version 2.1, select **Compile ESQL for broker Version 2.1** in the Broker Archive editor before you deploy. You must have different bar files for deployment to Version 6.0 and Version 2.1.

Error message BIP5347 is issued on AIX when you deploy a message set:

- **Scenario:** Error message BIP5347 (MtilmbParser2: RM has thrown an unknown exception) is issued on AIX in either of these circumstances:
 - When you are deploying a message set
 - When you are running a message flow that uses a message set
- **Explanation:** BIP5347 is typically caused by a database exception, and it is issued when an execution group tries to load an MRM dictionary from the broker database for use by a message flow. This process involves two steps:
 1. The execution group accesses the broker database, and issues a SELECT call to retrieve the dictionary and wire format descriptors.

2. The execution group stores the dictionary in the memory that a message flow uses to process an MRM message.

BIP5347 is typically issued during step 1. This problem can appear to be intermittent; if you restart the execution group, the message is sometimes processed correctly.

BIP5347 typically occurs on AIX, where it is caused by the default limitation of ten shared memory connections to DB2.

BIP5347 can also be caused by the presence of a datetime value constraint in the message set, which causes the error each time the message set is deployed.

- **Solution:** To identify the cause of the error, capture a service level debug trace to confirm that the database exception is occurring; see “Starting service trace” on page 146.

- If the database exception is caused by the connection limitation on AIX, you see the following message in the service level debug trace:

```
SQL1224N A database agent could not be started to service a request, or was terminated as a result of a database system shutdown or a force command.
```

See the solution for this problem in “DB2 error message SQL1224N is issued when you connect to DB2” on page 113.

- If the error is caused by the presence of a datetime value constraint, you see a message similar to the following message in the service level debug trace (the exact message depends on the datetime constraint in the message set):

```
Unable to parse datetime internally, 9, 2001-12-17T09:30:47.0Z,  
yyyy-MM-dd'T'HH:mm:ss.SZZZ
```

This error occurs because the MRM element in question has a datetime value that is not compatible with the datetime format string, so the dictionary is rejected. To solve this problem, change the datetime value to be compatible with the datetime format string.

Error messages are issued when you deploy:

Additional error messages that might be generated during a deployment are explained in this section.

Message BIP1106 with WebSphere MQ reason code 2030

- **Scenario:** Error message BIP1106 is issued with reason code 2030 when you are deploying a large message set.
- **Explanation:** The size of the message exceeds the maximum message length of the transmission queue to the broker queue manager.
- **Solution:** Increase the maximum message length for the transmission queue using the WebSphere MQ **alter qllocal** command, where the maximum message length (maxmsgl) is in bytes:

```
alter ql(transmit_queue_name) maxmsgl(104857600)
```

See the *WebSphere MQ System Administration Guide* for more information about this command.

Message BIP1106 with WebSphere MQ error AMQ7463

- **Scenario:** Error message BIP1106 is issued with reason code 2102 when you are deploying a large message set to a broker that shares the queue manager with the Configuration Manager. WebSphere MQ error message AMQ7463 is also issued with the text: The log for queue manager *<queue manager>* is full.

- **Solution:**
 1. Stop the Configuration Manager using the `mqsisistop` command:
`mqsisistop Configuration Manager -q -i`
 2. Stop the broker using the `mqsisistop` command:
`mqsisistop broker -q -i`
 3. Stop the queue manager using the WebSphere MQ `amqmdain` command:
`amqmdain end <queue manager>`
 4. If you have WebSphere MQ Version 5 installed:
 - a. Start WebSphere MQ Services.
 - b. Right-click the queue manager, and click **Properties**
 - c. Click the **Log** tab
 5. If you have WebSphere MQ Version 6 installed, start WebSphere MQ Explorer, and select the Log entry in the left pane.
 6. Increase the number of log primary and secondary files so that the total size is larger than the deployment message.
 7. Restart the Configuration Manager using the `mqsisistart` command.
 8. Restart the broker using the `mqsisistart` command.

Message BIP1538 with reason code 2218

- **Scenario:** Error message BIP1538 is issued with reason code 2218 when you are deploying a large message set.
- **Explanation:** The size of the message exceeds the maximum message size on the channel.
- **Solution:** Increase the channel `maxmsgl` parameter on both channel pairs, at both ends:
 1. On the Configuration Manager queue manager, issue the WebSphere MQ **alter channel** command:
`alter chl(CM_to_BRK) chltype(sdr) MAXMSGL(104857600)`
`alter chl(BRK_to_CM) chltype(rcvr) MAXMSGL(104857600)`
 2. On the broker queue manager, issue the WebSphere MQ **alter channel** command:
`alter chl(BRK_to_CM) chltype(sdr) MAXMSGL(104857600)`
`alter chl(CM_to_BRK) chltype(rcvr) MAXMSGL(104857600)`
 3. Stop and restart each of the channels.

Message BIP1536

- **Scenario:** You have defined a Configuration Manager to run with one user ID, and you have defined a broker to run on a different computer with a different user ID. Deployment is successful but error message BIP1536 is issued when you deploy message flows and message sets to the broker.
- **Explanation:** The Configuration Manager is unable to register for internal subscriptions with the broker because the broker is running under one ID and the Configuration Manager is running under another ID. The broker and the Configuration Manager relay internal messages back and forth via publish/subscribe. These messages are carried through WebSphere MQ, which requires certain authorizations.
- **Solution:**
 - Ensure that the broker's user ID is a member of the `mqm` and `mqbrkr` groups.

- Define the broker’s user ID on the computer where the Configuration Manager is running.
- Define the Configuration Manager’s user ID on the computer where the broker is running.
- Ensure that all IDs are in lowercase so that they are compatible between computers.

Messages BIP1536 and BIP7017

- **Scenario:** Error messages BIP1536 and BIP7017 are displayed.
- **Explanation:** The Configuration Manager has a problem registering its internal subscriptions on topics that relate to broker status change. The Configuration Manager tries to register its internal subscriptions each time that 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 to which you are deploying does not have the Configuration Manager service user ID in its user cache.
- **Solution:** Make the following checks. When you identify and correct the problem, the subscriptions will be registered correctly the next time you deploy:
 - Ensure that the User Name Server is started.
 - Ensure that the WebSphere MQ channels between the User Name Server and the broker are started.
 - Ensure that the Configuration Manager service user ID is present in the User Name Server’s domain.

Message BIP1835

- **Scenario:** Error message BIP1835 is displayed.
- **Explanation:** The message set that you are deploying produces a message set dictionary that is larger than the internal limit of 4 MB. This problem can occur if you have many large message definitions defined to the same message set. The size of an exported message set is not a good indication of the size of the message set dictionary that is generated at the time of deployment, because the exported message set is stored as XML. XML can be very verbose, but the dictionary has a much more compact internal format.
- **Solution:** Split the message definitions into several smaller message sets.

Message BIP2045

- **Scenario:** Error message BIP2045 is displayed in the Message Brokers Toolkit after deployment.
- **Explanation:** Each broker is identified by a universally unique identifier (UUID), which is stored in the Configuration Manager when the broker is defined. The UUID is also stored in the broker when it receives its first deployment message. If the broker receives a deployment message that contains a different UUID, it rejects the deployment message and issues error message BIP2045. This problem can occur in the following circumstances:
 - You try to deploy from a second Configuration Manager; this scenario is not supported in WebSphere Message Broker.
 - You re-create the Configuration Manager but not the broker.
 - You experience problems with the WebSphere MQ channel while you are deleting and re-creating the broker.
- **Solution:** Ensure that you are not using more than one Configuration Manager to control a single broker. If your configuration is correct, follow the instructions

in the BIP2045 error message to regain control of the broker by rebuilding the broker, and redeploying your message flow applications.

Message BIP2066

- **Scenario:** Error message BIP2066 is displayed.
- **Explanation:** The deployment request was not acknowledged by the execution group before the broker timeout **ConfigurationTimeout** plus the **ConfigurationDelayTimeout** (default 60 seconds) expired.
- **Solution:** Change these timeouts using the **-g** and **-k** parameters of the `mqsicreatebroker` or `mqsichangebroker` command.

Message BIP2242

- **Scenario:** Error message BIP2242 is displayed.
- **Explanation:** The deployment request (configuration change) was not accepted before the broker timeout **ConfigurationTimeout** expired. This timeout must be long enough for the message flow to complete processing its current message and then accept the deploy request; the default is 300 seconds.
- **Solution:** Set the timeout using the **-g** and **-k** parameters of the `mqsicreatebroker` or `mqsichangebroker` command.

Message BIP7053S

- **Scenario:** When you deploy to a broker, error message BIP7053S is displayed.
- **Explanation:** This error occurs in a multi TCP/IP stack environment, and indicates that the UNIX System Services (USS) TCP/IP environment has not been set up correctly.

WebSphere Message Broker uses USS functions to obtain the hostname for a particular system. The following error message is displayed if the default hostname is not set up correctly in the USS environment:

```
BIP7053S: Broker $SYS_mqsi 0 unexpected Java exception java.lang.Error:
-2103399272!java.net.UnknownHostException :
Hostname: Hostname
```

The hostname that is reported in the error message is the one that has been returned to the broker as a result of the `gethostname` call.

- **Solution:** Ensure that the TCP/IP environment is configured correctly in USS.

Tagged/Delimited String (TDS) Validator error

- **Scenario:** You try to deploy a message set with a TDS wire format that has an error.
- **Explanation:** The following extract from an error log illustrates what you might see for a TDS Validator error. In this case, the cause of the problem is that the element `Town` does not have a tag defined.

```
TDS Extractor Trace File
=====
```

```
Beginning Extract..
```

```
Extracting Identification Info
Extracting Project Info
Extracting Messages
Extracting Elements
Extracting Compound Types
Extracting Type Members
Extracting Type Members
Extracting Type Members
```

```

Extracting Type Members
Extracting Type Members
Beginning Indexing..

Creating Member IDs to Tags Index Table.

Beginning Validation..

Validating Project
Validating Types
ERROR: TDSValidator::ValidateTypeMemberSimpleElement:
  Simple elements in a type with Data Element Separation attribute = Tagged
  Delimited must have the following attribute set:
  Element Level - Tag
  (Element ID: Town)
  (Type ID: AddressType)
  Return Code: -80

Validating Messages

Trace Info
=====
EXCEPTION: TDSValidator::Validate:
  TDS Validation failed.
    1 errors
    0 warnings
  Return Code: -1

```

- **Solution:** Use the information in the error log to rectify the problem.

Resolving problems that occur when canceling deployment of message flows:

This topic contains advice for dealing with some common problems that can arise when canceling the deployment of message flows or message sets.

When canceling a deployment, mqsilist shows a message flow in an execution group but the tooling does not:

- **Scenario:** When canceling a deployment, mqsilist shows a message flow in an execution group but the tooling does not show it. You have canceled deployment to an execution group, but the deployment takes place and is shown by mqsilist.
- **Solution:** Delete the execution group. mqsilist still shows the old execution group if it is the only one that has been deployed. If you re-create the execution group in the tooling, it is listed twice by mqsilist until the broker is recycled.

Resolving problems that occur after deployment of message flows:

This topic contains advice for dealing with some common problems that can arise after deploying message flows or message sets.

You are not notified of the result of a deploy:

- **Scenario:** After you have closed the Broker Topology editor, saved your changes, and requested a deploy, you are not notified of the result of a configuration deploy.
- **Explanation:** When you close the editor, the notification link with the Configuration Manager is broken, so the workbench is not notified of the deploy result. This is the same for any eventual failure notifications.
- **Solution:** To ensure that you receive any notification, save the editor without closing it and wait for the alert Waiting for answer from Configuration

Manager to disappear. This alert is removed automatically when the editor receives all expected responses from the Configuration Manager.

You do not receive confirmation that the deployment was successful:

- **Scenario:** You have initiated deployment but have not received confirmation that the deployment was successful.
- **Solution:** Assume that communications from the workbench to the Configuration Manager are working, because the workbench gives an error immediately if this link fails. Follow these steps to find out if there is a communication problem that stops the receipt of deployment confirmation:
 1. Stop the broker using the **mqsisstop** command.
 2. On the broker queue manager, check the SYSTEM.BROKER.ADMIN.QUEUE queue. If there are messages on this queue, there might be a broker error; look in the local error log on the broker's system. If the queue is empty, continue with the next step.
 3. Redeploy your message flow.
 4. Recheck the SYSTEM.BROKER.ADMIN.QUEUE queue on the broker queue manager. If the queue depth has not increased, there is a problem with the channel between the Configuration Manager and the broker; check the WebSphere MQ logs. If the queue depth has increased to one, continue with the next step.
 5. Stop the Configuration Manager, then start the broker.

This allows the broker to process the configuration change and send a response. Wait for the broker to process the message; this could take some time. (If the message takes more than five minutes to process, there is a problem with the deployed message and failure messages appear in the local error log on the broker's system indicating the reason for the failure.)
 6. Check the SYSTEM.BROKER.ADMIN.REPLY queue on the Configuration Manager's queue manager. This should contain a response. If it does not, check that the channel from the broker to the Configuration Manager is running.
 7. Restart the Configuration Manager.
 8. Check that the messages are read from the SYSTEM.BROKER.ADMIN.REPLY queue on the Configuration Manager's queue manager. If they are not, check the local error log on the Configuration Manager's system for errors.
 9. Refresh the Event Log editor in the workbench. You should now get a reply.

You cannot see any deployed message flows or message sets:

- **Scenario:** After you deploy a broker archive (bar) file, you cannot see any deployed message flows or message sets under the execution group.
- **Explanation:** After deployment, an information dialog box should tell you whether deployment has been started successfully on the Configuration Manager. When the deploy has started, the time it takes to complete depends on your configuration size and work overload on your computers. However, if after a while no deployment-related messages are displayed in the Event Log editor, this means that the broker has not responded to the deployment request.
- **Solution:** Check that the broker is running and that all WebSphere MQ queue managers and channels between the Configuration Manager and the broker are running. If the messages are present in the Event Log editor, see if any errors have occurred that mean that your changes were not activated.

A deleted broker remains in the domains navigator:

- **Scenario:** After you have deleted a broker and deployed changes, the broker remains in the domains navigator.
- **Explanation:** If you did not receive any failure response indicating that the deletion failed, and the Event Log editor has been automatically refreshed with a set of messages about the deployment result, the deletion succeeded but the workbench has not been notified of this deletion.
- **Solution:** For the broker topology to reflect the actual Configuration Manager content, refresh the broker topology. If the broker topology is open, click **Revert**.

Your XMLTransformation node does not work after deployment:

There are two scenarios that explain why your XMLTransformation node might not work after deployment:

Error messages are displayed indicating that the style sheets were not found

- **Scenario:** Error messages are displayed indicating that the style sheets were not found.
- **Explanation:** This error message is displayed if the broker cannot find the style sheets or XML files required, or if the content of a style sheet or XML file is damaged and therefore no longer usable. This can happen if a file system failure occurs during a deployment.
- **Solution:** If the style sheets or relevant XML files cannot be found, perform the migration steps described in Migration of style sheets and XML files.
If the style sheets or XML files are damaged, redeploy the damaged style sheets or XML files.

You get unexpected transformation results.

- **Scenario:** You get unexpected transformation results.
- **Explanation:** For complex message flows, incompatibility might arise among style sheets and XML files after a deployment. There are two likely reasons for this:
 - Only part of the cooperating style sheets or XML files are deployed and updated (this might be caused by a file system failure).
 - Multiple XMLT nodes that are running inside the same execution group are supposed to use compatible style sheets, but are using different versions to process the same incoming message.
- **Solution:** If only part of the cooperating style sheets or XML files are deployed and updated, resolve any incompatibility by redeploying the compatible versions. To avoid multiple XMLT nodes using different versions of the style sheet, pause relevant message flows in the target execution group before performing the deployment, then restart the flows.

Resolving problems that occur when debugging message flows

This topic contains advice for dealing with some of the common problems that can arise when debugging message flows.

“Resolving problems that occur when starting and stopping the debugger:” on page 81

- “Java class error messages are displayed when you start the debugger” on page 81

- “An endless “waiting for communication” progress bar is displayed when you start the debugger” on page 82
- “The debugger seems to stop” on page 82
- “The session ends abnormally while debugging” on page 82
- “An error message is displayed indicating that the Rational Agent Controller is not installed” on page 83
- “Message flow engines are not available for selection” on page 83
- “You cannot see the list of execution groups” on page 83
- “You see the wrong execution group names in the Agent page” on page 83
- “Shared Memory Allocation Error on AIX” on page 83
- “An error message is displayed indicating that the debug session cannot be launched” on page 84
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“Resolving problems when debugging message flows” on page 84

- “A timeout occurs before the Rational Agent Controller service can connect” on page 84
- “The debugger does not pause at the next breakpoint” on page 84
- “The message does not stop executing at any breakpoint” on page 84
- “Editing problems occur in the Message Flow editor” on page 85
- “Editing the MQ message descriptor (MQMD) causes unexpected behavior in the debugger” on page 85
- “You cannot see the message content when debugging your message flow” on page 85
- “You cannot see the message flow names in the Debug view” on page 85
- “You cannot see the deployed flow names in the Debug view” on page 85
- “There is an exclamation mark above a node during debugging” on page 86
- “The PutTime that is reported by WebSphere MQ on z/OS, and other times or timestamps are inconsistent” on page 86
- “The message does not stop processing at breakpoints” on page 86

“Resolving problems that occur after debugging:” on page 86

- “You cannot change a message flow after debugging” on page 86
- “You redeployed a debugged message flow but deployment hangs” on page 86

Resolving problems that occur when starting and stopping the debugger:

This topic contains advice for dealing with some of the common problems that can arise when debugging message flows.

Java class error messages are displayed when you start the debugger:

- **Scenario:** You are trying to start the debugger on a message flow, but the debugger does not start, and a number of event errors are issued about Java classes.

- **Explanation:** The most likely cause of this problem is that you have not installed the Rational Agent Controller. Although the Agent Controller is not a prerequisite for WebSphere Message Broker, it is a prerequisite for the message flow debugger.
- **Solution:** Install the Agent Controller.

An endless "waiting for communication" progress bar is displayed when you start the debugger:

- **Scenario:** After you click **Start Debugging**, you get an endlessly cycling progress bar entitled "waiting for communication". The "debug session started" message is not displayed in the information pane.
- **Explanation:** If the message flow has nodes with ESQL statements, the flow might not deploy even if the statements are correct syntactically. This can occur, for example, because of multiple declarations or uninitialized variables (that is, semantic problems that the syntax parser does not pick up). Always check the workbench Event Log to confirm that the debugged version of your message flow has deployed successfully; it has the same name as the original message flow, with the suffix `_debug_`.
If the message flow does not deploy properly, the debugger cannot establish communication with the flow, and you see the endless progress bar.
- **Solution:** Click **Cancel** to clean up and return to a good state, then fix your errors and try again. As a check, see if your flow can deploy without the debugger.

The debugger seems to stop:

- **Scenario:** You are debugging a message flow and continue after encountering a breakpoint. However, nothing seems to happen and after about a minute, a progress bar appears, indicating that the debugger is waiting for communication.
- **Explanation:** There are two possibilities.
 - The message flow might have encountered a time-intensive operation, such as a huge database query that you simply have to wait for.
 - The broker ended, or some other extraordinary condition occurred, and communication was lost. In this case, click **Cancel** to stop the debug session.

The session ends abnormally while debugging:

- **Scenario:** After debugging a message flow, the session ends abnormally and you still have the debug instance of the message flow (`mf_debug_`) deployed to the broker's execution group. You are concerned that this is going to affect the operation of the flow, and want to put the execution group back to its original state.
- **Explanation:** The orphaned message flow should behave as the flow would have done normally, and the Debug nodes have no effect on message processing. If you have a small number of nodes in the message flow, corrective action makes no noticeable difference to the flow, apart from its name. However, if you have a large message flow (that is, more than 15 nodes or several subflows), take the corrective action described below, because the performance of message processing might be affected.
- **Solution:** Redeploy the broker.
A full redeploy of the broker should replace the orphaned flow with the original message flow. If this has no effect, remove the orphaned flow from the execution group, deploy, and then add the flow and deploy to restore the original state of the broker as it was before the debugging session.

An error message is displayed indicating that the Rational Agent Controller is not installed:

- **Scenario:** You are using the message flow debugger and an error is issued indicating that the Agent Controller is not installed, or that you have chosen the wrong hostname or port. However you have the Agent Controller service started, and the hostname and port are valid.
- **Solution:** Close and reopen the workbench, and retry the command. You can also try stopping and restarting the Agent Controller service.

Message flow engines are not available for selection:

- **Scenario:** You open the "Attach to the Message Flow Engine" wizard, but there are no message flow engines listed for the host computer.
- **Solution:** Close the wizard, restart Rational Agent Controller on the server computer, then open the wizard again. See also Attaching to the flow engine for debugging.

You cannot see the list of execution groups:

- **Scenario:** Your Rational Agent Controller is started, your broker is running, but you cannot see the list of execution groups in the Agent page when you attach to the debugger.
- **Solution:** Start your Agent Controller services before you start the broker. Restart the Agent Controller and try to attach again.

You see the wrong execution group names in the Agent page:

- **Scenario:** You see the same execution group names in the Agent page when you try to attach to the debugger.
- **Explanation:** The Rational Agent Controller has not updated the agent list since the last attempt to attach to the debugger.
- **Solution:** Restart the Agent Controller to refresh the list.

Shared Memory Allocation Error on AIX:


- **Scenario:** Your Rational Agent Controller has started, your broker is running, and you see an error message saying that shared memory allocation has failed after the broker is attached to the Agent Controller.
- **Explanation:** This is a general timing problem that occurs when the Agent Controller is connected to the broker when the broker has not started completely.
- **Solution:** Wait until the broker has started completely before attaching it to the Flow Debugger. Alternatively, set the logging level in the Agent Controller to debug or information; this allows more time for the broker to start up. The following steps show you how to change the logging level.

