Sun Cluster 3.1 Data Service for WebSphere MQ Integrator

Adobe PostScript™

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Contents

Installing and Configuring Sun Cluster HA for WebSphere MQ Integrator

Installing and Configuring Sun Cluster HA for WebSphere MQ Integrator

Table 1–1 lists the tasks for installing and configuring Sun Cluster HA for WebSphere MQ Integrator . Perform these tasks in the order that they are listed.

TABLE 1–1 Task Map: Installing and Configuring Sun Cluster HA for WebSphere MQ Integrator

Task	For Instructions, Go To
Plan the installation	"Sun Cluster HA for WebSphere MQ Integrator Overview" on page 6
	"Planning the Sun Cluster HA for WebSphere MQ Integrator Installation and Configuration" on page 6
Install and configure WebSphere MQ Integrator	"How to Install and Configure WebSphere MQ Integrator" on page 12
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TABLE 1–1 Task Map: Installing and Configuring Sun Cluster HA for WebSphere MQ Integrator   *(Continued)*

Task	For Instructions, Go To
Understand Sun Cluster HA for WebSphere MQ Integrator fault monitor	"Understanding Sun Cluster HA for WebSphere MQ Integrator Fault Monitor" on page 20
Debug Sun Cluster HA for WebSphere MQ Integrator	"How to Verify the Installation and Configuration of WebSphere MQ Integrator" on page 14

Sun Cluster HA for WebSphere MQ Integrator Overview

WebSphere MQ Integrator works with WebSphere MQ messaging, extending its basic connectivity and transport capabilities to provide a powerful message broker solution driven by business rules. Messages are formed, routed and transformed according to the rules defined by an easy-to-use graphical user interface (GUI).

The Sun Cluster HA for WebSphere MQ Integrator data service provides a mechanism for orderly startup and shutdown, fault monitoring and automatic failover for the WebSphere MQ Integrator service. The following WebSphere MQ Integrator components are protected by the Sun Cluster HA for WebSphere MQ Integrator data service.

TABLE 1–2 Protection of Components

Component	Protected by
Broker	Sun Cluster HA for WebSphere MQ Integrator
User Name Server	Sun Cluster HA for WebSphere MQ Integrator

Planning the Sun Cluster HA for WebSphere MQ Integrator Installation and Configuration

This section contains the information you need to plan your Sun Cluster HA for WebSphere MQ Integrator installation and configuration.

Configuration Restrictions

Caution – Your data service configuration might not be supported if you do not observe these restrictions.

Consider the restrictions in this section to plan the installation and configuration of Sun Cluster HA for WebSphere MQ Integrator . This section provides a list of software and hardware configuration restrictions that apply to Sun Cluster HA for WebSphere MQ Integrator only.

For restrictions that apply to all data services, see the *Sun Cluster Release Notes*.

- **The Sun Cluster HA for WebSphere MQ Integrator data service can only be configured as a failover service –** WebSphere MQ Integrator cannot operate as a scalable service and therefore the Sun Cluster HA for WebSphere MQ Integrator data service can only be configured to run as a failover service.

- **Installing WebSphere MQ Integrator onto Cluster File Systems –** Initially, the WebSphere MQ Integrator product is installed into /opt/mqsi and /var/mqsi.

  /var/mqsi must be mounted as a Global File System with a symbolic link for /var/mqsi/locks to a Local File System. It is recommended that /opt/mqsi be on a local disk, however for a discussion of the advantages and disadvantages of installing the software on local versus cluster file system, see "Determining the Location of the Application Binaries" on page 3 of the *Sun Cluster Data Services Installation and Configuration Guide*

- **Mount /var/mqsi as a Global File System –** WebSphere MQ Integrator makes use of several directories within /var/mqsi, which needs to be available on all nodes within Sun Cluster as a Global File System. However, generated locks need to be located within a Local File System. Because of this, /var/mqsi/locks must be setup as a symbolic link to a Local File System.

Note – It is considered best practice when mounting Global File Systems to mount them with the /global prefix and to mount Failover File Systems with the /local prefix. However, be aware that this is simply viewed as best practice.

