

WebSphere Message Broker



# Migration

*Version 6 Release 0*



WebSphere Message Broker



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*Version 6 Release 0*

**Note**

Before you use this information and the product that it supports, read the information in the Notices appendix.

This edition applies to version 6, release 0, modification 0, fix pack 7 of IBM WebSphere Message Broker, and to all subsequent releases and modifications until otherwise indicated in new editions.

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## About this topic collection

This PDF has been created from the WebSphere Message Broker Version 6.0 (Fix Pack 7 update, March 2008) information center topics. Always refer to the WebSphere Message Broker online information center to access the most current information. The information center is periodically updated on the document update site and this PDF and others that you can download from that Web site might not contain the most current information.

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## Migrating and upgrading

To migrate a broker domain to WebSphere® Message Broker Version 6.0 or WebSphere Message Broker with Rules and Formatter Extension Version 6.0, plan your migration strategy, perform pre-migration tasks, migrate your domain components, and then complete post-migration tasks.

Migration information is regularly updated on the WebSphere Message Broker support Web page with the latest details available. Look under the heading "Solve a problem" for the document "Problems and solutions when migrating".

You can migrate to WebSphere Message Broker Version 6.0 or WebSphere Message Broker with Rules and Formatter Extension Version 6.0 from the following products:

- WebSphere MQ Event Broker Version 2.1
- WebSphere MQ Integrator Broker Version 2.1 (CSD02 or later)
- WebSphere MQ Integrator Version 2.1 (CSD02 or later)
- WebSphere Business Integration Event Broker Version 5.0 (Fix Pack 4 or later)
- WebSphere Business Integration Message Broker Version 5.0 (Fix Pack 4 or later)
- WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0 (Fix Pack 4 or later)

The instructions apply to all operating systems supported by the Version 2.1 and Version 5.0 products.

The tasks in this section refer to installing Version 6.0; see the Installation Guide for details of how to complete this task.

**Version 5.1 Message Brokers Toolkit:** if you are using the Version 5.1 Message Brokers Toolkit, follow the instructions in this section, replacing all references to "Version 5.0 Message Brokers Toolkit" with "Version 5.1 Message Brokers Toolkit".

**Upgrading:** You can also upgrade a broker domain from WebSphere Event Broker Version 6.0 to WebSphere Message Broker Version 6.0.

If you have WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0 or WebSphere Message Broker with Rules and Formatter Extension Version 6.0, you are not required to complete any additional steps to migrate the extension.

If you are already using WebSphere MQ Publish/Subscribe, migrate your applications to use the publish/subscribe functions provided by WebSphere Message Broker Version 6.0 following the instructions in this section.

This section contains the following topics:

- "Coexistence with previous versions and other products" on page 4
- "Migrating from Version 2.1 products" on page 12
- "Migrating from Version 5.0 products" on page 52
- "Upgrading from WebSphere Event Broker Version 6.0 to WebSphere Message Broker Version 6.0" on page 75

- “Restoring migrated components to previous versions” on page 75
- Migrating WebSphere MQ Publish/Subscribe applications  
WebSphere Message Broker support Web page

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## Coexistence with previous versions and other products

WebSphere Message Broker Version 6.0 can coexist and interoperate with previous versions and with other products.

This topic contains advice for the following scenarios:

- “Coexistence with previous versions of the product installed on the same computer”
- “Coexistence of Version 6.0 components with components from previous versions” on page 5
- “Coexistence with other products” on page 7

### Coexistence with previous versions of the product installed on the same computer

WebSphere Message Broker Version 6.0 can coexist with either a Version 2.1 or a Version 5.0 product on the same computer.

- You cannot install both a Version 2.1 and a Version 5.0 product on the same computer.
- You cannot install more than one instance of either Version 2.1 or Version 5.0 products on a single computer.
- Component names must be unique on the computer, regardless of version.

When you migrate from a Version 2.1 or Version 5.0 product to WebSphere Message Broker Version 6.0, you do not have to uninstall the earlier product before you install Version 6.0. You can install WebSphere Message Broker Version 6.0 in a different location on the same computer, migrate your components and resources to Version 6.0, and uninstall the Version 2.1 or Version 5.0 product later, when you are sure that you no longer need it.

If you install more than one version on a single computer, and you create multiple components, check that sufficient memory and disk space is available.

The following table shows which Version 2.1 and Version 5.0 components can exist on the same computer as Version 6.0 components:

Can the components exist together on the same computer?	Version 6.0 Message Brokers Toolkit	Version 6.0 Configuration Manager	Version 6.0 broker	Version 6.0 User Name Server
Version 2.1 Control Center	Yes	Yes	Yes	Yes
Version 2.1 Configuration Manager	Yes	Yes	Yes	Yes
Version 2.1 broker	Yes	Yes	Yes	Yes

Can the components exist together on the same computer?	Version 6.0 Message Brokers Toolkit	Version 6.0 Configuration Manager	Version 6.0 broker	Version 6.0 User Name Server
Version 2.1 User Name Server	Yes	Yes	Yes	Yes <sup>1</sup>
Version 5.0 or Version 5.1 Message Brokers Toolkit	Yes	Yes	Yes	Yes
Version 5.0 Configuration Manager	Yes	Yes	Yes	Yes
Version 5.0 broker	Yes	Yes	Yes	Yes
Version 5.0 User Name Server	Yes	Yes	Yes	Yes

**Restriction:**

1. On distributed systems, only one User Name Server can exist on a single computer.

## Coexistence of Version 6.0 components with components from previous versions

With some restrictions, all Version 5.0 components can participate in a Version 6.0 broker domain, and all Version 6.0 components can participate in a Version 5.0 broker domain.

A broker is the only Version 2.1 component that can take part in a Version 6.0 broker domain. WebSphere MQ Event Broker Version 2.1 components cannot operate with Version 6.0 components at all.

Because Version 6.0 components can coexist with components from Version 5.0, you do not have to migrate all of your components at the same time. You can migrate those components that can coexist with Version 6.0 components in stages that are convenient to you.

The User Name Server has not changed between Version 5.0 and Version 6.0, therefore you can choose not to migrate this component. You can use a Version 5.0 User Name Server with components that you have migrated to Version 6.0.

The following table shows which Version 2.1 and Version 5.0 components can operate with Version 6.0 components, and shows the restrictions that apply.

Can the components operate together in a domain?	Version 6.0 Message Brokers Toolkit	Version 6.0 Configuration Manager	Version 6.0 broker	Version 6.0 User Name Server
Version 2.1 Control Center	No	No	No	No

Can the components operate together in a domain?	Version 6.0 Message Brokers Toolkit	Version 6.0 Configuration Manager	Version 6.0 broker	Version 6.0 User Name Server
Version 2.1 Configuration Manager	No	(Not applicable)	No	No
Version 2.1 broker	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes <sup>1</sup>	Yes <sup>1</sup>
Version 2.1 User Name Server	(Not applicable)	No	No	(Not applicable)
Version 5.0 or Version 5.1 Message Brokers Toolkit	Yes <sup>2</sup>	Yes <sup>3</sup>	Yes	Yes
Version 5.0 Configuration Manager	Yes <sup>3</sup>	(Not applicable)	Yes <sup>4</sup>	Yes
Version 5.0 broker	Yes <sup>5</sup>	Yes	Yes	Yes
Version 5.0 User Name Server	(Not applicable)	Yes	Yes	(Not applicable)

**Restrictions:**

1. Use of a Version 2.1 broker in a Version 6.0 domain is subject to some restrictions. For full details, see “Conditions for a Version 2.1 broker participating in a Version 6.0 broker domain” on page 8.
2. Sharing resources between Message Brokers Toolkit Version 6.0 and Message Brokers Toolkit Version 5.0 or Version 5.1 is subject to some restrictions. For full details, see “Conditions for using migrated resources with previous versions of the Message Brokers Toolkit” on page 7
3. You cannot use a domain user ID to connect a Version 5.0 or Version 5.1 Message Brokers Toolkit to a Version 6.0 Configuration Manager, nor to connect a Version 6.0 Message Brokers Toolkit to a Version 5.0 Configuration Manager.
4. If you deploy through a Version 5.0 Configuration Manager, only message flows and dictionaries are extracted from the broker archive (bar) file. If you are using a Version 5.0 Configuration Manager to deploy to a Version 6.0 broker, any .xsl, .xml, and .jar resources that are required by the JavaCompute and XMLTransformation nodes are not deployed automatically.
5. If you want to use a Version 6.0 Message Brokers Toolkit and a Version 5.0 Configuration Manager to deploy to a Version 5.0 broker that is part of a WebSphere Business Integration Message Broker Version 5.0 installation at service level Fix Pack 3 or earlier, apply Fix Pack 5 to the WebSphere Business Integration Message Broker Version 5.0 installation of which the Version 5.0 Configuration Manager is part.

## Coexistence with other products

You can create and operate a heterogeneous network of WebSphere MQ Publish/Subscribe brokers and WebSphere Message Broker brokers. You can also migrate WebSphere MQ Publish/Subscribe brokers to WebSphere Message Broker brokers. Follow the instructions in “Migrating publish/subscribe applications” on page 80.

You cannot install WebSphere Event Broker and WebSphere Message Broker as separate products on the same computer. WebSphere Message Broker, however, can perform all of the functions of WebSphere Event Broker.

## Conditions for using migrated resources with previous versions of the Message Brokers Toolkit

WebSphere Message Broker Version 6.0 can interoperate with components of previous versions. Conditions apply when you use migrated development and deployed resources with previous versions of the Message Brokers Toolkit.

### Version 2.1

If you migrate from WebSphere MQ Integrator Broker Version 2.1 (or other supported Version 2.1 products), migrate the following resources:

- Message flows: use the `mqsimigratemsgflows` command.
- User-defined extensions: use the `mqsimigratemsgflows` command.
- Message sets: use the `mqsimigratemsgsets` command.

For detailed instructions, see “Migrating message flows from Version 2.1” on page 100 and “Migrating Message Sets from Version 2.1” on page 120.

### Version 5.0

If you migrate from WebSphere Business Integration Message Broker Version 5.0 (or other supported Version 5.0 products), migrate the following resources:

- User-defined extensions: follow the instructions in “Migrating a user-defined node from Version 5.0 or Version 5.1” on page 107.
- Mapping files: follow the instructions in “Migrating message mappings from Version 5.0” on page 103.

You do not have to migrate any other development or deployment resources, such as message flow files, message set definition files, ESQL files, XML Schema files, and broker archive files.

## Restrictions after migration

After you have migrated workbench resources to Version 6.0, your use of these resources in the Version 5.0 or Version 5.1 Message Brokers Toolkit is restricted.

### Development resources

Resources in Version 5.0, 5.1, and 6.0 formats can coexist in the Version 6.0 workspace.

Resources remain in their original format until you save them in the Version 6.0 Message Brokers Toolkit. After saving, all resources are stored in the Version 6.0 format.

You can no longer use these saved resources in earlier versions of the Message Brokers Toolkit. Therefore you cannot share development resources between the Version 6.0 and previous versions of the Message Brokers Toolkit.

If you expect to continue development of these resources, you must retain a Message Brokers Toolkit at the version that you require.

#### **Deployment resources**

You can deploy from the Version 6.0 Message Brokers Toolkit broker archive (bar) files that you created in earlier versions. You can deploy these bar files to brokers that are at previous versions, provided that the development resources referenced in the bar file do not use any features that are available only in Version 6.0.

You can create a new Version 6.0 bar file that includes message flows and message dictionaries that were compiled in earlier versions of the workbench.

The Version 6.0 Message Brokers Toolkit can coexist with either the Version 5.0 or Version 5.1 Message Brokers Toolkit on the same computer. However, because you cannot share development resources between the Version 6.0 Message Brokers Toolkit and previous versions of the Message Brokers Toolkit, you might find that it is appropriate to create and maintain a different workspace for the Version 6.0 Message Brokers Toolkit.

The Version 5.0 and Version 5.1 Message Brokers Toolkit cannot coexist on the same computer. Both versions are available only on Windows®.

## **Conditions for a Version 2.1 broker participating in a Version 6.0 broker domain**

WebSphere Message Broker Version 6.0 can coexist with previous versions and other products. This topic explains the conditions that apply when you use a Version 2.1 broker in a Version 6.0 broker domain.

If you preserve a broker at the Version 2.1 level when migrating to WebSphere Message Broker Version 6.0, the broker can subsequently participate in the Version 6.0 broker domain and can be managed by the Version 6.0 Configuration Manager. The Version 2.1 broker can be from either of the following products:

- WebSphere MQ Integrator Broker Version 2.1 at service level CSD06 or later
- WebSphere MQ Integrator Version 2.1 at service level CSD04 or later

No other components of these products, or any previous releases of these products, can participate in a Version 6.0 broker domain. This means that you must migrate all your Version 2.1 Control Center, Configuration Manager, and User Name Server components at the same time, but you can migrate your Version 2.1 brokers in stages.

It is not possible to preserve a WebSphere MQ Event Broker broker at the Version 2.1 level when you migrate a WebSphere MQ Event Broker Version 2.1 broker domain to a Version 6.0 broker domain.

There are some conditions for a Version 2.1 broker to participate in a WebSphere Message Broker Version 6.0 broker domain:



- A Version 2.1 broker and a Version 6.0 broker must use separate sets of database tables. This means that, if a Version 2.1 broker and a Version 6.0 broker share a database, they must use different database schemas.
- Only certain types of configuration data can be deployed to a Version 2.1 broker, as shown in the table:

Configuration data	Can it be deployed to a Version 2.1 broker?	Conditions
Message flows	Yes	See “Conditions for deploying a message flow to a Version 2.1 broker.”
Message sets	Yes	See “Conditions for deploying a message set to a Version 2.1 broker” on page 11.
Topology	Yes	There are no conditions.
Topics	Yes	A Version 2.1 broker uses only the access control list for the topic and ignores any multicast or quality of protection (QoP) settings for the topic.
Broker properties	No	Cannot be deployed to a Version 2.1 broker.

After migration, a Version 2.1 broker can continue to use the same WebSphere MQ queue manager, with the same WebSphere MQ configuration, and with the same release and service level of the WebSphere MQ product code, as it did before migration.

### **Conditions for deploying a message flow to a Version 2.1 broker**

This topic explains the conditions that apply when you deploy a message flow to a Version 2.1 broker.

WebSphere Message Broker Version 6.0 can coexist with previous versions and other products.

If you want to deploy a message flow to a Version 2.1 broker that is participating in a Version 6.0 broker domain, the message flow must not use any capability that is not present in Version 2.1 brokers. For example:

- The message flow must not contain any of the following built-in nodes:
  - DataDelete
  - DataInsert
  - DataUpdate
  - Extract
  - HTTPInput
  - HTTPReply
  - HTTPRequest
  - JavaCompute
  - JMSInput
  - JMSOutput
  - JMSMQTransform
  - MQJMSTransform
  - Mapping
  - MQGet
  - Passthrough
  - Real-timeInput

- Real-timeOptimizedFlow
- TimeoutControl
- TimeoutNotification
- Warehouse
- XMLTransformation

Use the following alternative nodes:

Node unavailable in Version 2.1	Alternative node
Extract node	Compute node
Mapping node	Compute node
DataDelete node	Database node
DataInsert node	Database node
DataUpdate node	Database node
Warehouse node	Database node

- The message flow must not contain any of the following elements in its ESQL files:
  - A LOG or RESIGNAL statement
  - An ACOS, ASIN, ATAN, ATAN2, COS, COSH, COT, DEGREES, EXP, FIELDNAMESPACE, LEFT, LN, LOG, LOG10, POWER, RADIANS, RAND, REPLICATE, RIGHT, SIGN, SIN, SINGULAR, SPACE, TAN, TANH, OR TRANSLATE function
  - A PATH clause
  - A BEGIN statement with an ATOMIC keyword
  - A CREATE FUNCTION or CREATE PROCEDURE statement at schema level (i.e. not within a module)
  - A DECLARE statement that uses any of the EXTERNAL, HANDLER, NAMESPACE, NAME, ROW, or SHARED keywords
  - A DELETE statement that uses any of the FIELD, FIRSTCHILD, LASTCHILD, PREVIOUS SIBLING, or NEXTSIBLING keywords
  - A PROPAGATE statement with any clauses of any kind
  - A CAST function with either of the DEFAULT or FORMAT keywords
  - A POSITION function with either of the FROM or REPEAT keywords
  - A SELECT function that is not enclosed in parentheses
  - A dynamically calculated database data source name or schema name
  - Any construct that attempts to change the Root or InputRoot message trees

In addition, the broker schema must not contain a mapping file.  
 These conditions mean that the broker schema can contain only module definitions.
- 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.
- There are restrictions on some parameters of existing nodes:
  - For input nodes that have a list of parsers, such as MQInput and MQeInput, do not select the XMLNSC or MIME parsers.
  - For nodes that have parser options, such as MQInput and Compute, do not specify non-default parser options.
  - For the MQOutput node, do not specify non-default Validate options.

## Conditions for deploying a message set to a Version 2.1 broker

WebSphere Message Broker Version 6.0 can coexist with previous versions and other products. This topic explains the conditions that apply when you deploy a message set to a Version 2.1 broker.

If you want to deploy a message set to a Version 2.1 broker that is participating in a Version 6.0 broker domain, the message set must satisfy the following conditions:

- For the logical model:
  - The Use Namespaces property of the message set must not be selected.
  - Integer values used in value constraints must be in the signed 32-bit integer range.
  - Datetime values used in value constraints must not specify a time zone.
- For an XML physical format:
  - The Strict DateTime checking property of the message set must not be selected.
  - The Daylight Savings Time property of the message set must not be selected.
  - The Encoding Numeric Null property of the message set must not have the value NULLXMLSchema.
  - The Encoding Non-Numeric Null property of the message set must not have the value NULLXMLSchema.
- For a Custom Wire Format (CWF) physical format:
  - The Strict DateTime checking property of the message set must not be selected.
  - The Daylight Savings Time property of the message set must not be selected.
  - The Trailing Skip Count property must have the value 0 (zero).
- For a Tagged Delimited String (TDS) physical format:
  - The Strict DateTime checking property of the message set must not be selected.
  - The Daylight Savings Time property of the message set must not be selected.
  - If the Suppress Absent Element Delimiters property of a group or complex type is set, it must have the value End of Type.

## Conditions for a Version 5.0 broker participating in a Version 6.0 broker domain

If you choose to include a Version 5.0 broker in a Version 6.0 broker domain, certain conditions and restrictions apply.

If you preserve a broker at the Version 5.0 level of code during migration to WebSphere Message Broker Version 6.0, the broker can subsequently participate in the Version 6.0 broker domain and can be managed by the Version 6.0 Configuration Manager. The Version 5.0 broker can be from either of the following products:

- WebSphere Business Integration Message Broker Version 5.0 (Fix Pack 4 or later)
- WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0 (Fix Pack 4 or later)

You cannot preserve a WebSphere MQ Event Broker broker at the Version 5.0 level of code when you migrate a WebSphere Business Integration Event Broker Version 5.0 broker domain to a Version 6.0 broker domain.

The following conditions apply:

- The Version 5.0 broker must use a unique set of database tables. Therefore, if a Version 5.0 broker and a Version 6.0 broker share a database, they must use different database schemas.
- You can use a Version 6.0 Message Brokers Toolkit and a Version 5.0 Configuration Manager to deploy to a Version 5.0 broker that is part of a WebSphere Business Integration Message Broker Version 5.0 installation. However, if WebSphere Business Integration Message Broker Version 5.0 is at service level Fix Pack 3 or earlier, apply Fix Pack 5 to the installation of which the Version 5.0 Configuration Manager is part.

After migration, a Version 5.0 broker can continue to use the same WebSphere MQ queue manager, with the same WebSphere MQ configuration, and with the same release and service level of the WebSphere MQ product code, as it did before migration.

You might need to perform migration tasks for user-defined extensions, mapping files, and data definitions; see “Message flow migration notes” on page 100 for details. You can continue to use other resources, such as message flow files, message set definition files, ESQL files, Java™ files, XML Schema files, and broker archive files, without change.

When you have migrated Version 5.0 mapping files (.mfmap) to Version 6.0 mapping files (.msgmap) using the `mqsimigratemfmaps` command, edit them only with a Version 6.0 Message Brokers Toolkit.

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## Migrating from Version 2.1 products

Migrate to WebSphere Message Broker Version 6.0 or WebSphere Message Broker with Rules and Formatter Extension Version 6.0.

You can migrate from the following products:

- WebSphere MQ Event Broker Version 2.1
- WebSphere MQ Integrator Broker Version 2.1 (CSD02 or later)
- WebSphere MQ Integrator Version 2.1 (CSD02 or later)

If you are migrating from a Version 2.1 product, you must apply APAR (IY45459) for migration to be successful, unless you have already applied CSD06, which includes this APAR.

If you are already using WebSphere MQ Publish/Subscribe, migrate your applications to use the publish/subscribe functions provided by WebSphere Message Broker. Follow the instructions in “Migrating publish/subscribe applications” on page 80.

The instructions apply to all platforms supported by the Version 2.1 products. This section contains the following topics:

- “Planning and pre-migration tasks” on page 13
- “Migrating from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0” on page 17
- “Migrating from WebSphere MQ Event Broker Version 2.1 to WebSphere Message Broker Version 6.0” on page 40
- “Migrating from WebSphere MQ Integrator Version 2.1 to WebSphere Message Broker Version 6.0” on page 49

- “Post-migration tasks” on page 49

## Planning and pre-migration tasks

The following topics describe what to do before migrating from Version 2.1 to Version 6.0:

- “Differences between Version 2.1 and Version 6.0 products”
- “Planning for migration from Version 2.1” on page 16
- “Backing up Version 2.1 resources” on page 17

## Differences between Version 2.1 and Version 6.0 products

The following table outlines the main differences between the Version 2.1 and Version 6.0 products:

Version 2.1	Version 6.0	Why has this changed?
<b>Installing the product</b>		
In Version 2.1, there can be only one copy of the product installed on the computer.	You can install the Version 6.0 product alongside the Version 2.1 product and the two products can run side-by-side. The new <b>mqsigratecomponents</b> command allows you to migrate components from Version 2.1 to Version 6.0.	Permitting Version 6.0 to coexist with Version 2.1 allows for easier migration.
<b>Entering commands on Windows</b>		
You enter Version 2.1 commands in a command window.	You enter Version 6.0 commands in the Command Console, which is in the <b>Start</b> menu: <b>Start</b> → <b>Programs</b> → <b>IBM WebSphere Message Brokers 6.0</b> → <b>Command Console</b> .	Multiple versions of the product can now coexist. The Command Console ensures that the commands that you enter are directed to the correct version.
<b>Configuration Manager Database Requirements</b>		

Version 2.1	Version 6.0	Why has this changed?
<p>You must specify two data sources when creating a Version 2.1 Configuration Manager: a configuration database for message flow source and domain information, and an MRM database for message dictionary source.</p> <p>When deleting a Configuration Manager, there are flags to remove the contents of these repositories (<b>-n</b> and <b>-m</b> for the configuration and MRM sources respectively).</p>	<p>There are no database requirements on the Configuration Manager.</p> <p>Source data for both message flows and dictionaries is now stored inside the Eclipse workspace. Domain information is stored in an internal configuration repository in the file system on the Configuration Manager computer, and there are commands to back up and restore this repository (<b>mqsibackupconfigmgr</b> and <b>mqsirestoreconfigmgr</b>).</p> <p>When you delete a Configuration Manager, the <b>-n</b> parameter now removes the contents of the internal repository and the <b>-m</b> parameter is ignored.</p>	<p>Removing the requirements on an external database simplifies the setup and administration of a Configuration Manager.</p>
<b>Starting the Control Center</b>		
<p>When you start the Control Center, a prompt opens for the connection details of the Configuration Manager.</p>	<p>The Control Center is now called the Message Brokers Toolkit and is based on the Eclipse framework.</p> <p>To connect the Configuration Manager, you must create a connection file by clicking <b>File</b> → <b>New</b> → <b>Other</b> → <b>Broker Administration</b> → <b>Domain</b>.</p>	<p>Each set of Configuration Manager connection parameters is a file stored within the Eclipse workspace.</p> <p>This allows you to share connection details more easily among multiple users, and allows you to manage multiple domains from a single Message Brokers Toolkit.</p>
<b>Displaying information in the Control Center</b>		

Version 2.1	Version 6.0	Why has this changed?
<p>The Version 2.1 Control Center contains a set of tabs that determine the type of information that is shown (for example, assignments, topology, topics, subscriptions).</p>	<p>In Version 6.0, there are two main screens of information (called perspectives):</p> <ul style="list-style-type: none"> <li>• <b>Broker Application Development perspective</b>, which allows you to create and edit message flows and message sets.</li> <li>• <b>Broker Administration perspective</b>, which shows you the state of the domain, as reported by the Configuration Manager, and allows you to manipulate it.</li> </ul> <p>It is possible to switch perspectives using the <b>Window</b> menu.</p>	<p>The concept of perspectives is inherited from the Eclipse framework and allows you to switch easily to the information set that is most relevant to what you are doing.</p>
<b>Modifying message flows</b>		
<p>In Version 2.1, message flows under development are stored in the Configuration Manager. In order to modify them, you must check them out, make your changes and then check them back in.</p>	<p>In Version 6.0, message flows are created and modified in an Eclipse workspace; by default, this is on the file system on which the Message Brokers Toolkit is installed.</p>	<p>Storing development objects in an Eclipse workspace allows you to manage them more effectively. Plug in third-party change-management tools into the Eclipse framework to provide better change control.</p>
<b>Assigning and deploying message flows and message sets</b>		
<p>In Version 2.1, message sets were assigned to brokers and were available to all execution groups in that broker, and message flows were assigned to execution groups. When this is done, the deploy action causes the Configuration Manager to send the assigned message flows to the correct execution group.</p>	<p>In Version 6.0, message flows and message sets are packaged in broker archives (bar files). These archives use a zipped file format to envelop a set of deployable objects.</p> <p>To deploy a bar file to an execution group, use the Broker Administration perspective to drag and drop the bar file to the required execution group.</p>	<p>Bar files provide a transferable package of deployment, so that the same message flow logic can be applied to multiple brokers and domains.</p> <p>Similar deployment concepts are used in other products.</p>
<b>Monitoring message flows</b>		
<p>In Version 2.1, traffic lights show the run state of message flows.</p>	<p>In Version 6.0, the Broker Administration perspective has an Alerts view that identifies any broker, execution group or message flow that is not running.</p>	<p>The use of the Alerts view is consistent with other tools in the Eclipse framework and provides an accessible way of notifying you if anything is not processing messages as expected.</p>
<b>User roles</b>		

Version 2.1	Version 6.0	Why has this changed?
In Version 2.1, several Windows user groups in the Configuration Manager are used to describe the typical role, and domain access, that each user has (for example, <b>mqbrkrs</b> , <b>mqbrops</b> , <b>mqbrtpic</b> , <b>mqbrasgn</b> ).	Membership of the <b>mqbrkrs</b> group is still required for administration of the broker component, but the <b>mqsicreateaclentry</b> command is now used to define specific user or group access control lists (ACLs) for each component (such as brokers and execution groups).	Access control lists (ACLs) in the Configuration Manager allow administrators to control access to the domain at a much finer level of granularity.

## Planning for migration from Version 2.1

### Before you start:

Before you carry out any migration tasks, back up Version 2.1 resources and read “Coexistence with previous versions and other products” on page 4.

This section explains the different ways in which to migrate from Version 2.1 to Version 6.0. Before carrying out any migration tasks, you should make the following decisions:

1. Decide how you want to migrate the product components:
  - a. Find out what is new in Version 6.0. These new and changed functions might affect how you want to use your migrated components in the future.
  - b. Decide where you want to migrate the product components. Migrate your components to the same computer or to a second computer. For example, you might want to migrate components to another location to maintain availability during the migration.
  - c. Decide when you want to migrate the product components. You might want to preserve some components at the Version 2.1 level of code temporarily, and migrate them later.
  - d. Decide the order in which you want to migrate your components. You can migrate components in any order, but your specific circumstances might mean that you need to migrate components in a particular order.

See “Coexistence with previous versions and other products” on page 4 for information about how Version 6.0 can coexist on the same computer with Version 2.1, and how Version 6.0 components can operate with Version 2.1 components.

2. Decide how you want to use your existing resources with WebSphere Message Broker Version 6.0.

You migrate your Version 2.1 message flows, message sets, and user-defined extensions using the **mqsimigratemsgflows** command and **mqsimigratemsgsets** command. The tooling part of any Version 2.1 user-defined extensions that you have migrated needs to be rewritten in Version 6.0. Decide which user-defined extensions you want to use in Version 6.0 and re-create them in the Version 6.0 tooling.

When you start using your resources in the Version 6.0 Message Brokers Toolkit, there are restrictions to using these same resources again with the Version 5.0 or Version 5.1 Message Brokers Toolkit. For more information, see “Conditions for using migrated resources with previous versions of the Message Brokers Toolkit” on page 7



3. Decide whether you need to carry out any testing to ensure a successful migration.  
Migrating your development and test domains before migrating your production domain allows you to identify problems and develop a strategy for dealing with further problems.
4. When you are ready to migrate, run the `mqsिमigratecomponents` command with the `-c` parameter. This performs a pre-migration check against the Version 2.1 components to ensure that they can be migrated. The pre-migration check identifies potential problems and allows you to correct them before proceeding with migration.

You do not need to change the configuration of a queue manager that is preserved during migration.

The other topics in this section provide instructions for different migration scenarios:

- “Migrating from Version 2.1 to Version 6.0: migrating applications and runtime components” on page 20
- “Migrating from Version 2.1 to Version 6.0: Version 6.0 coexisting temporarily with Version 2.1” on page 34

### **Backing up Version 2.1 resources**

Before you carry out any migration tasks, back up your Version 2.1 resources:

1. Back up the configuration repository.
2. Back up your broker database tables.
3. Stop any debug sessions and back up your broker application logic (message flow files, message set definition files, and user-defined node definition files).

For detailed instructions on how to back up the configuration repository and broker database tables, see your Version 2.1 documentation. For information on backing up message flow files, message set definition files, and user-defined node definition files, see “Preparing to migrate from WebSphere MQ Integrator Broker Version 2.1” on page 18.

Now that you have backed up your resources, you are ready to perform migration. Go to the appropriate topic for your product:

- Migrating from WebSphere MQ Integrator Broker
- Migrating from WebSphere MQ Event Broker
- Migrating from WebSphere MQ Integrator

## **Migrating from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0**

### **Before you start**

Read the following topics:

- “Planning for migration from Version 2.1” on page 16
- “Backing up Version 2.1 resources”
- “Preparing to migrate from WebSphere MQ Integrator Broker Version 2.1” on page 18
- “Coexistence with previous versions and other products” on page 4

The topics in this section describe two different migration scenarios that are available to you when migrating from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0. The following table lists each scenario, summarizes what is involved in that scenario, and tells you where to find the detailed, step-by-step instructions:

Scenario	Summary	Detailed instructions
<b>Scenario 1</b>		
You have a domain of Version 2.1 components that you want to migrate to Version 6.0, while maintaining the state of each component.	Application and server migration: migrate your applications and runtime components. This scenario allows you to maintain the state of the broker, for example, publish/subscribe retained publications and subscriptions.	Follow the instructions in “Migrating from Version 2.1 to Version 6.0: migrating applications and runtime components” on page 20
<b>Scenario 2</b>		
You have a Version 2.1 domain and you want to create a Version 6.0 domain that is running the same applications, and is running in parallel with the Version 2.1 domain.	Application-only migration: migrate your applications and create new runtime components, leaving the Version 2.1 components as they are. In this scenario, you must re-create the state of your broker, such as publish/subscribe retained publications and subscriptions, after you have redeployed the message flow applications.	Follow the instructions in “Migrating from Version 2.1 to Version 6.0: Version 6.0 coexisting temporarily with Version 2.1” on page 34

## Preparing to migrate from WebSphere MQ Integrator Broker Version 2.1

This topic describes what to do before you start to migrate a WebSphere MQ Integrator Broker Version 2.1 broker domain in any of the following tasks:

- “Migrating from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0” on page 17
  - “Migrating from WebSphere MQ Event Broker Version 2.1 and WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0” on page 43
1. Make sure that Control Center users have checked in all WebSphere MQ Integrator Broker resources.
  2. Back up all configuration repository, message repository, and broker database tables.
  3. Decide which message flows and message sets you want to migrate and use in the WebSphere Message Broker broker domain and export them:
    - a. Stop any debugging sessions in the Control Center. It is not possible to migrate message flows that are being debugged.
    - b. Using a Control Center session in which all the required message flows are visible in the workspace, export the message flows. Save the export files in a directory other than the one in which WebSphere MQ Integrator Broker is

installed. The export files also contain information about the user-defined nodes that are used by the message flows.

Alternatively, on the system where the Configuration Manager is running, export all the required Version 2.1 message sets using the **mqsiiimpexpmsgset** command with the **-e** parameter. Save the export files in a directory other than the one in which WebSphere MQ Integrator Broker is installed.

4. Decide how you are going to migrate the brokers:
  - Decide which brokers you no longer require after migration.
  - Decide which brokers you want to migrate from Version 2.1 to Version 6.0.
  - Decide which brokers you want to preserve at Version 2.1.

If two or more of the brokers share the same set of database tables, and you still require these brokers after migration, either migrate all of the brokers at the same time or preserve them all at Version 2.1.

5. For each broker that you want to migrate from Version 2.1 to Version 6.0, and for the associated assignments configuration data you want to preserve, record the information in the following list. Record this information manually from a Control Center session or export everything in the Control Center workspace by clicking **File** → **Export All in Workspace**, save the export file in a directory other than the one in which WebSphere MQ Integrator Broker is installed and extract the required information from the export file. (To find out how to do this, see “Assignments configuration data in an export file” on page 128.)

Record:

- The name of the broker
  - The name of each message set that is assigned to the broker
  - The name of each execution group within the broker
  - For each execution group within the broker, the name of each message flow that is assigned to the execution group
  - For each message flow assigned to an execution group, the following properties:
    - Additional instances
    - Commit count
    - Commit interval
    - Coordinated transaction
6. Decide whether you want to preserve the following configuration data, which is stored in the configuration repository:
    - Assignments data
    - Topology data
    - Topics data

Unless you decide that you no longer require any of your existing brokers after migration, you must preserve this configuration data.

7. Decide which components of WebSphere Message Broker you want to run on each of your systems after migration.

Consider the following criteria when making your decision:

- A broker must run on the same system and use the same queue manager as it did before migration, unless you decide that you no longer need the broker after migration.

- The Configuration Manager must run on the same system and use the same queue manager as it did before migration, unless you decide not to preserve the assignments, topology, and topics data in the configuration repository.
- A workbench can run on any system after migration. It does not have to run on a system where Control Center sessions used to run.
- To avoid adding unnecessary complexity to the migration process itself, run a User Name Server on the same system, and configure it to use the same queue manager as it did before migration. If required, change the location of a User Name Server and the queue manager it uses after successful migration.

You do not need to change the configuration of a queue manager that is preserved during migration. You might, however, need to ensure that the WebSphere MQ product code is at the required release and service level to support WebSphere Message Broker Version 6.0. At the same time, you might want to ensure that you have installed the other software prerequisites.

If you are not able to stop a broker during migration because it is doing critical work, but you want to migrate the broker to Version 6.0:

- a. Create a new Version 2.1 broker on a system on which you are not going to install WebSphere Message Broker.
- b. Using a Control Center session, deploy to the new broker all the configuration data that was deployed to the original broker.

The new broker can then take over the work of the original broker during the migration.

If you intend to preserve any brokers at Version 2.1, see “Conditions for a Version 2.1 broker participating in a Version 6.0 broker domain” on page 8 for what you need to consider in this case.

8. Decide where you are going to store the development data that is created and maintained in the workbench. Store the data in the local file system, on a shared drive, or in a shared repository that is supported by Eclipse. The instructions for the individual migration tasks assume that you are using the local file system or a shared drive.
9. When you are ready to migrate, run the **mqsimigratecomponents** command with the **-c** parameter. This performs a pre-migration check against the Version 2.1 components to ensure that they can be migrated. The pre-migration check identifies any potential problems and allows you to correct them before proceeding with migration.

When you have run the pre-migration check successfully, you are ready to perform migration. There are three scenarios for migration to Version 6.0:

- “Migrating from Version 2.1 to Version 6.0: migrating applications and runtime components”
- “Migrating from Version 2.1 to Version 6.0: Version 6.0 coexisting temporarily with Version 2.1” on page 34

### **Migrating from Version 2.1 to Version 6.0: migrating applications and runtime components**

This topic describes one of two migration scenarios that are available to you when migrating from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0.

#### **Before you start:**

- Back up your Version 2.1 resources

- Read the following topics:
  - “Planning for migration from Version 2.1” on page 16
  - “Coexistence with previous versions and other products” on page 4

In this migration scenario, your Version 2.1 domain components might be on several computers, but the steps are the same for each. After migration to Version 6.0, you no longer need to keep Version 2.1. The following topics tell you how to migrate individual components. The Version 2.1 tooling and Configuration Manager do not work with Version 6.0 components, so you must migrate components in the order shown:

1. Migrate the tooling
2. Migrate the Configuration Manager
3. Migrate the User Name Server
4. Migrate the broker

### **Migrating the tooling:**

#### **Before you start**

Record the following information for the broker and for the associated assignments configuration data that you want to preserve:

- The name of the broker
- The name of each message set that is assigned to the broker
- The name of each execution group within the broker
- For each execution group within the broker, the name of each message flow that is assigned to the execution group
- For each message flow assigned to an execution group, the following properties:
  - Additional instances
  - Commit count
  - Commit interval
  - Coordinated transaction.