1. Go to the IBM Agent Controller install dir/config directory and open the configuration file serviceconfig.xml.
2. Change the **loggingLevel** tag to debug or information. The default value is warning.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE AgentControllerConfiguration SYSTEM
"../dtd/serviceconfig.dtd">
<AgentControllerConfiguration
activeConfiguration="default" loggingDetail="LOW"
loggingLevel="DEBUG" port="10002" secureport="10003"
version="5.0.0">
```

3. Restart the Agent Controller.

An error message is displayed indicating that the debug session cannot be launched:

- **Scenario:** You try to relaunch or invoke a new debug session but when you click the green **Debug** icon , an error message is displayed stating: Cannot launch this debug session.
- **Explanation:** When you click the **Debug** icon, it re-launches the last debug session. It fails if you have not created a debug session previously. It also fails if the broker and execution group that were attached previously in a debug session are no longer running or have been restarted; the session cannot be re-attached without re-selection of the new broker and execution group process instance.
- **Solution:**
 1. Close the error message and click the drop-down arrow immediately to the right of the **Debug** icon.
 2. Re-select or modify the broker and execution group information from the previous debug launch configuration by clicking **Debug** in the drop-down menu and selecting the previous debug launch configuration. See Attaching to the flow engine for debugging for more information.

Errors are generated when you copy a message map into a message flow project:

- **Scenario:** You copied a message map into a message flow project and errors appeared in the task list.
- **Explanation:** The message flow project did not have the correct references set before you copied the message mapping.
- **Solution:** These errors will remain in the task list, even if you reset the project references immediately after copying; you must perform a clean build of the message flow project.

Resolving problems when debugging message flows

This topic contains advice for dealing with some of the common problems that can arise when debugging message flows.

A timeout occurs before the Rational Agent Controller service can connect:

- **Scenario:** You see error messages indicating that the Rational Agent Controller service failed to start and that a timeout occurred before the Agent Controller could connect.
- **Explanation:** The Agent Controller might be using the wrong version of the JVM.
- **Solution:** Ensure that a supported JVM is being used. To determine which JVM is being used, issue the `java -version` command at the command line. To get the correct result, the `java -version` command must call the Java executable file that was specified for use when the Agent Controller was installed.

The debugger does not pause at the next breakpoint:

- **Scenario:** The message flow debugger does not pause at the next breakpoint in your message flow.
- **Solution:** Perform the following checks:
 1. Check whether your DataFlowEngine is running; if it is not, restart it.
 2. Check the input queue. If your input queue has the leftover messages from the previous time that you used the debugger, clear them before you send a new message.

The message does not stop executing at any breakpoint:

- **Scenario:** The message does not stop executing at any breakpoint after you attach to the debugger.
- **Explanation:** This could be a timing problem or you might have set the wrong parameters for the debug session.
- **Solution:** Perform the following steps.
 1. Check your launch configuration settings, ensuring that you have specified the correct Flow Project, HostName and Flow Engine for the debug session.
 2. Restart the debug session.

Editing problems occur in the Message Flow editor:

- **Scenario:** While debugging a message flow, editing problems occur when you are using the Message Flow editor.
- **Solution:** Do not attempt to edit the message while the flow debugger is attached. To edit a message flow, detach the debugger, edit the message flow, and then redeploy the message flow.

Editing the MQ message descriptor (MQMD) causes unexpected behavior in the debugger:

- **Scenario:** You edit properties of the message MQMD descriptor in the Message Set editor, but this causes unexpected behavior in the debugger.
- **Explanation:** If you edit the content of the MQMD descriptor, these fields take a certain range of values. You need to know these ranges before editing the properties. Unless you explicitly specify the value of these fields, they take default values, and certain fields might not have been specified in the message. The values in the fields that are not set explicitly in the message are default values; do not change these unless you are aware of their importance or the possible range of values.

You cannot see the message content when debugging your message flow:

- **Scenario:** You are using the message flow debugger, and you can see the message passing through the message flow, but you cannot see the content of the message.
- **Solution:** Open the Flow Debug Message view by clicking **Window** → **Show View** → **Other** → **Message Flow** → **Flow Debug Message**, then **OK**.

You cannot see the message flow names in the Debug view:

- **Scenario:** You cannot see the deployed message flow names in the Debug view after attaching the debugger to the execution group.
- **Solution:**
 1. Stop the broker on which the execution group is running.
 2. Restart the Rational Agent Controller that is running on the same computer as the broker.
 3. Restart the broker.

You cannot see the deployed flow names in the Debug view:

- **Scenario:** You cannot see the deployed flow names in the Debug view after attaching to the execution group.
- **Explanation:** This could be a timing problem.
- **Solution:** Wait until the broker has started completely and try to attach the debugger again, or restart the Rational Agent Controller that is running on the same computer as the broker, and then restart the broker.

There is an exclamation mark above a node during debugging:

- **Scenario:** In the Message Flow editor, an exclamation mark (!) is displayed above a node during debugging.
- **Explanation:** An exception has occurred in the node during debugging.
- **Solution:** Look under the ExceptionList in the Variables view of the Debug perspective to find out what error has occurred.

The PutTime that is reported by WebSphere MQ on z/OS, and other times or timestamps are inconsistent:

- **Scenario:** The PutTime that is reported by WebSphere MQ on z/OS, and other times or timestamps are inconsistent. A difference of approximately 20 seconds is detected in:
 - traces (including that obtained from the Trace node)
 - the MQPUTTIME command timestamp in the message MQMD header
 - timestamps obtained from ESQL (for example, in a Compute node)
- **Explanation:** WebSphere Message Broker reports the time using Coordinated Universal Time (UTC), which does not account for leap seconds. However, on z/OS, the message putTime that is reported by WebSphere MQ in the MQMD header of a message *does* account for leap seconds, using the value specified for the number of leap-seconds in the CVT field.

This inconsistency can cause:

- problems when debugging
 - problems with message flows if you use timestamps to control the flow of messages
 - misinformation
- **Solution:** Set the CVT field so that it is consistent with the UTC leap seconds. Alternatively, add an offset to adjust a z/OS timestamp reading. For example, add 20 seconds when trying to get the CURRENT_TIME in ESQL.

The message does not stop processing at breakpoints:

- **Scenario:** Message processing continues when a breakpoint is encountered.
- **Explanation:** This could be a timing problem, or you may have set the wrong parameters for the debug session.
- **Solution:** Check your launch configuration setting. Ensure you have specified the correct Flow Project, HostName and Flow Engine for the debug session. Restart the debug session.

Resolving problems that occur after debugging:

This topic contains advice for dealing with some of the common problems that can arise after debugging message flows.

You cannot change a message flow after debugging:

- **Scenario:** You were debugging, but now your message flow seems to be stuck. When you put a new message in, nothing happens.
- **Explanation:** This might be because a message was backed out, but you have not set the **Backout requeue name** property of your input queue.
- **Solution:** Set the **Backout requeue name** property to a valid queue name (such as the name of the input queue itself) and your flow will become unstuck.

You redeployed a debugged message flow but deployment hangs:

- **Scenario:** You found problems in your message flow by using the debugger. You changed your message flow and then redeployed it, but now the deployment hangs.
- **Solution:** Make sure that when you redeploy the flow to an execution group, the execution group is not still attached to the debugger.

Resolving problems when developing message models

This topic contains advice for dealing with some common problems that can arise when working with message sets.

Message definition files:

- “Your message definition file does not open”
- “A message definition file error is written to the task list” on page 88
- “Your physical format property values have reverted to defaults” on page 88
- “You are unable to enter text in the Message Definition editors” on page 88
- “Objects in your message definition file are not listed in alphabetical order” on page 88
- “You want to make the Properties tab the default tab in the Message Definition editor” on page 90
- “Error messages are written to the task list after you have imported related XML schema files” on page 89
- “A group contains two different elements with the same XML name in the same namespace” on page 89
- “You are unable to set up a message definition file to include a message definition file within another message definition file” on page 89
- “Error message BIP5410 is issued because a union type cannot be resolved” on page 90
- “Error message BIP5395 is issued because an xsi:type attribute value does not correspond to a valid member type of the union” on page 90
- “Error message BIP5396 is issued because a data type does not correspond to any of the valid data types of the union” on page 91
- “A union type contains two or more simple types that are derived from the same fundamental type” on page 91
- “A list type is based on a union that also contains a list type” on page 91
- “A union type contains an enumeration or pattern facet” on page 92
- “Error message BIP5505 is issued because input data is not valid for the data type” on page 92

Other:

- “A deprecation error is issued on an imported .mrp file” on page 92
- “Your imported message set looks like a simple project” on page 93
- “User trace detects an element length error” on page 93
- “MRM dateTime value has changed after it has been parsed” on page 93

Your message definition file does not open

- **Scenario:** You have created a complex type with a base type that causes the types to be recursive, and now your message definition file does not open.

- **Solution:** Recover the last saved version of your message definition file from the local history or from your repository.

A message definition file error is written to the task list

- **Scenario:** An error is written to the task list indicating that the message definition file has been corrupted.
- **Explanation:** This error message appears when the base type of the complex type is itself, or a circular definition of two or more simple types. This type of recursion is not supported.
- **Solution:** Examine your code and ensure that the type of recursion described above does not occur.

Your physical format property values have reverted to defaults

- **Scenario:** Someone has sent you a message definition file. You have added it to a message set project, but all the physical format property values have reverted to defaults.
- **Explanation:** You cannot transfer message definition files on their own in this way because these files are not entirely independent. It is the messageSet.mset file that lists all the physical formats that are applicable to a message set. For example, if you have a message set *A* with CWF format *CWF1*, and a message set *B* without any physical formats, a message definition file copied from *A* to *B* does not show *CWF1* as a known physical format (although the properties are still in the message definition file).
- **Solution:** If possible, request the entire message set project.
Alternatively, add physical formats to the receiving message set so that they match the originating message set. Then any dormant properties become visible. However, make sure that the message set level physical format properties match, or those object properties that inherit defaults from the message set level will be incorrect.

You are unable to enter text in the Message Definition editors

- **Scenario:** You are unable to enter text in the Message Definition Overview editor, or change the text of an enumeration or pattern facet in the Message Definition Properties editor.
- **Solution:** The Message Definition editors are cell editors, and to enable them you have to double-click the cell. The first click selects the cell; the second click puts the cell into active state, allowing you to edit it.

Objects in your message definition file are not listed in alphabetical order

- **Scenario:** The objects in your message definition file (.mxsd) are listed in the order that you created them, but you want them to be in alphabetical order.
- **Solution:**
 1. In the Broker Application Development perspective, double-click the message definition file to open it in the Outline view.
 2. Click **az** (at the top of the Outline view).

This action changes the order of objects within each of the message definition file's folders (the Messages, Types, Groups, Elements, and Attributes folders) to be alphabetical.

Error messages are written to the task list after you have imported related XML schema files

- **Scenario:** When you have finished importing a collection of related XML schema files, you find that the workbench task list contains error messages for the message set project, indicating that referenced types or other objects cannot be found.
- **Explanation:** These errors are typically an indication that one message definition file includes or imports another message definition file, but that the Message Definition editor is unable to resolve the specified link.
- **Solution:**
 - Check that a message definition file exists in the workbench for each of the related XML schema files that you are importing. If the new message definition files have been created, they appear in the Broker Development view.
 - Using the Properties Hierarchy in the Message Definition editor, check that any message definition files that include or import other message definition files are correctly locating the target files.

One common scenario is where you have two XML schema files *X* and *Y*, which both exist in the same directory in the file system but where *X*, which includes *Y*, is defined with a real target namespace, while *Y* is defined in the notarget namespace. After you import the two files, *X* is placed into the location that is determined by its namespace, but *Y* is placed into the default namespace location used for files defined in the notarget namespace. This situation causes the link between the two files to break, and you must modify *X* so that it correctly includes *Y* in its new relative location.

A group contains two different elements with the same XML name in the same namespace

- **Scenario:** A warning is written to the task list because a group contains two different elements that have the same XML element name, in the same namespace.
- **Explanation:** When a message that has an XML physical format is validated, the validation includes a test to identify any part of a message definition where the parser might not be able to uniquely determine which element is represented by the XML name. This test generates a warning when a group contains two different XML elements with the same element name in the same namespace, even in cases where the duplication is legitimate.
- **Solution:** Determine whether the duplication that is identified in the warning message is in fact a problem that needs to be corrected, or whether it has arisen because of two elements on opposite sides of a choice sharing the same XML name, in which case the duplication is legitimate because no ambiguity can occur.

You are unable to set up a message definition file to include a message definition file within another message definition file

- **Scenario:** You are unable to set up the include property of a message definition file to include a second message definition file that is included within another message definition file.
- **Explanation:** A message definition file can reference objects in another message definition file only if the first file references the second file directly. For example, if three message definition files exist, *A*, *B* and *C*, where *A* includes *B* and *B* includes *C*, *A* can reference objects in *B*, and *B* can reference objects in *C*, but *A* cannot reference objects in *C*.

You might also encounter this problem after importing XML schema files that have nested includes.

- **Solution:** You can work around this problem by including the message definition file directly, which, in the above example, would mean including *C* directly in *A*. Alternatively, you can define all the message set definitions that are in *C* directly in *B* and then delete *C* so that *A* needs to include only *B*.

You want to make the Properties tab the default tab in the Message Definition editor

- **Scenario:** When using the Message Definition editor to edit your message definition files, you prefer to use the **Properties** tab rather than the **Overview** tab, but the **Overview** tab is always selected as the default.
- **Solution:** Use the workbench preferences to choose the **Properties** tab as the default tab:
 1. From the menu, click **Windows** → **Preferences**.
 2. Expand **Broker Development** then **Message Set**.
 3. Expand **Editors** and select **Tab Extensions**.
 4. In the **Message Definition Editor** section, select the **Properties** and the **Overview** check boxes.
 5. Click **OK**.

Error message BIP5410 is issued because a union type cannot be resolved

- **Scenario:** Error message BIP5410 is raised indicating that an element or attribute is based on a union type and that the element or attribute could not be cast to any member of the union.
- **Explanation:** When parsing an element or attribute that is based on a union type, the MRM XML parser uses an `xsi:type` attribute, where present, to resolve the union.

If an `xsi:type` attribute is not present, or an attribute is being parsed, the parser tries each union member type in turn, attempting to cast to the associated simple type, until the cast succeeds. The order of precedence for the attempted cast is the order in which the member types are listed in the message model, under the union type, in the Outline view.

If the data cannot be cast to any of the simple types within the union, the union cannot be resolved and a parser error is reported.

- **Solution:** Perform the following checks:
 - Check that the message contains a valid value for the element or attribute that is identified in the error message.
 - Check that the member types of the union that are identified in the error message contain the correct list of simple types.
 - If possible, use an `xsi:type` attribute to resolve the union explicitly.

Error message BIP5395 is issued because an xsi:type attribute value does not correspond to a valid member type of the union

- **Scenario:** Error message BIP5395 is issued, indicating that an element is based on a union type that has an `xsi:type` attribute with a value that should resolve the union explicitly to one of its modeled member types and that the `xsi:type` attribute value does not correspond to a valid member type of the union.
- **Explanation:** When parsing or writing an element or attribute that is based on a union type, the MRM XML parser or writer uses an `xsi:type` attribute, where

present, to resolve the union. The parser resolves the value of the `xsi:type` attribute to a simple type in the dictionary and checks that the simple type is a valid member type of the union.

If the `xsi:type` attribute identifies a type that is not a member type of the union, it reports an error.

- **Solution:** Perform one of the following steps:
 - Modify the message so that the `xsi:type` attribute identifies a valid member type of the union.
 - Check that the member types of the union identified in the error message contain the correct list of simple types.

Error message BIP5396 is issued because a data type does not correspond to any of the valid data types of the union

- **Scenario:** Error message BIP5396 is issued, indicating that an element or attribute is based on a union type but the data type does not correspond to any of the valid data types in the union.
- **Explanation:** When writing an element or attribute that is based on a union type, the MRM XML writer uses an `xsi:type` attribute, where present, to resolve the union. If an `xsi:type` attribute is not present, the writer tries to match the data type of the literal value in the tree to a simple type in the union. If the literal value cannot be matched to any of the simple types in the union, it reports a writing error.
- **Solution:** Perform one of the following steps:
 - Check that the message or ESQL contains a valid value for the element or attribute.
 - Check that the union type on which the element is based contains the correct list of simple types.
 - Consider using an `xsi:type` attribute to resolve the union explicitly.
 - Consider changing the type of the element in the tree to correspond with one of the union member types.

A union type contains two or more simple types that are derived from the same fundamental type

- **Scenario:** A warning is issued during logical validation indicating that a union type contains two or more simple types that are derived from the same fundamental type.
- **Explanation:** The broker does not apply value constraints until the data is in the logical tree. Therefore, it is not possible to choose between two simple types that are derived from the same fundamental type but with different constraints. For example, the broker cannot differentiate between a member type of integer with a range of 1-10 and another member type of integer with a range of 11-20, therefore it resolves the union to the first member type of integer.
- **Solution:** Ensure that the union type that is identified in the warning does not contain more than one simple type that is derived from the same fundamental type or ensure that the ordering of such member types is as desired.

A list type is based on a union that also contains a list type

- **Scenario:** An error message is issued during logical validation, indicating that a list type is based on a union type that includes a list type as one of its member types.

- **Explanation:** Lists of lists are not legal. An item type of a list type cannot be a list type itself nor can it be derived at any level from another list type. Therefore, a list type cannot have an item type of a union type that includes a list type as one of its member types.
- **Solution:** Ensure that any union type specified as an item type for a list type does not include a list type as one of its member types.

A union type contains an enumeration or pattern facet

- **Scenario:** An error message is raised during logical validation, indicating that a union type contains an enumeration or pattern facet that is not supported because enumeration and pattern facets must be specified directly on the member type.
- **Explanation:** The broker cannot support the union type facets of pattern and enumeration applied directly to a restriction of a union type. It can support facets directly on the chosen member type only. The Message Definition editor provides support for these facets to enable the import of schemas using direct facets on a restriction of a union type but it issues a warning notifying that they will be ignored by the broker.
- **Solution:** If you want to use the enumeration or pattern facets, specify them directly on the member type and not on the union type itself.

Error message BIP5505 is issued because input data is not valid for the data type

- **Scenario:** A data conversion fails while a message is being read or written. Error message BIP5505 is issued, indicating that the input data was not valid for the data type.
- **Solution:** Perform the following checks:
 - Ensure that the bit stream is correctly aligned to the model. If the incoming message is not consistent with the model, the wrong bytes are allocated to fields, and the data presented to a field is unlikely to contain valid data for the logical type.
 - Ensure that the correct encoding and CodedCharSetId are applied to the body of the input message. If the wrong encoding is used, the input message bit stream is subject to byte swapping and changes to the byte order. This change can affect the nature of data that applies to a field and make it unusable.
 - Ensure that an appropriate WebSphere MQ format is applied to the body of the input message. For example, if MQSTR is applied to a bit stream that contains numeric data, character conversions, rather than encodings, are used to translate the bytes. This use can change the meaning of bytes and make them not valid for the logical data type. If character conversions are used with negative external decimals, consider using the EBCDIC custom option.
 - If the error is on a numeric field, ensure that the input data is compatible with the physical format settings. For example, if the field is signed, ensure that a valid sign byte has been passed in, that it corresponds to the orientation of the sign, and that it is included or excluded as appropriate.
 - If the input message is found not to be compatible with the MRM message definitions, check the message at the source. If it is sent over channels, check that the conversion settings on the channels are correct.

A deprecation error is issued on an imported .mrp file

- **Scenario:** You have imported an .mrp file, and get an error message indicating that complex elements or embedded simple types are deprecated.

- **Explanation:** Complex elements and embedded simple types have no exact equivalent in XML schema. The closest equivalent to a complex type in XML schema is to derive a complex type from a simple type. However, such a type is not allowed to contain elements; only attributes are allowed.
- **Solution:** If your complex type contains elements that cannot be modeled as attributes, set the **Mixed content** flag on the complex type. If you need to parse messages that contain mixed content, set the **Mixed content** flag on the parent complex type. The anonymous data that used to be modeled by the complex type or the embedded simple type then appears as a self-defining node in the parsed message tree.

Your imported message set looks like a simple project

- **Scenario:** You have imported a Version 2.1 message set into the workbench using the `mqsimigratemsgsets` command, but, when you open the project, the content organization looks more like a simple project.
- **Explanation:** Occasionally, a message set project is displayed like a simple project. If you look at the project icon, it does not contain an envelope.
- **Solution:** Close the project and reopen it.

User trace detects an element length error

- **Scenario:** You have defined an MRM message and when you execute the message flow, an error message is written to the user trace indicating that the length of an element is invalid.
- **Explanation:** You have added an element of type string to the complex type making up the message, but you have not defined the length of the string in the instance of the element in its type.
- **Solution:**
 1. Open the message definition file in the Message Definition editor.
 2. In the Outline view, expand the appropriate complex type, then click the element to display its properties in the editor area.
 3. In the Properties Hierarchy, make sure that the element is selected within the CWF physical format under **Physical Properties**.
 4. Specify the properties that this element will have when it is part of the complex type; for example, in the above case, make sure that the **Length Count** value is set.
 5. Save any changes in the Message Definition editor and redeploy the message.

MRM dateTime value has changed after it has been parsed

- **Scenario:** You have defined an MRM dateTime element but the value created in the message tree is different to the value that you defined.
- **Explanation:** The parser uses lenient dateTime checking, converting out-of-band data values to the appropriate in-band value.
- **Solution:** See the information about lenient dateTime checking in `DateTime` as string data with particular reference to how years and fractional seconds are represented.

Resolving problems when using messages

This topic contains advice for dealing with some common problems that can arise when using messages:

- “A communication error is issued when you use the enqueue facility”
- “The enqueue facility is not picking up changes made to a message”
- “You do not know which header elements have any effect in enqueue” on page 95
- “Enqueue message files are still listed after they have been deleted” on page 95
- “The ESQL transform of an XML message gives unexpected results” on page 95
- “An XML message loses carriage return characters” on page 95
- “The broker is unable to parse an XML message” on page 96
- “Unexpected characters are displayed when using the XMLTransformation node on z/OS” on page 96
- “Error message BIP5004 is issued by the XML parser” on page 96
- “Error message BIP5005 is issued by the Compute node” on page 97
- “A message is propagated to the Failure terminal of a TimeoutControl node” on page 97
- “Message processing fails within a TimeoutNotification node” on page 98
- “An MRM CWF message is propagated to the Failure terminal” on page 98
- “Problems with XML attributes” on page 98
- “An MRM XML message exhibits unexpected behavior” on page 99
- “The MRM parser has failed to parse a message because two attributes have the same name” on page 100
- “You encounter problems when messages contain EBCDIC New Line characters” on page 100
- “The MIME parser produces a runtime error while parsing a message” on page 100
- “Runtime errors are issued when you write a MIME message from the logical message tree” on page 101
- “Output message has an empty message body” on page 101
- “Error message BIP5651 is issued when receiving a SOAP with Attachments message from a WebSphere Application Server client” on page 102
- “WebSphere Application Server produces an error when receiving a SOAP with Attachments message” on page 103
- “Problems when using code page translation on HP-UX” on page 104

A communication error is issued when you use the enqueue facility

- **Scenario:** You use the enqueue or dequeue tools to put a message on a queue, but an error message is issued indicating that a communication error has occurred with the queue manager name.
- **Explanation:** The WebSphere MQ queue manager has not started.
- **Solution:** Restart the WebSphere MQ queue manager.

The enqueue facility is not picking up changes made to a message

- **Scenario:** You are using the Message Brokers Toolkit’s message enqueue facility to put messages to WebSphere MQ queues. You have updated a message and want to put the message to the queue, but your changes do not seem to have been picked up.
- **Solution:**
 1. Close and then reopen your enqueue file.
 2. Select the message that you want to put to the queue.

3. Save and close the enqueue file.
4. Select the menu next to the **Put a message to a queue** icon.
5. Click **Put message**.
6. Click the enqueue file in the menu.
7. Click **Finish**.

This action puts your updated message to the queue.

You do not know which header elements have any effect in enqueue

- **Scenario:** When using the Enqueue editor, the accounting token, correlation ID, group ID, and message ID in the message header do not seem to have any effect.
- **Explanation:** These fields have no effect because they are not serialized properly.

Enqueue message files are still listed after they have been deleted

- **Scenario:** Enqueue message files are still listed in the drop-down menu after they have been deleted.
- **Explanation:** Deleted enqueue files are not removed from the drop-down menu. Selecting these files has no effect.

The ESQL transform of an XML message gives unexpected results

- **Scenario:** You 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>
```

You apply the ESQL transform:

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

This transform generates the 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 you expected.

- **Explanation:** The XML in your message contains two doc elements:
 - The doctype element
 - 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*.

- **Solution:** To assign a new value to the element *I1* within the message body element doc, explicitly identify the second doc element, like this:

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

An XML message loses carriage return characters

- **Scenario:** You are parsing an input XML message that contains carriage return or line feed characters, or you are writing an output XML message that contains carriage return line feed characters in an XML element. However, some or all of the carriage return characters are not present in the output message.
- **Explanation:** This behavior is correct, as described by the XML specification, and occurs in the XML, XMLNS, or XMLNSC domains.

In XML, the main line separator characters is a line feed character. Carriage return characters are accepted in an XML document, but an XML parser normalizes any carriage return line feed characters into a single line feed character. For more information, see the latest XML specification at Extensible Markup Language (XML), in particular, Section 2.11 *End of Line Handling*.

Note that you cannot work around this problem by embedding your data into a CDATA section; the XML specification states that a CDATA section is intended only to escape blocks of text that contain characters that could be interpreted as markup. In addition, CDATA sections are not protected from the parser.

You cannot use the `xml:space` attribute to preserve carriage return line feed characters; the XML specification states that normalization of carriage return and line feed characters is done before any other processing is performed.

- **Solution:** Any XML compliant data must not rely on the presence of carriage return line feed characters because in XML, the line feed character is only a line feed character and any XML compliant application or data must be aware that the parser normalizes any carriage return line feed characters.

The broker is unable to parse an XML message

- **Scenario:** You receive a large XML file and wrap it in a SOAP envelope to be passed to a .NET web service. The broker is unable to parse the XML message
- **Explanation:** The message that you receive is defined as UTF-8 but it contains UTF-16 characters, such as £. The presence of these characters causes a problem with the parser: the broker is unable to parse the XML message because it contains an invalid character.
- **Solution:** Force the coded character set ID (CCSID) to 1208 instead of the default 437.

Unexpected characters are displayed when using the XMLTransformation node on z/OS

- **Scenario:** When using the XMLTransformation node on z/OS, all the uppercase Os that are in an XML file on the incoming message are changed to underscore characters.
- **Explanation:** The XMLTransformation node input message must come in as ASCII for the transform to work correctly. The XMLTransformation node does not work with XML or XSL data in EBCDIC code. Java assumes a conversion from EBCDIC 1047. WebSphere Message Broker then converts to EBCDIC 500, because the CCSID is set to 500. EBCDIC 1047 and EBCDIC 500 are very similar. Only uppercase O, J, and Z are different. (J and Z are also converted incorrectly.) The conversions leave a string that is unreadable because it is really in ASCII. However, it does convert the O from an EBCDIC 1047 character to an EBCDIC 500 character.
- **Solution:** Change your program either to do a string assignment without any conversions, or specify that the string is in ASCII ISO-8859-1 (CCSID 819).

Error message BIP5004 is issued by the XML parser

- **Scenario:** Error message BIP5004 is issued, indicating that the XML parser has encountered a problem with an input XML message.
- **Explanation:** This message is issued for a number of reasons. Some of the more commonly occurring scenarios when this message is issued are:
 - You have specified an invalid XML character in the input XML message.
 - You have included binary data in your XML message that, when treated as character data, is invalid.

- The message has arrived as part of a WebSphere MQ message and the MQMD.CodedCharSetId does not correctly represent the XML text bit stream.
- You have used characters that are recognized as markup.

- **Solution:**

- Check that your sending application is sending only valid data. If, however, it is not possible to prevent invalid characters from being included in the XML message, represent it in BLOB domain and use the ESQL REPLACE function to replace or remove the invalid characters. You can then assign the modified bit stream to the required XML parser.

In accordance with XML specification, a CDATA section can be used only to protect characters that would be interpreted as markup. It cannot be used to protect invalid characters or binary data from the XML parser.

- If the input XML message contains binary data, ensure that the sending application is changed to represent this as base encoded binary encoded data. If the application cannot be changed, represent the message in the BLOB domain, and extract and replace the binary data before the bit stream is assigned to the required XML parser.
- Check that the incoming XML message is being represented by the correct MQMD.CodedCharSetId.

Error message BIP5005 is issued by the Compute node

- **Scenario:** You send 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;
```

You expect the following output message to be created:

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

The Compute node generates error message BIP5005 and does not implement the ESQL.

- **Explanation:** 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.
- **Solution:** You can do the cast yourself in the ESQL to achieve the result that you want, using either of the following two casts:

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

or:

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

A message is propagated to the Failure terminal of a TimeoutControl node

- **Scenario:** The TimeoutControl node receives a message with invalid, corrupt or missing timeout information. The message is propagated to the Failure terminal of the TimeoutControl node and an exception list is generated.
- **Explanation:** The following error conditions can cause propagation to the Failure terminal:
 - A timeout request has no Action or no Identifier.
 - A SET request has an Identifier that matches an existing stored SET request for this TimeoutControl node (identified by the Unique Identifier property) and AllowOverwrite of the original request is set to FALSE.

- A CANCEL request has an Identifier that does not match an existing stored SET request for this TimeoutControl node (identified by the Unique Identifier property).
- A SET request has a Count of 0 or is less than -1.
- The StartDate or StartTime are not in the correct format (or one of the understood keywords).
- The calculated timeout is in the past.
- The Interval is less than 0, or 0 with a Count of -1.
- **Solution:** Check for any of the error conditions listed above and rectify them.

Message processing fails within a TimeoutNotification node

- **Scenario:** A message is propagated to the Failure or Catch terminal of a TimeoutNotification node.
- **Explanation:** If the processing of a timeout generates an error within the TimeoutNotification node, an exception list is generated and a message is propagated to the Failure terminal. This action is done under the same transaction, if one is being used. If the Failure terminal is not wired, propagation does not occur.

If an error happens downstream of the TimeoutNotification node after a successful propagation (either to the Out or Failure terminal), the message is propagated to the Catch terminal (all under the same transaction). If the Catch terminal is not wired, or the propagation along the Catch flow fails, the processing of that timeout is rolled back.

- **Solution:** Ensure that the Failure and Catch terminals of your TimeoutNotification node are wired correctly.

An MRM CWF message is propagated to the Failure terminal

- **Scenario:** Your MRM CWF message is propagated to a Failure terminal, and generates error messages BIP5285, BIP5125, and BIP5181 or messages BIP5285, BIP5125, and BIP5288.
- **Explanation:** These errors report an inconsistency between the length of the message being processed, and the length of the message that is defined in the message model.
- **Solution:** Ensure that the length of the message as defined in the CWF layer is accurate. Check and correct the definition.

Problems with XML attributes

XML tags are written where XML attributes are expected, and vice versa.

- **Explanation:** The XML domains and the XML Wire Format in the MRM domain have their own representation of XML attributes.
 - XML domains rely on setting a field type of XML.Attribute in the message tree, because they have no model to parse against.
 - For the XML Wire Format in the MRM domain, the message model indicates whether an element is an attribute or a tag, therefore the message tree does not need to reflect whether a field is an attribute or a tag.

Therefore if fields are copied out of the XML or MRM domains, the fact that fields are attributes is lost. This loss happens if they are copied out to each other, or to another message tree, such as the Environment tree.

This problem typically appears in the following situations:

- **Scenario 1:** You are writing an XML message in the MRM domain, and XML tags are being written instead of XML attributes.

- **Solution 1:** Check that your message tree has the same structure and sequence as the message model. If the message tree does not match the message model, the field is written as self-defining, and consequently the XML Render property is not used.
 - Switch on message validation. Validation shows where the message tree and message definition do not match.
 - Or, take a user debug trace of the message flow; BIP5493W messages indicate which fields are being written as self-defining. Use this information to ensure that the message tree matches the model. When you have corrected any discrepancies, attributes should be correctly written.
- **Scenario 2:** An MRM message has been copied to an XML domain, and the XML attributes are now written as tags.
- **Solution 2:** Take one of these actions:
 - Serialize the XML message in the MRM domain, for example using the ESQL ASBITSTREAM function, and then use the ESQL CREATE PARSE clause to reparse the message using the required XML domain.
 - When copying fields between the MRM domain and XML, copy attribute fields individually, and specifically specify XML.Attribute on the target XML field.
- **Scenario 3:** An XML message has been copied to another message tree such as Environment. When the message is copied back to the XML message tree, XML attributes are now seen as XML tags.
- **Solution 3:** Serialize the XML message, for example using the ESQL ASBITSTREAM function, and then use the ESQL CREATE PARSE clause to reparse the XML message into the required target message tree. See CREATE statement for an example.
- **Scenario 4:** A portion of a non-XML message tree has been detached and attached to an XML tree, and XML tags are now written as XML attributes.
- **Solution 4:** Do not detach and attach portions of message trees that are owned by different parsers. Instead, use a tree copy.
- **Scenario 5:** An XML tag is copied to an XML attribute and the XML attribute is not written in the output message.
- **Solution 5:** When referencing the source XML tag, use the ESQL FIELDVALUE function to copy the specific field value to the target XML attribute field.

An MRM XML message exhibits unexpected behavior

- **Scenario:** Your message flow is processing a message that you have modeled in the MRM. The message tree has not been created as you expected, the output XML message does not have the expected contents, or the message contents are not being validated. No error message has been issued.
- **Explanation:** There are two possible reasons for this:
 - **Explanation 1:** The XML physical format settings for a message set contain a property called Root Tag Name. This property defaults to MRM, in order to remain compatible with previous releases of the product. If you have not deleted the contents of this field, the MRM XML parser expects the root tag for all XML messages to be MRM.

Solution 1: Clear this field, or set it to the root tag used by all your XML messages. If you provide a value in this field, the root tag does not need to be modeled in all your message definitions.
 - **Explanation 2:** In order to remain backwards compatible, the broker recognizes the format XML and invokes the XML parser with specific default values. If you have created an XML physical layer for this message with the

name XML, the broker uses your definition. However, if you have not created an XML physical layer with this name, but have specified XML as the format, either in the input node or the MQRFH2 header (when the input bit stream is parsed to a message tree), the broker accepts the value specified and passes default values to the parser to create the message tree.

Similarly, if you set XML in the Properties folder for the output message in the Compute node, this value is passed to the parser when it creates the message bit stream from the message tree, usually in the output node.

The use of these default values by the parser might result in different content, structure, or both, for either message tree or output message. You can find further information about the action taken by the broker in the user trace log where the following information might be written:

```
XMLWorker::initializeParse file:C:\s000\src\cpi\pwf\xml\xmlworker.cpp
line:126 message:5409.BIPv600
No dictionary present have you specified Wire Format 'XML' in error? ,
UserTrace BIP5409E: XML Worker: Wire Format 'XML' specified.
                    Default MRM XML settings are being used because wire format
                    identifier 'XML' was specified and not found.
                    This can be due to an incorrect setting of the wire format
                    identifier in a message.
```

Solution 2: If you have incorrectly entered the identifier of the format that you have defined, correct your code and retry. If you do not want the default action to be taken, define a physical layer that produces the required results.

The MRM parser has failed to parse a message because two attributes have the same name

- **Scenario:** Two attributes in different name spaces have identical names. Error message BIP5117 is issued.
- **Explanation:** The MRM parser has failed to parse the message.
- **Solution:** Modify the attribute names so that they are not identical. This is a known problem with the parser.

You encounter problems when messages contain EBCDIC New Line characters

- **Scenario:** If your bit stream input message contains EBCDIC New Line (NL) characters, problems might arise if your message flow changes the target CCSID to an ASCII CCSID. For example, during conversion from CCSID 1047 (EBCDIC used for z/OS Open Edition) to CCSID 437 (US PC ASCII), an NL character is translated from hex '15' to hex '7F', which is an undefined character. The error occurs because no corresponding code point for the New Line character exists in the ASCII code page.
- **Solution:** You can overcome the problem in these cases:
 - On a system where the queue manager uses an ASCII codeset, make sure that incoming messages do not contain any EBCDIC NL characters by:
 - Specifying that WebSphere MQ performs the conversion at the input node
 - Setting the queue manager attribute to convert NL to Line Feed (LF)
 - Where the input bit stream is character data, you can use MRM Tagged/Delimited message sets in a Compute node to replace the NL character with the desired output.

The MIME parser produces a runtime error while parsing a message

- **Scenario:** A MIME message is received by a message flow and produces a runtime error when the message is parsed.

- **Explanation:** The following errors can cause the MIME parser to reject a message:
 - The MIME header is not correctly formatted.
 - Either the top-level MIME header block, or a MIME header block for a nested multipart part, does not have a valid Content-Type header.
 - The top-level Content-Type has a media type of message.
 - The top-level Content-Type has a media type of multipart and no boundary definition.
 - A MIME header block is not correctly terminated by a blank line.
 - The constituent MIME parts are not correctly separated by boundary lines.
 - A boundary parameter value occurs in the content of a MIME part.
- **Solution:** Check the MIME message for any of the error conditions listed above and rectify them.

Runtime errors are issued when you write a MIME message from the logical message tree

- **Scenario:** You are writing a MIME logical message tree as a bit stream and the parser generates a runtime error.
- **Explanation:** The following errors can cause the MIME parser to reject a logical message tree:
 - The root of the tree is not called MIME.
 - The last child of MIME is not called Parts or Data.
 - Parts has a value-only element and this element is not the first or last child of Parts.
 - Parts has children that are not value-only elements or Part children.
 - Parts does not have any children called Part.
 - The last child of a Data element is not a BLOB.
- **Solution:** Check the MIME logical message tree for any of the error conditions listed above and rectify them.

Output message has an empty message body

- **Scenario:** You have unexpectedly encountered an empty message body, or the ASBITSTREAM function has produced a zero length BLOB.
- **Explanation:** This error can happen for the following reasons:
 - You have created a message tree folder in a user-defined node but have not associated it with an owning parser. An owning parser is not associated with the message tree if you have created standard elements by using code similar or equivalent to:


```

MbElement createElementAfter(int)
MbElement createElementAfter(int, String, Object)
MbElement createElementAsFirstChild(int)
MbElement createElementAsFirstChild(int, String, Object)
MbElement createElementAsLastChild(int)
MbElement createElementAsLastChild(int, String, Object)
MbElement createElementBefore(int)
MbElement createElementBefore(int, String, Object)
          
```
 - You have used ESQL to create a message tree folder by using ESQL CREATE but without setting an owning parser for it. You might have used code similar or equivalent to:


```

CALL CopyMessageHeaders();
DECLARE outRef REFERENCE TO OutputRoot;
CREATE LASTCHILD OF outRef AS outRef NAME 'BLOB';
CREATE LASTCHILD OF outRef NAME 'BLOB' VALUE X'01';
          
```

or the outRef reference variable was passed to an ESQL function or procedure that contained CREATE statements similar to these. You have not specified an owning parser by using the DOMAIN clause on the CREATE statement.

- An MRM message tree has been constructed and then only part of it has been passed, by specifying a subfolder or field, to the ASBITSTREAM function with the parser mode option set to RootBitStream. This combination is not valid, and results in a zero length BLOB.
- You have copied a message tree, or part of a message tree, to a folder and the owning parser association is not maintained.

• **Solution:** Depending on the reason for the empty message body or zero length BLOB, ensure that:

- When you create a message tree folder in a user-defined node, associate an owning parser with it. Use code similar or equivalent to:

```
createElementAfter(String parserName)
  createElementAsFirstChild(String parserName)
  createElementAsLastChild(String parserName)
  createElementBefore(String parserName)
```

- When you use ESQL CREATE to create a message tree folder, use the DOMAIN clause to associate an owning parser with the message tree, for example:

```
CALL CopyMessageHeaders();
DECLARE outRef REFERENCE TO OutputRoot;
CREATE LASTCHILD OF outRef AS outRef DOMAIN 'BLOB' NAME 'BLOB';
CREATE LASTCHILD OF outRef NAME 'BLOB' VALUE X'01';
```

This code creates a BLOB folder that has the BLOB parser associated with it.

- When copying a message tree, or part of a message tree, ensure that the owning parser association is maintained, by first serializing and then reparsing the message into the appropriate message tree. An example scenario is where you have created a field:

```
SET Environment.Variables.myMsg = InputRoot.XML;
```

and now you need to pass it to the ASBITSTREAM function. Unless you use ESQL similar or equivalent to:

```
DECLARE xm1MsgBlob BLOB
  ASBITSTREAM(InputRoot.XML, InputRoot.MQMD.Encoding, InputRoot.MQMD.CodedCharSetId);
CREATE LASTCHILD OF Environment.Variables.myMsg DOMAIN('XML')
  PARSE(xm1MsgBlob,
    InputRoot.MQMD.Encoding,
    InputRoot.MQMD.CodedCharSetId);
```

the result will be a zero length bit stream.

Error message BIP5651 is issued when receiving a SOAP with Attachments message from a WebSphere Application Server client

- **Scenario:** When a WebSphere Application Server client sends a SOAP with Attachments message to the broker over JMS, error message BIP5651 is issued stating that no valid Content-Type header has been found.
- **Explanation:** When a WebSphere Application Server client sends a SOAP with Attachments message to the broker over JMS, the MIME Content-Type value appears in the MQRFH2 header and not in the MIME message body.
- **Solution:** To solve this problem, the Content-Type value needs to be copied from the MQRFH2 header to the beginning of the message as a MIME header before

the message is parsed. The following ESQL adds the Content-Type value to the beginning of the WebSphere Application Server message and then invokes the MIME parser on the result.

