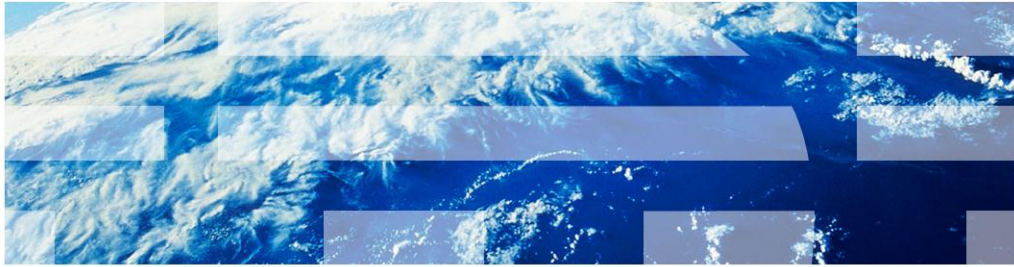


IBM WebSphere Application Server V8

Multiple connections in a systems integration bus MQ link to support WebSphere MQ high availability



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This presentation describes the high availability support of systems integration bus MQ link in WebSphere Application Server V8. This new feature allows the failover support in MQLink sender channel that can be used to connect to the WebSphere MQ Queue Manager instance to which the Queue Manager fails over.

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This presentation starts with a discussion on the background of WebSphere Application Server systems integration bus MQ link and WebSphere Message Queue. It will describe the problem that existed in WebSphere Application Server V7 since it could be configured to support failover whenever the WebSphere MQ V7.0.1 Queue Manager fails over. Next is a discussion on the changes done to the WebSphere Application Server administrative console and the scripting program, wsadmin, to support for multiple connections in MQ link sender channel.

Background

- WebSphere MQ V7.0.1 provides high availability of queue manager
 - One queue manager instance fails over to another queue manager instance in a different machine with different IP address
- WebSphere Application Server V7 does not provide systems integration bus MQ link high availability (HA)
 - systems integration bus MQ link does not provide failover support since, MQ link sender channel takes only one host name and port number
- In WebSphere Application Server V8, to support WebSphere MQ HA capability, MQ link sender channel has been updated to take multiple connection names that can be used to connect to the queue manager instance to which queue manager fail over

WebSphere MQ V7.0.1 provides the high-availability feature. It provides automatic failover of a WebSphere MQ queue manager, by providing support for MQI channels and message channels to try connecting or reconnecting to pre-configured primary and fail-over IP addresses.

WebSphere Application Server V7 does not provide this high availability feature and therefore during a failover it cannot connect to a Queue Manager that has failed over to a preconfigured IP address. There is no support in WebSphere Application Server V7 to configure multiple host names and port numbers in systems integration bus MQ link sender channel.

This problem is resolved in WebSphere Application Server V8, which provides support for configuring multiple connections in systems integration bus MQ link sender channel. Whenever a WebSphere MQ Queue Manager fails over to a preconfigured IP address then the systems integration bus MQ link sender channel uses its list of configured multiple connections to access and connect to the WebSphere MQ Queue Manager instance to which it has failed over.

Configuration of administrative console to add multiple connections in sender channel

The screenshot shows the WebSphere administrative console interface. The left-hand navigation pane is expanded to show 'Service integration' and its sub-item 'Buses'. The main content area is titled 'Buses' and contains a table listing the buses in the environment. The table has columns for 'Name' and 'Security'. One bus is listed with the name 'BUS' and a security status of 'Disabled'. A red box highlights the 'BUS' name in the table.

Select	Name	Description	Security
<input type="checkbox"/>	BUS		Disabled

Total 1

To access the Service Integration Bus administrative functions, expand Service Integration link in the left column of the page.

The Buses panel lists the Buses that are being managed in this environment. Click the bus name in the list displayed on this panel to configure its properties.

Configuration steps (1 of 7)

The screenshot shows the IBM WebSphere MQ Configuration console for a bus named 'BUS'. The console is divided into two main sections: 'General Properties' and 'Topology'. The 'General Properties' section includes fields for Name (BUS), UUID (CFFF703233287235), and Description. It also has checkboxes for 'Discard messages' (unchecked) and 'Configuration reload enabled' (checked), and a field for 'Default messaging engine high message threshold' (50000). The 'Topology' section is expanded, showing a tree view with 'Foreign bus connections' highlighted in red. Other sections include 'Destination resources' (Destinations, Mediations), 'Services' (Inbound services, Outbound services, WS-Notification services, Reliable messaging state), and 'Additional Properties' (Custom properties, Security, Web service gateway instances).

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A systems integration bus is linked to a WebSphere MQ Queue Manager using a foreign bus connection.

