Replacing an I/O module

To replace an I/O module, you must perform a specific sequence of tasks.

About this task

- You can use this procedure with all versions of ONTAP supported by your system
- All other components in the system must be functioning properly; if not, you must contact technical support.

Steps

1. Shutting down the impaired controller on page 1
2. Replacing I/O modules on page 3
3. Rebooting the controller after PCIe module replacement on page 4
4. Healing and switching back aggregates in a two-node MetroCluster configuration on page 5
5. Completing the replacement process on page 7

Shutting down the impaired controller

You can shut down or take over the impaired controller using different procedures, depending on the storage system hardware configuration.

Shutting down the impaired node

To shut down the impaired node, you must determine the status of the node and, if necessary, take over the node so that the healthy node continues to serve data from the impaired node storage.

Before you begin

If you have a cluster with more than two nodes, it must be in quorum. If the cluster is not in quorum or a healthy node shows false for eligibility and health, you must correct the issue before shutting down the impaired node.

Steps

1. If you have a cluster with more than two nodes, check the health and Epsilon from advanced mode:
   ```bash
   cluster show –epsilon *
   ```
   If the cluster is not in quorum or a node that is not the impaired node shows false for eligibility and health, correct the issue before proceeding to the next step.
   If Epsilon resides in the impaired node:
   a. Remove Epsilon from the impaired node:
      ```bash
      cluster modify –node impaired_node –epsilon false
      ```
   b. Assign Epsilon to a healthy node in the cluster:
      ```bash
      cluster modify –node healthy_node –epsilon true
      ```
2. If the impaired node is part of an HA pair, disable automatic giveback from the console of the healthy node:
storage failover modify -node local -auto-giveback false

3. Take the impaired node to the LOADER prompt:

<table>
<thead>
<tr>
<th>If the impaired node is displaying...</th>
<th>Then...</th>
</tr>
</thead>
<tbody>
<tr>
<td>The LOADER prompt</td>
<td>Go to the next step.</td>
</tr>
<tr>
<td>Waiting for giveback...</td>
<td>Press Ctrl-C, and then respond y.</td>
</tr>
<tr>
<td>System prompt or password prompt</td>
<td>Take over or halt the impaired node: storage failover takeover -ofnode impaired_node_name when the impaired node shows Waiting for giveback..., press Ctrl-C, and then respond y.</td>
</tr>
</tbody>
</table>

### Shutting down a node in a two-node MetroCluster configuration running ONTAP

To shut down the impaired node, you must determine the status of the node and, if necessary, switch over the node so that the healthy node continues to serve data from the impaired node storage.

**About this task**

You must leave the power supplies turned on at the end of this procedure to provide power to the healthy node.

**Steps**

1. Check the MetroCluster status to determine whether the impaired node has automatically switched over to the healthy node:

   metrocluster show

2. Depending on whether an automatic switchover has occurred, proceed according to the following table:

<table>
<thead>
<tr>
<th>If the impaired node...</th>
<th>Then...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Has automatically switched over</td>
<td>Proceed to the next step.</td>
</tr>
<tr>
<td>Has not automatically switched over</td>
<td>Perform a planned switchover operation from the healthy node: metrocluster switchover</td>
</tr>
<tr>
<td>Has not automatically switched over and planned switchover with the metrocluster switchover command fails</td>
<td>a. Halt the impaired node: system node halt b. Perform a forced switchover operation: metrocluster switchover -forced on disaster true</td>
</tr>
</tbody>
</table>

3. Resynchronize the data aggregates by running the metrocluster heal -phase aggregates command from the surviving cluster.

**Example**

```
controller_A_1::> metrocluster heal -phase aggregates
[Job 130] Job succeeded: Heal Aggregates is successful.
```

If the healing is vetoed, you have the option of reissuing the metrocluster heal command with the -override-vetoes parameter. If you use this optional parameter, the system overrides any soft vetoes that prevent the healing operation.

