

WebSphere Message Broker



Hypervisor Edition User's Guide and Reference

Version 8 Release 0

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About this book

This book explains how to load, configure, and use WebSphere Message Broker Hypervisor Edition.

The Terms of use and Notices that apply to the WebSphere Message Broker information centers also apply to this book.

This edition applies to WebSphere Message Broker Hypervisor Edition Version 8.0.0.2 (product number 5724-J05) and to all subsequent releases and modifications until otherwise indicated in new editions.

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Chapter 1. WebSphere Message Broker Hypervisor Edition overview

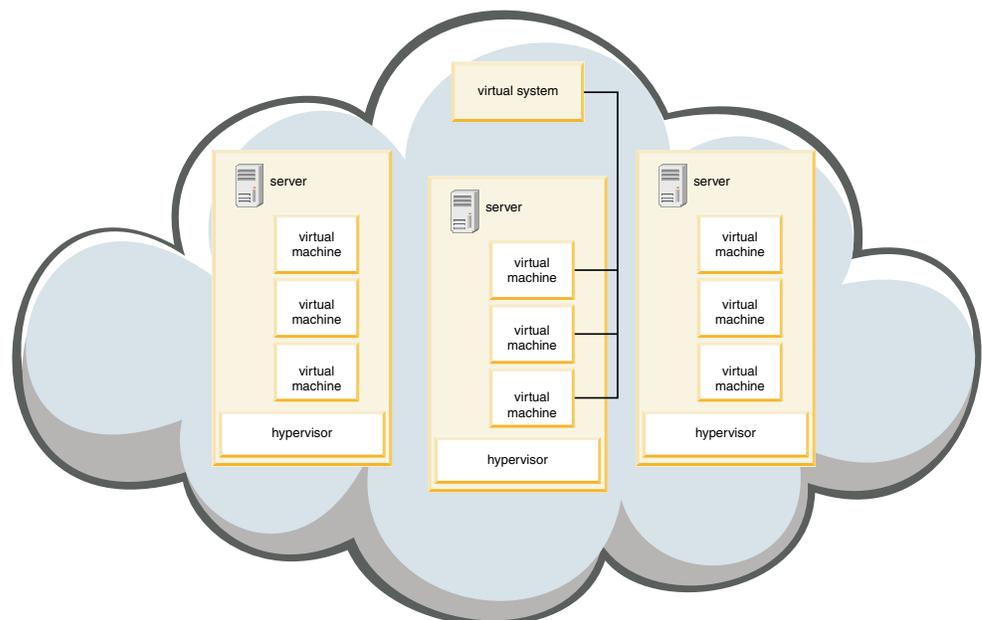
WebSphere® Message Broker Hypervisor Edition is a self-contained virtual machine image that contains a guest operating system and WebSphere Message Broker. Use Hypervisor Edition to create, deploy, and manage WebSphere Message Broker environments and applications by using a computer, which is known as a hypervisor, that hosts a virtual system.

WebSphere Message Broker Hypervisor Edition virtual systems

You can use hypervisors to divide the physical resources of a server between multiple instances of an operating system, so that each can run securely on the same computer, increasing the utilization of the server. A hypervisor manages the state of virtual machines; including processors, memory, and other resources, as well as allocating these resources among the virtual machines. Two hypervisors are supported for use with WebSphere Message Broker; VMware ESXi for RHEL Linux on x86-64 and PowerVM® for AIX® on POWER® systems.

Clouds are composed of one or more virtual systems. Virtual systems are composed of one or more virtual machine images that each contains an operating system and any number of applications.

Clouds contain one or more pieces of hardware (physical servers). A hypervisor controls each piece of hardware or a collection of hardware. The following diagram shows a cloud that contains several physical servers. Each server has a hypervisor that manages multiple virtual machines. The cloud in the diagram also contains a virtual system that consists of three virtual machines. In the diagram, all of the virtual machines are running on the same physical server, but it is possible for a virtual system to have virtual machines running on different physical servers in the cloud.



IBM® Workload Deployer and IBM PureApplication® System are hardware appliances that provide access to IBM middleware virtual images and patterns to easily, quickly and repeatedly create application environments that can be securely deployed and managed in a private cloud.

Note: Throughout this document, the term IBM Hardware Appliances refers to both the IBM Workload Deployer and IBM PureApplication System appliances.

Before you use WebSphere Message Broker Hypervisor Edition, ensure that you understand the terminology and concepts it shares with your IBM Hardware Appliances. For more information, see IBM Workload Deployer Information Center and IBM PureApplication System Information Center.

If you are using a hypervisor virtual machine image with IBM Hardware Appliances, the virtual systems are deployments of patterns; each hypervisor virtual machine image is configured as one part of a pattern, with a part representing a single virtual machine.

If you are using the hypervisor virtual machine image without the IBM Hardware Appliances, you must configure and deploy the hypervisor virtual machine image manually, by means of VMware ESXi for Linux on x86-64, or mksysb image for AIX on POWER systems.

The following table lists the supported combinations of operating systems and virtual machine images:

Operating System	Virtual Machine Image	Information
RHEL Linux on x86-64	IBM Workload Deployer	See Chapter 2, “Using WebSphere Message Broker Hypervisor Edition with IBM Workload Deployer for Linux on x86-64,” on page 3
	IBM PureApplication System	See Chapter 3, “Using WebSphere Message Broker Hypervisor Edition with IBM PureApplication System for Linux on x86-64,” on page 7
	VMware ESXi	See Chapter 4, “Using WebSphere Message Broker Hypervisor Edition with VMware for Linux on x86-64,” on page 11
AIX on POWER systems	IBM Workload Deployer	See Chapter 5, “Using WebSphere Message Broker Hypervisor Edition with IBM Workload Deployer for AIX on POWER,” on page 13
	IBM PureApplication System	See Chapter 6, “Using WebSphere Message Broker Hypervisor Edition with IBM PureApplication System for AIX on POWER,” on page 17
	mksysb image	See Chapter 7, “Using WebSphere Message Broker Hypervisor Edition mksysb image for AIX on POWER systems,” on page 21

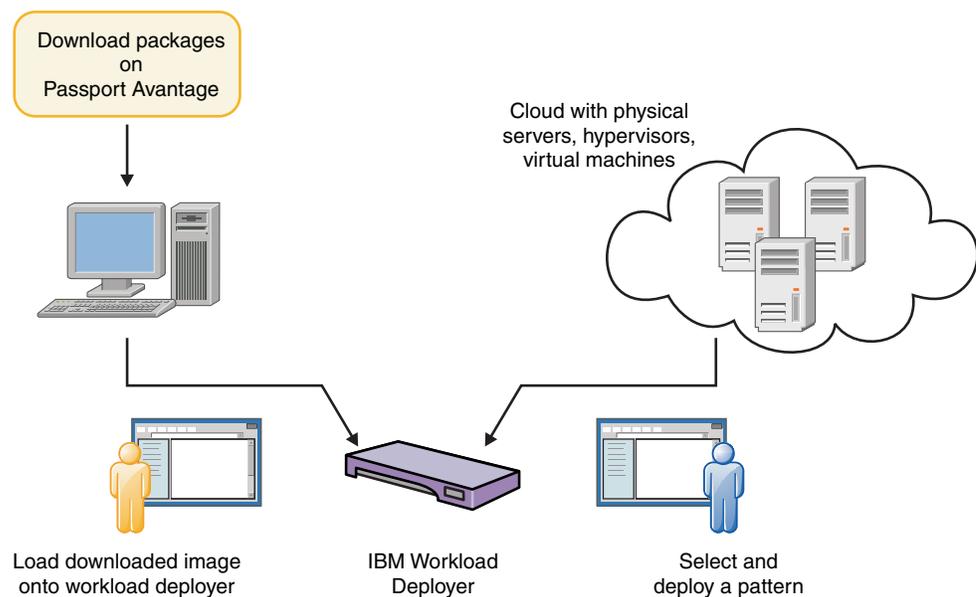
Chapter 2. Using WebSphere Message Broker Hypervisor Edition with IBM Workload Deployer for Linux on x86-64

Load WebSphere Message Broker Hypervisor Edition on to IBM Workload Deployer to create, deploy, and manage WebSphere Message Broker environments and applications in a cloud using a VMware hypervisor. This virtual system can be used for development, testing, and production environments.

WebSphere Message Broker Hypervisor Edition for IBM Workload Deployer

WebSphere Message Broker Hypervisor Edition is available for download from Passport Advantage® and can be manually uploaded to the IBM Workload Deployer.

The following diagram shows a basic work flow. An administrator downloads the WebSphere Message Broker Hypervisor Edition package from Passport Advantage, extracts it, and loads the virtual machine image and a set of predefined patterns onto IBM Workload Deployer. The patterns can then be deployed straight into the cloud, or they can be edited and customized first.



For more information about using WebSphere Message Broker Hypervisor Edition with IBM Workload Deployer, see the following topics:

- “Adding the WebSphere Message Broker Hypervisor Edition virtual machine image to the IBM Hardware Appliances image catalog” on page 27
- “Script packages” on page 41

Virtual machine image overview

The WebSphere Message Broker Hypervisor Edition virtual machine image includes a virtual machine template that you can use to create WebSphere Message Broker deployments in a cloud environment.

You can download a WebSphere Message Broker Hypervisor Edition virtual machine image from Passport Advantage and then load it on to the IBM Workload Deployer. After the virtual machine image has been added to the IBM Workload Deployer image catalog, an administrator can use IBM Workload Deployer to manage and deploy patterns to a cloud environment.

WebSphere Message Broker Hypervisor Edition includes two components:

The WebSphere Message Broker Hypervisor Edition virtual machine image

Provides a template for creating virtual machines, and includes installed versions of WebSphere Message Broker and other products that are required to create a deployment environment. The image includes the following preinstalled, ready-to-use patterns:

- WebSphere Message Broker (Basic)
- WebSphere Message Broker (Advanced)

These patterns address common WebSphere Message Broker topologies and are available when you use the WebSphere Message Broker Hypervisor Edition Image Loader utility to load the virtual machine image onto the IBM Workload Deployer. Each pattern is used to create a virtual system, which is a fully functional deployment environment.

