Presentation Overview

- Intermediate – assumes you know what an MQ Appliance is used for and have some background with MQ.

- We will cover the hardware set up and Appliance configurations needed to enable and test High Availability.

- We will then demonstrate a High Availability failover event and an Appliance Resume event with active clients.

- Along the way we will point out Best Practices and some “Gotchas” and how to deal with them.
New Form Factor: MQ Appliance

Released in March 2015

• An optimized version of IBM MQ v9 that runs in a hardware appliance
• Reduce the demand on IT skillset to administer and support MQ as a communications backbone for an organization

✓ Easy to install
✓ Easy to configure
✓ Lower administrative overhead
✓ Upgrades delivered as firmware
Demo: MQ Appliance HA Scenario
Hardware Setup

What is needed:

- 2 – MQ Appliances attached to your Network
- 2 – 1Gb Ethernet straight-through cables
- 1 – 10Gb Ethernet cable (OM3 or OM4 fiber cable recommended)
Hardware Setup

- Connect an Ethernet cable between port eth13 on Appliance 1 and eth13 on Appliance 2. This connection is the HA group primary interface.
- Connect an Ethernet cable between port eth17 on Appliance 1 and eth17 on Appliance 2. This connection is the HA group alternate interface.
- Connect 10Gb Ethernet cable between port eth21 on Appliance 1 and eth21 on Appliance 2. This connection is the replication interface.
# Hardware Setup

## Ethernet Interface

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Op-State</th>
<th>Administrative state</th>
<th>Comments</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>eth10</td>
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<td>eth18</td>
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<tr>
<td>eth19</td>
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<td>mg1</td>
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<td>mg22</td>
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</tbody>
</table>
Hardware Setup

System Settings

Main

Enable administrative state: 1
Comments: 
Product OID: 1.3.6.1.4.1.14885.1.8
Description: IBM MQ Appliance
Serial number: 7891552
Entitlement serial number: 7891552
Product ID: 843654X [Rev A101-1]
Contact: 
Appliance name: MQLeamer1
Hardware Setup

Gotchas and things to know:

- You must not disable or disconnect Ethernet links that are used for high availability configurations. If you do disable such links, high availability operation is no longer available, and you might have to set up the configuration again.

- You must not change IP addresses for Ethernet links that are used for high availability configurations. If you do change IP addresses, high availability operation is no longer available, and you might have to set up the configuration again.

- You must not aggregate Ethernet links that are used for high availability configurations. If you do aggregate such links, high availability operation is no longer available, and you might have to set up the configuration again.
MQ Appliance HA Setup

- Create HA Group
- Create HA Queue Manager
- Create Queue, Channel, Listener and Client-connection for Queue Manager
- Set security using Command Line Interface
MQ Appliance HA Setup

```
<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
</tr>
</thead>
</table>
```

Total: 0  Selected: 0  Updated: 1:39:49 PM
MQ Appliance HA Setup

Create a high availability (HA) group

Connect two appliances to form a HA group. This may take several minutes to complete.

* Connection order:
  - First
  - Second

* Primary IP address of other appliance:
  - 192.168.101.2

* Secret text:
  - MySecretText

Timeout:

Prepare | Cancel
MQ Appliance HA Setup

Create a high availability (HA) group

Connect two appliances to form a HA group. This may take several minutes to complete.

* Connection order: First  Second

* Primary IP address of other appliance: 192.168.101.1

* Secret text: MySecretText

Timeout:

Connect  Cancel
MQ Appliance HA Setup

Local Queue Managers

<table>
<thead>
<tr>
<th>▲Name</th>
<th>Status</th>
</tr>
</thead>
</table>

Total: 0  Selected: 0  Updated: 1:52:45 PM

- Appliance 'MQLoader1': Online
- This appliance: Online
- HA queue manager status...
- Suspend this appliance...
- Delete group...
- Manage HA Keys...
MQ Appliance HA Setup
MQ Appliance HA Setup

