



Maintain

Install and maintain

NetApp
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Maintain

Overview of hardware maintenance - ASA A20, ASA A30, and ASA A50

You might need to perform maintenance procedures on your hardware. Procedures specific to maintaining your ASA A20, ASA A30, and ASA A50 system components are in this section.

The procedures in this section assume that the ASA A20, ASA A30, or ASA A50 storage systems have already been deployed as storage nodes in the ONTAP environment.

System components

For the ASA A20, ASA A30, and ASA A50 storage systems, you can perform maintenance procedures on the following components.

Boot media	The boot media stores a primary and secondary set of ONTAP image files as well as system configuration information that the system uses when it boots.
Chassis	The chassis is the physical enclosure housing all the controller components such as the controller/CPU unit, power supply, and I/O.
Controller	A controller consists of a board, firmware, and software. It controls the drives and runs the ONTAP operating system software.
DIMM	A dual in-line memory module (DIMM) is a type of computer memory. They are installed to add system memory to a controller motherboard.
Drive	A drive is a device that provides the physical storage needed for data.
Fan	A fan cools the controller and drives.
I/O module	The I/O module (Input/Output module) is a hardware component that acts as an intermediary between the controller and various devices or systems that need to exchange data with the controller.
NV battery	The non-volatile memory (NV) battery is responsible for providing power to the NVMEM components while data in-flight is being destaged to flash memory after a power loss.
Power supply	A power supply provides a redundant power source in a controller.
Real-time clock battery	A real-time clock battery preserves system date and time information if the power is off.

Boot media

Overview of boot media recovery - AFF A20, AFF A30, and AFF A50

Boot media recovery uses the boot image from the partner node and automatically runs the appropriate boot menu option to install the boot image on the replacement boot media.

When you encounter boot error messages similar to the one shown below, you need to replace the boot media and restore the ONTAP image from the partner node.

```
Can't find primary boot device u0a.0
Can't find backup boot device u0a.1
ACPI RSDP Found at 0x777fe014

Starting AUTOBOOT press Ctrl-C to abort...
Could not load fat://boot0/X86_64/freebsd/image1/kernel: Device not found

ERROR: Error booting OS on: 'boot0' file:
fat://boot0/X86_64/Linux/image1/vmlinuz (boot0, fat)
ERROR: Error booting OS on: 'boot0' file:
fat://boot0/X86_64/freebsd/image1/kernel (boot0, fat)

Autoboot of PRIMARY image failed. Device not found (-6)
LOADER-A>
```

Boot media replacement workflow - AFF A20, AFF A30, and AFF A50

Follow these workflow steps to replace your boot media.

1

Review the boot media requirements

Review the requirements for boot media replacement.

2

Shut down the impaired controller

Shut down or take over the impaired controller so that the healthy controller continues to serve data from the impaired controller storage.

3

Replace the boot media

Remove the failed boot media from the impaired controller and install the replacement boot media.

4

Restore the image on the boot media

Restore the ONTAP image from the healthy controller.

5

Return the failed part to NetApp

Return the failed part to NetApp, as described in the RMA instructions shipped with the kit.

Requirements - AFF A20, AFF A30, and AFF A50

Before replacing the boot media, make sure to review the following requirements and considerations.

Requirements

- You must replace the failed component with a replacement FRU component of the same capacity that you received from NetApp.
- The e0S (e0M wrench) port on the impaired controller cannot be faulty.

The e0S port is used for automated boot recovery.

- Determine if Onboard Key Manager (OKM) or Eternal Key Manager (EKM) is configured using one of the following methods:
 - You can ask the system administrator if OKM or EKM are enabled.
 - To check if OKM is enabled, you can use the `security key-manager onboard show`.
 - To check if EKM is enabled, you can use the `security key-manager external show`.
- For OKM, you need the OKM passphrase file contents.
- For EKM, you need copies of the following files from the partner node:
 - `/cfcard/kmip/servers.cfg` file.
 - `/cfcard/kmip/certs/client.crt` file.
 - `/cfcard/kmip/certs/client.key` file.
 - `/cfcard/kmip/certs/CA.pem` file.

Considerations

- It is important that you apply the commands in these steps on the correct controller:
 - The *impaired* controller is the controller on which you are performing maintenance.
 - The *healthy* controller is the HA partner of the impaired controller.
- If needed, you can turn on the platform chassis location (blue) LEDs to aid in physically locating the affected platform. Log into the BMC using SSH and enter the `system location-led on` command.

A platform chassis has three location LEDs: one on the operator display panel and one on each controller. Location LEDs remain illuminated for 30 minutes.

You can turn them off by entering the `system location-led off` command. If you are unsure if the LEDs are on or off, you can check their state by entering the `system location-led show` command.

What's next

After you've reviewed the boot media requirements, [shut down the impaired controller](#).

Shut down the controller - AFF A20, AFF A30, and AFF A50

You need to complete the shutdown of the impaired controller. Shut down or take over the impaired controller.

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.

About this task

- If you have a SAN system, you must have checked event messages (`cluster kernel-service show`) for the impaired controller SCSI blade. The `cluster kernel-service show` command (from `priv advanced` mode) displays the node name, [quorum status](#) of that node, availability status of that node, and operational status of that node.

Each SCSI-blade process should be in quorum with the other nodes in the cluster. Any issues must be resolved before you proceed with the replacement.

- 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:
`system node autosupport invoke -node * -type all -message MAINT=<# of hours>h`

The following AutoSupport message 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`



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

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 <i>y</i> when prompted.
System prompt or password prompt	Take over or halt the impaired controller from the healthy controller: <code>storage failover takeover -ofnode impaired_node_name</code> When the impaired controller shows Waiting for giveback..., press Ctrl-C, and then respond <i>y</i> .

What's next

After you shut down the impaired controller, [replace the boot media](#).

Replace the boot media - AFF A20, AFF A30, and AFF A50

To replace the boot media, you must remove the impaired controller, remove the impaired boot media, and install the replacement boot media in the impaired controller.

Step 1: Remove the controller

You must remove the controller from the chassis when you replace the controller or replace a component inside the controller.

Before you begin

All other components in the storage system must be functioning properly; if not, you must contact [NetApp Support](#) before continuing with this procedure.

Steps

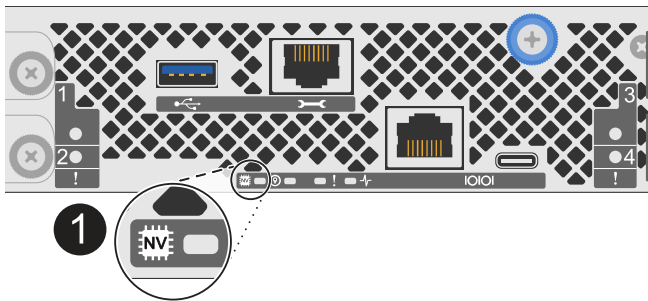
1. On the impaired controller, make sure the NV LED is off.

When the NV LED is off, destaging is complete and it is safe to remove the impaired controller.



If the NV LED is flashing (green), destage is in progress. You must wait for the NV LED to turn off. However, if the flashing continues for longer than five minutes, contact [NetApp Support](#) before continuing with this procedure.

The NV LED is located next to the NV icon on the controller.



1

NV icon and LED on the controller

2. If you are not already grounded, properly ground yourself.
3. Disconnect the power on the impaired controller:



Power supplies (PSUs) do not have a power switch.

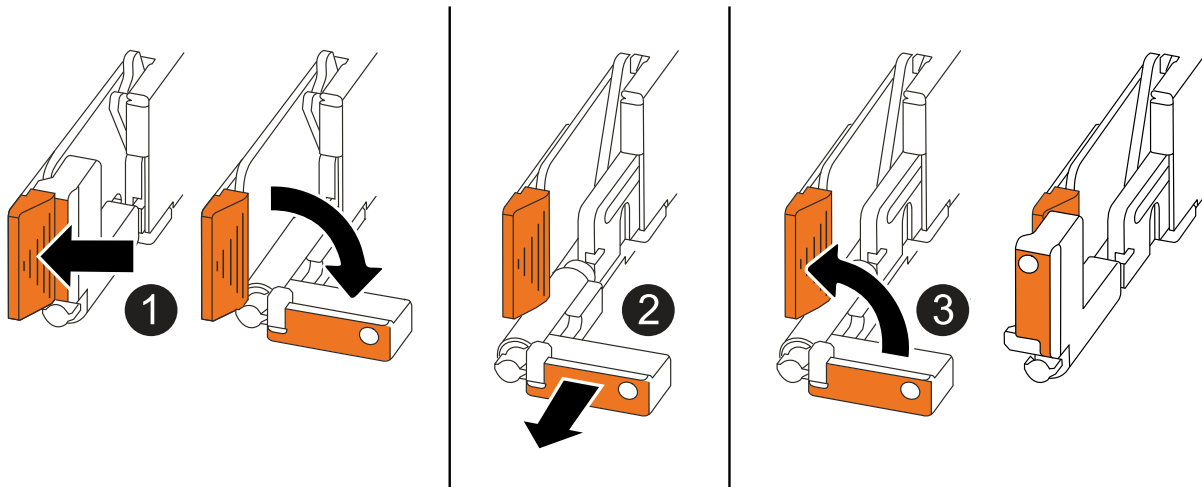
If you are disconnecting a...	Then...
AC PSU	<ol style="list-style-type: none"> 1. Open the power cord retainer. 2. Unplug the power cord from the PSU and set it aside.
DC PSU	<ol style="list-style-type: none"> 1. Unscrew the two thumb screws on the D-SUB DC power cord connector. 2. Unplug the power cord from the PSU and set it aside.

4. Unplug all cables from the impaired controller.

Keep track of where the cables were connected.

5. Remove the impaired controller:

The following illustration shows the operation of the controller handles (from the left side of the controller) when removing a controller:



1	On both ends of the controller, push the vertical locking tabs outward to release the handles.
2	<ul style="list-style-type: none"> • Pull the handles towards you to unseat the controller from the midplane. <p>As you pull, the handles extend out from the controller and then you feel some resistance, keep pulling.</p> <ul style="list-style-type: none"> • Slide the controller out of the chassis while supporting the bottom of the controller, and place it on a flat, stable surface.
3	If needed, rotate the handles upright (next to the tabs) to move them out of the way.

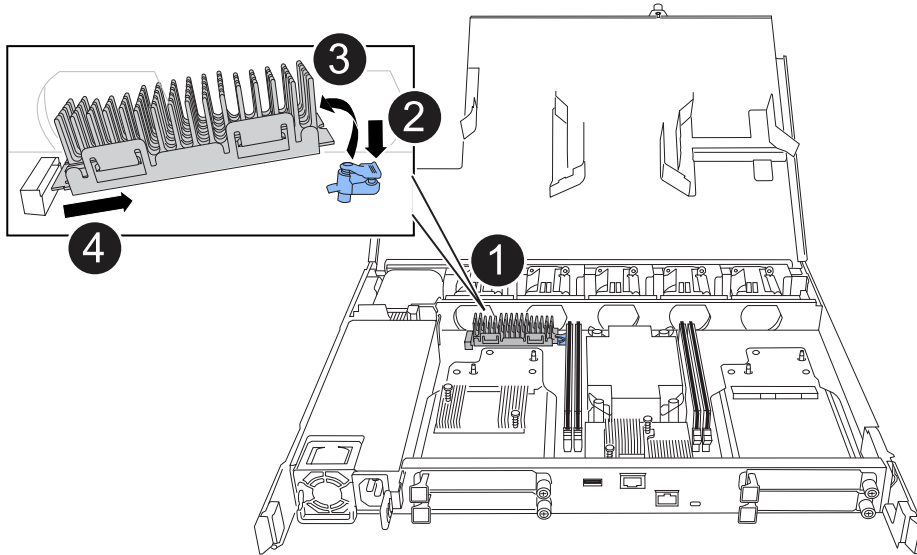
6. Place the controller on an anti-static mat.