The WebSphere Message Broker Hypervisor Edition Image Loader utility

This utility is used to add the WebSphere Message Broker Hypervisor Edition virtual image to the image catalog on the IBM Workload Deployer. In addition, it adds the preinstalled patterns to the collection of available patterns on the IBM Workload Deployer. It also adds the script packages.

You can run the virtual image on a VMware ESXi hypervisor.

Available virtual images

You can download the virtual image package from Passport Advantage, as follows:

1. Select and download the required virtual machine image version of WebSphere Message Broker Hypervisor Edition for RHEL Linux on x86-64.
2. Using the supplied WebSphere Message Broker Hypervisor Edition Image Loader utility, load the virtual machine image onto the IBM Workload Deployer.

All virtual machine images require IBM Workload Deployer and a hypervisor (VMware ESXi).

Virtual image contents

The virtual image contains the following preinstalled software:

- RHEL Linux on x86-64
- WebSphere MQ
- WebSphere MQ Explorer
- WebSphere Message Broker

- WebSphere Message Broker Explorer
- WebSphere Message Broker Toolkit

Maintenance

Maintenance for virtual machines is applied by using the mechanisms that are provided within IBM Workload Deployer. For more information about maintenance, see *Virtual system instance maintenance*.

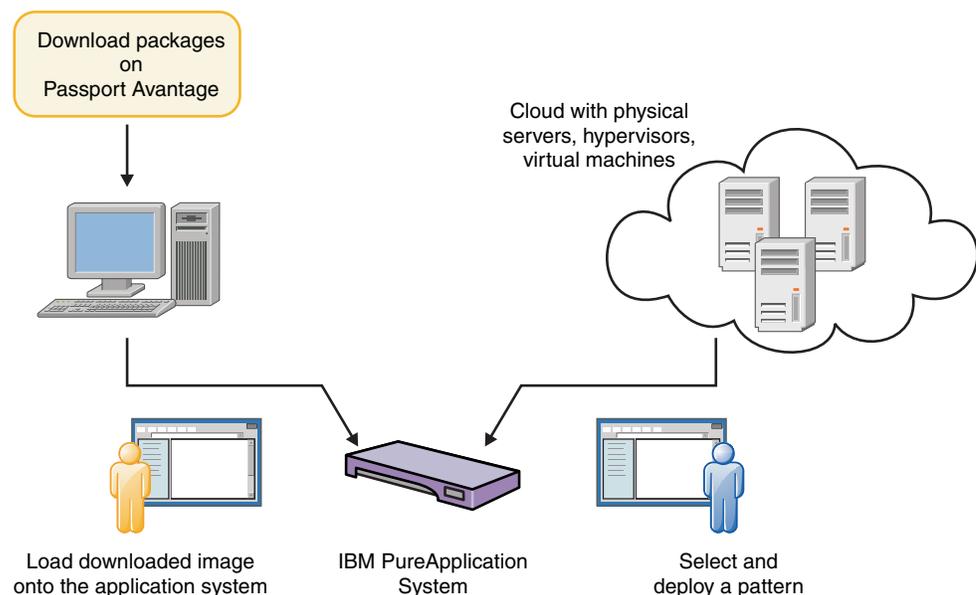
Chapter 3. Using WebSphere Message Broker Hypervisor Edition with IBM PureApplication System for Linux on x86-64

Load WebSphere Message Broker Hypervisor Edition on to IBM PureApplication System to create, deploy, and manage WebSphere Message Broker environments and applications in a cloud using a VMware hypervisor. This virtual system can be used for development, testing, and production environments.

WebSphere Message Broker Hypervisor Edition for IBM PureApplication System

WebSphere Message Broker Hypervisor Edition is available for download from Passport Advantage and can be manually uploaded to the IBM PureApplication System.

The following diagram shows a basic work flow. An administrator downloads the WebSphere Message Broker Hypervisor Edition package from Passport Advantage, extracts it, and loads the virtual machine image and a set of predefined patterns onto IBM PureApplication System. The patterns can then be deployed straight into the cloud, or they can be edited and customized first.



For more information about using WebSphere Message Broker Hypervisor Edition with IBM PureApplication System, see the following topics:

- “Adding the WebSphere Message Broker Hypervisor Edition virtual machine image to the IBM Hardware Appliances image catalog” on page 27
- “Script packages” on page 41

Virtual machine image overview

The WebSphere Message Broker Hypervisor Edition virtual machine image includes a virtual machine template that you can use to create WebSphere Message Broker deployments in a cloud environment.

You can download a WebSphere Message Broker Hypervisor Edition virtual machine image from Passport Advantage and then load it on to the IBM PureApplication System. After the virtual machine image has been added to the IBM PureApplication System image catalog, an administrator can use IBM PureApplication System to manage and deploy patterns to a cloud environment.

WebSphere Message Broker Hypervisor Edition includes two components:

The WebSphere Message Broker Hypervisor Edition virtual machine image

Provides a template for creating virtual machines, and includes installed versions of WebSphere Message Broker and other products that are required to create a deployment environment. The image includes the following preinstalled, ready-to-use patterns:

- WebSphere Message Broker (Basic)
- WebSphere Message Broker (Advanced)

These patterns address common WebSphere Message Broker topologies and are available when you use the WebSphere Message Broker Hypervisor Edition Image Loader utility to load the virtual machine image onto the IBM PureApplication System. Each pattern is used to create a virtual system, which is a fully functional deployment environment.

The WebSphere Message Broker Hypervisor Edition Image Loader utility

This utility is used to add the WebSphere Message Broker Hypervisor Edition virtual image to the image catalog on the IBM PureApplication System. In addition, it adds the preinstalled patterns to the collection of available patterns on the IBM PureApplication System. It also adds the script packages.

You can run the virtual image on a VMware ESXi hypervisor.

Available virtual images

You can download the virtual image package from Passport Advantage, as follows:

1. Select and download the required virtual machine image version of WebSphere Message Broker Hypervisor Edition for RHEL Linux on x86-64.
2. Using the supplied WebSphere Message Broker Hypervisor Edition Image Loader utility, load the virtual machine image onto the IBM PureApplication System.

All virtual machine images require IBM PureApplication System and a hypervisor (VMware ESXi).

Virtual image contents

The virtual image contains the following preinstalled software:

- RHEL Linux on x86-64
- WebSphere MQ
- WebSphere MQ Explorer

- WebSphere Message Broker
- WebSphere Message Broker Explorer
- WebSphere Message Broker Toolkit

Maintenance

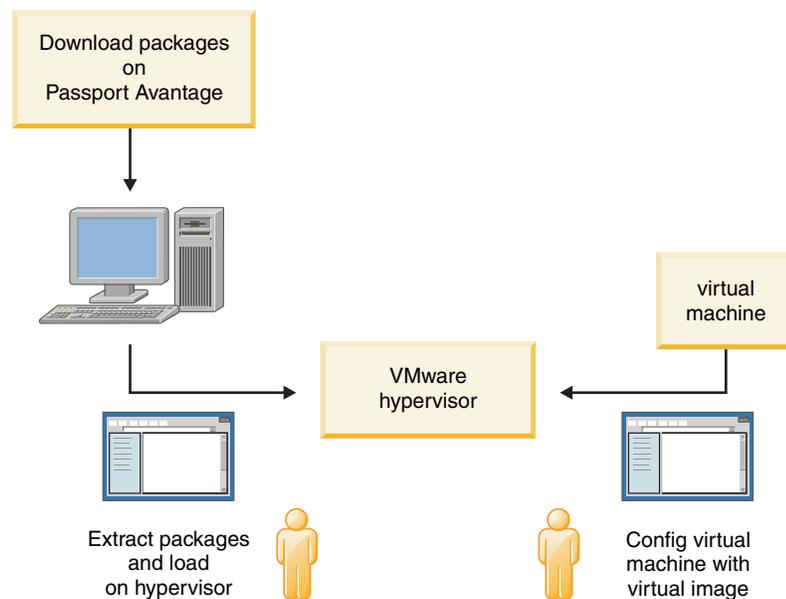
Maintenance for virtual machines is applied by using the mechanisms that are provided within IBM PureApplication System.

Chapter 4. Using WebSphere Message Broker Hypervisor Edition with VMware for Linux on x86-64

Providing your chosen operating system is Linux on x86-64, you can use the WebSphere Message Broker Hypervisor Edition without the IBM Hardware Appliances. In this stand-alone environment, you can deploy the virtual machine image on a VMware ESXi hypervisor. Using the virtual machine image without the IBM Hardware Appliances provides a way to deploy a virtual system without a full cloud environment.

WebSphere Message Broker Hypervisor Edition for VMware

The following diagram shows a basic work flow. An administrator downloads WebSphere Message Broker Hypervisor Edition on to a VMware ESXi hypervisor and configures the virtual machine image as a WebSphere Message Broker component by starting the virtual machine image and performing the required configuration on that virtual machine image.



For more information about using WebSphere Message Broker Hypervisor Edition with VMware ESXi, see the following topic:

- “Deploying a VMware image” on page 30

Virtual machine image

You must extract the product package and start the virtual machine. You are prompted to complete a series of panels to configure the operating system and the WebSphere Message Broker part on that virtual machine.

Virtual image contents

The virtual image contains the following preinstalled software:

- RHEL Linux on x86-64
- WebSphere MQ
- WebSphere MQ Explorer
- WebSphere Message Broker Explorer
- WebSphere Message Broker
- WebSphere Message Broker Toolkit

Maintenance

Maintenance for virtual machines is applied in the same way as it is for a WebSphere Message Broker environment.