View this information in the workbench and record it manually.

This topic describes the first step in migrating individual components from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0.

1. Use the Control Center to export all Version 2.1 resources, such as message flows, message sets, and user-defined nodes.
2. Stop WebSphere MQ Integrator Broker Version 2.1.
3. Uninstall the Version 2.1 Control Center.
4. Install the Version 6.0 Message Brokers Toolkit in a different location to where the Version 2.1 Message Brokers Toolkit is installed.
5. Import all Version 2.1 message flows, message sets, and user-defined extensions into Eclipse projects using the `mqsimportmsgflows` and `mqsimportmsgsets` commands.

Assignments data is not migrated automatically. After migration, if you want to deploy message flows with the same pre-migration parameters, compile the migrated message flows and message sets using the Version 6.0 Message Brokers Toolkit to create broker archive (.bar) files, then update any configurable

parameters to match the Version 2.1 settings that you recorded before migration. See the Deployment overview topic for more information.

After you have migrated the tooling, migrate your message flows and message sets and the Configuration Manager.

### **Migrating a Configuration Manager from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0:**

This topic describes the second step in migrating individual components from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0.

#### **Before you start**

Before you migrate the Configuration Manager, migrate the tooling.

In WebSphere Message Broker Version 6.0, the Configuration Manager no longer uses an external database to store the domain configuration but uses an internal repository instead. The Configuration Manager is also now available on more operating systems than in WebSphere MQ Integrator Broker Version 2.1.

From the following list of topics in this section, select the topic that is appropriate to your environment.

- “Migrating a Version 2.1 Configuration Manager to Version 6.0: to a different computer that has DB2 installed” on page 23
- “Migrating a Version 2.1 Configuration Manager to Version 6.0: to a different computer that does not have DB2 installed” on page 25
- “Migrating a Version 2.1 Configuration Manager to Version 6.0 on the same computer”

*Migrating a Version 2.1 Configuration Manager to Version 6.0 on the same computer:*

This topic describes one of three ways in which to migrate a Version 2.1 Configuration Manager to Version 6.0.

#### **Before you start**

Read about “Coexistence with previous versions and other products” on page 4.

The following steps describe how to replace the Version 2.1 Configuration Manager with a Version 6.0 Configuration Manager:

1. Install WebSphere Message Broker Version 6.0 in a location other than where Version 2.1 is installed.
2. Stop the Version 2.1 Configuration Manager.
3. Use the **mqsigratecomponents** command to migrate your Version 2.1 Configuration Manager.
4. Start the Version 6.0 Configuration Manager.

If you do not have additional hardware available but want to confirm the successful migration of the Configuration Manager before replacing the Version 2.1 Configuration Manager, migrate the Configuration Manager to a different location on the same computer. If you use this method, you can also change the name of the Configuration Manager. Complete the following steps:

1. Install WebSphere Message Broker Version 6.0 in a location other than where Version 2.1 is installed.
2. Stop the Version 2.1 Configuration Manager.
3. Create a Version 6.0 Configuration Manager using the `mqsicreateconfigmgr` command. Make sure that the Version 6.0 Configuration Manager has a different name and a different queue manager name to the Version 2.1 Configuration Manager. Use the `-n` parameter of the `mqsicreateconfigmgr` command to specify the Version 2.1 Configuration Manager's database.
4. Configure WebSphere MQ to allow the Version 6.0 Configuration Manager to communicate with the broker network. For example, you might need to configure channels and transmission queue definitions.
5. Start the Version 6.0 Configuration Manager.
6. In order to associate all brokers in the domain with the new Configuration Manager, so that the brokers publish their status messages to the correct queue manager, a complete topology deploy of the new Configuration Manager is required. Deploy the topology using either the Message Brokers Toolkit or the command-line interface. When the topology deploy has completed re-subscribing to the brokers in the domain, the brokers are managed by the new Configuration Manager; do not use the previous Configuration Manager. You can now delete the previous Configuration Manager.

If you have configured MCA users on the WebSphere MQ channels to the Configuration Manager, you might encounter problems when you try to connect to the migrated Configuration Manager from the Version 6.0 Message Brokers Toolkit. To resolve this, configure access control lists (ACLs) for users who are running the Version 6.0 Message Brokers Toolkit. Follow the instructions in Considering security for the workbench.

Before you migrate your brokers, or make any configuration changes, ensure that your Configuration Manager has been migrated correctly by performing the following checks:

1. Start the migrated Configuration Manager.
2. Start the Message Brokers Toolkit and connect it to the Configuration Manager's domain.
3. Check the list of domain components and see if any errors are produced.
4. Check the list of alerts for the domain and see if anything has stopped.
5. Check that you can open the Event Log.
6. Optional: If you have a broker running, stop and start a message flow, and check for a successful response; check that the Alerts view is updated when the message flow is stopped, and clear when the message flow is started.

If these steps are successful, your Configuration Manager has been migrated successfully. If they are unsuccessful, resolve any problems before you migrate further components or make configuration changes.

After you have migrated the Configuration Manager, migrate the User Name Server.

*Migrating a Version 2.1 Configuration Manager to Version 6.0: to a different computer that has DB2 installed:*

This topic describes one of three ways to migrate a Version 2.1 Configuration Manager to Version 6.0.

## Before you start

Read about “Coexistence with previous versions and other products” on page 4.

An existing Windows Configuration Manager can be migrated to a Version 6.0 Configuration Manager on any of the supported operating systems via a JDBC Type 4 Universal DB2® connection.

To migrate a Configuration Manager to a different computer that has a JDBC Type 4 Universal DB2 connection installed, complete the following steps:

1. Install WebSphere Message Broker Version 6.0 on the computer to which you want to migrate your Version 2.1 Configuration Manager.
2. Add the following files to the environment in which you are going to create the new Configuration Manager. On z/OS®, update the BIPCPROF file and submit the BIPGEN job. On all other operating systems, update the local environment.
  - a. Add the following classes to the CLASSPATH:

```
<db2 install>/jcc/classes/sqlj.zip  
<db2 install>/jcc/classes/db2jcc.jar  
<db2 install>/jcc/classes/db2jcc_javax.jar  
<db2 install>/jcc/classes/db2jcc_license_cisuz.jar
```

- b. Add to the computer-specific environment variable for libraries (for example LIBPATH on z/OS):

```
<db2 install>/jcc/lib
```

- c. Add to the PATH:

```
<db2 install>/jcc/bin
```

where <db2 install> is where DB2 is installed at your location (for example /usr/lpp/db2710/db2710).

3. Stop the Version 2.1 Configuration Manager.
4. Create a Version 6.0 Configuration Manager on the second computer by running the **mqsicreateconfigmgr** command (or the BIPCRCM job on z/OS), specifying the data source, user name, and password required to access the Version 2.1 Configuration Manager database. For example:

**-u (userid)**

The database userid on the Windows computer for the Configuration Manager

**-p (password)**

The database password on the Windows computer for the Configuration Manager

**-n (database name)**

*//server:port/database name*

where:

- *//server* is the IP address of the Windows computer (for example //9.20.235.197)
- *:port* is the port number of DB2 on Windows
- */database name* is the name of the Windows Configuration Manager database (for example /MQSICMDB)

For example: //9.20.235.197:50000/MQSICMDB

Use different queue manager names for the two Configuration Managers to maintain uniqueness in the WebSphere MQ network.



When you create the Version 6.0 Configuration Manager, domain information from the Version 2.1 Configuration Manager database is copied automatically to the Version 6.0 Configuration Manager internal repository. This might take a few minutes to migrate the database.

5. On the second computer, configure WebSphere MQ to allow the Version 6.0 Configuration Manager to communicate with the broker network. For example, you might need to configure channels, transmission queues, and remote queue manager definitions.
6. Start the Version 6.0 Configuration Manager.
7. In order to associate all brokers in the domain with the new Configuration Manager, so that the brokers publish their status messages to the correct queue manager, a complete topology deploy is required on the second computer. Deploy the topology using either the Message Brokers Toolkit or the command-line interface.

When the topology deploy has completed re-subscribing to the brokers in the domain, the brokers are managed by the new Configuration Manager on the new system; do not use the previous Configuration Manager.

8. If necessary, uninstall DB2 and the Version 2.1 broker.

Before you migrate your brokers, or make any configuration changes, ensure that your Configuration Manager has been migrated correctly by performing the following checks:

1. Start the migrated Configuration Manager.
2. Start the Message Brokers Toolkit and connect it to the Configuration Manager's domain.
3. Check the list of domain components and see if any errors are produced.
4. Check the list of alerts for the domain and see if anything has stopped.
5. Check that you can open the Event Log.
6. Optional: If you have a broker running, stop and start a message flow, and check for a successful response; check that the Alerts view is updated when the message flow is stopped, and clear when the message flow is started.

If these steps are successful, your Configuration Manager has been migrated successfully. If they are unsuccessful, resolve any problems before you migrate further components or make configuration changes.

After you have migrated the Configuration Manager, migrate the User Name Server.

*Migrating a Version 2.1 Configuration Manager to Version 6.0: to a different computer that does not have DB2 installed:*

This topic describes one of three ways in which to migrate a Version 2.1 Configuration Manager to Version 6.0.

### **Before you start**

Read about "Coexistence with previous versions and other products" on page 4.

To migrate a Configuration Manager to a different computer that does not have DB2 or a JDBC client for DB2 installed, complete the following steps:

1. Migrate the Version 2.1 Configuration Manager to Version 6.0 on the same computer. Complete the following tasks:

- a. Install WebSphere Message Broker Version 6.0 in a location other than where WebSphere MQ Integrator Broker Version 2.1 is installed.
- b. Stop the Version 2.1 Configuration Manager.
- c. Launch a Version 6.0 Command Console and issue the **mqsigratecomponents** command to migrate your Version 2.1 Configuration Manager.
- d. Start the Version 6.0 Configuration Manager.

When you start the Version 6.0 Configuration Manager for the first time, it automatically detects domain information in the DB2 database of the Version 2.1 Configuration Manager, and migrates it into the internal repository of the Version 6.0 Configuration Manager. No user intervention is required, and the DB2 database is not modified.

2. Stop the Version 6.0 Configuration Manager, and make a copy of its internal repository using the **mqsibbackupconfigmgr** command.
3. Install WebSphere Message Broker Version 6.0 on the second computer.
4. On the second computer, create a Version 6.0 Configuration Manager by issuing the **mqsicreateconfigmgr** command (or the BIPCRCM job on z/OS).  
Use different queue manager names for the Version 2.1 Configuration Manager and Version 6.0 Configuration Managers to maintain uniqueness in the WebSphere MQ network.
5. On the second computer, configure WebSphere MQ to allow the Version 6.0 Configuration Manager to communicate with the broker network. For example, you might need to configure channels, transmission queues, and remote queue manager definitions.
6. On the second computer, issue the **mqsirestoreconfigmgr** command (or the BIPRSCM job on z/OS) to overwrite the contents of the empty Version 6.0 Configuration Manager repository with the repository that you backed up from the original computer.
7. On the second computer, start the Version 6.0 Configuration Manager.
8. In order to associate all brokers in the domain with the new Configuration Manager, so that the brokers publish their status messages to the correct queue manager, a complete topology deploy is required on the second computer. Deploy the topology using either the Message Brokers Toolkit or the command-line interface.

When the topology deploy has completed re-subscribing to the brokers in the domain, the brokers are managed by the new Configuration Manager on the new system; do not use the previous Configuration Manager.

Before you migrate your brokers, or make any configuration changes, ensure that your Configuration Manager has been migrated correctly by performing the following checks:

1. Start the migrated Configuration Manager.
2. Start the Message Brokers Toolkit and connect it to the Configuration Manager's domain.
3. Check the list of domain components and see if any errors are produced.
4. Check the list of alerts for the domain and see if anything has stopped.
5. Check that you can open the Event Log.
6. Optional: If you have a broker running, stop and start a message flow, and check for a successful response; check that the Alerts view is updated when the message flow is stopped, and clear when the message flow is started.

If these steps are successful, your Configuration Manager has been migrated successfully. If they are unsuccessful, resolve any problems before you migrate further components or make configuration changes.

After you have migrated the Configuration Manager, migrate the User Name Server.

### **Migrating the User Name Server:**

This topic describes the third step in migrating individual components from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0.

To migrate the User Name Server from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0, see the appropriate topic for your operating system:

- “Migrating a Version 2.1 User Name Server to Version 6.0 on distributed systems”
- “Migrating a Version 2.1 User Name Server to Version 6.0 on z/OS”

*Migrating a Version 2.1 User Name Server to Version 6.0 on distributed systems:*

#### **Before you start:**

Before you migrate the User Name Server, migrate the tooling and the Configuration Manager.

If you have a User Name Server in your Version 2.1 domain, you must migrate it to Version 6.0 when you migrate the Configuration Manager for that domain. This applies if the Configuration Manager and User Name Server are on the same computer, or different computers. This does not affect the migration of brokers, which can be migrated after the User Name Server and Configuration Manager have been migrated.

1. Stop the Version 2.1 User Name Server.
2. Install WebSphere Message Broker Version 6.0.
3. Issue the **mqsिमigratecomponents** command for the User Name Server.
4. Start the Version 6.0 User Name Server.

When you have migrated all of your components, migrate the broker.

*Migrating a Version 2.1 User Name Server to Version 6.0 on z/OS:*

#### **Before you start**

- Ensure that you are familiar with the steps involved in creating a User Name Server on z/OS.
- The JCL uses the **mqsिमigratecomponents** command to migrate a User Name Server on z/OS. This command takes many parameters, which you must understand fully before attempting to migrate the User Name Server.

If you have a User Name Server in your Version 2.1 domain, you must migrate it to Version 6.0 when you migrate the Configuration Manager for that domain. This applies if the Configuration Manager and User Name Server are on the same

computer, or different computers. This does not affect the migration of brokers, which can be migrated after the User Name Server and Configuration Manager have been migrated.

1. Stop the Version 2.1 User Name Server.
2. Create a new User Name Server PDSE.
3. Copy all User Name Server JCL from the Version 6.0 installed SBIPPROC/SBIPSAMP PDSEs to the new User Name Server PDSE and customize them all. See Customizing the User Name Server JCL for more information.

When you customize the new Version 6.0 JCL for this migration, do not make the ++HOME++ JCL variable the same value as the existing Version 2.1 component directory, otherwise the previous ENVFILE will be overwritten when you submit the BIPGEN job. Set the ++HOME++ variable to the Started Task user ID home directory (for example, /u/mq01uns).

- a. Customize the BIPEDIT file using values that are defined in the User Name Server's Version 2.1 mqsicompcif file. "Equivalent z/OS customization variables in mqsicompcif and BIPEDIT" on page 126 lists the customization variables that are used in the Version 2.1 mqsicompcif file, and the equivalent variables in the Version 6.0 BIPEDIT file.
  - b. Copy any additional changes that you have made to the environment file, ENVFILE, to BIPUPROF in the component data set. Submit the BIPGEN job to create the environment file ENVFILE.
  - c. Customize and submit the BIPMGCMP job.
4. Copy the started task JCL (BIPUNSP) to the procedures library. When you copy the started task, keep a second copy of the original in a safe place for backup purposes.
  5. The verification program runs when you start the Version 6.0 User Name Server.

When you have migrated your User Name Server, migrate the broker.

### **Migrating the broker:**

This topic describes the third step in migrating individual components from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0.

#### **Before you start**

- Before you migrate the broker, migrate the tooling and migrate the Configuration Manager.
- On Linux<sup>®</sup> and UNIX<sup>®</sup> operating systems, ensure that you are using the updated database drivers for Oracle and Sybase. "Changing the 32-bit ODBC connection and XA resource manager definitions for a broker migrated from Version 2.1 or Version 5.0 to Version 6.0" on page 30 tells you how to make the necessary changes.
- Back up the database tables of the Version 2.1 broker that you want to migrate.
- The broker must run on the same system and use the same queue manager as it did before migration. You do not need to change the configuration of the queue manager, but you might need to ensure that the WebSphere MQ product code is at the required release and service level to support WebSphere Message Broker Version 6.0. At the same time, you might want to ensure that you have installed the other software prerequisites.

When you migrate a broker domain from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0, you can preserve some or all of your brokers at the Version 2.1 level of code. These brokers can participate in the Version 6.0 broker domain but, at any time subsequently, you can migrate the brokers to the Version 6.0 level of code, and you can do this in stages if you want. The following topics describe how to migrate a Version 2.1 broker to Version 6.0 when the Version 2.1 broker is already participating in a Version 6.0 broker domain.

When you migrate a broker from Version 2.1 to Version 6.0, retained publications are lost on z/OS. This is also the case when you migrate a Version 6.0 z/OS broker back to Version 2.1.

If two or more brokers share the same set of database tables, you must migrate all of these brokers at the same time. If you do need to migrate multiple brokers, on the same system or on different systems, adapt the instructions that follow.

The information in this topic assumes that you are migrating a WebSphere MQ Integrator Broker Version 2.1 broker. The same information applies, however, if you are migrating a WebSphere MQ Integrator Version 2.1 broker. Simply replace all references to “WebSphere MQ Integrator Broker” with “WebSphere MQ Integrator” in the instructions that follow.

If you are migrating a WebSphere MQ Integrator Version 2.1 broker that is participating in a WebSphere Message Broker with Rules and Formatter Extension Version 6.0 broker domain, replace all references to “WebSphere Message Broker” with “WebSphere Message Broker with Rules and Formatter Extension” in the instructions that follow. For instructions on how to migrate the New Era of Networks Rules and Formatter support for WebSphere MQ Integrator, see the New Era of Networks documentation.

The following topics tell you how to migrate the broker on distributed systems or on z/OS:

- “Migrating a Version 2.1 broker to Version 6.0 on distributed systems”
- “Migrating a Version 2.1 broker to Version 6.0 on z/OS” on page 33

*Migrating a Version 2.1 broker to Version 6.0 on distributed systems:*

### **Before you start**

Before migrating a broker, ensure that you do not have any aggregations in progress. When you migrate a broker to Version 6.0 any live data being stored for aggregations in progress will be lost.

If the broker runs in a locale that is not listed in the Locales topic, check that the code page is one of the supported code pages and that the locale is set up correctly.

To migrate a Version 2.1 broker to Version 6.0 on distributed operating systems, complete the following steps:

1. Install WebSphere Message Broker Version 6.0 in a different location from Version 2.1.
2. Stop Version 2.1.
3. Update the .odbc.ini file to Version 6.0 format by following the instructions in “Updating your ODBC definitions when migrating” on page 30.

4. Issue the **mqsimigratecomponents** command for the broker from the Version 6.0 Command Console.
5. Start the Version 6.0 broker.
6. Optional: Uninstall the Version 2.1 product.
7. Repeat these steps for all remaining brokers.

*Updating your ODBC definitions when migrating:*

As part of migrating a broker, you create ODBC definitions for broker and user databases that specify appropriate database drivers for the new product version.

Complete this update before you run the **mqsimigratecomponents** command.

Follow the instructions provided for your operating system:

### **Windows systems**

The operating system stores ODBC definitions in a single repository of ODBC data source names. Change Oracle and Sybase data source definitions according to the instructions in “Changing the 32-bit ODBC connection and XA resource manager definitions for a broker migrated from Version 2.1 or Version 5.0 to Version 6.0”

You do not need to change DB2, Informix, and SQL Server data source definitions.

### **Linux and UNIX systems**

ODBC definitions are stored in a text file. For previous versions of the product, the file `.odbc.ini` is located in `/var/mqsi/odbc/`. When working with Version 6.0, create a new text file in this directory, but do not replace the existing file to avoid affecting existing brokers. Set the environment variable `ODBCINI` to point to the new file; perform this step as part of the setup for a Version 6.0 command environment.

In your new Version 6.0 ODBC configuration file, ensure that you list all of the data sources that the brokers that you want to migrate will use. For information on how to create a new ODBC configuration file, see [Connecting to a database from Linux and UNIX systems](#).

If you are using XA to enable coordinated transactions, you must also update your `qm.ini` file for WebSphere MQ, as described in “Changing the 32-bit ODBC connection and XA resource manager definitions for a broker migrated from Version 2.1 or Version 5.0 to Version 6.0”

If you revert to a previous version of WebSphere Message Broker, you must reverse the changes that you make to the ODBC definitions. Update the `odbc.ini` after you have run the **mqsimigratecomponents** command, but before you restart the broker. If you are reverting to Version 5.0, follow the instructions in “Restoring components and resources to Version 5.0” on page 76.

*Changing the 32-bit ODBC connection and XA resource manager definitions for a broker migrated from Version 2.1 or Version 5.0 to Version 6.0:*

Update definitions for Oracle and Sybase databases.

WebSphere Message Broker Version 6.0 includes later versions of the ODBC drivers that are supplied by DataDirect Technology (formerly Merant). These ODBC drivers are for Oracle and Sybase databases. A new version of the DataDirect

Driver Manager for Linux and UNIX systems is also included. You must make a number of changes as a result of the later versions of the ODBC drivers for Oracle and Sybase databases.

Make the required changes before you run the Version 6.0 `mqsimigratecomponents` command. If you are restoring to an earlier version, keep the new definitions until after you have finished running the `mqsimigratecomponents` command. The following sections describe the changes in detail.

- **Linux** **UNIX** If you are migrating a broker from Version 2.1 or Version 5.0 to Version 6.0 on Linux or UNIX systems, create a new ODBC configuration file that contains definitions for each of your existing data sources as described in “Changing the 32-bit ODBC connection definitions on Linux and UNIX systems.”  
You must also change the XA resource manager definition for the database if you have a message flow that is running in the broker and updates an Oracle or Sybase database within a global unit of work that is coordinated by the broker queue manager. Follow the instructions provided in “Changing the XA resource manager definitions on Linux and UNIX systems.”
- **Windows** If you are migrating a broker from Version 2.1 or Version 5.0 to Version 6.0 on a Windows system, update the ODBC definition for each broker and the user data source name as described in “Changing the 32-bit ODBC connection definitions on Windows systems” on page 32. Complete this task for Oracle and Sybase databases only.  
You must also change the XA resource manager definition for the database if you have a message flow that is running in the broker and updates an Oracle or Sybase database within a global unit of work that is coordinated by the broker queue manager. Follow the instructions provided in “Changing the XA resource manager definitions on Windows systems” on page 33.
- If you are restoring a broker from Version 6.0 back to Version 2.1 or Version 5.0, you must reverse these changes.

*Changing the 32-bit ODBC connection definitions on Linux and UNIX systems:*

**Linux** **UNIX** Create a new ODBC definitions file by following the instructions in Connecting to a database from Linux and UNIX systems. Do not change the existing definition file.

Before you run Version 6.0 commands, check that your ODBCINI environment variable points to the new definitions file and not to the existing file.

*Changing the XA resource manager definitions on Linux and UNIX systems:*

**Linux** **UNIX** To change the XA resource manager definitions on a Linux or UNIX system, edit the queue manager configuration file (`qm.ini`) of the broker queue manager. This file is in the queue manager’s directory.

In the `XAResourceManager` stanza for each Oracle and Sybase database that participates in a global unit of work, coordinated by the broker queue manager, change the entry for the switch file. The following tables specify what you need to change for each broker operating system and database management system (DBMS).

**AIX** Complete the following changes on AIX®.

DBMS	Change ...	To ...
Oracle	SwitchFile= /usr/opt/mqsi/merant/lib/UKor8dtc16.so  or SwitchFile= /usr/opt/mqsi/merant/lib/UKor8dtc18.so	SwitchFile= install_dir/merant/lib/UKor8dtc20.so
Sybase	SwitchFile= /usr/opt/mqsi/merant/lib/UKase16.so  or SwitchFile= /usr/opt/mqsi/merant/lib/UKase18.so	SwitchFile= install_dir/merant/lib/UKase20.so

Solaris

Linux

Complete the following changes on Solaris and Linux.

DBMS	Change ...	To ...
Oracle	SwitchFile= /opt/mqsi/merant/lib/UKor8dtc16.so  or SwitchFile= /opt/mqsi/merant/lib/UKor8dtc18.so	SwitchFile= install_dir/merant/lib/UKor8dtc20.so
Sybase	SwitchFile= /opt/mqsi/merant/lib/UKase16.so  or SwitchFile= /opt/mqsi/merant/lib/UKase18.so	SwitchFile= install_dir/merant/lib/UKase20.so

HP-UX

Complete the following changes on HP-UX.

DBMS	Change ...	To ...
Oracle	SwitchFile= /opt/mqsi/merant/lib/libSwitchOracle.sl	SwitchFile= install_dir/merant/lib/UKor8dtc20.sl
Sybase	SwitchFile= /opt/mqsi/merant/lib/libSwitchSybase.sl	SwitchFile= install_dir/merant/lib/UKasedtc20.sl

*Changing the 32-bit ODBC connection definitions on Windows systems:*

Windows

To change the ODBC connection definitions on a Windows system:

1. Open the ODBC Data Source Administrator window.
2. Open the System DSN page.
3. For each Oracle and Sybase database that is accessed by the broker, associate the data source name with the new ODBC driver:
  - a. Delete the data source by clicking **Remove**.
  - b. Re-create the data source with the new ODBC driver by clicking **Add**.

The following table displays the name of the new ODBC driver for each database management system (DBMS).



<b>DBMS</b>	<b>New ODBC driver</b>
Oracle	MQSeries® DataDirect Technologies 5.0 32-BIT Oracle
Sybase	MQSeries DataDirect Technologies 5.0 32-BIT Sybase Wire Protocol

*Changing the XA resource manager definitions on Windows systems:*

**Windows** To change the XA resource manager definitions on a Windows system:

1. Open the **Properties** window of the broker queue manager using the WebSphere MQ Services snap-in.
2. Open the **Resources** page.
3. For each Oracle and Sybase database that participates in a global unit of work, coordinated by the broker queue manager, change the contents of the **SwitchFile** field. The following table specifies what you need to change for each database management system (DBMS).

*WBIMB* represents the fully qualified path name of the directory in which you have installed WebSphere Message Broker, and *WMQIB* represents the fully qualified path name of the directory in which you originally installed WebSphere MQ Integrator Broker or WebSphere MQ Integrator.

DBMS	Change ...	To ...
Oracle	<i>WMQIB</i> \bin\ukor8dtc16.dll or <i>WMQIB</i> \bin\ukor8dtc18 .dll	<i>WBIMB</i> \bin\ukor8dtc20.dll
Sybase	<i>WMQIB</i> \bin\ukase16.dll or <i>WMQIB</i> \bin\ukase18.dll	<i>WBIMB</i> \bin\ukase20.dll

*Migrating a Version 2.1 broker to Version 6.0 on z/OS:*

#### **Before you start**

- Ensure that you are familiar with the steps that are involved in creating a broker on z/OS.
- The JCL uses the **mqsिमigratecomponents** command to migrate a broker on z/OS. This command takes many parameters, which you must understand fully before attempting to migrate the broker.
- Before migrating a broker, ensure that you do not have any aggregations in progress. When you migrate a broker to Version 6.0, any live data being stored for aggregations in progress will be lost.
- If the broker runs in a locale that is not listed in the Locales topic, check that the code page is one of the supported code pages and that the locale is set up correctly.

When you migrate a broker from Version 2.1 to Version 6.0, retained publications are lost on z/OS. This is also the case when you migrate a Version 6.0 z/OS broker back to Version 2.1.

1. Stop the Version 2.1 broker.
2. Back up the broker database tables.
3. Create a new broker PDSE.
4. Copy all broker JCL from the Version 6.0 installed SBIPPROC and SBIPSAMP PDSEs to the new broker PDSE and customize them all.

When you customize the new Version 6.0 JCL for this migration, do not make the `++HOME++` JCL variable the same value as the existing Version 2.1 component directory, otherwise the previous ENVFILE will be overwritten

when you submit the BIPGEN job. Set the ++*HOME*++ variable to the Started Task user ID home directory (for example, /u/mq01brk).

- a. Customize the BIPEDIT file using values that are defined in the broker's Version 2.1 mqsicompcif file. "Equivalent z/OS customization variables in mqsicompcif and BIPEDIT" on page 126 lists the customization variables that are used in the Version 2.1 mqsicompcif file, and the equivalent variables in the Version 6.0 BIPEDIT file.
  - b. Copy any additional changes that you have made to the environment file, ENVFILE, and the ODBC initialization file, dsnaoini, to BIPBPROF and BIPDSNAO in the component data set. Submit the BIPGEN job to create the environment file ENVFILE.
  - c. Customize and submit the JCL BIPMGTB job. This creates LOB tablespaces. The broker database on z/OS introduced the use of LOB tablespaces in Version 5.0. They were not used in Version 2.1, so they need to be created at this point.
  - d. Customize and submit the BIPMGCMP job. This migrates the registry, queues and broker database. As part of the database migration, database tables are created or deleted, and dropped, so you must have the correct DB2 privileges. These privileges would be the same as those required for running the **mqsicreatebroker** command.
5. Copy the started task JCL (BIPBRKP) to the procedures library. When you copy the started task, keep a second copy of the original in a safe place for backup purposes.
  6. The verification program runs when you start the Version 6.0 broker.

### **Migrating from Version 2.1 to Version 6.0: Version 6.0 coexisting temporarily with Version 2.1**

This topic describes one of two migration scenarios that are available to you when migrating from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0.

#### **Before you start:**

- Back up your Version 2.1 resources
- Read the following topics:
  - "Planning for migration from Version 2.1" on page 16
  - "Coexistence with previous versions and other products" on page 4

In this migration scenario, all of your Version 2.1 components are on the same computer. You want to keep Version 2.1 installed temporarily during and after migration to Version 6.0. You can then stop and uninstall Version 2.1 at any time after migration has been completed.

1. Use the Control Center to export all Version 2.1 message flows, message sets, and user-defined nodes. See the *WebSphere MQ Integrator Broker Version 2.1 Administration Guide* for more information.
2. Install WebSphere Message Broker Version 6.0 in a different location from where WebSphere MQ Integrator Broker Version 2.1 is installed.
3. Create a Version 6.0 User Name Server using the **mqsicreateusername** command.
4. Start the Version 6.0 User Name Server.
5. Create a Version 6.0 Configuration Manager, using the **mqsicreateconfigmgr** command, specifying the Version 2.1 database but the Version 6.0 User Name Server.

6. Start the Version 6.0 Configuration Manager.
7. Create a Version 6.0 broker using the `mqsicreatebroker` command.
8. Start the Version 6.0 broker.
9. Import all Version 2.1 message flows, message sets, and user-defined extensions using the `mqsimigratemsgflows` and `mqsimigratemsgsets` commands.
10. Stop the Version 2.1 broker immediately after deployment.

When you no longer need to run Version 2.1, stop and uninstall any Version 2.1 components.

After you have completed the migration, see the post-migration tasks for information about tasks that you might want to perform after migration.

## Migrating a message flow

### Before you start:

Read about differences between Version 2.1 and Version 6.0 products.

You can migrate the message flows that you have created in your Version 2.1 product (WebSphere MQ Event Broker, WebSphere MQ Integrator Broker, or WebSphere MQ Integrator) and use them in WebSphere Message Broker Version 6.0.

If you are migrating from WebSphere MQ Event Broker Version 2.1, all information in this topic that refers to user-defined plug-ins and ESQL does not apply; these facilities are not available on WebSphere MQ Event Broker Version 2.1.

If you have migrated from WebSphere MQ Integrator Broker Version 2.1, you might have written message flows that handle XML messages that use XML namespaces. In Version 2.1, such XML messages are parsed in a different way to that used by WebSphere Message Broker Version 6.0. While such message flows will continue to work correctly when hosted by Version 6.0, upgrade them to make them namespace aware.

You might want to change the message flows that you migrate to take advantage of the new nodes and features that are available in Version 6.0. For example, you might want to replace a user-defined node that receives web services requests with the built-in HTTPInput node.

You can migrate more than one message flow at one time if you want them to be defined in the same message flow project. You must migrate subflows and user-defined nodes with the message flows in which they are included to ensure consistent references.

If you have defined more than one message flow with the same name, or the message flow has been exported into more than one export file, the migration task overwrites, without warning, any existing message flow with the next flow that it finds of the same name. Therefore, be careful to avoid conflicts, and to ensure that the most recent version of a message flow that has been defined more than once is the last one that you migrate.

If you have multiple versions of the same message flow, which you use as a subflow in other flows in the same migration directory, the results of the import process are unpredictable.

To migrate a message flow:

1. Before you uninstall Version 2.1, export the message flow or flows from the Control Center using the Version 2.1 tools (see the Version 2.1 documentation for detailed information).

The migration process is most efficient when all referenced subflows are included in the same export file, therefore export all message flows that you want to migrate to a single message flow project into a single export file.

2. Transfer the export file or files to the new system on which you are running the workbench.
  - Check that the directory in which you store these files does not contain any other files.
  - Store the files that you intend to import into a single message flow project in a separate directory and migrate each directory separately.
  - Make sure that you do not store any files in subdirectories of the project directory, because these files are ignored by the migrate command.
3. If a workbench session is active, close it. You cannot run the migrate command if the workbench is running.
4. At a command prompt, invoke the `mqsimigratemsgflows` command, specifying the new project name and the directory in which you stored the export files. When the command has completed:

- The message flows that are contained in the export files in the specified directory are imported into the specified message flow project. If the project already exists, the additional message flows are included with current content, if any. If the project does not exist before you invoke the command, it is created for you. The command is more effective if it creates the message flow project for you.
- Message flows and subflows are created and their definitions are stored in files named *flow\_name.msgflow*. User-defined nodes are created and their definitions are stored in files named *node\_name.msgnode*.

After you have imported them, if you want to rename any of these message flows or nodes to conform to your local naming conventions, use only the facilities that are provided by the workbench, in order to preserve consistency and integrity of all references. Do not rename any files within the file system.

- If any of the nodes in the message flows contain ESQL, the code is extracted from the node itself and stored in the ESQL file *message\_flow\_name.esql*. The ESQL for each node is wrapped between the appropriate CREATE and END MODULE statements (for Compute, Database, or Filter). The command creates the ESQL file if it does not already exist.

When you add a message flow to a bar file, runtime ESQL code is generated at Version 6.0 level. This code is incompatible with Version 2.1 brokers. If you want the bar file to include Version 2.1 runtime ESQL, check the **Compile ESQL for brokers version 2.1** box. If you do so, you cannot include Version 6.0 enhancements in the ESQL code, but you can deploy the flows to both Version 2.1 and Version 6.0 brokers.

For more information, see Adding files to a broker archive.

5. Check the report file `mqsimigratemsgflows.report.txt`, which is written to the directory from which you invoked the command. The command provides the following information:
  - The name of each message flow, subflow, and user-defined node that has been migrated. If any of these resources had a name that is incompatible with Version 6.0, the command updates the name and all references to that name to ensure consistency. (If you migrate a resource with an invalid name more than once, the correction that is made to the name is always the same.)
  - The success or failure of each resource that is migrated.
  - An indication of a subflow that cannot be located (its definition is not contained in any of the export files, but it is included in one or more of the migrated message flows). If this problem occurs, find the missing subflow and import it into the appropriate project. If you cannot retrieve the missing subflow for any reason, re-create it with the original name. All affected flows can then link correctly to the new subflow.

You do not need to repeat the whole export and import process.

  - An indication that a resource that was migrated as a message flow and stored in a `.msgflow` file might be a user-defined node. If this warning occurs, check if the specified resource is a user-defined node or a message flow. If it is a message flow, it has been migrated correctly. If it is a user-defined node, complete the actions outlined in step 11 on page 38.
6. Start the workbench and switch to the Broker Application Development perspective.
7. Open the message flow project that was created or updated by the migrate command.

If the project is already open, right-click it and click **Refresh**, then **Rebuild Project** to ensure that the Broker Development view reflects the new content. Rebuild also performs a validation of the message flow project contents.

Because ESQL and mappings are handled in a different way in Version 6.0, the migration process replaces some of the Version 2.1 nodes with different Version 6.0 nodes. The following table lists the replaced nodes. The ESQL that is associated with each node is created as a module with a default name, and the node property is set to the name of that module.

Version 2.1 node	Version 6.0 node
Compute	Compute
Filter	Filter
Database	Database
DataDelete	Database
DataInsert	Database
DataUpdate	Database
Extract	Compute
Warehouse	Database

8. If a message flow includes one or more Filter nodes, check the ESQL module for each node in the ESQL file to ensure that the RETURN statement correctly returns a valid expression that resolves to a Boolean value.
9. If a message flow includes a node with ESQL, the ESQL references fields in a message derived from an imported C header, and you have re-created the message model by importing the C header into the workbench, check the

ESQL statements that refer to this message. The import process into the Version 6.0 workbench might create a model with different naming conventions from those created by the Version 2.1 importer, and you might need to update one or more field references.