```
create procedure parseWAS_JMS(IN InputMessage reference,IN OutputMessage reference)
/*****
* convert a WAS/JMS message to the correct format for the MIME parser
*****/
begin
  -- get the data as a BLOB
  declare body BLOB InputMessage.BLOB.BLOB;

  -- get the Content-Type value from the RFH2 header. Content-Type is the only
  -- header which is critical for the MIME parser, but the same approach can be
  -- used for any MIME headers which have been stored under the RFH2 header.
  declare contentType char InputMessage.MQRFH2.usr.contentType;

  -- add the contentType to the bit stream as part of an RFC822 header block
  set body = cast(('Content-Type: '||contentType) as blob ccsid 819)||x'0d0a0d0a' ||body;

  -- invoke MIME parser on the modified bit stream
  CREATE LASTCHILD OF OutputMessage DOMAIN('MIME') PARSE(body);
end;
```

A message flow can take in the JMS message in the BLOB domain and then invoke the procedure above from a Compute node. The procedure can be called using the following ESQL from a Compute node:

```
CALL CopyMessageHeaders();           -- standard procedure to copy headers
CALL parseWAS_JMS(InputRoot, OutputRoot); -- parse the 'body' as MIME
```

WebSphere Application Server produces an error when receiving a SOAP with Attachments message

- **Scenario:** When sending a SOAP with Attachments message to a WebSphere Application Server client using JMS, an error is generated stating that the bit stream contains unexpected characters.
- **Solution:** When the broker sends a SOAP with Attachments message to WebSphere Application Server over JMS, the MIME Content-Type value must appear in the MQRFH2 header and not in the body of the message. The following procedure removes any MIME style headers from the front of the message bit stream and adds the Content-Type value to the MQRFH2 header. The supplied boundary value allows you to locate the start of the multipart MIME content.

```
create procedure writeWAS_JMS(IN OutputTree reference,IN boundary char)
/*****
* Serialise a MIME tree as normal, but then strip off any initial headers
* and save the Content-Type value in the RFH2 header as expected by WAS/JMS.
* Note: boundary - must be supplied with the leading hyphen pair
*****/
begin
  -- convert MIME subtree to BLOB
  declare body BLOB asbitstream(OutputTree.MIME);

  -- locate first occurrence of boundary and discard any data before this
  declare firstBoundary integer;
  set firstBoundary = position (cast(boundary as blob ccsid 819) in body);
  set body = substring(body from firstBoundary);

  -- save the MIME Content-Type value in the RFH2 header. Any other MIME
  -- headers which need to be preserved in the RFH2 header can be handled
  -- in the same way
  set OutputTree.MQRFH2.usr."contentType" = OutputTree.MIME."Content-Type";
```

```
-- clear the MIME tree and create a new BLOB child for the modified body
set OutputTree.MIME = null;
CREATE LASTCHILD OF OutputTree DOMAIN('BLOB')PARSE(body);
end
```

Before calling this procedure, the message flow needs to be able to obtain the value of the boundary. This value might be available only within a Content-type header. The following procedure allows you to extract the Boundary value:

```
create procedure getBoundary(IN ct reference,OUT boundary char)
/*****
* return value of the boundary parameter from a Content-Type value
*****/
begin
  declare boundaryStart integer;
  declare boundaryEnd integer;

  set boundaryStart = position('boundary=' in ct) + 9;
  set boundaryEnd = position('; ' in ct from boundaryStart);
  if (boundaryStart <> 0) then
    if (boundaryEnd <> 0) then
      set boundary = substring(ct from boundaryStart for boundaryEnd-boundaryStart);
    else
      set boundary = substring(ct from boundaryStart);
    end if;
  end if;
end;
```

A Compute node can invoke these procedures for sending a MIME message using the following ESQL:

```
SET OutputRoot = InputRoot;

declare boundary char;
CALL getBoundary(OutputRoot.Properties.ContentType, boundary);

CALL writeWAS_JMS(OutputRoot,boundary);
```

Problems when using code page translation on HP-UX

- **Scenario:** You experience code page translation problems on HP-UX.
- **Solution:** Check the WebSphere MQ queue manager attribute *CodedCharSetID*. The default value for this attribute is 1051. Change this value to 819 for queue managers that host WebSphere Message Broker components.

Resolving problems when you use the workbench

This topic contains advice for dealing with some common problems that can arise when you use the workbench.

“Resolving problems that occur when connecting:” on page 105

- “Your broker is not recognized by the workbench” on page 105
- “You cannot connect to the Configuration Manager from the workbench or command line” on page 105
- “A Version 5.0 or Version 5.1 Message Brokers Toolkit is unable to connect to a Version 6.0 Configuration Manager using a domain user ID” on page 106
- “Connection to the Configuration Manager is slow” on page 107

“Resolving error messages that occur when using the workbench:” on page 107

- “Errors occur while you are using the workbench” on page 107
- “An error is issued when you access the help system” on page 107

- “The Message Brokers Toolkit displays an error message after the error has been fixed” on page 108
- “Error message BIP0800 is issued when you rename a domain object” on page 108
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“Resolving problems relating to the appearance of the workbench:” on page 109

- “You cannot close a message dialog box” on page 109
- “The Domains navigator content is updated but you have not made any changes” on page 109
- “A server project containing a valid domain connection file is not displayed” on page 109
- “Some objects are not visible in the Domains Navigator” on page 109
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- “Your message flow and message set projects have changed their appearance” on page 110

“Resolving non-specific problems when using the workbench” on page 110

- “Deleting or closing a project takes a long time” on page 110
- “You are experiencing poor performance when working with large or complex projects” on page 110
- “You are considering moving database resources within the workbench” on page 110
- “You do not know how to return to the welcome page” on page 111

Resolving problems that occur when connecting:

This topic contains advice for dealing with some common problems that can arise when you connect to the workbench.

Your broker is not recognized by the workbench:

- **Scenario:** Your broker is not recognized by the workbench.
- **Explanation:** Broker names in the workbench are case sensitive.
- **Solution:** When you identify a broker in the workbench, make sure that you use the same case that was used when it was created. Note that the broker’s name when it was created might have become uppercase due to case-folding, even though you entered its name in lowercase.

You cannot connect to the Configuration Manager from the workbench or command line:

- **Scenario:** Error messages are issued when you try to connect to the Configuration Manager from the workbench or the command line.
- **Solution:** The following table shows the checks to carry out when an error message is issued in the Message Brokers Toolkit, or returned to the command line, when you try to connect to the Configuration Manager:

Error message		Actions
Message Brokers Toolkit	Command line	
BIP0914E	BIP1046E with MQ reason code 2059	<p>Check that the Configuration Manager's queue manager and listener are running, and that the correct port is specified for the queue manager.</p> <p>(The WebSphere MQ documentation describes the WebSphere MQ return codes.)</p>
BIP0889E	BIP1047E	<p>Check that the Configuration Manager is running.</p> <p>Check the system event log to ensure that the Configuration Manager is available for use, and correct any errors that are shown.</p>
BIP0915E	BIP1046E with MQ reason code 2035	<p>Check that the Message Brokers Toolkit local user ID is created on the Configuration Manager system. If it is not, create it.</p> <p>Check if the Message Brokers Toolkit local user ID that is created on the Configuration Manager system is authorized to connect to the Configuration Manager's queue manager.</p> <ul style="list-style-type: none"> • Use the WebSphere MQ <code>dspmqaout</code> command to determine what WebSphere MQ authorities the user has. • If necessary, add the Message Brokers Toolkit local user ID to the mqm group on the Configuration Manager system.
BIP0991E with BIP1711W specifying that the user cannot view the Configuration Manager Proxy	BIP1047E	<p>Add an access control list (ACL) entry to the Configuration Manager for the user with the Message Brokers Toolkit local user ID. For example, if <i>USERA</i> connects to the Message Brokers Toolkit on <i>COMPUTERA</i>, which belongs to <i>DOMAINA</i>, and is trying to connect to Configuration Manager <i>CMA</i>:</p> <ul style="list-style-type: none"> • <i>USERA</i> must exist as a user on the Configuration Manager system and belong to the mqm group • <i>USERA</i> could have one of the following ACL entries: <ul style="list-style-type: none"> – To create an ACL entry for <i>USERA</i> to connect with full Configuration Manager Proxy authority from any computer or domain, issue the following command: <pre>mqsicreateaclentry CMA -u USERA -a -x F -p</pre> – To create an ACL entry for <i>USERA</i> to connect with full Configuration Manager Proxy authority from <i>COMPUTERA</i> only, issue the following command: <pre>mqsicreateaclentry CMA -u USERA -m COMPUTERA -x F -p</pre> – To create an ACL entry for <i>USERA</i> to connect with full Configuration Manager Proxy authority from <i>DOMAINA</i> only, issue the following command: <pre>mqsicreateaclentry CMA -u USERA -m DOMAINA -x F -p</pre> <p>If a domain name and computer name match, and an ACL entry specified the -m parameter, connection from either the domain or computer is acceptable because they are not considered to be different users.</p> <p>ACLs are necessary for all connections to the Configuration Manager, so the user who issues a command such as mqsideploy from the command line must also have appropriate ACL entries.</p>

A Version 5.0 or Version 5.1 Message Brokers Toolkit is unable to connect to a Version 6.0 Configuration Manager using a domain user ID:

- **Scenario:** You cannot use a Version 5.0 or Version 5.1 Message Brokers Toolkit to connect to a Version 6.0 Configuration Manager using a domain user ID with access that is controlled by a domain user ID access control list (ACL) entry.

- **Solution:** If you are logged on to the Version 5.0 or Version 5.1 Message Brokers Toolkit with a domain user ID, you can connect to the Version 6.0 Configuration Manager by creating an ACL on the Configuration Manager for the local user ID. Specify the **-a** parameter to allow that user ID to be used from any computer or domain. For example:

```
mqsicreateaclentry CMGR01 -u USERA -a -x F -p
```

To use a domain user ID to connect to the Version 6.0 Configuration Manager and specify a user ID to access the Configuration Manager, as controlled by an ACL, you must upgrade the Message Brokers Toolkit to Version 6.0.

Connection to the Configuration Manager is slow:

- **Scenario:** Connection to the Configuration Manager is slow and you are unable to perform other actions in the tooling when you perform the following operations:
 - connecting to a domain
 - creating a new broker
 - creating a new execution group
 - deploying a broker archive file, using the Deploy a BAR File wizard
 - opening the Broker Topology editor
 - opening the Topics Hierarchy editor
 - opening the Subscriptions Query editor
 - opening the Event Log editor
- **Solution:** Click **Cancel** on the progress monitor dialog box to cancel the in-progress connection. Connection to the Configuration Manager is cancelled, allowing you to perform other actions in the tooling. You can then resubmit the cancelled operation.

Resolving error messages that occur when using the workbench:

This topic contains advice for dealing with error messages that might be displayed when you use the workbench.

Errors occur while you are using the workbench:

- **Scenario:** An error has occurred while you are using the workbench, and you want information to help you to diagnose the problem.
- **Solution:** Some errors that occur in the workbench are logged in the .log file in your workspace\metadata directory. You can view this log by switching to the Plug-in Development perspective and clicking the Error Log tab in the bottom right pane. The log shows in which plug-in the error occurred, and gives further information.

You can also use trace to try and determine the cause of your problem. See “Using trace” on page 142 for more information about tracing.

An error is issued when you access the help system:

- **Scenario:** You are accessing the help system through the workbench, and an error message is issued stating that the web page that you requested is not available offline.
- **Explanation:** This error might occur if you previously had a connection to a Web-based version of the help system and lost it, or if you have **Work Offline** selected in your Internet Explorer options.
- **Solution:** Click **Connect** to load the help system.

The Message Brokers Toolkit displays an error message after the error has been fixed:

- **Scenario:** The Message Brokers Toolkit is in an inconsistent state or displays an error message after the error has been fixed
- **Solution:** Clean the workspace:
 1. From the Message Brokers Toolkit, click **Project** → **Clean**.
 2. Click **Clean all projects** and **Finish**.

This cleans the whole workspace of any internal files, which are then re-created so that none of your data is lost.

Error message BIP0800 is issued when you rename a domain object:

- **Scenario:** Error message BIP0800 is issued when you click **OK** in the rename dialog box on a domain object.
- **Explanation:** This error occurs when the Domains Navigator receives a notification about object creation or deletion and changes its selection while you are entering the new name in the dialog box.
- **Solution:** Refresh the parent of the object that you are trying to rename to see whether the action was sent to the Configuration Manager before the error occurred. If the name of the object has not changed, wait for an automatic refresh in the Domains Navigator and try to rename the object again. An automatic refresh typically occurs when you or another user have saved many changes in the Topics hierarchy.

Error message BIP0935 is issued when you edit domain connection parameters:

- **Scenario:** You want to edit the connection parameters for the domain, and see only one connection file. However, error message BIP0935 is issued, stating that several domain connection files exist for the domain.
- **Explanation:** This error can occur when you delete the port value in the Domain Connection editor and save this file. The corresponding domain is displayed in the Domains view with a label like `yourQMGR@yourMachine:.` Error BIP0935 is issued when you try to edit parameters for this domain.
- **Solution:** In the Broker Administration perspective, edit the corresponding `.configmgr` file to set the port to 1414, and save the file. Even if the domain label is not updated in the Domains view, the port parameter has been taken into account in the domain connection file.

If you want to see the correct label and open the Domain Connection editor from the Domains view, close and restart the workbench.

Warning message BIP0876 is issued when you make changes in the Broker Topology editor:

- **Scenario:** While you are making some changes in the Broker Topology editor, warning message BIP0876 is issued and you are invited to close the editor without saving.
- **Explanation:** The editor has been told that Configuration Manager content has changed, and the changes that you have initiated will conflict with those recent changes. This is typically because another user has made some changes on the topology. To avoid potential conflicts between other users' changes and yours, you are invited to close the editor without saving. You can then reopen the editor, which will be populated with the actual Configuration Manager content.
- **Solution:** If you are sure that your changes will not be in conflict with those made by another user and you want to save your changes, you can save them.

The Configuration Manager tries to apply your changes on top of its actual content. You are notified if any of the requests fail.

The same message might be raised in the Topics editor for the same reason.

The message Unable to create part: filename.extension is issued:

- **Scenario:** You open an editor in the workbench and an error message is raised stating that a file cannot be created. Two possible explanations for this problem are given below:
- **Explanation 1:** The given file is not associated with any editor.
 - **Solution 1:** Right-click the file and choose the default editor to open it, or choose any other editor if the default editor cannot open it.
- **Explanation 2:** The given file contains syntax errors and cannot be loaded into the chosen editor. However, if you then try to open a valid file, you get the same error message repeatedly.
 - **Solution 2:** Restart the workbench and do not try to load the file into an editor again until you have fixed the syntax errors.

Resolving problems relating to the appearance of the workbench:

This topic contains advice for dealing with some common problems that relate to the appearance of the workbench.

You cannot close a message dialog box:

- **Scenario:** You have opened a pop-up menu, and a message dialog box appears to tell you that previous changes made have been processed successfully by the Configuration Manager. You cannot close the dialog.
- **Solution:** If you cannot close the dialog box by clicking **OK**, press Esc.

The Domains navigator content is updated but you have not made any changes:

- **Scenario:** You are connected to a domain and have not made any changes. However, the Domains Navigator and editor's content are updated.
- **Explanation:** Another user has made changes on the Configuration Manager. The Domains Navigator and editors are notified of these changes and are refreshed automatically.

A server project containing a valid domain connection file is not displayed:

- **Scenario:** You have a valid domain connection file in one of your workspace server projects, but you cannot see this project in the Broker Administration perspective, or an associated domain in the Domains Navigator.
- **Explanation:** The project is closed. Closed projects are not displayed in the Broker Administration perspective, and their content is not analyzed.
- **Solution:** Open the project from the Navigator view in the Resource perspective. The project appears in the Broker Administration perspective, and its content is analyzed and displayed. The domain connection and domain then appear in the appropriate navigators.

Some objects are not visible in the Domains Navigator:

- **Scenario:** Some objects, for example broker topologies, topics, brokers or execution groups, are not visible in the Domains Navigator.
- **Explanation:** ACL-restricted objects might not be visible in the Domains Navigator if the corresponding **Show ACL restricted objects in Navigators** preference was previously not selected.

- **Solution:**
 1. Click **Window** → **Preferences** → **Broker Administration preference page**.
 2. Check whether the **Show ACL restricted objects in Navigators** preference is selected. If it is not, select it and click **OK**.

Any restricted objects are displayed in the Domains Navigator.

You want to filter entries in the Tasks view:

- **Scenario:** The Tasks view has such a large number of entries that it is difficult to find the entry that you want.
- **Solution:** At the top of the Tasks View, click the icon with the arrows pointing to the right. This opens the Filter Tasks dialog box, in which you can tailor your selections to display only a subset of the task list entries, such as only those entries for the currently-selected project.

Your message flow and message set projects have changed their appearance:

- **Scenario:** You have created a new simple project in the workbench and now all your message flow and message set projects look different.
- **Explanation:** When you create a new simple project, the workbench switches automatically to the Resource Navigator view.
- **Solution:** To return to the previous view, switch to the Broker Application Development perspective.

Resolving non-specific problems when using the workbench

This topic contains advice for dealing with some common problems that can arise when you use the workbench, yet are not dealt with in previous categories.

Deleting or closing a project takes a long time:

- **Scenario:** Deleting or closing a project to save memory takes a long time.
- **Explanation:** If a project is referenced by other projects, removing that project requires all the other projects, and the projects that refer to them recursively, to be built fully. This process occurs to keep the content-assist and validation models current.
- **Solution:** To keep a project open in the workspace requires very little memory so you do not need to close or delete projects.

You are experiencing poor performance when working with large or complex projects:

- **Scenario:** You are experiencing poor performance in the workbench when working with large or complex projects.
- **Explanation:** Frequent project changes, such as adding and removing projects, or using **Project** → **Clean**, use large amounts of memory due to the size and number of files and the connections between them.
- **Solution:** Increase your system memory.

You are considering moving database resources within the workbench:

- **Scenario:** You are considering moving database resources within the workbench, such as the XMI files for connection, database, schema, and tables.
- **Solution:** You cannot move database resources after they are imported. The only move that you can perform without affecting the integrity of the files is between two projects while keeping the project-relative path of the files unchanged. To place the database resources in a different folder, import them again from the database.

You do not know how to return to the welcome page:

- **Scenario:** You do not know how to return to the welcome page that was displayed in the workbench when you first started using it.
- **Solution:** To open the welcome page:
 1. From the **Help** menu, select **Welcome**. If only one welcome page is available, it is displayed. If more than one is available, a list is displayed.
 2. Select the welcome page that you want, for example, WebSphere Message Broker Message Brokers Toolkit.
 3. Click **OK**.

Resolving problems when using databases

Before you start:

- Read “Is there a problem with a database?” on page 8

This topic contains advice for dealing with some common problems that can arise when using databases:

- “DB2 error message SQL0443N is issued” on page 112
- “DB2 error message SQL0805N is issued” on page 112
- “DB2 error message SQL0998N is issued” on page 112
- “DB2 error message SQL0998N or SQL1248N is issued” on page 113
- “DB2 error message SQL1040N is issued” on page 113
- “DB2 error message SQL1224N is issued when you connect to DB2” on page 113
- “DB2 error message SQLSTATE=58005 is issued” on page 115
- “DB2 or ODBC error messages are issued on z/OS” on page 115
- “Error message BIP1780 is issued on AIX” on page 116
- “You do not know how many database connections a broker requires” on page 116
- “You want to use XA with DB2” on page 116
- “XA coordination fails with DB2 V8 Fix Pack 2” on page 117
- “XA coordination fails if the database restarts while the broker is running” on page 117
- “Error message BIP2322 is issued when you access DB2 on z/OS” on page 117
- “On Oracle, a database operation fails to return any rows, even though the rows exist” on page 117
- “There is a memory leak from the Oracle Client Interface on HP-UX 11” on page 118
- “Stored procedure parameter sizes are different in Oracle 9i and Oracle 10g” on page 118
- “Oracle error message ORA-12500 is issued on Solaris 8 with Oracle 9” on page 118
- “Error messages BIP2731, BIP2321, and BIP2322 are issued when you use retained publications with a Sybase database” on page 118
- “Database updates are not committed as expected” on page 119
- “The DataDirect trace system is unable to open the ODBC trace file” on page 119
- “You want to list the database connections that the broker holds” on page 120

DB2 error message SQL0443N is issued

- **Scenario:** After you upgrade the server to DB2 Universal Database (DB2 UDB) Version 8.1 FixPak 10 (also known as Version 8.2 FixPak 3), a DB2 error message SQL0443N is issued if you invoke a DB2 Call Level Interface (CLI) catalog function, such as SQLTables(), SQLColumns(), or SQLStatistics(). An example of the error message is:

```
SQL0443N Routine "SYSIBM.SQLTABLES" (specific name "TABLES") has returned an error SQLSTATE with diagnostic text SYSIBM:CLI:-805". SQLSTATE=38553.
```

- **Solution:** Bind the db2schema.bnd file against each database by entering the following commands at a command prompt:

```
db2 terminate
db2 connect to database-name
db2 bind path\db2schema.bnd blocking all grant public sqlerror continue
db2 terminate
```

where *database-name* is the name of the database to which the utilities must be bound, and *path* is the full path name of the directory where the bind files are located. For example, the default location in Windows is C:\Program Files\IBM\SQLLIB\bnd\.

To list all the names of databases for a particular DB2 instance, run the DB2 CLI command **db2 list database directory**.

DB2 error message SQL0805N is issued

- **Scenario:** When you run the **mqsicreatebroker** command, or when a message flow that includes a Database node runs, SQL error SQL0805N NULLID.SQLLF000 is issued.
- **Solution:** Open a DB2 Command Line Processor window and issue a bind command to the database.

UNIX On Linux and UNIX systems, enter the commands:

```
connect to db
bind ~/sqllib/bnd/@db2cli.lst grant public CLIPKG 5
connect reset
```

where *db* is the database name.

Windows On Windows systems, enter the commands:

```
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.

DB2 error message SQL0998N is issued

- **Scenario:** When you use a globally coordinated message flow with a DB2 8.1 database, error SQL0998N is issued with Reason Code 09 and Subcode 02.
- **Solution:** Use the following procedure to set the DB2 database manager configuration parameter TP_MON_NAME to MQ, and alter the XAOpenString in the qm.ini file for your queue manager:
 1. To set the TP_MON_NAME parameter, use the following command from a login that has administrative authority for the DB2 instance:

```
db2 update dbm cfg using TP_MON_NAME MQ
```
 2. Stop and restart the DB2 instance so that the value is recognized.
 3. To set the AXLIB value in the qm.ini file, alter the XAOpenString to match the following example:

XAOpenString=DB=databasename,UID=userid,PWD=password,AXLIB=library

4. Set the AXLIB library path to one of the following values, depending on your operating system:
 - On Windows:
AXLIB=mqmax
 - On AIX:
AXLIB=usr/mqm/lib/libmqmax_r.a
 - On HP-UX:
AXLIB=/opt/mqm/lib/libmqmax_r.sl
 - On Linux:
AXLIB=/opt/mqm/lib/libmqmax_r.so
 - On Solaris:
AXLIB=/opt/mqm/lib/libmqmax.so
5. Stop and restart your broker and queue manager for these changes to take effect.

DB2 error message SQL0998N or SQL1248N is issued

- **Scenario:** When you try to use a globally coordinated message flow with a DB2 version 8.1 database, you get either of the following error messages:
 - SQL0998N with Reason Code 09 and Subcode ""
 - SQL1248N with a message indicating that the database is not defined with the transaction manager
- **Solution:** Use the instructions in Configuring global coordination with DB2 using a 32-bit queue manager to configure the database and XAResourceManager stanza.

DB2 error message SQL1040N is issued

- **Scenario:** You are using DB2, and error message BIP2322 is issued with error SQL1040N.
- **Explanation:** The following DB2 message indicates that the value of the DB2 database configuration parameter **maxappls** has been reached:
"SQL1040N The maximum number of applications is already connected to the database. SQLSTATE=57030"
DB2 has rejected the attempt to connect.
If this database is one of the defined broker databases, implying that a broker thread connection request has failed, the broker is probably not functioning correctly.
- **Solution:**
 1. Stop all brokers that connect to the affected database.
 2. Increase the value of the **maxappls** configuration parameter. Also, check the value of the associated parameter **maxagents** and increase it in line with **maxappls**.
 3. Restart the DB2 database.

DB2 error message SQL1224N is issued when you connect to DB2

- **Scenario:** DB2 error message SQL1224N is issued when you connect to DB2, indicating that a database agent could not be started or was terminated as a result of a database shutdown or force command.
- **Solution:** On AIX, use the TCP/IP node to connect to DB2 to avoid the limit of 10 connections. To set up AIX and DB2 loop-back to use the TCP/IP node:

1. Use the **mqsdeletebroker** command to delete your broker.
2. Configure DB2 to use TCP/IP, and to start the TCP/IP listener. On the server machine, log in as the DB2 instance owner, usually `db2inst1`, and issue the commands:

```
db2set DB2COMM=tcPIP
db2stop
db2start
```

3. If the DB2 connection port is not defined in `/etc/services`, edit the services file to add the DB2 connection and interrupt ports. You must use unique names, and port numbers that are not already defined in the services file; for example:

```
db2svc1    3700/tcp          # DB2 Connection Service
db2isvc1   3701/tcp          # DB2 Interrupt Service
```

4. Update the DB2 configuration; for example:

```
db2 update dbm cfg using svcnamedb2svc1
```

where `db2svc1` is the name of the DB2 Connection port service in `/etc/services`.

Alternatively, you can specify a port number directly.

5. Stop and restart the database using the commands:

```
db2stop
db2start
```

6. Catalog a new TCP/IP node:

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

where:

NODENAME

is the name of the new node. You can use `local` as your node name, providing it is unique.

HOSTNAME

is the name of your computer.

db2svc1

is the name of the DB2 connection port service in `/etc/services`.

Message `DB20000I` is displayed when the command completes successfully.

7. Catalog the database with a new alias name; for example:

```
db2 catalog database DATABASE as DBALIAS at node NODENAME
```

where:

DATABASE

is the physical name of the database.

DBALIAS

is the database alias name that you want to use.

Specify the new alias name in all subsequent references to the local database, for example when you run the **mqsicreatebroker** command.

8. Stop and start DB2:

```
db2 terminate
db2stop
db2start
```

9. Log on using the broker service user ID.

10. To enable WebSphere Message Broker brokers to use the database, update the ODBC configuration file to add definitions for the database (if you are using the default odbc.ini file, this is located at /var/wmqi/odbc/.odbc.ini):

a. At the top of the file, add a definition for the database alias name:

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

b. Add a new stanza for the database alias:

```
[DBALIAS]
Driver=INSTHOME/sql/lib/libdb2.a
Description=Broker Database Alias
Database=DBALIAS
```

where *INSTHOME* is the path to your DB2 Instance directory.

11. Create a new broker using the DBALIAS on the **-n** parameter:

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

12. Start the broker and redefine it in the workbench.

13. Deploy the broker and test the flows.

DB2 error message SQLSTATE=58005 is issued

- **Scenario:** DB2 error SQLSTATE=58005 is issued when you use WebSphere Message Broker Version 6.0 on Linux with DB2 Version 8.1 and Fix Pack 9.
- **Explanation:** This error is issued when the values of the kernel parameters (msgmni, sem) are too low.
- **Solution:** Increase the kernel parameters (msgmni, sem).

These kernel parameters should be significantly above their minimum values and at least the highest of the recommended values for DB2, WebSphere MQ, and WebSphere Message Broker. The following example shows possible values for a heavy workload environment where the broker has two execution groups with 200 message flows deployed, and approximately 45 applications that are using these message flows:

```
/proc/sys/kernel/msgmni 2048
/proc/sys/kernel/sem 250 256000 32 2048
```

DB2 or ODBC error messages are issued on z/OS

- **Scenario:** DB2 or ODBC messages are issued on z/OS indicating that:
 - An exception was caught while issuing the database SQL connect command.
 - There was a database error with an ODBC return code of -1, an SQL state of 58004 and a native error code of -99999.
 - The broker made an unsuccessful attempt to access its database using a particular user ID.

• **Solution:** If an ODBC message is displayed:

1. Turn ODBC application tracing on to produce the traceodbc file.
2. Locate the traceodbc file. This is in the /output subdirectory. For example /u/argo/VCP0BRK/output/traceodbc.
3. Go to the bottom of this file and search for previous instances of SQLERROR.

Common DB2 problems include:

- ODBC return code -1, SQL state 58004, Native error code -99999

This might be caused by:

- No SQL code. The DB2 subsystem is not started
- RRS is not started.
- SQLCODE 922.

- The user ID of the started task is not authorized to use plan DSNACLI.
- ODBC return code -1, SLQ state 42503, Native error code -553
- This might be caused by the user ID of the started task not being authorized to use the current SQL ID. Re-configure the broker and specify DB2_TABLE_NAME as a valid name, or create an RACF group and connect the started task user ID to this group.

Error message BIP1780 is issued on AIX

- **Scenario:** Error message BIP1780 is issued on AIX, indicating that the user ID could not be validated.
- **Explanation:** If you change your AIX operating system password after you create the broker, when you perform an action such as deploying a bar file, it fails because the password change causes the connection to the DB2 database to fail.
- **Solution:** Run the `mqsichangebroker` command for the user ID that is used to connect to the database:

```
mqsichangebroker broker -p password
```

This allows DB2 to authenticate the user ID correctly.

You do not know how many database connections a broker requires

- **Scenario:** You do not know how many database connections to set up for your broker.
- **Solution:** Determine the number of database connections required by a broker for capacity and resource planning. On DB2, the default action taken is to limit the number of concurrent connections to a database to the value of the **maxappls** configuration parameter; the default for **maxappls** is 40. The associated parameter **maxagents** also impacts the current connections. The connection requirements for a single message broker are:
 - Five are required by internal broker threads.
 - One is required for each publish/subscribe neighbor, if the topology has been deployed.
 - One is required for each message flow thread that contains a Publication node.
 - One is required for each message flow thread that parses MRM messages.
 - One is required for each database access node to separate ODBC data source names for each message flow thread (that is, if the same DSN is used by a different node, the same connection is used).
 - If you are using SCADA nodes with WebSphere MQ Everyplace, add a further number of connections depending on whether thread pooling is being used (check the Use Thread Pooling property of the SCADAInput node):
 - If Use Thread Pooling is not selected (the default), add the number of SCADA clients that will connect to the SCADAInput node.
 - If Use Thread Pooling is selected, add the value in the Max Threads property of the SCADAInput node. The default value is 500.Connections for neighbors and publication nodes are required only if you are using retained publications.

You want to use XA with DB2

- **Scenario:** You want to use XA with DB2.

- **Solution:** If you want to use XA coordination with DB2 V8.1, ensure that your queue manager is configured to use **ThreadOfControl=THREAD**. On Linux or UNIX you can configure this parameter in the XAResourceManager stanza in qm.ini . On Windows you can configure this parameter using the WebSphere MQ Explorer or WebSphere MQ Services snap-in depending on what version of WebSphere MQ you are using.

XA coordination fails with DB2 V8 Fix Pack 2

- **Scenario:** XA coordination fails with DB2 V8 Fix Pack 2 on AIX, HP-UX, Linux, Solaris, or Windows.
- **Explanation:** If a non-XA coordinated message flow tries to access a database that was previously being used by an XA coordinated message flow, failure can occur because DB2 believes that the later flow is still coordinated from the previous flow.
- **Solution:** This is fixed in DB2 V8 Fix Pack 3 by APAR IY44711.

