I/O module

Install and maintain

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I/O module

Add an I/O module - AFF A900

You can add an I/O module to your AFF A900 storage system when there are empty slots available or when all slots are fully populated.

Step 1: Shut down the impaired controller module

Shut down or take over the impaired controller module.

Option 1: Most systems

To shut down the impaired controller, you must determine the status of the controller and, if necessary, take over the controller so that the healthy controller continues to serve data from the impaired controller 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 controller shows false for eligibility and health, you must correct the issue before shutting down the impaired controller; see Synchronize a node with the cluster.

Steps

1. If AutoSupport is enabled, suppress automatic case creation by invoking an AutoSupport message command: `system node autosupport invoke -node * -type all -message MAINT=number_of_hours_downh`

   The following AutoSupport command suppresses automatic case creation for two hours: `cluster1:*> system node autosupport invoke -node * -type all -message MAINT=2h`

2. Disable automatic giveback from the console of the impaired controller:

   ```
   storage failover modify -node impaired-node -auto-giveback-of false
   ```

   > (i) When you see *Do you want to disable auto-giveback?*, enter `y`.

   a. If the impaired controller cannot be brought up or is already taken over, you must take the HA interconnect link down from the healthy controller before booting up the impaired controller. This will prevent the impaired controller from performing automatic giveback.

   ```
   system ha interconnect link off -node healthy-node -link 0
   ```

   ```
   system ha interconnect link off -node healthy-node -link 1
   ```

3. Take the impaired controller to the LOADER prompt:

If the impaired controller is displaying…	Then…
The LOADER prompt	Go to the next step.
System prompt or password prompt (enter system password)	Halt or take over the impaired controller from the healthy controller: `storage failover takeover -ofnode impaired_node_name` When the impaired controller shows Waiting for giveback…, press Ctrl-C, and then respond `y`.

Option 2: MetroCluster configuration

> (i) Do not use this procedure if your system is in a two-node MetroCluster configuration.

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

- 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 controller shows false for eligibility and health, you must correct the issue before shutting down the impaired controller; see Synchronize a node with the cluster.

- If you have a MetroCluster configuration, you must have confirmed that the MetroCluster Configuration State is configured and that the nodes are in an enabled and normal state (`metrocluster node show`).

Steps

1. If AutoSupport is enabled, suppress automatic case creation by invoking an AutoSupport command:
`system node autosupport invoke -node * -type all -message MAINT=number_of_hours_downh`

   The following AutoSupport command suppresses automatic case creation for two hours:
   `cluster1:*> system node autosupport invoke -node * -type all -message MAINT=2h`

2. Disable automatic giveback from the console of the healthy controller: `storage failover modify -node local -auto-giveback false`

3. Take the impaired controller to the LOADER prompt:

If the impaired controller is displaying…	Then…
The LOADER prompt	Go to the next Step.
Waiting for giveback…	Press Ctrl-C, and then respond `y` when prompted.
System prompt or password prompt (enter system password)	Halt or take over the impaired controller from the healthy controller: `storage failover takeover -ofnode` *impaired_node_name* When the impaired controller shows Waiting for giveback…, press Ctrl-C, and then respond `y`.

Step 2: Add the new I/O module

If the storage system has empty slots, install the new I/O module into one of the available slots. If all slots are occupied, remove an existing I/O module to make space and then install the new one.

Before you begin

- Check the NetApp Hardware Universe to make sure that the new I/O module is compatible with your system and version of ONTAP you're running.

- If multiple slots are available, check the slot priorities in NetApp Hardware Universe and use the best one available for your I/O module.

- To non-disruptively add an I/O module, you must take over the target controller, remove the slot blanking cover in the target slot or remove an existing I/O module, add the new or replacement I/O module, and then giveback the target controller.

- Make sure that all other components are functioning properly.

Add I/O module to an empty slot

You can add a new I/O module into a storage system with available empty slots.

Steps

1. If you are not already grounded, properly ground yourself.

2. Remove the target slot blanking cover:

    a. Depress the lettered and numbered cam latch.

    b. Rotate the cam latch down until it is the open position.

    c. Remove the blanking cover.

3. Install the I/O module:

    a. Align the I/O module with the edges of the slot.

    b. Slide 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.

    c. Push the I/O cam latch all the way up to lock the module in place.

4. If the replacement I/O module is a NIC, cable the module to the data switches.

    > ⓘ Make sure that any unused I/O slots have blanks installed to prevent possible thermal issues.

5. Reboot the controller from the LOADER prompt: *bye*

    > ⓘ This reinitializes the PCIe cards and other components and reboots the node.

6. Give back the controller from the partner controller. `storage failover giveback -ofnode target_node_name`

7. Enable automatic giveback if it was disabled: `storage failover modify -node local -auto -giveback true`

8. If you are using slots 3 and/or 7 for networking, use the `storage port modify -node <node name> -port <port name> -mode network` command to convert the slot for networking use.