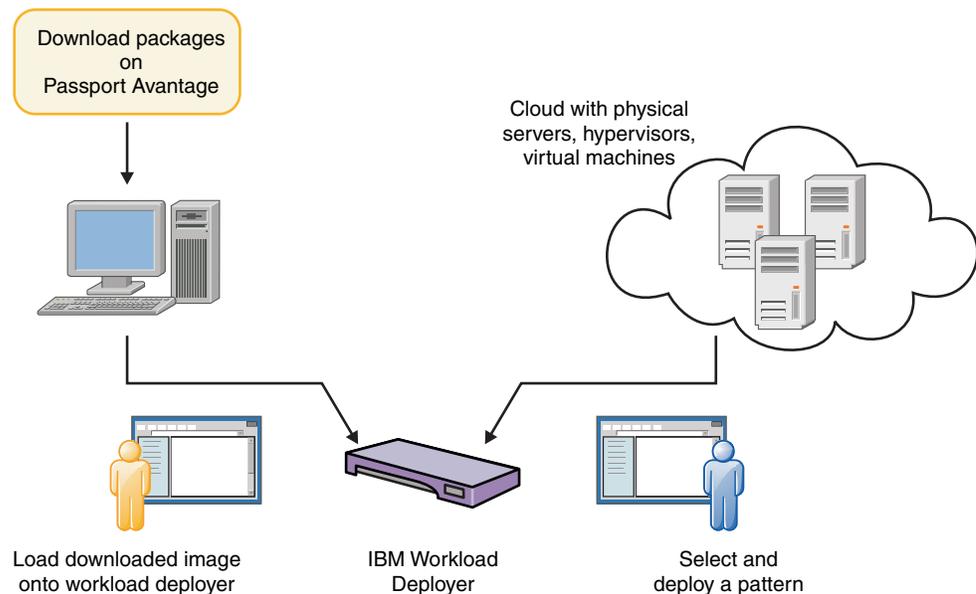
Chapter 5. Using WebSphere Message Broker Hypervisor Edition with IBM Workload Deployer for AIX on POWER

Load WebSphere Message Broker Hypervisor Edition on to IBM Workload Deployer to create, deploy, and manage WebSphere Message Broker environments and applications in a cloud using a PowerVM hypervisor. This virtual system can be used for development, testing, and production environments.

WebSphere Message Broker Hypervisor Edition for IBM Workload Deployer

Check to see if IBM Workload Deployer contains a copy of WebSphere Message Broker Hypervisor Edition for AIX on POWER. If not, or if a later version is required, it is available for download from Passport Advantage and can be manually uploaded to the IBM Workload Deployer.

The following diagram shows a basic work flow. An administrator downloads the WebSphere Message Broker Hypervisor Edition package from Passport Advantage, extracts it, and loads the virtual machine image and a set of predefined patterns onto IBM Workload Deployer. The patterns can then be deployed straight into the cloud, or they can be edited and customized first.



For more information about using WebSphere Message Broker Hypervisor Edition with IBM Workload Deployer, see the following topics:

- “Adding the WebSphere Message Broker Hypervisor Edition virtual machine image to the IBM Hardware Appliances image catalog” on page 27
- “Script packages” on page 41

Virtual machine image overview

The WebSphere Message Broker Hypervisor Edition virtual machine image includes a virtual machine template that you can use to create WebSphere Message Broker deployments in a cloud environment.

You can download a WebSphere Message Broker Hypervisor Edition virtual machine image from Passport Advantage and then load it on to the IBM Workload Deployer. After the virtual machine image has been added to the IBM Workload Deployer image catalog, an administrator can use IBM Workload Deployer to manage and deploy patterns to a cloud environment.

WebSphere Message Broker Hypervisor Edition includes two components:

The WebSphere Message Broker Hypervisor Edition virtual machine image

Provides a template for creating virtual machines, and includes installed versions of WebSphere Message Broker and other products that are required to create a deployment environment. The image includes the following preinstalled, ready-to-use patterns:

- WebSphere Message Broker (Basic)
- WebSphere Message Broker (Advanced)

These patterns address common WebSphere Message Broker topologies and are available when you use the WebSphere Message Broker Hypervisor Edition Image Loader utility to load the virtual machine image onto the IBM Workload Deployer. Each pattern is used to create a virtual system, which is a fully functional deployment environment.

The WebSphere Message Broker Hypervisor Edition Image Loader utility

This utility is used to add the WebSphere Message Broker Hypervisor Edition virtual image to the image catalog on the IBM Workload Deployer. In addition, it adds the preinstalled patterns to the collection of available patterns on the IBM Workload Deployer. It also adds the script packages.

You can run the virtual image on a PowerVM hypervisor.

Available virtual images

You can download the virtual image package from Passport Advantage, as follows:

1. Select and download the required virtual machine image version of WebSphere Message Broker Hypervisor Edition for AIX on POWER.
2. Using the supplied WebSphere Message Broker Hypervisor Edition Image Loader utility, load the virtual machine image onto the IBM Workload Deployer.

All virtual machine images require IBM Workload Deployer and a hypervisor (PowerVM).

Virtual image contents

The virtual image contains the following preinstalled software:

- AIX on POWER AIX
- WebSphere MQ
- WebSphere Message Broker

Maintenance

Maintenance for virtual machines is applied by using the mechanisms that are provided within IBM Workload Deployer. For more information about maintenance, see *Virtual system instance maintenance*.

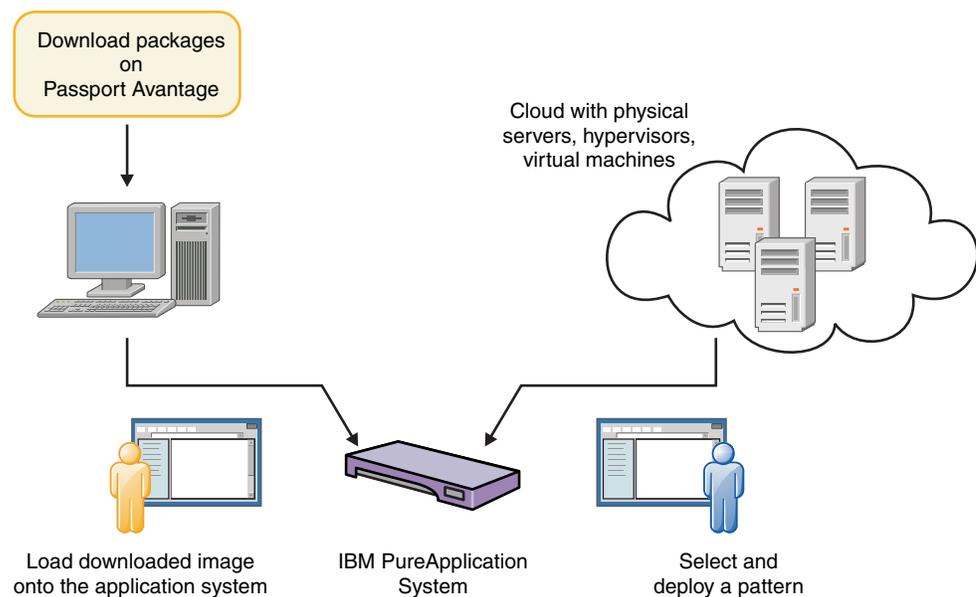
Chapter 6. Using WebSphere Message Broker Hypervisor Edition with IBM PureApplication System for AIX on POWER

Load WebSphere Message Broker Hypervisor Edition on to IBM PureApplication System to create, deploy, and manage WebSphere Message Broker environments and applications in a cloud using a PowerVM hypervisor. This virtual system can be used for development, testing, and production environments.

WebSphere Message Broker Hypervisor Edition for IBM PureApplication System

WebSphere Message Broker Hypervisor Edition is available for download from Passport Advantage and can be manually uploaded to the IBM PureApplication System.

The following diagram shows a basic work flow. An administrator downloads the WebSphere Message Broker Hypervisor Edition package from Passport Advantage, extracts it, and loads the virtual machine image and a set of predefined patterns onto IBM PureApplication System. The patterns can then be deployed straight into the cloud, or they can be edited and customized first.



For more information about using WebSphere Message Broker Hypervisor Edition with IBM PureApplication System, see the following topics:

- “Adding the WebSphere Message Broker Hypervisor Edition virtual machine image to the IBM Hardware Appliances image catalog” on page 27
- “Script packages” on page 41

Virtual machine image overview

The WebSphere Message Broker Hypervisor Edition virtual machine image includes a virtual machine template that you can use to create WebSphere Message Broker deployments in a cloud environment.

You can download a WebSphere Message Broker Hypervisor Edition virtual machine image from Passport Advantage and then load it on to the IBM PureApplication System. After the virtual machine image has been added to the IBM PureApplication System image catalog, an administrator can use IBM PureApplication System to manage and deploy patterns to a cloud environment.

WebSphere Message Broker Hypervisor Edition includes two components:

The WebSphere Message Broker Hypervisor Edition virtual machine image

Provides a template for creating virtual machines, and includes installed versions of WebSphere Message Broker and other products that are required to create a deployment environment. The image includes the following preinstalled, ready-to-use patterns:

- WebSphere Message Broker (Basic)
- WebSphere Message Broker (Advanced)

These patterns address common WebSphere Message Broker topologies and are available when you use the WebSphere Message Broker Hypervisor Edition Image Loader utility to load the virtual machine image onto the IBM PureApplication System. Each pattern is used to create a virtual system, which is a fully functional deployment environment.

The WebSphere Message Broker Hypervisor Edition Image Loader utility

This utility is used to add the WebSphere Message Broker Hypervisor Edition virtual image to the image catalog on the IBM PureApplication System. In addition, it adds the preinstalled patterns to the collection of available patterns on the IBM PureApplication System. It also adds the script packages.

You can run the virtual image on a PowerVM hypervisor.

Available virtual images

You can download the virtual image package from Passport Advantage, as follows:

1. Select and download the required virtual machine image version of WebSphere Message Broker Hypervisor Edition for AIX on POWER.
2. Using the supplied WebSphere Message Broker Hypervisor Edition Image Loader utility, load the virtual machine image onto the IBM PureApplication System.

All virtual machine images require IBM PureApplication System and a hypervisor (PowerVM).

Virtual image contents

The virtual image contains the following preinstalled software:

- AIX on POWER AIX
- WebSphere MQ
- WebSphere Message Broker

Maintenance

Maintenance for virtual machines is applied by using the mechanisms that are provided within IBM PureApplication System.

Chapter 7. Using WebSphere Message Broker Hypervisor Edition mksysb image for AIX on POWER systems

Providing your chosen operating system is AIX, you can use WebSphere Message Broker Hypervisor Edition without either of the IBM Hardware Appliances. In this stand-alone environment, you can deploy the virtual machine image on an IBM POWER system.

WebSphere Message Broker Hypervisor Edition mksysb image on IBM POWER systems

WebSphere Message Broker Hypervisor Edition for IBM AIX is available as an AIX mksysb image. Use standard AIX system administration tools (such as NIM) to deploy the mksysb image.