EXAMPLE 1–1 WebSphere MQ Integrator with /var/mqsi/locks symbolically linked to a local file system

The following example shows WebSphere MQ Integrator with /var/mqsi mounted as a Global File system through a symbolic link to /global/mqsi, with /var/mqsi/locks setup as a symbolic link to /var/mqsi_locks on the root file system, ie local disk.

```
# ls -l /var/mqsi
lrwxrwxrwx   1 root     other        12 Sep  5 15:32 /var/mqsi ->
 /global/mqsi
```

EXAMPLE 1–1 WebSphere MQ Integrator with /var/mqsi/locks symbolically linked to a local file system   *(Continued)*

```
#
# ls -l /global/mqsi/locks
lrwxrwxrwx   1 root     other        15 Sep 18 15:37 /global/mqsi/locks ->
 /var/mqsi_locks
#
# df -k /global/mqsi/locks
Filesystem            kbytes     used   avail capacity  Mounted on
/dev/dsk/c0t0d0s0   12731708 5792269 6812122    46%    /
#
# more /etc/vfstab (Subset of the output)
/dev/md/dg_d6/dsk/d60   /dev/md/dg_d6/rdsk/d60  /global/mqsi
            ufs     4       yes     logging,global
```

■ **The Sun Cluster HA for WebSphere MQ Integrator RDBMS –** Currently, the Sun Cluster HA for WebSphere MQ Integrator data service can only operate with a local RDBMS, ie not a remote RDBMS, and more specifically only with DB2 and Oracle.

This restriction is because the Sun Cluster HA for WebSphere MQ Integrator data service needs to manage the restart scenarios for WebSphere MQ Integrator, namely whenever the RDBMS restarts. However, this behavior is scheduled to be enhanced at a later date and also to include Sybase support.

Configuration Requirements

> **Caution –** Your data service configuration might not be supported if you do not adhere to these requirements.

Use the requirements in this section to plan the installation and configuration of Sun Cluster HA for WebSphere MQ Integrator . These requirements apply to Sun Cluster HA for WebSphere MQ Integrator only. You must meet these requirements before you proceed with your Sun Cluster HA for WebSphere MQ Integrator installation and configuration.

■ **WebSphere MQ Integrator components and their dependencies —**The Sun Cluster HA for WebSphere MQ Integrator data service can be configured to protect a WebSphere MQ Integrator Broker and UserNameServer. These components and their dependencies are briefly described below.

TABLE 1–3 WebSphere MQ Integrator components and their dependencies (via →
symbol)

Componet	Description
Broker(Mandatory)	→ *SUNW.HAStoragePlus* resource
	→ *WebSphere MQ Queue Manager* and *Listener* resources
	→ *RDBMS* resource
	The SUNW.HAStoragePlus resource manages the WebSphere MQ Integrator File System Mount point, ie /global/mqsi .
	Dependency on the *WebSphere MQ Queue Manager* resource ensures that the WebSphere MQ Queue Manager is available.
	Dependency on the *WebSphere MQ Listener* resource is only required if runmqlsr is used instead of inetd.
	Dependency on the *RDBMS* resource ensures that the RDBMS is available.
	All these dependencies ensure that WebSphere MQ Integrator is not started until these services are available.
UserNameServer (Optional)	→ *SUNW.HAStoragePlus* resource
	→ *WebSphere MQ Queue Manager* and *Listener* resources
	The SUNW.HAStoragePlus resource manages the WebSphere MQ Integrator File System Mount point, ie /global/mqsi .
	Dependency on the *WebSphere MQ Queue Manager* resource ensures that the WebSphere MQ Queue Manager is available.
	Dependency on the *WebSphere MQ Listener* resource is only required if runmqlsr is used instead of inetd.

The WebSphere MQ Integrator Broker component and its dependencies must all
reside within the same Resource Group. Likewise the WebSphere MQ Integrator
UserNameServer and its dependencies must also all reside with the same Resource
Group.