7. Open the controller cover by turning the thumbscrew counterclockwise to loosen, and then open the cover.

Step 2: Replace the boot media

To replace the boot media, locate it inside the controller and follow the specific sequence of steps.

1. If you are not already grounded, properly ground yourself.
2. Remove the boot media:



1	Boot media location
2	Press down on the blue tab to release the right end of the boot media.
3	Lift the right end of the boot media up at a slight angle to get a good grip along the sides of the boot media.
4	Gently pull the left end of the boot media out of its socket.

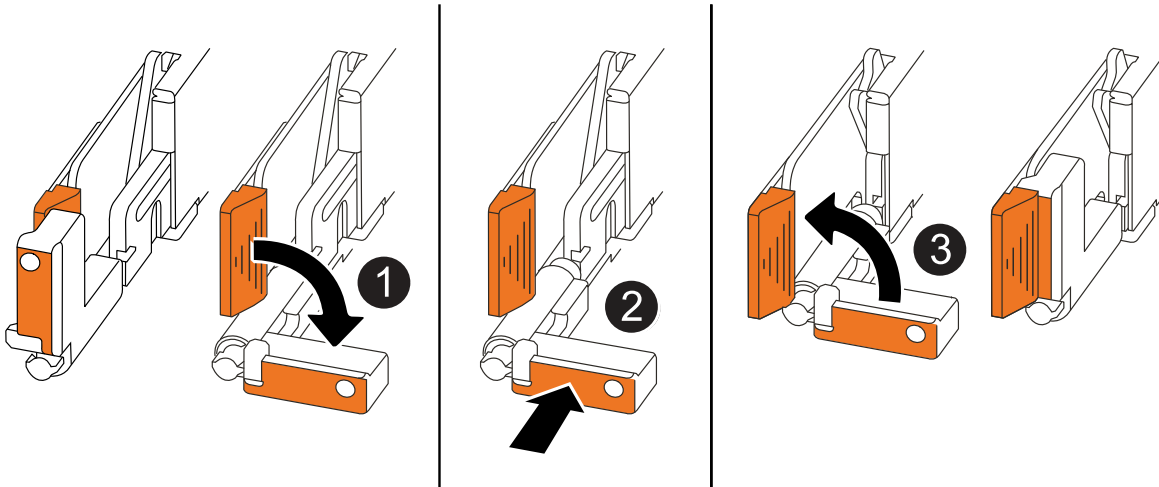
3. Install the replacement boot media:
 - a. Remove the boot media from its package.
 - b. Slide the socket end of the boot media into its socket.
 - c. At the opposite end of the boot media, press down and hold the blue tab (in the open position), gently push down on that end of the boot media until it stops, and then release the tab to lock the boot media into place.

Step 3: Reinstall the controller

Reinstall the controller into the chassis and reboot it.

About this task

The following illustration shows the operation of the controller handles (from the left side of a controller) when reinstalling the controller, and can be used as a reference for the rest of the controller reinstallation steps.



1	If you rotated the controller handles upright (next to the tabs) to move them out of the way while you serviced the controller, rotate them down to the horizontal position.
2	Push the handles to reinsert the controller into the chassis halfway and then, when instructed, push until the controller is fully seated.
3	Rotate the handles to the upright position and lock in place with the locking tabs.

Steps

1. Close the controller cover and turn the thumbscrew clockwise until tightened.
2. Insert the controller halfway into the chassis.

Align the rear of the controller with the opening in the chassis, and then gently push the controller using the handles.



Do not completely insert the controller in the chassis until instructed to do so later in this procedure.

3. Reconnect the cables to the controller; however, do not plug in the power cord to the power supply (PSU) at this time.



Make sure that the console cable is connected to the controller because you want to catch and log the boot sequence later in the boot media replacement procedure when you fully seat the controller in the chassis and it begins to boot.

4. Fully seat the controller in the chassis:

- a. Firmly push on the handles until the controller meets the midplane and is fully seated.

Do not use excessive force when sliding the controller into the chassis; it could damage the connectors.



The controller boots when fully seated in the chassis. It gets its power from the partner controller.

- b. If the controller boots to the LOADER prompt, reboot the controller: `boot_ontap`
 - c. Rotate the controller handles up and lock in place with the tabs.
5. Reconnect the power cord to the PSU on the impaired controller.

Once power is restored to the PSU, the status LED should be green.

If you are reconnecting a...	Then...
AC PSU	<ol style="list-style-type: none"> 1. Plug the power cord into the PSU. 2. Secure the power cord with the power cord retainer.
DC PSU	<ol style="list-style-type: none"> 1. Plug the D-SUB DC power cord connector into the PSU. 2. Tighten the two thumb screws to secure the D-SUB DC power cord connector to the PSU.

What's next

After physically replacing the impaired boot media, [restore the ONTAP image from the partner node](#).

Restore the ONTAP image - AFF A20, AFF A30, and AFF A50

Before you begin

- Determine if Onboard Key Manger (OKM) or Eternal Key Manager (EKM) is configured using one of the following methods:
 - You can ask the customer or system administrator if OKM or EKM are enabled.
 - To check if OKM is enabled, you can use the `security key-manager onboard show`.
 - To check if EKM is enabled, you can use the `security key-manager external show`.
- For OKM, you need the OKM passphrase file contents.
- For EKM, you need copies of the following files from the partner node:
 - `/cfcard/kmip/servers.cfg` file.
 - `/cfcard/kmip/certs/client.crt` file.
 - `/cfcard/kmip/certs/client.key` file.
 - `/cfcard/kmip/certs/CA.pem` file.

Steps

1. From the LOADER prompt, enter the command:

```
boot_recovery -partner
```

The screen displays the following message:

```
Starting boot media recovery (BMR) process. Press Ctrl-C to abort...
```

2. Monitor the boot media install recovery process.

The process completes and displays the `Installation complete. message`.

- The system checks for encryption and encryption type and displays one of two messages. Depending on what message is displayed, take one of the following actions:



Occasionally, the process may not be able to identify if key manager is configured on the system. It will display an error message, ask if key manager is configured for the system, and then ask what type of key manager is configured. The process will resume after you resolve the issue.

Show example of configuration error finding prompts

```
Error when fetching key manager config from partner ${partner_ip}:
${status}
```

```
Has key manager been configured on this system
```

```
Is the key manager onboard
```

If you see this message...	Do this...
key manager is not configured. Exiting.	<p>Encryption is not installed on the system. Complete the following steps:</p> <ol style="list-style-type: none"> Log into the node when the login prompt is displayed and give back the storage: <pre>storage failover giveback -ofnode impaired_node_name</pre> Go to step 5 to enable automatic giveback if it was disabled.
key manager is configured.	<p>Go to step 4 to restore the appropriate key manager.</p> <p>The node access the boot menu and runs:</p> <ul style="list-style-type: none"> Option 10 for systems with Onboard Key Manager (OKM). Option 11 for systems with External Key Manager (EKM).

- Select the appropriate key manager restoration process.

Onboard Key Manager (OKM)

If OKM is detected, the system displays the following message and begins running BootMenu Option 10.

```
key manager is configured.  
Entering Bootmenu Option 10...
```

```
This option must be used only in disaster recovery procedures. Are  
you sure? (y or n):
```

- a. Enter `Y` at the prompt to confirm you want to start the OKM recovery process.
- b. Enter the passphrase for onboard key manager when prompted, and enter the passphrase again when prompted, to confirm.

Show example of passphrase prompts

```
Enter the passphrase for onboard key management:  
Enter the passphrase again to confirm:  
Enter the backup data:  
-----BEGIN PASSPHRASE-----  
<passphrase_value>  
-----END PASSPHRASE-----
```

- c. Continue to monitor the recovery process as it restores the appropriate files from the partner node.

When the recovery process is complete, the node will reboot. The following messages indicate a successful recovery:

```
Trying to recover keymanager secrets....  
Setting recovery material for the onboard key manager  
Recovery secrets set successfully  
Trying to delete any existing km_onboard.keydb file.  
  
Successfully recovered keymanager secrets.
```

- d. When the node reboots, verify the boot media recovery was successful by confirming that the system is back online and operational.
- e. Return the impaired controller to normal operation by giving back its storage:

```
storage failover giveback -ofnode impaired_node_name
```

- f. After the partner node is fully up and serving data, synchronize the OKM keys across the cluster.

```
security key-manager onboard sync
```

External Key Manager (EKM)

If EKM is detected, the system displays the following message and begins running BootMenu Option 11.

```
key manager is configured.  
Entering Bootmenu Option 11...
```

- a. The next step depends on which version of ONTAP your system is running:

If your system is running...	Do this...
ONTAP 9.16.0	<ul style="list-style-type: none">a. Press <code>Ctlr-C</code> to exit BootMenu Option 11.b. Press <code>Ctlr-C</code> to exit the EKM configuration process and return to the boot menu.c. Select BootMenu Option 8.d. Reboot the node. <p>If <code>AUTOBOOT</code> is set, the node reboots and uses the configuration files from the partner node.</p> <p>If <code>AUTOBOOT</code> is not set, enter the appropriate boot command. The node reboots and uses the configuration files from the partner node.</p> <ul style="list-style-type: none">e. Reboot the node so that EKM protects the boot media partition.f. Proceed to step c.
ONTAP 9.16.1	Proceed to the next step.

- b. Enter the following EKM configuration setting when prompted:

Action	Example
Enter the client certificate contents from the <code>/cfcard/kmip/certs/client.crt</code> file.	Show example of client certificate contents <pre>-----BEGIN CERTIFICATE----- <certificate_value> -----END CERTIFICATE-----</pre>

Action	Example
Enter the client key file contents from the /cfcard/kmip/certs/client.key file.	<p data-bbox="865 159 1446 191">Show example of client key file contents</p> <pre data-bbox="899 233 1422 495"> -----BEGIN RSA PRIVATE KEY----- <key_value> -----END RSA PRIVATE KEY----- </pre>
Enter the KMIP server CA(s) file contents from the /cfcard/kmip/certs/CA.pem file.	<p data-bbox="865 573 1446 604">Show example of KMIP server file contents</p> <pre data-bbox="899 646 1422 909"> -----BEGIN CERTIFICATE----- <KMIP_certificate_CA_value > -----END CERTIFICATE----- </pre>

Action	Example
Enter the server configuration file contents from the <code>/cfcard/kmip/servers.cfg</code> file.	Show example of server configuration file contents <pre data-bbox="899 264 1424 1409">xxx.xxx.xxx.xxx:5696.host= xxx.xxx.xxx.xxx xxx.xxx.xxx.xxx:5696.port= 5696 xxx.xxx.xxx.xxx:5696.trusted_file=/cfcard/kmip/certs/CA.pem xxx.xxx.xxx.xxx:5696.protocol=KMIP1_4 1xxx.xxx.xxx.xxx:5696.timeout=25 xxx.xxx.xxx.xxx:5696.nbio= 1 xxx.xxx.xxx.xxx:5696.cert_file=/cfcard/kmip/certs/client.crt xxx.xxx.xxx.xxx:5696.key_file=/cfcard/kmip/certs/client.key xxx.xxx.xxx.xxx:5696.ciphers="TLSv1.2:kRSA:!CAMELLIA:!IDEA:!RC2:!RC4:!SEED:!eNULL:!aNULL" xxx.xxx.xxx.xxx:5696.verify=true xxx.xxx.xxx.xxx:5696.netapp_keystore_uuid=<id_value></pre>

Action	Example
<p>If prompted, enter the ONTAP Cluster UUID from the partner.</p>	<p>Show example of ONTAP Cluster UUID</p> <pre data-bbox="899 233 1425 730"> Notice: bootarg.mgwd.cluster_uuid is not set or is empty. Do you know the ONTAP Cluster UUID? {y/n} y Enter the ONTAP Cluster UUID: <cluster_uuid_value> System is ready to utilize external key manager(s). </pre>
<p>If prompted, enter the temporary network interface and settings for the node.</p>	<p>Show example of a temporary network setting</p> <pre data-bbox="899 884 1425 1864"> In order to recover key information, a temporary network interface needs to be configured. Select the network port you want to use (for example, 'e0a') e0M Enter the IP address for port : xxx.xxx.xxx.xxx Enter the netmask for port : xxx.xxx.xxx.xxx Enter IP address of default gateway: xxx.xxx.xxx.xxx Trying to recover keys from key servers.... [discover_versions] [status=SUCCESS reason= message=] </pre>

c. Depending on whether the key is successfully restored, take one of the following actions:

- If the EKM configuration has been successfully restored, the process attempts to restore the appropriate files from the partner node and reboots the node. Go to step d.