Virtual image contents

The virtual image contains the following preinstalled software:

- AIX on POWER
- WebSphere MQ
- WebSphere Message Broker

Maintenance

Maintenance for virtual machines is applied in the same way as it is for a WebSphere Message Broker environment.

Chapter 8. Parts and patterns

WebSphere Message Broker Hypervisor Edition parts are the functional components of a pattern. Each part represents a single virtual machine. A pattern provides a topology definition for repeatable deployment that can be shared.

Parts

Parts describe the components that are configured on a virtual machine. Use parts to create patterns. Each part has a set of properties (parameters) that is used during deployment to help define the overall configuration of the virtual system. You can customize a part by modifying its parameters, by adding a script package, or both. When you load the WebSphere Message Broker Hypervisor Edition virtual machine image onto your IBM Hardware Appliances, the parts are included.

Patterns

Patterns describe the function that is provided by each virtual machine in a virtual system. Each function is identified as a part in the pattern. Patterns take on the characteristics of their associated parts. For example, when a WebSphere Message Broker - Basic part is put into a pattern, which is then deployed, the result is a virtual machine that has a running WebSphere Message Broker instance.

Patterns in WebSphere Message Broker Hypervisor Edition differ from the topology patterns that are described in the WebSphere Message Broker Information Center. Topology patterns describe the functions that are provided by clusters, the WebSphere Message Broker Hypervisor Edition patterns describe the functions that are provided by virtual machines in the IBM Hardware Appliances.

You can use predefined patterns, create new patterns, and edit existing patterns that have not been completed and locked. See the IBM Workload Deployer and IBM PureApplication System Information Centers for detailed information about using the IBM Hardware Appliances to access existing patterns or create custom patterns.

- **Predefined patterns.** When you load WebSphere Message Broker Hypervisor Edition on your IBM Hardware Appliances, several predefined patterns are created. These predefined patterns can be deployed to the cloud without any further modification to the patterns. One pattern is a Basic pattern supporting WebSphere Message Broker for development and unit test. The second Advanced pattern provides additional configuration, potentially required for production and quality assurance environments. For a more detailed description of predefined patterns, see Chapter 9, “WebSphere Message Broker Hypervisor Edition predefined patterns,” on page 25.
- **Custom patterns.** Creating your own patterns requires knowledge of both WebSphere Message Broker and of WebSphere Message Broker Hypervisor Edition parts. Your requirements guide the design and define which pattern and script packages to use. For more information, see “Creating a WebSphere Message Broker Basic pattern manually” on page 33, “Creating a WebSphere Message Broker Advanced pattern manually” on page 39 and “Script packages” on page 41.
- **Deploying patterns.** Use your IBM Hardware Appliances to deploy patterns and create virtual systems in the cloud. You can deploy any pattern that is defined in

your IBM Hardware Appliances, including the predefined patterns that are loaded with the WebSphere Message Broker Hypervisor Edition virtual machine image or custom patterns that you create.

Chapter 9. WebSphere Message Broker Hypervisor Edition predefined patterns

WebSphere Message Broker Hypervisor Edition predefined patterns are composed of parts that define the elements of a WebSphere Message Broker deployment environment.

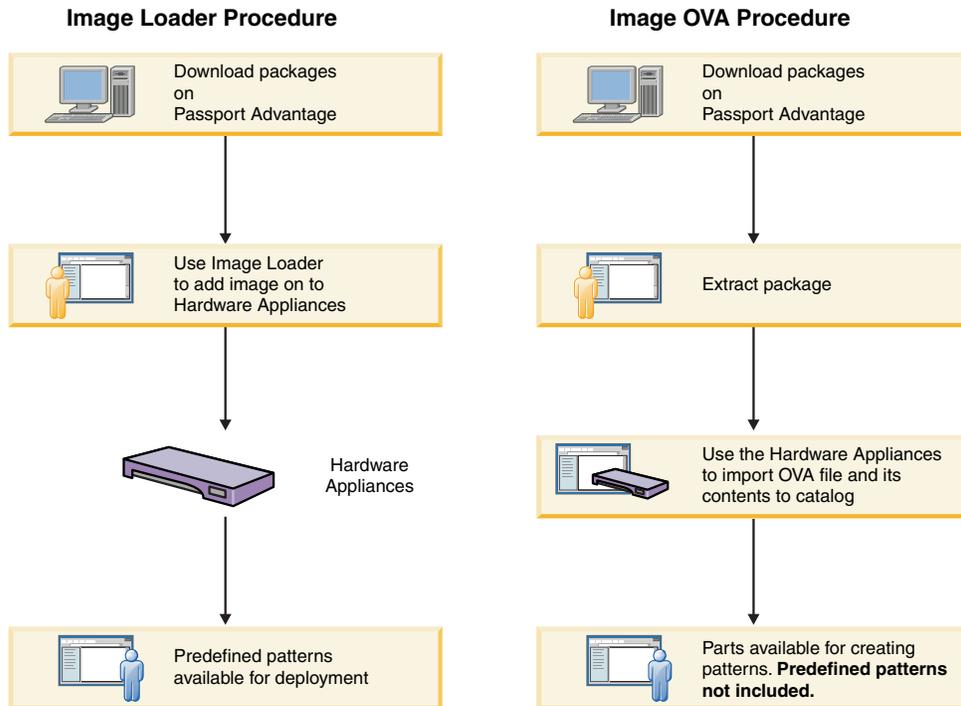
When you use the WebSphere Message Broker Hypervisor Edition Image Loader utility, predefined patterns are added to the appliance catalog. You can select any one of the loaded predefined patterns and deploy it to the cloud.

The predefined patterns are read-only. You can create a new pattern, or clone an existing one. You must clone a pattern if you want to change the composition of a predefined pattern.

To load the WebSphere Message Broker Hypervisor Edition virtual machine image on to the IBM Hardware Appliances, use the WebSphere Message Broker Hypervisor Edition Image Loader utility. The Image Loader utility and the steps that are required to load the virtual machine image are described in the section “Using the command line to add the virtual machine image to the IBM Hardware Appliances image catalog” on page 27.

If you manually add a WebSphere Message Broker Hypervisor Edition virtual image, by importing the OVA file, predefined patterns are not added to the catalog, and you must create your own patterns by using the image parts. Creating your own patterns is described in the sections “Creating a WebSphere Message Broker Basic pattern manually” on page 33 and “Creating a WebSphere Message Broker Advanced pattern manually” on page 39.

The following diagram shows the Image Loader utility Procedure and the Importing OVA Procedure.



The following table lists the predefined WebSphere Message Broker Hypervisor Edition patterns.

Pattern name that is used in the IBM Hardware Appliances	Description	Appliance/Operating systems	WebSphere Message Broker software versions
“WebSphere Message Broker Basic pattern” on page 32	WebSphere Message Broker, with a limited number of configuration options.	IBM Workload Deployer for RHEL Linux on x86-64 IBM Workload Deployer for AIX on POWER IBM PureApplication System for RHEL Linux on x86-64 IBM PureApplication System for AIX on POWER	Version 7.0 and Version 8.0 onwards. Version 8.0 onwards. Version 8.0.0.1 onwards. IBMIntegration Bus Version 9.0 onwards.
“WebSphere Message Broker Advanced pattern” on page 36	WebSphere Message Broker, with comprehensive configuration options, catering for tuned production environments.	IBM Workload Deployer for RHEL Linux on x86-64 IBM Workload Deployer for AIX on POWER IBM PureApplication System for RHEL Linux on x86-64 IBM PureApplication System for AIX on POWER	Version 7.0 and Version 8.0 onwards. Version 8.0 onwards. Version 8.0.0.1 onwards. IBMIntegration Bus Version 9.0 onwards.

Chapter 10. Reference

Use the reference information in this section to accomplish the tasks that address your business needs.

- “Adding the WebSphere Message Broker Hypervisor Edition virtual machine image to the IBM Hardware Appliances image catalog”
- “Deploying a VMware image” on page 30
- “Cloning an existing WebSphere Message Broker pattern” on page 31
- “WebSphere Message Broker Basic pattern” on page 32
- “WebSphere Message Broker Advanced pattern” on page 36
- “Script packages” on page 41

Adding the WebSphere Message Broker Hypervisor Edition virtual machine image to the IBM Hardware Appliances image catalog

Before you can start working with patterns and deploying virtual systems, you must add the WebSphere Message Broker Hypervisor Edition virtual image to the IBM Hardware Appliances image catalog.

Download the WebSphere Message Broker Hypervisor Edition package for your selected IBM Hardware Appliances from Passport Advantage. This package contains a virtual machine image that can be loaded into the required IBM Hardware Appliances image catalog, and the Image Loader utility that is used to load the virtual machine image.

Use one of the following methods to add the WebSphere Message Broker Hypervisor Edition virtual machine image to the image catalog on the IBM Hardware Appliances.

- Use the Image Loader utility command line interface on a Microsoft Windows or Linux system to load the WebSphere Message Broker Hypervisor Edition virtual machine image into the IBM Hardware Appliances image catalog. The virtual machine image includes ready-to-use deployment environment patterns and script packages that are automatically added to the IBM Hardware Appliances. See “Using the command line to add the virtual machine image to the IBM Hardware Appliances image catalog” for further details.
- Use the administrative console supplied with the IBM Hardware Appliances to add the WebSphere Message Broker Hypervisor Edition virtual machine image to the IBM Hardware Appliances image catalog. If you add the virtual machine image in this way, the predefined, ready-to-use patterns are not loaded with the virtual machine image. You must manually create patterns and script packages after loading the virtual machine image. See “Manually adding the virtual machine image to the IBM Hardware Appliances image catalog” on page 29 for further details.

Using the command line to add the virtual machine image to the IBM Hardware Appliances image catalog

You can use the Image Loader command line utility on a Microsoft Windows or Linux system to load the WebSphere Message Broker Hypervisor Edition virtual machine image into the IBM Hardware Appliances image catalog. The virtual machine image includes patterns and script packages that are automatically added to the IBM Hardware Appliances.