However, the WebSphere MQ Integrator Broker and UserNameServer do not have
to reside within the same Resource Group, they can reside in separate Resource
Groups. Likewise, multiple instances of the WebSphere MQ Integrator Broker can
reside in separate Resource Groups. However, only one instance of the WebSphere
MQ Integrator UserNameServer is allowed.

EXAMPLE 1–2 Multiple WebSphere MQ Integrator Brokers and UserNameServer .

The following example shows two WebSphere MQ Integrator Brokers (XXX and
YYY) and a WebSphere MQ Integrator UserNameServer within different Resource
Groups.

EXAMPLE 1–2 Multiple WebSphere MQ Integrator Brokers and UserNameServer .
(Continued)

The example also shows that all WebSphere MQ Integrator components (Broker and UserNameServer) use the same Global File System /global/mqsi .

Note – The file system mount points for DB2 and Oracle in the example that follows are simply examples. For a discussion of the advantages and disadvantages of installing the software on local versus cluster file system, see "Determining the Location of the Application Binaries" on page 3 of the *Sun Cluster Data Services Installation and Configuration Guide*.

- **Resource Group 1 —** with the following *resources*

  ```
  SUNW.HAStoragePlus resource with
   -x FilesystemMountPoints=/local/db2,/global/mqm,/global/mqsi,
       /local/mqm/qmgrs/qmgr1,/local/mqm/log/qmgr1
  RDBMS resource for DB2
  WebSphere MQ resource for Queue Manager qmgr1
  WebSphere MQ Integrator resource for Broker XXX
  ```

- **Resource Group 2—** with the following *resources*

  ```
  SUNW.HAStoragePlus resource with
   -x FilesystemMountPoints=/global/mqm,/global/mqsi
   -x AffinityOn=FALSE
  SUNW.HAStoragePlus resource with
   -x FilesystemMountPoints=/local/oracle,
       /local/mqm/qmgrs/qmgr2,/local/mqm/log/qmgr2
  RDBMS resource for Oracle
  RDBMS resource for Oracle Listener
  WebSphere MQ resource for Queue Manager qmgr2
  WebSphere MQ Integrator resource for Broker YYY
  ```

- **Resource Group 3—** with the following *resources*

  ```
  SUNW.HAStoragePlus resource with
   -x FilesystemMountPoints=/global/mqm,/global/mqsi
   -x AffinityOn=FALSE
  SUNW.HAStoragePlus resource with
   -x FilesystemMountPoints=/local/mqm/qmgrs/qmgr3,/local/mqm/log/qmgr3
  WebSphere MQ resource for Queue Manager qmgr3
  WebSphere MQ Integrator resource for UserNameServer
  ```

Note – For more detailed information about these WebSphere MQ Integrator components, refer to *IBM's WebSphere MQ Integrator Introduction and Planning* manual.

Each WebSphere MQ Integrator component has a configuration and registration file under, /opt/SUNWscmqi/xxx/util, where xxx is a three character abbreviation for the respective WebSphere MQ Integrator component. These files allow you to register the WebSphere MQ Integrator components with Sun Cluster.

Within these files, the appropriate dependencies have already been applied.

EXAMPLE 1–3 WebSphere MQ Integrator configuration and registration file for Sun Cluster

```
# cd /opt/SUNWscmqi
#
# ls -l sib/util
total 6
-rwxr-xr-x   1 root     sys          1032 Dec 20 14:44 sib_config
-rwxr-xr-x   1 root     sys           720 Dec 20 14:44 sib_register
#
# ls -l siu/util
-rwxr-xr-x   1 root     sys           733 Dec 20 14:44 siu_config
-rwxr-xr-x   1 root     sys           554 Dec 20 14:44 siu_register
#
# more sib/util/*
::::::::::::::
sib/util/sib_config
::::::::::::::
#
# Copyright 2003 Sun Microsystems, Inc.  All rights reserved.
# Use is subject to license terms.
#
# This file will be sourced in by sib_register and the parameters
# listed below will be used.
#
# These parameters can be customized in (key=value) form
#
#        RS - name of the resource for the application
#        RG - name of the resource group containing RS
#      QMGR - name of the Queue Manager
#      PORT - name of the Queue Manager port number
#        LH - name of the LogicalHostname SC resource
#    HAS_RS - name of the Queue Manager HAStoragePlus SC resource
#    SC3_IN - name of the Test Message Flow (Inbound)
#   SC3_OUT - name of the Test Message Flow (Outbound)
#   MQSI_ID - name of the WebSphere MQI userid
#    BROKER - name of the WebSphere MQI Broker
#  RDBMS_ID - name of the WebSphere MQI RDBMS userid
#   QMGR_RS - name of the Queue Manager SC resource
#  RDBMS_RS - name of the RDBMS SC resource and listener (if Oracle)
#             e.g. RDBMS_RS=<ora-rs>,<lsr-rs>
#

RS=
RG=
QMGR=
PORT=
LH=
```