Show example of successful 9.16.0 restore messages

```
kmip2_client: Importing keys from external key server:
xxx.xxx.xxx.xxx:5696
[Feb  6 04:57:43]: 0x80cc09000: 0: DEBUG:
kmip2::kmipCmds::K mipLocateCmdUtils:
[locateMrootAkUuids]:420: Locating local cluster MROOT-AK
with keystore UUID: <uuid>
[Feb  6 04:57:43]: 0x80cc09000: 0: DEBUG:
kmip2::kmipCmds::K mipLocateCmdBase: [doCmdImp]:79: Calling
KMIP Locate for the following attributes: [<x-NETAPP-
ClusterId, <uuid>>, <x-NETAPP-KeyUsage, MROOT-AK>, <x-
NETAPP-KeystoreUuid, <uuid>>, <x-NETAPP-Product, Data
ONTAP>]
[Feb  6 04:57:44]: 0x80cc09000: 0: DEBUG:
kmip2::kmipCmds::K mipLocateCmdBase: [doCmdImp]:84: KMIP
Locate executed successfully!
[Feb  6 04:57:44]: 0x80cc09000: 0: DEBUG:
kmip2::kmipCmds::K mipLocateCmdBase: [setUuidList]:50: UUID
returned: <uuid>
...
kmip2_client: Successfully imported the keys from external
key server: xxx.xxx.xxx.xxx:5696

GEOM_ELI: Device nvd0s4.eli created.
GEOM_ELI: Encryption: AES-XTS 256
GEOM_ELI:      Crypto: software
Feb 06 05:02:37 [_server-name_]: crypto_get_mroot_ak:140
MROOT-AK is requested.
Feb 06 05:02:37 [_server-name_]: crypto_get_mroot_ak:162
Returning MROOT-AK.
```

Show example of successful 9.16.1 restore messages

```
System is ready to utilize external key manager(s).
Trying to recover keys from key servers....
[discover_versions]
[status=SUCCESS reason= message=]
...
kmip2_client: Successfully imported the keys from external
key server: xxx.xxx.xxx.xxx:xxxx
Successfully recovered keymanager secrets.
```

- If the key is not successfully restored, the system will halt and indicate that it could not restore the key. The error and warning messages are displayed. Rerun the recovery process by entering `boot_recovery -partner`.

Show example of key recovery error and warning messages

```
ERROR: kmip_init: halting this system with encrypted
mroot...
WARNING: kmip_init: authentication keys might not be
available.
*****
*                               A T T E N T I O N                               *
*                                                                                   *
*          System cannot connect to key managers.          *
*                                                                                   *
*****
ERROR: kmip_init: halting this system with encrypted
mroot...
.
Terminated

Uptime: 11m32s
System halting...

LOADER-B>
```

- d. When the node reboots, verify that the boot media recovery was successful by confirming that the system is back online and operational.
- e. Return the controller to normal operation by giving back its storage:

```
storage failover giveback -ofnode impaired_node_name.
```

5. If automatic giveback was disabled, reenable it:

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

6. If AutoSupport is enabled, restore automatic case creation:

```
system node autosupport invoke -node * -type all -message MAINT=END.
```

Return the failed part to NetApp - AFF A20, AFF A30, and AFF A50

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.

Chassis

Chassis replacement workflow - ASA A20, ASA A30, and ASA A50

Follow these workflow steps to replace your chassis.

1

Review the chassis replace requirements

To replace the chassis, you must meet certain requirements.

2

Shut down the controllers

Shut down the controllers so you can perform maintenance on the chassis.

3

Replace the chassis

Replacing the chassis includes moving the drives and any drive blanks, controllers (with the power supplies), and bezel from the impaired chassis to the new chassis, and swapping out the impaired chassis with the new chassis of the same model as the impaired chassis.

4

Complete chassis replacement

Verify the HA state of the chassis and return the failed part to NetApp.

Chassis replacement requirements - ASA A20, ASA A30, and ASA A50

Before replacing the chassis, make sure to review the following requirements and considerations.

Requirements

- The replacement chassis must be the same model as the impaired chassis. This procedure is for a like-for-like replacement, not for an upgrade.
- All other components in the storage system must be functioning properly; if not, you must contact [NetApp](#)

[Support](#) before continuing with this procedure.

Considerations

- **The chassis replacement procedure is disruptive.** For a two-node cluster, you will have a complete service outage and a partial outage in a multi-node cluster.
- You can use the chassis replacement procedure with all versions of ONTAP supported by your storage system.
- The chassis replacement procedure is written with the assumption that you are moving the bezel, drives, any drive blanks, and controllers to the new chassis.
- If needed, you can turn on the storage system location (blue) LEDs to aid in physically locating the affected storage system. Log into the BMC using SSH and enter the `system location-led on` command.

A storage system has three location LEDs: one on the operator display panel and one on each controller. Location LEDs remain illuminated for 30 minutes.

You can turn them off by entering the `system location-led off` command. If you are unsure if the LEDs are on or off, you can check their state by entering the `system location-led show` command.

Shut down the controllers - ASA A20, ASA A30, and ASA A50

This procedure is for systems with two node configurations. For more information about graceful shutdown when servicing a cluster, see [Gracefully shutdown and power up your storage system Resolution Guide - NetApp Knowledge Base](#).

Before you begin

- Make sure you have the necessary permissions and credentials:
 - Local administrator credentials for ONTAP.
 - BMC accessibility for each controller.
- Make sure you have the necessary tools and equipment for the replacement.
- As a best practice before shutdown, you should:
 - Perform additional [system health checks](#).
 - Upgrade ONTAP to a recommended release for the system.
 - Resolve any [Active IQ Wellness Alerts and Risks](#). Make note of any faults presently on the system, such as LEDs on the system components.

Steps

1. Log into the cluster through SSH or log in from any node in the cluster using a local console cable and a laptop/console.
2. Stop all clients/host from accessing data on the NetApp system.
3. Suspend external backup jobs.
4. If AutoSupport is enabled, suppress case creation and indicate how long you expect the system to be offline:

```
system node autosupport invoke -node * -type all -message "MAINT=2h Replace chassis"
```

5. Identify the SP/BMC address of all cluster nodes:

```
system service-processor show -node * -fields address
```

6. Exit the cluster shell:

```
exit
```

7. Log into SP/BMC over SSH using the IP address of any of the nodes listed in the output from the previous step to monitor progress.

If you are using a console/laptop, log into the controller using the same cluster administrator credentials.

8. Halt the two nodes located in the impaired chassis:

```
system node halt -node <node1>,<node2> -skip-lif-migration-before-shutdown true -ignore-quorum-warnings true -inhibit-takeover true
```



For clusters using SnapMirror synchronous operating in StrictSync mode: `system node halt -node <node1>,<node2> -skip-lif-migration-before-shutdown true -ignore-quorum-warnings true -inhibit-takeover true -ignore-strict-sync-warnings true`

9. Enter **y** for each controller in the cluster when you see:

```
Warning: Are you sure you want to halt node <node_name>? {y|n}:
```

10. Wait for each controller to halt and display the LOADER prompt.

Replace the chassis - ASA A20, ASA A30, and ASA A50

Move the drives, any drive blanks, controllers, and bezel from the impaired chassis to the replacement chassis (of the same model), and then replace the impaired chassis within the equipment rack or system cabinet.

Step 1: Remove the controller

You must remove the controller from the chassis when you replace the controller or replace a component inside the controller.

Before you begin

All other components in the storage system must be functioning properly; if not, you must contact [NetApp Support](#) before continuing with this procedure.

Steps

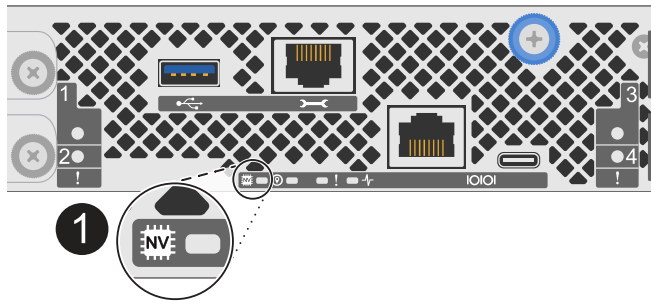
1. On the impaired controller, make sure the NV LED is off.

When the NV LED is off, destaging is complete and it is safe to remove the impaired controller.




If the NV LED is flashing (green), destage is in progress. You must wait for the NV LED to turn off. However, if the flashing continues for longer than five minutes, contact [NetApp Support](#) before continuing with this procedure.

The NV LED is located next to the NV icon on the controller.



1	NV icon and LED on the controller
----------	-----------------------------------

2. If you are not already grounded, properly ground yourself.
3. Disconnect the power on the impaired controller:

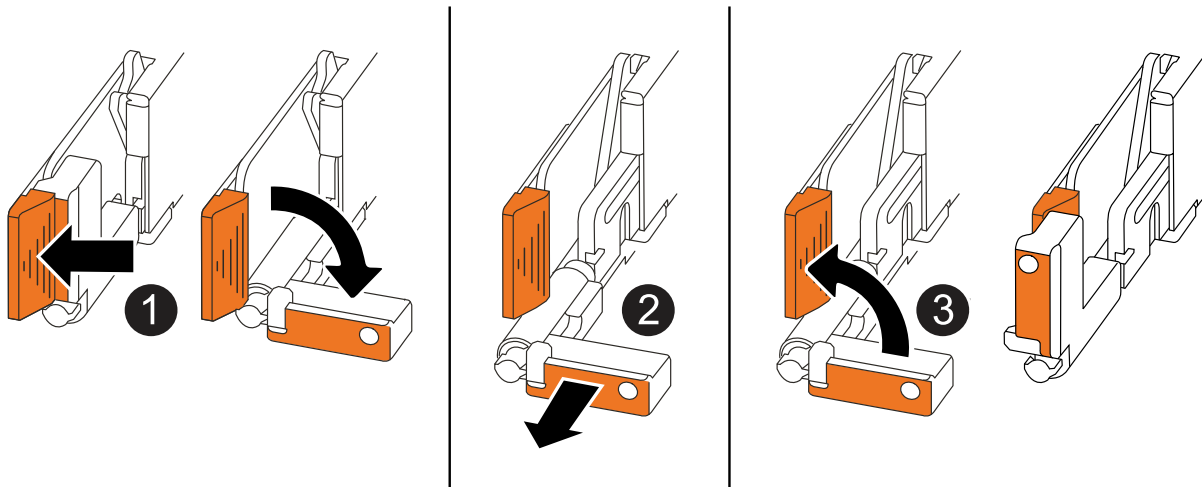
 Power supplies (PSUs) do not have a power switch.

If you are disconnecting a...	Then...
AC PSU	<ol style="list-style-type: none"> 1. Open the power cord retainer. 2. Unplug the power cord from the PSU and set it aside.
DC PSU	<ol style="list-style-type: none"> 1. Unscrew the two thumb screws on the D-SUB DC power cord connector. 2. Unplug the power cord from the PSU and set it aside.