XA coordination fails if the database restarts while the broker is running

- **Scenario:** XA global coordination fails and you get an error similar to the following example, which is from a DB2 user database:

```
Database error: SQL State '40003'; Native Error Code '-900'; Error Text '[IBM][CLI Driver]
SQL0900N The application state is in error. A database connection does not
exist.SQSTATE=08003'.
```
- **Explanation:** A globally coordinated message flow cannot automatically reconnect to a user database if the user database is restarted while the broker is still running.
- **Solution:** Stop and restart the broker if the user database goes down or is brought down for a scheduled maintenance.

Error message BIP2322 is issued when you access DB2 on z/OS

- **Scenario:** You are using a message flow in which a Database node, Compute node, or Filter node attempts to access a table on a DB2 data-sharing group other than the one that the broker is using. If ODBC tracing is turned on, an error message is written to the traceodbc file:

```
SQLError( hEnv=0, hDbc=0, hStmt=1, pszSqlState=&302f8ecc, pfNativeError=&302f8ec8,
pszErrorMsg=&28f6a6d0, cbErrorMsgMax=1024, pcbErrorMsg=&302f8eb4 )
SQLError( pszSqlState="51002", pfNativeError=-805, pszErrorMsg="{DB2 for OS/390}
{ODBC Driver}{DSN06011}
DSNT408I SQLCODE = -805, ERROR: DBRM OR PACKAGE NAME DSN610GH..DSNCLICS.16877-
BE5086005F4 NOT FOUND IN PLAN DSNACLI. REASON 02
DSNT418I SQLSTATE = 51002 SQLSTATE RETURN CODE
DSNT415I SQLERRP = DSNXEPM SQL PROCEDURE DETECTING ERROR
DSNT416I SQLERRD = -350 0 0 -1 0 0 SQL DIAGNOSTIC INFORMATION
DSNT416I SQLERRD = X'FFFFFFEA2' X'00000000' X'00000000' X'FFFFFFF'
X'00000000' X'00000000' SQL DIAGNOSTIC INFORMATION
```

This error is accompanied by the following BIP2322 error message in the syslog:
BIP2322E: DATABASE ERROR: SQL STATE '51002'; NATIVE ERROR CODE '-805'

- **Explanation:** This happens when the DSNACLI plan has not been bound in the correct way.
- **Solution:** Ensure that the DSNACLI plan is bound correctly.

On Oracle, a database operation fails to return any rows, even though the rows exist

- **Scenario:** You are using Oracle databases in your message flows and ESQL binds against columns, which are declared as data type CHAR, and those

parameter markers are referenced in a WHERE clause. The database operation fails to return any rows, even though the rows exist.

- **Explanation:** Such fixed length character strings need to be padded with blank characters on Oracle for this type of comparison to succeed.
- **Solution:** Define the CHAR columns as VARCHAR2 columns, or pad the ESQL variable with blank characters to the required column length, so that the comparison locates the desired rows from the table.

There is a memory leak from the Oracle Client Interface on HP-UX 11

- **Scenario:** A memory leak has been observed from the Oracle Client Interface (OCI) when using Oracle 9i Release 2 (9.2.0.1) on HP-UX 11.
- **Solution:** This problem has been fixed by Oracle and the fix is available by upgrading to Oracle 9i Release 2 Database Server Patch Set 2 for HP9000 Series HP-UX (64-bit). This has the Oracle patch number of 2761332. To install the above Oracle patch, you might need to upgrade your Oracle installer (OUI) to version 2.2.0.18.0 first. The Oracle patch number for this upgrade is 2878462.

Stored procedure parameter sizes are different in Oracle 9i and Oracle 10g

- **Scenario:** A stored procedure that contains a char(16) returns a parameter size of 2000 instead of 16.
- **Explanation:** Oracle 9i and Oracle 10g return different sizes for parameters in a stored procedure. This is due to differences in the way that Oracle 9 and Oracle 10 function. A statement from Oracle about this change of behavior, and a scenario that illustrates it, are available at the Oracle meta link web site in TAR 4567976.993.

Oracle error message ORA-12500 is issued on Solaris 8 with Oracle 9

- **Scenario:** Oracle error message ORA-12500 is issued on Solaris 8 with Oracle 9 when you run workload applications that are performing database insert, update, or delete operations.
- **Explanation:** This error is issued when the values of the tuning parameters are too low.
- **Solution:** Increase the following Oracle 9i Release 2 tuning SGA parameters in the initSID.ora file:
 - JAVA_POOL_SIZE
 - SHARED_POOL_SIZE
 - SORT_AREA_SIZE

The following example shows possible increased values for a workload setup with a single broker that has two execution groups, each with 92 message flows:

```
.java_pool_size=125829120  
.shared_pool_size=218862284  
.sort_area_size=65536
```

Error messages BIP2731, BIP2321, and BIP2322 are issued when you use retained publications with a Sybase database

- **Scenario:** The following error messages are issued when you use retained publications and a Sybase broker database:

```
BIP2731 Database statement 'INSERT INTO dbo.BRETAINEDPUBS  
VALUES(?, ?, ?, ?, ?, ?, ?, ?, ?, ?, ?)' could not be executed.  
BIP2321 Database error: ODBC return code '-1'.
```

BIP2322 Database error: SQL State '40001'; Native Error Code '1205'.
Text '[SYBASE][ODBC Sybase Driver][SQL Server]Your server command
(family id #0, process id #234) encountered a deadlock situation.
Please re-run your command.'

- **Explanation:** These errors are likely to occur only when you use retained publications with multiple topics, with a substantial workload.
- **Solution:** Apply row level locking to one of the broker's database tables:

1. At a Sybase command prompt, enter the command:

```
isql -Username -Ppassword
```

2. Connect to the broker's database:

```
use broker DSN
```

where *broker DSN* is the ODBC Data Source Name (DSN) for the broker database.

3. Enter the command:

```
alter table dbo.BRETAINEDPUBS lock datarows
```

where *dbo* is the schema name.

4. Enter the command:

```
go
```

Database updates are not committed as expected

- **Scenario:** You have included a Compute, Database, or Filter node in a message flow, and you have set the **Transaction** property to **Commit**. The message flow has raised an exception and has rolled back, but the database updates have not been committed.
- **Explanation:** When you set **Transaction** to **Commit**, the database updates performed by the node are committed when the node completes successfully. If an exception is raised before the node has completed, and this causes the message flow to be rolled back, the commit is not issued and the database updates are also rolled back. The situations in which this can occur are:
 - The node itself causes an exception to be raised. The commit is never performed.
 - The ESQL contains a PROPAGATE statement. This statement does not complete until all processing along the path taken by the propagated message has completed, and control returns to the node. Only then can the commit be performed. If an exception is raised along this path, control is not returned and the database updates are rolled back as part of the message flow.
- **Solution:** Review the operation of the node that performs the database updates. For example, it might be possible to split the work between two nodes, with the first updating the database, and the second propagating the output message. Consider changing the ESQL code to process the message in a different way.

The DataDirect trace system is unable to open the ODBC trace file

- **Scenario:** Commands, such as **mqsichangetrace** and **mqsicreatebroker**, fail and a message is displayed stating that the ODBC trace file cannot be opened.
- **Explanation:** The DataDirect ODBC file is inaccessible or its size has exceeded 2 GB and tracing has been turned on.
- **Solution:** To resolve this problem:
 1. Turn off tracing in the file to which the ODBCINI environment variable points.

2. Locate the ODBC trace file to which 'TraceFile' in the ODBC stanza points. If you need to keep the trace, move the ODBC trace file to another location. If you do not need to keep the trace, delete the ODBC trace file.
3. If you still need to gather ODBC trace, reset TRACE=1 in the odbc.ini file.

You want to list the database connections that the broker holds

- **Scenario:** You want to list the database connections that the broker holds.
- **Solution:** The broker does not have any functionality to list the connections that it has to a database. Use the facilities that your database supplies to list connections. Refer to the documentation for your database to find out about these.

Resolving problems when using publish/subscribe

Publish/subscribe within WebSphere Message Broker is managed from the workbench, which is used to connect brokers in a topology or hierarchy, and to administer topic-based security (if a User Name Server is in use). Like other workbench changes, you need to deploy any changes that you make so that updates are sent to the broker.

This topic contains advice for dealing with some common problems that can arise when using publish/subscribe:

- "Your broker is not registering with the User Name Server"
- "Application responses are not received" on page 121
- "Your application is not receiving publications" on page 121
- "Access control appears not to work" on page 122
- "You cannot access the broker topology after you change the access control list (ACL)" on page 123
- "Publishing a message causes a filter error" on page 123
- "Symbols in subscription filters cause problems" on page 123
- "There are problems with multiple brokers and communications" on page 123
- "The workbench does not display non-Windows users" on page 124
- "There are performance problems on AIX when the JIT compiler is not loaded" on page 124
- "Error message BIP2332 is issued with SQLSTATE 57011 when you access the publish/subscribe database on z/OS" on page 125
- "Your broker does not have the correct authority to run PGM/IP" on page 125
- "Your client does not have the correct authority to run PGM/IP" on page 125
- "Your client does not have sufficient memory to run PGM/IP" on page 125

Your broker is not registering with the User Name Server

- **Scenario:** Your broker has been enabled to use topic-based security by setting the **-s** parameter of the **mqsicreatebroker** command to the User Name Server queue manager, but many occurrences of warning message BIP8303 are displayed on the console, indicating that the broker's user or group cache is empty. When you try to deploy ACLs, more occurrences of BIP8303 are displayed, as well as the error message BIP7017:
- **Explanation:** It is normal to see a few occurrences of BIP8303, but if you continue to see this message after you deploy ACLs and try to use topic-based security, it is likely that your broker has not been registered with the User Name Server.

- **Solution:**

- Check that the broker has the correct name for the User Name Server queue manager by going to the broker's file system and looking at the value of the `UserNameServerQueueManagerName` field in the registry entry for the broker. If the value is not correct, use the `mqsichangebroker` command, setting the `-s` parameter to the correct User Name Server queue manager.
- Check that the User Name Server process and the control process are both running. WebSphere MQ intercommunication must also be running correctly if the User Name Server is on a different queue manager.

In each of these cases, restart the broker, deploy any topics data, and look for the message:

```
+() 0 BIP8204I: User Name Server is registering a client with UUID  
15db2a8e-869e-11d5-8000-091465ac0000, and cache version 0.
```

Application responses are not received

- **Scenario:** Application responses are not received.
- **Explanation:** Depending on the application code, a publisher or subscriber might request confirmation that its message was processed successfully. Responses can make debugging client problems much easier, because a response code is given in the event of a problem occurring.

This should always be possible for a subscriber, but for the publishing side, a message might be published without the knowledge of the originating application (for example, by using the default topic property on the input node, or by using a Compute node to modify this property in a message flow). The results of processing that message are still logged in user trace, which might give clues as to what is happening.

If a response is not received, there are several possible causes:

- The system is busy. Messages might build up on the input queue, and the client might not be waiting long enough for its response.
 - WebSphere MQ expiry is being used. There are cases where this is what is required, but the expiry of the input message is copied to the response. As a result, the message might expire on the broker's input queue, or it might expire on the way back to the client. This is not an error, even with a persistent message.
 - The input message or response might have been put to the dead-letter queue, if one is configured. Look on this queue to see if any new messages are there. This is normally accompanied by error messages in the broker's log that describe the problem. For example, the reply-to queue might have been specified incorrectly in the input message, so the reply message has been put to the dead-letter queue.
- **Solution:** If your application is not asking for responses (that is, not using messages of type `MQMT_REQUEST`) consider doing so, particularly when developing applications.

Your application is not receiving publications

- **Scenario:** Your application is not receiving publications.
- **Explanation:** If an application has subscribed successfully (that is, has received an OK response to a `RegSub` message), it should receive publications that match its subscription. Details of its registration can be viewed in the Subscriptions pane of the Broker Administration perspective. This can be useful to check that the details are correct.

Subscribers are sent messages only if they match the topic, the subscription point, *and* the filter. Because the subscription point is specified in the message flow, not in the publication message, an incorrect message flow setting can cause unexpected failures.

A user trace of the flow that contains the Publication node shows you whether publications are matching anything.

- **Solution:** If a filter is being used, a user trace shows you whether this is being evaluated as expected.

The case with multiple execution groups, or multiple brokers, is more complex. A response is sent to a subscriber once the message has been processed by the target execution group. Other execution groups (and brokers) are updated asynchronously. As a result, there might be a delay before publications made elsewhere are received. If the broker is busy, there can be a delay before messages are processed fully. In a multi-broker setup, if communications have been suspended, subscription changes are propagated through the network of brokers. Check the channels.

With multiple execution groups or brokers, it might be possible to fill intermediate WebSphere MQ queues if the load is very high. This might be reported in the syslog (if a broker cannot put to a queue because it is full) or in the WebSphere MQ log (if a message coming across a channel cannot be put to the target queue because it is full). If you see messages of this type, display the queue depths on all your queue managers to see if any are almost full.

Access control appears not to work

- **Scenario:** Access control appears not to work.
- **Solution:** Ensure that every broker is configured with the User Name Server. Use a single User Name Server for the whole broker domain. In addition, all the brokers and the Configuration Manager must be able to access the User Name Server's queue manager.

If BIP8303 errors are recorded in any broker's log after startup, it indicates a communication problem with the User Name Server. Check your WebSphere MQ channels to and from the User Name Server and try again. You should see event message BIP8204I for both the Configuration Manager and any brokers, showing that they have successfully registered with the User Name Server.

There might be problems with users and group memberships if your broker domain spans a number of systems with different lists of users. For each computer holding a broker, there must be a group called **mqbrkrs**. This must contain the following principals, or authorization failures are reported:

- Local broker's service user ID
- All neighboring brokers' service user IDs
- The Configuration Manager's service user ID

For client applications, if the user ID in the message is a member of the **mqbrkrs** group, security is bypassed (even if a User Name Server is being used).

If your publish/subscribe request fails, and event message BIP7017 is issued, check that the client user ID is known to the system on which the User Name Server is running. Also, if you are operating in a Windows domain environment, ensure that the User Name Server was created with the **-d** parameter on the **mqsicreateusernameserver** command set to the appropriate domain, and that all client application user IDs are members of this domain.

Message persistence in publish/subscribe is normally preserved. However, a subscriber might not get the expected persistence if ACLs do not allow it.

You cannot access the broker topology after you change the access control list (ACL)

- **Scenario:** After connecting to the Configuration Manager, the broker topology is displayed in the Domains Navigator with restricted access, because your user does not belong to suitable Windows security groups, or an ACL entry has not been defined for this user to access the broker topology. After you have created a suitable ACL entry using the `mqsicreateaclentry` command, and disconnected from, and reconnected to, the domain, the broker topology is still shown with restricted access.
- **Solution:** The ACL information has not yet been refreshed. To force a refresh, stop and restart the User Name Server and the Configuration Manager.

Publishing a message causes a filter error

- **Scenario:** When you publish a message, you receive an error response message with reason text `MQRCCF_FILTER_ERROR`.
- **Explanation:** A broker returns this message to a publication 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.

Symbols in subscription filters cause problems

- **Scenario:** If you specify certain symbols when you use filters in a subscription, the filter does not work. Sometimes your subscription messages are put to the dead-letter queue, and a number of error messages are written to the local error log indicating `MQRFH2` parsing errors.
- **Explanation:** The `MQRFH2` header employs standard XML encoding, so its parser interprets some symbols in a special way.
- **Solution:** If you want to include these symbols in your filters, use the appropriate escape character to ensure that they are parsed correctly:

Symbol	Escape character
<	<
>	>
"	"
'	'
&	&

For example, if you want to use:

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

specify:

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

There are problems with multiple brokers and communications

- **Scenario:** You are experiencing problems with multiple brokers and communications.
- **Explanation:** Channels and transmission queues are needed between each connected broker in the topology. These are configured in the same way as for communication between a single broker and the Configuration Manager. Within a collective, every broker is connected to every other broker, so many channels are needed.

- **Solution:** Using WebSphere MQ clustering might make the administration job easier. Otherwise, ensure that every channel is working.

When the configuration is deployed, a response is received from each broker; these appear in the workbench. However, also check each broker's local log. For each connection, a BIP7113 message is issued. To test communications, the Soccer sample application might prove useful. It is possible to run each part on a separate broker to test communications between them.

The workbench does not display non-Windows users

- **Scenario:** The workbench and Configuration Manager are running on Windows, and the User Name Server and broker are running on z/OS, or a Linux or UNIX system. After starting the workbench, you find that the expected list of users and groups from z/OS, Linux, or UNIX is not displayed in the Topics view of the Broker Administration perspective.
- **Explanation:** The Configuration Manager has not registered with the User Name Server.
- **Solution:**
 1. Stop the Configuration Manager, using the **mqsistop** command.
 2. Issue the **mqsichangeconfigmgr** command, setting the **-s** parameter to the correct User Name Server queue manager name.
 3. Restart the Configuration Manager using the **mqsistart** command.
 4. Check that the User Name Server is running.

You need to have both sender and receiver channels and transmission queues established to and from both the Configuration Manager queue manager and the User Name Server queue manager. Check that these channels have been created and are running.

If you make any changes, restart the Configuration Manager and check for Windows event message BIP8258, which shows that the Configuration Manager has successfully registered with the User Name Server. If you make any changes, for example to channels, you also need to restart the workbench to refresh the displayed list of users.

On z/OS, if the User Name Server is running, and if you have the above options set correctly, but you are still not seeing z/OS users listed in the Topics view of the Broker Administration perspective, check that the z/OS users all have OMVS segments defined. If they do not, they are not listed by the User Name Server.

There are performance problems on AIX when the JIT compiler is not loaded

- **Scenario:** There are performance problems on AIX when the JIT compiler is not loaded.
- **Explanation:** The environment variable LIBPATH can affect the loading of the Java JIT (just-in-time) compiler on AIX. WebSphere Message Broker for AIX will run correctly without the JIT compiler, but publish/subscribe performance will be adversely impacted.
- **Solution:** Ensure that the JIT compiler runs.

The JIT compiler will load and run correctly if LIBPATH is not set. This is the simpler case so it is better to not set LIBPATH. You can make libraries available by linking them into `/var/wmqi/lib` (for all WebSphere Message Broker for AIX processes) or `/usr/lib` (for all processes on the system). WebSphere Message Broker for AIX configuration does this for DB2 libraries.

If it is necessary to set LIBPATH, update it to include the directory /usr/java130/bin. For example, you can use the following command to start the broker:

```
LIBPATH=/usr/local/lib:/usr/java130/bin mqsisstart mybroker
```

Error message BIP2332 is issued with SQLSTATE 57011 when you access the publish/subscribe database on z/OS

- **Scenario:** You are using publish/subscribe on z/OS with the MQ transport and large numbers of retained publications or subscriptions are being changed. Error message BIP2332 is issued with SQLSTATE 57011 when you access the publish/subscribe database. You might also see DB2 errors in your SDF log; for example:

```
#DFLO DSNILMCL RESOURCE UNAVAILABLE 558
CORRELATION-ID=ST03BRK
CONNECTION-ID=RRSAF
LUW-ID=*
REASON 00C90092
TYPE 00000905
NAME IRLM
*DXR175E IFL0001 IRLM IS UNABLE TO OBTAIN STORAGE - ECSA
DSNT501I #DFLO DSNILMCL RESOURCE UNAVAILABLE 560
CORRELATION-ID=ST04BRK
CONNECTION-ID=RRSAF
LUW-ID=*
REASON 00C90092
TYPE 00000905
NAME IRLM
```

- **Explanation:** This problem indicates a DB2 tuning issue with the IRLM (lock manager) subcomponent.
- **Solution:** Make sure that you run IRLM with the lock information being held in local storage; use the startup parameter **PC=YES**. For more information, see the IBM Redbooks publication *DB2 UDB for OS/390 Version 6 Performance Topics, SG24-5351*.

Your broker does not have the correct authority to run PGM/IP

- **Scenario:** The broker does not have the correct authority to run and has reverted back to PGM/UDP.
- **Explanation:** The broker is configured to use PGM/IP but does not have the correct user authority. The broker has reverted back to PGM/UDP.
- **Solution:** Specify a valid user authority for the broker, or select a different protocol using the multicast properties panel or the **mqsischangeproperties** command.

Your client does not have the correct authority to run PGM/IP

- **Scenario:** An exception occurred when the client attempted to connect with the broker.
- **Explanation:** The client is configured to use PGM/IP but does not have the correct user authority. An exception occurred when the client tried to connect with the broker.
- **Solution:** Obtain the correct user authority for your client. Also obtain root access and ensure the broker is running as root (as Administrator or as a regular user who is a member of the Administrators group on Windows), in a secure environment. Be aware of the security implications of doing this.

Your client does not have sufficient memory to run PGM/IP

- **Scenario:** Your client does not have sufficient memory to run PGM/IP

- **Explanation:** Clients running PGM/IP require the multicast property Maximum Memory Size to be set to a suitable value.
- **Solution:** Change the value of Maximum Client Memory Size parameter using the multicast properties panel or the `mqsichangeproperties` command. The Maximum Client Memory Size parameter is applicable only to PGM protocols, and is greyed out unless Protocol Type is set to one of the PGM protocols. This parameter is available in the Advanced properties panel.

Resolving problems with performance

- **Scenario:** You are experiencing problems with performance, such as:
 - Poor response times in the workbench when developing message flows
 - Poor response time at deployment
 - Individual messages taking a long time to process
 - Poor overall performance, or performance that does not scale well
- **Solution:** Possible solutions are:
 - Speed up WebSphere MQ persistent messaging by optimizing the I/O (Input/Output)
 - Speed up database access by optimizing I/O
 - Increase system memory
 - Use additional instances or multiple execution groups
 - Optimize ESQL statements for best performance

A good source of information about performance is the set of reports in WebSphere MQ Family Category 2 (freeware) SupportPacs, available for download from the WebSphere MQ SupportPacs Web page.

Before you start:

- Read “Do you have a component that is running slowly?” on page 9

This topic contains advice for dealing with some common performance problems that can arise:

- “The system is getting increasingly slower”
- “You experience configuration problems with a large number of components” on page 127
- “A WHILE loop in a large XML array takes a long time to process” on page 128
- “Remote waitForMessages calls with WebSphere MQ Everywhere are slow” on page 128
- “Performance is reduced for stored procedures” on page 129
- “Message flow performance is reduced when you access message trees with many repeating records” on page 129
- “You are experiencing poor performance in the workbench when working with large projects” on page 130
- “The PutTime reported by WebSphere MQ on z/OS, and other times or timestamps are inconsistent” on page 131

The system is getting increasingly slower

- **Scenario:** The system is getting increasingly slower.
- **Explanation:** When a process ends abnormally, an entry is made in the local error log, and a dump data file might be written to the errors or z/OS log

directory. This directory is unbounded, and if you do not clear it of unwanted files, you might find that your system performance degrades due to significant space being used by oldabend files.

- **Solution:** Periodically clear the errors or z/OS log directory of unwanted files. On Windows, use the **-w** parameter of the **mqsicreatebroker** command to create the errors directory in a hard drive partition that does not contain WebSphere Message Broker or Windows itself.

You experience configuration problems with a large number of components

- **Scenario:** You are experiencing configuration problems with a large number of components.
- **Explanation:** If you are running WebSphere Message Broker with a large number of configured components, the memory footprint of the broker processes (particularly the DataFlowEngine) might exceed their memory limits. In particular, the user process limit might be exceeded, or the address space limit might be reached. You might encounter problems, such as the BIP2106E error message, when running a broker with:
 - A large number of message flows
 - Multiple databases
 - Very large input or output messages
- **Solution:** Use tools that are specific to your operating system to check the maximum size of the failing process, then check for any user limits (if applicable) or computer limits on process size.
 1. Use the **ulimit** command to check user limits on Linux or UNIX systems and increase these limits if needed.

A hard limit is set on each operating system for the maximum process size, beyond which failure is inevitable:

Operating system	Maximum process size
Windows Windows	2 GB
Solaris Solaris (32 bit system)	About 3.75 GB
HP-UX HP-UX (32 bit system)	About 3 GB, depending on kernel settings
AIX AIX (32 bit system)	2 GB
z/OS z/OS	2 GB

Increasing user limits beyond these values does not make any difference. If your broker processes regularly reach these sizes, consider spreading your message flows across more execution groups to reduce the size of each one below these limits.

2. On AIX, WebSphere Message Broker limits 32-bit DataFlowEngines to four 256 MB memory segments; that is, 1 GB. Normally DataFlowEngine processes do not require more than 1 GB of the AIX address space, therefore the DataFlowEngine executable file is linked to have a default address space of four segments. However, you can 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. You can patch the DataFlowEngine to use more memory segments using the following shell command:

```
/usr/bin/echo '\0140\0\0\0'|dd of=executable_file_name bs=4 count=1 seek=19 conv=notrunc
```

This command creates a version of the DataFlowEngine that uses six segments; that is, 1.5 GB.

Alternatively, on AIX 5.2 and above, you can achieve the same result by using the **ldedit** command:

```
ldedit -b maxdata:0x60000000 DataFlowEngine
```

The application of fix pack maintenance replaces the existing DataFlowEngine, so if you have used the above process, repeat it after every fix pack installation.

Another way of enabling the AIX "large address space" model is to set the environment variable LDR_CNTRL:

```
export LDR_CNTRL=MAXDATA=0x10000000
start_process (for example, mqsisstart brokername)
unset LDR_CNTRL
```

or

```
LDR_CNTRL=MAXDATA=0x40000000 mqsisstart brokername
```

Each increment in the value of MAXDATA and, therefore, the number of segments, increases the process memory limit by 256 MB.

The technique described above overrides only the soft limit and not the hard limit. If your broker processes regularly reach these sizes, consider spreading your message flows across more execution groups to reduce the size of each one to be below these limits.

A WHILE loop in a large XML array takes a long time to process

- **Scenario:** A WHILE loop in a large XML array takes a long time to process.
- **Explanation:** This problem arises when you use the CARDINALITY() function to determine the size of the array in the WHILE statement. With large arrays, the cost of determining the number of elements is proportional to the size of the array. The CARDINALITY function is invoked each time the WHILE statement is executed. The message has many elements, therefore there is a significant overhead when running the loop in this way.
- **Solution:** Unless you have a message in which the number of elements of the array grows dynamically, determine the size of the array before entering the WHILE loop. Use code similar to the following example:

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

Remote waitForMessages calls with WebSphere MQ Everyplace are slow

- **Scenario:** Remote waitForMessages calls with WebSphere MQ Everyplace are slow.

- **Explanation:** 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.
- **Solution:** Define a store-and-forward queue on the broker's queue manager and a home-server queue on the client. These queues provide a level of de-coupling that allows the arrangement to work in the event of the client queue manager becoming unavailable. Alternatively, specify a remote queue in the WebSphere MQ Everyplace output node, so that a local GET call is sufficient on the client side.

Performance is reduced for stored procedures

- **Scenario:** Stored procedures that do not return results sets do not perform as well as they did when using the DataDirect version 4.1 drivers.
- **Explanation:** The new DataDirect version 5 Oracle drivers now use the configuration parameter **ProcedureRetResults** to allow the driver to return results sets from stored procedures. This parameter applies only to Oracle. By default, the parameter is set to 1 and has to be 1 if you use stored procedures that return results sets. When this parameter is set to 0, the driver does not return results sets from stored procedures, which can result in better performance.
- **Solution:** If your stored procedures do not return any results sets, set the **ProcedureRetResults** parameter to 0 (zero).

Message flow performance is reduced when you access message trees with many repeating records

- **Scenario:** Message flow performance is reduced when the following conditions are true:
 - You are using ESQL processing to manipulate a large message tree.
 - The message tree consists of repeating records or a large number of fields.
 - You have used explicit SET statements with field reference paths to access or create the fields.
 - You have observed a gradual slowing of message flow processing as the ESQL processes more fields or repetitions.
- **Explanation:** This problem occurs when you use field references, rather than reference variables, to access or create consecutive fields or records.

Consider the following example, in which independent SET statements use field reference paths to manipulate the message tree. The SET statement takes a source and target parameter, where either or both parameters are field references:

```
SET OutputRoot.XML.TestCase.StructureA.ParentA.field = '1';
```

The problem arises when the SET statement is used to create many more fields, as shown in the following example:

```
SET OutputRoot.XML.TestCase.StructureA.ParentA.field1 = '1';
SET OutputRoot.XML.TestCase.StructureA.ParentA.field2 = '2';
SET OutputRoot.XML.TestCase.StructureA.ParentA.field3 = '3';
SET OutputRoot.XML.TestCase.StructureA.ParentA.field4 = '4';
SET OutputRoot.XML.TestCase.StructureA.ParentA.field5 = '5';
```

In this example, the five fields that are created are all children of ParentA. Before the specified field can be created or modified, the broker must navigate the named message tree to locate the point in the message tree that is to be altered. For example:

- To access field 1, the SET statement navigates to ParentA, then to the first field, therefore involving two navigations.
- To access field 5, the SET statement navigates to ParentA, then traverses each of the previous fields until it reaches field 5, therefore involving six navigations.

Navigating over all the fields that precede the specified field causes the loss in performance.

Now consider a scenario that accesses repeating fields in an input message tree; for example:

```
DECLARE myChar CHAR;
DECLARE thisRecord INT 0;
WHILE thisRecord < 10000 DO
  SET thisRecord = thisRecord + 1;
  SET myChar = InputRoot.MRM.myParent.myRepeatingRecord[thisRecord];
END WHILE;
```

When index notation is used, as the count increases, the processing needs to navigate over all the preceding fields to get the one it wants; that is, it has to count over the previous records to get to the one that is represented by the current indexed reference.

- When accessing InputRoot.MRM.myParent.myRepeatingRecord[1], one navigation takes place to get to the first record.
- When accessing InputRoot.MRM.myParent.myRepeatingRecord[2], two navigations take place to get to the second record.
- When accessing InputRoot.MRM.myParent.myRepeatingRecord[N], N navigations take place to get to the Nth record.

Therefore, the total number of navigations for this WHILE loop is: 1 + 2 + 3 + ... + N, which is non linear.

- **Solution:** If you are accessing or creating consecutive fields or records, use reference variables. When you use reference variables, the statement navigates to the main parent, which maintains a pointer to the field in the message tree. The following example shows the ESQL that can be used to reduce the number of navigations when creating new output message tree fields:

```
SET OutputRoot.XML.TestCase.StructureA.ParentA.field1 = '1';
DECLARE outRef REFERENCE TO OutputRoot.XML.TestCase.StructureA.ParentA;
SET outRef.field2 = '2';
SET outRef.field3 = '3';
SET outRef.field4 = '4';
SET outRef.field5 = '5';
```

When referencing repeating input message tree fields, you could use the following ESQL:

```
DECLARE myChar CHAR;
DECLARE inputRef REFERENCE TO InputRoot.MRM.myParent.myRepeatingRecord[1];
WHILE LASTMOVE(inputRef) DO
  SET myChar = inputRef;
  MOVE inputRef NEXTSIBLING NAME 'myRepeatingRecord';
END WHILE;
```

For further information, see Creating dynamic field references.

You are experiencing poor performance in the workbench when working with large projects

- **Scenario:** You are experiencing poor performance in the workbench when working with large or complex projects.

- **Explanation:** Performance is reduced because of frequent project changes, such as adding and removing projects, or using **Project** → **Clean**. Complete project updates use large amounts of memory due to the size, number, and connections between files.
- **Solution:** Increase your system memory.

The PutTime reported by WebSphere MQ on z/OS, and other times or timestamps are inconsistent

- **Scenario:** The PutTime reported by WebSphere MQ on z/OS, and other times or timestamps are inconsistent. A difference of approximately 20 seconds is detected in:
 - Traces (including those obtained from the Trace node)
 - The MQPUTTIME timestamp in the message MQMD header
 - Timestamps obtained from ESQL (for example, in a Compute node)
- **Explanation:** WebSphere Message Broker reports the time using Coordinated Universal Time (UTC), which does not account for leap seconds. However, on z/OS, the message putTime that is reported by WebSphere MQ in the MQMD header of a message *does* account for leap seconds, using the value specified for the number of leap seconds in the CVT field.