EXAMPLE 1–3 WebSphere MQ Integrator configuration and registration file for Sun Cluster   *(Continued)*

```
HAS_RS=
SC3_IN=
SC3_OUT=
MQSI_ID=
BROKER=
RDBMS_ID=
QMGR_RS=
RDBMS_RS=
::::::::::::::
sib/util/sib_register
::::::::::::::
#
# Copyright 2003 Sun Microsystems, Inc.  All rights reserved.
# Use is subject to license terms.
#

. 'dirname $0'/sib_config

scrgadm -a -j $RS -g $RG -t SUNW.gds \
-x Start_command="/opt/SUNWscmqi/sib/bin/start-broker \
-R $RS -G $RG -Q $QMGR -I $SC3_IN -O $SC3_OUT \
-U $MQSI_ID -B $BROKER -D $RDBMS_ID " \
-x Stop_command="/opt/SUNWscmqi/sib/bin/stop-broker \
-R $RS -G $RG -Q $QMGR -I $SC3_IN -O $SC3_OUT \
-U $MQSI_ID -B $BROKER -D $RDBMS_ID " \
-x Probe_command="/opt/SUNWscmqi/sib/bin/test-broker \
-R $RS -G $RG -Q $QMGR -I $SC3_IN -O $SC3_OUT \
-U $MQSI_ID -B $BROKER -D $RDBMS_ID " \
-y Port_list=$PORT/tcp -y Network_resources_used=$LH \
-x Stop_signal=9 \
-y Resource_dependencies=$HAS_RS,$QMGR_RS,$RDBMS_RS
```

Installing and Configuring WebSphere MQ Integrator

This section contains the procedures you need to install and configure WebSphere MQ Integrator.

▼ How to Install and Configure WebSphere MQ Integrator

Use this procedure to install and configure WebSphere MQ Integrator.

Note – For this section, follow *IBM's WebSphere MQ Integrator for Sun Solaris — Installation Guide* manual to install and create a Broker and UserNameServer.

1. **Mount the WebSphere MQ Integrator Cluster File Systems –** Before installing WebSphere MQ Integrator within Sun Cluster, you must ensure that the Cluster File System `/var/mqsi,` or `/global/mqsi` if you have setup a symbolic link, is mounted as a Global File System.

2. **Install WebSphere MQ Integrator onto all nodes within Sun Cluster –** It is recommended that WebSphere MQ Integrator binaries be installed onto local disks on `/opt/mqsi,` however for a discussion of the advantages and disadvantages of installing the software on local versus cluster file system, see "Determining the Location of the Application Binaries" on page 3 of the *Sun Cluster Data Services Installation and Configuration Guide*.

   ■ Install WebSphere MQ Integrator onto *all* nodes within Sun Cluster that will run WebSphere MQ Integrator, regardless of the location of the application binaries. This is required because the `pkgadd` for WebSphere MQ Integrator additionally sets up several symbolic links on the host.

3. **Create your WebSphere MQ Integrator Broker(s) –** Once WebSphere MQ Integrator has been installed onto *all* nodes within Sun Cluster that will run WebSphere MQ Integrator, you should create your WebSphere MQ Integrator Broker(s).