Before you can add the virtual machine image to the catalog, ensure that you have completed the following tasks:

- Download the WebSphere Message Broker Hypervisor Edition package for your selected IBM Hardware Appliances from Passport Advantage. This package contains the Image Loader command line utility that you use to add the virtual machine image to the IBM Hardware Appliances image catalog.
- Extract the downloaded package into an empty directory. The package is supplied as a tar file that has been compressed into GNU compressed file format. On Linux, the package can be extracted using the tar command with the -z (gzip) option. Use tar version 1.20 or higher. On Windows, there are a number of commonly available tools which can be used to extract the package. The extracted package is approximately 20% larger than the downloaded package.
- Ensure that you have Java Runtime Environment (JRE) version 6 SR3 or later installed.
- Verify that you can establish an active connection to your IBM Hardware Appliances, and that you have one of the following permissions necessary to load virtual images to the image catalog:
 - Create new catalog content.
 - Cloud administration.
- Ensure that there are 10 MB or more of free space in the home directory of the user who runs the Image Loader utility.

To use the Image Loader utility from a command line to load a virtual machine image on to the IBM Hardware Appliances, complete the following steps:

1. From a command prompt, change to the directory that contains the extracted files.
2. Enter the following command:
 - **Windows** On Windows: `loader.bat -h hostName -u userid -p password`
 - **Linux** On Linux: `loader.sh -h hostName -u userid -p password`

where:

hostName

The host name of the IBM Hardware Appliance. Use the DNS or IP address for the appliance. For example, `machine1.mybank.com`, or `2.48.158.97`.

userid The user ID required to authenticate to the IBM Hardware Appliance.

password

The password for the user ID. If you do not specify a password you are prompted to enter it during the loading process.

The WebSphere Message Broker Hypervisor Edition virtual image is loaded and is now available in the virtual images catalog of the IBM Hardware Appliances user interface.

In addition, several patterns and script packages are added to the IBM Hardware Appliance.

Now that you have completed loading the virtual image, you can complete one of the following tasks:

- Deploy the patterns and script packages immediately.

- Use the Pattern Editor to clone and customize the patterns and script packages.

Manually adding the virtual machine image to the IBM Hardware Appliances image catalog

You can use the administrative console that is supplied with the IBM Hardware Appliances to add the WebSphere Message Broker Hypervisor Edition virtual machine image to the image catalog. If you add the virtual machine image in this way, the predefined patterns and script packages are not loaded with the virtual machine image. You must create patterns and script packages manually after loading the virtual machine image.

Before you can manually add the virtual machine image to the image catalog, ensure that you have completed the following tasks:

- Download the WebSphere Message Broker Hypervisor Edition package from Passport Advantage.
- Extract the downloaded package into an empty directory. The package is supplied as a tar file that has been compressed into GNU compressed file format. On Linux, the package can be extracted using the tar command with the `-z` (gzip) option. Use tar version 1.20 or higher. On Windows, there are a number of commonly available tools which can be used to extract the package. The extracted package is approximately 20% larger than the downloaded package.
- Configure an HTTP server to either serve or pick up the WebSphere Message Broker Hypervisor Edition OVA file (WMBHVE.ova). The OVA file is located in the root directory where you extracted the package. See your HTTP server documentation for more information about configuring an HTTP server.
- Verify that you can establish an active connection to your IBM Hardware Appliance, and that you have one of the following permissions necessary to load virtual machine images to the image catalog:
 - Create new catalog content.
 - Cloud administration.

Follow these steps to manually add the WebSphere Message Broker Hypervisor Edition virtual machine image to the image catalog:

1. From the IBM Hardware Appliances user interface, navigate to the Virtual Images panel in one of the following ways:
 - From the menu bar at the top of the IBM Hardware Appliances user interface, click **Catalog > Virtual Images**.
 - From the Welcome page, click **Add virtual images**.
2. Click the **Add** icon to import the virtual image.
3. In the OVA file location field, enter the URL for the WebSphere Message Broker Hypervisor Edition image OVA file. This location is determined by your action in Step 2.
4. If you have set security on the OVA file that is handled by the HTTP server, use the User name and Password fields to enter the required user name and password. Retype your password in the Verify password field.
5. Click **OK**.

The WebSphere Message Broker Hypervisor Edition virtual machine image is now available in the IBM Hardware Appliances image catalog.

Manually create patterns and script packages that you can use to deploy virtual systems.

Deploying a VMware image

Deploy the WebSphere Message Broker Hypervisor Edition virtual machine image on a VMware ESXi hypervisor, when using a Linux system without the IBM Hardware Appliances. As part of the deployment, you must load the virtual machine image on a hypervisor and configure both the operating system and the virtual machine image.

Ensure that a VMware ESXi hypervisor is available.

To deploy the WebSphere Message Broker Hypervisor Edition virtual machine image, complete the following steps:

1. Download the WebSphere Message Broker Hypervisor Edition package from Passport Advantage to your local machine.
2. Load the WebSphere Message Broker Hypervisor Edition virtual machine image on the target VMware ESXi hypervisor as follows:
 - a. Extract the package into an empty directory. The package is supplied as a tar file that has been compressed into GNU compressed file format. The package can be extracted using the tar command with the -z (gzip) option. Use tar version 1.20 or higher.
 - b. From the VMware vSphere Client, select the **Summary** tab. In the Datastore panel, right-click the datastore in which you want to store the virtual machine image, and select **Browse Datastore** from the menu.
 - c. Using the Datastore Browser, create a directory in which to store the virtual machine image and then either upload the entire directory or upload the following individual files:

```
os.vmdk
os-flat.vmdk
app.vmdk
app-flat.vmdk
wmbhve.vmx
```

Note: The Datastore Browser does not show the files `os-flat.vmdk` and `app-flat.vmdk` by default because it represents them as being part of `os.vmdk` and `app.vmdk`.

- d. Register the virtual image on the hypervisor. In the Datastore Browser, right-click the file `wmbhve.vmx` and select **Add to inventory**, which starts a wizard.
 - e. Enter a name for the virtual machine image and select **Next**.
 - f. Select the Resource Pool in which to run the virtual machine and then select **Next**.
 - g. Check that the virtual machine options are correct and select **Finish**.
 3. Configure the network settings:
 - a. In the Inventory, right-click the virtual machine which has been added, and select **Edit Settings** from the menu.
 - b. Select **Network Adapter 1** in the hardware panel. In the Network Connection panel, select the network to which the virtual machine will connect from the Network label pull-down menu.
 - c. Click **OK**.

4. Select the virtual machine in the Inventory and click the **Power On** button in the toolbar. Navigate to the Console tab to open the virtual machine console.

Note: If a pop-up window appears asking whether the virtual machine image has been moved or copied, select **"I copied it"** and click **OK**.

5. Log in to the operating system by using the default root credentials. The user name is root and the password is password. The client presents the language selection screen.
6. Specify the language that you want, click **OK** and press **Enter**. The license screen opens.
7. Review and accept all license agreements for Red Hat Linux and WebSphere products to proceed with installing the virtual machine image. After you accept the license agreements, the network screen opens.
8. Specify the type of network protocol you want to use:

Note: If you plan to use multiple virtual machines, ensure that the network is properly configured between the machines.

- a. Select the appropriate network protocol. The virtual machine image supports both static addressing and Dynamic Host Configuration Protocol (DHCP) addressing.
- b. If you are using DHCP, enter values for the Host name and Domain fields.
- c. If you are using static addressing, enter values for the IP address and Subnet mask fields. Optionally, enter values for the Default gateway and DNS server fields. The value for the DNS server must be an IP address.
- d. Click **OK** and press **Enter**. Confirm the network settings by selecting **Yes** and press **Enter**.

The Password Configuration screen opens and prompts you to specify passwords.

9. Enter and confirm a password for the root user. The password should be changed from the default value.
10. Enter and confirm a password for the virtuser user. This user is the default non-root user for the installation.

The system then continues with the boot sequence. The values that have been entered are saved and do not need to be entered again. The operating system configuration is now complete.

Cloning an existing WebSphere Message Broker pattern

The IBM Hardware Appliances allow you to create your own patterns or modify existing patterns.

Instead of editing the Basic or Advanced patterns supplied, you can create clones

of them by clicking the clone button , and then edit the clones. In the pattern editor, you can edit the properties of the part or script packages by clicking the properties button  on the appropriate part or script package. You can change the default values of the properties, and lock or unlock them. If a property is locked, then it cannot be viewed or modified when the pattern is deployed to the cloud. When a property is unlocked, it can be viewed and edited in the deployment dialog when the pattern is being deployed. For example, by default, the Basic pattern sets the WebSphere Message Broker name to a fixed default

value. To set this name value each time that the pattern is deployed, you can click the locked padlock  next to the Broker Name property. The padlock then changes to unlocked position  to indicate that the Broker Name is now unlocked. When this pattern is deployed to the cloud, the Broker Name property is visible and modifiable in the deployment dialog. The default values of the properties can also be changed. For example, you can update the default name of the Queue Manager property. When the pattern is deployed to the cloud, the Queue Manager name takes the value you specified.

WebSphere Message Broker Basic pattern

WebSphere Message Broker Basic patterns provide limited configuration options. Advanced configuration options are set to values suitable for a non-production environment. Example uses for the Basic pattern are for flow development and unit testing.

Dependent on operating system, the Basic pattern contains a part with the following components installed:

Linux

- WebSphere MQ
- WebSphere MQ Explorer
- WebSphere Message Broker Explorer
- WebSphere Message Broker
- WebSphere Message Broker Toolkit

AIX

- WebSphere MQ
- WebSphere Message Broker

The WebSphere Message Broker Basic pattern consists of a single part, called WebSphere Message Broker - Basic. When this pattern is deployed, it creates a broker instance, a single execution group, and a queue manager with a WebSphere MQ listener defined on port 2414. You can configure the pattern in other ways; for example, by creating additional execution groups and deploying BAR files. You can use script packages for configuring the pattern, if required. For more information, see “Script packages” on page 41.

The following tables describe the properties for the WebSphere Message Broker - Basic part.

Table 1. Linux and AIX common properties

Field	Description
Number of CPUs	The number of processors to expose within the image.
Image memory size	The memory size of the image in megabytes.
Password (root)	The password for the root user ID. This password is for the operating system for the virtual machine that is represented by this part in the pattern. In the Verify password field, reenter the password.