This inconsistency can cause:

- Problems when debugging
 - Problems with message flows if you use timestamps to control the flow of messages
 - Misinformation
- **Solution:** Set the CVT field so that it agrees with the UTC leap seconds. Alternatively, add an offset to adjust a z/OS timestamp reading. For example, add 20 seconds when getting the CURRENT_TIME in ESQL.

Resolving problems when developing Configuration Manager Proxy applications

This topic contains advice for dealing with some common problems that can arise when developing Configuration Manager Proxy (CMP) applications:

- “Your Configuration Manager Proxy application hangs if the Configuration Manager is not available”
- “You set a property of an object and query its value, but the value has not changed” on page 132
- “You cannot connect to a Configuration Manager using .CONFIGMGR files” on page 132
- “You tried to move a broker between Configuration Managers and now you cannot see the broker’s resources” on page 132

Your Configuration Manager Proxy application hangs if the Configuration Manager is not available

- **Scenario:** When the Configuration Manager is unavailable, the Configuration Manager Proxy application hangs.
- **Explanation:** Communication between the Configuration Manager Proxy and the Configuration Manager is asynchronous, so the Configuration Manager Proxy hangs because it is waiting for a message from the Configuration Manager.
- **Solution:** Configure the maximum amount of time that the Configuration Manager Proxy waits by using the following method:

```
// Wait for a maximum of 10 seconds
ConfigManagerProxy.setRetryCharacteristics(10000);
```

This represents the time in milliseconds that the Configuration Manager Proxy will wait for information before throwing the *ConfigManagerProxyPropertyNotInitializedException* exception.

If you set this timeout value too low, an exception will be thrown even if the Configuration Manager is available.

You set a property of an object and query its value, but the value has not changed

- **Scenario:** You have set a property of an object, then queried its value; the value has not changed.
- **Explanation:** Methods that change properties of domain objects are not processed immediately. If you call a property change method on a Configuration Manager Proxy object, this causes the Configuration Manager Proxy to send a message to the Configuration Manager asking it to make the requested change. The Configuration Manager processes the request asynchronously and notifies any *AdministeredObjectListeners* of the affected object when the change has been attempted.
- **Solution:** Methods that change state usually return as soon as the request has been put to the Configuration Manager's queue manager, or following a call to *ConfigManagerProxy.beginUpdates()*, as soon as the request has been added to the current batch. If the property has still not been updated after the action's response to the request has been returned to the Configuration Manager Proxy, consult the response message for more details.

You cannot connect to a Configuration Manager using .CONFIGMGR files

- **Scenario:** You cannot connect to a Configuration Manager using .CONFIGMGR files.
- **Explanation:** The *MQPropertyFileConfigManagerConnectionParameters* class allows Configuration Manager Proxy applications to connect to Configuration Managers using files with a .configmgr extension, although it requires an XML parser in order to do this.
- **Solution:** Ensure that a supported parser is available on the CLASSPATH. A supported parser is shipped with the product.

Alternatively, use the *MQConfigManagerConnectionParameters* class instead of the *MQPropertyFileConfigManagerConnectionParameters* class. This allows you to connect to Configuration Managers by specifying the host name, queue manager name and port of the target Configuration Manager directly. This method does not require an XML parser.

You tried to move a broker between Configuration Managers and now you cannot see the broker's resources

- **Scenario:** You used the *BrokerProxy.setUUID()* method to attempt to move a broker from one Configuration Manager to another and you can no longer see the broker's execution groups, message flows, message sets, and subscriptions.
- **Explanation:** This is a limitation of the *setUUID()* method.
- **Solution:** Remove all deployed resources and redeploy them to the broker.

Resolving problems with user-defined extensions

This topic contains advice for dealing with some common problems that can arise when working with user-defined extensions:

- “You cannot deploy one of your user-defined nodes, despite having a plug-in LIL in the correct directory.”
- “You cannot deploy a flow with one of your user-defined nodes in it.”
- “You get problems when nodes try to use the ESQL path interface in the plug-in API”
- “Interpreting problems in user-defined extensions” on page 134
- “You want to debug classloading” on page 136
- “An error is issued when you deploy a user-defined extension on z/OS” on page 136
- “You cannot determine which user-defined extensions have been loaded by the broker on startup” on page 136
- “You are migrating a C user-defined node and cniDefineNodeClass returns CCI_INV_IMPL_FUNCTION.” on page 137

You cannot deploy one of your user-defined nodes, despite having a plug-in LIL in the correct directory.

- **Scenario:** You cannot deploy one of your user-defined nodes, despite having a plug-in LIL in the correct directory.
- **Explanation:** You have memset() the data area to zero and have not initialized the CNI_VFT structure with the initialization constant {CNI_VFT_DEFAULT}.
- **Solution:** Initialize by copying a predefined initialization structure over the function table area, as follows:

```
static CNI_VFT virtualFunctionTable = {CNI_VFT_DEFAULT};
```

 In addition, implement logging from your user-defined node so that you can see if the plug-in API is producing error codes; the broker does not log these to its own log, unless you take a service trace.

You cannot deploy a flow with one of your user-defined nodes in it.

- **Scenario:** You cannot deploy a flow with one of your user-defined nodes in it.
- **Explanation:** Your LIL file has failed to load.
- **Solution:** Check system log (syslog or Eventviewer) of broker startup; did you see a BIP2308 message saying a LIL file failed to load? If there are any problems loading a LIL file, a BIP2308 message appears in the system log.

You get problems when nodes try to use the ESQL path interface in the plug-in API

- **Scenario:** When you attempt to use the ESQL path interface in the plug-in API, the return value is CCI_PATH_NOT_NAVIGABLE.
- **Explanation:** The plug-in API allows you to specify a path in the form of an ESQL path expression and navigate to that element, returning a handle to it if it exists. It also allows you to create elements along the path to the requested element.

The navigate path utility function (cniSqlNavigatePath) executes the SQLPathExpression created with the cniSqlCreateReadOnlyPathExpression or cniSqlCreateModifiablePathExpression utility functions, as defined by the sqlPathExpression argument.

If the path is not navigable, the return code is set to CCI_PATH_NOT_NAVIGABLE. This might be returned when embedding a path expression in another path expression. The input cciMessage* functions must not be NULL; however, any of the output cciMessage* functions can be NULL. If

you embed a path expression that can be NULL inside a path expression that cannot be NULL, CCI_PATH_NOT_NAVIGABLE is returned.

- **Solution:** If the return code is set to CCI_PATH_NOT_NAVIGABLE, ensure that if a correlation name is specified in a path, the respective parameter is not NULL.

Interpreting problems in user-defined extensions

- **Scenario:** You want to debug problems in user-defined nodes and parsers.
- **Solution:** Start user trace at debug level. In order to see BIP4142, BIP4144, BIP4145, and BIP4146 messages, this must be done at the execution group level. For example, use the `mqsichangetrace` command without the `-f` parameter.

The following debug messages are available to help you to understand the execution of your user-defined nodes and parsers:

- BIP2233 and BIP2234: a pair of messages that are traced before and after a user-defined extension implementation function is invoked. These messages report the input parameters and returned value. For example:

```
BIP2233 Invoking user-defined extension function [function name]
([function call parameters])
```

```
BIP2234 Returned from user-defined extension function [function name]
with result: [result of call]
```

Note: In these messages, an *implementation function* can be interpreted as either a C implementation function or a Java implementation method.

- BIP2308: a message that is logged when the broker fails to load a LIL file.
BIP2308 File [name of LIL file] could not be loaded; operating system return code [error code return from operating system]
- BIP3904: a message that is traced before invoking the Java `evaluate()` method of a user-defined node. For example:
BIP3904 (for Java): Invoking the `evaluate()` method of node (class=[node class name], name=[label of node in flow]) where *node class name* is the name of the Java user-defined extension class.
- BIP3905: a message that is traced before invoking the C `cniEvaluate` implementation function (`iFpEvaluate` member of `CNI_VFT`) of a user-defined node. For example:
BIP3905 (for C): Invoking the `cniEvaluate()` implementation function of node (class=[node class name], name=[label of node in flow]) where *node class name* is the name of the user-defined extension class that is provided by the user-defined extension while calling `C cniDefineNodeClass`.
- BIP4142: a debug message that is traced when invoking a user-defined node utility function, where the utility function alters the state of a syntax element. This includes all utility functions that start with `cniSetElement*`, where `*` represents all nodes with that stem. For example:
BIP4142 Evaluating `cniSetElement` [element identifier type]. Changing value from [value before user's change] to [value after user's change]"
- BIP4144 and BIP4145: a pair of messages that are traced by certain implementation functions that, when invoked by a user-defined extension, can modify the internal state of a message broker's object. Possible message broker objects include syntax element, node, and parser. These messages report the input parameter provided to the invoked method and the returned value. For example:
BIP4144 Entered function [function name] ([function call parameters])

BIP4145 Exiting function [function name] with result: [result to be returned]

In these messages, an *implementation function* can be interpreted as either a C implementation function or a Java implementation method.

The C implementation functions that invoke messages BIP4144 and BIP4145 include:

For user-defined parsers	For user-defined nodes
cpiCreateParserFactory	cniCreateElement*
cpiDefineParserClass	cniDeleteMessage
cpiAppendToBuffer	cniAdd*
cpiCreateElement	cniDetach
cpiCreateAndInitializeElement	cniCopyElementTree
cpiAddBefore	cniFinalize
cpiAddAfter	cniWriteBuffer
cpiAddAsFirstChild	cniSql*
cpiAddAsLastChild	cniSetInputBuffer
cpiSetNameFromBuffer	cniDispatchThread

(* represents all nodes with that stem; for example, cniAdd* includes cniAddAfter, cniAddasFirstChild, cniAddasLastChild, and cniAddBefore.)

The Java methods that invoke messages BIP4144 and BIP4145 are:

For user-defined nodes
com.ibm.broker.plugin.MbElement.CreateElement*
com.ibm.broker.plugin.MbElement.add*
com.ibm.broker.plugin.MbElement.detach
com.ibm.broker.plugin.MbElement.copyElementTree

- BIP4146: a debug message that is traced when invoking a user-defined parser utility function, where the utility function alters the state of a syntax element. This includes all utility functions that start with cpiSetElement*, where * represents all nodes with that stem. For example:
 BIP4146 Evaluating cpiSetElement [element identifier type]. Changing value from [value before user's change] to [value after user's change]
 For information on the C user-defined API, see the C language user-defined parser API and the C language user-defined node API.
- BIP4147: an error message that is traced when a user-defined extension passes an invalid input object to a user-defined extension utility API function. For Example:
 BIP4147 User-defined extension input parameter failed debug validation check. Input parameter [parameter name] passed into function [function name] is not a valid object.
- BIP4148: an error message that is traced when a user-defined extension damages a broker's object. For Example:
 BIP4148 User-defined extension damaged broker's object. Function [function name] has damaged broker's object passed as parameter [parameter name].

- BIP4149: an error message that is traced when a user-defined extension passes an invalid input data pointer to a user-defined extension utility API function. For Example:
BIP4149 User-defined extension input parameter failed debug validation check. Input parameter [parameter name] passed into function [function name] is a NULL pointer.
- BIP4150: an error message that is traced when a user-defined extension passes invalid input data to a user-defined extension utility API function. For example:
BIP4150 User-defined extension input parameter failed debug validation check. Input parameter [parameter name] passed into function [function name] does not have a valid value.
- BIP4151: a debug message that is traced when `cniGetAttribute2` or `cniGetAttributeName2` sets the return code to an unexpected value. Expected values are `CCI_SUCCESS`, `CCI_ATTRIBUTE_UNKNOWN`, and `CCI_BUFFER_TOO_SMALL`. Any other value is an unexpected value. For example:
BIP4151 An unexpected value was returned from User-defined extension implementation function [function name].
- BIP4152: a debug message that is traced when `cniGetAttribute2` or `cniGetAttributeName2` sets the return code to `CCI_BUFFER_TOO_SMALL`, and then `cniGetAttribute2` or `cniGetAttributeName2` is called again, this time with the correct size buffer, however the return code is still set to `CCI_BUFFER_TOO_SMALL`. For example:
BIP4152 User-defined extension Implementation function [function name] returned `CCI_BUFFER_TOO_SMALL` on 2nd attempt.

You want to debug classloading

- **Scenario:** You want to debug classloading.
- **Solution:** Classes and the location from which they are loaded are written to user trace. Use this information to check that the correct classes are being loaded.

An error is issued when you deploy a user-defined extension on z/OS

- **Scenario:** When you deploy a user-defined extension on z/OS, Linux, or UNIX, an error is displayed in the log of each execution group, stating that there is insufficient authority to open the LIL file.
- **Explanation:** On Linux and UNIX, the user-defined extension must have group read permission. On z/OS, the user-defined extension must have group execute permission.
- **Solution:**
 - On Linux and UNIX, set the file permissions of the user-defined extension to group read by issuing the command `chmod a+r`.
 - On z/OS, set the file permissions of the user-defined extension to group read and execute by issuing the command `chmod a+rx`.

You cannot determine which user-defined extensions have been loaded by the broker on startup

- **Scenario:** You cannot determine which user-defined extensions have been loaded by the broker on startup.
- **Solution:** Use the `mqsiereportproperties` command for each type of user-defined extension.

- For a Java user-defined extension, issue the command:

```
mqsireportproperties WBRK_BROKER -e default -o ComIbmJavaPluginNodeFactory -r
```

You see a report similar to this example:

```
ComIbmJavaPluginNodeFactory
  uuid='ComIbmJavaPluginNodeFactory'
  userTraceLevel='none'
  traceLevel='none'
  userTraceFilter='none'
  traceFilter='none'
  NodeClassName='ComIbmJMSSClientInputNode'
  NodeClassName='ComIbmJMSSClientOutputNode'
  NodeClassName='ComIbmJavaComputeNode'
  NodeClassName='ComIbmXs1MqsiNode'
  NodeClassName='SearchFilterNode'
```

BIP8071I: Successful command completion.

The user-defined extension called SearchFilter has a NodeClassName of SearchFilterNode.

- For a C user-defined extension (assuming that CONST_PLUGIN_NODE_FACTORY was set to ComIbmSamplePluginNodeFactory in the NodeFactory.h file, as in the sample NumComputeNode), issue the command:

```
mqsireportproperties WBRK_BROKER -e default -o ComIbmSamplePluginNodeFactory -r
```

You see a report similar to this example:

```
ComIbmSamplePluginNodeFactory
  uuid='ComIbmSamplePluginNodeFactory'
  userTraceLevel='none'
  traceLevel='none'
  userTraceFilter='none'
  traceFilter='none'
  NodeClassName='NumComputeNode'
```

BIP8071I: Successful command completion.

The user-defined extension called NumCompute has a NodeClassName of NumComputeNode.

You are migrating a C user-defined node and `cniDefineNodeClass` returns `CCI_INV_IMPL_FUNCTION`.

- **Scenario:** When you attempt to migrate a C user-defined node, `cniDefineNodeClass` returns `CCI_INV_IMPL_FUNCTION`.
- **Explanation:** New fields have been added to the `CNI_VFT` struct. `CNI_VFT_DEFAULT` has been updated to initialize these new fields in the Version 6.0 header file `BipCci.h`. If you initialize your `CNI_VFT` with `CNI_VFT_DEFAULT`, you should not need to make any code changes. However, if you do not initialize `CNI_VFT` with `CNI_VFT_DEFAULT`, these new fields are initialized with random values.
- **Solution:** Initialize your `CNI_VFT` with `CNI_VFT_DEFAULT`.

Resolving problems when uninstalling

This topic contains advice for dealing with some problems that can arise when uninstalling:

- Uninstalling the Message Brokers Toolkit:
 - “RPU shortcut is removed during uninstall” on page 138
 - “Files are left behind after uninstall completes” on page 138
 - “Uninstall wizard reports an error” on page 138

- Uninstalling runtime components:
 - “The uninstallation process is interrupted” on page 139

RPU shortcut is removed during uninstall

- **Scenario:** When you uninstall the Message Brokers Toolkit on Linux (x86 platform), the IBM Rational Product Updater (RPU) menu shortcut is removed.
- **Explanation:** A menu entry is created for IBM Rational Product Updater (RPU) when you install any Rational product, including the Message Brokers Toolkit. You can use this entry to start the RPU to update Rational products. When you uninstall the Message Brokers Toolkit, this entry is removed even if other Rational products are installed on the system. If you uninstall the last Rational product, but retain the Message Brokers Toolkit, the same problem occurs.
- **Solution:** Select **Help** → **Software Updates** → **IBM Rational Product Updater** to access the RPU from within the Message Brokers Toolkit or other installed Rational products. You cannot recreate the menu entry.

Files are left behind after uninstall completes

- **Scenario:** When you uninstall the Message Brokers Toolkit on Linux (x86 platform) or Windows, the wizard completes successfully but some files and directories are left behind in the installation directory.
- **Solution:** Follow the instructions below for the scenario that reflects your system:
 - **The Message Brokers Toolkit was the only Rational product installed on this system**
When the uninstallation wizard for the Message Brokers Toolkit has completed, delete all remaining files and directories in the installation directory.
 - **Other Rational products are installed on this system**
When the uninstallation wizard for the Message Brokers Toolkit has completed, do not remove any files or directories in the installation directory. You can check whether other RAD products are still installed on the system:
 1. Navigate to the following directory:
 - On Linux (x86 platform): /etc/IBM/RAT60/.sdpinst
 - On Windows: *install_dir*\IBM\RAT60\.sdpinst
 2. Look for the properties file *cdi_ref.properties*:
 - If the file exists, and its size is greater than zero bytes, RAD products are installed on the system. Do not delete any files or directories.
 - If the file does not exist, or it is present but has a size of zero bytes, no RAD products are installed. Delete the files and directories that have been left behind when the Message Brokers Toolkit was uninstalled.

Do not manipulate this properties file in any way; check only its size and existence.

Uninstall wizard reports an error

- **Scenario:** When you uninstall the Message Brokers Toolkit on Linux (x86 platform) or Windows, the wizard reports an error and indicates that you should look in the log file.
- **Explanation:** During uninstallation, the Rational product code records the following error in the log file *home_directory/wmbt_uninstall.log*. (To improve readability, lines in the record have been split but content is unchanged.)

```
14-Nov-2005 1:12:18 AM), Uninstall, com.installshield.wizard.platform.win32.Win32ProductServiceImpl,
msg1, uninstalling CDI Delete Directory (b_updater_start_cdi_refcount_info)
(14-Nov-2005 1:12:18 AM), Uninstall, com.installshield.wizard.platform.win32.Win32ProductServiceImpl,
```

```

msg1, uninstalling CDI Delete Directory (b_updater_start_updater_workspace)
(14-Nov-2005 1:12:19 AM), Uninstall, com.installshield.wizard.platform.win32.Win32ProductServiceImpl,
err, An error occurred and product uninstallation failed.
Look at the log file C:\Documents and Settings\Administrator\wmbt_uninstall.txt for details.
(14-Nov-2005 1:12:20 AM), Uninstall, com.ibm.rational.cdi.wrapper.CDIDeleteDirectory,
err, ProductException: (error code = 601; message="err";
additional data = [Unable to delete C:\Program Files\IBM\MessageBrokersToolkit\6.0\.\updater\workspace :
ServiceException: (error code = -30020; message = "The system cannot find the path specified.
(3)"; severity = 0)])
STACK_TRACE: 13
ProductException: (error code = 601; message="err";
additional data = [Unable to delete C:\Program Files\IBM\MessageBrokersToolkit\6.0\.\updater\workspace :
ServiceException: (error code = -30020; message = "The system cannot find the path specified.
(3)"; severity = 0)])
at com.installshield.product.actions.DeleteDirectory.deleteDirectory(DeleteDirectory.java:82)
at com.installshield.product.actions.DeleteDirectory.uninstall(DeleteDirectory.java:39)
at com.ibm.rational.cdi.wrapper.CDIDeleteDirectory.uninstall(CDIDeleteDirectory.java:124)
at com.installshield.product.service.product.PureJavaProductServiceImpl.
  uninstallProductAction(PureJavaProductServiceImpl.java:1947)
at com.installshield.product.service.product.PureJavaProductServiceImpl.
  uninstallProductComponent(PureJavaProductServiceImpl.java:2521)
at com.installshield.product.service.product.PureJavaProductServiceImpl.
  uninstallSoftwareObject(PureJavaProductServiceImpl.java:2406)
at com.installshield.product.service.product.PureJavaProductServiceImpl.
  access$8(PureJavaProductServiceImpl.java:2346)
at com.installshield.product.service.product.PureJavaProductServiceImpl$Uninstaller.
  execute(PureJavaProductServiceImpl.java:3870)
at com.installshield.wizard.service.AsynchronousOperation.run(AsynchronousOperation.java:41)
at java.lang.Thread.run(Thread.java:566)

(14-Nov-2005 1:12:20 AM), Uninstall, com.installshield.wizard.platform.win32.Win32ProductServiceImpl,
msg1, uninstalling CDI Delete File (b_updater_start_delete_updater_flag)
(14-Nov-2005 1:12:20 AM), Uninstall, com.installshield.wizard.platform.win32.Win32ProductServiceImpl,
msg1, uninstalling CDI Reference Install (b_updater_start_install)

```

- **Solution:** This is a temporary error, and you can safely ignore it. The uninstallation has completed.

The uninstallation process is interrupted

- **Scenario:** When you uninstall the runtime components on any distributed system, the process is interrupted, for example by a power failure.
- **Solution:** Delete the *install_dir* and all its contents. You can now reinstall product components if you choose.

Using logs

This section describes how to view the various logs available to you with WebSphere Message Broker, and how to interpret the information in those logs. It contains the following topic areas:

Local error log

- “Windows: Viewing the local error log” on page 140
- “Linux and UNIX systems: Configuring the syslog daemon” on page 141

Eclipse log

- “Viewing the Eclipse error log” on page 141

There is also a section of reference topics about the various types of log.

Windows: Viewing the local error log

Windows The Windows Event Viewer is where WebSphere Message Broker writes records to the local system.

Viewing the system log

The system log contains events logged by the Windows system components. For example, the failure of a driver or other system component to load during startup is recorded in the system log. To view the system log:

1. Open a command prompt.
2. At the prompt, type `eventvwr`. This opens the Windows Event Viewer.
3. In the left pane of this window, click the **System Log** (this is often selected as default). Here all the events that have been written to the local system are displayed.

Viewing the application log

The application log contains events that are logged by applications or programs. For example, a database program might record a file error in the application log. To view the application log:

1. Open a command prompt.
2. At the prompt, type `eventvwr`. This opens the Windows Event Viewer.
3. In the left pane of this window, click the **Application Log**. This is where all the events that have been logged by applications or programs are displayed.

Interpreting log information

In both logs, each event is displayed on a separate row, in date and time order (most recent first), with the following information:

- **Type:** The event type, which can be information, a warning, or an error.
- **Date and time:** The date and time when the event was written to the log.
- **Source:** What action has caused the event.
- **Category:** The category of the event. The default category is none.
- **Event:** The event number.
- **User:** The name of the user at the time of the event.
- **Computer:** The name of the local machine.

To view an individual log entry:

1. Within the system or application log, find the log entry.
2. Right-click the entry and from the pop-up menu click **Properties**. This opens the Information Properties window, where there is a description of the event. There is also a Data section that details bytes or words that were parsed when the record was written to the log.
3. In the Information Properties window, use the up and down arrows to move through the events of the log.
4. To close the Information Properties window, click **OK**; this returns you to the system or application log.

Linux and UNIX systems: Configuring the syslog daemon

UNIX On Linux and UNIX systems, all WebSphere Message Broker messages (other than those generated by the command line utilities) are sent to the syslog, so it is useful to redirect user messages to a separate file.

Before you create a broker on Linux or UNIX systems, configure the syslog daemon to redirect user messages to a file called user.log:

1. Log on as root.
2. Enter the following commands to create a file called user.log.
On UNIX systems, enter the command:

```
touch /var/adm/user.log  
chown root:mqbrkrs /var/adm/user.log  
chmod 640 /var/adm/user.log
```


On Linux, enter the command:

```
touch /var/log/user.log  
chown root:mqbrkrs /var/log/user.log  
chmod 640 /var/log/user.log
```
3. Add the following line to the /etc/syslog.conf file to redirect debug level messages to the file user.log:

On UNIX systems, enter the command:

```
user.info /var/adm/user.log
```

On Linux, enter the command:

```
user.info /var/log/user.log
```

You can use user.* - instead of user info in the preceding examples.

- * means that information, notice, warning, and debug messages are caught
- - means that syslog does not synchronize the file after writing to it.

There is a performance gain, although you might lose some data if the machine crashes immediately after it has written to the file. You can add similar lines to direct information, warning, and error messages to user.log.

4. Restart the syslog daemon.

On AIX, enter the command:

```
refresh -s syslogd
```

On HP-UX and Solaris, enter the command:

```
kill -HUP 'cat /etc/syslog.pid'
```

On Linux, enter the command:

```
/etc/init.d/syslogd restart
```

or

```
/etc/rc.d/init.d/syslogd restart
```

for systems where rc.d is not a soft link

For other syslog options, see the documentation for your operating system.

Viewing the Eclipse error log

The Eclipse error log captures internal errors that are caused by the operating system or your code.

To view the Eclipse error log:

1. Switch to the Plug-in Development perspective.
2. In the Tasks view, in the bottom right pane, click the **Error Log** tab.
The error log is displayed, showing the following information for each error:
 - The status of the error (for example, error or warning)
 - A brief description of the error
 - From which plug-in the error derived
 - The date and time that the error was produced
3. If an error has a plus sign (+) at the start of it, it is a complex problem, and there are a number of errors contributing to it. Click the plus sign to view the individual errors.
4. To see the details of a particular problem, double-click the entry in the Tasks view. A separate window is displayed, showing more details of the error.

Using trace

This section describes how to use the optional trace.

For user trace:

- “Starting user trace”
- “Checking user trace options” on page 144
- “Changing user trace options” on page 144
- “Retrieving user trace” on page 145
- “Stopping user trace” on page 145

For service trace:

- “Starting service trace” on page 146
- “Checking service trace options” on page 147
- “Changing service trace options” on page 147
- “Retrieving service trace” on page 148
- “Stopping service trace” on page 148

For both types of trace:

- “Formatting trace” on page 149
- “Interpreting trace” on page 150
- “Clearing old information from trace files” on page 151
- “Changing trace settings from the workbench” on page 151

Other types of trace:

- “ODBC trace” on page 152
- “WebSphere MQ Java Client trace” on page 153
- “Configuration Manager Proxy trace” on page 153

You can also use the “IBM Support Assistant (ISA)” on page 158 to help with data collection.

Starting user trace

Before you start:

Before you start to trace a broker, or any of its execution groups or message flows, the broker must be running, and you must have deployed the message flows using the workbench. Follow the instructions in the Deploying topic.

To start a user trace:

1. Start WebSphere Message Broker user trace facilities by using the **mqsischangetrace** command, or, for execution groups and assigned message flows, from the workbench. You can select only one broker on each invocation of the command, but you can activate concurrent traces for more than one broker, by invoking the command more than once.
2. Specify an individual execution group or message flow within the specified broker to limit the scope of a trace. The events that are recorded when you select the message flow option include:
 - Sending a message from one Message Processing node to the next
 - Evaluating expressions in a Filter or Compute node
3. Start your trace. You can start trace at two levels:
 - normal** This tracks events that affect objects that you create and delete, such as nodes.
 - debug** This tracks the beginning and end of a process, as well as monitoring objects that are affected by that process.

Example: starting user trace for the default execution group

To start normal level user tracing for the default execution group on a broker that you have created with the name WBRK_BROKER, on distributed systems, enter the command

```
mqsischangetrace WBRK_BROKER -u -e default -l normal
```

where:

- u specifies user trace
- e specifies the execution group (in this case, the default execution group)
- l specifies the level of trace (in this case, normal)

z/OS On z/OS, enter the command
F MQP1BRK,ct u=yes, e='default', l=normal

Example: starting user trace for the default execution group from the workbench

To start normal level user tracing for the default execution group from the workbench:

1. Switch to the Broker Administration perspective.
2. In the Domains view, right-click the default execution group.
3. Click **User trace** → **Normal**.

Example: starting user trace for a message flow from the workbench

To start normal level user tracing for one of your message flows from the workbench:

1. Switch to the Broker Administration perspective.

2. In the Domains view, right-click the message flow for which you want to start trace.
3. Click **User trace** → **Normal**.

An alert saying Message Flow is tracing at level 'normal' is displayed in the Alert Viewer.

Checking user trace options

Use the **mqsiporttrace** command to check what tracing options are currently active for your brokers.

Specify the component for which the check is required, for example, the execution group or message flow. The command responds with the current trace status for the component that you have specified.

Example: checking user trace options for a broker

To check what options are currently set for the broker WBRK_BROKER and its execution group test, on distributed systems, enter the command

```
mqsiporttrace WBRK_BROKER -u -e test
```

where:

- u specifies user trace
- e specifies the execution group (in this case, test)

z/OS On z/OS, enter the command
F MQP1BRK,reporttrace u=yes, e='test'

If you have started tracing by following the example in “Starting user trace” on page 142, the response to the **mqsiporttrace** command is:

```
BIP8098I: Trace level: normal, mode: safe, size: 1024 KB  
BIP8071I: Successful command completion
```

Changing user trace options

Use the **mqsichange** command to change the trace options that you have set. You can also use the workbench to change the trace options for execution groups and assigned message flows.

Example: changing user trace from normal to debug

To change from a normal level of user trace to a debug level on the default execution group of a broker called WBRK_BROKER, on distributed systems, enter the command

```
mqsichange WBRK_BROKER -u -e default -l debug
```

where:

- u specifies user trace
- e specifies the execution group (in this case, the default execution group)
- l specifies the level of trace (in this case, changing it to debug)

z/OS On z/OS, enter the command


```
F MQP1BRK,ct u=yes, e='default', l=debug
```

Example: changing user trace from normal to debug from the workbench

To change from a normal level of user trace to a debug level for one of your message flows from the workbench:

1. Switch to the Broker Administration perspective.
2. In the Domains view, right-click the message flow for which you want to change trace.
3. Click **User trace** → **Debug**.

An alert saying Message Flow is tracing at level 'debug' is displayed in the Alert Viewer.

Stopping user trace

Use the `mqsichangetrace` command with a trace level of none to stop an active trace. This stops the trace activity for the component that you specify on the command. It does not affect active traces on other components. For example, if you stop tracing on the execution group `test`, an active trace on another execution group continues.

You can also stop an active trace for execution groups or assigned message flows using the workbench. If you redeploy a component from the workbench, trace for that component is returned to its default setting of none.

Example: stopping user trace on the default execution group

To stop the trace started by the command shown in “Starting user trace” on page 142, on distributed systems, enter the command

```
mqsichangetrace WBRK_BROKER -u -e default -l none
```

where:

- u specifies user trace
- e specifies the execution group (in this case, the default execution group)
- l specifies the level of trace (in this case, none)

z/OS On z/OS, enter the command

```
F MQP1BRK,ct u=yes, e='default', l=none
```

Example: stopping user trace on a message flow from the workbench

To stop trace for one of your message flows from the workbench:

1. Switch to the Broker Administration perspective.
2. In the Domains view, right-click the message flow for which you want to stop trace.
3. Click **User trace** → **None**.

Retrieving user trace

Use the `mqsireadlog` command to access the trace information that is recorded by the user trace facilities. This command retrieves the trace details according to

parameters that you specify on the command, and writes the requested records to a file, or to the command line window, in XML format.

Example: retrieving user trace information in XML format

To retrieve information for the user trace activated with the **mqsichangetrace** command and write it to an output file, on distributed systems, enter the command

```
mqsireadlog WBRK_BROKER -u -e default -o trace.xml where:
```

- u specifies user trace
- e specifies the execution group (in this case, the default execution group)
- o specifies the output file (in this case, trace.xml)

This sends a log request to the broker to retrieve the user trace log, and stores the responses in the trace.xml file. You can view this file using a plain text editor.