9. Repeat these steps for controller B.

10. If you installed a storage I/O module, install and cable your NS224 shelves, as described in Hot-add workflow.

Add I/O module to a fully-populated system

You can add an I/O module to a fully-populated system by removing an existing I/O module and installing a new one in its place.

About this task

Make sure you understand the following scenarios for adding a new I/O module to a fully-populated system:

Scenario	Action required
NIC to NIC (same number of ports)	The LIFs will automatically migrate when its controller module is shut down.
NIC to NIC (different number of ports)	Permanently reassign the selected LIFs to a different home port. See Migrating a LIF for more information.
NIC to storage I/O module	Use System Manager to permanently migrate the LIFs to different home ports, as described in Migrating a LIF.

Steps

1. If you are not already grounded, properly ground yourself.

2. Unplug any cabling on the target I/O module.

3. Remove the target I/O module from the chassis:

    a. Depress the lettered and numbered cam latch.

       The cam latch 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.

       Animation - Remove or replacing an I/O module
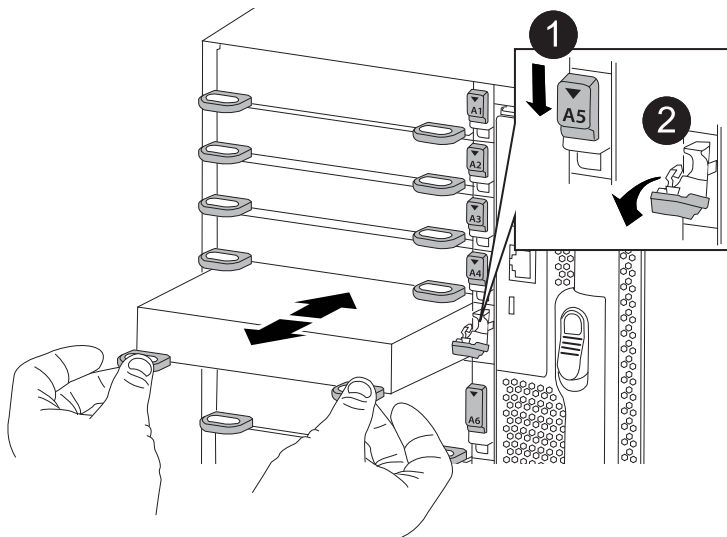
❶	Lettered and numbered I/O cam latch

		I/O cam latch completely unlocked
❷		

4. Install the I/O module into the target slot:

   a. Align the I/O module with the edges of the slot.

   b. Slide 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.

   c. Push the I/O cam latch all the way up to lock the module in place.

5. Repeat the remove and install steps to replace additional modules for controller A.

6. If the replacement I/O module is a NIC, cable the module or modules to the data switches.

7. Reboot the controller from the LOADER prompt:

   a. Check the version of BMC on the controller: `system service-processor show`

   b. Update the BMC firmware if needed: `system service-processor image update`

   c. Reboot the node: `bye`

   > ⓘ This reinitializes the PCIe cards and other components and reboots the node.

   > ⓘ If you encounter an issue during reboot, see BURT 1494308 - Environment shutdown might be triggered during I/O module replacement

8. Give back the controller from the partner controller. `storage failover giveback -ofnode target_node_name`

9. Enable automatic giveback if it was disabled: `storage failover modify -node local -auto -giveback true`

10. If you added:

If I/O module is a…	Then…
NIC module in slots 3 or 7,	Use the `storage port modify -node *<node name> -port *<port name> -mode network` command for each port.
Storage module	Install and cable your NS224 shelves, as described in Hot-add workflow.

11. Repeat these steps for controller B.

Replace an I/O module - AFF A900

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

- 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.

Step 1: Shut down the impaired node

Shut down or take over the impaired controller using one of the following options.

Option 1: Most systems

To shut down the impaired controller, you must determine the status of the controller and, if necessary, take over the controller so that the healthy controller continues to serve data from the impaired controller 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 controller shows false for eligibility and health, you must correct the issue before shutting down the impaired controller; see Synchronize a node with the cluster.

Steps

1. If AutoSupport is enabled, suppress automatic case creation by invoking an AutoSupport message command: `system node autosupport invoke -node * -type all -message MAINT=number_of_hours_downh`

   The following AutoSupport command suppresses automatic case creation for two hours: `cluster1:*> system node autosupport invoke -node * -type all -message MAINT=2h`

2. Disable automatic giveback from the console of the impaired controller:

   `storage failover modify -node impaired-node -auto-giveback-of false`

   > ⓘ   When you see *Do you want to disable auto-giveback?*, enter `y`.

   a. If the impaired controller cannot be brought up or is already taken over, you must take the HA interconnect link down from the healthy controller before booting up the impaired controller. This will prevent the impaired controller from performing automatic giveback.