4. Unplug all cables from the impaired controller.
Keep track of where the cables were connected.

5. Remove the impaired controller:

The following illustration shows the operation of the controller handles (from the left side of the controller) when removing a controller:



<p>1</p>	<p>On both ends of the controller, push the vertical locking tabs outward to release the handles.</p>
<p>2</p>	<ul style="list-style-type: none"> • Pull the handles towards you to unseat the controller from the midplane. <p>As you pull, the handles extend out from the controller and then you feel some resistance, keep pulling.</p> <ul style="list-style-type: none"> • Slide the controller out of the chassis while supporting the bottom of the controller, and place it on a flat, stable surface.
<p>3</p>	<p>If needed, rotate the handles upright (next to the tabs) to move them out of the way.</p>

6. Repeat these steps for the other controller in the chassis.

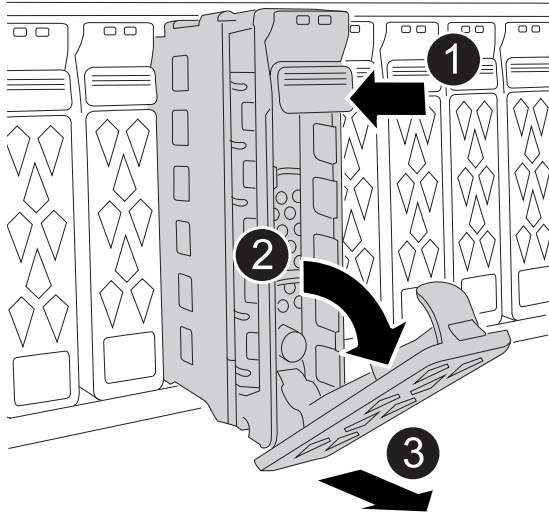
Step 2: Remove the drives from the impaired chassis


You need to remove all of the drives and any drive blanks from the impaired chassis so that later in the procedure you can install them in the replacement chassis.

1. Gently remove the bezel from the front of the storage system.
2. Remove the drives and any drive blanks:



Keep track of what drive bay each drive and drive blank was removed from because they must be installed in the same drive bays in the replacement chassis.



1	Press the release button on the drive face to open the cam handle.
2	Rotate the cam handle downward to disengage the drive from the midplane.
3	<p>Slide the drive out of the drive bay using the cam handle and supporting the drive with your other hand.</p> <p>When removing a drive, always use two hands to support its weight.</p> <div style="border-left: 1px solid black; padding-left: 10px; margin-top: 10px;"> <p> Because drives are fragile, minimize handling to avoid damaging them.</p> </div>

3. Set the drives aside on a static-free cart or table.

Step 3: Replace the chassis from within the equipment rack or system cabinet

You remove the impaired chassis from the equipment rack or system cabinet, install the replacement chassis, install the drives, any drive blanks and then install the bezel.

1. Remove the screws from the impaired chassis mount points.

Set the screws aside to use later in this procedure.



If the storage system shipped in a NetApp system cabinet, you must remove additional screws at the rear of the chassis before the chassis can be removed.

2. Using two people or a power lift, remove the impaired chassis from the equipment rack or system cabinet by sliding it off the rails, and then set it aside.

3. Using two people, install the replacement chassis into the equipment rack or system cabinet by sliding it onto the rails.

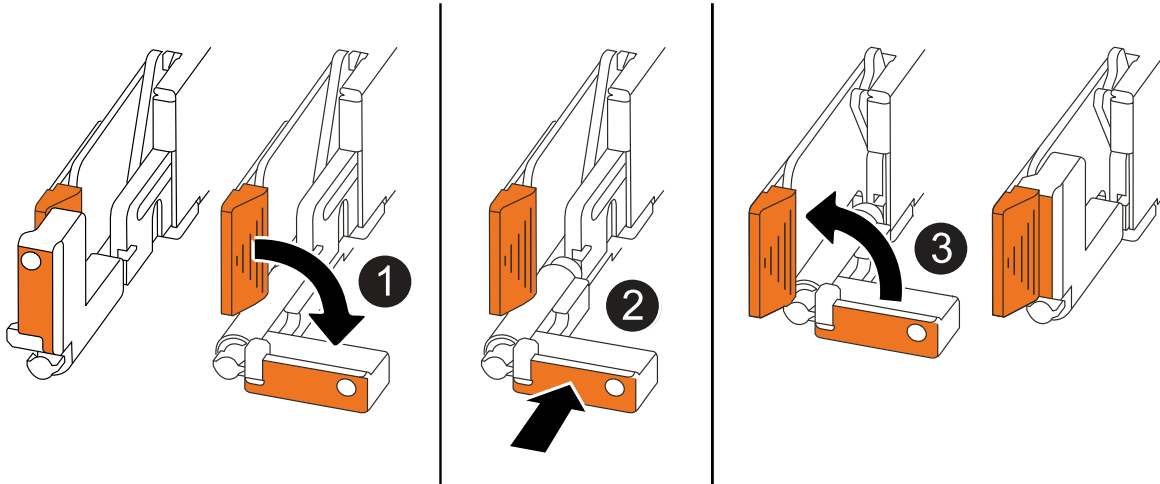
4. Secure the front of the replacement chassis to the equipment rack or system cabinet using the screws you removed from the impaired chassis.

Step 4: Install the controllers

Install the controllers into the replacement chassis and reboot them.

About this task

The following illustration shows the operation of the controller handles (from the left side of a controller) when installing a controller, and can be used as a reference for the rest of the controller installation steps.



1	If you rotated the controller handles upright (next to the tabs) to move them out of the way, rotate them down to the horizontal position.
2	Push the handles to reinsert the controller into the chassis and push until the controller is fully seated.
3	Rotate the handles to the upright position and lock in place with the locking tabs.

1. Insert one of the controllers into the chassis:

- a. Align the back of the controller with the opening in the chassis.
- b. Firmly push on the handles until the controller meets the midplane and is fully seated in the chassis.



Do not use excessive force when sliding the controller into the chassis; it could damage the connectors.

- c. Rotate the controller handles up and lock in place with the tabs.

2. Recable the controller, as needed, except for the power cords.
3. Repeat these steps to install the second controller into the chassis.
4. Install the drives and any drive blanks you removed from the impaired chassis into the replacement chassis:



The drives and drive blanks must be installed in the same drive bays in the replacement chassis.

- a. With the cam handle in the open position, use both hands to insert the drive.

- b. Gently push until the drive stops.
- c. Close the cam handle so that the drive is fully seated into the midplane and the handle clicks into place.

Be sure to close the cam handle slowly so that it aligns correctly with the face of the drive.

- d. Repeat the process for the remaining drives.
5. Install the bezel.
 6. Reconnect the power cords to the power supplies (PSU) in the controllers.

Once power is restored to a PSU, the status LED should be green.



The controllers begin to boot as soon as the power is restored.

If you are reconnecting a...	Then...
AC PSU	<ol style="list-style-type: none"> 1. Plug the power cord into the PSU. 2. Secure the power cord with the power cord retainer.
DC PSU	<ol style="list-style-type: none"> 1. Plug the D-SUB DC power cord connector into the PSU. 2. Tighten the two thumb screws to secure the D-SUB DC power cord connector to the PSU.

7. If controllers boot to the LOADER prompt, reboot the controllers:

```
boot_ontap
```

8. Turn AutoSupport back on:

```
system node autosupport invoke -node * -type all -message MAINT=END
```

Complete chassis replacement - ASA A20, ASA A30, and ASA A50

You must verify the HA state of the chassis and return the failed part to NetApp, as described in the RMA instructions shipped with the kit.

Step 1: Verify and set the HA state of the chassis

You must verify the HA state of the chassis, and, if necessary, update the state to match your storage system configuration.

1. In Maintenance mode, from either controller, display the HA state of the local controller and chassis:

```
ha-config show
```

The HA state should be the same for all components.

2. If the displayed system state for the chassis does not match your storage system configuration:
 - a. Set the HA state for the chassis:

```
ha-config modify chassis HA-state
```

The value for HA-state should be *ha*.

- b. Confirm that the setting has changed:

```
ha-config show
```

3. If you have not already done so, recable the rest of your storage system.

Step 2: 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.

Controller

Controller replacement workflow - ASA A20, ASA A30, and ASA A50

Follow these workflow steps to replace your controller.

1

Review the controller replacement requirements

To replace the controller, you must meet certain requirements.

2

Shut down the impaired controller

Shut down or take over the impaired controller so that the healthy controller continues to serve data from the impaired controller storage.

3

Replace the controller

Replacing the controller includes removing the impaired controller, moving FRU components to the replacement controller, installing the replacement controller in the chassis, setting the time and date, and then recabling.

4

Restore and verify the system configuration

Verify the low-level system configuration of the replacement controller and reconfigure system settings as necessary.

5

Give back the controller

Transfer the ownership of storage resources back to the replacement controller.

6

Complete controller replacement

Verify the LIFs, check cluster health, and return the failed part to NetApp.

Controller replacement requirements - ASA A20, ASA A30, and ASA A50

You must review the requirements and considerations for the controller replacement procedure.

Requirements

- All shelves must be working properly.
- The healthy controller must be able to take over the controller that is being replaced (referred to in this procedure as the “impaired controller”).
- You must replace a controller with a controller of the same model type. You cannot upgrade your system by just replacing the controller.
- You cannot change any drives or shelves as part of this procedure.
- You must always capture the controller’s console output to a text log file.

The console output provides you with a record of the procedure you can use to troubleshoot issues you might encounter during the replacement process.

Considerations

- It is important that you apply the commands in this procedure to the correct controller:
 - The *impaired* controller is the controller that is being replaced.
 - The *replacement* controller is the new controller that is replacing the impaired controller.
 - The *healthy* controller is the surviving controller.
- If needed, you can turn on the storage system location (blue) LEDs to aid in physically locating the affected storage system. Log into the BMC using SSH and enter the `system location-led on` command.

A storage system has three location LEDs: one on the operator display panel and one on each controller. Location LEDs remain illuminated for 30 minutes.

You can turn them off by entering the `system location-led off` command. If you are unsure if the LEDs are on or off, you can check their state by entering the `system location-led show` command.

Shut down the impaired controller - ASA A20, ASA A30, and ASA A50

Shut down or take over the impaired controller.

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.

About this task

- If you have a SAN system, you must have checked event messages (`cluster kernel-service show`) for the impaired controller SCSI blade. The `cluster kernel-service show` command (from `priv advanced` mode) displays the node name, [quorum status](#) of that node, availability status of that node, and operational status of that node.

Each SCSI-blade process should be in quorum with the other nodes in the cluster. Any issues must be resolved before you proceed with the replacement.

- 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:

```
system node autosupport invoke -node * -type all -message MAINT=<# of hours>h
```

The following AutoSupport message 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`



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

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 <code>y</code> when prompted.
System prompt or password prompt	Take over or halt the impaired controller from the healthy controller: <pre>storage failover takeover -ofnode impaired_node_name</pre> <p>When the impaired controller shows Waiting for giveback..., press Ctrl-C, and then respond <code>y</code>.</p>

Replace the controller - ASA A20, ASA A30, and ASA A50

To replace the controller, you must remove the impaired controller, move FRU components from the impaired controller to the replacement controller, install the replacement controller in the chassis, set the time and date, and then recable the replacement controller.

Step 1: Remove the controller

You must remove the controller from the chassis when you replace the controller or replace a component inside the controller.

Before you begin

All other components in the storage system must be functioning properly; if not, you must contact [NetApp Support](#) before continuing with this procedure.

Steps

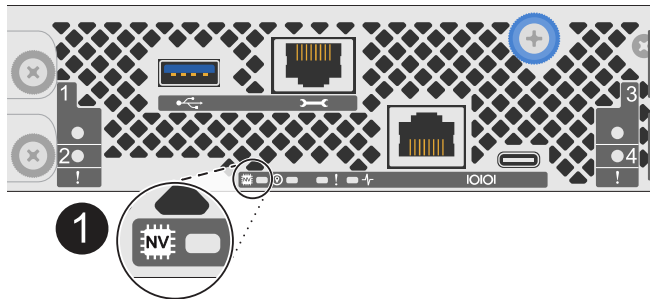
1. On the impaired controller, make sure the NV LED is off.