Table 1. Linux and AIX common properties (continued)

Field	Description
Password (virtuser)	The virtual user password for the virtuser user ID of the operating system. This user ID is used by the admin user of the WebSphere Message Broker environment. In the Verify password field, reenter the password.

Table 2. Linux and AIX hidden properties.

The following properties are hidden from view in the Basic pattern and are set to their respective default values

Field	Description
Broker Instance Name	The name of the broker instance in the format MBxBROKER, where x indicates the version of WebSphere Message Broker. For example, MB8BROKER is the name that is created under Version 8.0.
Execution Group Name	default.
Queue Manager Name	The name of the queue manager in the format MBxQMGR, where x indicates the version of WebSphere Message Broker. For example, MB8QMGR is the name that is created under Version 8.0.

Table 3. AIX specific properties

Field	Description
Physical Processor Count	The number of physical processors that are allocated to this virtual machine (LPAR).
Reserve physical CPUs	Determines if physical CPUs are reserved.

If you manually loaded the virtual image on the IBM Hardware Appliances instead of using Image Loader, the predefined patterns are not available. To create your own pattern, see “Creating a WebSphere Message Broker Basic pattern manually.”

Creating a WebSphere Message Broker Basic pattern manually

If you manually loaded the virtual machine image onto either of the IBM Hardware Appliances, instead of using Image Loader, predefined patterns are not available. You can create your own pattern that replicates the predefined WebSphere Message Broker Basic pattern.

Ensure that you have loaded the virtual machine image onto one of the IBM Hardware Appliances.

Review the information in “WebSphere Message Broker Basic pattern” on page 32 to understand the purpose of the Basic pattern and its parts.

Complete the following steps to create a replica of the WebSphere Message Broker Basic pattern:

1. Log in to the IBM Hardware Appliances user interface and navigate to the Virtual Systems Patterns view.

2. Create a pattern. On the upper left panel of the Virtual Systems Patterns view, click the Add icon  beside the Patterns label. Provide the following basic information about the pattern you are creating:
 - **Name.** Specify a name that describes the pattern you are creating.
 - **Description.** Optional: Describe the purpose of the pattern.
3. Click **OK** to save your changes. Your new pattern is added to the list in the Virtual Systems Patterns view and the information about it is shown in the viewer. There are no parts associated with the pattern.

You can now configure the pattern.

Configuring a WebSphere Message Broker Basic pattern

You can configure your own pattern so that it resembles the WebSphere Message Broker Basic pattern.

Create a Basic pattern; see “Creating a WebSphere Message Broker Basic pattern manually” on page 33.

Complete the following steps to configure a WebSphere Message Broker Basic pattern:

1. Click the **Edit** icon  in the Virtual Systems Patterns view.
2. From the list of parts, select WebSphere Message Broker - Basic and drag the part onto the canvas. A graphical representation of the part is shown on the canvas. Each instance of a part results in a virtual machine when the pattern is deployed.
3. Set the properties for the WebSphere Message Broker - Basic part as follows:
 - a. In the upper-right corner of the graphical representation of the part, click the **Properties part** icon .
 - b. Use the dialog box to set the values for each property.

Note: You can lock part properties at pattern creation time, or you can decide not to lock the property. If you do not lock a property, you can set or change values at deployment time.

Table 4. Linux and AIX common properties

Field	Description
Virtual CPUs	The number of virtual processors to expose within the image.
Image memory size (MB)	The amount of memory allocated to this virtual machine, in megabytes. The default value is 2048.
Password (root)	The password for the root user ID. This password is for the operating system for the virtual machine represented by this part in the pattern. In the Verify password field, reenter the password.
Password (virtuser)	The virtual user password for the virtuser user ID of the operating system. This user ID is used by the admin user of the WebSphere Message Broker environment. In the Verify password field, reenter the password.

Table 5. AIX specific properties

Field	Description
Physical Processor Count	The number of physical processors allocated to this virtual machine (LPAR)
Reserve physical CPUs	Determines if physical CPUs are reserved.

4. Click **OK** to save the properties.
5. Click **Done Editing** to finish creating the pattern. The Basic pattern for WebSphere Message Broker is added to the list of patterns.

You can choose to deploy the pattern now or at a later time.

Deploying a WebSphere Message Broker Basic pattern

Use the IBM Hardware Appliances to deploy a pattern and create virtual systems in the cloud. You can deploy any pattern defined in the IBM Hardware Appliances, including the predefined patterns loaded with the WebSphere Message Broker Hypervisor Edition virtual machine image, or custom patterns that you create.

Ensure that you have loaded the WebSphere Message Broker Hypervisor Edition image on the IBM Hardware Appliances and that you have a predefined or custom pattern ready to be deployed.

Predefined patterns are not configurable, however, custom patterns can be configured. To configure a custom Basic pattern, see “Configuring a WebSphere Message Broker Basic pattern” on page 34.

During deployment, you must provide values for all required parameters that do not already have values assigned. In some cases, you can override default or existing values for parameters.

1. Log in to the appliance with the necessary permissions to deploy patterns.
2. Select the pattern you want to deploy, from the list in the left panel of the Pattern view.
3. Click **Deploy** to begin the deployment process and enter the information necessary for deploying the pattern. An asterisk (*) indicates a required field.
4. Provide the necessary information for the pattern. When a check mark is shown on the clipboard icon next to an item, you have provided all required information for that item. All items must have a check mark before you can deploy the pattern. Because patterns vary, the information you must supply varies. Consult the IBM Hardware Appliances Information Centers and the pattern developer for complete descriptions of the fields defined for the parts in the pattern, including any fields added by script packages. The following information helps you to complete the fields that are displayed in the deployment dialog box:
 - a. Name the virtual system you are creating when you deploy the pattern.
 - b. Specify the cloud you are deploying into.
 - c. Use the Schedule deployment section to specify when to deploy and how long the virtual system runs in the cloud.
 - d. Use the Configure virtual parts section to list all of the parts in your pattern and provide any necessary information. For example, passwords.
5. When all items in the dialog box have a check mark next to them, click **OK** to deploy the pattern.

A virtual system in the cloud is created with the configuration defined by the deployed pattern.

WebSphere Message Broker Advanced pattern

WebSphere Message Broker Advanced pattern provides many configuration options to tune the WebSphere MQ and WebSphere Message Broker products. Example uses for the Advanced pattern are for production environments.

Dependent on operating system, the Advanced pattern contains a part with the following components installed:

Linux

- WebSphere MQ
- WebSphere MQ Explorer
- WebSphere Message Broker Explorer
- WebSphere Message Broker
- WebSphere Message Broker Toolkit

AIX

- WebSphere MQ
- WebSphere Message Broker

The following tables describe the properties for the WebSphere Message Broker - Advanced part.

Note: The value **null** is a special string used to denote a valid empty value.

Table 6. Linux and AIX common properties

Field	Default value	Description
Number of CPUs	1	The number of processors to expose within the image.
Image memory size (MB)	2048	The memory size of the image in megabytes.
Password (root)		The password for the root user ID. This password is for the operating system for the virtual machine represented by this part in the pattern. In the Verify password field, reenter the password.
Password (virtuser)		The virtual user password for the virtuser user ID of the operating system. This user ID is used by the admin user of the WebSphere Message Broker environment. In the Verify password field, reenter the password.
Broker Name	MBxBROKER	The name of the broker instance, where x indicates the version of WebSphere Message Broker. For example, MB8BROKER is the name created under Version 8.0.

Table 6. Linux and AIX common properties (continued)

Field	Default value	Description
Queue Manager	MBxQMGR	The name of the queue manager, where x indicates the version of WebSphere Message Broker. For example, MB8QMGR is the name created under Version 8.0.
Queue Manager Description	Broker Queue Manager	The description of the queue manager.
Queue Manager TCP/IP listener port	2414	The TCP/IP listener port number.
Authorized users	null	The users from which the WebSphere MQ listener accepts connections. If connecting the WebSphere Message Broker Toolkit from a remote machine, the user name under which the toolkit is running needs to be entered here. Multiple user names must be separated by spaces.
Queue Manager Dead Letter Queue	SYSTEM.DEAD.LETTER.QUEUE	The queue manager dead letter queue.
Queue Manager uses linear logging	False	Determines whether the queue manager uses linear logging. If False is specified, circular logging is used.
Queue Manager log pages	1024	The number of queue manager log pages.
Primary Logs	20	The number of primary WebSphere MQ log files.
Secondary Logs	12	The number of secondary WebSphere MQ log files.
Start HTTP Listener	False	The broker-wide listener that is used by deployed HTTP nodes is started by default. Use this parameter to change its status between active and inactive.
Enable SSL for HTTPListener	False	Set this value to True to start the HTTP listener listening for inbound SSL connections.
Thread Pool size for HTTPListener	null	The maximum number of request processing threads to be created. This value determines the maximum number of simultaneous requests that can be handled.

Table 6. Linux and AIX common properties (continued)

Field	Default value	Description
HTTP Address	null	For servers with more than one IP address, this value specifies which address is used for listening on the specified port. By default, this port is used on all IP addresses associated with the server. If specified, only 1 address can be used.
HTTP Port	null	The TCP port number on which this HTTPConnector creates a server socket and awaits incoming connections.
HTTPS Address	null	The address to use for HTTPS.
HTTPS Port	null	The port number to use for HTTPS.
HTTPS Algorithm	null	The certificate encoding algorithm to be used.
HTTPS Client Auth	null	Determines whether the SSL stack requires a valid certificate chain from the client before accepting a connection. A False value (which is the default) does not require a certificate chain unless the client requests a resource protected by a security constraint that uses CLIENT-CERT authentication.
HTTPS Keystore File	null	The path to the keystore file where the server certificate that is to be loaded has been stored. By default, this file is located in the home directory of the user who started the broker and its name has the extension .keystore.
HTTPS Keystore Pass	null	The password used to access the server certificate from the specified keystore file.
HTTPS Keystore Type	null	The type of keystore file to be used for the server certificate.
HTTPS SSL Protocol	null	The SSL protocol version to use.
HTTPS Ciphers	null	A comma-separated list of the encryption ciphers that can be used. If not specified, any available cipher can be used.
Security Cache Timeout	null	The timeout value for marking entries in the cache as invalid. The time is specified in seconds.