Create a Queue Manager

<table>
<thead>
<tr>
<th><strong>Queue manager name:</strong></th>
<th>QM1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Port:</strong></td>
<td>1414</td>
</tr>
<tr>
<td><strong>High availability:</strong></td>
<td>Replicated</td>
</tr>
<tr>
<td><strong>File system size:</strong></td>
<td>Custom</td>
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<tr>
<td></td>
<td>MB  GB</td>
</tr>
<tr>
<td><strong>Startup:</strong></td>
<td>Automatic</td>
</tr>
<tr>
<td><strong>Floating IP interface:</strong></td>
<td>eth10</td>
</tr>
<tr>
<td><strong>Floating IP:</strong></td>
<td>10.100.2.103</td>
</tr>
</tbody>
</table>
Failed to create queue manager 'QM1'
MQ Appliance HA Setup

Authority records for 'QM1'

Create Authorities

- Entity name: cindy
- Entity type: User

Create Cancel
Save Close
MQ Appliance HA Setup

Authority records for 'QM1'

<table>
<thead>
<tr>
<th>Entity name</th>
<th>Entity type</th>
</tr>
</thead>
<tbody>
<tr>
<td>cindy</td>
<td>User</td>
</tr>
<tr>
<td>mqm</td>
<td>Group</td>
</tr>
<tr>
<td>mqsystem</td>
<td>User</td>
</tr>
</tbody>
</table>

Administration
- Change
- Delete
- Display
- Ctrl

Context
- Set all context
- Set identity context

MQI
- Alternate user authority
- Connect
- Inquire
- Set
- System

Total: 3 Selected: 1 Updated: 3:25:15 PM
MQ Appliance HA Setup

Add a new widget

Local Queue Managers
- Manage local queue managers

Chart
- Monitor your MQ platform

Add a widget to display MQ object information for the specified queue manager

Queue manager: QM1

- Queues: Configure destinations for messages
- Topics: Administrative objects for assigning attributes to topics
- Listeners: Configure processes to accept network requests
- Channels: Queue manager communication paths
- Client-connection Channels: Client connectivity details
- Authentication Information: Configure authentication mechanisms
- Subscriptions: Configure how subscriptions to topics are handled
- Channel Authentication Records: Control access to channels

Close
MQ Appliance HA Setup

Local Queue Managers

- Name: QM1
- Status: Running

Total: 1 Selected: 1

Updated: 4:27:30 PM

Queues on QM1

- Name
- Queue type
- Queue depth

Total: 0 Selected: 0

Updated: 4:27:18 PM
MQ Appliance HA Setup

Create a Queue

* Queue name: Q1

* Queue type: Local Remote Alias Model

Create Cancel
MQ Appliance HA Setup

Properties for 'Q1'

General

Queue name: Q1
Queue type: Local
Description:

Extended

Enable put: Allowed
Enable get: Allowed

Cluster

Default priority: 0
Default persistence: Persistent
Usage: Normal

Triggering

Events

Storage

Statistics

Status

Save  Cancel
### MQ Appliance HA Setup

#### Properties for 'Q1'

<table>
<thead>
<tr>
<th>General</th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Max queue depth:</td>
<td>100000</td>
</tr>
<tr>
<td></td>
<td>Extended</td>
<td>Max message length:</td>
<td>4194304</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shareability:</td>
<td>Shareable</td>
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<tr>
<td></td>
<td>Cluster</td>
<td>Default input open option:</td>
<td>Input shared</td>
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<tr>
<td></td>
<td>Trigerring</td>
<td>Message delivery sequence:</td>
<td>Priority</td>
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<td></td>
<td>Events</td>
<td>Retention interval:</td>
<td>0000000000</td>
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<td>Storage</td>
<td>Definition type:</td>
<td>Predefined</td>
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<td>Statistics</td>
<td>Distribution lists:</td>
<td>Not Supported</td>
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<td>Status</td>
<td>Default read ahead:</td>
<td>No</td>
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<td></td>
<td></td>
<td>Default put response type:</td>
<td>Synchronous</td>
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<td>Property control:</td>
<td>Compatibility</td>
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<td>Cluster channels:</td>
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<td></td>
<td></td>
<td>Scope:</td>
<td>Queue manager</td>
</tr>
</tbody>
</table>