10. If you had promoted the ESQL property of any of the Version 2.1 nodes that included ESQL customization to reuse ESQL in multiple nodes, the promotion is not maintained in the migrated Version 6.0 message flows because promotion of ESQL related properties is no longer supported. The Tasks view shows an error for each ESQL promoted property. To achieve the same effect, create an ESQL function and call that function from each node's ESQL module.
11. If you have migrated a user-defined node, only the XML interface definition file is migrated into a node .msgnode file (this file defines only the terminals and properties of the node). Complete its migration and its definition manually in Version 6.0 of the product. The following steps provide an outline of the required process. For full details, see *Creating the user interface representation of a user-defined node in the workbench*.
  - a. Create a user-defined node project and move the .msgnode file from the message flow project into the new user-defined node project. When you move this file, the associated properties files are created.
  - b. Optional: Complete development of the user-defined node in the Eclipse environment to create the user-defined node Eclipse plug-in (the directory structure that contains the files that make up this node). This task includes creating node resources for help, icons, and property editors and compilers, if required.
  - c. Check for errors in the task list. Errors might be generated, for example, if the node or its terminal names include the space character (not supported in Version 6.0), or if a flow embeds another migrated flow and the reference is not correct. Resolve these errors by correcting names, or by using the **Locate subflow** menu option.
  - d. Install the runtime code for the node (the .lil file) on the appropriate broker systems. You do not need to recompile the code for your user-defined node when you migrate it.
  - e. Stop and restart the broker to recognize the new or changed files.

When you have migrated your resources, see the Version 2.1 post-migration tasks for information about tasks that you might want to perform after migration.

### **Making a message flow namespace-aware:**

This topic describes how to make a message flow namespace-aware.

If you have migrated from WebSphere MQ Integrator Broker Version 2.1, you might have written message flows that handle XML messages that use XML namespaces. In Version 2.1, such XML messages are parsed in a different way to that used by WebSphere Message Broker. Although these message flows continue to work correctly when they are hosted by WebSphere Message Broker, it is better to upgrade them to become namespace-aware by performing the following steps.

1. Correct the message model.

If you are using the MRM domain, you have modeled the XML message in question. Create a new message set, ensuring that the Use namespaces property is set, and that you create an XML physical format with the same name as the original. The message conforms to one of two cases:

- The XML message is described by an XML Schema. Import the XML Schema into the new message set. This creates a new namespace-aware message definition file automatically.
  - The XML message is modeled by hand. Create a new message definition file in the desired target namespace (this property is specified on the last page of the wizard), then re-create your message model using the editor.
    - Do not set the XML Name property of an element, as you did in Version 2.1. Let it take the default value.
    - Do not re-create any elements or attributes with names commencing “xsi\_” or “xmlns\_”; these elements are all handled automatically by the parser.
    - Re-create XML attributes as attributes in the model (instead of elements with an XML Render property set to XMLAttribute).
2. Correct the message flow.
    - If you are using the MRM domain, change any references to the message set in input nodes (for example, MQInput) or Compute nodes.
    - If you are using the XML domain, change the domain to either the XMLNS or the XMLNSC domain in input nodes and in ESQL statements. These domains are namespace-aware; the original XML domain is not, and is effectively deprecated.
    - Change ESQL paths that refer to elements in the message to use the correct namespace-aware syntax. The ESQL editor content assist feature can help with the automatic creation of namespace constants if a message model exists.
  3. Deploy the corrected message flow and the new message set.
 

Add the corrected resources to a new broker archive file and deploy it to the target broker execution group. If the XML messages that are received by the message flow contain an MQRFH2 header that specifies the message set, the sending application must be changed in step.

You have upgraded your message flows to become namespace-aware.

## Migrating a message set

Migrate a message set from Version 2.1 to Version 6.0 using the `mqsimigratemsgsets` command.

### Before you start:

Before you perform this task, read the `mqsimigratemsgsets` command and the associated help.

This task applies only to migrating a message set from WebSphere MQ Integrator Version 2.1 or WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0.

You can use message sets in WebSphere Message Broker Version 6.0 that were created using WebSphere MQ Integrator Version 2.1 or WebSphere MQ Integrator Broker Version 2.1.

If you modify the `*.mrp` file by hand between exporting it from WebSphere MQ Integrator Version 2.1 or WebSphere MQ Integrator Broker Version 2.1, and importing it into WebSphere Message Broker Version 6.0, the results are not guaranteed and errors might occur.

To migrate one or more message sets:

1. Export the message set or sets from WebSphere MQ Integrator Broker Version 2.1. For more detailed information about this task refer to the WebSphere MQ Integrator Broker Version 2.1 documentation.
2. Transfer the exported \*.mrp file or files to the system on which you are running the WebSphere Message Broker Version 6.0 workbench. Check that the directory in which you store these files contains only the files that you want to import.
3. Close the workbench, which must not be running when you invoke the mqsimigratemsgsets command.
4. From a command line, invoke the mqsimigratemsgsets command, specifying the parameters that you require.
5. Check the report file mqsimigratemsgsets.report.txt that is written to the directory from which you invoked the command. The command provides the following information:
  - The parameters specified when the mqsimigratemsgsets command was invoked
  - The name of each message set file (\*.mrp file) that has been migrated
  - Any warnings that have been generated
  - Details of the objects created
  - The time taken to process the message set
  - The number of warnings produced for the message set
  - The number of objects created for the message set
  - The number of exported files that were processed
6. Start the workbench and switch to the Broker Application Development perspective.
7. You can now examine and manipulate the newly created message set project or projects. The created projects are closed in the Broker Application Development perspective and must be opened (right-click the project, then click **Open Project**).

When you have migrated your resources, see the Version 2.1 post-migration tasks for information about tasks that you might want to perform after migration.

## Migrating from WebSphere MQ Event Broker Version 2.1 to WebSphere Message Broker Version 6.0

### Before you start

Complete the following task:

- “Preparing to migrate from WebSphere MQ Event Broker Version 2.1” on page 42

and find out more about “Coexistence with previous versions and other products” on page 4.

To migrate a broker domain from WebSphere MQ Event Broker Version 2.1 to WebSphere Message Broker Version 6.0:

1. Close all Version 2.1 Control Center sessions.
2. On each system where one or more brokers are running, perform the following steps for each broker:



- a. Stop the broker by issuing the `wmqpsstop` command specifying the name of the broker.
  - b. Delete the broker by issuing the `wmqpsdeletebroker` command specifying the name of the broker.
3. Drop the database tables that were used by the brokers that you have just deleted. If a set of broker database tables are in a database by themselves, and you do not intend to use the database after migration, drop the whole database. The broker database tables are listed in the *WebSphere MQ Event Broker Version 2.1 Administration Guide*.
  4. On the system where the Configuration Manager is running:
    - a. Stop the Configuration Manager by issuing the `wmqpsstop` command for the component `ConfigMgr`.
    - b. Delete the Configuration Manager by issuing the `wmqpsdeleteconfigmgr` command with the `-n` parameter. This parameter causes the configuration repository to be deleted.
  5. On a system where a User Name Server is running:
    - a. Stop the User Name Server by issuing the `wmqpsstop` command for the component `UserNameServer`.
    - b. Delete the User Name Server by issuing the `wmqpsdeleteusername server` command.
  6. On each system, uninstall WebSphere MQ Event Broker. Follow the instructions in the appropriate book for your operating system:
    - *WebSphere MQ Event Broker for AIX Version 2.1 Installation Guide*
    - *WebSphere MQ Event Broker for HP-UX Version 2.1 Installation Guide*
    - *WebSphere MQ Event Broker for Solaris Version 2.1 Installation Guide*
    - *WebSphere MQ Event Broker for Windows NT and Windows 2000 Version 2.1 Installation Guide*
- Windows** On a Windows system, select the option to uninstall including data.
7. On each system, install the components of WebSphere Message Broker Version 6.0 that you require. For detailed instructions on how to perform this task, see the *Installation Guide*.
  8. Re-create your broker domain. As part of this task, perform the following steps, using the information that you recorded previously, where appropriate:
    - a. Import the message flows that you want to migrate by issuing the `mqsimportmsgflows` command.
    - b. Using WebSphere Message Broker commands, re-create and start the Configuration Manager, a User Name Server, and the brokers that you want to migrate.
    - c. Start the Message Brokers Toolkit, add each broker to the broker domain and re-create the execution groups that were originally within the broker. Re-create only the execution groups that you want to preserve.
    - d. In the workbench, enter and deploy the assignments, topology, and topics configuration data that you want to preserve.  
 Deploy migrated message flows to a test environment first. When you are sure that they are working correctly, deploy them to a production environment.

The migration is now complete and the broker domain is ready for use. Delete any queue managers that you no longer need.

The migration does not preserve the subscriptions and retained publications at the brokers. To re-create this information after migration, subscribers must renew their subscriptions and publishers must republish.

## Preparing to migrate from WebSphere MQ Event Broker Version 2.1

Complete the preparation tasks before you migrate from Version 2.1.

This topic describes what to do before you start to migrate a WebSphere MQ Event Broker Version 2.1 broker domain in any of the following tasks:

- “Migrating from WebSphere MQ Event Broker Version 2.1 to WebSphere Message Broker Version 6.0” on page 40
- “Migrating from WebSphere MQ Event Broker Version 2.1 and WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0” on page 43

1. Make sure that Version 2.1 Control Center users have checked in all WebSphere MQ Event Broker resources.
2. Back up all configuration repository and broker database tables.
3. Decide which message flows you want to migrate and use in the WebSphere Message Broker Version 6.0 broker domain. In a Control Center session, in which all the required message flows are visible in the workspace, export the message flows. Save the exported files in a directory other than the one in which WebSphere MQ Event Broker is installed.
4. Decide which brokers you want to migrate, and which assignments, topology, and topics configuration data you want to preserve.

For each broker that you want to migrate, and for the associated assignments configuration data that you want to preserve, record the following information (view this information in a Control Center session and record it manually):

- The name of the broker
- The name of each execution group within the broker
- For each execution group within the broker, the name of each message flow that is assigned to the execution group
- For each message flow assigned to an execution group, the following properties:
  - Additional instances
  - Commit count
  - Commit interval
  - Coordinated transaction

For the topology configuration data that you want to preserve, record the following information:

- The name of each collective and the names of the brokers that are in the collective
- All direct connections between brokers

For the topics configuration data that you want to preserve, record the following information:

- The hierarchy of topics, including the name of each topic
- The access control list for each topic

5. Decide which databases and queue managers you want to preserve.

When you migrate, you will delete all the components of WebSphere MQ Event Broker and drop all the database tables used by the Configuration Manager

and the brokers. However, to simplify the task of configuring the new broker domain, preserve the databases and queue managers used by the brokers that you want to migrate.

If you are migrating a single broker domain from WebSphere MQ Event Broker to WebSphere Message Broker, also preserve the database and queue manager used by the Configuration Manager, and the queue manager used by a User Name Server.

You do not need to change the configuration of a queue manager that is preserved during migration. You might, however, need to ensure that the WebSphere MQ product code is at the required release and service level to support WebSphere Message Broker. At the same time, ensure that you have installed the other software prerequisites.

6. Decide where you are going to store the development data that is created and maintained in the workbench. Store the data in the local file system, on a shared drive, or in a shared repository that is supported by Eclipse. The instructions for the individual migration tasks assume that you are using the local file system or a shared drive.
7. When you are ready to migrate, run the `mqsिमigratecomponents` command with the `-c` parameter. This performs a pre-migration check against the Version 2.1 components to ensure that they can be migrated. The pre-migration check identifies potential problems, and allows you to correct them before proceeding with migration.

When you have run the pre-migration check successfully, you are ready to perform migration. Go to the appropriate topic for your product:

- Migrating from WebSphere MQ Event Broker Version 2.1 and WebSphere MQ Integrator Broker Version 2.1
- Migrating from WebSphere MQ Event Broker Version 2.1 and WebSphere MQ Integrator Version 2.1
- Migrating from WebSphere MQ Event Broker Version 2.1 and WebSphere MQ Integrator Version 2.1 to WebSphere Message Broker with Rules and Formatter Extension Version 6.0

## **Migrating from WebSphere MQ Event Broker Version 2.1 and WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0**

### **Before you start**

Complete the task:

- “Preparing to migrate from WebSphere MQ Event Broker Version 2.1” on page 42

and find out more about “Coexistence with previous versions and other products” on page 4.

WebSphere MQ Event Broker and WebSphere MQ Integrator Broker might be installed on the same system, or there might be no system in the two domains on which both products are installed. Use the procedure that follows in either case.

To migrate a WebSphere MQ Event Broker Version 2.1 broker domain and a WebSphere MQ Integrator Broker Version 2.1 broker domain into a single WebSphere Message Broker Version 6.0 broker domain, perform the following steps:

1. Close all Version 2.1 Control Center sessions for the WebSphere MQ Event Broker broker domain.
  2. On each system where one or more WebSphere MQ Event Broker brokers are running, perform the following steps for each broker:
    - a. Stop the broker by issuing the `wmqpsstop` command with the name of the broker.
    - b. Delete the broker by issuing the `wmqpsdeletebroker` command with the name of the broker.
  3. Drop the database tables that were used by the brokers that you have just deleted. If a set of broker database tables are in a database by themselves and you do not intend to use the database after migration, drop the whole database. The broker database tables are listed in the *WebSphere MQ Event Broker Version 2.1 Administration Guide*.
  4. On the system where the WebSphere MQ Event Broker Configuration Manager is running:
    - a. Stop the Configuration Manager by issuing the `wmqpsstop` command for the component `ConfigMgr`.
    - b. Delete the Configuration Manager by issuing the `wmqpsdeleteconfigmgr` command with the `-n` parameter. Using this parameter causes the configuration repository to be deleted.
  5. On a system where a WebSphere MQ Event Broker User Name Server is running:
    - a. Stop the User Name Server by issuing the `wmqpsstop` command for the component `UserNameServer`.
    - b. Delete the User Name Server by issuing the `wmqpsdeleteuserserver` command.
  6. On each system where WebSphere MQ Event Broker is installed, uninstall WebSphere MQ Event Broker by following the instructions in the appropriate book for your operating system:
    - *WebSphere MQ Event Broker for AIX Version 2.1 Installation Guide*
    - *WebSphere MQ Event Broker for HP-UX Version 2.1 Installation Guide*
    - *WebSphere MQ Event Broker for Solaris Version 2.1 Installation Guide*
    - *WebSphere MQ Event Broker for Windows NT and Windows 2000 Version 2.1 Installation Guide*
- Windows** On a Windows system, select the option to uninstall including data.
7. Migrate the WebSphere MQ Integrator Broker broker domain to a WebSphere Message Broker broker domain by following the instructions in “Migrating from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0” on page 17.
 

At the point where you import the message flows that you exported from the WebSphere MQ Integrator Broker broker domain, import the message flows that you exported from the WebSphere MQ Event Broker broker domain.
  8. Within the WebSphere Message Broker broker domain, re-create those aspects of the WebSphere MQ Event Broker broker domain that you want to migrate. Use the information you recorded previously, where appropriate.
    - a. Using WebSphere Message Broker commands, re-create and start the brokers that you want to migrate.
    - b. Using the workbench, add each broker to the broker domain and re-create the execution groups that were originally within the broker. Re-create only the execution groups that you want to preserve.

- c. Using the workbench, enter and deploy the assignments, topology, and topics configuration data that you want to preserve.

Deploy migrated message flows to a test environment first. When you are sure that they are working correctly, deploy them to a production environment.

The migration is now complete and the broker domain is ready for use. Drop any databases and delete any queue managers that you no longer need.

The migration does not preserve the subscriptions and retained publications at the WebSphere MQ Event Broker brokers. To re-create this information after migration, subscribers must renew their subscriptions and publishers must republish.

## **Migrating from WebSphere MQ Event Broker Version 2.1 and WebSphere MQ Integrator Version 2.1 to WebSphere Message Broker Version 6.0**

If you have used the New Era of Networks Rules and Formatter support in WebSphere MQ Integrator Version 2.1 and want to continue using it after migration, migrate to WebSphere Message Broker with Rules and Formatter Extension Version 6.0 by following the instructions in “Migrating from WebSphere MQ Event Broker Version 2.1 and WebSphere MQ Integrator Version 2.1 to WebSphere Message Broker with Rules and Formatter Extension Version 6.0.”

To migrate a WebSphere MQ Event Broker Version 2.1 broker domain and a WebSphere MQ Integrator Version 2.1 broker domain into a single WebSphere Message Broker Version 6.0 broker domain, follow the instructions in “Migrating from WebSphere MQ Event Broker Version 2.1 and WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0” on page 43, replacing all references to “WebSphere MQ Integrator Broker” with “WebSphere MQ Integrator”.

## **Migrating from WebSphere MQ Event Broker Version 2.1 and WebSphere MQ Integrator Version 2.1 to WebSphere Message Broker with Rules and Formatter Extension Version 6.0**

To migrate a WebSphere MQ Event Broker Version 2.1 broker domain and a WebSphere MQ Integrator Version 2.1 broker domain into a single WebSphere Message Broker with Rules and Formatter Extension Version 6.0 broker domain, follow the instructions in “Migrating from WebSphere MQ Event Broker Version 2.1 and WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0” on page 43, replacing all references to “WebSphere MQ Integrator Broker” with “WebSphere MQ Integrator” and all references to “WebSphere Message Broker” with “WebSphere Message Broker with Rules and Formatter Extension”.

For instructions on how to migrate the New Era of Networks Rules and Formatter support for WebSphere MQ Integrator, see the New Era of Networks documentation.

## **Migrating a message flow**

### **Before you start:**

Read about differences between Version 2.1 and Version 6.0 products.

You can migrate the message flows that you have created in your Version 2.1 product (WebSphere MQ Event Broker, WebSphere MQ Integrator Broker, or WebSphere MQ Integrator) and use them in WebSphere Message Broker Version 6.0.

If you are migrating from WebSphere MQ Event Broker Version 2.1, all information in this topic that refers to user-defined plug-ins and ESQL does not apply; these facilities are not available on WebSphere MQ Event Broker Version 2.1.

If you have migrated from WebSphere MQ Integrator Broker Version 2.1, you might have written message flows that handle XML messages that use XML namespaces. In Version 2.1, such XML messages are parsed in a different way to that used by WebSphere Message Broker Version 6.0. While such message flows will continue to work correctly when hosted by Version 6.0, upgrade them to make them namespace aware.

You might want to change the message flows that you migrate to take advantage of the new nodes and features that are available in Version 6.0. For example, you might want to replace a user-defined node that receives web services requests with the built-in HTTPInput node.

You can migrate more than one message flow at one time if you want them to be defined in the same message flow project. You must migrate subflows and user-defined nodes with the message flows in which they are included to ensure consistent references.

If you have defined more than one message flow with the same name, or the message flow has been exported into more than one export file, the migration task overwrites, without warning, any existing message flow with the next flow that it finds of the same name. Therefore, be careful to avoid conflicts, and to ensure that the most recent version of a message flow that has been defined more than once is the last one that you migrate.

If you have multiple versions of the same message flow, which you use as a subflow in other flows in the same migration directory, the results of the import process are unpredictable.

To migrate a message flow:

1. Before you uninstall Version 2.1, export the message flow or flows from the Control Center using the Version 2.1 tools (see the Version 2.1 documentation for detailed information).

The migration process is most efficient when all referenced subflows are included in the same export file, therefore export all message flows that you want to migrate to a single message flow project into a single export file.

2. Transfer the export file or files to the new system on which you are running the workbench.
  - Check that the directory in which you store these files does not contain any other files.
  - Store the files that you intend to import into a single message flow project in a separate directory and migrate each directory separately.
  - Make sure that you do not store any files in subdirectories of the project directory, because these files are ignored by the migrate command.
3. If a workbench session is active, close it. You cannot run the migrate command if the workbench is running.

4. At a command prompt, invoke the `mqsimigratemsgflows` command, specifying the new project name and the directory in which you stored the export files. When the command has completed:
  - The message flows that are contained in the export files in the specified directory are imported into the specified message flow project. If the project already exists, the additional message flows are included with current content, if any. If the project does not exist before you invoke the command, it is created for you. The command is more effective if it creates the message flow project for you.
  - Message flows and subflows are created and their definitions are stored in files named `flow_name.msgflow`. User-defined nodes are created and their definitions are stored in files named `node_name.msgnode`.  
 After you have imported them, if you want to rename any of these message flows or nodes to conform to your local naming conventions, use only the facilities that are provided by the workbench, in order to preserve consistency and integrity of all references. Do not rename any files within the file system.
  - If any of the nodes in the message flows contain ESQL, the code is extracted from the node itself and stored in the ESQL file `message_flow_name.esql`. The ESQL for each node is wrapped between the appropriate CREATE and END MODULE statements (for Compute, Database, or Filter). The command creates the ESQL file if it does not already exist.

When you add a message flow to a bar file, runtime ESQL code is generated at Version 6.0 level. This code is incompatible with Version 2.1 brokers. If you want the bar file to include Version 2.1 runtime ESQL, check the **Compile ESQL for brokers version 2.1** box. If you do so, you cannot include Version 6.0 enhancements in the ESQL code, but you can deploy the flows to both Version 2.1 and Version 6.0 brokers.

For more information, see Adding files to a broker archive.

5. Check the report file `mqsimigratemsgflows.report.txt`, which is written to the directory from which you invoked the command. The command provides the following information:
  - The name of each message flow, subflow, and user-defined node that has been migrated. If any of these resources had a name that is incompatible with Version 6.0, the command updates the name and all references to that name to ensure consistency. (If you migrate a resource with an invalid name more than once, the correction that is made to the name is always the same.)
  - The success or failure of each resource that is migrated.
  - An indication of a subflow that cannot be located (its definition is not contained in any of the export files, but it is included in one or more of the migrated message flows). If this problem occurs, find the missing subflow and import it into the appropriate project. If you cannot retrieve the missing subflow for any reason, re-create it with the original name. All affected flows can then link correctly to the new subflow.  
 You do not need to repeat the whole export and import process.
  - An indication that a resource that was migrated as a message flow and stored in a `.msgflow` file might be a user-defined node. If this warning occurs, check if the specified resource is a user-defined node or a message flow. If it is a message flow, it has been migrated correctly. If it is a user-defined node, complete the actions outlined in step 11 on page 38.

6. Start the workbench and switch to the Broker Application Development perspective.
7. Open the message flow project that was created or updated by the migrate command.

If the project is already open, right-click it and click **Refresh**, then **Rebuild Project** to ensure that the Broker Development view reflects the new content. Rebuild also performs a validation of the message flow project contents.

Because ESQL and mappings are handled in a different way in Version 6.0, the migration process replaces some of the Version 2.1 nodes with different Version 6.0 nodes. The following table lists the replaced nodes. The ESQL that is associated with each node is created as a module with a default name, and the node property is set to the name of that module.

Version 2.1 node	Version 6.0 node
Compute	Compute
Filter	Filter
Database	Database
DataDelete	Database
DataInsert	Database
DataUpdate	Database
Extract	Compute
Warehouse	Database

8. If a message flow includes one or more Filter nodes, check the ESQL module for each node in the ESQL file to ensure that the RETURN statement correctly returns a valid expression that resolves to a Boolean value.
9. If a message flow includes a node with ESQL, the ESQL references fields in a message derived from an imported C header, and you have re-created the message model by importing the C header into the workbench, check the ESQL statements that refer to this message. The import process into the Version 6.0 workbench might create a model with different naming conventions from those created by the Version 2.1 importer, and you might need to update one or more field references.
10. If you had promoted the ESQL property of any of the Version 2.1 nodes that included ESQL customization to reuse ESQL in multiple nodes, the promotion is not maintained in the migrated Version 6.0 message flows because promotion of ESQL related properties is no longer supported. The Tasks view shows an error for each ESQL promoted property. To achieve the same effect, create an ESQL function and call that function from each node's ESQL module.
11. If you have migrated a user-defined node, only the XML interface definition file is migrated into a node .msgnode file (this file defines only the terminals and properties of the node). Complete its migration and its definition manually in Version 6.0 of the product. The following steps provide an outline of the required process. For full details, see Creating the user interface representation of a user-defined node in the workbench.
  - a. Create a user-defined node project and move the .msgnode file from the message flow project into the new user-defined node project. When you move this file, the associated properties files are created.
  - b. Optional: Complete development of the user-defined node in the Eclipse environment to create the user-defined node Eclipse plug-in (the directory



structure that contains the files that make up this node). This task includes creating node resources for help, icons, and property editors and compilers, if required.

- c. Check for errors in the task list. Errors might be generated, for example, if the node or its terminal names include the space character (not supported in Version 6.0), or if a flow embeds another migrated flow and the reference is not correct. Resolve these errors by correcting names, or by using the **Locate subflow** menu option.
- d. Install the runtime code for the node (the .lil file) on the appropriate broker systems. You do not need to recompile the code for your user-defined node when you migrate it.
- e. Stop and restart the broker to recognize the new or changed files.

When you have migrated your resources, see the Version 2.1 post-migration tasks for information about tasks that you might want to perform after migration.

## **Migrating from WebSphere MQ Integrator Version 2.1 to WebSphere Message Broker Version 6.0**

If you have used the New Era of Networks Rules and Formatter support in WebSphere MQ Integrator Version 2.1 and want to continue using it after migration, migrate to WebSphere Message Broker with Rules and Formatter Extension Version 6.0 by following the instructions in “Migrating from WebSphere MQ Integrator Version 2.1 to WebSphere Message Broker with Rules and Formatter Extension Version 6.0.”

To migrate a broker domain from WebSphere MQ Integrator Version 2.1 to WebSphere Message Broker Version 6.0, follow the instructions in “Migrating from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0” on page 17, replacing all references to “WebSphere MQ Integrator Broker” with “WebSphere MQ Integrator”.

### **Migrating from WebSphere MQ Integrator Version 2.1 to WebSphere Message Broker with Rules and Formatter Extension Version 6.0**

To migrate a broker domain from WebSphere MQ Integrator Version 2.1 to WebSphere Message Broker with Rules and Formatter Extension Version 6.0, follow the instructions in “Migrating from WebSphere MQ Integrator Broker Version 2.1 to WebSphere Message Broker Version 6.0” on page 17, replacing all references to “WebSphere MQ Integrator Broker” with “WebSphere MQ Integrator” and all references to “WebSphere Message Broker” with “WebSphere Message Broker with Rules and Formatter Extension”.

For instructions on how to migrate the New Era of Networks Rules and Formatter support for WebSphere MQ Integrator, see the New Era of Networks documentation.

## **Post-migration tasks**

After migrating to WebSphere Message Broker Version 6.0 from a previous version, test the broker resources and components to verify that there is no loss or unexpected change of functionality. Some changes in behavior might be caused by defects being fixed between versions.

The following topics describe what to do after migrating from Version 2.1 to Version 6.0:

- “Removing the Configuration Manager database tables after migration”
- “Issuing commands from a program after migration” on page 51
- “Setting up a command environment” on page 52

## Removing the Configuration Manager database tables after migration

This topic describes one of the tasks that you might want to complete after migration.

### Before you start

Before you start this task, make sure that the migration was successful and that you no longer need to retain the flexibility to restore the Version 2.1 level of code.

If you preserve the assignments, topology, and topics data in the configuration repository during a migration from WebSphere MQ Integrator Broker Version 2.1 or WebSphere MQ Integrator Version 2.1 and do not delete the Configuration Manager, the Configuration Manager database tables contain development data that the Configuration Manager no longer requires after migration. When you are sure that the migration has been successful, delete the data by performing this task.

To clean up the Configuration Manager DB2 database tables, drop the following database tables by using the **DB2 DROP TABLE** command. If the Configuration Manager tables are in a DB2 database by themselves, drop the whole database by using the **DB2 DROP DATABASE** command.

- CBROKER
- CBROKERCEG
- CCOLLECTIVE
- CCOLLECTIVECBROKER
- CDELETE
- CEG
- CEGCMSGFLOW
- CEGCMSGPROJECT
- CLOG
- CMSGFLOW
- CMSGPROJECT
- CNEIGHBOURS
- COUTSTANDING
- CSUBSCRIBE
- CTOPIC
- CTOPICCTOPIC
- CTOPOLOGY
- CTRACE
- CUUIDLOCKS

## Issuing commands from a program after migration

If you have programs that issue WebSphere MQ Event Broker Version 2.1 or WebSphere MQ Integrator Broker Version 2.1 commands, this topic describes how to run these programs unchanged after you have migrated to WebSphere Message Broker Version 6.0.

### UNIX systems:

The names of WebSphere MQ Event Broker Version 2.1 commands start with the prefix “wmqps”, not “mqsi”. In addition, WebSphere MQ Event Broker commands and WebSphere MQ Integrator Broker commands are stored in different directories to where WebSphere Message Broker commands are stored. If you have programs, such as shell scripts, that issue WebSphere MQ Event Broker or WebSphere MQ Integrator Broker commands, continue to use these programs unchanged after migration by running the shell script migration.sh, which is supplied with WebSphere Message Broker. migration.sh creates the required symbolic links to the WebSphere Message Broker commands.

Run migration.sh only if you have migrated from WebSphere MQ Event Broker Version 2.1 or WebSphere MQ Integrator Broker Version 2.1. You do not need to run it if you have migrated from WebSphere MQ Integrator Version 2.1.

The following table displays the fully qualified path name of migration.sh for each operating system:

Operating system	Fully qualified path name of migration.sh
AIX	/usr/opt/mqsi/sample/migration/migration.sh
HP-UX Solaris	/opt/mqsi/sample/migration/migration.sh

migration.sh works by creating symbolic links, so you do not need to run it again after applying a maintenance update to WebSphere Message Broker.

### Windows systems:

The names of WebSphere MQ Event Broker Version 2.1 commands start with the prefix “wmqps”, not “mqsi”. If you have programs, such as batch programs (or batch files), that issue WebSphere MQ Event Broker commands, continue to use these programs unchanged after migration by running the batch program migration.bat, which is supplied with WebSphere Message Broker. migration.bat makes a copy of each WebSphere Message Broker command that has an equivalent WebSphere MQ Event Broker command and gives the copied command its WebSphere MQ Event Broker name.

Run migration.bat only if you have migrated from WebSphere MQ Event Broker Version 2.1. You do not need to run it if you have migrated from WebSphere MQ Integrator Broker Version 2.1 or WebSphere MQ Integrator Version 2.1.

migration.bat is in the directory *WBIMB*\sample\migration, where *WBIMB* is the fully qualified path name of the directory where you have installed WebSphere Message Broker. You must run migration.bat from this directory.

migration.bat works by copying commands, so you must run it again after every maintenance update you apply to WebSphere Message Broker.

### **Setting up a command environment**

After you have installed the product on any of the distributed systems, you must initialize the environment before you can use any runtime component or command.

Also complete this task if you have migrated to WebSphere Message Broker Version 6.0 from a previous version. A profile is provided to help you set up the environment.

Ensure that you use this environment each time you run one of the administrative commands, or start a component; for example, a broker.

For information on setting up your command and runtime environment on a Windows system, see [Command environment: Windows platforms](#)

For information on setting up your command and runtime environment on Linux and UNIX systems, see [Command environment: Linux and UNIX systems](#)

---

## **Migrating from Version 5.0 products**

Migrate to WebSphere Message Broker Version 6.0 or WebSphere Message Broker with Rules and Formatter Extension Version 6.0 from Version 5.0 products.

You can migrate from the following products:

- WebSphere Business Integration Event Broker Version 5.0
- WebSphere Business Integration Message Broker Version 5.0
- WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0

The instructions apply to all operating systems supported by the Version 5.0 products.

This section contains the following topics:

- “Planning and pre-migration tasks”
- “Migrating from WebSphere Business Integration Event Broker Version 5.0 to WebSphere Message Broker Version 6.0” on page 58
- “Migrating from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0” on page 59
- “Migrating from WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0 to WebSphere Message Broker with Rules and Formatter Extension Version 6.0” on page 72
- “Post-migration tasks” on page 73

If you are already using WebSphere MQ Publish/Subscribe, migrate your applications to use the publish/subscribe functions that are provided by WebSphere Message Broker. See “Migrating publish/subscribe applications” on page 80.

## **Planning and pre-migration tasks**

Plan your migration and complete pre-migration tasks.

The following topics describe what to do before you migrate from Version 5.0 to Version 6.0:

- “Planning for migration from Version 5.0”
- “Backing up WebSphere Business Integration Message Broker Version 5.0 resources” on page 57

## Planning for migration from Version 5.0

Plan the order and extent of the migration of components and resources to Version 6.0.

This section explains how to plan your migration. Take the following steps:

1. Decide how you want to migrate the product components:
  - a. Find out what is new in Version 6.0 and learn about new and changed function. These changes might affect how you use your migrated components in the future.
  - b. Check the requirements for other products on which Version 6.0 components might have dependencies. Details of prerequisite and other optional products are in both the Installation Guide and the Installation reference section.
  - c. Decide where to migrate the product components; to a different location on the same computer or to a second computer. For example, you might want to migrate components to another location to maintain availability during the migration. You might also consider moving the Configuration Manager to another operating system.

The following topics describe different migration scenarios:

- “Planning to migrate a small domain from Version 5.0” on page 54
  - “Planning to migrate a large domain from Version 5.0” on page 55
  - “Planning to migrate multiple domains from Version 5.0” on page 55
  - “Planning to migrate a high-availability domain from Version 5.0” on page 56
- d. Decide when to migrate the product components. You might decide to preserve some components at the Version 5.0 level for now, and migrate them later.
  - e. Decide the order in which to migrate your components. You can migrate components in any order, but your specific circumstances might mean that you need to migrate components in a particular order.
- “Coexistence with previous versions and other products” on page 4 shows you how WebSphere Message Broker Version 6.0 can coexist on the same computer with previous versions of the product, and how Version 6.0 components can operate with components from previous versions.
2. Decide how you will use your existing resources with WebSphere Message Broker Version 6.0.

Except for user-defined extensions and mapping files, you do not need to perform any specific tasks to migrate your development and deployment resources, such as message flow files, message set definition files, ESQL files, XML Schema files, and broker archive files. You can start using these resources with WebSphere Message Broker Version 6.0 immediately. However, some migration actions are performed automatically when you open or rebuild resources in the toolkit, and some behavioral changes might affect the way in which your message flows and message sets are used; read the guidance provided in “Message flow migration notes” on page 100 and “Message set migration notes” on page 116.

- You must upgrade all Version 5.0 and Version 5.1 user-defined node projects to work with Message Brokers Toolkit Version 6.0. Upgrade a project by cleaning it: click **Project** → **Clean**. When you clean a project, the extension point that is required by Version 6.0 to compile the ESQL files contained in the user-defined extension is created in the project plugin.xml file.
- Migrate Version 5.0 mapping files (.mfmap) to Version 6.0 mapping files (.msgmap) using the mqsimigratemfmaps command.

After you start using your current resources in the Message Brokers Toolkit Version 6.0, reuse of those resources is subject to restrictions in Message Brokers Toolkit Version 5.0 or Version 5.1. For more information, see “Conditions for using migrated resources with previous versions of the Message Brokers Toolkit” on page 7.

3. Decide what testing you will do to ensure a successful migration.

The purpose of testing your migration is to identify any problems that might arise during migration. For example, if problems arise you might need to restore some migrated resources to the Version 5.0 level that you backed up before you started the migration, and any post-migration changes to these resources would be lost. Migrating your development and test domains before migrating your production domain allows you to identify problems like this and develop a strategy for dealing with further problems.

4. Optional: When you are ready to migrate, run the mqsigratecomponents command with the -c parameter. This form of the command performs a pre-migration check against the Version 5.0 components to ensure that they can be migrated. The pre-migration check identifies potential problems, which you can correct before proceeding with migration.

5. Optional: Consider adding time to your migration plan to update resources in response to changes in product behavior. Every release includes enhancements and fixes to external behavior, for example a correction to conform to an external standard. If your resources depend on undocumented or incorrect behavior (for example, the ESQL code in a Compute node), you might need to make changes and test these resources to understand the implications in your business scenarios.

After you have planned your migration, back up your resources.

**Planning to migrate a small domain from Version 5.0:**

Migrate a small domain that extends over a small number of computers.

Typically, a small domain has many or all components installed on a single computer. In this situation, the simplest approach is to migrate all the components on that single computer at the same time. If you cannot migrate in one step, install WebSphere Message Broker Version 6.0 at a different location on the same computer, or on a second computer, and migrate each component separately. You can stage the migration because Version 5.0 components can coexist with Version 6.0 components within a single domain. See “Coexistence with previous versions and other products” on page 4 for more information.

Migrate components in the order that best suits your environment. For example, a typical order in which to migrate the three major components might be as follows:

1. Instances of the Message Brokers Toolkit
2. Configuration Manager
3. Brokers

If you migrate instances of the Message Brokers Toolkit first, you can begin to develop message flows that use features that are new in Version 6.0. If you migrate the Configuration Manager, administrators can prepare your Version 6.0 broker domain for deployment. Finally, when you migrate the brokers, you can run your new message flows.

Depending on the goals of migration, the order in which you migrate components can be different. For example, if the primary reason for migration is to make use of new broker functions, you might want to migrate the brokers first. Or if you plan to move your Configuration Manager to a new operating system, you might want to migrate the Configuration Manager first to discover any operating system or environment issues early on.

Before you start to perform migration, back up your resources.

### **Planning to migrate a large domain from Version 5.0:**

Migrate a large domain that contains many components and extends over many computers.