4. Verify that the operation has been completed by running the metrocluster operation show command.
5. Check the state of the aggregates by running the `storage aggregate show` command.

Example

```
ccontroller_A_1::> storage aggregate show
Aggregate     Size Available Used% State   #Vols Nodes            RAID Status
--------- -------- --------- ----- ------- ------ ---------------- ------------
... aggr_b2    227.1GB   227.1GB    0% online       0 mcc1-a2          raid_dp, mirrored,
normal...
```

6. Heal the root aggregates by running the `metrocluster heal -phase root-aggregates` command.

Example

```
mcc1A::> metrocluster heal -phase root-aggregates
[Job 137] Job succeeded: Heal Root Aggregates is successful
```

If the healing is vetoed, you have the option of reissuing the `metrocluster heal` command with the `--override-vetoes` parameter. If you use this optional parameter, the system overrides any soft vetoes that prevent the healing operation.

7. Verify that the heal operation is complete by running the `metrocluster operation show` command on the destination cluster:

Example

```
mcc1A::> metrocluster operation show
Operation: heal-root-aggregates
  State: successful
End Time: 7/29/2016 20:54:42
Errors: -
```

### Replacing I/O modules

To replace an I/O module, locate it within the chassis and follow the specific sequence of steps.

**Steps**

1. If you are not already grounded, properly ground yourself.
2. Unplug any cabling associated with the target I/O module.
   Make sure that you label the cables so that you know where they came from.
3. Remove the target I/O module from the chassis:
   a. Depress the lettered and numbered cam button.
The cam button moves away from the chassis.
b. Rotate the cam latch down until it is in a horizontal position.

The I/O module disengages from the chassis and moves about 1/2 inch out of the I/O slot.
c. Remove the I/O module from the chassis by pulling on the pull tabs on the sides of the module face.

Make sure that you keep track of which slot the I/O module was in.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Lettered and numbered I/O cam latch</td>
</tr>
<tr>
<td>2</td>
<td>I/O cam latch completely unlocked</td>
</tr>
</tbody>
</table>

4. Set the I/O module aside.

5. Install the replacement I/O module into the chassis by gently sliding the I/O module into the slot until the lettered and numbered I/O cam latch begins to engage with the I/O cam pin, and then push the I/O cam latch all the way up to lock the module in place.

6. Recable the I/O module, as needed.

**Rebooting the controller after PCIe module replacement**

After you replace a PCIe module, you must reboot the controller module.

**Steps**

1. If the node is at the LOADER prompt, boot the node, responding \textit{y} if you see a prompt warning of a system ID mismatch and asking to override the system ID:
2. If your system is configured to support 10GbE cluster interconnect and data connections on 40GbE NICs or onboard ports, you must convert these ports to 10GbE connections with the `nicadmin convert` command from Maintenance mode.

   **Note:** Be sure to exit Maintenance mode after completing the conversion.

3. Return the node to normal operation:

<table>
<thead>
<tr>
<th>If your system is in...</th>
<th>Issue this command from the partner's console...</th>
</tr>
</thead>
<tbody>
<tr>
<td>An HA pair</td>
<td><code>storage failover giveback -ofnode impaired_node_name</code></td>
</tr>
<tr>
<td>A two-node MetroCluster configuration</td>
<td>Proceed to the next step. The MetroCluster healing and switchback procedures are done in the next task in the replacement process.</td>
</tr>
</tbody>
</table>

4. If automatic giveback was disabled, reenable it:

   `storage failover modify -node local -auto-giveback true`

### Healing and switching back aggregates in a two-node MetroCluster configuration

After you have completed the FRU replacement in a two-node MetroCluster configuration, you can perform the MetroCluster healing and switchback operations. These operations return the configuration to its normal operating state, with the sync-source Storage Virtual Machines (SVMs) on the formerly impaired site now active and serving data from the local disk pools.

**About this task**

This task only applies to two-node MetroCluster configurations.