      `system ha interconnect link off -node healthy-node -link 0`

      `system ha interconnect link off -node healthy-node -link 1`

3. Take the impaired controller to the LOADER prompt:

If the impaired controller is displaying…	Then…
The LOADER prompt	Go to the next step.
System prompt or password prompt (enter system password)	Halt or take over the impaired controller from the healthy controller: `storage failover takeover -ofnode impaired_node_name` When the impaired controller shows Waiting for giveback…, press Ctrl-C, and then respond `y`.

Option 2: Controller is in a MetroCluster

> ⓘ   Do not use this procedure if your system is in a two-node MetroCluster configuration.

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

- 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 controller shows false for eligibility and health, you must correct the issue before shutting down the impaired controller; see Synchronize a node with the cluster.

- If you have a MetroCluster configuration, you must have confirmed that the MetroCluster Configuration State is configured and that the nodes are in an enabled and normal state (`metrocluster node show`).

Steps

1. If AutoSupport is enabled, suppress automatic case creation by invoking an AutoSupport command: `system node autosupport invoke -node * -type all -message MAINT=number_of_hours_downh`

   The following AutoSupport command suppresses automatic case creation for two hours: `cluster1:*> system node autosupport invoke -node * -type all -message MAINT=2h`

2. Disable automatic giveback from the console of the healthy controller: `storage failover modify -node local -auto-giveback false`

3. Take the impaired controller to the LOADER prompt:

If the impaired controller is displaying…	Then…
The LOADER prompt	Go to the next Step.
Waiting for giveback…	Press Ctrl-C, and then respond `y` when prompted.
System prompt or password prompt (enter system password)	Halt or take over the impaired controller from the healthy controller: `storage failover takeover -ofnode impaired_node_name` When the impaired controller shows Waiting for giveback…, press Ctrl-C, and then respond `y`.

Step 2: Replace I/O modules

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

   Animation - Remove/install I/O module
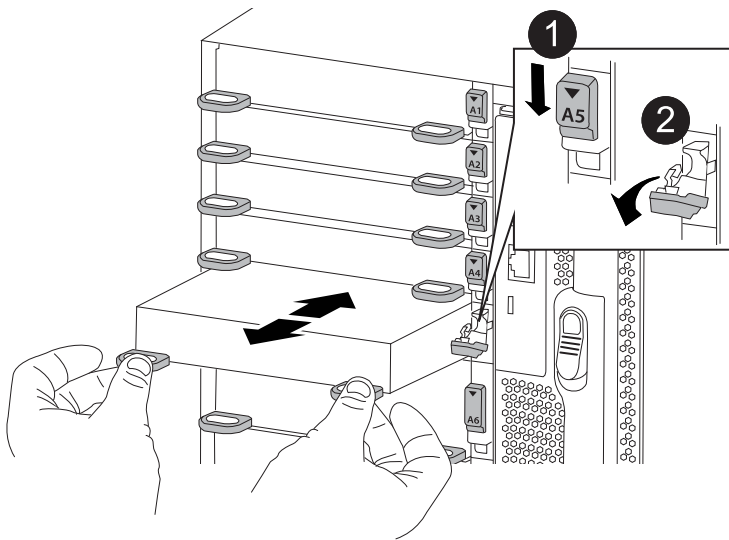
①	Lettered and numbered I/O cam latch
②	I/O cam latch completely unlocked

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.

Step 3: Reboot the controller

After you replace an I/O module, you must reboot the controller module.

> ⓘ   If the new I/O module is not the same model as the failed module, you must first reboot the BMC.

Steps

1. Reboot the BMC if the replacement module is not the same model as the old module:

    a. From the LOADER prompt, change to advanced privilege mode: `priv set advanced`

    b. Reboot the BMC: `sp reboot`

2. From the LOADER prompt, reboot the node: `bye`

    > ℹ️ This reinitializes the PCIe cards and other components and reboots the node.

3. If your system is configured to support 10 GbE cluster interconnect and data connections on 40 GbE NICs, convert these ports to 10 GbE connections by using the nicadmin convert command from Maintenance mode. See Convert 40GbE NIC ports into multiple 10GbE ports for 10GbE connectivity for more information.

    > ℹ️ Be sure to exit Maintenance mode after completing the conversion.

4. Return the node to normal operation: `storage failover giveback -ofnode impaired_node_name`

5. If automatic giveback was disabled, reenable it: `storage failover modify -node local -auto -giveback true`

Step 4: Return the failed part to NetApp

Return the failed part to NetApp, as described in the RMA instructions shipped with the kit. See the Part Return and Replacements page for further information.