On a large domain, you might not be able to migrate all components at the same time. In this situation, you can split the migration of the components, for example:

1. Migrate a test Message Brokers Toolkit and a test Configuration Manager
2. Migrate a test broker
3. Migrate more instances of the Message Brokers Toolkit
4. Migrate more brokers
5. Migrate the remaining components

The migration order is flexible because Version 6.0 components can coexist with Version 5.0 components within a single domain. However, coexistence does enforce some restrictions. In particular, these restrictions will affect you if you plan to stagger the migration of several instances of the Message Brokers Toolkit, because some files cannot be read using Message Brokers Toolkit Version 5.0 or Version 5.1 after they have been saved using Message Brokers Toolkit Version 6.0. See “Coexistence with previous versions and other products” on page 4 for more information.

Before you start to perform migration, back up your resources.

### **Planning to migrate multiple domains from Version 5.0:**

Migrate multiple domains that perform different functions in your environment.

A typical configuration for WebSphere Message Broker is to use a set of three or more domains, consisting of development, test, and production domains.

#### **Development domain**

In a development domain, message flow developers create message flows and unit test them in a sandbox environment. The brokers in the domain are not responsible for handling business-critical data.

#### **Test domain**

Message flows in the development domain are eventually promoted to a test domain, where message flows are tested against recent, but not live, production data in a realistic broker configuration.

## Production domain

When message flows in the test domain are deemed to be sufficiently robust, they are promoted to the production domain. This domain is responsible for performing actual business transactions, and message flows in the domain work with live data. Non-critical updates to production flows usually take place only at predefined service intervals.

Development and test domains must be migrated before production domains. Migrating the development domain first minimizes potential downtime associated with any migration activity. In addition, development domains typically require access to new broker functions before test and production domains. When you develop message flows that make use of new functions, you must migrate the test and production domains before you deploy the new message flows to them.

Because each Message Brokers Toolkit can administer multiple domains, be careful when migrating instances of the Message Brokers Toolkit not to affect any domains that have not been migrated yet.

Message Brokers Toolkit Version 6.0 can administer Version 5.0 domains; similarly, Message Brokers Toolkit Version 5.0 can administer Version 6.0 domains

Before you start to perform migration, back up your resources.

### Planning to migrate a high-availability domain from Version 5.0:

Special considerations apply when you are migrating a high-availability domain.

*High availability* is the requirement for a system to be running all, or for a very high proportion of, the time. Providing a high-availability environment involves having multiple brokers so that some brokers can be used for backup purposes. The entire production domain might be duplicated so that the backup system can be switched on in the event of a problem.

When you migrate, a high-availability environment presents a potential problem because a vulnerable period exists between stopping the previous version of the product, and installing and starting WebSphere Message Broker Version 6.0. One solution is to install and configure WebSphere Message Broker Version 6.0 while the previous version of the product is running in parallel, and then switch to WebSphere Message Broker Version 6.0. Install WebSphere Message Broker Version 6.0 on the same computers that are running the previous version of the product, or on a different set of computers.

The following sections of this topic provide a general framework for how you might want to migrate your high-availability domain. Adjust this guidance to suit your specific circumstances and refer to the product-specific migration topics for detailed migration instructions.

#### *Preparing to migrate a high-availability domain:*

To achieve high-availability migration, your environment must be configured correctly. Complete the following tasks (production and test domains are described in “Planning to migrate multiple domains from Version 5.0” on page 55):

1. Ensure that the production domain that you want to migrate is configured for high availability. You must have at least three brokers supporting the executing applications, so that when broker 1 is being migrated, brokers 2 and 3 can provide backup support for each other. This setup is typical for a high-availability domain at all times, and is not specific to migration.



2. Ensure that the test domain is identical to the production domain. If your domains are set up in this way, you can identify any problems during the migration of the test domain and resolve them before you migrate the production domain.

*Preparing to migrate the test domain:*

By migrating the test domain first, you can ensure that operation is successful after migration, and solve any problems before migrating the production domain. Test the migration of your resources to WebSphere Message Broker Version 6.0 for each functional area in turn. The following steps describe one way in which to migrate the test domain to minimize disruption. Refer to the product-specific migration topics for detailed instructions.

1. After you have backed up your resources and installed Version 6.0, create a Version 6.0 Configuration Manager and broker on as many computers as are required to mirror the production domain.
2. Move one functional area to Version 6.0 by migrating the Message Brokers Toolkit and the resources that are used within that area. Test that the migrated resources work as expected by deploying them and checking the results. Resolve any problems, then migrate the remaining functional areas. If you migrate the functional areas one by one, existing development can continue on the previous version of the product.
3. In the same way that you migrate the functional areas individually, migrate the brokers individually to Version 6.0. When you have migrated one broker, test that your resources still work as expected by deploying the migrated resources for which this broker is responsible. Resolve any problems and repeat for the remaining brokers. Migrating the brokers one at a time means that only small changes are made at each stage. If problems occur, other brokers that have not been migrated yet can process requests while the migration problems are resolved.

*Preparing to migrate the production domain:*

After you have migrated the test domain and resolved any problems, prepare to migrate the production domain. Before you migrate your resources, configure an administration system with Message Brokers Toolkit Version 6.0. You can then administer the new Version 6.0 components. Refer to the product-specific migration topics for detailed instructions.

When you are ready to perform migration, back up your resources.

## **Backing up WebSphere Business Integration Message Broker Version 5.0 resources**

Back up your resources before migration.

### **Before you start:**

Read the following planning topics:

- “Planning to migrate a small domain from Version 5.0” on page 54
- “Planning to migrate a large domain from Version 5.0” on page 55
- “Planning to migrate multiple domains from Version 5.0” on page 55
- “Planning to migrate a high-availability domain from Version 5.0” on page 56

Before you carry out any migration tasks, back up your WebSphere Business Integration Message Broker Version 5.0 resources:

1. Back up the configuration repository database. Use the documented procedures that are provided by DB2.
2. Back up the broker database tables. Use the documented procedures that are provided by your database supplier.
3. Back up your Message Brokers Toolkit workspace and resources; for example, message flow files, message set definition files, Java files, ESQL files, mapping files, XML Schema files, and broker archive (bar) files.
  - If you manage your workspace resources in a shared repository, for example CVS, follow standard backup procedures for safeguarding versions.
  - If you maintain your workspace resources on a local or shared disk, copy your workspace directory to a different location.

For detailed instructions on how to back up these resources, see the WebSphere Business Integration Message Broker Version 5.0 information center.

After you have backed up your WebSphere Business Integration Message Broker Version 5.0 resources, proceed to one of the following topics:

- “Migrating from WebSphere Business Integration Event Broker Version 5.0 to WebSphere Message Broker Version 6.0”
- “Migrating from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0” on page 59
- “Migrating from WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0 to WebSphere Message Broker with Rules and Formatter Extension Version 6.0” on page 72

## **Migrating from WebSphere Business Integration Event Broker Version 5.0 to WebSphere Message Broker Version 6.0**

Migrating from WebSphere Business Integration Event Broker Version 5.0 follows the same process as migrating from WebSphere Business Integration Message Broker Version 5.0.

To migrate from WebSphere Business Integration Event Broker Version 5.0 to WebSphere Message Broker Version 6.0, follow the instructions in “Migrating from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0” on page 59, replacing all references to “WebSphere Business Integration Message Broker Version 5.0” with “WebSphere Business Integration Event Broker Version 5.0”.

In some places, the instructions for migrating from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0 give information about the file types to which the instructions apply. Some of the file types in WebSphere Message Broker do not exist in WebSphere Event Broker; ignore any file types that are specific to WebSphere Message Broker.

For example, if the instructions ask you to perform an action on message flow files, message set definition files, ESQL files, mapping files, XML Schema files, and broker archive files, you need to perform the action only on message flow files and broker archive files, because the other file types apply only to WebSphere Message Broker.

# Migrating from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0

Migrate product components from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0.

## Before you start

Before you start migration:

- Ensure that your installation of WebSphere Business Integration Message Broker Version 5.0 is at service level Fix Pack 4 or later.
- Read about coexistence with previous versions and other products.
- Plan your migration.
- Back up your Version 5.0 resources.

Each of the tasks listed at the end of this topic explains how to migrate a component. Each task also tells you at which point during the migration of that component you must install WebSphere Message Broker Version 6.0.

To migrate a single component, complete the task for that component. To migrate all components, complete all of the tasks listed, but plan your migration so that you apply the tasks as required by your situation. For example, because each task includes steps for installing WebSphere Message Broker Version 6.0, you might want to carry out the tasks in parallel, rather than by completing one task before starting the next task.

The order in which you migrate components is not significant, so complete the tasks in any order. The following list of tasks are presented in a typical order of migration:

- Migrating the Message Brokers Toolkit
- Migrating a Configuration Manager
- Migrating a broker
- Migrating a User Name Server

After you have completed the migration, see the post-migration tasks for information about tasks that you might want to perform after migration.

## Migrating the Message Brokers Toolkit from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0

Migrate the Message Brokers Toolkit Version 5.0.

If you are using Message Brokers Toolkit Version 5.1, follow the instructions in this topic, replacing all references to "Message Brokers Toolkit Version 5.0" with "Message Brokers Toolkit Version 5.1".

When you start using your resources in Message Brokers Toolkit Version 6.0, restrictions apply to the use of these same resources again with Message Brokers Toolkit Version 5.0 or Version 5.1. For more information, see "Conditions for using migrated resources with previous versions of the Message Brokers Toolkit" on page 7.

To migrate Message Brokers Toolkit Version 5.0 to Version 6.0:

1. Install Version 6.0 in a different location from WebSphere Business Integration Message Broker Version 5.0.
2. Migrate Version 5.0 mappings using the `mqsimigratemfmaps` command.
3. When you start the Message Brokers Toolkit Version 6.0 for the first time, you are prompted to enter a workspace location. Enter the directory where the Message Brokers Toolkit Version 5.0 workspace that you want to migrate is located. In Version 5.0, the default location is `install_dir/eclipse/workspace`.
  - Version 5.0 message flows are converted to the Version 6.0 format automatically when you save them for the first time. Message Brokers Toolkit Version 5.0 cannot read message flows that have been saved in Version 6.0 format.
  - If your message flows use WebSphere MQ Everyplace® (MQE) nodes, follow the instructions in “Migrating a message flow that contains WebSphere MQ Everyplace nodes” on page 109.
  - If your message flows use XML style sheets, follow the instructions in “Migrating style sheets and XML files” on page 116.
  - Version 5.0 message sets are converted automatically to Version 6.0 format when you save them for the first time. Message Brokers Toolkit Version 5.0 cannot read message sets that have been saved in Version 6.0 format.
4. Clean and rebuild your workspace.
5. To migrate user-defined nodes from Version 5.0, import the user-defined node project into the Version 6.0 workbench and rebuild the project. If you are migrating user-defined nodes from Version 5.0, perform the following additional steps:
  - a. Modify the `<requires>` element in the `plugin.xml` file in the user-defined node project root to match the following example. Ensure that you delete all extraneous entries from the Version 5.0 `plugin.xml` file so that it matches the following example exactly:
 

```
<requires>
  <import match="greaterOrEqual" plugin="com.ibm.etools.mft.api" version="6.0.0"/>
</requires>
```
  - b. Modify the `"org.eclipse.help.contexts"` extension in the same `plugin.xml` file to match the following example:
 

```
<extension point="org.eclipse.help.contexts">
  <contexts file="HelpContexts.xml"/>
</extension>
```
  - c. Restart the Message Brokers Toolkit using the `-clean` option.

If you have configured MCA users on the WebSphere MQ channels to the Configuration Manager, you might encounter problems when you try to connect to the migrated Configuration Manager from Message Brokers Toolkit Version 6.0. To resolve these problems, configure access control lists for users who are running the Message Brokers Toolkit Version 6.0. Follow the instructions in Considering security for the workbench.

When you have migrated the Message Brokers Toolkit, migrate the rest of the components:

- Migrate the Configuration Manager
- Migrate the broker
- Migrate the User Name Server

When you have completed these tasks, see “Post-migration tasks” on page 73 for information about tasks that you might want to perform after migration.

## Migrating a Configuration Manager from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0

Follow the instructions to migrate the Configuration Manager Version 5.0.

In WebSphere Message Broker Version 6.0, the Configuration Manager no longer stores the domain configuration in an external database; it uses an internal repository instead. The Configuration Manager is also available on more operating systems than in WebSphere Business Integration Message Broker Version 5.0.

From the following list of topics in this section, select the topic that is appropriate to your environment:

- Migrating on the same computer
- Migrating to a different computer that has DB2 installed
- Migrating to a different computer that does not have DB2 installed

### Migrating a Version 5.0 Configuration Manager to Version 6.0 on the same computer:

Migrate a Version 5.0 Configuration Manager to Version 6.0 on the same system.

#### Before you start

Read about “Coexistence with previous versions and other products” on page 4.

If the Configuration Manager runs in a locale that is not listed in the Locales topic, check that the code page is one of the supported code pages and that the locale is set up correctly.

To migrate a Version 5.0 Configuration Manager to Version 6.0:

1. Install WebSphere Message Broker Version 6.0 in a location other than where Version 5.0 is installed.
2. Stop the Version 5.0 Configuration Manager.
3. Use the `mqsigratecomponents` command to migrate your Version 5.0 Configuration Manager.
4. Start the Version 6.0 Configuration Manager using the `mqsistart` command.

If you do not have additional hardware available, but you want to confirm the successful migration of the Configuration Manager before you remove the Version 5.0 Configuration Manager, migrate the Configuration Manager to a different location on the same computer. If you use this method, you can also change the name of the Configuration Manager.

Complete the following steps:

1. Install WebSphere Message Broker Version 6.0 in a location other than where Version 5.0 is installed.
2. Stop the Version 5.0 Configuration Manager.
3. Create a Version 6.0 Configuration Manager using the `mqscreateconfigmgr` command. Make sure that the Version 6.0 Configuration Manager has a different name and a different queue manager name to the Version 5.0 Configuration Manager. Use the `-n` parameter of the `mqscreateconfigmgr` command to specify the Version 5.0 Configuration Manager database.

4. Configure WebSphere MQ to allow the Version 6.0 Configuration Manager to communicate with the broker network. For example, you might need to configure channels and transmission queue definitions.
5. Start the Version 6.0 Configuration Manager using the `mqsistart` command.
6. Deploy the complete topology using either the Message Brokers Toolkit or the `mqsdeploy` command. This action subscribes all brokers in the domain with the new Version 6.0 Configuration Manager, so that the brokers publish their status messages to the correct queue manager. When deployment is complete, the brokers are managed by the Version 6.0 Configuration Manager on the new system; do not use the previous Configuration Manager.

If you have configured MCA users on the WebSphere MQ channels to the Configuration Manager, you might encounter problems when you try to connect to the migrated Configuration Manager from the Message Brokers Toolkit Version 6.0. To resolve these problems, configure access control lists for users who are running the Message Brokers Toolkit Version 6.0. Follow the instructions in Considering security for the workbench.

Before you migrate your brokers, or make any configuration changes, ensure that your Configuration Manager has been migrated correctly by performing the following checks:

1. Start the migrated Configuration Manager.
2. Start the Message Brokers Toolkit and connect it to the Configuration Manager's domain.
3. Check the list of domain components and see if any errors are produced.
4. Check the list of alerts for the domain and see if anything has stopped.
5. Check that you can open the Event Log.
6. Optional: If you have a broker running, stop and start a message flow, and check for a successful response; check that the Alerts view is updated when the message flow is stopped, and clear when the message flow is started.

If these steps are successful, you have successfully migrated your Configuration Manager. If they are unsuccessful, resolve any problems before you migrate further components or make configuration changes.

When you have migrated the Configuration Manager, migrate the rest of the components:

- Migrate the Message Brokers Toolkit
- Migrate the broker
- Migrate the User Name Server

When you have completed these tasks, see the post-migration tasks for information about tasks that you might want to perform after migration.

### **Migrating a Version 5.0 Configuration Manager to Version 6.0 on a different computer that has DB2 installed:**

Migrate a Version 5.0 Configuration Manager to Version 6.0 on another system.

#### **Before you start**

Read about "Coexistence with previous versions and other products" on page 4.

If the Configuration Manager runs in a locale that is not listed in the Locales topic, check that the code page is one of the supported code pages and that the locale is set up correctly.

An existing Windows Configuration Manager can be migrated to a Version 6.0 Configuration Manager on any of the supported operating systems through a JDBC Type 4 Universal DB2 connection.

To migrate a Configuration Manager to a different computer that has a JDBC Type 4 Universal DB2 connection installed, complete the following steps:

1. Install WebSphere Message Broker Version 6.0 on the computer to which you are migrating your Version 5.0 Configuration Manager.
2. Modify the environment in which you are going to create the Version 6.0 Configuration Manager. On z/OS, update the BIPCPROF file and submit the BIPGEN job when you have completed these updates. On all other operating systems, update the local environment.
  - a. Add the following files to the CLASSPATH:

```
db2_install/jcc/classes/sqlj.zip  
db2_install/jcc/classes/db2jcc.jar  
db2_install/jcc/classes/db2jcc_javax.jar  
db2_install/jcc/classes/db2jcc_license_cisuz.jar
```

- b. Add the following entry to the environment variable for libraries (for example, LIBPATH on z/OS):

```
db2_install/jcc/lib
```

- c. Add the following content to the PATH:

```
db2_install/jcc/bin
```

where *db2\_install* is the directory in which DB2 is installed at your location (for example */usr/lpp/db2710/db2710*).

3. Stop the Version 5.0 Configuration Manager.
4. Create a Version 6.0 Configuration Manager on the second computer by issuing the `mqsicreateconfigmgr` command or run the BIPCRCM job on z/OS. Specify the database name, user name, and password that are required to access the Version 5.0 Configuration Manager database on Windows. For example:

**-u (userid)**

The user ID for the Configuration Manager configuration repository database.

**-p (password)**

The password associated with the database user ID.

**-n (database name)**

The identification of the database, in the following format:

```
//server:port/database_name
```

where:

- *server* is the IP address of the computer where the database exists.
- *port* is the port number of DB2 on that computer.
- *database\_name* is the name of the database (for example MQSICMDB)

For example: `//9.20.235.197:50000/MQSICMDB`.

To determine the port number:

- a. Open the DB2 Control Center and right-click the DB2 instance.

- b. Select **Setup Communications...**
- c. Enter the user ID and password, if required.

The properties box contains the address and port number for this DB2 instance.

To maintain uniqueness in the WebSphere MQ network, use different queue manager names for the two Configuration Manager components.

When you create the Version 6.0 Configuration Manager, domain information from the Version 5.0 Configuration Manager database is copied to the Version 6.0 Configuration Manager internal repository, therefore it might take a few minutes to migrate the database.

5. On the second computer, configure WebSphere MQ to allow the Version 6.0 Configuration Manager to communicate with the broker network. For example, you might need to configure channels, transmission queues, and remote queue manager definitions.
6. Start the Version 6.0 Configuration Manager.
7. Deploy the complete topology using either the Message Brokers Toolkit or the `mqsidedeploy` command. This action subscribes all brokers in the domain with the new Version 6.0 Configuration Manager, so that the brokers publish their status messages to the correct queue manager. When deployment is complete, the brokers are managed by the Version 6.0 Configuration Manager on the new system; do not use the previous Configuration Manager.

Before you migrate your brokers, or make any configuration changes, perform the following checks to ensure that your Configuration Manager has been migrated correctly:

1. Start the migrated Configuration Manager.
2. Start the Message Brokers Toolkit and connect it to the domain of the migrated Configuration Manager.
3. Check the list of domain components and see if any errors are produced.
4. Check the list of alerts for the domain and see if anything has stopped.
5. Check that you can open the Event Log.
6. Optional: If you have a broker running, stop and start a message flow, and check for a successful response; check that the Alerts view is updated when the message flow is stopped, and clear when the message flow is started.

If these steps are successful, you have successfully migrated your Configuration Manager. If they are unsuccessful, resolve any problems before you migrate further components or make configuration changes.

When you have migrated the Configuration Manager, migrate the rest of the components:

- Migrate the Message Brokers Toolkit
- Migrate the broker
- Migrate the User Name Server

When you have completed these tasks, see the post-migration tasks for information about tasks that you might want to perform after migration.

#### **Migrating a Version 5.0 Configuration Manager to Version 6.0 on a different computer that does not have DB2 installed:**

Migrate a Version 5.0 Configuration Manager to Version 6.0 on another system.



## Before you start

Read about “Coexistence with previous versions and other products” on page 4.

If the Configuration Manager runs in a locale that is not listed in the Locales topic, check that the code page is one of the supported code pages and that the locale is set up correctly.

To migrate a Configuration Manager to a different computer that does not have DB2 or a JDBC client for DB2 installed, complete the following steps:

1. Migrate the Version 5.0 Configuration Manager to Version 6.0 on the same computer:

- a. Install WebSphere Message Broker Version 6.0 in a location other than where WebSphere Business Integration Message Broker Version 5.0 is installed.
- b. Stop the Version 5.0 Configuration Manager.
- c. Launch a Version 6.0 Command Console and enter the `mqsigratecomponents` command to migrate your Version 5.0 Configuration Manager.
- d. Start the Version 6.0 Configuration Manager.

When you start the Version 6.0 Configuration Manager for the first time, it automatically detects domain information in the DB2 database of the Version 5.0 Configuration Manager, and migrates it into the internal repository of the Version 6.0 Configuration Manager. You do not need to do anything, and the DB2 database is not modified.

2. Stop the Version 6.0 Configuration Manager, and make a copy of its internal repository using the `mqsibbackupconfigmgr` command.
3. Install WebSphere Message Broker Version 6.0 on the second computer.
4. On the second computer, create a Version 6.0 Configuration Manager by either issuing the `mqsicreateconfigmgr` command or running the BIPCRCM job on z/OS.

You must maintain unique queue manager names in your WebSphere MQ network. When you create the Version 6.0 Configuration Manager, choose a different queue manager name.

5. On the second computer, configure WebSphere MQ to allow the Version 6.0 Configuration Manager to communicate with the broker network. For example, you might need to configure channels, transmission queues, and remote queue manager definitions.
6. On the second computer, issue the `mqsirestoreconfigmgr` command (or the BIPRSCM job on z/OS) to overwrite the contents of the empty Version 6.0 Configuration Manager repository with the repository that you backed up from the original computer.
7. On the second computer, start the Version 6.0 Configuration Manager.
8. Deploy the complete topology using either the Message Brokers Toolkit or the `mqsidedeploy` command. This action subscribes all brokers in the domain with the new Version 6.0 Configuration Manager, so that the brokers publish their status messages to the correct queue manager. When deployment is complete, the brokers are managed by the Version 6.0 Configuration Manager on the new system; do not use the previous Configuration Manager.

Before you migrate your brokers, or make any configuration changes, ensure that your Configuration Manager has been migrated correctly by performing the following checks:

1. Start the migrated Configuration Manager.
2. Start the Message Brokers Toolkit and connect it to the Configuration Manager domain.
3. Check the list of domain components and see if any errors are produced.
4. Check the list of alerts for the domain and see if anything has stopped.
5. Check that you can open the Event Log.
6. Optional: If you have a broker running, stop and start a message flow, and check for a successful response; check that the Alerts view is updated when the message flow is stopped, and clear when the message flow is started.

If these steps are successful, you have successfully migrated your Configuration Manager . If they are unsuccessful, resolve any problems before you migrate further components or make configuration changes.

When you have migrated the Configuration Manager, migrate the rest of the components:

- Migrate the Message Brokers Toolkit
- Migrate the broker
- Migrate the User Name Server

When you have completed these tasks, see the post-migration tasks for information about tasks that you might want to perform after migration.

### **Migrating a broker from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0**

Follow the instructions to migrate the broker.

To migrate a broker from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0, see the appropriate topic for your operating system:

- Distributed systems
- z/OS

#### **Migrating a Version 5.0 broker to Version 6.0 on distributed operating systems:**

Migrate a broker to use the enhanced facilities available in a Version 6.0 broker domain.

If you stop the broker, you can migrate it immediately to the new version on the same computer. If you prefer not to stop the broker to avoid problems for your business applications, or if you want to reproduce the broker capability on another computer, you can move the Version 5.0 broker's application logic onto a separate Version 6.0 broker.

If you are using the Version 5.1 Message Brokers Toolkit, replace all references to "Version 5.0" with "Version 5.1".

Select the topic that is appropriate to your environment.

- "Migrating a Version 5.0 broker to Version 6.0" on page 67

- “Migrating a Version 5.0 broker’s application logic to another installation”

*Migrating a Version 5.0 broker to Version 6.0:*

### **Before you start**

Before migrating a broker, ensure that you do not have any aggregations in progress. When you migrate a broker to WebSphere Message Broker Version 6.0, any live data that is being stored for aggregations in progress will be lost.

If the broker runs in a locale that is not listed in the *Locales* topic, check that the code page is one of the supported code pages and that the locale is set up correctly.

To migrate a Version 5.0 broker on distributed operating systems to Version 6.0 on the same computer, complete the following steps:

1. Install WebSphere Message Broker Version 6.0 in a different location from WebSphere Business Integration Message Broker Version 5.0.
2. Stop the Version 5.0 broker.
3. Stop any channels to the Version 5.0 broker.
4. Update the ODBC definitions file to Version 6.0 format by following the instructions in “Updating your ODBC definitions when migrating” on page 30.
5. Set up the correct Version 6.0 command environment.
  - **Linux** **UNIX** On Linux and UNIX systems, run the environment profile `mqsiprofile`.
  - **Windows** On Windows, open a Command Console from the **Start** menu.
6. Enter the `mqsigratecomponents` command to migrate the broker. For example:
 

```
mqsigratecomponents Broker1
```
7. If you are running Version 6.0 on a 64-bit operating system, make the following changes to your environment:
  - You no longer have to export 32-bit libraries in the `LIBPATH` environment variable. Remove all variable settings similar to the following settings:
 

```
export LD_LIBRARY_PATH=[DB2instanceDir]/sql1lib/lib32:$LD_LIBRARY_PATH
export SHLIB_PATH=$ORACLE_HOME/1ib32:$SHLIB_PATH
```
  - If you want to continue to use 32-bit execution groups, and you use DB2 for your broker database, set the appropriate environment variable for the DB2 version that you have installed.
 

For DB2 Version 8:

```
MQSI_LIBPATH32=$MQSI_LIBPATH32:[DB2InstanceDir]/sql1lib/lib
```

For DB2 Version 9:

```
MQSI_LIBPATH32=$MQSI_LIBPATH32:[DB2InstanceDir]/sql1lib/lib32
```

If your broker will support only 64-bit execution groups, this variable is not required.
8. Start the Version 6.0 broker using the `mqsistart` command.

*Migrating a Version 5.0 broker’s application logic to another installation:*

### **Before you start**

To complete this task you must have either a Version 5.0 or a Version 6.0 Message Brokers Toolkit available.

Before migrating a broker, ensure that you do not have any aggregations in progress. When you migrate a broker to Version 6.0, any live data that is being stored for aggregations in progress will be lost.

If the broker runs in a locale that is not listed in the Locales topic, check that the code page is one of the supported code pages and that the locale is set up correctly.

To migrate a Version 5.0 broker on distributed operating systems to Version 6.0 at a different location on the same computer, or to a different computer, complete the following steps:

1. Install WebSphere Message Broker Version 6.0 either as a new instance on the computer where WebSphere Business Integration Message Broker Version 5.0 is installed, or on a different computer. For detailed instructions, see the Installation Guide.
2. Update the ODBC definitions file to Version 6.0 format by following the instructions in "Updating your ODBC definitions when migrating" on page 30.
3. Create a Version 6.0 broker; give it a name that is different from the name of the Version 5.0 broker.

Brokers cannot share queue managers. You cannot migrate a broker to a queue manager that is already being used by an existing broker.

4. Start the Version 6.0 broker using the **mqsistart** command.
5. Add the new broker to the domain by completing the following tasks:
  - a. Create a Configuration Manager
  - b. Create a domain connection
  - c. Connect to the broker domain
  - d. Add a broker to a broker domain
6. Write a list of the execution groups that you have on the Version 5.0 broker, and create these same execution groups on the new broker. Use either the Version 5.0 or Version 6.0 Message Brokers Toolkit to complete this step.
7. Deploy the message flows and message sets of the Version 5.0 broker to the Version 6.0 broker. Use either the Version 5.0 or Version 6.0 Message Brokers Toolkit to complete this step.
8. Configure any other relevant properties of the Version 5.0 broker on the Version 6.0 broker. For example, you might need to configure properties that you set using the **mqsichangeproperties** command, or as a result of using certain nodes, such as Publication or SCADA nodes.
9. Stop the Version 5.0 broker.
10. Remove the Version 5.0 broker from the workbench.
11. Redeploy the topology.
12. Delete the Version 5.0 broker.

When you have migrated the broker, migrate the rest of the components:

- Migrate the Message Brokers Toolkit
- Migrate the Configuration Manager
- Migrate the User Name Server

When you have completed these tasks, see the post-migration tasks for information about tasks that you might want to perform after migration.

#### *Updating your ODBC definitions when migrating:*

As part of migrating a broker, you create ODBC definitions for broker and user databases that specify appropriate database drivers for the new product version.

Complete this update before you run the `mqsigratecomponents` command.

Follow the instructions provided for your operating system:

#### **Windows systems**

The operating system stores ODBC definitions in a single repository of ODBC data source names. Change Oracle and Sybase data source definitions according to the instructions in “Changing the 32-bit ODBC connection and XA resource manager definitions for a broker migrated from Version 2.1 or Version 5.0 to Version 6.0” on page 30

You do not need to change DB2, Informix, and SQL Server data source definitions.

#### **Linux and UNIX systems**

ODBC definitions are stored in a text file. For previous versions of the product, the file `.odbc.ini` is located in `/var/mqsi/odbc/`. When working with Version 6.0, create a new text file in this directory, but do not replace the existing file to avoid affecting existing brokers. Set the environment variable `ODBCINI` to point to the new file; perform this step as part of the setup for a Version 6.0 command environment.

In your new Version 6.0 ODBC configuration file, ensure that you list all of the data sources that the brokers that you want to migrate will use. For information on how to create a new ODBC configuration file, see *Connecting to a database from Linux and UNIX systems*.

If you are using XA to enable coordinated transactions, you must also update your `qm.ini` file for WebSphere MQ, as described in “Changing the 32-bit ODBC connection and XA resource manager definitions for a broker migrated from Version 2.1 or Version 5.0 to Version 6.0” on page 30

If you revert to a previous version of WebSphere Message Broker, you must reverse the changes that you make to the ODBC definitions. Update the `odbc.ini` after you have run the `mqsigratecomponents` command, but before you restart the broker. If you are reverting to Version 5.0, follow the instructions in “Restoring components and resources to Version 5.0” on page 76.

#### **Migrating a Version 5.0 broker to Version 6.0 on z/OS:**

Migrate a broker to use the enhanced facilities available in a Version 6.0 broker domain.

#### **Before you start**

- Ensure that you are familiar with the steps involved in creating a broker on z/OS.

- The JCL (Job Control Language) migration job file uses the `mqsigratecomponents` command to migrate a broker on z/OS. This command takes many parameters, which you must understand fully before attempting to migrate the broker.
- Ensure that you do not have any aggregations in progress. When you migrate a broker to Version 6.0, any live data that is being stored for aggregations in progress will be lost.
- If the broker runs in a locale that is not listed in the Locales topic, check that the code page is one of the supported code pages and that the locale is set up correctly.

To migrate a Version 5.0 broker to Version 6.0 on z/OS,:

1. Stop the Version 5.0 broker.
2. Back up the broker database tables.
3. Create a new broker PDSE.
4. Copy all broker JCL jobs from the Version 6.0 installed SBIPPROC and SBIPSAMP PDSEs to the new broker PDSE and customize them all. See Customizing the broker JCL for more information.

When you customize the new Version 6.0 JCL for this migration, do not make the `++HOME++` JCL variable the same value as the existing Version 5.0 component directory, otherwise the previous `ENVFILE` will be overwritten when you submit the `BIPGEN` job. Set the `++HOME++` variable to the Started Task user ID home directory (for example, `/u/mq01brk`).

- a. Customize the `BIPEDIT` file using values that are defined in the broker's Version 5.0 `mqsicompcif` file. See "Equivalent z/OS customization variables in `mqsicompcif` and `BIPEDIT`" on page 126 for details of the customization variables.
  - b. Copy any additional changes that you have made to the environment file, `ENVFILE`, and the ODBC initialization file, `dsnaoini`, to `BIPBPROF` and `BIPDSNAO` in the component data set. Submit the `BIPGEN` job to create the environment file `ENVFILE`.
  - c. Customize and submit the `BIPMGCMP` job. This job migrates the registry, queue, and broker database. As part of the database migration, database tables are created, or deleted, and dropped, therefore you must have the correct DB2 privileges. These privileges are the same as those required for running the `mqsicreatebroker` command.
5. Copy the started task job `BIPBRKP` to the procedures library. When you copy the started task, keep a second copy of the original in a safe place for backup purposes.
  6. The verification program runs when you start the Version 6.0 broker.

When you have migrated the broker, migrate the rest of the components:

- Migrate the Message Brokers Toolkit
- Migrate the Configuration Manager
- Migrate the User Name Server

When you have completed these tasks, see the post-migration tasks for information about tasks that you might want to perform after migration.

## Migrating a User Name Server from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0

Follow the instructions to migrate the User Name Server.

To migrate a User Name Server from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0, see the appropriate topic for your operating system:

- Distributed systems
- z/OS

### Migrating a Version 5.0 User Name Server to Version 6.0 on distributed systems:

Migrate a Version 5.0 User Name Server to Version 6.0.

The User Name Server component has not been changed for the Version 6.0 product. This component also retains no persistent state. Therefore you do not have to perform migration for this component. You can migrate the component, or you can delete and recreate it.

### Before you start

If the User Name Server runs in a locale that is not listed in Locales, check that the code page is one of the supported code pages and that the locale is set up correctly.

To migrate the User Name Server:

1. Install Version 6.0 in a different location on the computer where WebSphere Business Integration Message Broker Version 5.0 is installed.
2. Stop the Version 5.0 User Name Server.
3. Set up the correct Version 6.0 command environment.
  - **Linux** **UNIX** On Linux and UNIX systems, run the environment profile `mqsiprofile`.
  - **Windows** On Windows, open a command console from the **Start** menu.
4. Enter the `mqsimigratecomponents` command to migrate the User Name Server. For example:  
`mqsimigratecomponents usernameserver`
5. Start the Version 6.0 User Name Server using the **mqsistart** command.

When you have migrated the User Name Server, migrate the rest of the components:

- Migrate the Message Brokers Toolkit
- Migrate the Configuration Manager
- Migrate the broker

When you have completed these tasks, see the post-migration tasks for information about tasks that you might want to perform after migration.

### Migrating a Version 5.0 User Name Server to Version 6.0 on z/OS:

Migrate a Version 5.0 User Name Server to Version 6.0.

### Before you start

- Ensure that you are familiar with the steps involved in creating a User Name Server on z/OS.
- The JCL job uses the `mqsigratecomponents` command to migrate a User Name Server on z/OS. This command takes many parameters, which you must understand fully before attempting to migrate the User Name Server.

To migrate a Version 5.0 User Name Server to Version 6.0 on z/OS, complete the following steps:

1. Stop the Version 5.0 User Name Server.
2. Create a new User Name Server PDSE.
3. Copy all User Name Server JCL from the Version 6.0 installed SBIPPROC and SBIPSAMP PDSEs to the new User Name Server PDSE and customize them all. When you customize the new Version 6.0 JCL for this migration, do not make the `++HOME++` JCL variable the same value as the existing Version 5.0 component directory, otherwise the previous ENVFILE will be overwritten when you submit the BIPGEN job. Set the `++HOME++` variable to the Started Task user ID home directory (for example, `/u/mq01uns`).
  - a. Customize the BIPEDIT file using values that are defined in the User Name Server's Version 5.0 `mqsicompcif` file. "Equivalent z/OS customization variables in `mqsicompcif` and BIPEDIT" on page 126 lists the customization variables that are used in the Version 5.0 `mqsicompcif` file, and the equivalent variables in the Version 6.0 BIPEDIT file.
  - b. Copy any additional changes that you have made to the environment file, ENVFILE, to BIPUPROF in the component data set. Submit the BIPGEN job to create the environment file, ENVFILE.
  - c. Customize and submit the BIPMGCOMP job.
4. Copy the started task JCL (BIPUNSP) to the procedures library. When you copy the started task, keep a second copy of the original in a safe place for backup purposes.
5. The verification program runs when you start the Version 6.0 User Name Server.

When you have migrated the User Name Server, ensure that you have migrated the rest of the components:

- Migrate the Message Brokers Toolkit
- Migrate the Configuration Manager
- Migrate the broker

When you have completed these tasks, see the post-migration tasks for information about tasks that you might want to perform after migration.

## Migrating from WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0 to WebSphere Message Broker with Rules and Formatter Extension Version 6.0

To migrate a broker domain from WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0 to WebSphere Message Broker with Rules and Formatter Extension Version 6.0, follow the instructions in "Migrating from WebSphere Business Integration Message Broker Version 5.0 to



WebSphere Message Broker Version 6.0” on page 59, replacing all references to “WebSphere Message Broker” with “WebSphere Message Broker with Rules and Formatter Extension”.

For instructions on how to migrate the Rules and Formatter Extension, see the New Era of Networks documentation.

You must migrate the Rules and Formatter extension immediately after migrating from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0. Do not carry out any operations between migrating WebSphere Message Broker and migrating the Rules and Formatter Extension.