When the NV LED is off, destaging is complete and it is safe to remove the impaired controller.



If the NV LED is flashing (green), destage is in progress. You must wait for the NV LED to turn off. However, if the flashing continues for longer than five minutes, contact [NetApp Support](#) before continuing with this procedure.

The NV LED is located next to the NV icon on the controller.



1	NV icon and LED on the controller
----------	-----------------------------------

2. If you are not already grounded, properly ground yourself.
3. Disconnect the power on the impaired controller:



Power supplies (PSUs) do not have a power switch.

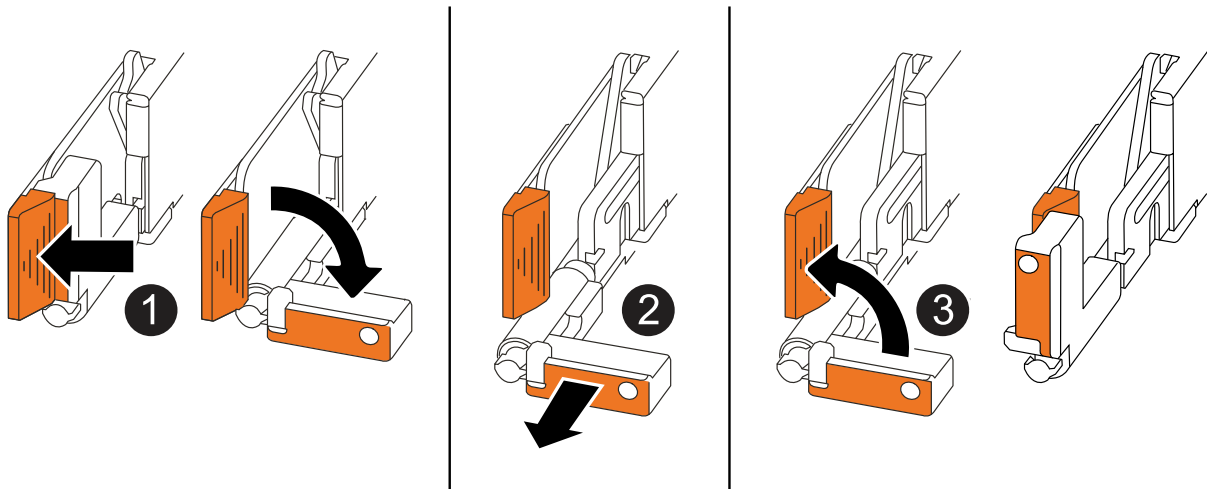
If you are disconnecting a...	Then...
AC PSU	<ol style="list-style-type: none"> 1. Open the power cord retainer. 2. Unplug the power cord from the PSU and set it aside.
DC PSU	<ol style="list-style-type: none"> 1. Unscrew the two thumb screws on the D-SUB DC power cord connector. 2. Unplug the power cord from the PSU and set it aside.

4. Unplug all cables from the impaired controller.

Keep track of where the cables were connected.

5. Remove the impaired controller:

The following illustration shows the operation of the controller handles (from the left side of the controller) when removing a controller:



<p>1</p>	<p>On both ends of the controller, push the vertical locking tabs outward to release the handles.</p>
<p>2</p>	<ul style="list-style-type: none"> • Pull the handles towards you to unseat the controller from the midplane. <p>As you pull, the handles extend out from the controller and then you feel some resistance, keep pulling.</p> <ul style="list-style-type: none"> • Slide the controller out of the chassis while supporting the bottom of the controller, and place it on a flat, stable surface.
<p>3</p>	<p>If needed, rotate the handles upright (next to the tabs) to move them out of the way.</p>

6. Open the controller cover by turning the thumbscrew counterclockwise to loosen, and then open the cover.

Step 2: Move the power supply

Move the power supply (PSU) to the replacement controller.

1. Move the PSU from the impaired controller:

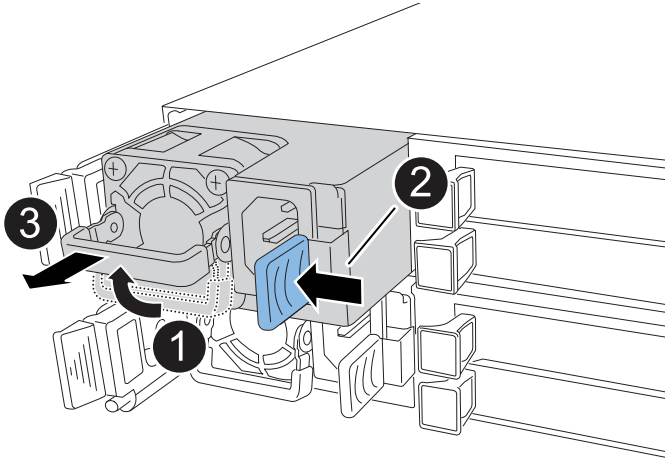
Make sure the left side controller handle is in the upright position to allow you access to the PSU.


Option 1: Move an AC PSU

To move an AC PSU, complete the following steps.

Steps

1. Remove the AC PSU from the impaired controller:



1	Rotate the PSU handle up, to its horizontal position, and then grasp it.
2	With your thumb, press the blue tab to release the PSU from the controller.
3	Pull the PSU out of the controller while using your other hand to support its weight.  The PSU is short. Always use two hands to support it when removing it from the controller so that it does not suddenly swing free from the controller and injure you.

2. Insert the PSU into the replacement controller:

- a. Using both hands, support and align the edges of the PSU with the opening in the controller.
- b. Gently push the PSU into the controller until the locking tab clicks into place.

A PSU will only properly engage with the internal connector and lock in place one way.



To avoid damaging the internal connector, do not use excessive force when sliding the PSU into the controller.

- c. Rotate the handle down, so it is out of the way of normal operations.

Option 2: Move a DC PSU

To move a DC PSU, complete the following steps.

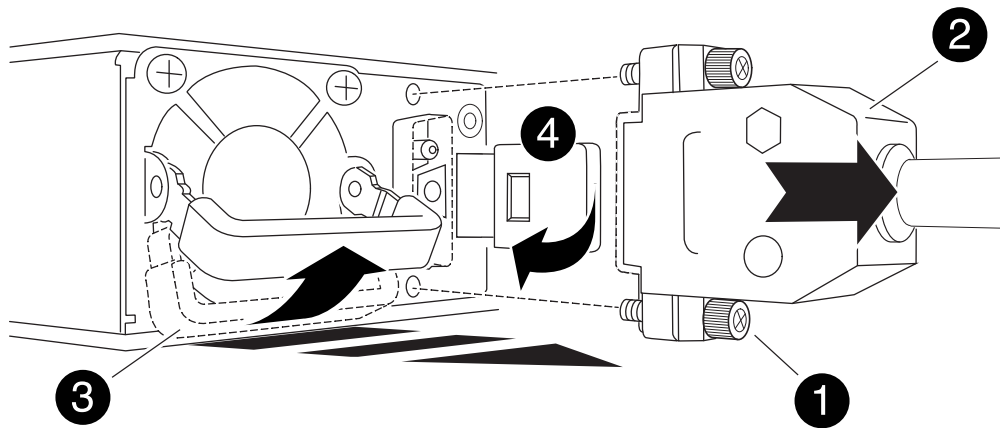
Steps

1. Remove the DC PSU from the impaired controller:

- a. Rotate the handle up, to its horizontal position, and then grasp it.
- b. With your thumb, press the terracotta tab to release the locking mechanism.
- c. Pull the PSU out of the controller while using your other hand to support its weight.



The PSU is short. Always use two hands to support it when removing it from the controller so that it does not swing free from the controller and injure you.



1	Thumb screws
2	D-SUB DC power PSU cord connector
3	Power supply handle
4	Terracotta PSU locking tab

2. Insert the PSU into the replacement controller:
 - a. Using both hands, support and align the edges of the PSU with the opening in the controller.
 - b. Gently slide the PSU into the controller until the locking tab clicks into place.

A PSU must properly engage with the internal connector and locking mechanism. Repeat this step if you feel the PSU is not properly seated.



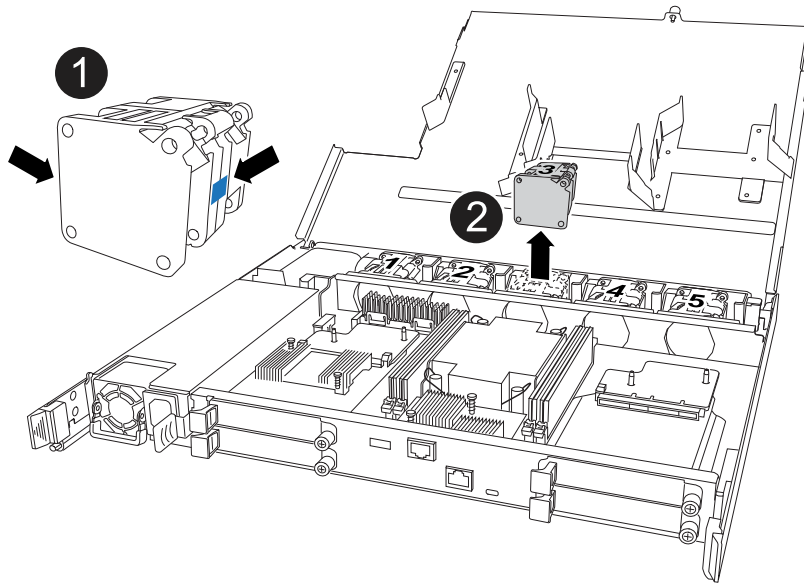
To avoid damaging the internal connector, do not use excessive force when sliding the PSU into the controller.

- c. Rotate the handle down, so it is out of the way of normal operations.

Step 3: Move the fans

Move the fans to the replacement controller.

1. Remove one of the fans from the impaired controller:



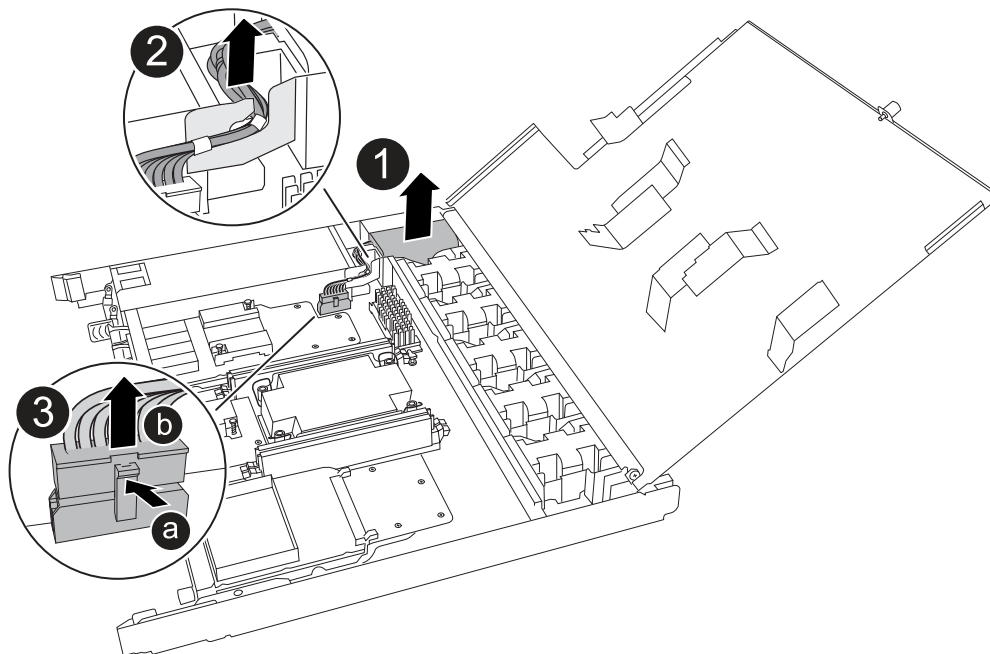
<p>1</p>	<p>Hold both sides of the fan at the blue touch points.</p>
<p>2</p>	<p>Pull the fan straight up and out its socket.</p>

2. Insert the fan into the replacement controller by aligning it within the guides, and then push down until the fan connector is fully seated in the socket.
3. Repeat these steps for the remaining fans.