Click the Foreign Bus Connections under Topology Section to access its properties.

Configuration steps (2 of 7)

Buses

Buses > BUS > Foreign bus connections

A foreign bus connection allows communication with another bus. The foreign bus can represent another Service Integration Bus, an instance of WebSphere MQ, or an indirect connection to another foreign bus.

⊕ Preferences

New... Delete Test connection

⊞ ⊞ ⊞ ⊞

Select	Name	Routing type	Description	Configuration status
You can administer the following resources:				
<input type="checkbox"/>	QM	Direct, WebSphere MQ link		Current

Total 1

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This panel lists all Foreign Bus connections configured on this systems integration bus. Click the Foreign Bus connection name that is configured to a WebSphere MQ Link.

Configuration steps (3 of 7)

The screenshot shows the configuration page for a foreign bus connection named 'QM'. The breadcrumb navigation is 'Buses > BUS > Foreign bus connections > QM'. A brief description states: 'A foreign bus connection allows communication with another bus. The foreign bus can represent another Service Integration Bus, an instance of WebSphere MQ, or an indirect connection to another foreign bus.'

The configuration area is divided into several sections:

- General Properties:** Includes fields for Name (QM), UUID (A11F8E20E0B1A55E7AAESDF0), Routing type (Direct, WebSphere MQ link), and a Description text area. There is a checked checkbox for 'Send allowed'.
- Additional Properties:** Contains two links: 'Destination defaults' and 'WebSphere MQ link routing properties'.
- Related Items:** Contains one link: 'WebSphere MQ links', which is highlighted with a red rectangular box.

At the bottom of the configuration area are buttons for 'Apply', 'OK', 'Reset', and 'Cancel'. The footer of the page includes the number '7', the text 'Multiple connections in a systems integration bus MQ link to support WebSphere MQ high availability', and the copyright notice '© 2011 IBM Corporation'.

Click the WebSphere MQ Links under Related items section to navigate to the MQ link properties.

Configuration steps (4 of 7)

Buses

Buses > BUS > Foreign bus connections > QM > WebSphere MQ links

A link between the messaging engine and a WebSphere MQ network. The WebSphere MQ link connects the messaging engine as a queue manager to WebSphere MQ, providing a bridge between the bus and a WebSphere MQ network.

Preferences

Refresh New... Delete Start

Stop mode: Quiesce Target state: Inactive Stop

Select	Name	Description	Local messaging engine	Virtual queue manager name	Status	Current outbound messages	Messages sent	Messages received								
<input type="checkbox"/>	mqlink		KSAKTHIRNode02.server1-BUS	BUS	RUNNING: No problems to report...	<table border="1"> <tr> <td>Sender channel transmitter</td> <td>0</td> </tr> <tr> <td>Link transmitters</td> <td>0</td> </tr> </table>	Sender channel transmitter	0	Link transmitters	0	<table border="1"> <tr> <td>Sender channel transmitter</td> <td>0</td> </tr> <tr> <td>Link transmitters</td> <td>0</td> </tr> </table>	Sender channel transmitter	0	Link transmitters	0	0
Sender channel transmitter	0															
Link transmitters	0															
Sender channel transmitter	0															
Link transmitters	0															

Total 1

8

Multiple connections in a systems integration bus MQ link to support WebSphere MQ high availability

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This panel lists the MQ Links configured for this Foreign Bus Connection. Click the MQ link name to navigate to its properties.

Configuration steps (5 of 7)

The screenshot displays the configuration page for an MQ link in the IBM WebSphere MQ console. The breadcrumb navigation is: **Buses > BUS > Foreign bus connections > QM > WebSphere MQ links > mqlink**. Below the breadcrumb, a brief description states: "A link between the messaging engine and a WebSphere MQ network. The WebSphere MQ link connects the messaging engine as a queue manager to WebSphere MQ, providing a bridge between the bus and a WebSphere MQ network." The page is divided into two tabs: "Configuration" (selected) and "Runtime".

The configuration is organized into three main sections:

- Administration:** Contains fields for "Name" (mqlink), "UUID" (3D08D966D2FDCB3), and "Description" (empty).
- Connection:** Contains fields for "Foreign bus connection name" (QM), "Local messaging engine" (KSAKTHRRNode02.server1-BUS), "Virtual queue manager name" (BUS), "Batch size" (50), and "Maximum message size" (4194304 bytes).
- Additional Properties:** A list of links including "Publish/subscribe broker profiles", "Receiver channel", "Sender channel" (highlighted with a red circle), and "Sender channel transmitters".
- Related Items:** A list of links including "Foreign bus connection" and "Link transmitters".