Starting service trace

Activate service traces only when you receive an error message that instructs you to start service trace, or when directed to do so by your IBM Support Center.

Use the **mqsichangetrace** command to start WebSphere Message Broker service trace facilities.

You can select only one broker on each invocation of the command, but you can activate concurrent traces for more than one broker by invoking the command more than once.

You must specify the individual component that you want to trace; for example the broker, Configuration Manager, or User Name Server, to limit the scope of a trace.

If you want to trace the command executable files themselves, set the environment variables **MQSI_UTILITY_TRACE** and **MQSI_UTILITY_TRACESIZE** before you initiate trace. Ensure that you reset these variables when the command that you are tracing has completed. If you do not do so, all subsequent commands are also traced, and their performance is therefore degraded.

If the trace cannot be associated with a specific component, the component name part of the file name is set to *utility*, for example, when tracing a command such as **mqsilist**, when no arguments are used.

In order to trace the **mqsideploy**, **mqsistartmsgflow**, **mqsistopmsgflow**, **mqsicreateexecutiongroup**, and **mqsideleteexecutiongroup** commands, use the **-v** parameter. This takes an argument that is the name of the file to which trace will be written.

Example: starting service trace for the User Name Server

To start debug level service tracing for the User Name Server, on distributed systems, enter the command

```
mqsichangetrace UserNameServer -t -b -l debug
```

where:

- t specifies service trace
- b specifies that trace for the agent subcomponent of the specified component is to be started
- l specifies the level of trace (in this case, debug)

z/OS On z/OS, enter the command
 F MQPIUNS,ct t=yes, b=yes, l=debug

Checking service trace options

Use the **mqsiporttrace** command to check what tracing options are currently active for your brokers.

Specify the component for which the check is required. The command responds with the current trace status for the component that you have specified.

Example: checking service trace options for a broker

To check what options are currently set for the User Name Server, on distributed systems, enter the command

```
mqsiporttrace UserNameServer -t
```

where **-t** specifies service trace.

z/OS On z/OS, enter the command
 F MQP1UNS,reporttrace t=yes

If you have started tracing by following the example in “Starting service trace” on page 146, the response to the **mqsiporttrace** command is:

```
BIP8098I: Trace level: debug, mode: safe, size: 1024 KB
BIP8071I: Successful command completion
```

Changing service trace options

Use the **mqsichange** command to change the service trace options that you have set.

Example: changing service trace from debug to normal

To change from a debug level of trace to a normal level on the User Name Server, on distributed systems, enter the command

```
mqsichange UserNameServer -t -b -l normal
```

where:

- t specifies service trace
- b specifies that tracing for the agent subcomponent of the specified component is to be changed
- l specifies the level of trace (in this case, changing it to normal)

z/OS On z/OS, enter the command
 F MQP1UNS,ct t=yes, b=yes, l=normal

Stopping service trace

Use the **mqsichangetrace** command with a trace level of `none` to stop an active trace. This stops the trace activity for the component that you specify on the command. It does not affect active traces on other components. For example, if you stop tracing on the execution group `test`, an active trace on another execution group continues.

If you redeploy a component from the workbench, trace for that component is returned to its default setting of `none`.

Example: stopping service trace on the User Name Server

To stop the trace started by the command shown in “Starting service trace” on page 146, on distributed systems, enter the command

```
mqsichangetrace UserNameServer -t -b -l none
```

where:

- t specifies service trace
- b specifies that trace for the agent subcomponent of the specified component is to be stopped
- l specifies the level of trace (in this case, `none`)

z/OS On z/OS, enter the command
F MQP1UNS,ct t=yes, b=yes, l=none

Retrieving service trace

Use the **mqsireadlog** command to access the trace information recorded by the service trace facilities.

This command retrieves the trace details according to parameters that you specify on the command, and writes the requested records to a file, or to the command line window, in XML format.

Example: retrieving service trace information in XML format

To retrieve information for the service trace activated with the **mqsichangetrace** command, and write it to an output file, on distributed systems, enter the command

```
mqsireadlog UserNameServer -t -b agent -f -o strace.xml where:
```

- t specifies service trace
- b *agent* specifies that trace for the agent subcomponent of the specified component is to be retrieved
- f specifies that the log file is to be read directly from the file system (this flag is mandatory for service trace)
- o specifies the output file (in this case, `strace.xml`)

This sends a log request to the broker to retrieve the service trace log, and stores the responses in the file `strace.xml`. You can view this file using a plain text editor.

Formatting trace

The trace information that is generated by the **mqsireadlog** command is not easy to read unless you use an XML viewer (such as an Internet browser) or an XML editor that understands the document type descriptor (DTD) in the file.

WebSphere Message Broker provides the command **mqsiformatlog** to format the trace information to a flat file, so that you can view it using a text editor.

The **mqsiformatlog** command takes a file generated by the **mqsireadlog** command as input, and flattens the XML log into structured records. It also retrieves the inserts for the XML message in your current locale. You can direct the formatted output to a file, or view it in the command line window.

Each trace entry contains a time stamp and a WebSphere Message Broker message that contains a number (for example, BIP2622) and a text string containing variable inserts.

Example: formatting user trace information on Windows

Windows On Windows, to format the trace file that is created in “Starting user trace” on page 142, enter the command

```
mqsiformatlog -i trace.xml -o formattrace.log
```

where:

-i specifies the input file (in this case, trace.xml)

-o specifies the output file (in this case, formattrace.log)

This command reads the trace information in the file trace.xml, formats it, and writes it to the file formattrace.log. The following example shows a portion of the output of the **mqsiformatlog** command for a normal level trace file.

Timestamps are formatted in local time, 330 minutes past GMT.

```
2003-06-19 11:30:29.795999      2852  UserTrace  BIP2632I: Message received and
propagated to 'out' terminal of MQ Input node 'Video_Test.VIDEO_XML_IN'.
2003-06-19 11:30:29.795999      2852  UserTrace  BIP6060I: Parser type 'Properties'
created on behalf of node 'Video_Test.VIDEO_XML_IN' to handle portion of incoming
message of length
0 bytes beginning at offset '0'.
2003-06-19 11:30:29.795999      2852  UserTrace  BIP6061I: Parser type 'MQMD'
created on behalf of node 'Video_Test.VIDEO_XML_IN' to handle portion of incoming
message of length '364' bytes beginning at offset '0'. Parser type selected based
on value 'MQHMD' from previous parser.
2003-06-19 11:30:29.795999      2852  UserTrace  BIP6061I: Parser type 'MRM'
created on behalf of node 'Video_Test.VIDEO_XML_IN' to handle portion of incoming
message of length '650' bytes beginning at offset '364'. Parser type selected based
on value 'MRM' from previous parser.
2003-06-19 11:30:29.795999      2852  UserTrace  BIP2537I: Node 'Video_Test.Extract
Fields':
Executing statement 'BEGIN ... END;' at (.Video_Test_Compute.Main, 2.2).
2003-06-19 11:30:29.795999      2852  UserTrace  BIP2537I: Node 'Video_Test.Extract
Fields':
Executing statement 'SET OutputRoot = InputRoot;' at (.Video_Test_Compute.Main, 7.3).
2003-06-19 11:30:29.795999      2852  UserTrace  BIP2538I: Node 'Video_Test.Extract
Fields':
Evaluating expression 'InputRoot' at (.Video_Test_Compute.Main, 7.20).
2003-06-19 11:30:29.795999      2852  UserTrace  BIP2568I: Node 'Video_Test.Extract
Fields':
```

```
Performing tree copy of 'InputRoot' to 'OutputRoot'.
```

```
...
```

```
2003-06-19 11:30:29.827999    2852  UserTrace  BIP4124I: Message propagated to
'out' terminal of Compute node 'Video_Test.Extract Fields'.
2003-06-19 11:30:29.827999    2852  UserTrace  BIP2638I: The MQ Output node
'Video_Test.VIDEO_OUT' attempted to write a message to queue 'VIDEO_OUT' connected
to queue manager 'T'. The MQCC was '0' and the MQRC was '0'.
2003-06-19 11:30:29.827999    2852  UserTrace  BIP2622I: Message successfully
output by output node 'Video_Test.VIDEO_OUT' to queue 'VIDEO_OUT' on queue manager ''.
```

```
Threads encountered in this trace:
2852
```

Interpreting trace

A formatted log file, like the one in “Formatting trace” on page 149, contains a sequence of WebSphere Message Broker messages that records the activity in a specific part of the system (the part that you identify when you start the trace). You can use this sequence to understand what is happening, and to check that the behavior that is recorded is what you are expecting.

For example, if you have activated message flow trace, you can see entries that record the path that a message takes through the message flow, and why decisions result in this path (where a choice is available).

If you see unexpected behavior in a message flow or execution group, use this trace information to check the actions that have been taken and identify the source of an error or other discrepancy.

The messages contain identifiers for the resources that are being traced, for example the execution groups and message flows. The identifier that is given is usually the label (the name) that you gave to the resource when you defined it.

Here is an extract from a user trace file. In the example, each column has been labelled:

Timestamp	Thread ID	Trace type	Message
2005-07-12 16:17:18.242605	5344	UserTrace	BIP2537I: Node 'Reply.MapToRequestor': Executing statement ''SET I = I + 1;'' at ('.MapToRequestor.CopyMessageHeaders', '6.4').
2005-07-12 16:17:18.242605	5344	UserTrace	BIP2539I: Node 'Reply.MapToRequestor': Evaluating expression ''I'' at ('.MapToRequestor.CopyMessageHeaders', '6.12'). This resolved to ''I''. The result was ''1''.
2005-07-12 16:17:18.242605	5344	UserTrace	BIP2539I: Node 'Reply.MapToRequestor': Evaluating expression ''I + 1'' at ('.MapToRequestor.CopyMessageHeaders', '6.14'). This resolved to ''1 + 1''. The result was ''2''.
2005-07-12 16:17:18.242605	5344	UserTrace	BIP2566I: Node 'Reply.MapToRequestor': Assigning value ''2'' to field / variable ''I''.

References such as '6.12' apply to the row and column number within a function that specify the location of the command that is being executed; in this case, row 6, column 12.

Clearing old information from trace files

If the component that you are tracing has stopped, you can delete its trace files from the log subdirectory of the WebSphere Message Broker home directory.

If you are tracing an execution group, you can use the **-r** parameter of the **mqsichangetrace** command to reset (clear) the trace log (the **-r** parameter can be specified only if you specify the **-e** parameter). You might do this, for example, when you start a new trace to ensure that all the records on the log are unique to the new trace.

Example: clearing the user trace log for the default execution group

To clear the user trace log for the default execution group, on distributed systems, enter the command: **mqsichangetrace WBRK_BROKER -u -e default -r** where:

WBRK_BROKER specifies the name of the broker

-u specifies user trace

-e specifies the execution group (in this case the default execution group)

-r clears the trace log

z/OS

On z/OS, enter the command **F MQP1BRK,ct u=yes, e='default', r=yes**

Changing trace settings from the workbench

In addition to collecting user trace and service trace for various components, you can also collect the following additional types of trace from the workbench:

- Trace for all WebSphere Message Broker components, including the workbench itself. This uses the logger.
- Configuration Manager Proxy trace
- Broker Administration trace

The following sections tell you how to change the settings for these types of trace.

Changing the logger settings

Before you change the settings, take these steps to enable logger settings to be displayed on the preferences screen:

1. Click **Window** → **Preferences** → **Workbench** → **Capabilities**.
2. Select the **Tester** check box.
3. Click **Apply**, and then **OK**.

WebSphere Message Broker provides a logger that controls tracing for all the components of WebSphere Message Broker. This is the `com.ibm.etools.mft.util` plug-in. By default, the logger is set to produce trace for severe errors, but you can change this level:

1. Click **Window** → **Preferences**.
2. In the left menu, click **Logging**.
3. Click `com.ibm.etools.mft.util`.
4. Click the **General** tab.
5. From the **Default logging level** list, click the logging level that you want. For the most detailed report, select **FINEST**.

6. Click **OK**.

Changes are applied, and the Preferences window closes.

The files from this trace are written to the directory *install_dir*\eclipse\workbench\.metadata. Logging utility output is written to the LoggingUtil.log file. Any workbench errors are written to the .log file.

Changing the Configuration Manager proxy trace settings

You control tracing of the Configuration Manager proxy from the workbench:

1. Click **Window** → **Preferences**.
2. In the left menu, expand **Broker Administration**.
3. Click **Configuration Manager proxy**.
4. In the Configuration Manager proxy tracing section of the menu, change the level of tracing that is performed. The default is **Message Logging Utility**. If you select **Errors to file**, the default file to which trace is written is *install_dir*\eclipse\workspace\cmpttraceerror.log.

5. Click **OK**.

Changes are applied, and the Preferences window closes.

Changing the Broker Administration trace settings

You control tracing of the Broker Administration from the workbench:

1. Click **Window** → **Preferences**.
2. In the left menu, expand **Broker Administration**.
3. Click **Trace**.
4. Change the type of tracing. The default is **None**. If you select **Stored in a file**, the default file to which trace is written is *install_dir*/eclipse/workspace/.metadata/.plugins/com.ibm.etools.mft.admin/mbda.log.

5. Click **OK**.

Changes are applied, and the Preferences window closes.

ODBC trace

There are various methods for initiating trace for ODBC activity, depending on the operating system that you are using:

Windows For Windows, use the **Tracing** tab of the ODBC function:

1. Click **Start** → **Settings** → **Control Panel** → **Administrative Tools**.
2. Double-click **Data Sources**.
3. Click the **Tracing** tab.
4. Click **Start Tracing Now**.
5. Click **OK**.

To stop ODBC tracing, on the **Tracing** tab, click **Stop Tracing Now**, then **OK**.

UNIX For Linux and UNIX operating systems, edit the ODBC.ini file to initiate trace for ODBC activity (if you are using the default ODBC.ini file, located at /var/wmqi/odbc/.odbc.ini):

1. Under the stanza entry [ODBC], change Trace=0 to Trace=1

2. Optionally, modify the TraceFile file path value to a preferred value. All trace records go to one file, which can be confusing if you have multiple flows or execution groups.

z/OS For z/OS, edit the BIPDSNA0 file in the component dataset to initiate application trace for ODBC activity:

1. Under the stanza entry [COMMON], change APPLTRACE=0 to APPLTRACE=1
2. Optionally, modify the APPLTRACEFILENAME file path to a preferred value. All trace records go to one file, which can be confusing if you have multiple flows or execution groups.

Trace information is output to the location that is specified in the .odbc.ini file, or in the ODBC configuration on Windows. By default on non-Windows systems, this is /var/wmqi/odbc/odbctrace.out.

WebSphere MQ Java Client trace

You can activate WebSphere MQ Java Client trace while putting a message on a WebSphere MQ queue using the Enqueue editor.

1. Click **Window** → **Preferences**.
2. On the left, click **Enqueue**. The Enqueue preferences screen opens.
3. To activate WebSphere MQ Java Client tracing, click the **To file** radio button. The default output file is specified. You can specify a different output file by typing in the filepath or using the **Browse** button.

If the output file that you specify is invalid (if it is read-only or already in use), error message BIP0832 is displayed:

```
A class java.io.FileNotFoundException exception occurred which reported the following message: [filepath] (The process cannot access the file because it is being used by another process). Resolve the reason of error and try again.
```

If you do not resolve this error, this BIP0832 error message will be displayed next time you start up if the output file is still invalid.

You can also enable and disable WebSphere MQ Java Client service trace from the **File** menu of the Configuration Manager Proxy API Exerciser.

If trace is activated, any trace messages that are written using the Enqueue editor are written to the specified output file.

Configuration Manager Proxy trace

You can enable and disable service trace for the Configuration Manager Proxy (CMP).

Enabling Configuration Manager Proxy trace

To enable tracing for the Configuration Manager Proxy for your application, use the following command in your code:

```
// Enable Config Manager Proxy service trace
ConfigManagerProxy.enableTracing("outputfile.txt");
```

This logs all calls to the Configuration Manager Proxy to the outputfile.txt file in the current directory. All Configuration Manager Proxy activity in the entire Java Virtual Machine is logged.

You can also enable Configuration Manager Proxy service trace from the **File** menu of the Configuration Manager Proxy API Exerciser.

In addition, because the Configuration Manager Proxy uses the MQ Java client, you can enable MQ Java client tracing.

Disabling Configuration Manager Proxy trace

To disable tracing for the Configuration Manager Proxy for your application, use the following command in your code:

```
// Disable Config Manager Proxy service trace
ConfigManagerProxy.disableTracing();
```

You can also disable Configuration Manager Proxy service trace from the **File** menu of the Configuration Manager Proxy API Exerciser.

Using dumps and abend files

This section contains the following topics:

- “Checking for dumps”
- “Using the DUMP command on z/OS”
- “Checking for abend files” on page 156

You can also use the “IBM Support Assistant (ISA)” on page 158 to help with data collection.

Checking for dumps

If a dump occurs on your system, an error message is produced.

- **On Windows**

BIP2111 error message (message broker internal error). The error message contains the path to the MiniDump file in your errors directory.

- **On UNIX**

BIP2060 error message (execution group terminated unexpectedly). Look in the directory where the broker was started, or in the service user ID’s home directory, to find the core dump file.

- **On z/OS**

- Abend X’2C3’ followed by a reason code, for example:

```
IEF450I STU1051 - ABEND=S2C3 U0000 REASON=01050001
```

Look in the system’s dump directory for the dump file.

- An entry in the z/OS syslog for a SYSMDUMP. Look in the started task’s user directory for the coredump.pid file, as specified in the z/OS syslog.

Using the DUMP command on z/OS

z/OS You might be asked to dump any or several of the following address spaces for IBM to resolve the problem:

- Control address space
- DataFlowEngine address space
- UserNameServer address space
- OMVS kernel address space

The following procedure demonstrates how to dump the DataFlowEngine address space. This procedure is the same for any of the address spaces.

1. Find the address space ID of the address space that you want to dump using the display command on the z/OS syslog:

```
D OMVS,U=your started task user ID
```

This command displays the address spaces of all the processes that are running from your started task user ID, for example:

```
D OMVS,U=MQ01BRK
BPX0040I 16.14.30 DISPLAY OMVS 237
OMVS      000D ACTIVE          OMVS=(14)
USER      JOBNAME  ASID        PID          PPID STATE   START      CT_SECS

MQ01BRK  MQ01BRK  009D    67306064   84083282 HRI--- 15.41.55   48.37
  LATCHWAITPID= 0 CMD=bipservice MQ01BRK AUTO
MQ01BRK  MQ01BRK  009D    84083282          1 1WI--- 15.41.55   48.37
  LATCHWAITPID= 0 CMD=/argoinst/S000_L30307_P/usr/lpp/mqsi/bin
MQ01BRK  MQ01BRK  009D    16974444   67306064 HRI--- 15.42.01   48.37
  LATCHWAITPID= 0 CMD=bipbroker MQ01BRK
MQ01BRK  MQ01BRK  009F    16974445          1 1W---- 15.42.05  2914.22
  LATCHWAITPID= 0 CMD=/argoinst/S000_L30307_P/usr/lpp/mqsi/bin
MQ01BRK  MQ01BRK  009F    33751662   16974445 HR---- 15.42.05  2914.22
  LATCHWAITPID= 0 CMD=DataFlowEngine MQ01BRK ca614eec-f300-000
```

The infrastructure main program bipimain is the first process in every address space. For a control address space, bipimain starts the bipservice process, which starts the bipbroker process, which might also start the biphttplistener process, depending on the configuration. For a DataFlowEngine address space, bipimain starts the DataFlowEngine process. For a UserNameServer address space, bipimain starts the bipuns process. For each execution group, an additional DataFlowEngine address space is started. In this example, only one execution group is deployed.

2. Use the z/OS DUMP command to dump the DataFlowEngine address space, which is shown in the above example as 9F.
 - a. Enter the following command:

```
DUMP TITLE=(DFE)
```

The console returns:

```
*^15 IEE094D SPECIFY OPERAND(S) FOR DUMP COMMAND
```

- b. Enter:

```
R 15,ASID=9F,CONT
```

The console returns:

```
*16 IEE094D SPECIFY OPERAND(S) FOR DUMP COMMAND
```

- c. Enter:

```
R 16,SDATA=(CSA,RGN,PSA,SQA,LSQA,LPA,TRT,GRSQ,SUM),END
```

The console returns:

```
IEE600I REPLY TO 16 IS;SDATA=(CSA,RGN,PSA,SQA,LSQA,LPA,TRT,GRSQ,SUM),END
IEA794I SVC DUMP HAS CAPTURED: 356
DUMPID=014 REQUESTED BY JOB (*MASTER*)
DUMP TITLE=DFE
IEF196I IGD101I SMS ALLOCATED TO DDNAME (SYS00018)
IEF196I          DSN (SYS3.DUMP.ARG5.#MASTER#.T142958.S00014      )
IEF196I          STORCLAS (SMS) MGMTCLAS (DUMP) DATACLAS (      )
IEF196I          VOL SER NOS= ARGSMR
```

The dump is stored in either a pre-allocated dump data set called SYS1.DUMPPxx, or an automatically allocated dump data set named according to an installation-specified pattern.

3. In some scenarios, all address spaces for a given broker, that is, all those listed in the example above, plus the OMVS address space and dataspace, are needed by IBM to resolve the problem. Use the z/OS DUMP command to dump all MQ01BRK address spaces.

- a. Enter the command:

```
DUMP TITLE=(ALL)
```

The console returns:

```
^15 IEE094D SPECIFY OPERAND(S) FOR DUMP COMMAND
```

- b. Enter:

```
R 15,JOBNAME=(OMVS,MQ01BRK),DSPNAME=('OMVS' .*),SDATA=(PSA,SQA,LSQA,RGN,TRT,
LPA,CSA,GRSQ,SUM,NUC)
```

The console returns:

```
IEE600I REPLY TO 15 IS;JOBNAME=(OMVS,MQ01BRK),DSPNAME=('OMVS' .*),S
IEA794I SVC DUMP HAS CAPTURED: 303
DUMPID=040 REQUESTED BY JOB (*MASTER*)
DUMP TITLE=ALL
IEE853I 13.40.40 SYS1.DUMP TITLES 306
SYS1.DUMP DATA SETS AVAILABLE=000 AND FULL=000
CAPTURED DUMPS=0001, SPACE USED=00000447M, SPACE FREE=00001053M
DUMP.MVK4.#MASTER#.D030415.T134007.S00039 DATA UNAVAILABLE WHILE
BEING DUMPED TO
IEA611I COMPLETE DUMP ON DUMP.MVK4.#MASTER#.D030415.T134007.S00039 309
DUMPID=040 REQUESTED BY JOB (*MASTER*)
FOR ASIDS(000D,009D,009F)
```

You can also find information on the individual thread by issuing the DISPLAY z/OS console command, as in the example:

```
D OMVS,PID=83886535
```

Checking for abend files

Abend files are produced when a process ends abnormally. The information contained in an abend file helps the IBM Support Center to diagnose and fix the problem.

The following list contains examples of what might cause the broker to produce an abend file:

- The broker runs out of memory
- A user-defined extension causes an illegal instruction in the broker process
- There is an unrecoverable error in the broker

Abend files are never produced during normal operation. If an abend file is produced, contact the IBM Support Center for assistance.

Contacting your IBM Support Center

If you cannot resolve problems that you find when you use WebSphere Message Broker, or if you are directed to do so by an error message generated by WebSphere Message Broker, you can request assistance from your IBM Support Center.

Before you contact your Support Center, use the checklist below to gather important information. Some items might not be relevant in every situation, but you should provide as much information as possible to enable the IBM Support Center to re-create your problem. You can also use the “IBM Support Assistant (ISA)” on page 158 to help with data collection.

For WebSphere Message Broker:

- The product version.
- Any fix packs applied.
- Any interim fixes applied.
- All current trace and error logs, including relevant Windows Event log or LinuxUNIX operating system syslog entries, and any abend or dump files from the *install_dir*\errors directory on Windows, or the */var/mqsi/errors* directory on LinuxUNIX. Obtain user trace log files at debug level for all relevant message flows and preferably format them. Also include any requested service trace files.

To send files from distributed systems, create a zipped file using any zip utility.

To send a file from the file system to IBM, use **tar** to compress the file. For example `tar -cx -f coredump.0002009E coredump.toibm`. To send MVS data sets to IBM, terse them using TRSMAIN, which you can download from z/OS tools download.

- A list of the components installed. Include details of the number of computers and their operating systems, the number of brokers and the computers on which they are running, and the existence and details of any User Name Servers.
- The zipped file obtained by exporting your workspace and appropriate message flows and message sets. This action is performed from the workbench.
- Details of the operation that you were performing, the results that occurred, and the results that you were expecting.
- A sample of the messages that were being used when the problem arose
- If relevant, the report file from the C or COBOL importer. This file is located in the directory from which the file import was attempted.
- If you are using tagged delimited wire format on message sets, the TDS log files.

For WebSphere MQ:

- The product version.
- Any fix packs applied.
- Any interim fixes applied.
- All current trace and error logs, including relevant Windows Event log or Linux and UNIX operating system syslog entries and First Failure Support Technology™ (FFST™) output files. You can find these files, which have the extension .fdc, in the errors subdirectory within the WebSphere MQ home directory.
- Details of WebSphere MQ client software, if appropriate.

For each database that you are using:

- The product and release level (for example, DB2 7.1).
- Any fix packs applied.
- Any interim fixes applied.

- All current trace and error logs, including relevant Windows Event log or Linux and UNIX operating system syslog entries, for example the db2dialog.log file on DB2. Check the database product documentation for details of where to find these files.
- Definitions of any database tables.
- Any ODBC traces.

Windows **For Windows:**

- The version.
- The Service Pack level.
- The version of the system files msvcrt.dll, msvcp60.dll, msvcirt.dll, and mfc42.dll. You can find these files in the Windows\SYSTEM32 directory. Use the Windows Explorer file properties to display the versions.
- The environment settings.

UNIX **For Linux and UNIX operating systems:**

- The product version. You can find the version installed by using the **uname -a** command.
- Any service level and patches that have been applied.
- The environment settings.

z/OS **For z/OS:**

- The product version
- The list of PTFs that have been applied
- The environment settings
- The joblogs from all address spaces

IBM Support Assistant (ISA)

The IBM Support Assistant (ISA) helps you to resolve questions and problems with IBM software products by providing access to support-related information and troubleshooting tools.

ISA is available at no charge to install on your computer; you then install the relevant product plug-ins. ISA has a built-in user guide, and the ISA download package includes an installation and troubleshooting guide. This topic contains a brief overview of the features of ISA Version 3; you can find more detailed information on the ISA Web page.

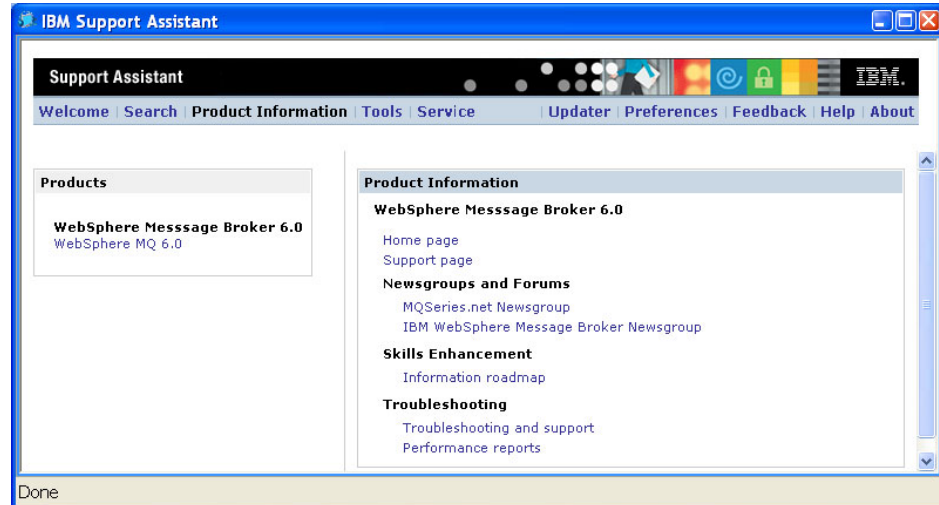
Search

ISA provides a tool that searches multiple sources of product information, and returns the results in the following categories:

- IBM software support documents
- IBM developerWorks
- IBM news groups and forums
- Google Web search
- Product information center

Product Information

The product information component directs you to the appropriate IBM Web sites for WebSphere Message Broker or another product that you have selected, as shown in the following example:



Tools

If diagnostic tools are available for WebSphere Message Broker, or any other product plug-in that you have installed on ISA, you can access them through the Tools component. More tools might be made available, so check for updates periodically.

Service

Use the Service component to perform the following tasks:

- Collect diagnostic data automatically
- Send files to IBM Support for problem determination
- Create and submit a new problem report
- View or update an existing problem report

Two data collectors are supplied for the WebSphere Message Broker plug-in:

- A general runtime data collector (to run for run time problems)
- A general toolkit data collector (to run for toolkit problems)

Run the appropriate data collector before you open a PMR, so that you can send the collected data to IBM with the PMR.

You can use the problem submission tool to enter your entitlement information once, and save it for future sessions. You can then create a problem report and attach the collector file at the same time.

Updater

Use the Updater component to perform the following tasks:

- Install and uninstall product plug-ins and tools
- Upgrade the ISA when an updated version is available

As well as WebSphere, product plug-ins are available for other products, such as DB2, Lotus, Rational, and Tivoli. You can also choose from a number of diagnostic tools that are common to all products.

Installing the IBM Support Assistant (ISA)

Before you start:

Read the concept topic about the “IBM Support Assistant (ISA)” on page 158.

Follow these steps to install the IBM Support Assistant (ISA) on your computer:

1. Go to the ISA downloads Web page to download the installation package.
2. Log in using your IBM ID and password. If you do not have an IBM ID, click **register now** to create one.
3. Select the version of the ISA that you want and click **continue**.
4. Click **View license** to read the license agreement in a separate window, then select **I agree** and click **I confirm**.
5. Click **Download now** for the relevant operating system and save the compressed file to a temporary directory.
6. Extract the files from the compressed file to a temporary directory. The files that you extract include an installation and troubleshooting guide and an executable file.
7. Follow the instructions in the guide to install ISA.

When you have installed ISA successfully, you can use the desktop icon to open it, or you can click **Programs** → **IBM Support Assistant** → **IBM Support Assistant**.

Now that you have installed ISA, install the WebSphere Message Broker plug-in, as described in “Updating the IBM Support Assistant.”

Updating the IBM Support Assistant

Before you start:

1. Read the concept topic about the “IBM Support Assistant (ISA)” on page 158.
2. Install the IBM Support Assistant.

You can update the ISA in two ways: installing product plug-ins, and upgrading the ISA itself. Use the Updater component to perform both tasks:

1. Open the IBM Support Assistant by clicking **Programs** → **IBM Support Assistant** → **IBM Support Assistant**.
2. Click **Updater**.
 - To install a product plug-in, click **New Products and Tools**.
 - To install an updated version of ISA, click **Upgrades**.
3. Select the item or items to install. Plug-in features are categorized by product family, so expand **WebSphere** and select WebSphere Message Broker.
4. Click **Install**.
5. Click the feature to read its licence agreement, then accept the license agreement.
6. Click **OK** to restart ISA.

When you have installed the product plug-in successfully, click **Product Information, Search, Tools, or Service** to find out what resources are available for WebSphere Message Broker.

Recovering after failure

The types of recovery that are described in this section are really a last resort. You must try to get to the root of the problem first, using the diagnosis techniques described throughout the “Troubleshooting and support” on page 3 section of the information center. If your problem cannot be resolved using these techniques, contact your IBM Support Center.