### **Migrating from WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0 to WebSphere Message Broker Version 6.0**

Migrate from WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0 to WebSphere Message Broker Version 6.0 only if you have not used the Rules and Formatter functions in WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0, or you do not want to continue using them after the migration.

If you have deployed any message flows that use the Rules and Formatter function that is available in WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0, remove these message flows from the affected brokers before the brokers are migrated to WebSphere Message Broker Version 6.0.

After you have removed these message flows from the affected brokers, follow the instructions in “Migrating from WebSphere Business Integration Message Broker Version 5.0 to WebSphere Message Broker Version 6.0” on page 59.

## **Post-migration tasks**

After you have migrated from Version 5.0 to Version 6.0, finish setting up your environment.

Test the WebSphere Message Broker Version 6.0 broker resources and components to verify that you experience no loss or unexpected change of functionality. Some changes in behavior might be caused by defects that have been fixed between versions.

The following topics describe further tasks that you must do after migration:

- “Removing unwanted files and database tables after migration”
- “Setting up a command environment” on page 52

When you have done these tasks, you can delete the Version 5.0 components and remove the installed code. Access the Version 5.0 information center in the workbench for details of these tasks (or use the link in Related Links).

### **Removing unwanted files and database tables after migration**

When you have completed migration from Version 5.0, you can remove resources from the computer.

#### **Before you start**

Make sure that the migration was successful and that you no longer need to retain the flexibility to use WebSphere Message Broker Version 5.0 code and resources.

To remove unwanted files and database tables after migration:

1. If you no longer need WebSphere Business Integration Message Broker Version 5.0, remove it from the computer. Refer to the WebSphere Business Integration Message Broker Version 5.0 information center for instructions about uninstalling the product.
2. If you no longer use prerequisite software products that are required by Version 5.0 but not for Version 6.0, remove them. For example, DB2 might no longer be required. For instructions, refer to the documentation for those products.
3. If you do not remove DB2, you might want to remove the DB2 database tables used by Configuration Manager Version 5.0.

In Version 6.0, the Configuration Manager stores the domain configuration in an internal repository instead of an external database. Therefore you cannot use your Version 5.0 Configuration Manager DB2 database tables with the Version 6.0 Configuration Manager.

To remove the Configuration Manager DB2 database tables, drop the following database tables by using the DB2 DROP TABLE command. If the Configuration Manager tables are in a DB2 database by themselves, drop the whole database by using the DB2 DROP DATABASE command.

- CACLGROUPS
- CBROKER
- CBROKERCEG
- CCOLLECTIVE
- CCOLLECTIVECBROKER
- CDELETE
- CEG
- CEGCMSGFLOW
- CEGCMSGPROJECT
- CLOG
- CMSGFLOW
- CMSGPROJECT
- CNEIGHBOURS
- COUTSTANDING
- CPROXY
- CPROXYCRESOURCE
- CSUBSCRIBE
- CTOPIC
- CTOPICCTOPIC
- CTOPOLOGY
- CTRACE
- CUUIDLOCKS

### **Setting up a command environment**

After you have installed the product on any of the distributed systems, you must initialize the environment before you can use any runtime component or command.

Also complete this task if you have migrated to WebSphere Message Broker Version 6.0 from a previous version. A profile is provided to help you set up the environment.

Ensure that you use this environment each time you run one of the administrative commands, or start a component; for example, a broker.

For information on setting up your command and runtime environment on a Windows system, see *Command environment: Windows platforms*

For information on setting up your command and runtime environment on Linux and UNIX systems, see *Command environment: Linux and UNIX systems*

---

## Upgrading from WebSphere Event Broker Version 6.0 to WebSphere Message Broker Version 6.0

Upgrade your broker domain to WebSphere Message Broker.

### Before you start

Before you start this task, read about “Coexistence with previous versions and other products” on page 4.

To upgrade a broker domain from WebSphere Event Broker Version 6.0 to WebSphere Message Broker Version 6.0, complete the following steps:

1. Make sure that workbench users have saved all WebSphere Event Broker resources and closed all workbench sessions.
2. Stop the Configuration Manager, User Name Server, and all the brokers.
3. On each computer where the workbench or a broker can run, install WebSphere Message Broker over WebSphere Event Broker.
4. Start the Configuration Manager, User Name Server, and all the brokers.

The upgrade is now complete and the broker domain is ready for use.

---

## Restoring migrated components to previous versions

You can restore migrated components to previous versions of WebSphere Message Broker.

For some components, you restore them to the previous version and their original state; for other components, you restore them to the previous version, but keep any changes that you have made to them, such as deployed message flows.

You might want to restore components if you encounter a problem after you have migrated your broker domain to Version 6.0. By restoring components to the previous level, you can fix the problem with Version 6.0. You do not need to restore the entire domain; restore only those components that are causing a problem. For example, if a message flow does not work as expected in Version 6.0, restore that broker until you can resolve the problem.

You can restore components to a previous version only if they were migrated from that version originally. You cannot create a new Version 6.0 broker, then restore it to a previous level. Nor can you create a Version 2.1 broker, migrate it to Version 6.0, then restore it to Version 5.0.

The topics in this section explain how to restore components and resources that you have migrated from Version 5.0 or Version 2.1 products back to their original state:

- “Restoring components and resources to Version 5.0”
- “Restoring components and resources to Version 2.1” on page 78

## Restoring components and resources to Version 5.0

If you have migrated from Version 5.0 to Version 6.0, you can restore your installation to Version 5.0, subject to certain restrictions.

### Restrictions

- When you restore a broker from Version 6.0 to Version 5.0, message sets are deleted, therefore you must redeploy them. Running the `mqsigratecomponents` command generates BIP warning messages that remind you to do this.
- Source files in Message Brokers Toolkit Version 6.0 are maintained in a different format to that used in Version 5.0 and Version 5.1. The files are migrated to the new format when you save them using the Message Brokers Toolkit Version 6.0. After you have saved them, you can no longer use the resources in Message Brokers Toolkit Version 5.0 or Version 5.1. For detailed information, see “Conditions for using migrated resources with previous versions of the Message Brokers Toolkit” on page 7.
- When you have restored a broker, you must redeploy the bar files that you had previously deployed at Version 6.0. If you do not redeploy, the deployed resources are not compatible with the Version 5.0 broker, and errors are generated when you restart the broker; always check logs to search for errors or warnings about message flows that the broker cannot start.

### Restoring resources to Version 5.0

The following sections describe how to restore the Message Brokers Toolkit and your runtime components to Version 5.0.

#### Restoring the Message Brokers Toolkit to Version 5.0

To restore the Message Brokers Toolkit to Version 5.0:

1. Stop the Message Brokers Toolkit Version 6.0.
2. Restore the Version 5.0 workspace from the backup that you took before migration.

If you did not create a backup of your Version 5.0 workspace, you cannot restore the Message Brokers Toolkit to this version.

3. Restart Message Brokers Toolkit Version 5.0 with your Version 5.0 workspace.

Any changes that you made to resources in the Message Brokers Toolkit Version 6.0 cannot be restored to Version 5.0.

#### Restoring runtime components to Version 5.0

Use the `-s` and `-t` parameters of the `mqsigratecomponents` command to restore components from Version 6.0 to Version 5.0.

- Specify the installed level of Version 6.0 for the source version parameter (`-s`), for example `6.0.0.2` for Version 6.0, Fix Pack 2, or allow this to take the default value.
- Specify the appropriate level of Version 5.0 for the target version parameter (`-t`), for example `5.0.0.8` for Version 5.0, Fix Pack 8.

See the `mqsigratecomponents` command for detailed information about these parameters and the format to use when specifying version numbers.

**z/OS** To restore z/OS runtime components to Version 5.0:

1. Submit the BIPMGCOMP job to call the `mqsigratecomponents` command, specifying the `-s` and `-t` parameters as described above.
2. Replace the started task JCL in USER.PROCLIB with the Version 5.0 backup that you took before migration.

### Restoring a broker to Version 5.0

To restore a migrated broker to its Version 5.0 state:

1. Stop the Version 6.0 broker.
2. Restore the broker to Version 5.0 using the `mqsigratecomponents` command, as shown in the following example:

```
mqsigratecomponents Broker -t 5.0.0.4
```

Warning message BIP8688 might be displayed, warning you to redeploy your message sets.

3. Reverse the changes that you made to the ODBC definitions when you migrated to Version 6.0.
  - **UNIX** On Linux and UNIX, reset the ODBCINI environment variable to point to the previous version of the `odbc.ini` file.
  - **Windows** On Windows, use the Control Panel to adjust the ODBC settings.
4. Restart the broker using a Version 5.0 command window.

If you migrate to Version 6.0, deploy a message set to the Version 6.0 broker, and then migrate back to Version 5.0, Version 5.0 cannot recognize the message set that was deployed by Version 6.0. In this case, any message sets that Version 5.0 cannot use are deleted, and a warning message is displayed for each message set, prompting you to redeploy it to Version 5.0 following successful migration.

### Restoring a User Name Server to Version 5.0

The User Name Server is unchanged between Version 5.0 and Version 6.0.

If you choose to restore a User Name Server to Version 5.0, issue the `mqsigratecomponents` command, as shown in the following example:

```
mqsigratecomponents UserNameServer -t 5.0.0.4
```

### Restoring a Configuration Manager to Version 5.0

When you migrate a Configuration Manager from Version 5.0 to Version 6.0, the DB2 database is neither changed nor deleted. Version 6.0 does not use DB2 for the configuration repository.

If you migrate from Version 6.0 back to Version 5.0, the original DB2 database is used again, so you must ensure that the database is available to the component. If you made any changes after migration to Version 6.0, these changes are not restored to Version 5.0. As a result, you will lose any domain changes that you made after migration to Version 6.0.

If you deployed any broker configuration changes after migration to Version 6.0, these changes are lost when you restore the Configuration Manager to Version 5.0. You must rebuild your brokers by deleting them and redeploying them to maintain a consistent state. Check carefully that your Configuration Manager works correctly before deploying for the first time after migration to Version 6.0.

If you changed the Configuration Manager queue manager during migration to Version 6.0, you must keep the new queue manager if you restore using the `mqsimigratecomponents` command. If the new queue manager is on an operating system other than Windows, you cannot use the `mqsimigratecomponents` command to restore; instead, you must restore from a backup.

The following example shows the command used to restore the Configuration Manager to Version 5.0 state on a Windows system:

```
mqsimigratecomponents ConfigMgr -t 5.0.0.4
```

## Restoring components and resources to Version 2.1

Restore components and resources that you have migrated from Version 2.1 products back to their original version.

### Restrictions

- You can restore resources to a Version 2.1 product only on operating systems that were supported by Version 2.1. You cannot restore resources to Version 2.1 on the following operating systems:
  - Linux (x86 platform)
  - Linux (zSeries<sup>®</sup> platform)
  - Linux (POWER<sup>™</sup> platform)
  - Solaris (x86-64 platform)
- If you have used the following features in Version 6.0, restoring resources to Version 2.1 will result in loss of data:
  - Multicast
  - MQe nodes
  - Quality of Protection (QOP)
- When you restore a broker from WebSphere Message Broker Version 6.0 to Version 2.1, message sets are deleted, so you must redeploy them. You are reminded to do this by warning message BIP8688, which appears when you run the `mqsimigratecomponents` command.
- When you restore a broker from Version 6.0 to Version 2.1 on z/OS, retained publications are deleted.
- After migration to Version 6.0, if you have deployed any message flows that use new Version 6.0 functions, such as new nodes or new ESQLE

syntax, those message flows will not start if your broker is restored to Version 2.1. Other message flows in your broker that do not use new Version 6.0 functions will continue to run.

- Due to coexistence requirements, you can restore the Configuration Manager to Version 2.1 only if you have not migrated any brokers to Version 6.0. If you restore the Configuration Manager to Version 2.1, you must also restore the Message Brokers Toolkit to Version 2.1.

### Restoring resources to Version 2.1

The following sections describe how to restore the Message Brokers Toolkit and runtime components to Version 2.1.

#### Restoring the Message Brokers Toolkit to Version 2.1

If you restore the Message Brokers Toolkit to Version 2.1, you must also restore the Configuration Manager to Version 2.1 at the same time. Any changes that you made after migration to Version 6.0 will be lost.

1. Migrate the Configuration Manager back to Version 2.1.
2. Restart the Version 2.1 Control Center.

#### Restoring runtime components to Version 2.1

Use the `-s` and `-t` parameters of the `mqsigratecomponents` command to migrate components from Version 6.0 to Version 2.1. Specify Version 6.0 for the source version parameter (`-s`) and Version 2.1.0.8 for the target version parameter (`-t`). See the `mqsigratecomponents` command topic for detailed information about these parameters and the format to use when specifying version numbers.

**z/OS** To restore z/OS runtime components to Version 2.1, perform the following steps:

1. Submit the BIPMGCMP job to call the `mqsigratecomponents` command, specifying the `-s` and `-t` parameters as described above.
2. Replace the started task JCL in USER.PROCLIB with the Version 2.1 copy that you backed up.

#### Restoring a broker to Version 2.1

To restore a migrated broker to its Version 2.1 state, perform the following steps:

1. Stop the Version 6.0 broker.
2. Restore the broker to Version 2.1 using the `mqsigratecomponents` command, as shown in the following example:

```
mqsigratecomponents Broker -t 2.1.0.8
```

Warning message BIP8688 might be displayed, warning you to redeploy your message sets.

3. Reverse the changes that you made to the ODBC definitions when you migrated to Version 6.0.
  - **UNIX** On Linux and UNIX, reset the ODBCINI environment variable to point to the previous version of the `odbc.ini` file.
  - **Windows** On Windows, use the Control Panel to adjust the ODBC settings.

#### 4. Restart the broker.

If you migrate to Version 6.0, deploy a message set to the Version 6.0 broker, then migrate back to Version 2.1, Version 2.1 is unable to recognize the message set that was deployed by Version 6.0. In this case, any message sets that Version 2.1 is unable to use are deleted and a warning message is displayed for each message set, prompting you to redeploy it to Version 2.1 following successful migration.

#### Restoring a User Name Server to Version 2.1

The User Name Server has not changed between WebSphere MQ Integrator Broker Version 2.1 and WebSphere Message Broker Version 6.0. To restore a User Name Server to Version 2.1, issue the **mqsimigratecomponents** command, as shown in the following example:

```
mqsimigratecomponents UserNameServer -t 2.1.0.8
```

#### Restoring a Configuration Manager to Version 2.1

If you restore the Configuration Manager to Version 2.1, you must also restore the Message Brokers Toolkit and any brokers to Version 2.1.

The Version 6.0 Configuration Manager does not use the DB2 database that was used by the Version 2.1 Configuration Manager; if you restore to Version 2.1, the original database is used again. This means that any configuration changes that you made after you migrated the Configuration Manager to Version 6.0 will be lost. This can leave your domain in an inconsistent state, forcing you to rebuild and redeploy all of your brokers in order to regain a consistent state. After you have migrated your Configuration Manager to Version 6.0, check carefully that the Message Brokers Toolkit and Configuration Manager are working correctly before you attempt any further configuration changes or before you migrate any brokers.

If you have moved the Configuration Manager's queue manager during migration, you must keep the new queue manager when you restore, unless you restore your entire domain from a backup. If you have moved the Configuration Manager onto an operating system other than Windows, you cannot restore it to Version 2.1 unless you restore your domain from a backup.

Given these warnings, you can restore a Version 6.0 Configuration Manager to Version 2.1 using the command in the following example:

```
mqsimigratecomponents ConfigMgr -t 2.1.0.8
```

Your Version 6.0 Message Brokers Toolkit will no longer work; you must use a Version 2.1 Control Center instead.

---

## Migrating publish/subscribe applications

If you are already using WebSphere MQ Publish/Subscribe, you can migrate your applications to use the publish/subscribe functions provided by WebSphere Message Broker.

Before you start this migration, check that you have the required level of WebSphere MQ for your WebSphere MQ Publish/Subscribe system. WebSphere Message Broker Version 6.0 requires at least WebSphere MQ Version 5.3.

For more information, refer to the following topics:



- “Planning for migration”
- “Running two independent broker networks”
- “Creating and operating a heterogeneous network” on page 82
- “Migrating WebSphere MQ brokers” on page 88
- “Migrating a WebSphere MQ broker network” on page 91

## Planning for migration

If you are already using WebSphere MQ Publish/Subscribe, you can migrate your applications to use the publish/subscribe functions provided by WebSphere Message Broker.

You can also migrate individual WebSphere MQ Publish/Subscribe brokers to create replacement WebSphere Message Broker brokers, with support for their client applications remaining intact.

These two possibilities offer you a number of advantages:

- Publications from within the WebSphere MQ Publish/Subscribe network can be targeted by WebSphere Message Broker subscribers. This includes messages originating in environments not yet supported by WebSphere Message Broker.
- Message flows can be created and deployed on WebSphere Message Broker brokers to:
  - Analyze the information that is flowing around your enterprise.
  - Create and execute additional business logic dependent upon the content of the publications.
  - Consolidate the information within your enterprise in the form of new publications, that can then be republished as a series of additional topics available to both WebSphere Message Broker and WebSphere MQ Publish/Subscribe clients.

There are three possible scenarios for exploiting the two networks:

1. You can choose to have two independent broker networks, and therefore have two separate broker domains for publish/subscribe applications. See “Running two independent broker networks.”
2. You can connect the two networks to allow publications and subscriptions to flow throughout the integrated network. Further details are provided in “Creating and operating a heterogeneous network” on page 82.
3. You can selectively and gradually migrate individual brokers from WebSphere MQ Publish/Subscribe to WebSphere Message Broker. For more guidance on this option, see “Migrating WebSphere MQ brokers” on page 88 and “Migrating a WebSphere MQ broker network” on page 91.

Before you can make this choice, and create your migration plan, you must be aware of the differences between the two products. These differences are described in WebSphere MQ Publish/Subscribe.

## Running two independent broker networks

If you already have an WebSphere MQ Publish/Subscribe broker network, you can continue to use this network unchanged. The introduction of WebSphere Message Broker Version 6.0 to your environment, and the creation of brokers in that broker

domain, does not affect your WebSphere MQ Publish/Subscribe broker domain until you take specific action to connect the two networks.

If you want to run in this mode with two separate, independent networks, you do not have to take any specific actions. You can retain your existing WebSphere MQ Publish/Subscribe network, and install and configure a WebSphere Message Broker Version 6.0 network, without any interaction.

Your existing applications can continue to work unchanged. However, there can be no interchange of publications in this scenario.

You must be aware that a single queue manager cannot support both a WebSphere MQ Publish/Subscribe broker and a WebSphere Message Broker Version 6.0 broker. If you have brokers of both types on the same system, each broker must have its own dedicated queue manager.

You can implement this scenario while you assess the new product and the extra functions contained within the publish/subscribe support. It also lets you plan for the extent of integration or migration, or both, that you require, without affecting your current environment.

## Creating and operating a heterogeneous network

You can integrate your existing WebSphere MQ Publish/Subscribe broker network with a WebSphere Message Broker broker network to create a mixed, heterogeneous network. This enables publications and subscriptions to be propagated through one logical network, made up of two or more physical networks. As a result, subscribers to the WebSphere MQ Publish/Subscribe brokers can target information being published to the WebSphere Message Broker broker network, and subscribers to the WebSphere Message Broker brokers can target information being published to the WebSphere MQ Publish/Subscribe broker network.

In a heterogeneous network, any new stream that is created for a WebSphere MQ Publish/Subscribe broker is supported by any WebSphere MQ Publish/Subscribe brokers that are connected to it. However, the new stream is not supported by WebSphere MQ Publish/Subscribe brokers that are separated by a WebSphere Message Broker broker from the WebSphere MQ Publish/Subscribe broker where the new stream was created.

WebSphere MQ Publish/Subscribe brokers and WebSphere Message Broker brokers can be running on Windows or other platforms.

There are two ways in which a WebSphere Message Broker broker can be joined to the WebSphere MQ Publish/Subscribe network; it can be joined either as a leaf node (that is, as a child of an existing WebSphere MQ Publish/Subscribe broker) or as a parent node (that is, as the parent of an existing WebSphere MQ Publish/Subscribe broker).

Every WebSphere Message Broker broker that you integrate into an WebSphere MQ Publish/Subscribe network must have a minimum of two queues available:

- `SYSTEM.BROKER.DEFAULT.STREAM`

This queue supports the default publication stream. You must create this queue on every broker. You must also create and deploy a message flow that services this stream queue.

- SYSTEM.BROKER.INTER.BROKER.COMMUNICATIONS

This queue is used by the broker to communicate with neighboring WebSphere MQ Publish/Subscribe brokers. You must create this queue on every broker, however the message flow for this queue is created internally by the broker.

### Adding a broker as a leaf node

The steps described in this topic assume that you are joining:

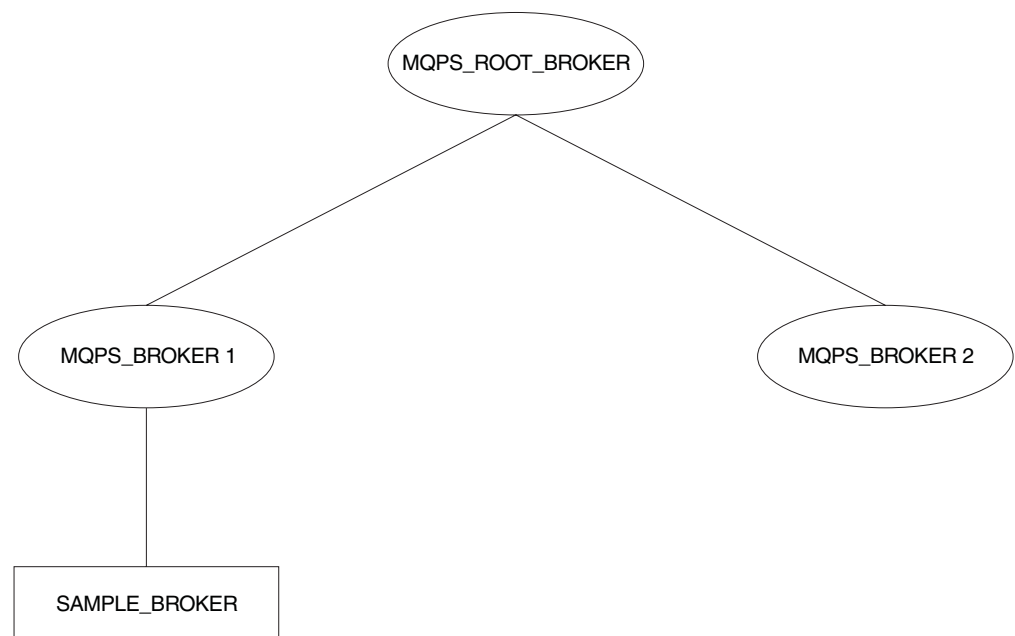
- A WebSphere Message Broker broker named WBRK\_BROKER. When this broker was created, the same name was specified for the queue manager.
- A WebSphere MQ Publish/Subscribe broker network with a root broker MQPS\_ROOT\_BROKER, and two leaf brokers MQPS\_BROKER1 and MQPS\_BROKER2.

Substitute the names of your brokers for these examples wherever they are used.

All commands shown must be issued on the system on which the appropriate resource is defined. WebSphere MQ commands (for example, the command to define a queue) are shown in MQSC format. For more information about WebSphere MQ commands, refer to your WebSphere MQ documentation.

The following steps describe what you should do to add, as a leaf node within your WebSphere MQ Publish/Subscribe broker network, a WebSphere Message Broker broker that you have already created.

This is shown in the following diagram. WebSphere Message Broker broker **WBRK\_BROKER** is joined to the WebSphere MQ Publish/Subscribe network, with broker **MQPS\_BROKER1** as its parent broker.



1. Ensure that the WebSphere Message Broker broker's default execution group is successfully deployed. This execution group is deployed the first time you deploy a newly created WebSphere Message Broker broker. You can check the status of both the execution group and the broker from the topology view in the workbench.

2. Define the queue required to support interbroker communications with WebSphere MQ Publish/Subscribe neighbors on the WebSphere Message Broker broker's queue manager:

```
define qlocal(SYSTEM.BROKER.INTER.BROKER.COMMUNICATIONS) noshare
```

3. Stop the WebSphere Message Broker broker:

```
mqsistop WBRK_BROKER
```

4. Restart the WebSphere Message Broker broker:

```
mqsistart WBRK_BROKER
```

When the WebSphere Message Broker broker is restarted, the presence of the interbroker queue (defined above) enables the broker to receive and process messages on this queue.

5. Create the resources required on the WebSphere Message Broker broker to support the default WebSphere MQ Publish/Subscribe stream:

- a. Create the default stream queue:

```
define qlocal(SYSTEM.BROKER.DEFAULT.STREAM) noshare
```

- b. Create a message flow based on the supplied publish/subscribe message flow:

- 1) Start up the workbench and select the designer view.
- 2) If you have not already imported and saved the default message flows supplied, import these now. This enables you to reuse the default publish/subscribe flow here. Click **File** → **Import** and open the file, called `SampleWorkspaceForImport`, in the `examples` subdirectory within the WebSphere Message Broker home directory. This might take a few minutes to complete.

If you prefer, you can create your own message flow.

- 3) Make a copy of the supplied message flow and rename it.
- 4) Check the properties of the nodes in the message flow. You must set the appropriate input (stream) queue property for the MQInput node. Check that the other properties of the nodes are set correctly for your requirements.
- 5) Finally, check in your changes and deploy the message flow to the default execution group of the broker `WBRK_BROKER`.

You can find full details of how to complete these steps in the online help for the workbench.

6. If you are using additional streams in the WebSphere MQ Publish/Subscribe network, you must also enable these on the WebSphere Message Broker broker. Although the WebSphere Message Broker broker is able to support all the streams of its WebSphere MQ Publish/Subscribe neighbors, you need only define queues, and define and deploy message flows, for those streams requested by WebSphere Message Broker subscriber clients.

- a. Create a local queue on the WebSphere Message Broker broker's queue manager for each stream on which messages are to be processed. For example:

```
define qlocal(STREAM.X) noshare
```

- b. Create and deploy a message flow to read and process the WebSphere MQ Publish/Subscribe messages that are sent to each stream (publication) queue.

You can use the supplied publish/subscribe message flow as the basis for each new message flow. Each MQInput node representing a non-default stream must have the property `implicitStreamNaming` set (this is the default setting).

7. Ensure that the WebSphere MQ Publish/Subscribe broker is running. If it is not, you can start it using the start command:  

```
strmqbrk MQPS_BROKER1
```
8. Ensure that the WebSphere MQ connection between the two brokers is enabled; you must start the listeners for the receiver channels, and you must then start the sender channels.
9. Join the WebSphere Message Broker broker to the WebSphere MQ Publish/Subscribe network as a child of the WebSphere MQ Publish/Subscribe broker:  

```
mqsijoinmqpubsub WBRK_BROKER -p MQPS_BROKER1
```
10. Verify the success of the join command to ensure that the WebSphere MQ Publish/Subscribe broker is an active neighbor:  

```
mqsilistmqpubsub WBRK_BROKER
```

If the join command has completed successfully, you see a response to the list command that is similar to:

```
BIP8090I: WebSphere MQ Publish/Subscribe neighbor WBRK_BROKER
         is active

BIP8091I: Common stream      SYSTEM.BROKER.DEFAULT.STREAM
BIP8091I: Common stream      STREAM.X
```

## Adding a broker as a parent node

The steps described in this topic assume that you are joining:

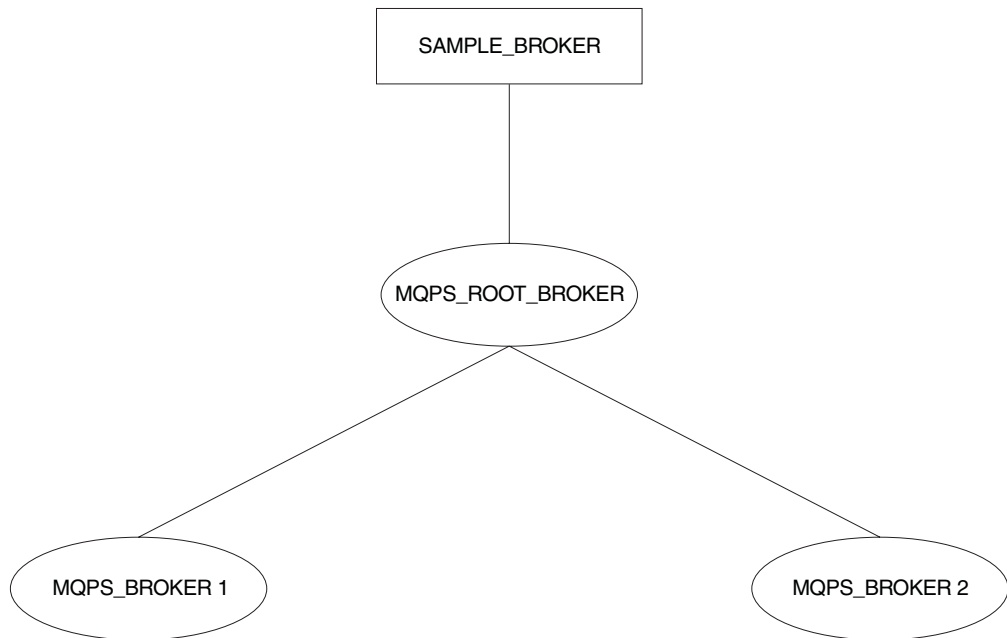
- A WebSphere Message Broker broker named WBRK\_BROKER. When this broker was created, the same name was specified for the queue manager.
- A WebSphere MQ Publish/Subscribe broker network with a root broker MQPS\_ROOT\_BROKER, and two leaf brokers MQPS\_BROKER1 and MQPS\_BROKER2.

Substitute the names of your brokers for these examples wherever they are used.

All commands shown must be issued on the system on which the appropriate resource is defined. WebSphere MQ commands (for example, the command to define a queue) are shown in MQSC format. For more information about WebSphere MQ commands, refer to your WebSphere MQ documentation.

The following steps describe what you should do to add, as a parent node within your WebSphere MQ Publish/Subscribe broker network, a WebSphere Message Broker broker that you have already created.

This is shown in the following diagram. WebSphere Message Broker broker **SAMPLE\_BROKER** is joined to the WebSphere MQ Publish/Subscribe network as the new parent node (that is, as the parent of the original parent node **MQPS\_ROOT\_BROKER**).



1. Ensure that the WebSphere Message Broker broker's default execution group is successfully deployed. This execution group is deployed the first time you deploy a newly created WebSphere Message Broker broker. You can check the status of both the execution group and the broker from the topology view in the workbench.
2. Define the queue required to support interbroker communications with WebSphere MQ Publish/Subscribe neighbors on the WebSphere Message Broker broker's queue manager:  

```
define qlocal(SYSTEM.BROKER.INTER.BROKER.COMMUNICATIONS) noshare
```
3. Stop the WebSphere Message Broker broker:  

```
mqsistop SAMPLE_BROKER
```
4. Restart the WebSphere Message Broker broker:  

```
mqsistart SAMPLE_BROKER
```

When the WebSphere Message Broker broker is restarted, it is enabled to receive and process messages on the interbroker queue.
5. Create the resources required on the WebSphere Message Broker broker to support the default WebSphere MQ Publish/Subscribe stream:
  - a. Create the default stream queue:  

```
define qlocal(SYSTEM.BROKER.DEFAULT.STREAM) noshare
```
  - b. Create a message flow for publish/subscribe, either your own, or one based on the supplied publish/subscribe message flow:
    - 1) Start up the workbench and select the designer view.
    - 2) Make a copy of the supplied message flow and rename it; you must import this default message flow before you can access and use it.
    - 3) Check the properties of the nodes in the message flow. You must set the appropriate input (stream) queue property for the MQInput node. Check that the other properties of the nodes are set correctly for your requirements.
    - 4) Finally, deploy the message flow to the default execution group of the broker SAMPLE\_BROKER.

You can find full details of how to complete these steps in the online help for the workbench.

6. If you are using additional streams in the WebSphere MQ Publish/Subscribe network, you must also enable these on the WebSphere Message Broker broker. Although the WebSphere Message Broker broker is able to support all the streams of its WebSphere MQ Publish/Subscribe neighbors, you need only define queues, and define and deploy message flows, for those streams requested by WebSphere Message Broker subscriber clients.

- a. Create a local queue on the WebSphere Message Broker broker's queue manager for each stream on which messages are to be processed. For example:

```
define qlocal(STREAM.X) noshare
```

- b. Create and deploy a message flow to read and process the WebSphere MQ Publish/Subscribe messages that are sent to each stream (publication) queue.

You can use the supplied publish/subscribe message flow as the basis for each new message flow. Each MQInput node representing a non-default stream must have the property *implicitStreamNaming* set.

7. Enter the following WebSphere MQ Publish/Subscribe command against the broker that is the current WebSphere MQ Publish/Subscribe parent broker, to terminate its activities:

```
endmqbrk -c -m MQPS_ROOT_BROKER
```

This requests a controlled shutdown (-c). When the shutdown has completed, the broker can be restarted. You can request an immediate shutdown, by specifying -i instead of -c, if you need to force this shutdown to complete.

8. Ensure that the WebSphere MQ connection between the two brokers is active; you must start the listeners for the receiver channels, and then start the sender channels.

9. Enter the following WebSphere MQ Publish/Subscribe command against the current WebSphere MQ Publish/Subscribe parent broker to restart it:

```
strmqbrk -m MQPS_ROOT_BROKER -p SAMPLE_BROKER
```

If the queue manager associated with the WebSphere Message Broker broker SAMPLE\_BROKER has not been created with the same name as the broker, you must specify the queue manager name here after the -p flag, not the broker name.

10. Verify the success of the integration:

```
mqsilistmqpubsub SAMPLE_BROKER
```

If the WebSphere Message Broker broker has been integrated into the WebSphere MQ Publish/Subscribe network successfully, you see a response that is like the following:

```
BIP8090I: WebSphere MQ Publish/Subscribe neighbor SAMPLE_BROKER
         is active
```

```
BIP8091I: Common stream      SYSTEM.BROKER.DEFAULT.STREAM
BIP8091I: Common stream      STREAM.X
```

## Deleting brokers

If you have a mixed broker network, you must take particular care to maintain the integrity of the network if you need to remove or delete a broker from the network:

- When you issue the `mqsideletebroker` command to delete a WebSphere Message Broker broker, the WebSphere MQ Publish/Subscribe brokers that are neighbors of this WebSphere Message Broker broker are not automatically informed of its

deletion. Remove the WebSphere Message Broker broker from the network using the clear commands `mqsiclearmqpubsub` (at the WebSphere Message Broker broker) and `clrmqbrk` (at its WebSphere MQ Publish/Subscribe neighbors) before you delete it.

- If you delete a WebSphere Message Broker broker before you remove it from the network, and it has a parent WebSphere MQ Publish/Subscribe broker, the parent broker continues to attempt to send publication and subscription messages to it. You can correct this behavior by issuing the `clrmqbrk` command at the parent. For example, if you issue:

```
mqsideletebroker -m WBRK_CHILD_BROKER
```

while the WebSphere Message Broker broker is still known to its parent WebSphere MQ Publish/Subscribe broker, you can then issue the command

```
cclrmqbrk -m MQPS_PARENT_BROKER -c WBRK_CHILD_BROKER
```

to the parent broker to clean up the network.

- When you issue the `dltmqbrk` command to delete an WebSphere MQ Publish/Subscribe broker that is a child of a WebSphere Message Broker broker, the WebSphere Message Broker broker receives notification of the deletion. Therefore you do not have to issue the `mqsiclearmqpubsub` command to remove knowledge of the deleted child at the WebSphere Message Broker parent broker. For example, if you want to delete the child broker `MQPS_CHILD_BROKER` you must issue the following single command:

```
dltmqbrk -m MQPS_CHILD_BROKER
```

You are prevented from deleting a WebSphere MQ Publish/Subscribe broker that is a parent of any broker; the `dltmqbrk` command fails.

## Migrating WebSphere MQ brokers

### Migrating WebSphere MQ brokers

When you plan the migration of one or more WebSphere MQ brokers, you must take account of the differences between WebSphere MQ Publish/Subscribe and WebSphere Message Broker. This might mean that you have to make some changes to your applications, your topics, or both, before you start migration.

The information here tells you the steps you must take to migrate a single broker. “Migrating a WebSphere MQ broker network” on page 91 tells you how to migrate a WebSphere MQ broker network.

These steps result in the replacement of the WebSphere MQ brokers by WebSphere Message Broker brokers.

Each replacement WebSphere Message Broker broker must be created on the same queue manager as the WebSphere MQ broker that it replaces. Because the WebSphere MQ broker shares the same name as the queue manager that supports it, you must specify the WebSphere MQ broker name as the queue manager parameter on the `mqsicreatebroker` command (the `-q` flag).

Migration involves the transfer of the following state information from the WebSphere MQ broker to the WebSphere Message Broker broker:

- Subscriptions.  
All client subscriptions are exported from all streams except `SYSTEM.BROKER.ADMIN.STREAM`.
- Retained publications.



All retained publications in MQRFH format are exported from all streams except SYSTEM.BROKER.ADMIN.STREAM.

- Local publishers.

Registrations for all publishers that are producing local publications are exported from all streams except SYSTEM.BROKER.ADMIN.STREAM.