Verifying the Installation and Configuration of WebSphere MQ Integrator

This section contains the procedure you need to verify the installation and configuration.

Note – For this section, refer to *IBM's WebSphere MQ Intercommunication* and *IBM's WebSphere MQ Command Reference* manuals to create queues and channels for communication between the Broker(s) and UserNameServer within Sun Cluster and the Configuration Manager on Windows NT.

▼ How to Verify the Installation and Configuration of WebSphere MQ Integrator

Use this procedure to verify the installation and configuration. This procedure does not verify that your application is highly available because you have not installed your data service yet.

Caution – Note that the Sun Cluster HA for WebSphere MQ Integrator data service requires that a message flow has been setup within the Broker.

Note – This section requires that the WebSphere MQ queue manager Logical Hostname IP address be available. This should have been setup if you have completed the Sun Cluster HA for IBM WebSphere MQ data service installation. Ensure that you have completed the installation of the Sun Cluster HA for IBM WebSphere MQ data service before you continue with the next steps.

1. **Create the communication links between the Broker queue manager and Configuration Manager queue manager –** Here you need to setup queues and channels between the Broker queue manager(s) and the Configuration Manager queue manager, so that the message flows and rules setup on the Configuration Manager can be deployed from the Configuration Manager to the Broker queue manager(s) within Sun Cluster.

   Refer to *Chapter 4 — Configuring a broker domain* within *IBM's WebSphere MQ Integrator for Sun Solaris — Installation Guide* . In particular, refer to the section *Starting your broker domain*.

2. **Create the communication links between the Broker queue manager and UserNameServer (UNS) queue manager –** If you are using a UNS, then you need to setup queues and channels between the Broker queue manager(s) and the UserNameServer.

   Refer to *Chapter 4 — Configuring a broker domain* within *IBM's WebSphere MQ Integrator for Sun Solaris — Installation Guide* . In particular, refer to the section *Starting your broker domain*.

3. **Test the communication links between the queue managers –** Once all queues and channels have been setup between the Broker(s), UserNameServer and Configuration Manager, you should test that all the queue managers can communicate with each other.

   Refer to *Chapter 4 — Configuring a broker domain* within *IBM's WebSphere MQ Integrator for Sun Solaris — Installation Guide* . In particular, refer to the section *Starting your broker domain*.

4. **Create and deploy a message flow on the Configuration Manager –** Once all queues and channels have been setup and tested between the Broker(s), UserNameServer and Configuration Manager, you should create a message flow

and deploy it to the Broker queue manager. You will require a separate message flow for each Broker queue manager.

a. **Create a message flow**

You must create a simple message flow, that uses two queues, to receive a message from an input queue and put it to an output queue. Within the Control Center on Windows NT you can use the IBMPrimitives `MQInput` and `MQOutput` to achieve this simple message flow.

- Refer to *Chapter 5 — Verifying your installation* within *IBM's WebSphere MQ Integrator for Sun Solaris — Installation Guide* . In particular, refer to the section *Building and using a message flow*.

b. **Deploy the message flow to the broker**

- Refer to *Chapter 5 — Verifying your installation* within *IBM's WebSphere MQ Integrator for Sun Solaris — Installation Guide* . In particular, refer to the section *Building and using a message flow*

Note – The message flow and message flow queues that you create will be used by the Sun Cluster HA for WebSphere MQ Integrator data service to probe WebSphere MQ Integrator Broker.

Installing the Sun Cluster HA for WebSphere MQ Integrator Packages

This section contains the procedure you need to install the Sun Cluster HA for WebSphere MQ Integrator packages.

▼ How to Install the Sun Cluster HA for WebSphere MQ Integrator Packages

Use this procedure to install the Sun Cluster HA for WebSphere MQ Integrator packages. You need the Sun Cluster Agents CD-ROM to perform this procedure. This procedure assumes that you did not install the data service packages during your initial Sun Cluster installation.

If you installed the Sun Cluster HA for WebSphere MQ Integrator packages as part of your initial Sun Cluster installation, proceed to "Registering and Configuring Sun Cluster HA for WebSphere MQ Integrator " on page 16.