At the bottom of the page, there is a page number "9", a footer note "Multiple connections in a systems integration bus MQ link to support WebSphere MQ high availability", and a copyright notice "© 2011 IBM Corporation".

Click the sender channel link under additional properties of the MQ link. This will navigate to a list of sender channels configured to WebSphere MQ on this MQ link.

Configuration steps (6 of 7)

The screenshot shows the configuration page for a WebSphere MQ link sender channel. The breadcrumb navigation is: Buses > BUS > Foreign bus connections > QM > WebSphere MQ links > mqlink > WebSphere MQ link sender channel. Below the breadcrumb is a description: "The sender channel that sends messages to the gateway queue manager. The sender channel communicates with a WebSphere MQ receiver channel on the gateway queue manager, and converts service integration bus messages to MQ format messages." There is a "Preferences" section with buttons for "New...", "Delete", "Reset", and "Start". Below these are "Stop mode: Quiesce" and "Target state: Inactive" dropdown menus, and a "Stop" button. A table lists the sender channels with columns for "Select", "WebSphere MQ link sender channel name", "Host name", "Port", and "Status". The table contains one entry: "TO.QM" (highlighted with a red box), "9.124.36.110", "3333", and a green status icon. Below the table is a "Total 1" summary.

Buses

Buses > BUS > Foreign bus connections > QM > WebSphere MQ links > mqlink > WebSphere MQ link sender channel

The sender channel that sends messages to the gateway queue manager. The sender channel communicates with a WebSphere MQ receiver channel on the gateway queue manager, and converts service integration bus messages to MQ format messages.

Preferences

New... Delete Reset Start

Stop mode: Quiesce Target state: Inactive Stop

Select	WebSphere MQ link sender channel name	Host name	Port	Status
<input type="checkbox"/>	TO.QM	9.124.36.110	3333	

Total 1

10

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There will always be one sender channel configured for a single MQ link. Click the sender channel name in the list to navigate to its properties.

Configuration steps (7 of 7)

Buses

Buses > BUS > Foreign bus connections > OM > WebSphere MQ links > mqlink > WebSphere MQ link sender channel > TO.QM

The sender channel that sends messages to the gateway queue manager. The sender channel communicates with a WebSphere MQ receiver channel on the gateway queue manager, and converts service integration bus messages to MQ format messages.

Configuration Runtime

General Properties

Administration

WebSphere MQ link sender channel name
TO.QM

Connection

Single Connection

Host name
9.124.36.110

Port
3333

Multiple Connection Names List

Connection Names List Example: 9.254.128.113(1414),localhost(1424)
9.124.36.110(3333),9.124.36.110(3333)

* Transport chain
OutboundBasicMQLink

Disconnect interval
900 seconds

Short retry count
10

Short retry interval
60 seconds

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This is the configuration panel for the sender channel. To configure the multiple connections for failover support, you need to input the comma separated list of host names and port numbers in the Connection Names List property under Multiple Connection Names List radio button.

Configuration of wsadmin commands to add multiple connections to sender channel

- wsadmin commands are enhanced to support the multiple connections for SIB MQ link sender channel
 - createSIBMQLink command has added new a property connameList, which takes multiple connections value from the user for to configure an MQ link sender channel.
 - modifySIBMQLink command has added new property connameList, which takes multiple connections value from the user to configure an MQ link sender channel.
- The information center links in WebSphere Application Server V8
 - modifySIBMQLink command
 - http://www-01.ibm.com/support/knowledgecenter/SSAW57_8.0.0/com.ibm.websphere.nd.multiplatform.doc/info/ae/ae/rjj_mqlink_modify.html
 - createSIBMQLink command
 - http://www-01.ibm.com/support/knowledgecenter/SSAW57_8.0.0/com.ibm.websphere.nd.multiplatform.doc/info/ae/ae/rjj_mqlink_create.html

For those users that need programmatic access to configure the systems integration bus MQ link sender channel, the wsadmin program of WebSphere Application Server V8 has been enhanced to provide this support. This is done by providing multiple connections value to new property connameList, which is added to the existing commands, createSIBMQLink and modifySIBMQLink.

The Information Center of the WebSphere Application Server V8 contains very complete and useful information for new property connameList in wsadmin commands.

Summary

- WebSphere Application Server V8 supports high availability of multiple connections between systems integration bus and WebSphere MQ V7.0.1
- The support is provided by configuring multiple connections on systems integration bus MQ link sender channel by using either administrative console or wsadmin commands

WebSphere Application Server V8 introduces high availability of connections between WebSphere Application Server and WebSphere MQ , by enabling the configuration of multiple connections on the systems integration bus MQ link sender channel using the administrative console and wsadmin. You can configure the MQ link sender channel and update it to support multiple connections.

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