Table 7. Linux specific properties

Field	Default value	Description
Enable VNC	False	Determines whether the Virtual Network Computing (VNC) server is enabled for the virtual machine associated with the part in the pattern. Acceptable values are True or False. When enabled, the VNC client accesses the virtual machine using the user ID virtuser. By default, this property is locked. You can change the value only during pattern creation; it cannot be changed during deployment.

Table 8. AIX specific properties

Field	Default value	Description
Physical Processor Count	0.3	The number of physical processors allocated to this virtual machine (LPAR)
Reserve physical CPUs	False	Determines if physical CPUs are reserved.

If you load the virtual machine image on the IBM Hardware Appliances manually instead of using Image Loader utility, the predefined patterns are not available. To create your own pattern, see “Creating a WebSphere Message Broker Advanced pattern manually.”

Creating a WebSphere Message Broker Advanced pattern manually

If you manually loaded the virtual machine image onto either of the IBM Hardware Appliances, instead of using the Image Loader utility, the predefined patterns are not available. You can create your own pattern that replicates the predefined WebSphere Message Broker Advanced pattern.

Ensure that you have loaded the virtual machine image onto one of the IBM Hardware Appliances.

Review the information in “WebSphere Message Broker Advanced pattern” on page 36 to understand the purpose of the Advanced pattern and its parts.

Complete the following steps to create a replica of the WebSphere Message Broker Advanced pattern:

1. Log in to the IBM Hardware Appliances user interface and navigate to the Virtual Systems Patterns view.
2. Add a pattern. On the upper left panel of the Virtual Systems Patterns view, click the Add icon  beside the Patterns label. Provide the following basic information about the pattern you are creating:
 - **Name.** Specify a name that describes the pattern you are creating.
 - **Description.** Optional: Describe the purpose of the pattern.

3. Click **OK** to save your changes. Your new pattern is added to the list in the Virtual Systems Patterns view and the information about it is shown in the viewer. There are no parts associated with the pattern.

You can now configure the pattern.

Configuring a WebSphere Message Broker Advanced pattern

You can configure your own pattern so that it resembles the predefined WebSphere Message Broker Advanced pattern.

Create an Advanced pattern; see “Creating a WebSphere Message Broker Advanced pattern manually” on page 39.

Complete the following steps to configure a WebSphere Message Broker Advanced pattern:

1. Click the **Edit** icon  in the Virtual Systems Patterns view.
 2. From the list of parts, select WebSphere Message Broker - Advanced and drag the part onto the canvas. A graphical representation of the part is shown on the canvas. Each instance of a part results in a virtual machine when the pattern is deployed.
 3. Set the properties for the WebSphere Message Broker - Advanced part as follows:
 - a. In the upper-right corner of the graphical representation of the part, click the **Properties part** icon .
 - b. Use the dialog box to set the values for each property. The table in the topic “WebSphere Message Broker Advanced pattern” on page 36 lists each property with its description.
- Note:** You can lock part properties at pattern creation time, or you can decide not to lock the property. If you do not lock a property, you can set or change values at deployment time.
4. Click **OK** to save the properties.
 5. Click **Done Editing** to finish creating the pattern. The Advanced pattern for WebSphere Message Broker is added to the list of patterns.

You can choose to deploy the pattern now or at a later time.

Deploying a WebSphere Message Broker Advanced pattern

Use the IBM Hardware Appliances to deploy a pattern and create virtual systems in the cloud. You can deploy any pattern defined in the IBM Hardware Appliances, including the predefined patterns loaded with the WebSphere Message Broker Hypervisor Edition virtual machine image or custom patterns that you create.

Ensure that you have loaded the WebSphere Message Broker Hypervisor Edition image on the IBM Hardware Appliances and that you have a predefined or custom pattern ready to be deployed.

To configure an Advanced pattern, see “Configuring a WebSphere Message Broker Advanced pattern.”

During deployment, you must provide values for all required parameters that do not already have values assigned. In some cases, you can override default or existing values for parameters.

1. Log in to the appliance with the necessary permissions to deploy patterns.
2. Select the pattern you want to deploy from the list in the left panel of the Pattern view.
3. Click **Deploy** to begin the deployment process and enter the information necessary for deploying the pattern. An asterisk (*) indicates a required field.
4. Provide the necessary information for the pattern. When a check mark is shown on the clipboard icon next to an item, you have provided all required information for that item. All items must have a check mark before you can deploy the pattern. Because patterns vary, the information you must supply varies. Consult the IBM Hardware Appliances Information Center and the pattern developer for complete descriptions of the fields defined for the parts in the pattern, including any fields added by script packages. The following information will help you complete the fields that are displayed in the deployment dialog box:
 - a. Name the virtual system you are creating when you deploy the pattern.
 - b. Specify the cloud you are deploying into.
 - c. Use the Schedule deployment section to specify when to deploy and how long the virtual system runs in the cloud.
 - d. Use the Configure virtual parts section to list all of the parts in your pattern and provide any necessary information. For example, passwords.
5. When all items in the dialog box have a check mark next to them, click **OK** to deploy the pattern.

A virtual system in the cloud is created with the configuration defined by the deployed pattern.

Script packages

This topic lists the script packages to provide multiplicity for use with the two WebSphere Message Broker patterns.

Certain options within WebSphere Message Broker and WebSphere MQ configuration support multiples. For example, multiple execution groups, or multiple configurable services. These multiples are handled with the use of additional script packages that you can drag onto a pattern. For example, if you require two additional execution groups, then you drag the additional execution groups script package onto your pattern twice.

To use one of the provided script packages, see the following topics:

- “Script package: “WMB: Configure MQ Clustering”” on page 42
- “Script package: “WMB: Create Configurable Service”” on page 42
- “Script package: “WMB: Create Execution Group Basic”” on page 43
- “Script package: “WMB: Create Execution Group Advanced”” on page 43
- “Script package: “WMB: Deploy Bar Files”” on page 44
- “Script package: “WMB: mqsischangeproperties”” on page 45
- “Script package: “WMB: mqsisetdbparms”” on page 46
- “Script package: “WMB: Run MQSC Script”” on page 46

You can also create your own script packages to perform specific operations that you require. The steps to create additional script packages are described in the IBM Workload Deployer and IBM PureApplication System documentation.

Script package: "WMB: Configure MQ Clustering"

This script package can be used to add the queue manager to an existing WebSphere MQ cluster as a partial repository.

To deploy a script package that configures MQ Clustering:

1. In the **Patterns** tab of the Pattern Editor, click the pattern that you want to work with.
2. Click the **Edit** icon within the pattern. You can now edit the pattern that you have selected.
3. Click the **Scripts** pull-down located at the lower left side of the Pattern Editor. The list of available scripts is displayed.
4. Select and drag the **WMB: Configure MQ Clustering** script package onto the part, which is on the canvas.
5. Click the **Parameters** icon within the script package to edit the parameters. The Parameters window opens. The parameters of the script package can be entered in the Pattern Editor, when the pattern is deployed, or both. If a parameter is set in the Pattern Editor, then it can be updated when the pattern is deployed, unless the parameter is locked. To lock a parameter in the Pattern Editor, click

the unlocked padlock  associated with that parameter, which then

changes to a locked padlock  to indicate that the property has been locked.

6. Complete the following parameters. All of these properties are mandatory.

```
MQ_CLUSTER_NAME = (no default value)
MQ_FULL_REPOSITORY_QMGR_NAME = (no default value)
MQ_FULL_REPOSITORY_CONNNAME = (no default value)
MQ_FULL_REPOSITORY_PORT = (no default value)
```

Script package: "WMB: Create Configurable Service"

This script package can be used to create a configurable service using the `mqsicreateconfigurableservice` command.

To deploy a script package that creates a configurable service:

1. In the **Patterns** tab on the Pattern Editor, click the pattern that you want to work with.
2. Click the **Edit** icon within the pattern. You can now edit the pattern that you have selected.
3. Click the **Scripts** pull-down menu located at the lower left side of the Pattern Editor. The list of available scripts is displayed.
4. Select and drag the **WMB: Create Configurable Service** script package onto the part, which is on the canvas.
5. Click the **Parameters** icon within the script package to edit the parameters. The Parameters window opens. The parameters of the script package can be entered in the Pattern Editor, when the pattern is deployed, or both. If a parameter is set in the Pattern Editor, then it can be updated when the pattern is deployed, unless the parameter is locked. To lock a parameter in the Pattern Editor, click

the unlocked padlock  associated with that parameter, which then changes to a locked padlock  to indicate that the property has been locked.

6. Complete the following parameters. All of these properties are mandatory.

Note: null is a special string used to denote a valid empty value. Not all of the values within the script package are null. Fields that are empty must be filled before the pattern can be deployed. For this script package, the MQSI_NAME and MQSI_VALUE fields are optional.

```
MQSI_CONFIGURABLE_SERVICE = (no default value)
MQSI_OBJECT = (no default value)
MQSI_NAME = null
MQSI_VALUE = null
```

Script package: "WMB: Create Execution Group Basic"

This script package can be used to create an execution group with the specified name.

To deploy a script package that creates an execution group:

1. In the **Patterns** tab of the Pattern Editor, click the pattern that you want to work with.
2. Click the **Edit** icon within the pattern. You can now edit the pattern that you have selected.
3. Click the **Scripts** pull-down menu located at the lower left side of the Pattern Editor. The list of available scripts is displayed.
4. Select and drag the **WMB: Create Execution Group Basic** script package onto the part, which is on the canvas.
5. Click the **Parameters** icon within the script package to edit the parameters. The Parameters window opens. The parameters of the script package can be entered in the Pattern Editor, when the pattern is deployed, or both. If a parameter is set in the Pattern Editor, then it can be updated when the pattern is deployed, unless the parameter is locked. To lock a parameter in the Pattern Editor, click

the unlocked padlock  associated with that parameter, which then changes to a locked padlock  to indicate that the property has been locked.

6. Enter the name of the execution group within the value field associated with the MQSI_EXEC_GRP_NAME name. This field is mandatory and cannot be left blank.

Script package: "WMB: Create Execution Group Advanced"

This script package can be used to create an execution group. A comprehensive set of properties is available with which to customize the execution group.