Otherwise, use this procedure to install the Sun Cluster HA for WebSphere MQ Integrator packages. Perform this procedure on all nodes that can run Sun Cluster HA for WebSphere MQ Integrator data service.

1. **Load the Sun Cluster Agents CD-ROM into the CD-ROM drive.**

2. **Run the `scinstall` utility with no options.**
   This step starts the `scinstall` utility in interactive mode.

3. **Choose the menu option, Add Support for New Data Service to This Cluster Node.**
   The `scinstall` utility prompts you for additional information.

4. **Provide the path to the Sun Cluster Agents CD-ROM.**
   The utility refers to the CD as the "data services cd."

5. **Specify the data service to install.**
   The `scinstall` utility lists the data service that you selected and asks you to confirm your choice.

6. **Exit the `scinstall` utility.**

7. **Unload the CD from the drive.**

Registering and Configuring Sun Cluster HA for WebSphere MQ Integrator

This section contains the procedures you need to configure Sun Cluster HA for WebSphere MQ Integrator .

▼ How to Register and Configure Sun Cluster HA for WebSphere MQ Integrator

Use this procedure to configure Sun Cluster HA for WebSphere MQ Integrator as a failover data service. This procedure assumes that you installed the data service packages during your initial Sun Cluster installation.

If you did not install the Sun Cluster HA for WebSphere MQ Integrator packages as part of your initial Sun Cluster installation, go to "How to Install the Sun Cluster HA for WebSphere MQ Integrator Packages" on page 15.

Otherwise, use this procedure to configure the Sun Cluster HA for WebSphere MQ Integrator data service.

Note that the WebSphere MQ Integrator Broker component is dependent on WebSphere MQ and an RDBMS. The WebSphere MQ Integrator UserNameServer component is dependent only on WebSphere MQ, refer back to "Configuration Requirements" on page 8 for a list of WebSphere MQ Integrator components and their dependencies.

Furthermore, currently only local RDBMS support for DB2 or Oracle is supported, refer back to "Configuration Restrictions" on page 7, in particular to *Sun Cluster HA for WebSphere MQ Integrator RDBMS* for a description of this restriction.

Note – As the WebSphere MQ Integrator Broker component is dependent on WebSphere MQ and an RDBMS, all resources for the WebSphere MQ Integrator Broker component, WebSphere MQ components and the RDBMS *must* reside within the same Resource Group, for an example refer back to Example 1–2.

Note – As the WebSphere MQ Integrator UserNameServer component is dependent on WebSphere MQ , all resources for the WebSphere MQ Integrator UserNameServer component and WebSphere MQ components *must* reside within the same Resource Group, for an example refer back to Example 1–2.

Note – For information about Sun Cluster HA for WebSphere MQ, refer to the *Sun Cluster Data Service 4/03 for WebSphere MQ* documentation. For information about Sun Cluster HA for Oracle, refer to the *Sun Cluster Data Service 4/03 for Oracle* documentation. For further information about DB2 within Sun Cluster, you may wish to consult the *DB2 and High Availability on Sun Cluster 3.0* white paper, located at the database and data management site `http://www.ibm.com/software/data/pubs`.

---

1. **Become superuser on one of the nodes in the cluster that will host WebSphere MQ Integrator.**

2. **Register the SUNW.gds resource type.**

   # `scrgadm -a -t SUNW.gds`

3. **Register the SUNW.HAStoragePlus resource type.**

   # `scrgadm -a -t SUNW.HAStoragePlus`

4. **Create a failover resource group .**

   # `scrgadm -a -g` *WebSphere MQ-failover-resource-group*

5. **Create a resource for the WebSphere MQ Integrator Disk Storage.**

   # **scrgadm -a -j** *WebSphere MQ Integrator-has-resource* \
   -g *WebSphere MQ-failover-resource-group* \
   -t SUNW.HAStoragePlus \
   -x FilesystemMountPoints=*WebSphere MQ Integrator- instance-mount-points*

6. **Enable the failover resource group that now includes the WebSphere MQ Integrator Disk Storage resource.**

   # **scswitch -Z -g** *WebSphere MQ-failover-resource-group*

7. **Create and register each required WebSphere MQ Integrator component.**

   Note – This section requires that the Sun Cluster HA for WebSphere MQ and RDBMS data services have been installed and their resources are online within Sun Cluster. Ensure that you have completed those steps before you continue with this step.