Step 4: Move the NV battery

Move the NV battery to the replacement controller.

1. Remove the NV battery from the impaired controller:



<p>1</p>	<p>Lift the NV battery up and out of its compartment.</p>
<p>2</p>	<p>Remove the wiring harness from its retainer.</p>
<p>3</p>	<p>1. Push in and hold the tab on the connector. 2. Pull the connector up and out of the socket.</p> <p>As you pull up, gently rock the connector from end to end (lengthwise) to unseat it.</p>

2. Install the NV battery into the replacement controller:

- a. Plug the wiring connector into its socket.
- b. Route the wiring along the side of the power supply, into its retainer, and then through the channel in front of the NV battery compartment.
- c. Place the NV battery into the compartment.

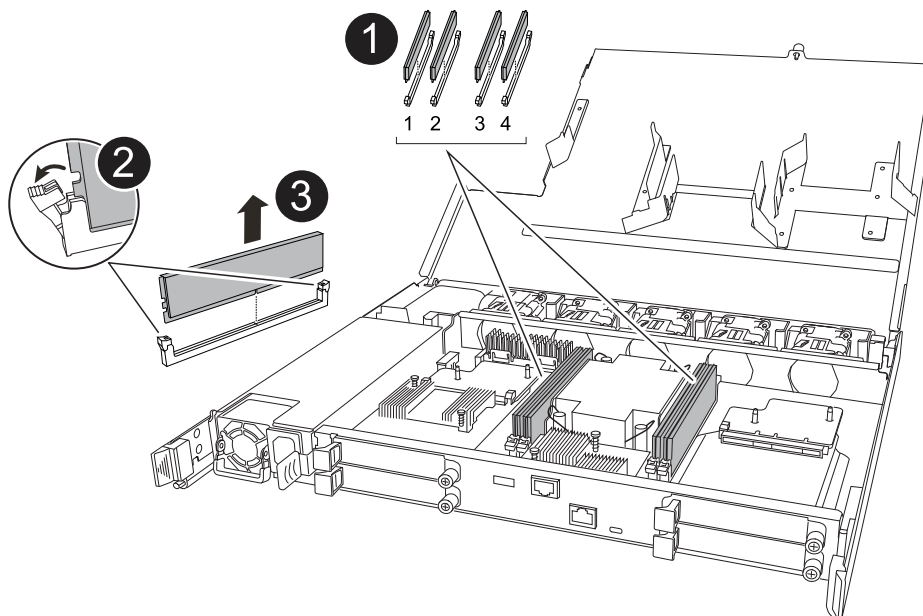
The NV battery should sit flush in its compartment.



Step 5: Move system DIMMs

Move the DIMMs to the replacement controller.

If you have DIMM blanks, you do not need to move them, the replacement controller should come with them installed.

1. Remove one of the DIMMs from the impaired controller:



<p>1</p>	<p>DIMM slot numbering and positions.</p> <p> Depending on your storage system model, you will have two or four DIMMs.</p>
<p>2</p>	<ul style="list-style-type: none"> • Note the orientation of the DIMM in the socket so that you can insert the DIMM in the replacement controller in the proper orientation. • Eject the DIMM by slowly pushing apart the two DIMM ejector tabs on both ends of the DIMM slot. <p> Carefully hold the DIMM by the corners or edges to avoid pressure on the DIMM circuit board components.</p>
<p>3</p>	<p>Lift the DIMM up and out of the slot.</p> <p>The ejector tabs remain in the open position.</p>

2. Install the DIMM in the replacement controller:

- Make sure that the DIMM ejector tabs on the connector are in the open position.
- Hold the DIMM by the corners, and then insert the DIMM squarely into the slot.

The notch on the bottom of the DIMM, among the pins, should line up with the tab in the slot.

When inserted correctly, the DIMM goes in easily but fits tightly in the slot. If not, reinsert the DIMM.

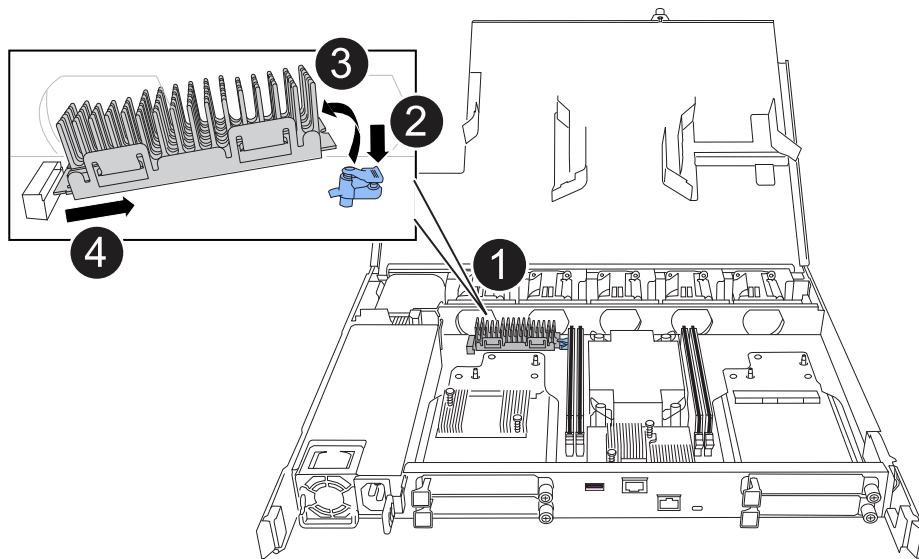
- Visually check the DIMM to make sure it is evenly aligned and fully inserted into the slot.
- Push down carefully, but firmly, on the top edge of the DIMM until the ejector tabs snap into place over the notches at both ends of the DIMM.

3. Repeat these steps for the remaining DIMMs.

Step 6: Move the boot media

Move the boot media to the replacement controller.

1. Remove the boot media from the impaired controller:



1	Boot media location
2	Press down on the blue tab to release the right end of the boot media.
3	Lift the right end of the boot media up at a slight angle to get a good grip along the sides of the boot media.
4	Gently pull the left end of the boot media out of its socket.

2. Install the boot media into the replacement controller:

- a. Slide the socket end of the boot media into its socket.
- b. At the opposite end of the boot media, press down and hold the blue tab (in the open position), gently push down on that end of the boot media until it stops, and then release the tab to lock the boot media into place.

Step 7: Move the I/O modules

Move the I/O modules and any I/O blanking modules to the replacement controller.

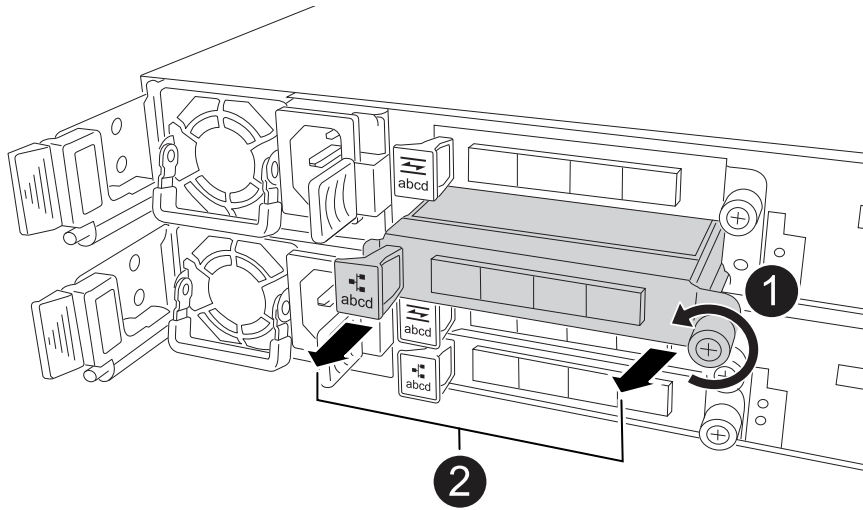
1. Unplug cabling from one of the I/O modules.

Make sure to label the cables so that you know where they came from.

2. Remove the I/O module from the impaired controller:

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

If you are removing the I/O module in slot 4, make sure the right side controller handle is in the upright position to allow you access to the I/O module.



1	Turn the I/O module thumbscrew counterclockwise to loosen.
2	Pull the I/O module out of the controller using the port label tab on the left and the thumbscrew.

3. Install the I/O module into the replacement controller:

- a. Align the I/O module with the edges of the slot.
- b. Gently push the I/O module all the way into the slot, making sure to properly seat the module into the connector.

You can use the tab on the left and the thumbscrew to push in the I/O Module.

- c. Turn the thumbscrew clockwise to tighten.

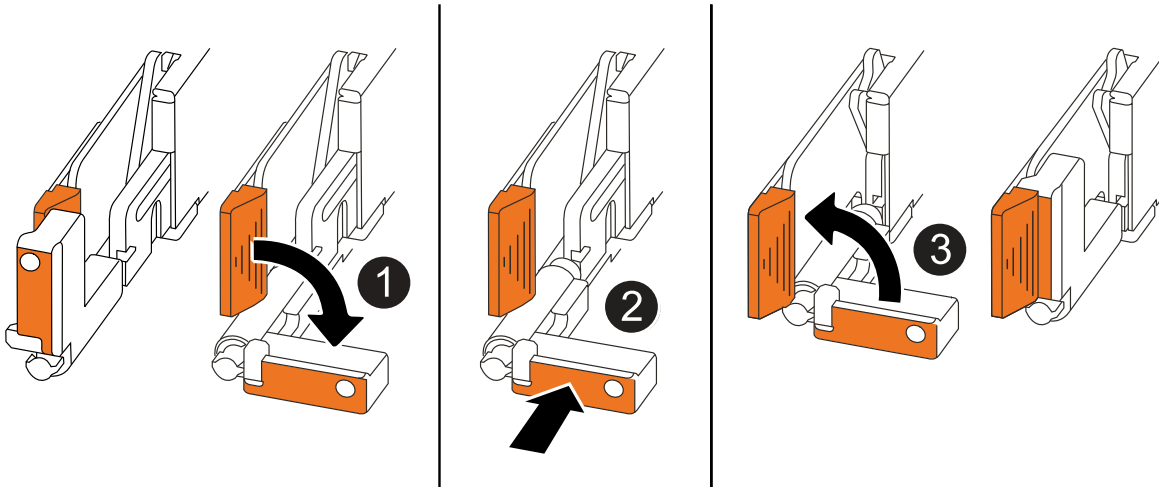
4. Repeat these steps to move the remaining I/O modules and any I/O blanking modules to the replacement controller.

Step 8: Install the controller

Reinstall the controller into the chassis and reboot it.

About this task

The following illustration shows the operation of the controller handles (from the left side of a controller) when reinstalling the controller, and can be used as a reference for the rest of the controller reinstallation steps.



1	If you rotated the controller handles upright (next to the tabs) to move them out of the way while you serviced the controller, rotate them down to the horizontal position.
2	Push the handles to reinsert the controller into the chassis halfway and then, when instructed, push until the controller is fully seated.
3	Rotate the handles to the upright position and lock in place with the locking tabs.

Steps

1. Close the controller cover and turn the thumbscrew clockwise until tightened.
2. Insert the controller halfway into the chassis.

Align the rear of the controller with the opening in the chassis, and then gently push the controller using the handles.



Do not completely insert the controller in the chassis until instructed to do so.

3. Connect the console cable to the console port on the controller and to the laptop so that the laptop receives console messages when the controller reboots.
4. Fully seat the controller in the chassis:
 - a. Firmly push on the handles until the controller meets the midplane and is fully seated.



Do not use excessive force when sliding the controller into the chassis; it could damage the connectors.

- b. Rotate the controller handles up and lock in place with the tabs.



The controller begins to boot as soon as it is fully seated in the chassis.