---

You have unsaved changes

[Save] [Cancel]
MQ Appliance HA Setup

Authority records for 'Q1' on QM1

Create Authorities

* Entity name: cindy
* Entity type: User Group

Create Cancel
MQ Appliance HA Setup

Authority records for 'Q1' on QM1

<table>
<thead>
<tr>
<th>Entity name</th>
<th>Entity type</th>
</tr>
</thead>
<tbody>
<tr>
<td>cindy</td>
<td>User</td>
</tr>
<tr>
<td>mqm</td>
<td>Group</td>
</tr>
<tr>
<td>mqsystem</td>
<td>User</td>
</tr>
</tbody>
</table>

Queues on QM1

<table>
<thead>
<tr>
<th>Name</th>
<th>Queue type</th>
<th>Queue depth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>Local</td>
<td>0</td>
</tr>
</tbody>
</table>

Administration
- Change
- Clear
- Delete
- Display

Context
- Pass all context
- Pass identity context
- Set all context
- Set identity context

MQI
- Browse
- Inquire
- Get
- Put
- Set

MQ Technical Conference v2.0.1.8
MQ Appliance HA Setup

Create a Channel

* Channel name: CLNTCHL

* Channel type: Server-connection

Create

Cancel
MQ Appliance HA Setup

Properties for 'CLNTCHL'

General

Extended

MCA

MCA user ID: cindy

Exits

SSL

Statistics

Save  Cancel
MQ Appliance HA Setup

Create a TCP Listener

* Listener name: L1
Port: 2323
MQ Appliance HA Setup

### Properties for 'L1'

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
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<tbody>
<tr>
<td>Listener name:</td>
<td>L1</td>
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<tr>
<td>Description:</td>
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<tr>
<td>Control:</td>
<td>Queue Manager</td>
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<tr>
<td>Xmit protocol:</td>
<td>TCP</td>
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<tr>
<td>Port:</td>
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<td>IP address:</td>
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<td>0</td>
</tr>
<tr>
<td>Alteration date:</td>
<td>September 13, 2017</td>
</tr>
<tr>
<td>Alteration time:</td>
<td>4:50:53 PM</td>
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</table>

You have unsaved changes
MQ Appliance HA Setup

Create a Client-connection Channel

* Channel name: CLNTCHL

* Conn name: CLNT2323
MQ Appliance HA Setup

Put Message
Enter a message to put on queue 'Q1'

Message:
Test
MQ Appliance HA Setup
MQ Appliance HA – Failover Demo

- Demo – transition over to laptops to view MQ Appliance in action
  - Connect to MQ consoles on both Appliances
  - Start Sender application on Laptop A
  - Demo messages going from A to Appliance A via looking at MQ console
  - Start Receiver application on Laptop B
  - Create an IT disaster – HA event
  - Verify messages still flowing and observe failover pause
  - Resume after an IT disaster
  - Verify messages still flowing and observe resume pause
MQ Appliance Wrap-Up Discussion

**HA Discussion items:**
- MQ Appliance Setup does require two appliances and cabling between the two
- Easy to configure – works as expected
- Review Best Practices and Gotchas
- Monitoring
  - ITCAM for Messaging monitoring agent. Need a Client channel created to remote server where the monitoring agent is running.
  - IBM APM agents can monitors MQ Queue Manager.
  - MQ Web Console. Provide out of the box charts and widgets to see real time data for Queue, Qmgrdisk memory and CPU utilized. Widget Data is not stored.
  - Several Third-Party Applications are available.
Resources

Resources

- [IBM Redbook: Integrating the IBM MQ Appliance into your IBM MQ Infrastructure](http://www.redbooks.ibm.com/abstracts/sg248283.html)
- [IBM Redbook: Enabling IBM MQ Messaging with the IBM MQ Appliance](http://www.redbooks.ibm.com/abstracts/redp5307.html)
- [Configuring client connection to a IBM MQ Appliance queue manager using Client Channel Definition Table CCDT](https://www.ibm.com/developerworks/community/blogs/messaging/entry/Configuring_client_connection_to_a_IBM_MQ_Appliance_queue_manager_using_Client_Channel_Definition_Table_CCDT?lang=en)
Questions & Answers