To deploy a script package that creates an execution group:

1. In the **Patterns** tab of the Pattern Editor, click the pattern that you want to work with.
2. Click the **Edit** icon within the pattern. You can now edit the pattern that you have selected.

3. Click the **Scripts** pull-down menu located at the lower left side of the Pattern Editor. The list of available scripts is displayed.
4. Select and drag the **WMB: Create Execution Group Advanced** script package onto the part, which is on the canvas.
5. Click the **Parameters** icon within the script package to edit the parameters. The Parameters window opens. The parameters of the script package can be entered in the Pattern Editor, when the pattern is deployed, or both. If a parameter is set in the Pattern Editor, then it can be updated when the pattern is deployed, unless the parameter is locked. To lock a parameter in the Pattern Editor, click the unlocked padlock  associated with that parameter, which then changes to a locked padlock  to indicate that the property has been locked.
6. Enter the name of the execution group within the value field associated with the MQSI_EXEC_GRP_NAME name. This field is mandatory and cannot be left blank.
7. The following fields contain default values. Change any of these fields that must be updated to meet your environment or scenario.

Note: null is used to denote a valid empty value. Not all of the values within the script package are null. Fields that are empty must be filled before the pattern can be deployed.

```
MQSI_JVM_MIN_HEAP_SIZE = -1
MQSI_JVM_MAX_HEAP_SIZE = -1
MQSI_JVM_DEBUG_PORT = 0
MQSI_JVM_NATIVE_STACK_SIZE = -1
MQSI_JVM_JAVA_OS_STACK_SIZE = -1
MQSI_CONTENT_BASED_FILTERING_ENABLED = FALSE
MQSI_CONTENT_BASED_FILTERING_EVALUATION_THREADS = 1
MQSI_CONTENT_BASED_FILTERING_VALIDATION_THREADS = 1
MQSI_SOCKET_CONN_MAX_KEEP_ALIVE_REQUESTS = 90
MQSI_SOCKET_CONN_TCP_NO_DELAY = null
MQSI_SOCKET_CONN_TCP_NO_DELAY_SSL = null
MQSI_HTTP_CONNECTOR_EXPLICITLY_SET_PORT_NUMBER = null
MQSI_HTTP_CONNECTOR_ADDRESS = null
MQSI_HTTPS_CONNECTOR_EXPLICITLY_SET_PORT_NUMBER = null
MQSI_HTTPS_CONNECTOR_ADDRESS = null
MQSI_HTTPS_CONNECTOR_ALGORITHM = null
MQSI_HTTPS_CONNECTOR_CLIENT_AUTH = null
MQSI_HTTPS_CONNECTOR_KEYSTORE_FILE = null
MQSI_HTTPS_CONNECTOR_KEYSTORE_PASS = null
MQSI_HTTPS_CONNECTOR_KEYSTORE_TYPE = null
MQSI_HTTPS_CONNECTOR_SSL_PROTOCOL = null
MQSI_HTTPS_CONNECTOR_CIPHERS = null
```

Script package: "WMB: Deploy Bar Files"

This script package can be used to deploy BAR files to an execution group. The script package must first be cloned and the BAR files added to the package.

To deploy a bar file to a nominated execution group:

1. From the browser used to connect to the IBM Hardware Appliances, select **Catalog**, then **Script Packages** from the drop-down window.
2. Click the **WMB: Deploy Bar Files** script package.
3. Clone the script package by selecting the WMB: Deploy Bar Files script

package and selecting the **clone** option  .

4. Provide the name for the new cloned script package and click **OK**.
5. Under the Script package files section, click the download link and save the file to a temporary folder.
6. Add the required BAR files to the downloaded compressed file. Achieved by directly adding the files to the compressed archive or, alternatively, extracting the file, adding the BAR files to the directory and rearchiving the file.
7. Click the **Browse** field within the **Script package files** section and navigate to the updated compressed archive, select the file and click **Upload**.
8. The Environment section now contains the variable `MQSI_DEPLOY_EXEC_GRP_NAME`.
9. In the **Patterns** tab of the Pattern Editor, click the pattern that you want to work with.
10. Click the **Edit** icon within the pattern. You can now edit the pattern that you have selected.
11. Click the **Scripts** pull-down menu located at the lower left side of the Pattern Editor. The list of available scripts is displayed.
12. Select and drag your new script package onto the part, which is on the canvas.
13. Click the **Parameters** icon within the script package to edit the parameters. The Parameters window opens. The parameters of the script package can be entered in the Pattern Editor, when the pattern is deployed, or both. If a parameter is set in the Pattern Editor, then it can be updated when the pattern is deployed, unless the parameter is locked. To lock a parameter in the Pattern Editor, click the unlocked padlock  associated with that parameter, which then changes to a locked padlock  to indicate that the property has been locked.
14. Within the Value field for `BAR_MQSI_EXEC_GRP_NAME`, specify the name of the execution group that you want to deploy the BAR files to.

Script package: "WMB: mqsichangeproperties"

This script package can be used to run the `mqsichangeproperties` command.

To deploy a script package that changes a property using `mqsichangeproperties`:

1. In the **Patterns** tab of the Pattern Editor, click the pattern that you want to work with.
2. Click the **Edit** icon within the pattern. You can now edit the pattern that you have selected.
3. Click the **Scripts** pull-down menu located at the lower left side of the Pattern Editor. The list of available scripts is displayed.
4. Select and drag the **WMB: mqsichangeproperties** script package onto the part, which is on the canvas.
5. Click the **Parameters** icon within the script package to edit the parameters. The Parameters window opens. The parameters of the script package can be entered in the Pattern Editor, when the pattern is deployed, or both. If a parameter is set in the Pattern Editor, then it can be updated when the pattern is deployed, unless the parameter is locked. To lock a parameter in the Pattern Editor, click

the unlocked padlock  associated with that parameter, which then

changes to a locked padlock  to indicate that the property has been locked.

6. Complete the following parameters. All of these properties are mandatory.

Note: Fields that are empty must be filled before the pattern can be deployed.

MQSI_EXEC_GRP_NAME = (no default value)
MQSI_OBJECT_NAME = (no default value)
MQSI_PROPERTY_NAME = (no default value)
MQSI_PROPERTY_VALUE = (no default value)

Script package: "WMB: mqsisetdbparms"

This script package can be used to run the mqsisetdbparms command.

To deploy a script package that runs mqsisetdbparm:

1. In the **Patterns** tab of the Pattern Editor, click the pattern that you want to work with.
2. Click the **Edit** icon within the pattern. You can now edit the pattern that you have selected.
3. Click the **Scripts** pull-down menu located at the lower left side of the Pattern Editor. The list of available scripts is displayed.
4. Select and drag the **WMB: mqsisetdbparms** script package onto the part, which is on the canvas.
5. Click the **Parameters** icon within the script package to edit the parameters. The Parameters window opens. The parameters of the script package can be entered in the Pattern Editor, when the pattern is deployed, or both. If a parameter is set in the Pattern Editor, then it can be updated when the pattern is deployed, unless the parameter is locked. To lock a parameter in the Pattern Editor, click

the unlocked padlock  associated with that parameter, which then

changes to a locked padlock  to indicate that the property has been locked.

6. Complete the following parameters. All of these properties are mandatory.

Note: Fields that are empty must be filled before the pattern can be deployed.

MQSI_RESOURCE = (no default value)
MQSI_USER = (no default value)
MQSI_PASSWORD = (no default value)

Script package: "WMB: Run MQSC Script"

This script package can be used to run MQSC scripts against the queue manager. The script package must first be cloned and the MQSC scripts added to the package.

To run an MQSC script:

1. From the browser used to connect to the IBM Hardware Appliances, select **Catalog**, then **Script Packages** from the drop-down window.
2. Click the **WMB: Run MQSC Script** package.

3. Clone the script package by selecting the **WMB: Run MQSC Script** package and selecting the clone option  .
4. Provide a name for the new cloned script package and click **OK**.
5. Under the Script package files section, click the download link and save the file to a temporary folder.
6. Add the required MQSC file to the downloaded compressed file. Achieved by directly adding the files to the compressed archive or, alternatively, extracting the file, adding the MQSC files to the directory and rearchiving the file.
7. Click the **Browse** field within the Script package files section and navigate to the updated compressed archive, select the file and click **Upload**.
8. No fields are provided for this script package.
9. In the **Patterns** tab of the Pattern Editor, click the pattern that you want to work with.
10. Click the **Edit** icon within the pattern. You can now edit the pattern that you have selected.
11. Click the **Scripts** pull-down menu located at the lower left side of the Pattern Editor. The list of available scripts is displayed.
12. Select and drag your new script package onto the part, which is on the canvas.

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Glossary of terms and abbreviations

This glossary defines WebSphere Message Broker Hypervisor Edition terms and abbreviations.

Cloud Group

A collection of one or more hypervisors.

IBM Hardware Appliances

A term used to reference both IBM Workload Deployer and IBM PureApplication System appliances. Both products are hardware and software based and sold as sealed boxes that are used to deploy the Hypervisor Edition of IBM products to cloud groups.

Hypervisor

A platform virtualization software that allows multiple operating systems to run on a host computer.

Open Virtualization Archive (OVA)

A file format for storing virtual images that is used both by the IBM Hardware Appliances and by VMware ESXi. However, the files are not interchangeable between these two systems.

Part

A part is a virtual image combined with configuration data and scripts. A virtual image can have one or more parts. Parts are used to expose different configuration templates for the virtual image. For example, one part might expose basic configuration options, while another part might expose more advanced configuration options.

Pattern

A pattern is used to combine one or more parts with zero or more script packages. In the pattern editor, parts can be added to a canvas, and script packages can be registered to run against those parts. Parameters for a part can also be locked or unlocked so that they become hidden or are revealed. A pattern is the object that is deployed to the cloud.

Script Package

A compressed file containing a shell script (or other executable file) and other configuration information that the IBM Hardware Appliances can run on a virtual system.

Virtual Image

In the IBM Hardware Appliances, a virtual image is an OVA file that has been loaded into the IBM Hardware Appliances.

Virtual Machine

In the IBM Hardware Appliances, a virtual machine is a virtual image that has been deployed to a cloud group.

Virtual System

A deployed pattern that might contain one or more virtual machines.

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