5. Take the controller to the LOADER prompt by pressing CTRL-C to abort AUTOBOOT.
6. Set the time and date on the controller:

Make sure you are at the controller's LOADER prompt.

- a. Display the date and time on the controller:

```
show date
```



Time and date default is in GMT. You have the option to display in local time and in 24hr mode.

- b. Set the current time in GMT:

```
set time hh:mm:ss
```

You can get the current GMT from the healthy node:

```
date -u
```

- c. Set the current date in GMT:

```
set date mm/dd/yyyy
```

You can get the current GMT from the healthy node:

```
date -u
```

7. Recable the controller as needed.
8. Reconnect the power cord to the power supply (PSU).

Once power is restored to the PSU, the status LED should be green.

If you are reconnecting a...	Then...
AC PSU	<ol style="list-style-type: none">1. Plug the power cord into the PSU.2. Secure the power cord with the power cord retainer.
DC PSU	<ol style="list-style-type: none">1. Plug the D-SUB DC power cord connector into the PSU.2. Tighten the two thumb screws to secure the D-SUB DC power cord connector to the PSU.

Restore and verify the system configuration - ASA A20, ASA A30, and ASA A50

Verify the low-level system configuration of the replacement controller and reconfigure the system settings as necessary.

Step 1: Verify HA config settings

You must verify the HA state of the controller and, if necessary, update the state to match your storage system configuration.

1. Boot to maintenance mode:

```
boot_ontap maint
```

a. Enter `y` when you see *Continue with boot?*.

If you see the *System ID mismatch* warning message, enter `y`.

2. Enter `sysconfig -v` and capture the display contents.



If you see *PERSONALITY MISMATCH* contact customer support.

3. From the `sysconfig -v` output, compare the adapter card information with the cards and locations in the replacement controller.

4. Verify that all components display the same HA state:

```
ha-config show
```

The HA state should be the same for all components.

5. If the displayed system state of the controller does not match your storage system configuration, set the HA state for the controller:

```
ha-config modify controller ha-state
```

The value for HA-state can be one of the following:

- `ha`

- `non-ha` (not supported)

6. Confirm that the setting has changed:

```
ha-config show
```

Step 2: Verify disk list

1. Verify that the adapter lists the paths to all disks:

```
storage show disk -p
```

If you see any issues, check cabling and reseal cables.

2. Exit Maintenance mode:

```
halt
```

Give back the controller - ASA A20, ASA A30, and ASA A50

Give back the controller.

Give back the controller

Reset encryption if enabled and return the controller to normal operation.

No encryption

1. From the LOADER prompt, enter `boot_ontap`.
2. Press <enter> when console messages stop.
 - If you see the *login* prompt, go to the next step at the end of this section.
 - If you see *Waiting for giveback*, press the <enter> key, log into the partner node, and then go to the next step at the end of this section.
3. Return the impaired controller to normal operation by giving back its storage: `storage failover giveback -ofnode impaired_node_name`
4. If automatic giveback was disabled, reenable it: `storage failover modify -node local -auto-giveback true`
5. If AutoSupport is enabled, restore/unsuppress automatic case creation: `system node autosupport invoke -node * -type all -message MAINT=END`

Onboard encryption (OKM)

1. From the LOADER prompt, enter `boot_ontap maint`.
2. Boot to the ONTAP menu from the LOADER prompt `boot_ontap menu` and select option 10.
3. Enter the OKM passphrase.



You are prompted twice for the passphrase.

4. Enter the backup key data when prompted.
5. At the boot menu, enter option 1 for normal boot.
6. Press <enter> when *Waiting for giveback* is displayed.
7. Move the console cable to the partner node and login as `admin`.
8. Give back only the CFO aggregates (the root aggregate): `storage failover giveback -fromnode local -only-cfo-aggregates true`
 - If you encounter errors, contact [NetApp Support](#).
9. Wait 5 minutes after the giveback report completes, and check failover status and giveback status: `storage failover show` and `storage failover show-giveback`.
10. Synchronize and verify status of the keys:
 - a. Move the console cable back to the replacement controller.
 - b. Synchronize missing keys: `security key-manager onboard sync`



You are prompted for the cluster-wide passphrase of OKM for the cluster.

- c. Verify status of the keys: `security key-manager key query -restored false`

The output should show no results when when properly synchronized.

If the output shows results (the key IDs of keys that are not present in the system's internal key table), contact [NetApp Support](#).

11. Return the impaired controller to normal operation by giving back its storage: `storage failover giveback -ofnode impaired_node_name`
12. If automatic giveback was disabled, reenable it: `storage failover modify -node local -auto-giveback true`
13. If AutoSupport is enabled, restore/unsuppress automatic case creation: `system node autosupport invoke -node * -type all -message MAINT=END`

External key manager (EKM)

1. If the root volume is encrypted with External Key Manager and the console cable is connected to the replacement node, enter `boot_ontap` menu and select option 11.
2. Answer `y` or `n` to the following questions:

Do you have a copy of the `/cfcard/kmip/certs/client.crt` file? {y/n}

Do you have a copy of the `/cfcard/kmip/certs/client.key` file? {y/n}

Do you have a copy of the `/cfcard/kmip/certs/CA.pem` file? {y/n}

OR

Do you have a copy of the `/cfcard/kmip/servers.cfg` file? {y/n}

Do you know the KMIP server address? {y/n}

Do you know the KMIP port? {y/n}



Contact [NetApp Support](#) if you have issues.

3. Supply the information for:
 - The client certificate (`client.crt`) file contents
 - The client key (`client.key`) file contents
 - The KMIP server CA(s) (`CA.pem`) file contents
 - The IP address for the KMIP server
 - The port for the KMIP server
4. Once the system processes, you see the Boot Menu. Select '1' for normal boot.
5. Check the takeover status: `storage failover show`
6. Ensure any core dumps on the repaired node are saved by going to advanced mode `set -privilege advanced` and then run `local partner nosavecore`.
7. Return the impaired controller to normal operation by giving back its storage: `storage failover giveback -ofnode impaired_node_name`
8. If automatic giveback was disabled, reenable it: `storage failover modify -node local -auto-giveback true`
9. If AutoSupport is enabled, restore/unsuppress automatic case creation: `system node autosupport invoke -node * -type all -message MAINT=END`

Complete controller replacement - ASA A20, ASA A30, and ASA A50

To restore your storage system to full operation, you must verify the LIFs, check cluster health, and return the failed part to NetApp.

Step 1: Verify LIFs and check cluster health

Before returning the replacement node to service, verify that the logical interfaces are on their home ports, check the cluster health, and reset automatic giveback.

Steps

1. Verify that the logical interfaces are reporting to their home server and ports: `network interface show -is-home false`

If any logical interfaces are listed as false, revert them to their home ports: `network interface revert -vserver * -lif *`

2. Check the health of your cluster. See the [How to perform a cluster health check with a script in ONTAP KB](#) article for more information.
3. If automatic giveback was disabled, reenable it: `storage failover modify -node local -auto-giveback true`

Step 2: 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.

Replace a DIMM - ASA A20, ASA A30, and ASA A50

You must replace a DIMM in the controller when your storage system encounters errors such as, excessive CECC (Correctable Error Correction Codes) errors that are based on Health Monitor alerts or uncorrectable ECC errors, typically caused by a single DIMM failure preventing the storage system from booting ONTAP.

Before you begin

- Ensure all other components in the storage system are working correctly; if not, contact [NetApp Support](#) before continuing."
- You must replace the failed FRU component with a replacement FRU component you received from your provider.

About this task

If needed, you can turn on the storage system location (blue) LEDs to aid in physically locating the affected storage system. Log into the BMC using SSH and enter the `system location-led on` command.

A storage system has three location LEDs: one on the operator display panel and one on each controller. Location LEDs remain illuminated for 30 minutes.

You can turn them off by entering the `system location-led off` command. If you are unsure if the LEDs are on or off, you can check their state by entering the `system location-led show` command.

Step 1: Shut down the impaired controller

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.

About this task

- If you have a SAN system, you must have checked event messages (`cluster kernel-service show`) for the impaired controller SCSI blade. The `cluster kernel-service show` command (from `priv advanced` mode) displays the node name, [quorum status](#) of that node, availability status of that node, and operational status of that node.

Each SCSI-blade process should be in quorum with the other nodes in the cluster. Any issues must be resolved before you proceed with the replacement.

- 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:
`system node autosupport invoke -node * -type all -message MAINT=<# of hours>h`

The following AutoSupport message 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`



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

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 <i>y</i> when prompted.
System prompt or password prompt	Take over or halt the impaired controller from the healthy controller: <code>storage failover takeover -ofnode impaired_node_name</code> When the impaired controller shows Waiting for giveback..., press Ctrl-C, and then respond <i>y</i> .

Step 2: Remove the controller

You must remove the controller from the chassis when you replace the controller or replace a component inside the controller.

Before you begin

All other components in the storage system must be functioning properly; if not, you must contact [NetApp Support](#) before continuing with this procedure.

Steps

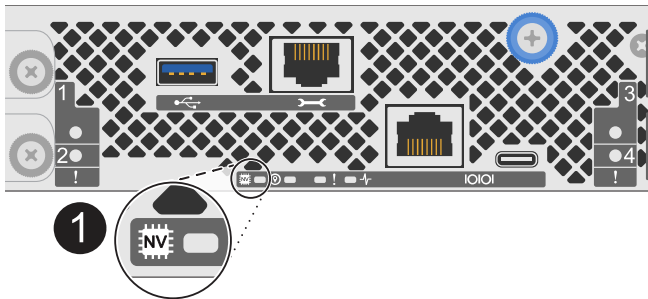
1. On the impaired controller, make sure the NV LED is off.

When the NV LED is off, destaging is complete and it is safe to remove the impaired controller.



If the NV LED is flashing (green), destage is in progress. You must wait for the NV LED to turn off. However, if the flashing continues for longer than five minutes, contact [NetApp Support](#) before continuing with this procedure.

The NV LED is located next to the NV icon on the controller.



1	NV icon and LED on the controller
----------	-----------------------------------

2. If you are not already grounded, properly ground yourself.
3. Disconnect the power on the impaired controller:



Power supplies (PSUs) do not have a power switch.

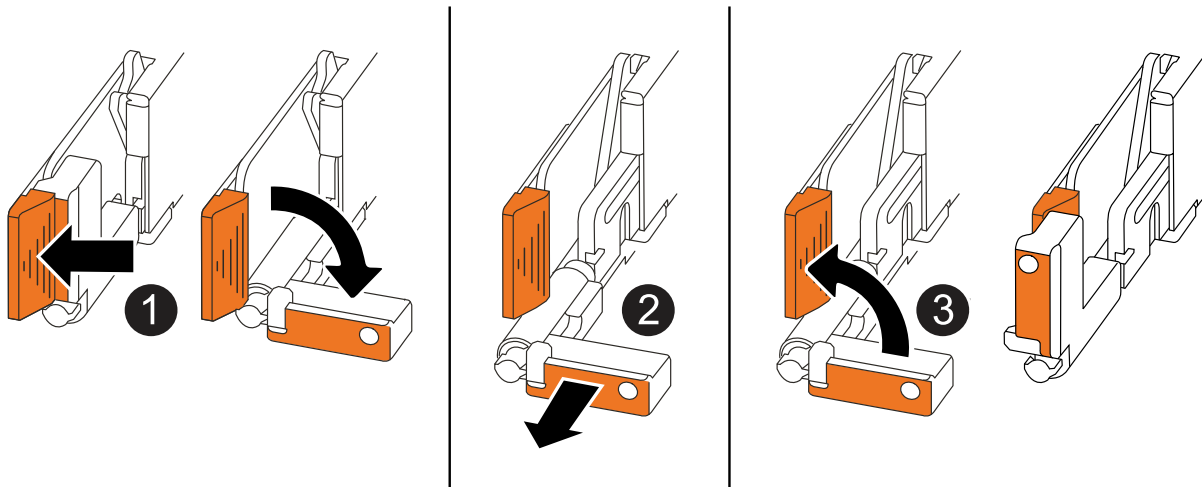
If you are disconnecting a...	Then...
AC PSU	<ol style="list-style-type: none">1. Open the power cord retainer.2. Unplug the power cord from the PSU and set it aside.
DC PSU	<ol style="list-style-type: none">1. Unscrew the two thumb screws on the D-SUB DC power cord connector.2. Unplug the power cord from the PSU and set it aside.