- Related brokers.

If the broker is part of a multi-broker hierarchy, details of all its relations are exported. This includes the names of all streams that the broker to be migrated has in common with the relation.

- Streams.

On WebSphere MQ Publish/Subscribe, streams are the queues from which publications are read by a broker.

This information is exported as a series of messages that are sent from the WebSphere MQ broker to its replacement. When migration is complete, the WebSphere MQ broker is deleted automatically, and cannot be recreated.

## The workbench and migration

If you are migrating a WebSphere MQ broker, you cannot fully deploy it in your WebSphere Message Broker broker domain until migration has completed successfully. You should not deploy additional execution groups or message flows until after you have successfully migrated the WebSphere MQ Publish/Subscribe broker.

Use the *Broker Topology* editor to define the WebSphere Message Broker broker, and deploy the topology. Create an empty .bar file and drag it onto the default execution group. You are now ready to start the migration.

If migration fails, and you want to revert to your WebSphere MQ broker, you must delete the WebSphere Message Broker. See *Deleting a broker*.

## Migrating a single broker

When you migrate a WebSphere MQ broker that is not part of a network, you are replacing it in the network and assigning all the function that was previously supported by that broker to a WebSphere Message Broker broker.

You must shutdown the WebSphere MQ broker before you start migration, and ensure that all applications that use the broker are also quiesced.

## Preparing for the migration

Before you can migrate a broker, you need to do some preparation.

1. Identify the WebSphere MQ broker that you are going to migrate.

The steps used here assume you have chosen the name WBRK\_BROKER for your new WebSphere Message Broker broker, and that the WebSphere MQ broker you are migrating is currently hosted by the queue manager MQPS\_BROKER1.

2. Back up the queue manager hosting the WebSphere MQ broker.

Ensure that this backup is complete before you start the migration process. This allows you to retrieve the old WebSphere MQ broker after successful migration, if you should need to do so for any reason. The *WebSphere MQ System Administration* book describes this backup process.

3. Quiesce any applications that are registered with the broker.  
Any messages generated during the migration exercise are queued and could cause performance or capacity problems. Quiescing the applications as well as the broker ensures that publish/subscribe traffic is only generated when there is a broker ready to process it.
4. End your WebSphere MQ broker operation:  

```
endmqbrk MQPS_BROKER1
```

## Preparing the replacement broker

You are now ready to work with the new broker.

1. Create a WebSphere Message Broker broker.  
You must create the new broker on the system on which the queue manager MQPS\_BROKER1 is defined. You must select the migration option (flag -m) on the command.  

```
mqsicreatebroker WBRK_BROKER -q MQPS_BROKER1  
-i mqbroker -a sample -n WBRKBKDB -m
```
2. Start the new WebSphere Message Broker broker:  

```
mqsistart WBRK_BROKER
```
3. Configure the broker in the workbench.  
Create the new broker in the broker domain topology from the *Topology* view in the workbench. Save and deploy the topology. Create a default execution group and drag an empty .bar file onto the default execution group.

## Migrating the WebSphere MQ broker

The new WebSphere Message Broker broker is ready to receive migration data for the WebSphere MQ broker that it replaces.

1. Migrate the WebSphere MQ broker function to the replacement WebSphere Message Broker broker by issuing the following command:

```
migmqbrk -m MQPS_BROKER1
```

This command is supplied as part of the WebSphere MQ Publish/Subscribe package on the Web. You must ensure you have the latest level of this command, and the *WebSphere MQ Publish/Subscribe User's Guide* that describes its use.

The command retrieves the persistent information (subscriptions and retained publications) from the WebSphere MQ broker, and sends it in specially constructed messages to the queue SYSTEM.BROKER.INTERBROKER.QUEUE on the new WebSphere Message Broker broker.

The message flow that services this queue (deployed when you deployed the broker and its default execution group) receives these messages and records the information. When all the messages have been processed, the message flow is terminated and cannot be re-initialized.

The migration command can only be re-invoked if the whole process of migration has not completed successfully. If any error occurs, for any reason, the WebSphere MQ broker is recoverable and can be restarted. You can then continue to use it. The WebSphere Message Broker broker also exists, but has not recorded any migration information. You can delete and create this broker to restart the migration process.

If the whole process succeeds, the WebSphere MQ broker no longer exists and cannot be recovered.

You receive the following message on successful completion of migration:

WebSphere MQ broker has been successfully migrated

When you have successfully migrated all the WebSphere MQ brokers that you plan to migrate, delete or rename the file `strmqbrk.exe`. This prevents any WebSphere MQ brokers from starting accidentally.

## Deploying the stream queues

The new WebSphere Message Broker broker is now set up to take over from the WebSphere MQ broker. You must create and deploy the message flows that it needs to activate the streams; you do not need to define the stream queues, because these are already defined to the queue manager. The queue definitions are not deleted when the migration takes place, and the same queue manager is used by the WebSphere MQ broker and the WebSphere Message Broker broker that has replaced it.

You can create the message flows you need by following these steps:

1. Start the workbench and select the message flow view.
2. For each stream, including the default stream:
  - a. Build a basic publish/subscribe message flow by copying and renaming the supplied publish/subscribe message flow.
  - b. Check the properties of the nodes in each message flow that you create. You must set the input queue name (the stream queue) property in the input node. You must also set the `implicitStreamNaming` property for every non-default stream queue input node.
  - c. Finally, assign the message flow to an execution group of the broker `WBRK_BROKER`, check in your changes, and deploy the broker.

## Migrating a WebSphere MQ broker network

The procedure that you must follow to migrate a WebSphere MQ broker that is part of a multi-broker network is basically the same as that needed to migrate a single broker.

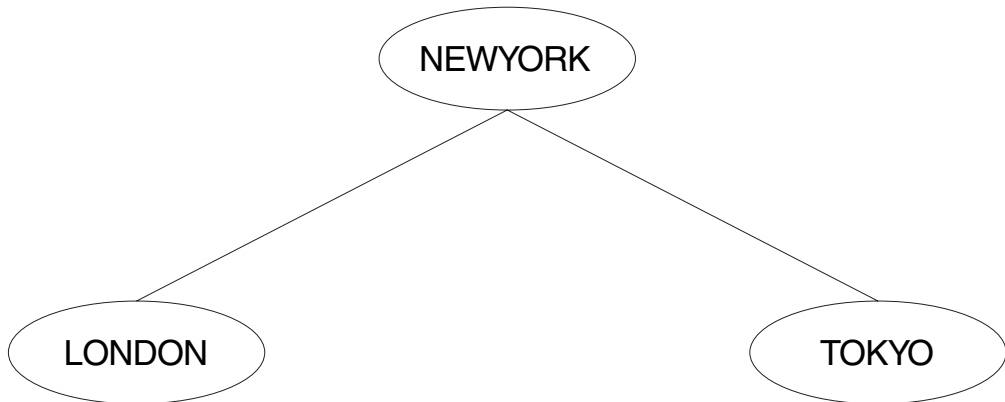
Before you start the migration, you must consider:

- The order in which you migrate the brokers.
- The place of each broker in the network, and the relationships it has with its neighbors.
- The use of collectives in the WebSphere Message Broker network.

Refer to “Planning for migration” on page 81 for more information.

The following sequence of figures illustrates the migration of a network of three brokers. The actions taken to migrate the network assumes that the three brokers are migrated one at a time, and that all three are to be grouped in a single collective in the WebSphere Message Broker broker domain.

The WebSphere MQ broker network that is to be migrated has three brokers, the root (NEWYORK) and two children (LONDON and TOKYO).



These brokers do not have to be migrated in any particular order. This example shows the migration being done in the following order:

1. LONDON
2. NEWYORK
3. TOKYO

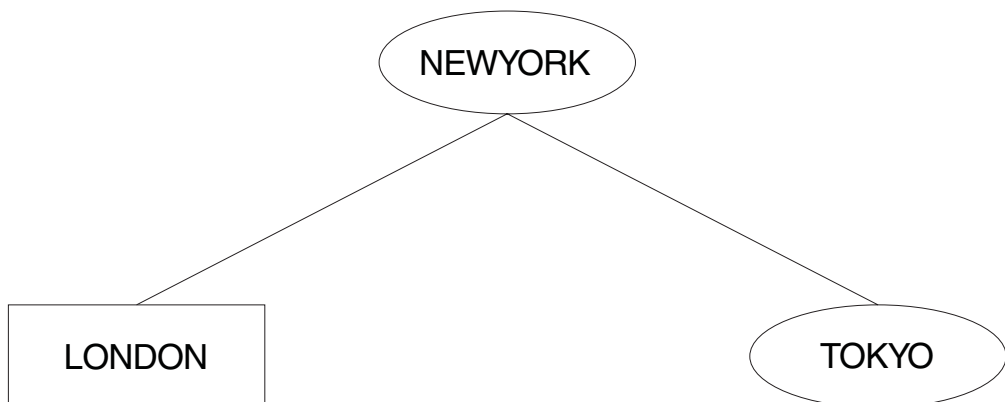
The migration is completed in a number of separate steps. Each step is best taken when network traffic is low (for example, at weekends). The whole migration is planned in three stages:

### Stage 1: migration of the LONDON broker

The steps that you need to take to migrating a single broker within a network are exactly the same as those that you need to take to migrate a standalone WebSphere MQ broker. See “Migrating WebSphere MQ brokers” on page 88.

1. Quiesce all client applications at both the LONDON and NEWYORK brokers. This ensures that no publications are missed by any subscribers while the topology is being changed.
2. Quiesce all other brokers in the network (in this example, the TOKYO broker). This guarantees that no publications are delivered while the topology is being changed.

After the migration of the LONDON broker you have a mixed network, consisting of two WebSphere MQ brokers (NEWYORK and TOKYO) and one WebSphere Message Broker broker:



The connection between the LONDON and NEWYORK brokers is a WebSphere MQ connection. The workbench only recognizes WebSphere Message Broker brokers, and therefore only LONDON has been defined to it. A WebSphere Message Broker connection cannot be created at this stage.

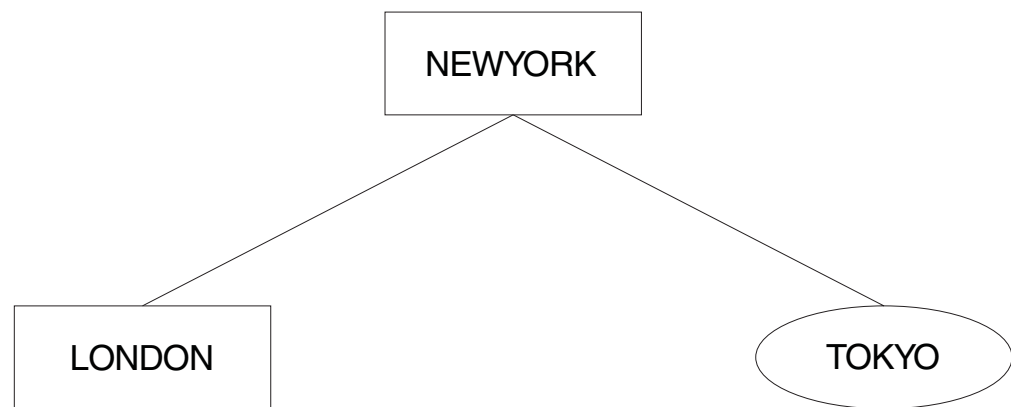
This mixed network is in a perfectly valid state. It can remain in this state until you are ready to do the next stage of the migration.

## Stage 2: migration of the NEWYORK broker

Follow the step-by-step procedure for migrating a single broker for broker NEWYORK. This is described in “Migrating WebSphere MQ brokers” on page 88.

1. Quiesce all client applications at all brokers to which NEWYORK is a neighbor; in this network, LONDON and TOKYO. This ensures that no publications are missed by any subscribers while the topology is being changed.
2. Quiesce all the brokers in the network. This guarantees that no publications are delivered while the topology is being changed.

The network now contains two WebSphere Message Broker brokers (LONDON and NEWYORK), and one WebSphere MQ broker (TOKYO):



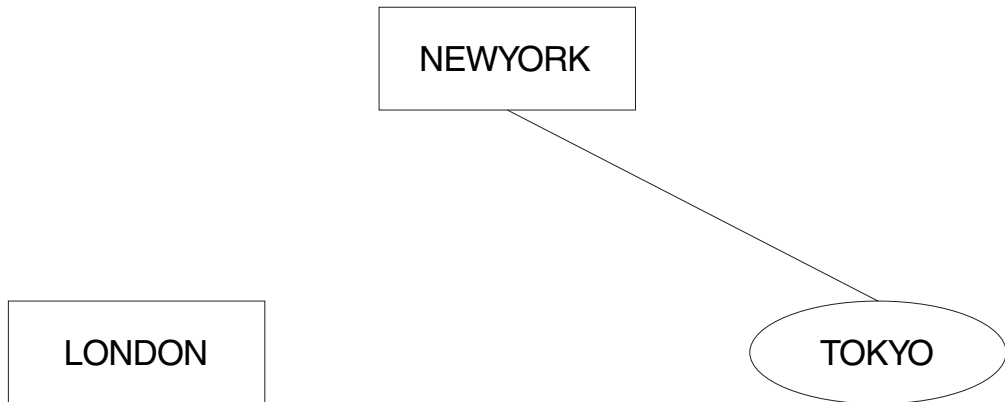
The LONDON and NEWYORK brokers are still connected by a WebSphere MQ connection. They can remain connected in this way for as long as necessary. However, to develop applications that use the functions provided by WebSphere Message Broker you must join the two WebSphere Message Broker brokers together using the workbench.

The connection can be upgraded to a WebSphere Message Broker connection by first removing the original WebSphere MQ connection between LONDON and NEWYORK.

To remove this connection, issue the WebSphere Message Broker command `mqsiclearmqpubsub` at both brokers:

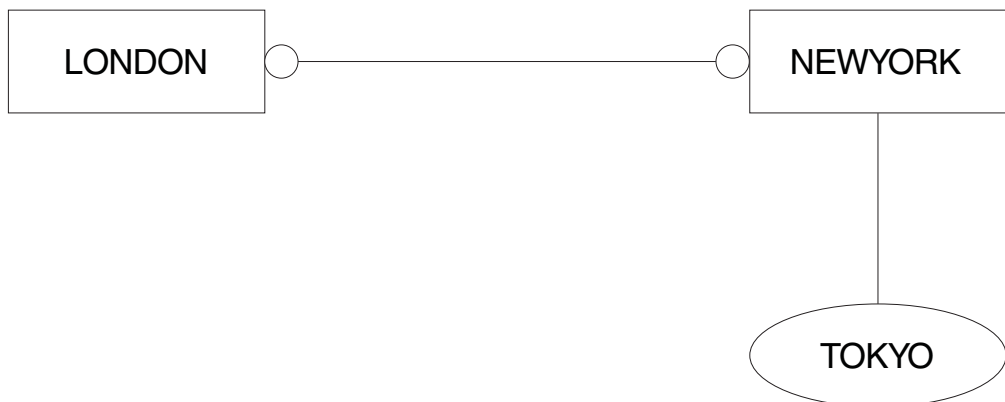
```
mqsiclearmqpubsub NEWYORK -n LONDON  
mqsiclearmqpubsub LONDON -n NEWYORK
```

The network now looks like this:



Now use the workbench to define the relationship between the two brokers, LONDON and NEWYORK. Both brokers are already defined, but the collective to which they are to be assigned is not. You can define this collective from the *Topology* view, and assign the two brokers to it. All brokers in a collective are assumed to be connected, so you do not have to make those connections using the workbench.

The new topology can now be deployed. The connection between LONDON and NEWYORK is now implemented using WebSphere Message Broker functions. The network is now:



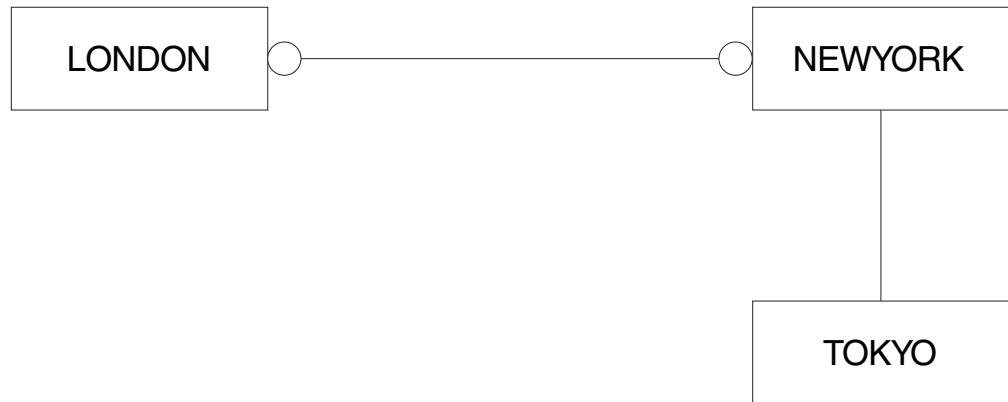
The two brokers, LONDON and NEWYORK, are no longer in a parent-child relationship but are neighbors within a collective. The topology of the WebSphere Message Broker network is not based on a hierarchical structure as was the WebSphere MQ network.

Now that LONDON and NEWYORK form a collective, there is no root node left in the WebSphere MQ network. NEWYORK is the gateway between the WebSphere MQ broker (TOKYO) and the WebSphere Message Broker collective of brokers.

### Stage 3: migration of the TOKYO broker

The final WebSphere MQ broker, TOKYO, is now ready to be migrated. Follow the procedure described in “Migrating WebSphere MQ brokers” on page 88.

The network is now:



The WebSphere MQ connection between TOKYO and NEWYORK can now be broken. This is done by using the following commands:

```
mqsiclearmqpubsub NEWYORK -n TOKYO  
mqsiclearmqpubsub TOKYO -n NEWYORK
```

Now use the workbench to add the TOKYO broker to the WebSphere Message Broker network, and to the collective. The operation of a collective requires that all brokers have direct physical connections with each other (via WebSphere MQ).

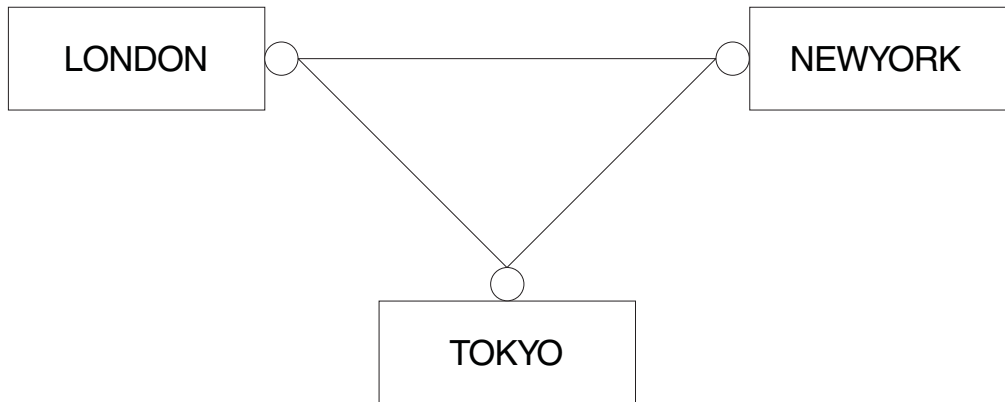
Before the topology of the new WebSphere Message Broker network can be deployed, a WebSphere MQ connection between LONDON and TOKYO is required. A series of WebSphere MQ commands must be invoked to define the channels and transmission queues that support two-way traffic.

When you have completed the migration of all the brokers in the collective, you have removed the single point of failure at the NEWYORK broker. Subscribers on the LONDON broker can receive publications from the TOKYO broker even when the NEWYORK broker is not running.

Before migration, traffic between brokers was always routed through NEWYORK, the root node, which was therefore the single point of failure.

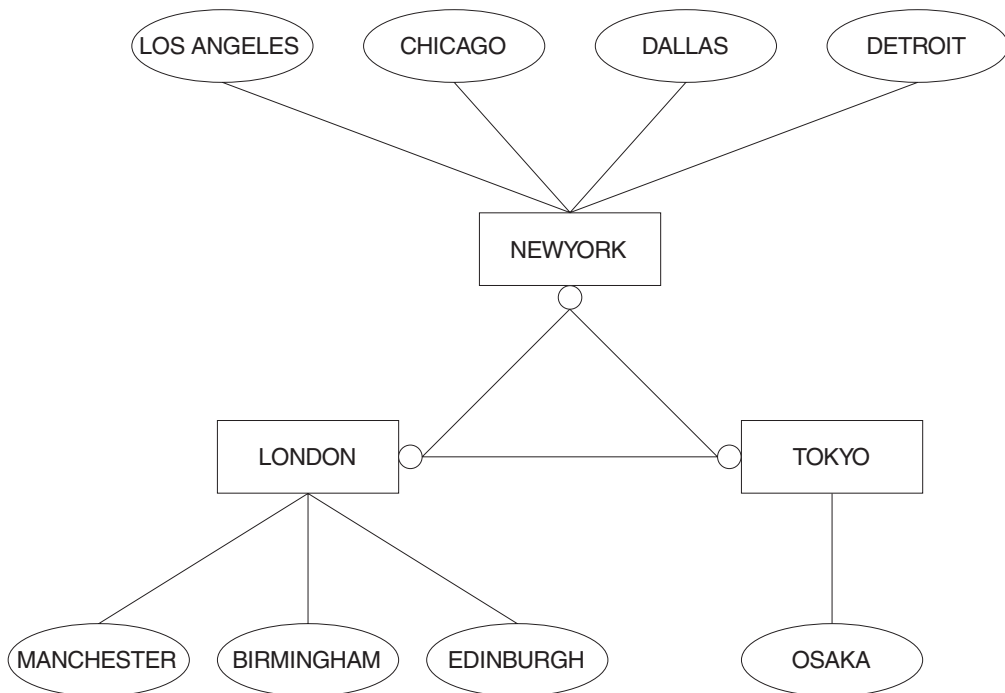
For further details of connecting brokers to each other, see *Configuring WebSphere Message Broker*. For more general information about distributed WebSphere MQ networks, refer to *WebSphere MQ Intercommunication*.

When all migration and associated tasks have been completed, the network comprises a single collective, containing three WebSphere Message Broker brokers connected as equals.



### A network of migrated brokers

The following diagram shows a mixed network of WebSphere Message Broker and WebSphere MQ brokers. Brokers NEWYORK, LONDON, and TOKYO have been migrated to form a WebSphere Message Broker collective. All the other brokers remain as WebSphere MQ brokers.





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## Migration and upgrade

Consider the factors involved in the migration of components and resources from Version 2.1 or Version 5.0 to Version 6.0.

This section contains the following topics:

- “Supported migration and upgrade paths”
- “Message flow migration notes” on page 100
- “Message set migration notes” on page 116
- “Equivalent z/OS customization variables in mqsicompconf and BIPEDIT” on page 126
- “Assignments configuration data in an export file” on page 128
- “Migration glossary” on page 131

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### Supported migration and upgrade paths

Migration and upgrade paths are provided to Version 6.0 products.

From ...	You can migrate to ...
MQSeries Integrator Version 2.0.2	<ul style="list-style-type: none"><li>• Migration from MQSeries Integrator Version 2.0.2, or an earlier release, is not supported.</li></ul>
WebSphere MQ Event Broker Version 2.1 (at any service level)	<ul style="list-style-type: none"><li>• WebSphere Event Broker Version 6.0</li><li>• WebSphere Message Broker Version 6.0</li></ul>
WebSphere MQ Integrator Broker Version 2.1 (at CSD02 or later) <sup>1</sup>	<ul style="list-style-type: none"><li>• WebSphere Message Broker Version 6.0</li></ul>
WebSphere MQ Integrator Version 2.1 (at CSD02 or later) <sup>1</sup>	<ul style="list-style-type: none"><li>• WebSphere Message Broker Version 6.0<sup>2</sup></li><li>• WebSphere Message Broker with Rules and Formatter Extension Version 6.0</li></ul>
WebSphere MQ Event Broker Version 2.1 (at any service level) and WebSphere MQ Integrator Broker Version 2.1 <sup>3</sup> (at CSD02 or later) <sup>1</sup>	<ul style="list-style-type: none"><li>• WebSphere Message Broker Version 6.0</li></ul>
WebSphere MQ Event Broker Version 2.1 (at any service level) and WebSphere MQ Integrator Version 2.1 <sup>3</sup> (at CSD02 or later) <sup>1</sup>	<ul style="list-style-type: none"><li>• WebSphere Message Broker Version 6.0<sup>2</sup></li><li>• WebSphere Message Broker with Rules and Formatter Extension Version 6.0</li></ul>
WebSphere Business Integration Event Broker Version 5.0	<ul style="list-style-type: none"><li>• WebSphere Event Broker Version 6.0</li><li>• WebSphere Message Broker Version 6.0</li></ul>
WebSphere Business Integration Message Broker Version 5.0	<ul style="list-style-type: none"><li>• WebSphere Message Broker Version 6.0</li></ul>
WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0	<ul style="list-style-type: none"><li>• WebSphere Message Broker Version 6.0<sup>4</sup></li><li>• WebSphere Message Broker with Rules and Formatter Extension Version 6.0</li></ul>
WebSphere MQ Publish/Subscribe	<ul style="list-style-type: none"><li>• WebSphere Event Broker Version 6.0</li><li>• WebSphere Message Broker Version 6.0</li></ul>

From ...	You can migrate to ...
WebSphere Event Broker Version 6.0	<ul style="list-style-type: none"> <li>WebSphere Message Broker Version 6.0</li> </ul>

**Notes:**

1. If you have applied CSD02, CSD03, CSD04, or CSD05 to Version 2.1, you must apply an additional APAR (IY45459) in order for migration to be successful. APAR IY45459 is included in CSD06.
2. This migration path is possible only if you have not used the New Era of Networks Rules and Formatter support in WebSphere MQ Integrator Version 2.1, or you do not want to continue using it after migration.
3. Two broker domains are merged into one broker domain during migration.
4. This migration path is possible only if you have not used the Rules and Formatter function in WebSphere Business Integration Message Broker with Rules and Formatter Extension Version 5.0, or you do not want to continue using it after migration.

---

## Message flow migration notes

This section provides reference information to help you to migrate message flows to WebSphere Message Broker Version 6.0.

It contains the following topics:

- “Migrating message flows from Version 2.1”
- “Migrating message mappings from Version 5.0” on page 103
- “Migrating a user-defined node from Version 5.0 or Version 5.1” on page 107
- “Migrating a message flow that contains WebSphere MQ Everyplace nodes” on page 109
- “Migrating style sheets and XML files” on page 116

If you are using the Message Brokers Toolkit Version 5.1, replace all references in these topics to “Version 5.0” with “Version 5.1”.

### Migrating message flows from Version 2.1

Use the `mqsimigratemsgflows` command to migrate message flows from Version 2.1 to Version 6.0. **It is not necessary to use this command when migrating from Version 5.0 to Version 6.0.**

This topic contains the following sections:

- “Conditions for using the `mqsimigratemsgflows` command”
- “Custom property editor” on page 101
- “Promoted property name” on page 101
- “Converting Version 2.1 names that are not valid” on page 102
- “Mapping of node type” on page 102

#### Conditions for using the `mqsimigratemsgflows` command

- Export message flows from Version 2.1 to an export file. You can use SupportPac utilities to create the files, and these exported files are the input to the migration process.

- Message flows that are found in multiple export files are migrated each time that they occur. When migrating a message flow, any previous flow with the same name is overwritten without warning.
- Message flows and their related subflows should be exported to the same file. This is the default Version 2.1 export behavior. This helps you to identify and resolve references to the other message flows and subflows, and to rename objects consistently. The migration uses the name of the message flow rather than the UUID to link flows and subflows and to name the message flow file.
- If a message flow refers to a subflow that cannot be located, but appears to be in the project, it is possible that it has been migrated separately, and was referenced internally in an inconsistent manner due to renaming. To correct the situation, export the message flows again in the same export file.
- User-defined nodes should be exported to the same export file as the message flows that are using them. If you do not do this, the message flows that have references to the user-defined nodes refer to these as .msgflow files rather than .msgnode files. The migration report specifies if this has occurred.
- User-defined nodes that are also input nodes (for example, those nodes that accept messages), must have their new "input node" system property set after migration using the Message Node editor. This allows the Rational® Application Developer to recognize these nodes on the same level as, for example, MQInput.
- When migration is complete, open the workbench. If the project is closed, open it; if the project is open, refresh it and clean all the projects by clicking Project -> Clean.
- ESQL code is copied from the Version 2.1 message flow and put in a MODULE. There is no change to the code.
- ESQL filter expressions are migrated in the following manner:
  - If a RETURN statement is found in the code, a module is created, just like any other compute expression, field mapping or database statement.
  - If a RETURN statement is not found, the ESQL code is wrapped around a RETURN statement.

Review the results of this migration in case the detection of the RETURN statement did not work as expected.

## Custom property editor

When a user-defined node or a promoted property has a Property editor, the XML attribute is type="MyType" and there exists a class `<package>MyTypePropertyEditor.class`.

The Property editors themselves (written in Java code) are not migrated. However, if new ones are created (using the Eclipse SWT toolkit) with the same class name, the new editor is found and loaded without the need to change the migrated flow.

## Promoted property name

In Version 2.1, when a promoted property is created through the drag-and-drop process, the property name (xmi.label) is set to be the translation of the attribute name. The original attribute name must not contain spaces otherwise it is rejected by the broker. However, promoted attributes are never sent to the broker, so they might have contained spaces in Version 2.1.

When the message flow is migrated, the original name is lost and only the translation is kept. The promoted attribute can override several attributes, so the original name must correspond to the translated name.

The solution is to generate a suitable attribute name by replacing spaces or other offending characters with the unicode representation. The *propertyName* attribute of the *propertyDescriptor* is set to `key=Property.<the translated attribute name>`. The UI returns *<the translated attribute name>*.

However, migrated message flows have not retained the attribute system name, only the translated name. It is therefore difficult or impossible to locate the original attribute. For example, a *DataSource* promoted property is not shown as translated if the message flow is shipped as a plug-in flow and another user flow promotes the property from the plug-in flow.

## Converting Version 2.1 names that are not valid

Message flows and properties can contain names that are not valid in Version 6.0. If this situation arises, the following transformation occurs. Each offending character is replaced with a series of characters representing its unicode code point. For example, an exclamation mark ("!") is replaced with X0026. This is explained in the report file that is generated.

This transformation is deterministic. If a message flow is migrated on another occasion, and the message flow refers to a flow with a character that is not valid, both names are transformed in the same way.

These transformations do not result in conflicting names except in extremely rare circumstances. A conflict might occur because a Unicode code point sequence occurs in a name precisely where the corresponding character occurs in another name, which is otherwise identical. In this case, rename one of these message flows or properties and re-export the flows. Select a new name that does not contain a Unicode code point sequence ('Xnnnn') and rename the message flow in the Control Center before you migrate. Never rename a .msgflow file in the file system; always use the Control Center or the workbench to perform renaming tasks.

## Mapping of node type

Version 2.1 nodes are converted to Version 6.0 nodes as follows:

Version 2.1 node	Version 6.0
Compute	Compute
Database	Database
DataDelete	Database
DataInsert	Database
DataUpdate	Database
Extract	Compute
Filter	Filter
Warehouse	Database

## Migrating message mappings from Version 5.0

Use the `mqsimigratemfmaps` command to migrate message mappings to the Version 6.0 format.

The `mqsimigratemfmaps` command creates Version 6.0 mapping files (.msgmap) from your Version 5.0 mapping files (.mfmap).

When you migrate message mappings from Version 5.0, read the restrictions that apply.

The following table lists the mapping functions that are supported in Version 5.0 but not supported in Version 6.0, and shows the error messages that you might see. Mappings that contain these Version 5.0 functions cannot be migrated to Version 6.0; you must re-create and redeploy these mappings using another node, such as a JavaCompute node. Alternatively, migrate as much of the mapping as possible using the migration command, view the error report to see details of the functions that could not be migrated, and create a new node that can execute those functions that were not migrated.

Supported in Version 5.0	Migration utility error message
Expressions that involve multiple instances of a repeating source element, for example:  <code>src_msg.e[1] + src_msg.e[2] -&gt; tgt_msg.e</code>	Error:102: Unexpected index '2' encountered for target mappable 'e'. The expected index is '1'. Migration currently provides no support for expressions involving more than one instance of the same repeating-element.
ESQL field references that contain the asterisk wildcard character "*". For example:  <code>src_msg.e.*</code> or <code>src_msg.e.*[]</code>	Error:130: ESQL field-reference 'src_msg.e.*' cannot be migrated. Migration currently provides no support for field-references containing '*'.
Dynamic ESQL field references. For example:  <code>src_msg.e.{ 'a'    'b' }</code>	Error:131: ESQL field-reference 'src_msg.e.{ 'a'    'b' }' cannot be migrated. Migration currently provides no support for dynamic field-references.
ESQL expressions that contain a reference to the temporary index-variable "#I". For example:  <code>src_msg_e    "#I" -&gt; tgt_msg.e</code>	Error:128: ESQL expressions containing the variable '#I' anywhere other than the index of a repeating-element cannot be handled by the migration.
Expressions within an index of a repeating element. For example:  <code>src_msg.e[src_msg.a]</code> or <code>src_msg.e["#I" +5]</code> or <code>src_msg.e[&lt; 3]</code>	Error:116: ESQL field-reference 'src_msg.e[< 3]' cannot be migrated. Migration currently provides no support for indexes other than the variable '#I' and plain integer indexes.
Aggregation functions MIN, MAX, and COUNT, used with the ESQL SELECT expression. For example:  <code>SELECT MAX("#T".FIRSTNAME) FROM Database.CUSTOMER AS "#T" WHERE "#T".CUSTOMERID = 7</code>	Error:135: The ESQL expression 'SELECT MAX("#T".FIRSTNAME) FROM Database.CUSTOMER AS "#T" WHERE "#T".CUSTOMERID = 7' could not be migrated. The expression contains syntax which has no direct equivalent in the new map-script language.

Supported in Version 5.0	Migration utility error message
ESQL IN operator. For example: <code>src_msg.e IN (1, 2, 3)</code>	Error:135: The ESQL expression `SELECT MAX("#T".FIRSTNAME) FROM Database.CUSTOMER AS "#T" WHERE "#T".CUSTOMERID = 7` could not be migrated.

## Restrictions on migrating message mappings

In certain scenarios, restrictions apply to the migration of .mfmap files from Version 5.0.

This topic explains why migration is not automatic in these situations, and provides instructions for how to complete a successful migration. This topic also provides information about restrictions that apply when you migrate submaps.

The programming model for message maps is different between Version 5.0 (where the file format is .mfmap) and Version 6.0 (where the format is .msgmap). Version 5.0 message maps have a procedural programming model, which is essentially an alternative ESQL, where you describe all the steps that are required to perform a transformation. Version 6.0 uses a declarative programming model, where you describe the result of the transformation, and the tools determine how to achieve that result.

Most migration failures result from message maps that contain too much information about the steps that perform the transformation, and not enough information about the desired result. For these message maps, migration is enabled by changing the .mfmap file so that specific "how to" sections are separated into an ESQL function or procedure that can be called by the message map. The .mfmap file calls the ESQL function instead of containing it as an expression. The mqsimigratemfmaps command then migrates the .mfmap file, but calls the ESQL function instead of logging a migration error.

A limitation is that ESQL (the run time for .mfmap and .msgmap files) cannot define functions that return complex element (or REFERENCE) values. The following procedure explains how to work around this complex element target limitation; in many cases, you must rewrite the map as an ESQL function. For more examples and information about calling ESQL from maps, refer to the following sample:

- Message Map sample

You can view samples only when you use the information center that is integrated with the Message Brokers Toolkit.

1. Determine whether you can define an ESQL function for the .mfmap file.
  - a. When the target value is a complex element, or in ESQL terms a REFERENCE, the individual mapping must be rewritten in the .msgmap file. Delete the mapping from the .mfmap file, and proceed to Step 4.
  - b. Use a function for all other cases: CHAR string, numbers, date, and time. Proceed to Step 2.
2. Determine the source parameters and returns type for your function.
  - a. For each source path in the mapping, there must be one parameter in the function or procedure. For a function, all parameters are unchangeable. The type of the parameter must match the source data type.
  - b. The function return type is the ESQL data type identified above.



3. Update the .mfmap file to enable migration. Change the .mfmap file to invoke the function in the mapping, passing the source parameters to the function in the order in which they were listed in step 2a.
4. Re-run the mqsimigratemfmaps command to migrate the modified .mfmap file.
5. Repeat Steps 1 to 4 until no errors are reported in the migration log.
6. Start the Version 6.0 Message Brokers Toolkit and open the migrated .msgmap file.
  - a. For ESQL that is migrated as functions, there should be no errors.
  - b. For complex element targets, rewrite the mapping using the Version 6.0 features.

The following examples illustrate migration of .mfmap files to .msgmap files.

- To migrate a multiple reference to a repeating source expression:

```
src_msg.e[1] + src_msg.e[2]
```

compute the result in an ESQL function like:

```
CREATE FUNCTION addOneAndTwo(IN src_msg)
BEGIN
  RETURN src_msg.e[1] + src_msg.e[2];
END;
```

In the .msgmap file, call the ESQL function addOneAndTwo using the parent element src\_msg as a parameter.