   Perform this step for the Broker component (`sib`), then repeat for the optional UserNameServer component, replacing `sib` with,

   siu - UserNameServer

   # **cd /opt/SUNWscmqi/sib/util**

   Edit the `sib_config` file and follow the comments within that file, ie

   ```
   # These parameters can be customized in (key=value) form
   #
   #        RS - name of the resource for the application
   #        RG - name of the resource group containing RS
   #      QMGR - name of the Queue Manager
   #      PORT - name of the Queue Manager port number
   #        LH - name of the LogicalHostname SC resource
   #    HAS_RS - name of the Queue Manager HAStoragePlus SC resource
   #    SC3_IN - name of the Test Message Flow (Inbound)
   #   SC3_OUT - name of the Test Message Flow (Outbound)
   #   MQSI_ID - name of the WebSphere MQI userid
   #    BROKER - name of the WebSphere MQI Broker
   #  RDBMS_ID - name of the WebSphere MQI RDBMS userid
   #   QMGR_RS - name of the Queue Manager SC resource
   #  RDBMS_RS - name of the RDBMS SC resource and listener (if Oracle)
   #             e.g. RDBMS_RS=<ora-rs>,<lsr-rs>
   #
   ```

   The following is an example for WebSphere MQ Integrator Broker XXX , with WebSphere Integrator MQ Manager `qmgr1`.

   ```
   RS=wmq-broker-res
   RG=wmq-rg
   QMGR=qmgr1
   PORT=1414
   LH=wmq-lh-res
   HAS_RS=wmqi-has-res
   ```

```
SC3_IN=SC3_IN
SC3_OUT=SC3_OUT
MQSI_ID=mqsi1
BROKER=XXX
RDBMS_ID=db2
QMGR_RS=wmq-qmgr-res
RDBMS_RS=wmq-rdbms-res
```

After editing `sib_config` you must now register the resource.

./sib_register

8. **Enable each WebSphere MQ Integrator resource.**

   Repeat this step for each WebSphere MQ Integrator component as in the previous step.

   # **scstat**

   # **scswitch -e -j** *WebSphere MQ Integrator-resource*

Verifying the Sun Cluster HA for WebSphere MQ Integrator Installation and Configuration

This section contains the procedure you need to verify that you installed and configured your data service correctly.

▼ How to Verify the Sun Cluster HA for WebSphere MQ Integrator Installation and Configuration

Use this procedure to verify that you installed and configured Sun Cluster HA for WebSphere MQ Integrator correctly.

1. **Become superuser on one of the nodes in the cluster that will host WebSphere MQ Integrator.**

2. **Ensure all the WebSphere MQ Integrator resources are online with `scstat`.**

   # **scstat**

   For each WebSphere MQ Integrator resource that is not online, use the `scswitch` command as follows.

   # **scswitch -e -j** *WebSphere MQ Integrator- resouce*

3. **Run the `scswitch` command to switch the WebSphere MQ Integrator resource group to another cluster node, such as** *node2***.**

   # **scswitch -z -g** *WebSphere MQ Integrator-failover-resource-group* **-h** *node2*

Understanding Sun Cluster HA for WebSphere MQ Integrator Fault Monitor

Use the information in this section to understand Sun Cluster HA for WebSphere MQ Integrator fault monitor. This section describes the Sun Cluster HA for WebSphere MQ Integrator fault monitor's probing algorithm or functionality, states the conditions, messages, and recovery actions associated with unsuccessful probing, and states the conditions and messages associated with unsuccessful probing.

For conceptual information on fault monitors, see the *Sun Cluster Concepts Guide*.