This section contains the following topics:

- “Recovering after the Configuration Manager fails”
- “Recovering after the broker fails” on page 162
- “Recovering after the User Name Server fails” on page 162
- “Recovering after an execution group fails” on page 163
- “Recovering after the broker’s queue manager fails” on page 163
- “Recovering after the Configuration Manager’s queue manager fails” on page 164
- “Recovering after the User Name Server’s queue manager fails” on page 165
- “Recovering after a shared queue manager fails” on page 166
- “Recovering after the configuration repository fails” on page 166
- “Recovering after the broker database fails” on page 167

Recovering after the Configuration Manager fails

Try to get to the root of the problem first, using the diagnosis techniques described throughout the “Troubleshooting and support” on page 3 section of the information center. If your problem cannot be resolved using these techniques, contact your IBM Support Center. Use the procedure in this section only as a last resort.

If the Configuration Manager environment is damaged, or the configuration repository is corrupted, and the problem cannot be corrected using problem determination, or by the IBM Support Center, perform the following sequence of operations to re-create the Configuration Manager.

The following sequence of operations applies to Windows, Linux, and UNIX systems. For z/OS, use the JCL equivalents of the commands.

1. Ensure that all workbench sessions are stopped.
2. Stop the Configuration Manager using the **mqsistop** command.
3. Stop the Configuration Manager’s queue manager using the **endmqm** command.
4. Delete the Configuration Manager using the **mqsdeleteconfigmgr** command:
 - a. If you are recovering the Configuration Manager because the configuration repository is damaged, delete it when you delete the Configuration Manager. This destroys all information pertinent to the broker domain (not just data internal to the Configuration Manager). You must export everything you can from the domain before you issue the **mqsdeleteconfigmgr** command specifying the **-n** parameter.

- b. If the configuration repository is undamaged, *omit* the **-n** parameter. This preserves your configuration data in the repository.

The **mqsdeleteconfigmgr** command:

- Stops the service that runs the Configuration Manager.
 - Stops and deletes the WebSphere MQ queue manager for the Configuration Manager, if requested.
 - Removes the tables from the configuration repository, if requested.
 - Removes the record for the component in the broker registry.
5. If you are recovering the Configuration Manager because the configuration repository is damaged, restore the repository from a previously successful backup version using the **mqsrestoreconfigmgr** command.
 6. Recreate the Configuration Manager using the **mqscreateconfigmgr** command.
 7. Start the Configuration Manager using the **mqsistart** command.
 8. Restart the workbench if it is not currently running, and switch to the Broker Administration perspective.
 9. If you have completed step 4a and step 5, you must also redeploy the domain configuration to ensure that the configuration across the broker domain is consistent.

Recovering after the broker fails

Try to get to the root of the problem first, using the diagnosis techniques described throughout the “Troubleshooting and support” on page 3 section of the information center. If your problem cannot be resolved using these techniques, contact your IBM Support Center. Use the procedure in this section only as a last resort.

If a broker’s database becomes corrupted, follow the instructions described in “Recovering after the broker database fails” on page 167. If the database is not corrupted, but the problem cannot be corrected using problem determination, perform the following sequence of operations to re-create the broker:

1. Ensure that no workbench users are deploying to brokers. You must wait until these actions have completed.
2. Stop the broker using the **mqsistop** command.
3. Stop the broker’s queue manager using the **endmqm** command.
4. Take a backup of the broker database tables. These tables are interdependent and must all be in a consistent state when restored. You cannot backup or restore individual tables.
5. Delete the broker using the **mqsdeletebroker** command.
6. Recreate the broker using the **mqscreatebroker** command.
7. Restore the broker database tables, either from the backup you have just taken, or from a previously successful backup version.
8. Start the broker using the **mqsistart** command.
9. Redeploy the domain configuration to ensure that the configuration across the broker domain is consistent.

Recovering after the User Name Server fails

Try to get to the root of the problem first, using the diagnosis techniques described throughout the “Troubleshooting and support” on page 3 section of the

information center. If your problem cannot be resolved using these techniques, contact your IBM Support Center. Use the procedure in this section only as a last resort.

If the User Name Server environment becomes damaged, and the problem cannot be corrected using problem determination, or by the IBM Support Center, perform the following sequence of operations to re-create the User Name Server:

1. Stop the User Name Server using the **mqsistop** command.
2. Stop the User Name Server's queue manager using the **endmqm** command.
3. Delete the User Name Server using the **mqsdeleteusernameserver** command.
4. Re-create the User Name Server using the **mqsicreateusernameserver** command.
5. Start the User Name Server using the **mqsistart** command.

Recovering after an execution group fails

Try to get to the root of the problem first, using the diagnosis techniques described throughout the "Troubleshooting and support" on page 3 section of the information center. If your problem cannot be resolved using these techniques, contact your IBM Support Center. Use the procedure in this section only as a last resort.

If a single execution group fails, and the problem cannot be corrected using problem determination, or by the IBM Support Center, perform the following sequence of operations to re-create the execution group:

1. Ensure that no workbench users are deploying to the broker to which the execution group belongs. You must wait until these actions have completed.
2. Stop the broker using the **mqsistop** command.
3. Delete the execution group.
4. Start the broker using the **mqsistart** command.
5. Clean the execution group.
6. Redeploy the configuration.

If more than one execution group fails, you might need to re-create the broker. See "Recovering after the broker fails" on page 162 for information on how to do this.

Recovering after the broker's queue manager fails

Try to get to the root of the problem first, using the diagnosis techniques described throughout the "Troubleshooting and support" on page 3 section of the information center. If your problem cannot be resolved using these techniques, contact your IBM Support Center. Use the procedure in this section only as a last resort.

If the failed queue manager is shared between a broker, User Name Server and Configuration Manager, re-create all three components, because each component creates different queues. For information on how to recover a shared queue manager, see "Recovering after a shared queue manager fails" on page 166.

If the broker's queue manager fails and cannot be corrected using problem determination, or by the IBM Support Center, perform the following sequence of operations to re-create the queue manager:

1. Ensure that no workbench users are deploying to the broker. You must wait until any such actions have completed.
2. Stop the broker using the **mqsistop** command.
3. If there is no damage to any of the broker database tables, take a backup of these tables. These tables are interdependent and must all be in a consistent state when restored. You cannot back up or restore individual tables.
4. Delete the broker using the **mqsdeletebroker** command, with the **-q** parameter to remove the queue manager.
5. Re-create the broker using the **mqsicreatebroker** command. The **mqsicreatebroker** command creates the queue manager and default queues automatically.
6. Re-create any specific queues that are needed for your message flows.
7. Restore the broker database tables, either from the backup that you have just taken, or from a previously-successful backup version.
8. Start your brokers using the **mqsistart** command.
9. Redeploy the domain configuration.

Recovering after the Configuration Manager's queue manager fails

Try to get to the root of the problem first, using the diagnosis techniques described throughout the "Troubleshooting and support" on page 3 section of the information center. If your problem cannot be resolved using these techniques, contact your IBM Support Center.

Follow the link below for your operating system:

- Windows, Linux, and UNIX systems
- z/OS

If you need to transfer the Configuration Manager onto another queue manager, follow the steps described in Moving the Configuration Manager to a new queue manager.

Recovering after the Configuration Manager's queue manager fails on Windows, Linux, and UNIX systems

Use the procedure in this section only as a last resort.

If the failed queue manager was shared between a broker, User Name Server and Configuration Manager, re-create all three components, because each component creates different queues. For information on how to recover a shared queue manager, see "Recovering after a shared queue manager fails" on page 166.

If the Configuration Manager's queue manager fails and cannot be corrected using problem determination, or by the IBM Support Center, perform the following sequence of operations to re-create the queue manager:

1. Ensure that no workbench users are deploying to brokers. You must wait until any such actions have completed.
2. Stop all brokers that are using the Configuration Manager using the **mqsistop** command.
3. Stop the Configuration Manager using the **mqsistop** command.

4. Delete the Configuration Manager using the **mqsdeleteconfigmgr** command, with the **-q** parameter to remove the queue manager.
5. Re-create the Configuration Manager using the **mqscreateconfigmgr** command. The **mqscreateconfigmgr** command creates the queue manager and default queues automatically.
6. Start the Configuration Manager using the **mqsistart** command.
7. Start your brokers using the **mqsistart** command.
8. Redeploy the domain configuration.

Recovering after the Configuration Manager's queue manager fails on z/OS

Use the procedure in this section only as a last resort.

If the failed queue manager was shared between a broker, User Name Server and Configuration Manager, re-create all three components, because each component creates different queues. For information on how to recover a shared queue manager, see "Recovering after a shared queue manager fails" on page 166.

If the Configuration Manager's queue manager fails and cannot be corrected using problem determination, or by the IBM Support Center, perform the following sequence of operations to re-create the queue manager:

1. Ensure that no workbench users are deploying to brokers. You must wait until any such actions have completed.
2. Stop all brokers that are using the Configuration Manager.
3. Stop the Configuration Manager.
4. Correct any queue manager problems.
5. Re-create the Configuration Manager queues using the BIPCRCM JCL; see the Sample BIPCRCM file. Include the **mqscreateconfigmgr** command **-2** parameter.
6. Start the Configuration Manager.
7. Start your brokers.
8. Redeploy the domain configuration.

Recovering after the User Name Server's queue manager fails

Try to get to the root of the problem first, using the diagnosis techniques described throughout the "Troubleshooting and support" on page 3 section of the information center. If your problem cannot be resolved using these techniques, contact your IBM Support Center. Use the procedure in this section only as a last resort.

If the failed queue manager was shared between a broker, User Name Server, and Configuration Manager, re-create all three components, because each component creates different queues. For information on how to recover a shared queue manager, see "Recovering after a shared queue manager fails" on page 166.

If the User Name Server's queue manager fails and cannot be corrected using problem determination, or by the IBM Support Center, perform the following sequence of operations to re-create the queue manager:

1. Ensure that no workbench users are deploying to brokers. You must wait until any such actions have completed.

2. Stop the User Name Server using the **mqsistop** command.
3. Delete the User Name Server using the **mqsdeleteusernameserver** command, with the **-q** parameter to remove the queue manager.
4. Re-create the User Name Server using the **mqsicreateusernameserver** command. The **mqsicreateusernameserver** command creates the queue manager and default queues automatically.
5. Start the User Name Server using the **mqsistart** command.
6. Redeploy the domain configuration.

Recovering after a shared queue manager fails

Try to get to the root of the problem first, using the diagnosis techniques described throughout the “Troubleshooting and support” on page 3 section of the information center. If your problem cannot be resolved using these techniques, contact your IBM Support Center. Use the procedure in this section only as a last resort.

If a queue manager that is shared between a broker, User Name Server, and Configuration Manager fails and cannot be corrected using problem determination, or by the IBM Support Center, re-create all three components, because each component creates different queues. Perform the following sequence of operations:

1. Ensure that no workbench users are deploying to brokers. You must wait until any such actions have completed.
2. Stop each component using the **mqsistop** command.
3. Delete the User Name Server using the **mqsdeleteusernameserver** command.
4. Delete the broker using the **mqsdeletebroker** command.
5. Delete the Configuration Manager using the **mqsdeleteconfigmgr** command, with the **-q** parameter to remove the queue manager.
You must delete the queue manager last. It cannot be deleted while other components are still sharing it.
6. Re-create each component using the relevant **mqsi** command.
7. Start each component using the **mqsistart** command.
8. Redeploy the domain configuration.

If you need to transfer the Configuration Manager onto another queue manager, follow the steps described in Moving the Configuration Manager to a new queue manager.

Recovering after the configuration repository fails

Try to get to the root of the problem first, using the diagnosis techniques described throughout the “Troubleshooting and support” on page 3 section of the information center. If your problem cannot be resolved using these techniques, contact your IBM Support Center. Use the procedure in this section only as a last resort.

If the configuration repository fails and cannot be corrected using problem determination, or by the IBM Support Center, perform the following sequence of operations to re-create the configuration repository:

1. Ensure that no workbench users are deploying to brokers. You must wait until any such actions have completed.

2. Stop all brokers that are using the Configuration Manager using the **mqsistop** command.
3. Stop the Configuration Manager using the **mqsistop** command.
4. Re-create the configuration repository from a backup version using the **mqsirestoreconfigmgr** command on the same machine as the Configuration Manager.

If you do not have a backup of your configuration repository, re-create the Configuration Manager at this stage. This re-creates the configuration repository. However, any of the data that you previously had in the repository will be lost. To re-create the Configuration Manager:

- a. Delete the Configuration Manager using the **mqsdeleteconfigmgr** command, specifying the **-n** parameter.
 - b. Re-create the Configuration Manager using the **mqscreateconfigmgr** command. The **mqscreateconfigmgr** command creates the configuration repository automatically.
5. Start the Configuration Manager using the **mqsistart** command.
 6. Start your brokers using the **mqsistart** command.

Recovering after the broker database fails

Try to get to the root of the problem first, using the diagnosis techniques described throughout the “Troubleshooting and support” on page 3 section of the information center. If your problem cannot be resolved using these techniques, contact your IBM Support Center. Use the procedure in this section only as a last resort.

If the broker database fails and cannot be corrected using problem determination, or by the IBM Support Center, perform the following sequence of operations to re-create the broker:

1. Ensure that no workbench users are deploying to the broker. You must wait until any such actions have completed.
2. Stop the broker using the **mqsistop** command.
3. If possible, re-create the broker database from a backup version. If this is not possible, perform the following actions in the order shown:
 - a. Delete the broker using the **mqsdeletebroker** command.
 - b. Remove completely all references to the broker from the Configuration Manager repository. You can do this by removing the broker from the topology using the Message Brokers Toolkit. Ensure that the broker’s SYSTEM.BROKER.ADMIN.QUEUE queue has been deleted and initiate a topology deploy.

Alternatively, you can use the Configuration Manager Proxy API “TopologyProxy.removeDeletedBroker(String)” to programmatically purge all references to the broker:

- 1) Start the Configuration Manager Proxy API Exerciser sample (which is available on the **Start** menu on Windows).
 - 2) Connect to the Configuration Manager.
 - 3) Right-click the topology object, then click **Remove references to a previously deleted broker**.
 - c. Re-create the broker using the **mqscreatebroker** command.
 - d. Add the broker to the Configuration Manager’s domain topology.
4. Start the broker using the **mqsistart** command.

5. If you were unable to restore the broker's database from a backup, redeploy the broker's configuration.

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Troubleshooting

The following reference information is provided to help you to diagnose errors in WebSphere Message Broker:

- “Logs”
- “Trace” on page 175
- Trace logging from a user-defined C extension
- “Dumps” on page 178
- “Abend files” on page 181
- “Event reports” on page 182
- “WebSphere MQ facilities” on page 195
- “Database facilities” on page 196
- “Other sources of diagnostic information on z/OS” on page 196
- “Solutions to similar problems” on page 197
- Diagnostic messages

Logs

Logs are one of the first places to look when you are trying to diagnose any type of error. Your system will have a number of different types of logs, and any number of them might be used during operation of WebSphere Message Broker.

The information that is recorded in a log typically consists of a time stamp, which indicates when the error occurred, and a brief description of the error, which can be expanded to provide more details of the error. Sometimes there might be a general error that was caused by a number of other errors, and they are grouped under the general error.

When an error occurs, check the local error log first. The local error log records information about major activities within the system. All components of WebSphere Message Broker provide diagnostic information whenever error or warning conditions affect broker operation. These conditions include:

- Unsuccessful attempts to write a message to a WebSphere MQ output queue
- Errors interacting with databases
- The inability to parse an input message

There are also a number of logs that are specific to WebSphere Message Broker, which record runtime errors, internal errors that are produced by the operating system or your code, or errors related to the work that you are doing in a particular perspective, all of which you can view using the workbench.

The topics in this section are:

- “Local error logs” on page 172
- “WebSphere Message Broker logs” on page 172
- “z/OS broker joblogs” on page 173
- “WebSphere MQ logs” on page 174
- “Database logs” on page 175

Local error logs

WebSphere Message Broker components use the local error log (also known as the system log) to record information about major activities within the system. When an error occurs, check the local error log first.

Windows On Windows, the local error log is the Windows Event log (Application view).

UNIX On UNIX and Linux systems, the local error log is the *syslog*. Where syslog messages are sent depends on how you configure your UNIX or Linux system.

z/OS On z/OS, the local error log is the operator console.

Entries in the local error log that are generated by WebSphere Message Broker are identified as follows:

- **Windows** On Windows, by events from the source WebSphere Broker v**** and a message number of the form nnnn, where **** is the current four-digit product version number.
- **UNIX** On UNIX, by a message number of the form BIPnnnn.
- **z/OS** On z/OS, by a started task ID, and a message number of the form BIPnnnn.

When a broker encounters an error, more than one message might be written to the local error log. Typically these start with a general message (for example, Could not process a message), and further messages give more details about the cause of the error (for example, An error was detected while processing the following SQL statement...).

WebSphere Message Broker logs

This section describes the logs that are specific to WebSphere Message Broker:

- “Eclipse error log”
- “The broker domain Event Log” on page 173
- “The Problems or Alerts view” on page 173
- “TDS log” on page 173

Eclipse error log

The Eclipse error log captures internal errors from Eclipse or your code. This is useful at run time, in case you cause exceptions during development. As errors are triggered, they are added to the Error Log view of the Plug-in Development perspective, and you can examine details by double-clicking them. You can also clear the view when you have fixed all the errors, although you cannot clear individual errors. Entries are sorted in reverse chronological order; that is, most recent first. You can open the Properties view to see entry details.

Some errors might be hierarchical; that is, there might be a general entry for a complex problem and a number of child entries listing the individual problems in detail.

The same information that is shown in the Error Log view is stored in the .log file in the C:\Documents and Settings\user\IBM\wmbt6.0\workspace\metadata directory.

The Eclipse error log shows errors that are generated by the person using that particular workbench.

The broker domain Event Log

Broker domain log information is written to the broker domain Event Log. This log is stored and managed by the Configuration Manager. The Event Log displays messages about events that occur within the broker domain, such as deploying topology or topics hierarchy configuration. The messages can be information, errors, or warnings. You view the messages in the editor area of the Broker Administration perspective.

The broker domain Event Log shows errors that are generated by all workbench users in that particular domain.

The Problems or Alerts view

Either the Problems or the Alerts view is displayed, depending on the perspective being used at the time.

- In the Broker Application Development perspective, the Problems view shows information messages, warnings and errors for message flow applications (such as message flows, message sets, ESQL, Java, and mapping).
- In the Broker Administration perspective, the Alerts view shows information about stopped resources (such as message flows, execution groups, and brokers).

TDS log

When you use the Tagged/Delimited String (TDS) physical format messages, you must conform to a number of rules that apply to the setting of values of properties. These rules are checked at deploy time, and, if an inconsistency is found, error message BIP1836 is displayed in the workbench. Details of the error are written to the TDS.log file in the *install_dir*/log directory.

For more information about the rules for TDS physical format properties, see TDS message model integrity.

z/OS broker joblogs

Understanding the broker address spaces

On z/OS, the broker writes messages to the appropriate z/OS system log and joblogs. These might include information, warning, error, and severe messages to indicate various situations and events.

The broker run time consists of multiple address spaces. There is a single control address space that is always running when the broker is active and is responsible for communicating with the Configuration Manager and workbench. Each execution group within the broker is mapped to its own address space and as these execution groups start and stop, the corresponding address spaces are started and stopped. The control address space is assigned a JOBNAME and STEPNAME, which is the same as the broker name. The execution groups have a JOBNAME that is also the same as the broker name, and a STEPNAME that matches the last seven characters of the execution group name.

Viewing the z/OS system console log

The broker writes all of its messages to the z/OS system console log. You can see messages from all address spaces running on the z/OS system in this log. It is easy to identify jobs associated with the broker in the console log because of the naming of broker address spaces. Using the console log, you can see the order of event reporting for different products. This is helpful for cross-product problem determination.

Viewing the broker joblogs

The broker control address space and each of the execution group address spaces has its own joblog. Selecting the joblog for the appropriate broker address space allows you to see all messages relating to that address space. This is helpful in a busy system where the system console log might have many messages from different products obscuring the information in which you are interested.

Interpreting log information

In both logs, each message is displayed on its own, in date and time order; it might span multiple lines, if necessary. For each message, the following information is available:

- **Date and time:** The exact date and time when the event was written to the log.
- **JOBID:** The started task job identifier of the address space.
- **Message Number:** The message number that identifies whether the event is information, a warning, or an error, with diagnostic text.
- **JOBNAME:** The JOBNAME of the address space issuing the message. This is always the same as the broker name.
- **STEPNAME:** The STEPNAME of the address space that is issuing the message. For the control address space, this is the same as the broker name; otherwise, it is the same as the last seven characters of the execution group that is issuing the message.

WebSphere MQ logs

WebSphere MQ messages are written to the local error log in the same way as WebSphere Message Broker messages. WebSphere MQ messages start with the prefix AMQ followed by a number between 4000 and 9999. The number specifies from which part of WebSphere MQ the message originates:

4000 to 4999

Windows user interface messages

5000 to 5999

Installable services messages

6000 to 6999

Common services messages

7000 to 7999

WebSphere MQ product messages

8000 to 8999

WebSphere MQ administration messages

9000 to 9999

Remote messages

For a full explanation of each message, see the WebSphere MQ library Web page.

Database logs

Databases write severe error and warning conditions to the local error log (syslog). Typically, databases also write errors to a database log file, such as the db2diag.log file on DB2.

You can open the db2diag.log file in a text editor.

The example below shows a typical entry from the db2diag.log file:

```
Jun 18 15:02:53 bluj DB2[46827]: DB2(db2inst1.000(1))oper_system_services sqlobeep(2)
reports:(3)
Jun 18 15:02:53 (4) bluj (5) DB2[46827(6)]: extra symptom string provided:(7) RIDS/sqlsysc_
Jun 18 15:02:53 bluj DB2[46827]: data: (8) 54686973 20697320 616e2065 78616d70
Jun 18 15:02:53 bluj DB2[46827]: data: 6c65206f 66206c6f 67676564 20646174
Jun 18 15:02:53 bluj DB2[46827]: data: 61
Jun 18 15:02:53 bluj DB2[46827]: 2 piece(s) of dump data provided... to file(9) /u/db2inst1/
Jun 18 15:02:53 bluj DB2[46827]: 1. 'DUMP EXAMPLE #1' has been dumped (10)
Jun 18 15:02:53 bluj DB2[46827]: 2. 'DUMP EXAMPLE #2' has been dumped
```

The bold numbers in the example show various items in the log file:

- (1)** The instance name and node number
- (2)** The reporting component and function
- (3)** The probe ID and error and alert numbers
- (4)** A time stamp for when the event occurred
- (5)** The host name
- (6)** The process ID of the reporting process. Use the **ps** command to view information about the process ID of the reporting process. For example, enter the following command to get information about the reporting process:

```
ps -fu 46827
```
- (7)** A symptom string that contains additional information about where and why the problem occurred
- (8)** A hexadecimal dump of data that includes return codes and other information that can be interpreted by your IBM Support Center
- (9)** Information about additional dump files. Larger structures and other binary data might be dumped to additional files. The name of the file is identified in the syslog file
- (10)** An entry to identify a piece of dump data

Trace

If you cannot get enough information about a particular problem from the entries that are available in the various logs described in “WebSphere Message Broker logs” on page 172 and “Local error logs” on page 172, the next troubleshooting method to consider is using trace. Trace provides more details about what is happening while code executes. The information produced from trace is sent to a specified trace record, so that you or IBM support personnel can analyze it to discover the cause of your problem.

Trace is inactive by default, and must be explicitly activated by a command, or by the workbench.

There are two main types of trace available in WebSphere Message Broker: user trace and service trace. Typically, you utilize user trace for debugging your applications; you can trace brokers, execution groups, and deployed message flows. With service trace, you can activate more comprehensive broker tracing, and start tracing for the workbench, Configuration Manager, and User Name Server. You can also trace the execution of all the commands described in Commands.

When you start user tracing, you cause additional processing for every activity in the component that you are tracing. Large quantities of data are generated by the components. Expect to see some impact on performance while trace is active. You can limit this additional processing by being selective about what you trace, and by restricting the time during which trace is active.

User trace

User trace is one of two types of optional trace available in WebSphere Message Broker. User trace is inactive by default, and must be activated explicitly by a command, or by the workbench, when you need more information than that provided by the entries in the Event Log. For more information about logs, see “Logs” on page 171.

Typically you utilize user trace for debugging your applications, as it can trace brokers, execution groups, and deployed message flows.

You can use the workbench to control most of the trace activity that you need. The workbench also enables you to start and stop tracing on remote systems.

When you activate user tracing, you cause additional processing for every activity in the component that you are tracing. Large quantities of data are generated by the components. Expect to see some impact on performance while user trace is active. You can limit this additional processing by being selective about what you trace, and by restricting the time during which trace is active.

The user trace log files

When trace is active for any component, information is recorded in binary form. The location of the trace logs is as follows:

Windows Windows

If you set the workpath using the **-w** parameter of the **mqsicreatebroker** command, the location is `workpath\log`. If you do not specify the broker workpath, the location is `C:\Documents and Settings\All Users\Application Data\IBM\MQSI\common\log`.

UNIX UNIX

`/var/mqsi/common/log`

z/OS z/OS

`/component_filesystem/log`

The file names reflect the component and subcomponent for which the trace is active. For example, the broker name and unique execution group identifier form part of the file name when you are tracing activity within that execution group.

For example, if you have created a broker called `WBRK_BROKER`, you might see the following files in the log subdirectory:

```
WBRK_BROKER.682ec116-dc00-0000-0080-ce28a236e03d.userTrace.bin.1  
WBRK_BROKER.682ec116-dc00-0000-0080-ce28a236e03d.userTrace.bin.2
```

You cannot view these files directly; use the commands that are provided to access the trace information and convert it to a viewable format. Use the **`mqsireadlog`** command to retrieve the trace log for the specified component. Issue the command on the computer on which the log was generated. You can specify the output to be directed to a file, which is independent of operating system, and can be transferred to other systems for browsing or formatting using the **`mqsiformatlog`** command.

Using a Trace node

If you include a Trace node in your message flows when you are developing and testing them, this option not only gives you the ability to trace messages and activity in the flow, but also allows you to specify an alternate target file for the trace contents to isolate the detail in which you are interested. For details of how to use and configure a trace node, see the Trace node topic.

Service trace

Service trace is one of two types of optional trace available in WebSphere Message Broker. Service trace is inactive by default, so you must activate it explicitly using a command when you need more information than that provided by the entries in the Event Log or by user trace.

With service trace, you can activate more comprehensive broker tracing, and start tracing for the workbench, Configuration Manager, and User Name Server. You can also trace the execution of all the commands described in Commands, including the trace commands themselves. Use the **`mqsichangetrace`** command to work with service trace; you cannot use the workbench.

Activate service trace only when you receive an error message that instructs you to, or when directed to do so by your IBM Support Center.

When you activate service tracing, you cause additional processing for every activity in the component that you are tracing. Large quantities of data are generated by the components. Expect to see some impact in performance while service trace is active. You can limit this additional processing by being selective about what you trace, and by restricting the time during which trace is active.

The location of the trace logs is as follows:

Windows Windows

If you have set the workpath using the **`-w`** parameter of the **`mqsicreatebroker`** command, the location is `workpath\log`. If you have not specified the broker workpath, the location is `C:\Documents and Settings\All Users\Application Data\IBM\MQSI\common\log`.

UNIX UNIX

`/var/mqsi/common/log`

z/OS z/OS

`/component_filesystem/log`

The directory to which the service trace logs are written must be able to hold all the logs for that computer. You might want to place it on a separate file system, if allowed by your system operator.

Dumps

Under exceptional circumstances, Windows MiniDumps, UNIX core dumps, or z/OS SVC or core dumps might be produced; for example, if errors occur in the broker or User Name Server executable files or in the infrastructure main program. The amount and complexity of data produced in these cases normally requires the assistance of your IBM Support Center.

Dumps on Windows

Windows MiniDumps might be produced by broker processes in extreme cases. They are never produced during normal operation.

They are accompanied by a BIP2111 error message (message broker internal error) that contains the path to the MiniDump file in your workpath/errors directory. MiniDump files have the extension .dmp. You can analyze these MiniDumps using a suitable debugger; contact IBM for assistance.

Dumps on UNIX systems

UNIX core dumps are produced by broker processes in extreme cases. They are never produced during normal operation.

A BIP2060 error message (execution group terminated unexpectedly) might be produced. Look in the directory where the broker was started to find the core dump file. If this directory is not writable by the service ID, the core dumps are produced in the service user ID's home directory.

You can analyze these core dumps using a suitable debugger; contact IBM for assistance.

Dumps on z/OS

A WebSphere Message Broker for z/OS broker or User Name Server produces different types of dumps depending on where the original error occurs.

SVC dumps

These are produced for errors in the WebSphere Message Broker for z/OS infrastructure main program (bipimain).

Core dumps

These are produced for errors in the broker or User Name Server executable files (bipservice, bipbroker, DataFlowEngine, and bipuns).

SVC dumps

Errors in the infrastructure main program cause system abend X'2C3' followed by a specific reason code. This abend might occur before the WebSphere Message Broker for z/OS recovery routine is active, so might occur without a dump being written. The reason code helps the IBM Support Center to determine the error. In that situation you get only the following information in the z/OS syslog:

```
IEF450I STU1051 - ABEND=S2C3 U0000 REASON=01050001
```

An SVC dump that is caused by z/OS or WebSphere Message Broker for z/OS is written to the system's dump directory, and can be formatted with IPCS. The name of the dump is listed on the z/OS syslog.

Under some circumstances, SVC dumps are not produced. Generally, dumps are suppressed because of time or space problems, or security violations. In addition, you can suppress SVC dumps that duplicate previous dumps using z/OS DAE, for example, use the command SET DAE=xx. (DAE is Dump Analysis and Elimination: a z/OS service that enables an installation to suppress SVC dumps and ABEND SYSDUMP dumps that are not needed because they duplicate previously written dumps.)

The following example shows a message on the z/OS syslog, indicating whether duplicates of SYSDUMPs are suppressed:

```
IEA995I SYMPTOM DUMP OUTPUT 504
SYSTEM COMPLETION CODE=0C4 REASON CODE=00000004
TIME=11.02.24 SEQ=02327 CPU=0000 ASID=0060
PSW AT TIME OF ERROR 078D2000 8D70A656 ILC 4 INTC 04
ACTIVE LOAD MODULE ADDRESS=0D708F68 OFFSET=000016EE
NAME=SPECIALNAME
61939683 81936199 85A2F1F0 61A48689 */local/res10/ufi*
A7F5F161 82899561 82899789 94818995 *x51/bin/bipimain*
DATA AT PSW 0D70A650 - 91345000 00001F22 41209140
GPR 0-3 00000000 0D711B18 0D711B18 00000000
GPR 4-7 0D711300 0D70BD04 00000000 0D711B18
GPR 8-11 0D7121CF 0D7111D0 0D70C316 0D70B317
GPR 12-15 8D70A318 0D7111D0 00000312 00000000
END OF SYMPTOM DUMP
IEA838I SYSDUMP SUPPRESSED AS A DUPLICATE OF: 505
ORIGINAL:DATE 01170 TIME 10:59:40:05 CPU 8A7645349672
MOD/#PATHNAM CSECT/BIPIP PIDS/5655G9700 AB/S00C4
REXN/IMBSIREC FI/913450000001F2241209140 REGS/0C33E
HRC1/00000004 SUB1/INFRASTRUCTURE#MAIN
```

The *MVS Diagnosis: Tools and Service Aids* manual provides details about using z/OS dump analysis and elimination (DAE).

Core dumps

A broker or User Name Server produces USS (UNIX System Services) core dumps. These core dumps are SYSDUMP dumps. They are written to the started task's user directory. The name is coredump.pid, where .pid is the hexadecimal value of the process ID of the process that encountered the error, and is listed on the z/OS syslog. The dump can be found in the started task user's home directory, for example, /u/stu1/coredump.000000ae.