- An expression that does not use element names:

```
src_msg.*
```

or

```
src_msg.*[]
```

can be processed using a function that takes the parent of the repeating field:

```
CREATE FUNCTION processAny(IN src_msg)
BEGIN
  DECLARE nodeRef REFERENCE TO src_msg.e.*;
  DECLARE result <dataType> <initialValue>;
  WHILE LASTMOVE nodeRef DO
    --expression goes here
    SET result = result;
  END WHILE;
  RETURN RESULT;
END;
```

In the .msgmap file, call the ESQL function processAny using the parent element src\_msg as a parameter.

- Expressions that dynamically compute element names:

```
src_msg.{ 'a' || 'b' }
```

can be processed by ESQL functions that process the parent of the repeating field:

```
CREATE FUNCTION processDynamicName(IN src_msg)
BEGIN
  RETURN src_msg.{ 'a' || 'b' };
END;
```

In the .msgmap file, call the ESQL function processDynamicName using the parent element src\_msg as a parameter.

- Expressions that use the select MIN, MAX, and COUNT functions:

```
SELECT MAX("#T".FIRSTNAME)
  FROM Database.CUSTOMER AS "#T"
 WHERE "#T".CUSTOMERID = custId
```

can be processed by ESQL functions that process the parent of the repeating field:

```
CREATE FUNCTION processMAX(IN custId)
BEGIN
  RETURN
  SELECT MAX("#T".FIRSTNAME)
    FROM Database.CUSTOMER AS "#T"
   WHERE "#T".CUSTOMERID = custId
END;
```

In the .msgmap file, call the ESQL function processMAX using the element custId as a parameter.

- .mfmap files that use mfmap index variables in expressions:

```
e || "#I"
```

must be rewritten entirely in ESQL. By definition, there must be a complex repeating parent element, and this is not supported by ESQL functions.

- Expressions that use source expressions to compute values:

```
src_msg.e[src_msg.a]
```

must be rewritten using if rows, msgmap:occurrence() functions, and ESQL functions:

```
for src_msg.e
  if
    condition msgmap:occurrence(src_msg/e) = src_msg/a
```

- For expressions that use index expressions to compute values:

```
src_msg.e["#I" +5]
src_msg.e[< 3]
```

the entire .msgmap file must be rewritten in ESQL, because the .msgmap files do not support indexed access to repeating fields.

- .mfmap files that use ROW expressions to compute values:

```
src_msg.e IN (1, 2, 3)
```

must be rewritten in ESQL, because .msgmap files do not support ESQL ROW expressions.

## Restrictions on migrating submaps

In Version 5.0 message maps, any complex element type can be a root of a submap. However, in Version 6.0, only a global element or a global attribute can be the root of a submap. When a Version 5.0 message map with a call to a submap with a non-global element as the map root is migrated, the submap is not migrated as a standalone submap. Instead, the call to the submap in the main message map is replaced by the migrated content of the submap. Alternatively, if the submap has a global element as the map root, the submap is migrated to a standalone Version 6.0 submap instead.

For Version 6.0, you must define reusable schema structures as global elements and types. If you have Version 5.0 submaps that use local elements, you must change the schema to add definitions of global elements for the local elements, and then

use the new schema after migration. If the new global elements have the same name and type as the local elements, the Version 5.0 submaps do not need to be changed.

You must qualify a local element in a Version 5.0 submap with a namespace to ensure its successful migration to Version 6.0, because the global element that replaces it after migration must be qualified by the namespace. If your submap contains local elements, you must re-create the submap and re-create the call to the submap from the main message map.

The following table shows differences between the features that are supported in a submap for Version 5.0 and Version 6.0.

Version	Supported feature
Version 5.0	global elements and global attributes as map source
	global elements and global attributes as map target
	local elements and local attributes as map source
	local elements and local attributes as map target
Version 6.0	global elements, global attributes, and global types as map source
	global elements and global attributes as map target

## Migrating a user-defined node from Version 5.0 or Version 5.1

Migrate your user-defined nodes to Version 6.0.

### Migrating a user-defined node from Version 5.0

To migrate a user-defined node from Version 5.0 to Version 6.0, you must migrate both toolkit and runtime components.

Complete the following steps to migrate a user-defined node:

1. “Migrating the Message Brokers Toolkit representation of the user-defined node”
2. “Migrating the user-defined node runtime code” on page 108

### Migrating the Message Brokers Toolkit representation of the user-defined node:

To migrate from the Message Brokers Toolkit Version 5.1 to the Message Brokers Toolkit Version 6.0:

1. Import the user-defined node project into the Message Brokers Toolkit Version 6.0.
2. Select your user-defined node project in the Package Explorer, and click **Project** → **Clean Project**.

To migrate from the Message Brokers Toolkit Version 5.0 to the Message Brokers Toolkit Version 6.0:

1. Import the user-defined node project into the Message Brokers Toolkit Version 6.0.
2. Select your user-defined node project in the Package Explorer, and click **Project** → **Clean Project**.
3. Modify the <requires> element in the plugin.xml file in the user-defined node project root to match the following content:
 

```
<requires>
    <import match="greaterOrEqual" plugin="com.ibm.etools.mft.api" version="6.0.0"/>
</requires>
```
4. Modify the extension point for "org.eclipse.help.contexts" in the same plugin.xml file to match the following content:
 

```
<extension point="org.eclipse.help.contexts">
  <contexts file="HelpContexts.xml"/>
</extension>
```

When you have migrated your user-defined nodes, you do not need to migrate any message flows that contain the user-defined node.

Now complete the step "Migrating the user-defined node runtime code."

#### **Migrating the user-defined node runtime code:**

Before you start this step, you must have migrated the Message Brokers Toolkit representation of the user-defined node.

To migrate the user-defined node runtime code:

1. Store a copy of your compiled or packaged user-defined extension file on every broker system on which you intend to use it. Save the .lil or .jar file in the directory that you specified on the mqsicreatebroker or mqsicchangebroker command for each Version 6.0 broker. (On Version 5.0 broker systems, the .lil or .jar file was saved in the installation directory.)
  - If you are migrating a Java user-defined node, you can build the user-defined extension file once and distribute it to each of your systems.
  - If you are migrating a C user-defined node, and all of your brokers are of the same machine type, you can build the user-defined extension file once and distribute it to each of your systems.
  - If you are migrating a C user-defined node and you have a cluster that consists of various machine types, for example one AIX, one Solaris, and one Windows broker, you must build the files separately on each machine type.
2. For C user-defined extensions, also store the .pdb file that corresponds to the .lil file, in the specified directory. The .pdb file provides symbolic information that is used in stack diagnostic information in the event of access violations or other software malfunctions.
3. Stop and start each broker to ensure that the existence of a new file is detected. A broker restart is not required in the following two scenarios:
  - If you have created an execution group in the Message Brokers Toolkit, and you have not yet deployed to it, you can add the .lil, .pdb, and .jar file to your chosen directory.
  - If you have already deployed to the execution group that you want to use, add the .lil, .pdb, or .jar file to your chosen directory, then use the mqsireload command to restart the group. You cannot overwrite an existing file on the Windows operating system when the broker is running because of the file lock that is put in place by the operating system.

Use these two approaches with caution because any execution group that is connected to the same broker will also detect the new .lil, .pdb, and .jar files when that execution group is restarted, or when something is first deployed to that execution group. By using the more conventional way of restarting the broker, you ensure that anyone with an interest in a particular execution group is made aware that recent changes have been made to the broker.

These two situations assume that you have already completed the previous step, and have therefore used either the `mqschangebroker` command or the `mqscreatebroker` command to notify the broker of the directory in which the user-defined extension files have been placed.

When you have installed a user-defined node, it is referred to by its schema and name, just like a message flow.

## Migrating a message flow that contains WebSphere MQ Everyplace nodes

Support for WebSphere MQ Everyplace in WebSphere Message Broker Version 6.0 differs from that provided in WebSphere Business Integration Message Broker Version 5.0, and you must update message flows that make use of the support.

This topic summarizes the changes, and the subsequent topics describe the situation in more detail:

1. Migrating an MQe message flow (this topic)
2. “Designing MQe connections” on page 110
3. “Deploying an MQe message flow” on page 111
4. “Configuring after MQe message flow deployment” on page 113

### Version 5.0 configuration

- You can use either of these connection configurations:
  - MQe device client *<--connects to -->* MQe gateway *<--connects to -->* broker (using MQInput and MQOutput nodes)
  - MQe device client *<--connects to -->* broker (using MQeInput and MQeOutput nodes)
- The MQe code level in the MQe nodes in the broker is at a fixed version, and you cannot update it independently.

### Version 6.0 configuration

Using message flows that contain MQeInput and MQeOutput nodes in Version 6.0 is deprecated. The behavior that is described here is intended only for when you are deploying from Version 6.0 to a previous version, and to provide a route for migration. Redesign your flows to remove the MQe nodes and replace them with MQ nodes that are configured to your own specifications and coordinated with your MQe gateway configuration.

- You must install WebSphere MQ Everyplace separately. The WebSphere MQ Everyplace code is now all contained in that separate installation and it can be upgraded independently to newer versions.
- The MQeInput and MQeOutput nodes are in the workbench for compatibility only, and are not implemented within the broker component.
- You can use only this connection configuration:
  - MQe device client *<--connects to -->* MQe gateway *<--connects to -->* broker (using MQInput and MQOutput nodes)

- You can migrate your existing MQe message flows unchanged to Version 6.0, but you must configure the MQe gateway according to the modified implementation:
  - The bar file generated is identical to that created in Version 5.0.
  - When you deploy to a Version 5.0 broker, the flow works just as before.
  - When you deploy to a Version 6.0 broker, the broker interprets the bar file differently, and changes the MQeInput and MQeOutput nodes internally into MQInput and MQOutput nodes. The broker also ignores some MQe node properties, and reinterprets others.
- If you are using MQeOutput nodes with the Destination Mode property set to Destination List, when you migrate your MQe flows to a Version 6.0 broker, change the Destination Mode property to Reply to Queue, and then redeploy the modified flows. You can use the Message Brokers Toolkit at either Version 6.0, or at Version 5.0 (or Version 5.1) to perform the redeployment.

If you want to use WebSphere MQ Everyplace connections with Version 6.0, see the subsequent topics for more details, starting with “Designing MQe connections.”

For help with configuring WebSphere MQ Everyplace, see the documentation supplied with that product.

## Designing MQe connections

Design the connections used by your MQe message flows when you migrate from Version 5.0 to Version 6.0.

This topic describes one in a sequence of migration tasks; complete these tasks in the order shown:

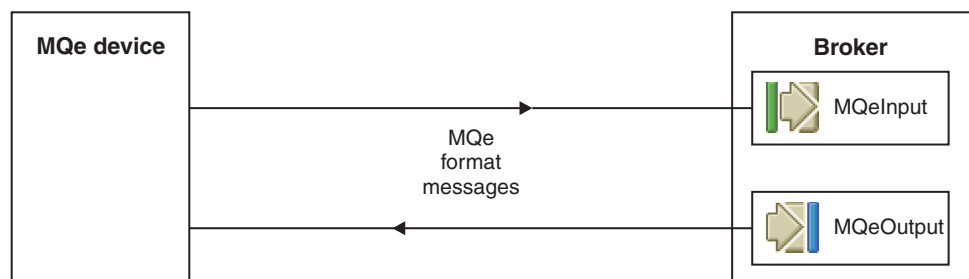
1. “Migrating a message flow that contains WebSphere MQ Everyplace nodes” on page 109
2. Designing MQe connections (this topic)
3. “Deploying an MQe message flow” on page 111
4. “Configuring after MQe message flow deployment” on page 113

This topic describes the connection options between WebSphere MQ Everyplace device clients and WebSphere Message Broker.

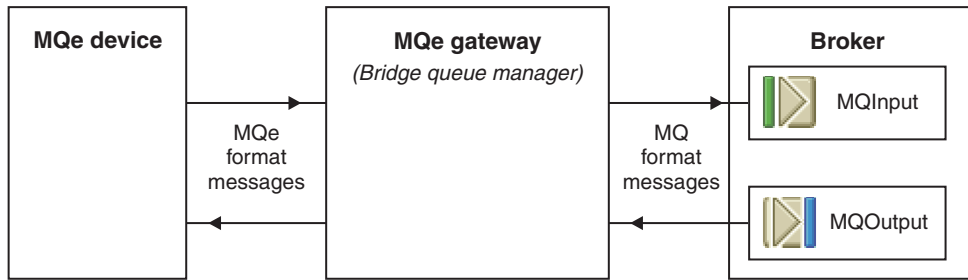
The following two diagrams represent how the connections are made; the table following the diagrams provides the details.

1. The connection options for Version 5.0:

- Direct:

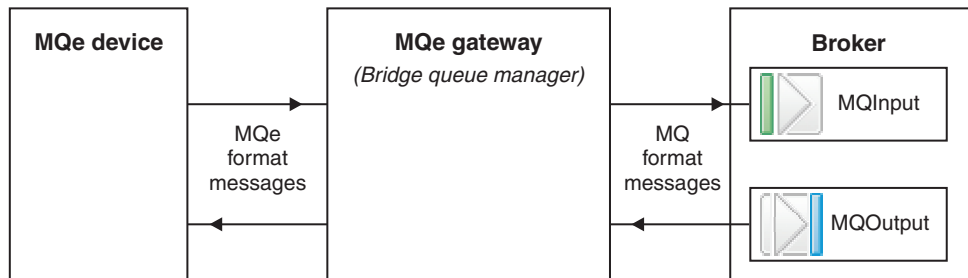


- Through an MQe gateway:



2. The connection option for Version 6.0:

- Through an MQe gateway:



The following table lists connection options between WebSphere MQ Everyplace device clients and WebSphere Message Broker.

Connection considerations	Version 5.0	Version 6.0
MQe devices connect directly to the broker	Yes	No
MQe devices connect to an MQe gateway that connects to the broker	Yes	Yes
The format of messages into and out of the broker is:	MQe format or MQ format	MQ format only

The next task in this migration sequence is “Deploying an MQe message flow.”

For help with configuring WebSphere MQ Everyplace, see the documentation supplied with that product.

### Deploying an MQe message flow

Deploy your MQe message flows after you have migrated them from Version 5.0 to Version 6.0.

This topic describes one in a sequence of migration tasks; complete these tasks in the order shown:

1. “Migrating a message flow that contains WebSphere MQ Everyplace nodes” on page 109
2. “Designing MQe connections” on page 110
3. Deploying an MQe message flow (this topic)
4. “Configuring after MQe message flow deployment” on page 113

Using message flows that contain MQeInput and MQeOutput nodes in Version 6.0 is deprecated. The behavior that is described here is intended only for when you are deploying from Version 6.0 to a previous version, and to provide a route for migration. Redesign your flows to remove the MQe nodes and replace them with MQ nodes that are configured to your own specifications and coordinated with your MQe gateway configuration.

The following table describes the options when you deploy a message flow that contains MQeInput and MQeOutput nodes.

Deploy from	Deploy to	Result
Version 5.0	Version 5.0	Works as before
Version 5.0	Version 6.0	Not supported. Import your existing message flow into the Message Brokers Toolkit Version 6.0 and deploy from there. <sup>1</sup>
Version 6.0	Version 5.0	Works as before. <sup>2</sup>
Version 6.0	Version 6.0	Works when you set up an MQe gateway that you have configured appropriately. When the broker receives the bar file, the MQeInput and MQeOutput nodes in the message flow are converted into MQInput and MQOutput nodes that are re-configured as described below.

**Notes:**

1. When you save the flow in Version 6.0, you see an error message saying that the use of MQe nodes is deprecated. You can ignore the error and continue to save and deploy.
2. The bar files generated by Version 6.0 contain XML that is identical to that produced by Version 5.0.

The following list describes what happens to all the MQe node properties when the node is converted into an MQ node. (For a summary of the key properties, see “Configuring after MQe message flow deployment” on page 113).

MQeInput and MQeOutput node properties panels	Converted MQ node properties
<b>General panel properties</b> <ul style="list-style-type: none"> <li>• Trace</li> <li>• Trace Filename</li> <li>• Use Config File</li> <li>• Config Filename</li> <li>• Queue Manager Name</li> <li>• Queue Name</li> </ul>	All discarded except: <ul style="list-style-type: none"> <li>• Queue Manager Name</li> <li>• Queue Name</li> </ul> Do your tracing in the normal way for WebSphere Message Broker, as described in Using trace. When this flow is traced, the MQ nodes are seen, not the MQe nodes in the message flow in the deployed bar file that have been converted.



MQeInput and MQeOutput node properties panels	Converted MQ node properties
<b>Registry panel properties</b> <ul style="list-style-type: none"> <li>• Registry type</li> <li>• Directory</li> <li>• PIN</li> <li>• Certificate Request PIN</li> <li>• Keyring Password</li> <li>• Certificate Host</li> <li>• Certificate Port</li> </ul>	All discarded  These properties concern MQe registry and security, and you configure these characteristics on your MQe gateway.
<b>Listener panel properties</b> <ul style="list-style-type: none"> <li>• Listener Type</li> <li>• Host Name</li> <li>• Port</li> <li>• Time Interval</li> </ul>	All discarded  You configure these properties on your MQe gateway and your broker queue manager.

To use such a deployment, create a suitable configuration on the broker queue manager for the converted nodes to work, as described in the next topic, “Configuring after MQe message flow deployment.”

For help with configuring WebSphere MQ Everyplace, see the documentation supplied with that product.

### Configuring after MQe message flow deployment

Create a configuration on the broker queue manager to handle the MQe message flows that you have migrated from Version 5.0 to Version 6.0.

This topic describes one in a sequence of migration tasks; complete these tasks in the order shown:

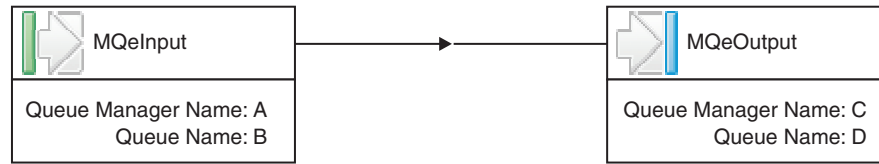
1. “Migrating a message flow that contains WebSphere MQ Everyplace nodes” on page 109
2. “Designing MQe connections” on page 110
3. “Deploying an MQe message flow” on page 111
4. Configuring after MQe message flow deployment (this topic)

Using message flows that contain MQeInput and MQeOutput nodes in Version 6.0 is deprecated. The behavior that is described here is intended only for when you are deploying from Version 6.0 to a previous version, and to provide a route for migration. Redesign your flows to remove the MQe nodes and replace them with MQ nodes that are configured to your own specifications and coordinated with your MQe gateway configuration.

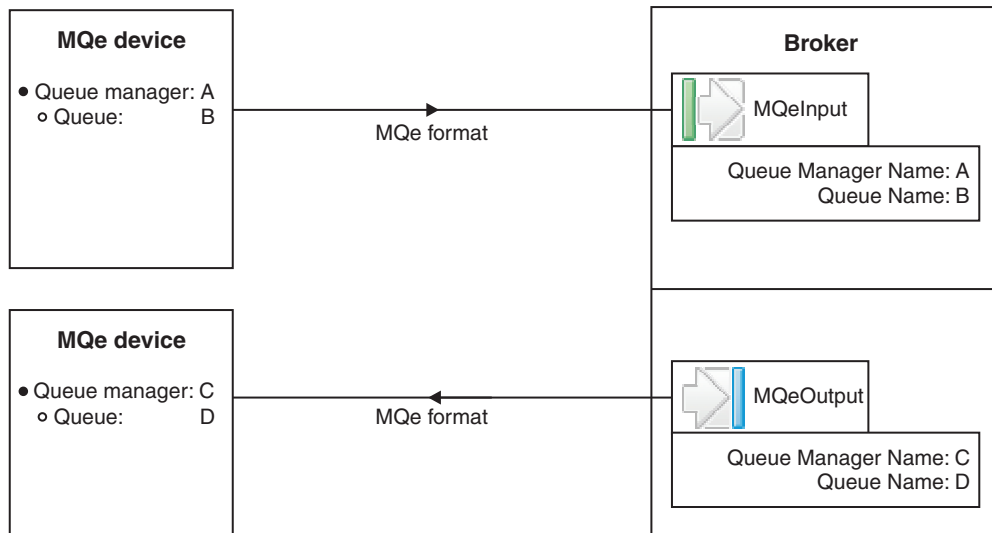
When you deploy a message flow that contains MQeInput and MQeOutput nodes on WebSphere Message Broker Version 6.0 the nodes are converted to MQInput and MQOutput nodes (as described in “Deploying an MQe message flow” on page 111).

When the MQe nodes are converted into MQ nodes at deployment time, the node properties Queue Manager Name and Queue Name are retained, and you must create a configuration on the broker queue manager to handle these nodes.

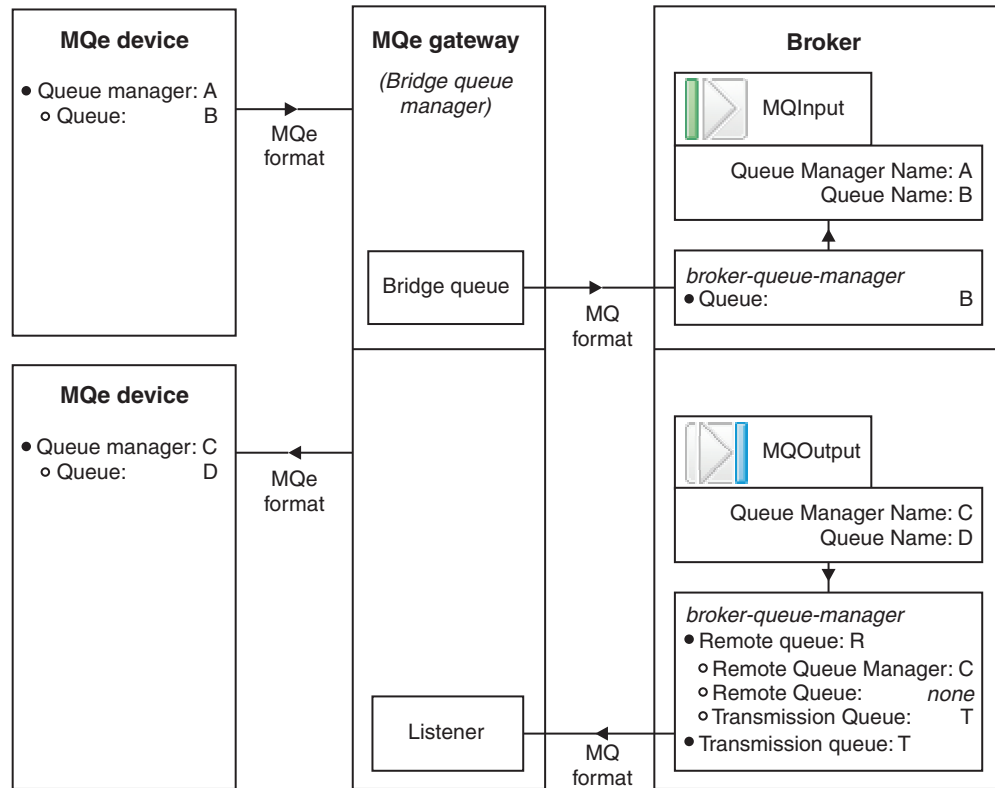
For example, suppose you have a message flow like this simplified one that contains MQeInput and MQeOutput nodes:



The following diagram shows this message flow connected directly to MQe devices, as it would be used on a Version 5.0 broker:



When you deploy this message flow to a Version 6.0 broker, create a configuration as shown below:



Configuration details:

1. Configure your broker queue manager with the following parameters:

- A local queue named B.
- A remote queue definition R with these attributes:
  - Remote Queue Manager = C
  - Remote Queue = *none* (leave blank)
  - Transmission Queue = T

This remote queue definition matches all messages that are destined for any queue on queue manager C and puts them to the transmission queue.

2. Configure your MQE gateway with the following parameters:

- Provision for accepting messages from an MQE device with queue manager A and queue B, transforming the format from MQE to MQ, and putting them onto a bridge queue.
- A bridge queue that puts messages to queue B on the broker queue manager.
- A listener that reads messages from transmission queue T on the broker queue manager.
- Provision for transforming the message format of the messages on queue T from MQ to MQE format, and sending them to the MQE device with queue manager C and queue D.

For help with configuring WebSphere MQ Everyplace, see the documentation supplied with that product.

## Migrating style sheets and XML files

You might have to make changes to message flows and to the style sheet and XML files that they use when you migrate from Version 2.1 and Version 5.0 to Version 6.0.

If you do not plan to include the style sheets and XML files with the message flows that use them in the broker archive file that you deploy, and your XMLTransformation nodes reference style sheets with partially-qualified paths (relative referencing), you might need to migrate both the message flows and the style sheets. If your XMLTransformation nodes reference style sheets with fully-qualified paths (absolute referencing), migration is not necessary.

You can continue to deploy your style sheets and XML files manually into the broker file systems, but you must store relatively-referenced style sheets and XML files (and their dependants) in the *broker work path*/*{XSL,XML}*/external directories.

In Version 2.1 and Version 5.0, any relative references to manually-deployed style sheets are relative to the location of the file directory where the broker is started. In later versions, any relative references to manually-deployed style sheets are relative to the directory *broker work path*/*{XSL,XML}*/external on the broker file system. You must therefore complete the following actions:

1. Move the relatively-referenced style sheets (and their descendants), to the correct directory structure under *broker work path*/*{XSL}*/external.
2. Move all their dependent XML files to the correct directory structure under *broker work path*/*{XML}*/external.

For example, a relatively-referenced principal style sheet, *a/b.xml*, must now be stored as *broker work path*/*{XSL}*/external/*a/b.xml* on the broker file system. An XML file that is referenced by *a/b.xml* as *c/d.xml* must be stored as *broker work path*/*{XML}*/external/*a/c/d.xml*.

An embedded style sheet is handled in the same way as a file that is loaded from the root of the broker's deployed storage, therefore move any descendant style sheets or XML files of embedded style sheets to the *broker work path*/*{XSL,XML}*/external tree. If you cannot move the files, you can reference them with a fully-qualified path (absolute reference).

---

## Message set migration notes

Read these notes to help you to migrate message sets to WebSphere Message Broker Version 6.0.

This topic contains the following sections:

- "Migrating from Version 2.1"
- "Migrating from Version 5.0" on page 117

If you are using the Message Brokers Toolkit Version 5.1, replace all references in this topic to "Version 5.0" with "Version 5.1".

## Migrating from Version 2.1

To migrate message sets from Version 2.1 to Version 6.0, use the **mqsimigratemsgsets** command to convert your Version 2.1 message set export files

(.mrp) into Version 6.0 message set projects. Before you run the command, refer to the “Migrating Message Sets from Version 2.1” on page 120 topic, which provides detailed notes on its operation.

For guidance about changes to the behavior of parsers, and for general migration information, see the following sections:

- “Behavioral changes in the MRM parser”
- “General migration information” on page 119

## Migrating from Version 5.0

To migrate message sets from Version 5.0 to Version 6.0, no migration commands are necessary. Message Brokers Toolkit Version 6.0 can read the content of a Version 5.0 message set project and automatically converts it to Version 6.0 format when you modify and save it for the first time.

For guidance about changes to the behavior of parsers, and for general migration information, see the following sections:

- “Behavioral changes in the MRM parser”
- “General migration information” on page 119

## Behavioral changes in the MRM parser

The following changes are implemented in Version 6.0 and are relevant when you migrate from Version 5.0 and Version 2.1:

- XML physical format. Version 6.0 is sensitive to `xsi:type` attributes in the XML document and modifies its behavior accordingly. `xsi:type` attributes are no longer treated as self-defining attributes, therefore they appear in the message tree with the name ‘type’ instead of ‘@type’. If your message flow logic is sensitive to `xsi:type` attributes in the message tree, change your message flow to comply with the new behavior. To retain pre-Version 6.0 logic in your message flows, set the environment variable `MQSI_IGNORE_XSI_TYPE` to any value, and the pre-Version 6.0 behavior is adopted.
- XML physical format. DOCTYPE information in an XML document does not appear in the logical message tree when parsed, but it is preserved from input document to output document because the MRM keeps a copy of the DOCTYPE internally. Prior to Version 6.0, this data is an exact copy of the bit stream. In Version 6.0, the copying process causes some formatting white space to be lost. The following example shows an element declaration in an input DOCTYPE:

```
<!ELEMENT e0 (e1|e2)+ >
```

In the output message, the element declaration has changed:

```
<!ELEMENT e0 (e1|e2)+>
```

The new behavior is consistent with the way that the XML physical format processes white space in all other XML constructs.

- TDS physical format. For a group with logical property Composition set to Choice and TDS property Data Element Separation set to Fixed Length, the parser always assumes that the length of the choice data is that of the longest child of the group, and always reads and writes that number of characters. Ensure that your messages comply with this assumption, otherwise the parser will treat data that follows the choice as part of the choice. Prior to Version 6.0, the parser does not enforce this rule.

- TDS physical format. If TDS element property Encoding Null is set to NullPadFill, it is only acted upon if the corresponding Length property is being used actively when parsing or writing. Prior to Version 6.0, NullPadFill is acted upon regardless of whether the Length property is being used actively.
- TDS physical format. TDS property Data Element Separation is set to All Elements Delimited or Variable Length Elements Delimited. A complex element is now always treated as having variable length, regardless of its own Data Element Separation setting. Therefore, a Delimiter is expected in the message bit stream between the complex element and any subsequent element, and a Repeating Element Delimiter is expected between all instances of a complex element, even if the complex element has a fixed length. Prior to Version 6.0, the parser does not enforce this rule, and for Variable Length Elements Delimited, the writer does not output delimiters when the length of the complex element was known.
- TDS physical format. TDS property Data Element Separation is set to Use Data Pattern. If the regular expression that is specified for a data pattern returns a zero length match, it is treated as an element with a zero-length value. Prior to Version 6.0, a zero-length match is treated as an element being omitted.
- TDS physical format. TDS property Data Element Separation is set to Tagged Delimited. An extraneous delimiter that occurs after the last child of the group in the bit stream is no longer tolerated and causes a parsing exception. If this is a problem, consider modeling the extraneous delimiter using the TDS Group Terminator property. Prior to Version 6.0, the parser does not enforce this rule.
- TDS physical format. TDS property Data Element Separation is set to Tagged Delimited. In Version 6.0, when parsing a Tagged Delimited group, the parser attempts to make sense of groups where the members appear out of order in the message bit stream, even if the group Composition property is set to Sequence or OrderedSet. However, if the group contains either an embedded message or a complex element or group that cannot be identified from the bit stream, all the members of the group must appear in the bit stream in the same order that they are defined in the model. If they appear out of order, the group is not parsed correctly and has unpredictable results. One symptom of this condition is the appearance of self-defining elements in the message tree, caused by a failure to match an element to the model.

A specific example of this condition is where your message contains an embedded message and you are using either the Message Key or Message Identity technique to identify the embedded message. If the element that is providing the message key or message identity value fails to be matched with the model, the parser does not know whether to interpret its value as a message key or message identity.

Prior to Version 6.0, the parser attempts to make sense of all out-of-order Tagged Delimited groups, with a consequent reduction in performance. In Version 6.0, if this behavior is a problem, consider modeling the unordered content of the group as an embedded child group with Composition set to UnorderedSet.

A complex element or group can be identified from the bit stream if it provides a group indicator, a tag, or a data pattern, or if its child members provide a group indicator, tag, or data pattern.

Despite its name, under some circumstances members of a Tagged Delimited group do not need to provide a tag; specifically, if the member is an embedded message or is a complex element or group.

- TDS physical format. The TDS Data Element Separation property is set to Tagged Encoded Length. When writing, the encoded length is written as the number of characters in the data, to match the interpretation when parsing. Prior

to Version 6.0, the encoded length is written as the number of bytes in the data, which does not match the interpretation when parsing if the data is not SBCS.

- TDS physical format. When data is written, if the number of repeats of an element or group is fixed in the model but the actual occurrences in the logical message tree exceed the number of repeats, and the Data Element Separation property is not one of the "Tagged" separations, the extra occurrences are discarded and do not appear in the output message. Prior to Version 6.0, the extra occurrences appear in the output message. If the extra repeats are expected to appear in the output message, specify `maxOccurs=-1` to indicate that the number of repeats is unbounded.
- All physical formats. When writing date`Time` fields that have a `Format` property of `I`, the output form depends on the logical type of the field, as described in `DateTime as string data`. Prior to Version 6.0, the output form is incorrectly the full `yyyy-MM-dd'THH:mm:ssZZZ` form.
- Validation of input and output messages has been improved to provide additional detection of invalid messages. In Version 6.0, a message might therefore be flagged as invalid when it was incorrectly not flagged in previous versions.

## General migration information

The following items are relevant when you migrate from Version 5.0 and Version 2.1:

- The CWF property `Repeat Count` has been superseded by the logical property `Max Occurs`, bringing the CWF physical format in line with TDS and XML physical formats, which already use `Max Occurs` to determine the number of repeats. A warning appears in the Problems view of the message editor for each element or group that had a CWF `Repeat Count` value set. Right-click the warning and click **Quick Fix** to resolve the issue.

In Version 5.0, if the CWF property `Repeat Count` is not set *and* `Min Occurs` is not equal to `Max Occurs`, the number of repeats is taken to be one. In Version 6.0, the number of repeats is taken to be `Max Occurs`. A warning cannot be generated for this situation. Such a message model is not created by the COBOL or C importers, therefore it can occur only if you have created a CWF message model using the Version 5.0 message editor.

- The TDS physical format prior to Version 6.0 included embedded message identification by `Message Key`. The `Message Key` technique has been deprecated and is superseded by a technique called `Message Identity`. A warning appears in the Problems view of the message editor for each message that has a TDS `Message Key` value, and for each element or attribute that has `TDS Interpret Element Value` property set to `Message Key`. Right-click the warning and click **Quick Fix** to resolve the issue.

Continue to use TDS `Message Key` if the message set will ever be deployed to a Version 5.0 or Version 2.1 broker, because these brokers do not support the `Message Identity` technique of embedded message identification.

- The TDS physical format property `Data Pattern` is now validated by the Message Brokers Toolkit to ensure that it is a valid XML Schema regular expression. Errors appear in the Problems view of the message editor, and you must correct them manually using the editor. In particular, some errors are issued against the XML Schema specification concerning the escaping of meta-characters, which can cause validation errors to appear. To correct the errors, you might need to escape the hyphen character (`-`) or the brace characters (`{}` and `()`), using the backslash

character (\); for example \{ or \-. If you receive such errors when using an IBM-supplied message set, contact IBM® to obtain a corrected version of the message set.

- The default value or fixed value of an element or attribute, and enumeration values of a simple type, are now checked against the length, maximum length, and minimum length facets of the simple type, if supplied. If a value does not comply with the facets, an error appears in the Problems view of the message editor. Right-click the error and click **Quick Fix** to resolve the issue, if a quick fix is available. Otherwise, correct the problem manually using the editor. This error is most likely to occur if you import a COBOL copybook into the Version 5.0 Fix Pack 2 or earlier version of the Message Brokers Toolkit.
- The CWF and TDS Encoding Null and Encoding Null Value properties have been removed from local attributes, global attributes, and attribute references. In XML Schema, only elements can have a Nillable property, therefore a null value cannot be carried by a data field that is modeled as an attribute. If you had specified CWF or TDS Encoding Null values for attributes in Version 5.0, they were ignored.
- The TDS Repeating Element Delimiter property has been removed from local attributes and attribute references. In XML Schema, attributes cannot repeat. If you had specified TDS Repeating Element Delimiter values for attributes in Version 5.0, they were ignored.
- For an element or attribute with simple type xsd:gMonth, the default value for the CWF, XML, and TDS Datetime Format property is now "--MM". In Version 5.0, the default value is "--MM--". This value has been corrected to comply with an XML Schema errata.
- When you are migrating, you do not have to redeploy your message sets because the `mqsimigratecomponents` command upgrades message dictionaries in the broker database to Version 6.0 format. However, if you do not redeploy a message set, and you observe a `ParserException`, such as a "checked vector error" or an "access violation", when you first use a message flow that uses the message set, you must redeploy the message set. This situation can occur if the message dictionary contains previously undetected bad data. In Version 6.0, a message dictionary is checked on first use; in Version 2.1 and Version 5.0, it is not.

## Migrating Message Sets from Version 2.1

To migrate message sets from Version 2.1 to Version 6.0 use the `mqsimigratemsgsets` command. **It is not necessary to use this command when migrating from Version 5.0 to Version 6.0.**

This topic contains the following sections:

- "Conditions of the `mqsimigratemsgsets` command" on page 121
- "What the `mqsimigratemsgsets` command creates" on page 122
- "Prefixed identifiers" on page 124
- "Embedded simple type" on page 124
- "Compound type with an MRM base type" on page 124
- "Mapping of MRM simple types to schema simple types" on page 125



## Conditions of the `mqsimigratemsgsets` command

Do not modify the message set file manually between export from Version 2.1 and import into WebSphere Message Broker Version 6.0 because this causes errors, indicated by those warning and error messages in the report: BIP0141, BIP0142 to BIP0157, and BIP0163.