**Steps**

1. Resynchronize the aggregates by using the `metrocluster heal -phase aggregates` command from the surviving cluster.

   **Example**

   ```controller_A_1::> metrocluster heal -phase aggregates
   [Job 130] Job succeeded: Heal Aggregates is successful.```

   If the healing is vetoed, you have the option of reissuing the `metrocluster heal` command with the `-override-vetoes` parameter. If you use this optional parameter, the system overrides any soft vetoes that prevent the healing operation.

2. Verify that the operation was completed successfully by using the `metrocluster operation show` command.

   **Example**

   ```controller_A_1::> metrocluster operation show
   Operation: heal-aggregates
   State: successful
   Start Time: 7/25/2014 18:45:55
   End Time: 7/25/2014 18:45:56
   Errors: -```
3. Check the state of the aggregates by using the `storage aggregate show` command.

Example

```
controller_A_1::> storage aggregate show
Aggregate     Size Available Used% State   #Vols Nodes            RAID Status
--------- -------- --------- ----- ------- ------ ---------------- ------------
... aggr_b2    227.1GB   227.1GB    0% online       0 mcc1-a2          raid_dp, mirrored,
    normal...
```

4. Switch back the mirrored aggregates by using the `metrocluster heal -phase root-aggregates` command.

Example

```
mcc1A::> metrocluster heal -phase root-aggregates
[Job 137] Job succeeded: Heal Root Aggregates is successful
```

If the healing is vetoed, you have the option of reissuing the `metrocluster heal` command with the `-override-vetoes` parameter. If you use this optional parameter, the system overrides any soft vetoes that prevent the healing operation.

5. Verify that the heal operation was completed successfully by using the `metrocluster operation show` command on the healthy cluster:

Example

```
mcc1A::> metrocluster operation show
Operation: heal-root-aggregates
    State: successful
    End Time: 7/29/2014 20:54:42
    Errors: -
```

6. Verify that all nodes are in the enabled state:

```
metrocluster node show
```

Example

```
cluster_B::> metrocluster node show
DR                           Configuration  DR
Group Cluster Node           State          Mirroring Mode
----- ------- -------------- -------------- --------- ---------------------
1     cluster_A
     controller_A_1 configured enabled heal roots completed
     controller_A_2 configured enabled heal roots completed
     cluster_B
     controller_B_1 configured enabled waiting for switchback recovery
     controller_B_2 configured enabled waiting for switchback recovery
4 entries were displayed.
```

7. Verify that resynchronization is complete on all SVMs:

```
metrocluster vserver show
```

8. Verify that any automatic LIF migrations being performed by the healing operations were completed successfully:

```
metrocluster check lif show
```

9. Perform the switchback by using the `metrocluster switchback` command from any node in the surviving cluster.

10. Verify that the switchback operation has completed:
**Example**

The switchback operation is still running when a cluster is in the `waiting-for-switchback` state:

```plaintext
cluster_B::> metrocluster show
Cluster     Configuration State     Mode
--------------------    -------------------     ---------
Local: cluster_B configured           switchover
Remote: cluster_A configured           waiting-for-switchback
```

The switchback operation is complete when the clusters are in the `normal` state:

```plaintext
cluster_B::> metrocluster show
Cluster     Configuration State     Mode
--------------------    -------------------     ---------
Local: cluster_B configured              normal
Remote: cluster_A configured              normal
```

If a switchback is taking a long time to finish, you can check on the status of in-progress baselines by using the `metrocluster config-replication resync-status show` command.

11. Reestablish any SnapMirror or SnapVault configurations.

**ONTAP 9 Data Protection Guide Using SnapMirror and SnapVault Technology**

**Completing the replacement process**

After you replace the part, you can return the failed part to NetApp, as described in the RMA instructions shipped with the kit. Contact technical support at NetApp Support, 888-463-8277 (North America), 00-800-44-638277 (Europe), or +800-800-80-800 (Asia/Pacific) if you need the RMA number or additional help with the replacement procedure.

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8

FAS9000 systems: Replacing an I/O module