Resource Properties

Sun Cluster HA for WebSphere MQ Integrator fault monitor uses the same resource properties as resource type `SUNW.gds`. Refer to the `SUNW.gds(5)` man page for a complete list of resource properties used.

Probing Algorithm and Functionality

- **WebSphere MQ Integrator Broker**

  - Sleeps for Thorough_probe_interval

  - Test if the RDBMS or Queue Manager has been restarted. If the RDBMS has been restarted, then the whole Resource Group will be restarted. If the Queue Manager has been restarted, then the Broker is stopped and waits until the Queue Manager is restarted after which the Broker is then restarted.

  - If the RDBMS and Queue Manager have not been restarted, then a check against `bipservice` is made. If `bipservice` is lost then the probe will restart the Broker.

  - If `bipservice` is available then the probe checks that the queue names for `SC3_IN` and `SC3_OUT` are valid and empty, puts a test message to `SC3_IN` and checks that the message flows to `SC3_OUT` by checking that the `CURDEPTH` for `SC3_OUT` is equal to 1. If this test fails, then the probe will restart the Broker.

- If the Broker is repeatedly restarted and subsequently exhausts the `Retry_count` within the `Retry_interval` then a failover is initiated for the Resource Group onto another node.

- **WebSphere MQ Integrator UserNameServer**

  - Sleeps for Thorough_probe_interval
  - If `bipservice` for the UserNameServer is lost, then the probe will restart the UserNameServer.
  - If the UserNameServer is repeatedly restarted and subsequently exhausts the `Retry_count` within the `Retry_interval` then a failover is initiated for the Resource Group onto another node.

Debug Sun Cluster HA for WebSphere MQ Integrator

▼ How to turn debug on for Sun Cluster HA for WebSphere MQ Integrator

Use the information in this section to understand how to turn on debug for Sun Cluster HA for WebSphere MQ Integrator .

Sun Cluster HA for WebSphere MQ Integrator can be used by multiple WebSphere MQ Integrator instances. However, it is possible to turn debug on for all WebSphere MQ Integrator instances or a particular WebSphere MQ Integrator instance.

Each WebSphere MQ Integrator component has a `DEBUG` file under `/opt/SUNWscmqi/xxx/etc`, where xxx is a three character abbreviation for the respective WebSphere MQ Integrator component.

These files allow you to turn debug on for all WebSphere MQ Integrator instances or for a specific WebSphere MQ Integrator instance on a particular node with Sun Cluster. If you require debug to be turned on for Sun Cluster HA for WebSphere MQ Integrator across the whole Sun Cluster, you will need to repeat this step on all nodes within Sun Cluster.

1. **Edit `/etc/syslog.conf`**

   Edit `/etc/syslog.conf` and change `daemon.notice` to `daemon.debug`

   ```
   # grep daemon /etc/syslog.conf
   *.err;kern.debug;daemon.notice;mail.crit          /var/adm/messages
   *.alert;kern.err;daemon.err                       operator
   ```

```
#
```

Change the `daemon.notice` to `daemon.debug` and restart `syslogd`. Note that the output below, from the command `grep daemon /etc/syslog.conf`, shows that `daemon.debug` has now been set.

```
# grep daemon /etc/syslog.conf
*.err;kern.debug;daemon.debug;mail.crit        /var/adm/messages
*.alert;kern.err;daemon.err                    operator
#
# pkill -1 syslogd
#
```

2. **Edit /opt/SUNWscmqi/sib/etc/config**

   Perform this step for the Broker component (`sib`), then repeat for the optional UserNameServer (`siu`) that requires debug output, on each node of Sun Cluster as required.

   Edit `/opt/SUNWscmqi/sib/etc/config` and change `DEBUG=` to `DEBUG=ALL` or `DEBUG=`*resource*

```
# cat /opt/SUNWscmqi/sib/etc/config
#
# Copyright 2003 Sun Microsystems, Inc.  All rights reserved.
# Use is subject to license terms.
#
# Usage:
#       DEBUG=<RESOURCE_NAME> or ALL
#
DEBUG=ALL
#
```

Note – To turn off debug, simply reverse the steps above.