Each new message definition file `.mxsd` is an annotated XML schema model, and each artifact in the message set is re-created and retains its existing properties in the new model, with the following exceptions:

- The *Name* in the WebSphere Message Broker Version 6.0 model is the *Identifier* from the Version 2.1 model. If the object is an element with a prefixed identifier, the prefix is removed, as the prefix in Version 2.1 was a way of indicating that this element was local.
- *Label*, *Short* and *Long Description*, and *History* are merged into a single *Documentation* property for WebSphere Message Broker Version 6.0
- Each compound type becomes an `xsd:complexType` and an associated `xsd:group` in WebSphere Message Broker Version 6.0.

The `xsd:complexType` that is created in this way can be local or global. The default is local, but it becomes global if any one of the following conditions is true:

- The compound type is unreferenced
- The compound type has a Version 2.1 MRM base type
- The compound type is referenced by more than one element
- A message is based on the compound type
- The `-g` parameter is specified

The `xsd:group` that is created in this way can be local or global. The default is local, but it becomes global if any of the following conditions are true:

- The compound type is embedded directly within another compound type.
- The compound type has a Version 2.1 MRM base type.
- The compound type has a Version 2.1 type composition of `simpleUnorderedSet` and a Version 2.1 type content of `closed`.

The type composition of `simpleUnorderedSet` is dropped from the model in WebSphere Message Broker Version 6.0.

- If type content is `closed` then it is replaced by composition `all` with a BIP0191 warning message.
- Otherwise, it is replaced by composition `unorderedSet` with a BIP0192 warning message.
- Type composition of `empty` is replaced by an empty sequence with a BIP0193 warning message.
- Embedded messages with *minOccurs* or *maxOccurs* not equal to 1 have the occurs corrected to 1 with a BIP0162 warning message.
- Each element becomes an `xsd:element`. The `xsd:element` that is created in this way can be local or global, depending on the following criteria applied in the specified order:
  1. If the element is unreferenced, it is global.
  2. If the element has a prefixed identifier and is a member of exactly one compound type, it is local.
  3. If the element has a prefixed identifier and the `-pl` parameter is specified, it is local.

4. If the element is of a compound type with a Version 2.1 MRM base type, it is local.
5. If the element is a member of more than one compound type, it is global.
6. If the `-g` parameter is specified, it is global.
7. Otherwise, the element is local.

The type of the `xsd:element` that is created in this way can be:

- A global `xsd:complexType`
- An anonymous local `xsd:complexType`
- A schema built-in `xsd:simpleType`. (See “Mapping of MRM simple types to schema simple types” on page 125.)
- An anonymous `xsd:simpleType` that restricts a schema built-in `xsd:simpleType`
- Any value constraints that belong to the element are processed as follows:
  - A Default constraint sets the default attribute of the `xsd:element`.
  - A Null Permitted constraint sets the nillable attribute of the `xsd:element`.
  - A Date Template constraint changes the `xsd:simpleType` of the `xsd:element`. (See “Mapping of MRM simple types to schema simple types” on page 125.)
  - All others restrict the `xsd:simpleType` of the `xsd:element` by the application of `xsd:facets`.

Any unreferenced value constraint is discarded with a BIP0158, BIP0159, or BIP0160 warning message.

Any value constraint that results in an illegal `xsd:facet` being created is not migrated, but gives a BIP0165 warning message.

**Note:** For elements of type `STRING` only, value constraints *MinInclusive* and *MaxInclusive* are instead imported as hidden annotations for documentation purposes, because there is no equivalent `xsd:facet`.

- Element qualifiers are discarded with a once-only BIP0167 warning message.
- Each message becomes a message *and* an associated global `xsd:element`.
- A message that used element qualifiers has the qualification discarded with a BIP0166 warning message.
- Some physical format properties that were redundant in Version 2.1 have been removed from the new model. If one of these properties is encountered with a non-default value, a BIP0164 (or other more specific) warning message is issued.
- The TDS message set level property *Century window* default value was always set to 53 in Version 2.1. For messaging standard SWIFT this is incorrect, so the default for SWIFT only is changed to 80. This is reflected in an imported model.

## What the `mqsimigratemsgsets` command creates

For each `.mrp` file encountered, a new message set project is created with a name that is derived from the message set name and level in Version 2.1. The utility does this by adding a suffix to the message set name for all Level values other than 1. This process restores the one-to-one mapping and enables the broker to locate just one message set, given the name.

For example, a Version 2.1 message set with name SWIFT and Level 1, migrates in Version 6.0 to the message set name SWIFT, whereas a Version 2.1 message set with name SWIFT and Level 2 migrates in Version 6.0 to SWIFT\_2.

A message set folder and associated messageSet.mset file is created within the new project. The following points apply to the content of the message set:

- The message set folder name is the same as the new project.
- The message set identifier is the identifier of the original Version 2.1 message set.
- The message set is created specifying that namespaces are not supported.
- All physical format layers are re-created in the new message set.
- Any COBOL language binding layer is discarded with a BIP0174 warning message.
- Any C language binding layer is discarded with a BIP0173 warning message.
- Any finalized state is discarded with a BIP0170 warning message.
- Any basing information is discarded with a BIP0172 warning message.
- Any freeze timestamp is discarded with a BIP0169 warning message. Note that you always receive this message because the Version 2.1 export operation freezes the message set.

Each message category that is encountered in the .mrp file results in a new .category file being created. Note:

- Each transaction is replaced by the equivalent message category, containing all the messages in the transaction.
- Each transaction category is replaced by the equivalent message category, containing all the messages in all the transactions that are referenced by the transaction category.

A single message definition .mxsd file is created within the message set with the same name as the message set and in the default (notarget) namespace, unless the **-part** parameter is present.

If **-part** is specified, multiple .mxsd files can be created, if:

- The number of messages, elements and compound types in the file exceeds 1000, and
- The .mrp file can be partitioned into wholly disjoint subsets.

In Version 2.1, all elements and compound types are global. In Version 6.0, xsd:elements and xsd:complex types can be global or local. When you migrate a Version 2.1 message set, you will probably find that many elements and compound types that were global in Version 2.1 have been converted into local xsd:elements and xsd:complex types in Version 6.0, according to the rules stated above.

There are two reasons why you might want to override this behavior:

- You prefer the Version 2.1 organization of your message set, where all objects are global. If you specify the **-g** parameter, this organization is retained as far as is practical.
- You make use of compound type *Type content* with a value of Open defined.

This means that the valid content of a compound type can be any object in the message set, subject to *Type composition* property rules. Typically in this case, the compound type has not been modelled with any explicit content.

This can cause the **mqsimigratemsgsets** command to incorrectly make certain elements local rather than global. If you use Open defined and you find that after

migration a runtime validation error BIP5372E occurs, when previously it did not, rerun the `mqsimigratemsgsets` command with the `-g` parameter.

## Prefixed identifiers

In Version 2.1, a prefixed identifier was intended to indicate that an element is local. However, it is possible that an element with a prefixed identifier is actually used in more than one compound type, making it global. If this is so, a global `xsd:element` is created according to the preceding rules. A BIP0195 warning message is also issued, because this is a misuse of prefixed identifiers, and can result in duplicate global `xsd:elements` being created. For example, `A^X` and `B^X`, but both are used more than once, resulting in two global `xsd:elements` with name `X`.

If duplicates are created, run the `mqsimigratemsgsets` command again, specifying the `-pl` parameter. This forces all referenced elements with prefixed identifiers to be created as *local* `xsd:elements`.

## Embedded simple type

Embedded simple types within compound types need special treatment because the schema model is unable to cope with this construct. As embedded simple types are deprecated, replace them by taking advantage of the mixed attribute of the containing `xsd:complexType`.

Embedded simple types were introduced primarily to model a complex XML element that contained data values that were interspersed between child elements. Each such data value was modelled explicitly by an embedded simple type, which acted as a placeholder for the value and also supplied its simple type.

In XML schema, there is no exact equivalent. The closest is the mixed attribute of `xsd:complexType`. However, this only states that text can appear before or between child elements. It implies nothing about the location or data type of the text.

To retain this semantic, a schema extension is introduced, called the Embedded Simple Type. This is an unnamed local `xsd:element` of the appropriate simple type. The type itself is a restriction of the real underlying `xsd:simple` type, with a special name (commencing `ComIbmMrm_Anon`).

## Compound type with an MRM base type

This situation produces a BIP0161 warning message and needs special treatment because the schema model is unable to cope with this compound construct. Compound elements are deprecated, so replace the use of compound elements with the use of normal elements that reference the global `xsd:complexType`, as described in 1 on page 125 below, and take advantage of the mixed attribute.

Such compound types were introduced primarily to model a complex XML element that contained a data value as well as child elements. So an element of such a complex type has both complex content like a normal complex element, but also has a value like a simple element (the MRM base type information).

In XML schema, there is no exact equivalent. The closest is use of the mixed attribute of the `xsd:complexType`. But this just says that text can appear before and between (or just between) child elements. It implies nothing about the location or data type of the text.

There is no exact equivalent in XML schema, so the following steps have been taken:

1. A global `xsd:complexType` and a global `xsd:group` are created in the usual way. The `xsd:complexType` additionally has the mixed attribute set and its content is just a reference to the global `xsd:group`. This models the complex content, but loses the MRM base type information.
2. A specific schema extension, the Compound Element is introduced. This is an amalgamation of a complex element and a simple element. It is implemented in schema terms as an element with an anonymous complex type, the content of that type being:
  - A local `xsd:element` of the appropriate simple type (to model the MRM base type information). The simple type is a restriction of the real underlying `xsd:simple` type, with a special name (commencing `ComIbmMrm_BaseValue`)
  - A group reference to the global `xsd:group` created in 1 above.

A compound element is created for each element that referenced the compound type. Note that this can be done only if the element was itself a member of another compound type.

The combination of these two things means that meaningful use of such compound types within a message is preserved, because the MRM base type information is lost only when it was never used actively in a message.

The special data types that are created by the situations described in the preceding sections, commencing `ComIbmMrm`, are defined in an XML schema called `.wmq21.mxsd`, which is included in each message definition file that is created by the `mqsिमigratemsgsets` command.

## Mapping of MRM simple types to schema simple types

The simple type mapping is as follows:

MRM type	Schema type
BINARY	<code>xsd:hexBinary</code>
BOOLEAN	<code>xsd:boolean</code>
DECIMAL	<code>xsd:decimal</code>
DATETIME	<code>xsd:dateTime</code> (see the following table)
FLOAT	<code>xsd:float</code>
INTEGER	<code>xsd:int</code>
STRING	<code>xsd:string</code>

For DATETIME type, the simple type mapping is potentially changed by the presence of a Date Template value constraint as follows:

MRM DATETIME Date Template	Schema type
<code>CCYY-MM-DDThh:mm:ss.s</code>	<code>xsd:dateTime</code>
<code>CCYY-MM-DD</code>	<code>xsd:date</code>
<code>CCYY-MM</code>	<code>xsd:gYearMonth</code>
<code>CCYY</code>	<code>xsd:gYear</code>
<code>--MM-DD</code>	<code>xsd:gMonthDay</code>

MRM DATETIME Date Template	Schema type
--MM	xsd:gMonth
---DD	xsd:gDay
Thh:mm:ss.s	xsd:time

If the Date Template is not in the preceding list, the DATETIME is mapped to either an `xsd:time` or an `xsd:dateTime` with a BIP0175 warning message, depending on whether or not the Date Template had just a time component. However, note that this mapping can cause errors to appear in the task list after the import.

If the element concerned also had Version 2.1 Default Value, Min Inclusive, Max Inclusive, or Enumeration value constraints, the values for these do not match the lexical space for an `xsd:time` or `xsd:dateTime`, and so fail validation. These must be corrected manually using the editor.

The same task list error also appears for any Version 2.1 DATETIME type that supplied a Default Value, Min Inclusive, Max Inclusive, or Enumeration constraint where the value was not fully specified. For example, Date Template CCYY-MM, Enumeration 2003 was allowed in Version 2.1 as it was interpreted as 2003-01 at runtime. However, in the new model, the value must match the lexical space of the simple type and so must include the -01.

---

## Equivalent z/OS customization variables in mqsicompCIF and BIPEDIT

If you are migrating from Version 2.1 or Version 5.0 to Version 6.0 on z/OS, customize the Version 6.0 BIPEDIT file to match the Version 2.1 or Version 5.0 mqsicompCIF file.

The broker and User Name Server components are set up using the profile BIPEDIT. The following table lists the customization variables that are used in the Version 2.1 and Version 5.0 mqsicompCIF file, and the equivalent variables in the Version 6.0 BIPEDIT file so that you can set up the same values.

You can also look at the sample BIPEDIT file.

Version 2.1 and Version 5.0 mqsicompCIF customization variables	Version 6.0 BIPEDIT customization variables
DB2_SAMPLE_PGMNAME	++DB2SAMPLEPROGRAM++
DB2_SAMPLE_PGMPLAN	++DB2SAMPLEPROGRAMPLAN++
DB2_DSNACLI_PLANNAME	++DB2DSNACLIPLAN++
DB2_SUBSYSTEM	++DB2SUBSYSTEM++
DB2_LOCATION	++DB2LOCATION++
DB2_TABLE_OWNER	++DB2TABLEOWNER++ ++DB2CURRENTSQLID++ (These two values can have different values)
DB2_STORAGE_GROUP	++DB2STORAGEGROUP++
DB2_STOR_GROUP_VCAT	++DB2LOCATION++
DB2_STOR_GROUP_VOL	Default value in BIPCRDB
DB2_DATABASE	++DB2DATABASE++

Version 2.1 and Version 5.0 mqsicompfcif customization variables	Version 6.0 BIPEDIT customization variables
DB2_BUFFER_POOL	++DB2BUFFERPOOL++ ++DB2INDEXBP++ ++DB2LOBBP++ (These three values can have different values)
COMPONENT_PDS	++COMPONENTDATASET++
COMPONENT_KEY	++STARTEDTASKNAME++
STPN	++STARTEDTASKNAME++
USER_PROCLIB_PDS	N/A
STEPLIB_NAME	Defined in each JCL
JAVAHOME	++JAVA++
CLASSPATH	Default value in profile
PATH	Default value in profile
LIBPATH	Default value in profile
LILPATH	Default value in profile
DISTHUB_PATH	Default value in profile
LANG	++LOCALE++
LC_ALL	++LOCALE++
TZ	++TIMEZONE++
NLSPATH	Default value in profile
CONSOLE_NLSPATH	Default value in profile
MC_MESSAGES	Default value in profile
DB2_CONVERSION	++DB2CONVERSION++
USE_ARM	Default value in profile
ARM_ELEMENTNAME	Default value in profile
ARM_ELEMENTTYPE	Default value in profile
_CEE_RUNOPTS	N/A
NNSY_ROOT	Default value in profile
NNSY_CATALOGUES	Default value in profile
NN_CONFIG_FILE_PATH	NN_CONFIG_FILE_PATH in BIPBRPOF
//BIPXXXXX JOB 5655-G97, // MSGLEVEL=(1,1), // MSGCLASS=A, // NOTIFY=&SYSUID	Defined in each JCL
mqsicreate(broker/username server) command	++INSTALL++
mqsicreate(broker/username server) command	++COMPONENTDIRECTORY++
mqsicreate(broker/username server) command	++COMPONENTNAME++
N/A	++HOME++
N/A	++OPTIONS++
STEPLIB	++WMQHLQ++

Version 2.1 and Version 5.0 mqsicompfcif customization variables	Version 6.0 BIPEDIT customization variables
mqsicreate(broker/username/server) command	++QUEUEMANAGER++
N/A	++COMPONENTPROFILE++
N/A	++XMLTOOLKIT++
STEPLIB	++DB2HLQ++
STEPLIB	++DB2RUNLIB++
N/A	++MQPATH++

## Assignments configuration data in an export file

Find the assignments configuration data when you export all your resources from a Version 2.1 Control Center workspace.

This topic describes the assignments configuration data in the XML file that is generated when you export resources by clicking **File** → **Export All in Workspace**. Specifically, the topic tells you how to find the following configuration data for each broker in the broker domain:

- The name of the broker
- The name of each message set that is assigned to the broker
- The name of each execution group within the broker
- For each execution group within the broker, the name of each message flow that is assigned to the execution group
- For each message flow assigned to an execution group, the following properties:
  - Additional instances
  - Commit count
  - Commit interval
  - Coordinated transaction

The following XML shows the start of an example export file.

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE XMI SYSTEM "mqsi.dtd">
<XMI xmi.version="1.0">
  <XMI.header>
    <XMI.documentation>
      <XMI.owner>name</XMI.owner>
    </XMI.documentation>
  </XMI.header>
  Broker/a3916f02-f500-0000-0080-8818935dcec8
  ExecutionGroup/23bd6f02-f500-0000-0080-8818935dcec8
  MessageProcessingNodeType/24c55cb6-ea00-0000-0080-c5b38dd899ad
  MessageProcessingNodeType/7e8b6bb6-ea00-0000-0080-c5b38dd899ad
  MessageProcessingNodeType/c0656ab6-ea00-0000-0080-c5b38dd899ad
  MessageProcessingNodeType/575960b6-ea00-0000-0080-c5b38dd899ad
  TopicRoot/TopicRoot
  PubSubTopology/PubSubTopology
  MessageProcessingNodeType/2f11692e-e900-0000-0080-c5b38dd899ad
  MessageProcessingNodeType/8322692e-e900-0000-0080-c5b38dd899ad
  MessageProcessingNodeType/4e2f692e-e900-0000-0080-c5b38dd899ad
  MessageProcessingNodeType/ff3c692e-e900-0000-0080-c5b38dd899ad
  MessageProcessingNodeType/fba95b0e-ef00-0000-0080-aed9bbfe32dc
  MessageProcessingNodeType/fc149e14-ef00-0000-0080-aed9bbfe32dc
  MessageProcessingNodeType/857e100f-ef00-0000-0080-aed9bbfe32dc
</XMI.documentation>
</XMI.header>
```



```

<XMI.content>
  <Broker icon="images/Broker.gif" creator="" version="" collectionPath=""
    versionTimestamp="" longDescription="" status="" versionCreator=""
    creationTimestamp="" shortDescription=""
    xmi.uuid="a3916f02-f500-0000-0080-8818935dcec8"
    xmi.id="a3916f02-f500-0000-0080-8818935dcec8" xmi.label="fred_tp">
    <Broker_queueManager value="ANAME" encoded="false"
      xmi.label="queueManager" type="String" valueMandatory="true"/>
    <AssignedMsgProject icon="images/MRProject.gif" collectionPath="MRM"
      status="" xmi.label="MQSISTR_MRM2">
      <MRProjectRef icon="images/MRProject.gif" xml:link="simple"
        xmi.label="MRProject" type="MRProject" refType="MRProject"
        title="MQSISTR_MRM2"
        href="MRM/MRProject/71bb0097-e700-0000-0080-abda7687be69"/>
    </AssignedMsgProject>
    <ExecutionGroupRef icon="images/ExecutionGroup.gif" xml:link="simple"
      xmi.label="ExecutionGroup" type="ExecutionGroup"
      refType="ExecutionGroup"
      href="ExecutionGroup/23bd6f02-f500-0000-0080-8818935dcec8"
      title="default"/>
  </Broker>
  <ExecutionGroup icon="images/ExecutionGroup.gif" creator="" version=""
    collectionPath="" versionTimestamp="" longDescription="" status=""
    versionCreator="" creationTimestamp="" shortDescription=""
    xmi.uuid="23bd6f02-f500-0000-0080-8818935dcec8"
    xmi.id="23bd6f02-f500-0000-0080-8818935dcec8" xmi.label="default">
  <AssignedMessageFlow icon="images/MessageProcessingNodeType.gif" status=""
    xmi.label="mqsistrmrmswiftflow">
    <AssignedMessageFlow_additionalInstances value="3" encoded="false"
      xmi.label="additionalInstances" type="Integer"
      valueMandatory="false"/>
    <AssignedMessageFlow_commitCount value="5" encoded="false"
      xmi.label="commitCount" type="Integer" valueMandatory="false"/>
    <AssignedMessageFlow_commitInterval value="1" encoded="false"
      xmi.label="commitInterval" type="Integer" valueMandatory="false"/>
    <AssignedMessageFlow_coordinatedTransaction value="no" encoded="false"
      xmi.label="coordinatedTransaction" type="yes_no"
      valueMandatory="false"/>
    <MessageProcessingNodeTypeRef icon="images/MessageProcessingNodeType.gif"
      xml:link="simple" xmi.label="MessageProcessingNodeType"
      type="MessageProcessingNodeType" refType="MessageProcessingNodeType"
      href="MessageProcessingNodeType/24c55cb6-ea00-0000-0080-c5b38dd899ad"
      title="mqsistrmrmswiftflow"/>
  </AssignedMessageFlow>
</ExecutionGroup>
  ...
</XMI.content>
</XMI>

```

The following sections describe how to find the assignments configuration data in an export file.

## The name of the broker

For each broker in the broker domain, look for a Broker element within the XMI.content element. The name of the broker is the value of the Broker element's xmi.label attribute.

In the example, only one broker is defined. The name of the broker is fred\_tp.

## The name of each message set that is assigned to the broker

For each message set that is assigned to a broker, look for an `AssignedMsgProject` element within the `Broker` element. The name of the message set is the value of the `AssignedMsgProject` element's `xmi.label` attribute.

In the example, only one message set is assigned to the broker `fred_tp`. The name of the message set is `MQSISTR_MRM2`.

## The name of each execution group within the broker

For each execution group within a broker, look for an `ExecutionGroupRef` element within the `Broker` element. The name of the execution group is the value of the `ExecutionGroupRef` element's `title`.

In the example, the broker `fred_tp` has only one execution group, which is the default execution group.

For each execution group in the broker domain, look for an `ExecutionGroup` element within the `XMI.content` element. You can determine the broker to which an execution group belongs by examining the value of the `ExecutionGroup` element's `xmi.uuid` attribute. This value forms part of the value of the `href` attribute on the `Broker` element's corresponding `ExecutionGroupRef` element.

In the example, only one execution group in the broker domain is defined, the default execution group for the broker `fred_tp`. The value of the `xmi.uuid` attribute on the `ExecutionGroup` element is `23bd6f02-f500-0000-0080-8818935dcec8`, and this forms part of the value of the `ExecutionGroupRef` element's `href` attribute for the broker `fred_tp`.

## The name of each message flow that is assigned to each execution group

For each message flow that is assigned to an execution group, look for an `AssignedMessageFlow` element within the `ExecutionGroup` element. The name of the message flow is the value of the `AssignedMessageFlow` element's `xmi.label` attribute. In the example, only one message flow is assigned to the default execution group for the broker `fred_tp`. The name of the message flow is `mqsisstrmrmswiftflow`.

## The properties of each message flow

For each property of an assigned message flow, look for a corresponding element within the `AssignedMessageFlow` element. The following table lists each property and its corresponding tag.

Property of an assigned message flow	Corresponding tag
Additional instances	<AssignedMessageFlow_additionalInstances>
Commit count	<AssignedMessageFlow_commitCount>
Commit interval	<AssignedMessageFlow_commitInterval>
Coordinated transaction	<AssignedMessageFlow_coordinatedTransaction>

The value of a property is the value of the corresponding element's value attribute.

For example, the following table displays the properties of the message flow `mqsisrtrmrmswiftflow` that is assigned to the default execution group within broker `fred_tp`.

Property	Value
Additional instances	3
Commit count	5
Commit interval	1
Coordinated transaction	no

---

## Migration glossary

This glossary lists differences in terminology between WebSphere Message Broker Version 6.0 and previous versions of the product.

For a full list of terms and abbreviations used by the product documentation, and for definitions that are more complete, see the Glossary of terms and abbreviations.

### A

#### **assigned message flow**

In Version 2.1, a message flow that is assigned to an execution group. In Version 6.0, when you add a message flow to a broker archive (bar) file and deploy the bar file to an execution group, the message flow is assigned implicitly to the execution group.

#### **assigned message flow properties**

In Version 2.1, the properties of an assigned message flow. In Version 6.0, you specify the equivalent properties in the deployment descriptor of a broker archive (bar) file.

#### **assigned message set**

In Version 2.1, a message set that is assigned to a broker. In Version 6.0, when you add a message set to a broker archive (bar) file and deploy the bar file to an execution group, the message set is assigned implicitly to the execution group.

#### **Assignments view**

In Version 2.1, the user interface in the Control Center that is used to assign message flows to an execution group and message sets to a broker. In Version 6.0, the equivalent function is provided by the Broker Administration perspective of the workbench. When you add message flows and message sets to a broker archive (bar) file and deploy the bar file to an execution group, the message flows and message sets are assigned implicitly to the execution group.

### B

#### **base message set**

In Version 2.1, a finalized message set upon which another message set is based. The two message set definitions are linked and the definition of the base message set can never be modified. In Version 6.0, when you base a message set on another message set, the workbench makes a copy of the

definition of the base message set. Subsequently, the two message set definitions are completely separate from each other and can be modified independently.

**base type**

In Version 2.1, a compound type as a whole can have a simple value. The type of this simple value is called the base type. In Version 6.0, a base type is the simple type or complex type upon which another type is based.

**Broker Administration perspective**

In Version 6.0, a broker administration console that communicates with one or more Configuration Managers. Administrators work in this perspective to manage the resources (also referred to as domain objects) in the broker domain that are defined on one or more Configuration Managers. In Version 2.1, the equivalent function is provided by the Assignments view.

**built-in node**

In Version 6.0, a message processing node that is supplied by the product. In Version 2.1, this is referred to as an IBM Primitive node.

**C**

**check in**

In Version 2.1, a Control Center action that stores a new or updated resource in the Configuration Manager. In Version 6.0, the equivalent check-in function might be provided by an external repository that is associated with the workbench.

**check out**

In Version 2.1, a Control Center action that extracts a resource from the Configuration Manager and locks it for local modification by a user. In Version 6.0, the equivalent check-out function might be provided by an external repository that is associated with the workbench.

**C language binding**

See language binding.

**COBOL language binding**

See language binding.

**complex type**

In Version 6.0, a type that has structure. In Version 2.1, this role is performed by a compound type.

**compound type**

In Version 2.1, this has two roles:

- A type that has structure. In Version 6.0, this is referred to as a complex type.
- A collection of elements. In Version 6.0, this is referred to as a group.

**Composition**

In Version 6.0, a property that describes how a message tree is structured. In Version 2.1, the equivalent property of a compound type is Type Composition.

**Configuration Manager**

In Version 6.0, the Configuration Manager does not store message flow and message set definitions. Instead, these definitions are stored in the local file system or in an external repository that is associated with the workbench.

In addition in Version 6.0 the Configuration Manager no longer uses an external database to store the domain configuration, but uses an internal repository instead.

**connection**

In Version 6.0, this represents the flow of control and data between two message processing nodes. In Version 2.1, this is referred to as a connector.

**Connection pane**

In Version 2.1, a pane that is used to specify certain properties of an element or compound type. In Version 6.0, these properties are specified as the logical properties of an element reference or group reference.

**connector**

In Version 2.1, this represents the flow of control and data between two message processing nodes. In Version 6.0, this is referred to as a connection.

**Content Validation**

In Version 6.0, a property of a group. In Version 2.1, the equivalent property applies to a compound type and is called Type Content.

**context tag**

See element qualifier.

**Control Center**

In Version 2.1, the graphical user interface that provides the function to define, configure, deploy, and monitor resources. In Version 6.0, this function is provided, with enhancements, by the Message Brokers Toolkit, which is also known as the workbench.

**customizer**

In Version 2.1, a means of specifying complex properties of a message processing node. In Version 6.0, you use an editor to perform this task.

**D**

**debugger**

In Version 2.1, a tool that is accessed from the Message Flows view in the Control Center and enables message flows to be debugged. In Version 6.0, similar but enhanced function is provided by the flow debugger.

**Description pane**

In Version 2.1, a pane that is associated with every object and that is used to specify the Short Description and Long Description properties of the object. In Version 6.0, some objects still have short and long descriptions, but message model objects have a documentation property instead.

**documentation property**

In Version 6.0, the documentation property of an object allows you to add information to enhance the understanding of that object's function. In Version 2.1, the equivalent information is provided using the Description pane.

**E**

**element member**

In Version 2.1, an object that represents the membership of an element within a compound type. In Version 6.0, the object that represents the membership of a global element within a complex type or group is called an element reference.

**element qualifier**

In Version 2.1, an object that is associated with an element in a message to enable that element to be treated differently in different contexts. It is also known as a context tag. In Version 6.0, element qualifiers are no longer used.

**element reference**

In Version 6.0, an object that represents the membership of a global element within a complex type or group. In Version 2.1, the object that represents the membership of an element within a compound type is called an element member.

**element value**

In Version 2.1, a named value that you can use to specify a value constraint on an element. In Version 6.0, element values are no longer used. Instead, you associate value constraints with a simple type.

**extended decimal**

In Version 2.1, a Custom Wire Format (CWF) physical representation of a number. In Version 6.0, this is referred to as external decimal.

**external decimal**

In Version 6.0, a Custom Wire Format (CWF) physical representation of a number. In Version 2.1, this is referred to as extended decimal.

**F****finalize**

In Version 2.1, the action to put a message set into a finalized state. When a message set is in this state, you can never modify its definition again. In Version 6.0, a message set cannot be finalized.

**flow debugger**

In Version 6.0, a facility to debug message flows that is provided in the Debug perspective in the workbench. In Version 2.1, the equivalent function is provided by the debugger .

**freeze** In Version 2.1, the action to put a message set into a frozen state to prevent further modification to its definition. See also unfreeze. In Version 6.0, a message set cannot be frozen.

**G****glossary**

In Version 2.1, a form of documentation in HTML format that you can generate from a message set definition. In Version 6.0, this has been replaced by message set documentation, which is also in HTML format.

**group** In Version 6.0, a structure that can be included in a complex type or another group. In Version 2.1, this role is performed by a compound type.

**H****History pane**

In Version 2.1, a pane that is used to specify additional documentation for certain MRM objects such as an element, a message, and a compound type. In Version 6.0, the Documentation property of an object is used to specify this information.

**I**

**IBM Primitive node**

In Version 2.1, a message processing node that is supplied by the product. In Version 6.0, this is referred to as a built-in node.

**identifier**

In Version 2.1, an identifier that identifies each object uniquely within a message set. You use the identifier to reference the object in an ESQL statement. In Version 6.0, an object is identified by its name only. When you migrate a message set, the name of an object is formed from its Version 2.1 identifier.

**Input Compression Technique**

In Version 2.1, a Tagged Delimited String (TDS) property of a message set. In Version 6.0, this property does not exist.

**Input Terminal node**

In Version 2.1, an IBM Primitive node through which a message is received by a subflow. In Version 6.0, this function is provided by the Input node.

**L****language binding**

In Version 2.1, a set of properties associated with a message set that enable you to generate a C header or COBOL copy book from the message set definition. In Version 6.0, this set of properties does not exist, and it is not possible to generate a C header or COBOL copy book from a message set definition.

**Level** In Version 2.1, a property of a message set that specifies the version of the message set. In Version 6.0, this property does not exist.

**Long Description**

See Description pane.

**M****message book**

In Version 2.1, a form of documentation in HTML format that you can generate from a message set definition. In Version 6.0, this has been replaced by message set documentation, which is also in HTML format.

**Message Brokers Toolkit**

In Version 6.0, the development and operational management environment for a broker domain. It is also referred to as the workbench. In Version 2.1, the Control Center provides this function.

**message category**

In Version 6.0, a way of grouping messages, perhaps for documentation or convenience purposes, or for assisting in the generation of Web Services Description Language (WSDL) files. This replaces the Version 2.1 transaction and transaction category.

**Message Domain**

In Version 6.0.2, a message set property that specifies the message domain of messages in the message set. It replaces the *Runtime Parser* property of earlier releases.

**message repository**

In Version 2.1, the set of database tables used by the Configuration Manager to store message set definitions. In Version 6.0, there is no

message repository, and message set definitions are stored in the local file system or in an external repository that is associated with the workbench.

### **Message Repository Manager**

In Version 2.1, the component of the Configuration Manager that manages message set definitions in the message repository. In Version 6.0, there is no Message Repository Manager.

### **message set documentation**

In Version 6.0, documentation in HTML format that you can generate from a message set definition. In Version 2.1, the equivalent documentation is provided by a glossary and a message book.

**MRM** In Version 2.1, the name of a message domain and the abbreviation for Message Repository Manager. In Version 6.0, it is the name of only a message domain.

## **N**

**name** In Version 2.1, a descriptive name of an object in a message set. This name is not used to identify the object in an ESQL statement; the identifier of the object is used instead. In Version 6.0, the name is used to identify an object and must be a valid XML Schema identifier. When you migrate a message set, the name of an object is formed from its Version 2.1 identifier.

## **O**

### **Operations view**

In Version 2.1, the Control Center view that is used to manage and monitor the brokers in a broker domain. In Version 6.0, the equivalent function is provided by the Domains and Alerts views in the Broker Administration perspective of the workbench.

### **Output Compression Technique**

In Version 2.1, a Tagged Delimited String (TDS) property of a message set. In Version 6.0, this property does not exist.

### **Output Terminal node**

In Version 2.1, an IBM Primitive node through which a message is propagated by a subflow. In Version 6.0, this function is provided by the Output node.

## **P**

### **plug-in**

In Version 2.1, a user-written extension to the broker that provides a message processing node or message parser in addition to those supplied with the product. In Version 6.0, this is referred to as a user-defined extension.

### **prefixed identifier**

In Version 2.1, an identifier that contains a prefix to ensure that the identifier is unique within a message set. Use prefixed identifiers in situations where different elements have the same name so that the element is defined globally even though it is considered to be local to a compound type of which it is a member. In Version 6.0, prefixed identifiers are no longer required because an element can be defined locally. When you migrate a message set, an element with a prefixed identifier becomes a local element, and the prefix is discarded when the identifier is used to form the Version 6.0 name.



## R

### **Run Time pane**

In Version 2.1, the pane that is used to specify the runtime parser for a message set. In Version 6.0, this information is specified as a general message set property.

### **Runtime Parser**

See Message Domain.

## S

### **shared data**

In Version 2.1, configuration repository and message repository data that is shared by Control Center users. In Version 6.0, the equivalent functionality might be provided by an external repository that is associated with the workbench.

### **Short Description**

See Description pane.

### **simple type**

In Version 2.1, one of seven types defined by the MRM to describe an item of data. In Version 6.0, a simple type is one of the 44 XML Schema simple types or a user-defined simple type.

### **Simple Unordered Set**

In Version 2.1, one of the permissible values of the Type Composition property of a compound type. It is intended for the modelling XML DTD attribute list declarations. In Version 6.0, this value is not required because XML Schema attribute groups are modelled as objects in their own right. If the Type Composition property of a compound type has this value when you migrate a message set, the Composition property of the group that is formed from the compound type has the value All, if the Type Content property of the compound type has the value Closed, or the value Unordered Set otherwise.

### **suspended from use**

In Version 2.1, certain MRM objects in a message set that is based on another message set can be suspended from use. When suspended from use, an object cannot be used. In Version 6.0, an object cannot be suspended from use.

## T

### **traffic light status icon**

In Version 2.1, an icon next to a message flow, execution group, or broker in the Domain Topology pane of the Operations view in the Control Center. A green traffic light indicates that the resource is running, and a red traffic light indicates that it is not running. In Version 6.0, an alert appears in the Alerts view in the Broker Administration perspective of the workbench only when the resource is not running.

### **transaction**

In Version 2.1, a group of messages that are considered to be part of a single business transaction. In Version 6.0, transactions are no longer used. When you migrate a message set, a transaction is replaced by a message category that contains the same messages as the original transaction.

### **transaction category**

In Version 2.1, a group of transactions within a message set. In Version 6.0,

transaction categories are no longer used. When you migrate a message set, a transaction category is replaced by a message category. This message category contains all the messages in all the transactions that were members of the original transaction category.

#### **Type Composition**

In Version 2.1, a property of a compound type. In Version 6.0, the equivalent property applies to a group and is called Composition.

#### **Type Content**

In Version 2.1, a property of a compound type. In Version 6.0, the equivalent property applies to a group and is called Content Validation.

### **U**

#### **unfreeze**

In Version 2.1, the action to remove a message set from a frozen state to allow further modification to its definition. In Version 6.0, a message set cannot be frozen.

#### **unlock**

In Version 2.1, the action to end the checked-out state of a resource in such a way that any changes made to the resource since it was checked out are not stored in the Configuration Manager. In Version 6.0, the equivalent function might be provided by an external repository that is associated with the workbench.

#### **user-defined extension**

In Version 6.0, a user-written extension to the broker that provides a message processing node or message parser in addition to those supplied with the product. In Version 2.1, this is referred to as a plug-in.

### **V**

#### **value constraint**

In Version 2.1, the use of an element value to specify a constraint on the value of an element. In Version 6.0, a value constraint is represented by an XML schema facet that is applied to a simple type.

**view** In Version 2.1, a user interface in the Control Center that enables a user to perform a specified task. There are eight views: Message Sets, Message Flows, Topology, Assignments, Topics, Operations, Subscriptions, and Log. In Version 6.0, a view is a component of a perspective in the workbench. To perform a specified task, the user selects the appropriate perspective and then uses a combination of one or more views and an editor.

### **W**

#### **workbench**

See Message Brokers Toolkit.

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## **Part 3. Appendixes**



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## Appendix. Notices for WebSphere Message Broker

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