The maximum size of a core dump is defined through MAXCORESIZE in the BPXPRMxx parmlib member. The IBM-supplied default is 4MB. To ensure completeness of a core dump of any WebSphere Message Broker for z/OS address space, change this to 2GB. The started task user's directory must then have at least this size.

When the error recovery routines of WebSphere Message Broker for z/OS provide an SVC dump, a core dump is also written to your started task user ID directory. In this case, the SVC dump and the entry on the z/OS syslog are of interest to IBM to resolve the problem. The following example shows an entry on the z/OS syslog when an SVC dump and core dump have been provided:

```

IEA794I SVC DUMP HAS CAPTURED: 486
DUMPID=008 REQUESTED BY JOB (STU1051 )
DUMP TITLE=COMP=WMQI z/OS CID=G9700 ISSUER=BIPIMAIN (BIPIP
): WMQI InfraMain : SOC4-00000004.
IEF196I IGD101I SMS ALLOCATED TO DDNAME (SYS00010)
IEF196I DSN (SYS3.DUMP.ARG5.STU1051.T085940.S00008 )
IEF196I STORCLAS (SMS) MGMTCLAS (DUMP) DATACLAS ( )
IEF196I VOL SER NOS= ARGSMY
IEF196I IGD104I SYS3.DUMP.ARG5.STU1051.T085940.S00008 RETAINED,
IEF196I DDNAME=SYS00010
IEA611I COMPLETE DUMP ON SYS3.DUMP.ARG5.STU1051.T085940.S00008 493
DUMPID=008 REQUESTED BY JOB (STU1051 )
FOR ASID (0060)
INCIDENT TOKEN: ARGPLEX ARG5 06/19/2001 08:59:40
ERROR ID = SEQ02325 CPU00 ASID0060 TIME10.59.40.5
IEA995I SYMPTOM DUMP OUTPUT 494
SYSTEM COMPLETION CODE=0C4 REASON CODE=00000004
TIME=10.59.40 SEQ=02325 CPU=0000 ASID=0060
PSW AT TIME OF ERROR 078D2000 8D70A656 ILC 4 INTC 04
ACTIVE LOAD MODULE ADDRESS=0D708F68 OFFSET=000016EE
NAME=SPECIALNAME
61939683 81936199 85A2F1F0 61A48689 */local/res10/ufi*
A7F5F161 82899561 82899789 94818995 *x51/bin/bipimain*
DATA AT PSW 0D70A650 - 91345000 00001F22 41209140
GPR 0-3 00000000 0D711B18 0D711B18 00000000
GPR 4-7 0D711300 0D70BD04 00000000 0D711B18
GPR 8-11 0D7121CF 0D7111D0 0D70C316 0D70B317
GPR 12-15 8D70A318 0D7111D0 00000312 00000000
END OF SYMPTOM DUMP
IEA993I SYSDUMP TAKEN TO coredump.0300019D

```

To make use of these core dumps, copy them to a partitioned data set using the TSO/E OGET command. Allocate the data set as a sequential data set with a logical record length (LRECL) of 4160 and a record format of FBS. Specify a primary allocation of at least 500 cylinders and a secondary allocation of at least 250 cylinders. The data set must be transferred as binary. For example:

```
oget '/u/user_directory/coredump.pid' 'mvs_dataset_name.pid' bin
```

Dump options

To collect all the diagnostic information, specify the following dump options in SYS1.PARMLIB:

- Member IEADMP* SDATA=(LSQA,TRT,CB,ENQ,DM,IO,ERR,SUM)
- Member IEADMR* SDATA=(NUC,SQA,LSQA,SWA,TRT,RGN,LPA,CSA,SUM,GRSQ)

You can check the values on your system by using the D Dump,Options z/OS console command, as follows:

```
D D,0
```

Example output from this command is as follows:

```

SYSABEND- ADD PARMLIB OPTIONS SDATA=(LSQA,TRT,CB,ENQ,DM,IO,ERR,SUM),
          PDATA=(SA,REGS,LPA,JPA,PSW,SPLS)
SYSUDUMP- ADD PARMLIB OPTIONS SDATA=(LSQA,TRT,CB,ENQ,DM,IO,ERR,SUM),
          PDATA=(SA,REGS,LPA,JPA,PSW,SPLS)
SYSDUMP-  ADD OPTIONS (NUC,SQA,LSQA,SWA,TRT,RGN,LPA,CSA,SUM,GRSQ)

```

The last entry shows the SYSDUMP options that are used when taking core dumps.

Abend files

When a process ends abnormally (an abend or dump), an entry is made in the syslog, or the Windows Event log. If there is more data to be written than is appropriate for the log, a new file is created to contain it, and the log entry tells you the file name. You need to send the file to your IBM Support Center for analysis.

Abend files are never generated during normal operation; always involve your IBM Support Center when they do occur.

The new file is called:

Windows

Windows

filename.abend; if you have set the workpath using the **-w** parameter of the **mqsicreatebroker** command, the location is `workpath\common\errors`. If you have not specified the broker workpath, the workpath can be resolved by issuing the command **echo %MQSI_WORKPATH%** from the installation's Command Console. If it is not possible to write to this directory, the file is put in the `workpath\common\log` directory, but in either case the message in the Event Log tells you where to find it.

UNIX

UNIX

filename.abend in the `/var/mqsi/common/errors` directory.

z/OS

z/OS

filename.abend in the `/component_HFS/common/errors` directory.

where *filename* is a unique dynamically-allocated name, as given in the syslog or Event Log message.

The abend file might provide a stack for the failing thread; this might help you to identify problems in the plug-in code when an abend occurs here. In which case, for z/OS, this stack will be available in a CEEDUMP file in the same directory as the abend file by default.

Each abend file contains a header that includes the following sections:

- Product details (the broker product that is being used)
- Operating System
- Environment (including the installation path and the process ID that contains the failing thread)
- Deployment (including the component and, where applicable, the execution group name and UUIDs)
- Build Information (for IBM internal use)
- Failure Location (including the time of failure and, where applicable, the message flow name)

The content and organization of the abend file and its header are subject to change without notice.

Periodically clear any unwanted abend files from the errors or z/OS log directory. You can do this by moving the files to an archive, or by deleting them when they are no longer needed. This ensures that the workpath does not become full; in extreme conditions, your system performance can be degraded if significant space is being used up with old abend files.

WebSphere Message Broker for z/OS abends

Abend code
2C1

Explanation

The WebSphere Message Broker for z/OS infrastructure encountered a severe internal error. The reason code helps the IBM Support Center to identify the source of the error. It has the format X'ppmmnnnn', where pp defines the part within the infrastructure where the error occurred, mm defines the specific location of the error, and nnnn defines a recursion index.

You can resolve the following reason codes but you should refer other codes to the IBM Support Center.

ABN=S2C1-0001xxxx Error opening a file system file

The file system component might be full or the broker user ID might not have the correct permissions to access files or directories in the file system component.

ABN=S2C1-0113xxxx Region size too small

Source

WebSphere Message Broker for z/OS

System Action

The system might issue a dump.

Programmer Response

None

System Programmer Response

Search the problem-reporting databases for a fix for the problem. If no fix exists, contact the IBM Support Center, providing the reason code and, if present, the dump.

Event reports

This topic and the associated topics describe the event messages that are published by a message broker in response to:

- "Configuration changes" on page 184
- "Operational information" on page 189

In addition, there are associated topics on:

- "General architecture" on page 183
- "Operational warnings" on page 191
- "Notification message schema" on page 193

The events are published on a series of system-defined topics. The body of the message contains additional information in XML format. Every message is generated in code page 1208.

The following set of events can be reported:

Configuration changes

- An execution group has been created, changed, or deleted

- A message flow has been created, changed, or deleted
- A neighbor has been created, changed, or deleted
- An ACL for a topic has been created, changed, or deleted

Operational information

- A broker has been started or stopped
- A message flow has been started or stopped
- A subscription has been registered or de-registered

Operational warnings

- A retained publication has expired
- A subscription has expired

General architecture

This section describes reserved topics on which brokers publish messages after significant events within the broker. By subscribing to these topics, a client can be informed when events occur.

For each topic, the type of event and message body are explained. The body of these messages is in XML format.

An event publication can contain more than one entry if the topic is the same (for example, if several message flows are created in the same operation).

The general form of the system topics on which events are published is:

`$SYS/Broker/broker_name/event_type/...`

where:

broker_name

is the name of the broker issuing or raising this event.

event_type

is the type of the event and is one of:

- Configuration
- Neighbor
- Subscription
- Topic
- Status
- Expiry

This specification of topics helps clients to filter events, based on the broker from which the event originated and the type of event. The clients register subscriptions for these topics to receive the reports.

For specific events, additional information is included in the topic to help filter on the specific object that raised the event. The inclusion of the string `Broker` at the second level of the topic hierarchy allows for extension should other subsystems (for example, the queue manager or Configuration Manager) that publish system management events through the broker be supported in the future.

Configuration changes

Configuration changes include changes to the operational configuration of a single broker (for example, the addition or removal of a message flow) and changes to the topology for a multibroker network.

This information is described in the following topics:

- “Changes to the local configuration of the broker”
- “Neighbor changes” on page 185
- “ACL updates” on page 187

Changes to the local configuration of the broker

Notification of changes to the broker’s configuration (create, change, or delete entities) is provided by publishing events on the following system topic:

`$SYS/Broker/broker_name/Configuration/ExecutionGroup/exec_grp_name`

where:

broker_name

is the name of the broker issuing this message

exec_grp_name

is the name of the execution group for which the configuration has changed

One such event is published for each configuration request message that is received and processed by an execution group within the broker and can thus contain information that reflects complex configuration changes to multiple entities within the broker.

The body of each publication is the part of the configuration request that causes the event to be triggered. If an execution group is renamed, subsequent publications that report the state of that execution group use the new name.

These events are published non-persistently as non-retained publications.

Only create, change, and delete actions on the message flow are reported.

Configuration change:

The following figure shows an example notification when a message flow is created. The number of attributes mentioned in the example can vary.


```

<Broker uuid="1234" label="Broker1" version="1">
  <ExecutionGroup uuid="2345">
    <Create>
      <MessageFlow uuid="3456" label="MessageFlow1">
        <!-- Create the Input and Output Nodes -->
        <ComIbmMqInputNode uuid="4567"
          queueName="InputQueue1" label="InputNode1" />
        <ComIbmMqOutputNode uuid="5678"
          queueName="OutputQueue1"
          label="OutputNode1"/>
        <ComIbmMqOutputNode uuid="6789"
          queueManagerName="QueueManager1"
          queueName="OutputQueue2"
          label="OutputNode2"/>
        <!-- Create the filter -->
        <ComIbmFilterNode uuid="7890"
          filterExpression="Company=IBM"
          label="FilterNode1"/>
        <!-- Connect them together -->
        <Connection sourceNode="4567"
          sourceTerminal="out"
          targetNode="7890" targetTerminal="in"/>
        <Connection sourceNode="7890"
          sourceTerminal="true"
          targetNode="5678" targetTerminal="in"/>
        <Connection sourceNode="7890"
          sourceTerminal="false"
          targetNode="6789" targetTerminal="in"/>
      </MessageFlow>
    </Create>
  </ExecutionGroup>
</Broker>

```

Neighbor changes

A change in the set of neighbors (the topology) for a given broker publishes an event using the following system topic:

```
$SYS/Broker/broker_name/Neighbor
```

where *broker_name* is the name of the broker issuing this message.

The body of each publication is an XML message that describes the change made.

These events are nonpersistent, non-retained publications.

Certain operations delete all neighbor (topology) information at a broker. In this case, the deleted neighbors are not published in the event publication. Instead, the body of the event publication contains a single XML tag that indicates that all neighbors have been deleted.

Examples:

The following example event messages show a neighbor being created, changed, and deleted, together with an example of all neighbors being deleted.

Neighbor created:

```

Event publication topic = "$SYS/Broker/Broker1/Neighbor"

<Broker uuid="1234" label="Broker1" version="1">
  <ControlGroup>
    <DynamicSubscriptionEngine>
      <Create>
        <Neighbor name="5678" collectiveId="">
          <MQBrokerConnection queueManagerName="nbr_QM_Name"/>
        </Neighbor>
      </Create>
    </DynamicSubscriptionEngine>
  </ControlGroup>
</Broker>

```

Neighbor changed:

```

Event publication topic = "$SYS/Broker/Broker1/Neighbor"

<Broker uuid="1234" label="Broker1" version="1">
  <ControlGroup>
    <DynamicSubscriptionEngine>
      <Change>
        <Neighbor name="5678"
          collectiveId="12345678-1234-1234-1234-123456789abc"/>
      </Change>
    </DynamicSubscriptionEngine>
  </ControlGroup>
</Broker>

```

Neighbor deleted:

```

Event publication topic = "$SYS/Broker/Broker1/Neighbor"

<Broker uuid="1234" label="Broker1" version="1">
  <ControlGroup>
    <DynamicSubscriptionEngine>
      <Delete>
        <Neighbor name="5678"/>
      </Delete>
    </DynamicSubscriptionEngine>
  </ControlGroup>
</Broker>

```

All neighbors deleted:

```

Event publication topic = "$SYS/Broker/Broker1/Neighbor"

<Broker uuid="1234" label="Broker1" version="1">
  <ControlGroup>
    <DynamicSubscriptionEngine>
      <Delete>
        <AllNeighbors/>
      </Delete>
    </DynamicSubscriptionEngine>
  </ControlGroup>
</Broker>

```

ACL updates

The creation, deletion, or modification of the ACL associated with a topic causes a publication using the following system topics:

`$/SYS/Broker/broker_name/Topic/topic`

where:

broker_name

is the name of the broker issuing this message

topic

is the topic whose ACL is being modified

The body of each publication is an XML message that describes the ACL update.

These events are nonpersistent, non-retained publications.

Certain operations delete all ACL entries for a single topic or for all topics. In this case, the individual entries are not published in the event publication. Instead, the body of the event publication contains a single XML tag that indicates that all ACL entries have been deleted.

Examples:

Here are example event messages for an ACL being created, changed, and deleted, together with examples for all ACLs being deleted on a single topic and all topics.

ACL created:

```
Event publication topic = "$SYS/Broker/Broker1/Topic/stock/IBM"
```

```
<Broker uuid="1234" label="Broker1" version="1">
  <ControlGroup>
    <DynamicSubscriptionEngine>
      <Topic name="stock/IBM">
        <Create>
          <ACLEntry
            principalName="Fred"
            principalType="user"
            publish="false"
            subscribe="inherit"
            persistent="true"/>
        </Create>
      </Topic>
    </DynamicSubscriptionEngine>
  </ControlGroup>
</Broker>
```

ACL changed:

Event publication topic = "\$SYS/Broker/Broker1/Topic/stock/IBM"

```
<Broker uuid="1234" label="Broker1" version="1">
  <ControlGroup>
    <DynamicSubscriptionEngine>
      <Topic name="stock/IBM">
        <Change>
          <ACLEntry
            principalName="Fred"
            principalType="user"
            publish="true"
            subscribe="false"
            persistent="inherit"/>
        </Change>
      </Topic>
    </DynamicSubscriptionEngine>
  </ControlGroup>
</Broker>
```

ACL deleted:

Event publication topic = "\$SYS/Broker/Broker1/Topic/stock/IBM"

```
<Broker uuid="1234" label="Broker1" version="1">
  <ControlGroup>
    <DynamicSubscriptionEngine>
      <Topic name="stock/IBM">
        <Delete>
          <ACLEntry principalName="Fred"/>
        </Delete>
      </Topic>
    </DynamicSubscriptionEngine>
  </ControlGroup>
</Broker>
```

All ACLs deleted on a single topic:

Event publication topic = "\$SYS/Broker/Broker1/Topic/stock/IBM"

```
<Broker uuid="1234" label="Broker1" version="1">
  <ControlGroup>
    <DynamicSubscriptionEngine>
      <Topic name="stock/IBM">
        <Delete>
          <AllACLEntries/>
        </Delete>
      </Topic>
    </DynamicSubscriptionEngine>
  </ControlGroup>
</Broker>
```

All ACLs deleted on all topics:

```
Event publication topic = "$SYS/Broker/Broker1/Topic"
```

```
<Broker uuid="1234" label="Broker1" version="1">  
  <ControlGroup>  
    <DynamicSubscriptionEngine>  
      <Delete>  
        <AllACLEntries/>  
      </Delete>  
    </DynamicSubscriptionEngine>  
  </ControlGroup>  
</Broker>
```

Operational information

Changes to the processing state of a broker or an individual message flow publish events using the following system topics:

`$SYS/Broker/broker_name/Status`

`$SYS/Broker/broker_name/Status/ExecutionGroup/exec_grp_name`

where:

broker_name

is the name of the broker whose execution state has changed

exec_grp_name

is the name of the execution group that contains the message flow whose execution state has changed

The body of each publication is an XML message that gives additional information concerning the state change that caused the event to be triggered, specifically indicating whether the entity has been started or stopped.

For example, starting a message flow generates the following message:

```
<Broker uuid="1234" label="Broker1" version="1">  
  <ExecutionGroup uuid="5678">  
    <Start>  
      <MessageFlow uuid="7812"/>  
    </Start>  
  </ExecutionGroup>  
</Broker>
```

Stopping a broker generates the following message body:

```
<Broker uuid="1234" label="Broker1" version="1">  
  <StatusChange state="Stopped"/>  
</Broker>
```

Currently, the only states that are notified for both brokers and message flows are Started and Stopped.

These events are nonpersistent, retained publications.

Subscriptions and topics

Events are published to provide notification of changes to the subscription tables, changes in the list of defined topics or their access control lists.

Registration or de-registration of subscriptions causes events to be published using the following system topics:

`$/SYS/Broker/broker_name/Subscription/topic`

where:

broker_name

is the name of the broker issuing this message

topic is the original topic on which the subscription is being, or was, registered

The body of each publication is an XML message giving additional information concerning the registration or de-registration request.

These events are nonpersistent, non-retained publications.

Examples:

Here are example event messages for a subscription being created, changed, and deleted.

Subscription created:

```
Event publication topic = "$SYS/Broker/Broker1/Subscription/stock/IBM"

<Broker uuid="1234" label="Broker1" version="1">
  <ControlGroup>
    <DynamicSubscriptionEngine>
      <Topic name="stock/IBM">
        <Create>
          <Subscription
            clientId="mqrh2:Broker1:client1queue"
            subscriptionPoint="poundsSterling"
            filter="currentPrice>100"
            user="Fred"
            persistent="true"
            localOnly="false"
            pubOnReqOnly="false"
            informIfRet="true"
            expiryTimeStamp="2000-12-31 23:59:59"
            createTimeStamp="2000-01-01 00:00:00"
            tempDynamicQueue="false"
            clientContext="hex digits"/>
          </Create>
        </Topic>
      </DynamicSubscriptionEngine>
    </ControlGroup>
  </Broker>
```

Subscription changed:

```
Event publication topic = "$SYS/Broker/Broker1/Subscription/stock/IBM"
```

```
<Broker uuid="1234" label="Broker1" version="1">  
  <ControlGroup>  
    <DynamicSubscriptionEngine>  
      <Topic name="stock/IBM">  
        <Change>  
          <Subscription  
            clientId="mqrh2:Broker1:client1queue"  
            subscriptionPoint="poundsSterling"  
            filter="currentPrice>100"  
            user="Fred"  
            persistent="false"  
            localOnly="true"  
            pubOnReqOnly="true"  
            informIfRet="false"  
            expiryTimeStamp="2005-12-31 23:59:59"  
            createTimeStamp="2000-01-01 00:00:00"  
            tempDynamicQueue="false"  
            clientContext="hex digits"/>  
          </Change>  
        </Topic>  
      </DynamicSubscriptionEngine>  
    </ControlGroup>  
  </Broker>
```

Subscription deleted (deregistered):

```
Event publication topic = "$SYS/Broker/Broker1/Subscription/stock/IBM"
```

```
<Broker uuid="1234" label="Broker1" version="1">  
  <ControlGroup>  
    <DynamicSubscriptionEngine>  
      <Topic name="stock/IBM">  
        <Delete>  
          <Subscription  
            clientId="mqrh2:Broker1:client1queue"  
            subscriptionPoint="poundsSterling"  
            filter="currentPrice>100"  
            user="Fred"/>  
        </Delete>  
      </Topic>  
    </DynamicSubscriptionEngine>  
  </ControlGroup>  
</Broker>
```

Operational warnings

Operational warnings provide notification about expired subscriptions or retained publications.

See “Expired publications and subscriptions” for further information.

Expired publications and subscriptions

Notification of the expiry of retained publications and subscriptions is published on the following system topics:

```
$SYS/Broker/broker_name/warning/expiry/Publication/timestamp/topic
```

```
$SYS/Broker/broker_name/warning/expiry/Subscription/timestamp/topic
```

where:

broker_name

is the name of the broker issuing this message

timestamp

is the time stamp of the expiry of the subscription or retained publication (expressed as a GMT time)

topic is the topic of the subscription or retained publication

These events are nonpersistent, non-retained publications.

Examples:

The following example event messages show a retained publication and subscription having expired.

Publication expired:

```
Event publication topic =
"$SYS/Broker/Broker1/warning/expiry/Publication/2000-12-31
23:59:59/stock/IBM"

<Broker uuid="1234" label="Broker1" version="1">
  <ControlGroup>
    <DynamicSubscriptionEngine>
      <Topic name="stock/IBM">
        <Delete>
          <RetainedPublication
            subscriptionPoint="poundsSterling"/>
        </Delete>
      </Topic>
    </DynamicSubscriptionEngine>
  </ControlGroup>
</Broker>
```

Subscription expired:

```
Event publication topic =
"$SYS/Broker/Broker1/warning/expiry/Subscription/2000-12-31
23:59:59/stock/IBM"

<Broker uuid="1234" label="Broker1" version="1">
  <ControlGroup>
    <DynamicSubscriptionEngine>
      <Topic name="stock/IBM">
        <Delete>
          <Subscription
            clientId="mqrh2:Broker1:client1queue"
            subscriptionPoint="poundsSterling"
            filter="currentPrice>100"
            user="Fred"/>
        </Delete>
      </Topic>
    </DynamicSubscriptionEngine>
  </ControlGroup>
</Broker>
```


Notification message schema

The following specification describes the structure of all valid notification messages. This example describes the structure of the messages only. It says nothing about how many elements are in the messages or the order in which they appear. The rules for the number of elements are:

- One broker element
- Other elements: zero, one, or more

There are no rules for the order of notification messages.

In this example, <...> denotes an XML element, and ??? indicates where individual class names are allowed:

```
<Broker identifier label>
. <ExecutionGroup identifier>
. . <Create>
. . . <MessageFlow message_flow_identifier message_flow_attributes>
. . . . <???Node node_identifier node_attributes>
. . . . <Connection connection_identifier>
. . <Change>
. . . <MessageFlow message_flow_identifier message_flow_attributes>
. . <Delete>
. . . <AllMessageFlows>
. . . <MessageFlow message_flow_identifier>
. . <Start>
. . . <AllMessageFlows>
. . . <MessageFlow message_flow_identifier>
. . <Stop>
. . . <AllMessageFlows>
. . . <MessageFlow message_flow_identifier>
. <ControlGroup>
. . <DynamicSubscriptionEngine>
. . . <Create>
. . . . <Neighbor neighbor_identifier neighbor_attributes>
. . . . . <MQBrokerConnection mqbrokerconnection_attributes>
. . . . <Neighbor neighbor_identifier neighbor_attributes>
. . . . <Topic topic_identifier>
. . . . . <ACLEntry>
. . . . . <Subscription>
. . . <Change>
. . . . <Neighbor neighbor_identifier neighbor_attributes>
. . . <Delete>
. . . . <AllNeighbors>
. . . . <Neighbor neighbor_identifier>
. . . . <Topic topic_identifier>
. . . . <AllACLEntries>
. . . . <AllSubscriptions>
. . . . <AllRetainedPublications>
. . . <Topic topic_identifier>
. . . . <Create>
. . . . . <ACLEntry acl_identifier acl_attributes>
. . . . . <Subscription subscription_identifier subscription_attributes>
. . . . <Change>
. . . . . <ACLEntry acl_identifier acl_attributes>
. . . . . <Subscription subscription_identifier subscription_attributes>
. . . . <Delete>
. . . . . <AllACLEntries>
. . . . . <ACLEntry acl_identifier>
. . . . . <AllSubscriptions>
. . . . . <Subscription subscription_identifier>
. . . . . <RetainedPublication retained_publication_identifier>
```

Identifiers and attributes used in the schema

Items shown as [...] are optional attributes. Items shown as {xxx | yyy} mean that the value can be one of the alternatives given. Items shown in *italics* mean that the variable can have any value.

uuid The universally unique identifier for WebSphere Message Broker objects (for example, nodes in a message flow)

client identifier

The delivery destination for the subscriber. For example:

```
mqrh2:WBRK_QM:subscriberqueue  
mqrh:WBRK_QM:subscriberqueue2:CorrelId
```

identifier

```
uuid="uuid"
```

label label="*label*"

message_flow_identifier

```
uuid="message_flow_identifier" //This is usually a uuid
```

message_flow_attributes

```
[label='label']  
[additionalInstances="number"]  
[commitCount="number"]  
[commitInterval"number"]  
[coordinatedTransaction={"yes" | "no" }]
```

node_identifier

```
uuid='node_flow_identifier' //This is usually a number of concatenated  
uuids
```

node_attributes

```
[label='label']
```

Others vary according to type. All are optional. See the node descriptions for details.

connection_identifier

```
sourceNode='source_node_identifier'  
sourceTerminal='source_terminal_name'  
targetNode='target_node_identifier'  
targetTerminal='target_terminal_name'
```

neighbor_identifier

```
name="uuid"
```

neighbor_attributes

```
collectiveId={" | "uuid"}
```

CollectiveId is "" if the neighbor is in the same collective as the broker; otherwise, it is the identifier for the neighbor's collective.

mqbrokerconnection_attributes

```
queueManagerName="queueManagerName"
```

topic_identifier

```
name="topicName"
```

acl_identifier

```
principalName="userIdentifier"
```

acl_attributes

```
principalType={"user" | "group"}
[publish={"yes" | "no" | "inherit"}]
[subscribe={"yes" | "no" | "inherit"}]
[persistent={"yes" | "no" | "inherit"}]
```

subscription_identifier

```
clientId="client identifier"
[subscriptionPoint="subscriptionPointName"]
[filter="filterExpression"]
```

subscription_attributes

```
userId="userIdentifier"
persistent={"true" | "false" | "asPublish" | "asQDef"}
localOnly={"true" | "false"}
pubOnReqOnly={"true" | "false"}
informIfRet={"true" | "false"}
expiryTimeStamp={"GMTTimeStamp" | "0" }
createTimeStamp="GMTTimeStamp"
tempDynamicQueue={"true" | "false"}
clientContext="clientContext"
```

retainedpublication_identifier

```
[subscriptionPoint="subscriptionPointName"]
```

WebSphere MQ facilities

WebSphere Message Broker components depend on WebSphere MQ resources in many ways. You can therefore gain valuable information from the WebSphere MQ logs and events.

WebSphere MQ logs

The WebSphere MQ product logs can be very useful in diagnosing errors that occur in your broker domain. For example, if the Configuration Manager cannot communicate with a broker, the channels that connect them might be wrongly configured, or experiencing network problems.

On distributed systems, operational messages in a user-readable format (such as queue manager started), are written to the error logs in the errors subdirectory of the queue manager's subdirectory.

FFST files

First Failure Support Technology (FFST) records are normally severe, unrecoverable errors, and indicate either a configuration problem with the system or a WebSphere MQ internal error. FFST files are named AMQnnnnn.mm.FDC, where nnnnn is the ID of the process that is reporting the error, and mm is a sequence number. On Windows, records are written to the *install_dir*\errors directory. Operational messages and FFST records are also written to the Event log. On UNIX and Linux systems, records are written to the /var/mqm/errors directory. WebSphere MQ writes one line for each FFST to the syslog containing the name of the FFST file, but no operational messages.

WebSphere MQ events

WebSphere MQ provides information about errors, warnings, and other significant occurrences in queue managers in the form of instrumentation event messages.

You can activate event activity using the MQSC or PCF interfaces in three areas:

- Queue manager events
- Performance events
- Channel events

When active, these event messages are sent to event queues that can be monitored or triggered. You might find it appropriate to activate WebSphere MQ events when you are investigating the performance, or unexpected behavior, of your WebSphere Message Broker broker domain.

Database facilities

The database products used by WebSphere Message Broker also record information that might be useful if you have any problems with their access. Refer to the database product documentation for details of logs and other problem determination options.

Database logs

DB2 has a number of facilities that assist you with problem diagnosis and recovery. For example, there are the error logs, `db2diag.log` on distributed systems, and `db2alert.log` on z/OS, that contain error and alert information recorded by various components of the DB2 product. Refer to the *DB2 Troubleshooting Guide* for comprehensive information on what options are available, how to use them, and how to interpret the information provided.

Other database products have similar logs; consult your database administrator or database documentation for more information.

ODBC trace

You can trace ODBC activity; follow the instructions in “ODBC trace” on page 152.

Trace information is output to the location specified in the `.odbc.ini` file, or in the ODBC configuration on Windows. By default, this is `/var/wmqi/odbc/odbctrace.out` on non-Windows systems.

Other sources of diagnostic information on z/OS

This section describes some other files that you might find useful for problem determination on z/OS.

Files from a broker, Configuration Manager, or User Name Server

The broker, Configuration Manager, and User Name Server put files into the file system. If you do not know where the files are for the broker, look at the `MQSI_REGISTRY` value in the component profile (`BIPBPROF`, `BIPCPROF`, or `BIPUPROF`) in the component dataset. This is set to a value like `/u/argo/VCP0BRK`. Be careful to access the file system on the correct system; if the file system is not shared, there could be the same directory on each MVS image. To be sure, log on to the system where the broker is running and access the file system. You can use the **TSO**

ISHell command, or go into OMVS itself. Go to the directory specified and select the output directory. The traceodbc file should appear in this directory.

When submitting JCL from the component PDSE, output files are written to the ++HOME++ location. The following files should appear in this directory:

- ENVFILE
- bippof

Files in the home directory

Other files are stored in the home directory of the user ID of the started task. The MVS command **D A, jobname** displays the user ID of the job. The directory of the user ID is typically /u/userid but you should check this with your system programmer, or issue the TSO command **LU userid OMVS**. If you are authorized, this command displays text including the HOME statement.

There might be several different sorts of files in the home directory, such as core dump files.

Problems accessing files in the file system

If you cannot access a file system file or directory, it might be that you do not have permission to do so. This could mean that you are not able to issue certain commands. You need to ask the owner of the file or directory to give you permission to use the file.

Solutions to similar problems

There are a variety of resources that contain information about problems with IBM licensed programs and their use. Searching these resources might help you to find information that helps solve your problem.

Useful Web sites

There are a variety of Web sites available on the Internet, not all managed by IBM, that you might find useful aids to problem determination. Here are some URLs that you might try:

- WebSphere Message Broker support Web page
- WebSphere MQ Integrator newsgroup
- MQSeries.net

RETAIN

IBM keeps records of all known problems with its licensed programs on its software support database (RETAIN®). IBM Support Center staff continually update this database as new problems that are found, and they regularly search the database to see if problems that they are told about are already known.

If you have access to one of IBM's search tools, such as INFORMATION/ACCESS or INFORMATION/SYSTEM, you can look on the RETAIN database yourself. If not, you can contact the IBM Support Center to search for you.

You can search the database using a string of keywords to see if a similar problem already exists.

You can use the keyword string (also called the symptom string) that appears in a dump or SYS1.LOGREC record to search the database, or you can build your own keyword string.

If the search is successful, you find a similar problem description and, usually, a fix. If the search is unsuccessful, use these keywords when contacting IBM for additional assistance, or when documenting a possible authorized program analysis report (APAR).

Part 3. Appendixes

Appendix. Notices

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