4. Unplug all cables from the impaired controller.

Keep track of where the cables were connected.

5. Remove the impaired controller:

The following illustration shows the operation of the controller handles (from the left side of the controller) when removing a controller:



<p>1</p>	<p>On both ends of the controller, push the vertical locking tabs outward to release the handles.</p>
<p>2</p>	<ul style="list-style-type: none"> • Pull the handles towards you to unseat the controller from the midplane. <p>As you pull, the handles extend out from the controller and then you feel some resistance, keep pulling.</p> <ul style="list-style-type: none"> • Slide the controller out of the chassis while supporting the bottom of the controller, and place it on a flat, stable surface.
<p>3</p>	<p>If needed, rotate the handles upright (next to the tabs) to move them out of the way.</p>

6. Open the controller cover by turning the thumbscrew counterclockwise to loosen, and then open the cover.

Step 3: Replace a DIMM

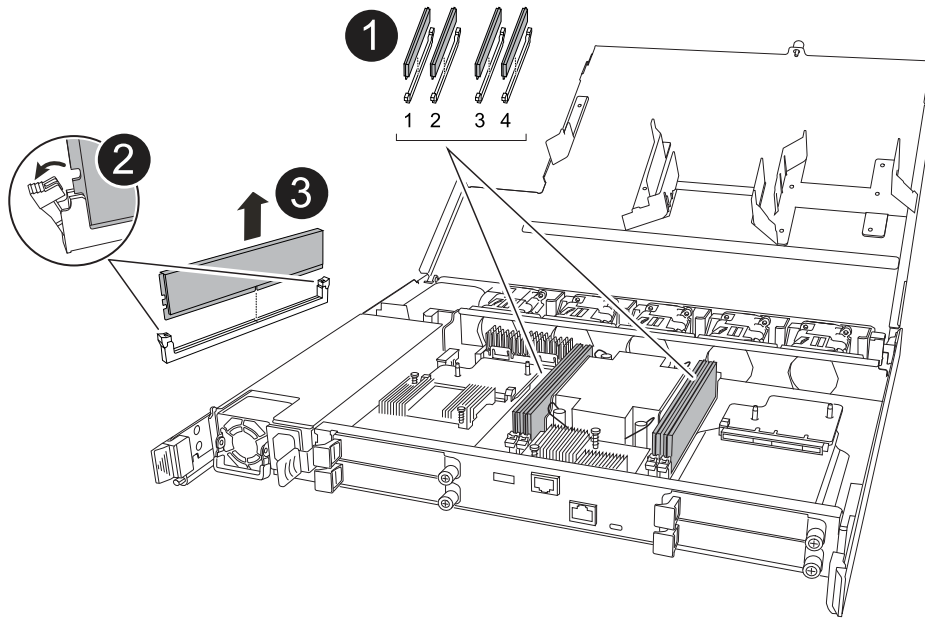
To replace a DIMM, locate the faulty DIMM inside the controller and follow the specific sequence of steps.

1. If you are not already grounded, properly ground yourself.
2. Locate the DIMMs on your controller and identify the faulty DIMM.



Consult either the [Netapp Hardware Universe](#) or the FRU map on the cover of the controller for exact DIMM locations.

3. Remove the faulty DIMM:



<p>1</p>	<p>DIMM slot numbering and positions.</p> <p>i Depending on your storage system model you will have two or four DIMMs.</p>
<p>2</p>	<ul style="list-style-type: none"> • Note the orientation of the DIMM in the socket so that you can insert the replacement DIMM using the same orientation. • Eject the faulty DIMM by slowly pushing apart the two DIMM ejector tabs on both ends of the DIMM slot. <p>i Carefully hold the DIMM by the corners or edges to avoid pressure on the DIMM circuit board components.</p>
<p>3</p>	<p>Lift the DIMM up and out of the slot.</p> <p>The ejector tabs remain in the open position.</p>

4. Install the replacement DIMM:

- Remove the replacement DIMM from its antistatic shipping bag.
- Make sure that the DIMM ejector tabs on the connector are in the open position.
- Hold the DIMM by the corners, and then insert the DIMM squarely into the slot.

The notch on the bottom of the DIMM, among the pins, should line up with the tab in the slot.

When inserted correctly, the DIMM goes in easily but fits tightly in the slot. Reinsert the DIMM if you feel it is not inserted correctly.

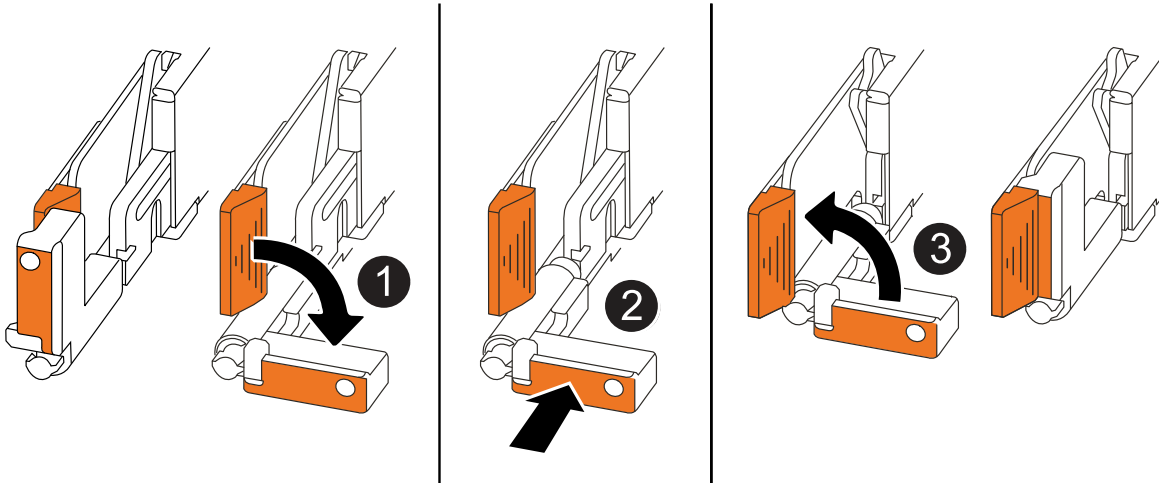
- Visually check the DIMM to make sure it is evenly aligned and fully inserted into the slot.
- Push down carefully, but firmly, on the top edge of the DIMM until the ejector tabs snap into place over the notches at both ends of the DIMM.

Step 4: Reinstall the controller

Reinstall the controller into the chassis and reboot it.

About this task

The following illustration shows the operation of the controller handles (from the left side of a controller) when reinstalling the controller, and can be used as a reference for the rest of the controller reinstallation steps.



1	If you rotated the controller handles upright (next to the tabs) to move them out of the way while you serviced the controller, rotate them down to the horizontal position.
2	Push the handles to reinsert the controller into the chassis halfway and then, when instructed, push until the controller is fully seated.
3	Rotate the handles to the upright position and lock in place with the locking tabs.

Steps

1. Close the controller cover and turn the thumbscrew clockwise until tightened.
2. Insert the controller halfway into the chassis.

Align the rear of the controller with the opening in the chassis, and then gently push the controller using the handles.



Do not completely insert the controller in the chassis until instructed to do so.

3. Connect the console cable to the console port on the controller and to the laptop so that the laptop receives console messages when the controller reboots.
4. Fully seat the controller in the chassis:
 - a. Firmly push on the handles until the controller meets the midplane and is fully seated.



Do not use excessive force when sliding the controller into the chassis; it could damage the connectors.

b. Rotate the controller handles up and lock in place with the tabs.



The controller begins to boot as soon as it is fully seated in the chassis.

5. Take the controller to the LOADER prompt by pressing CTRL-C to abort AUTOBOOT.

6. Set the time and date on the controller:

Make sure you are at the controller's LOADER prompt.

a. Display the date and time on the controller:

```
show date
```



Time and date default is in GMT. You have the option to display in local time and in 24hr mode.

b. Set the current time in GMT:

```
set time hh:mm:ss
```

You can get the current GMT from the healthy node:

```
date -u
```

c. Set the current date in GMT:

```
set date mm/dd/yyyy
```

You can get the current GMT from the healthy node:

```
date -u
```

7. Recable the controller as needed.

8. Reconnect the power cord to the power supply (PSU).

Once power is restored to the PSU, the status LED should be green.

If you are reconnecting a...	Then...
AC PSU	<ol style="list-style-type: none">1. Plug the power cord into the PSU.2. Secure the power cord with the power cord retainer.
DC PSU	<ol style="list-style-type: none">1. Plug the D-SUB DC power cord connector into the PSU.2. Tighten the two thumb screws to secure the D-SUB DC power cord connector to the PSU.

Step 5: 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.

Replace Drive - ASA A20, ASA A30, and ASA A50

You can replace a failed drive nondisruptively while I/O is in progress.

Before you begin

- The drive that you are installing must be supported by your storage system.

[NetApp Hardware Universe](#)

- If self-encrypting drive (SED) authentication is enabled, you must use the SED replacement instructions in the ONTAP documentation.

Instructions in the ONTAP documentation describe additional steps you must perform before and after replacing an SED.

[NetApp encryption overview with the CLI](#)

- All other components in the storage system must be functioning properly, if not, you must contact [NetApp Support](#) before continuing with this procedure.
- Verify that the drive you are removing is failed.

You can verify that the drive is failed by running the `storage disk show -broken` command. The failed drive appears in the list of failed drives. If it does not, you should wait, and then run the command again.



Depending on the drive type and capacity, it can take up to several hours for the drive to appear in the list of failed drives.

About this task

- When replacing a failed drive, you must wait 70 seconds between the removal of the drive and the insertion of the replacement drive to allow the storage system to recognize that a drive was removed.
- The best practice is to have the current version of the Disk Qualification Package (DQP) installed before hot-swapping a drive.

Having the current version of the DQP installed allows your system to recognize and use newly qualified drives. This avoids system event messages about having noncurrent drive information and prevention of drive partitioning because drives are not recognized. The DQP also notifies you of noncurrent drive firmware.

[NetApp Downloads: Disk Qualification Package](#)

- The best practice is to have current versions of NVMe shelf module (NSM) firmware and drive firmware on your system before replacing FRU components.

[NetApp Downloads: Disk Shelf Firmware](#)

[NetApp Downloads: Disk Drive Firmware](#)



Do not revert firmware to a version that does not support your shelf and its components.

- Drive firmware is automatically updated (nondisruptively) on new drives that have non-current firmware versions.



Drive firmware checks occur every two minutes.

- If needed, you can turn on the storage system location (blue) LEDs to aid in physically locating the affected storage system. Log into the BMC using SSH and enter the `system location-led on` command.

A storage system has three location LEDs: one on the operator display panel and one on each controller. Location LEDs remain illuminated for 30 minutes.

You can turn them off by entering the `system location-led off` command. If you are unsure if the LEDs are on or off, you can check their state by entering the `system location-led show` command.

Steps

1. If you want to manually assign drive ownership for the replacement drive, you need to disable automatic drive assignment if it is enabled.



You manually assign drive ownership and then reenables automatic drive assignment later in this procedure.

- a. Verify whether automatic drive assignment is enabled:

```
storage disk option show
```

You can enter the command on either controller.

If automatic drive assignment is enabled, the output shows `on` in the `Auto Assign` column (for each controller).

- b. If automatic drive assignment is enabled, disable it:

```
storage disk option modify -node node_name -autoassign off
```

You must disable automatic drive assignment on both controllers.

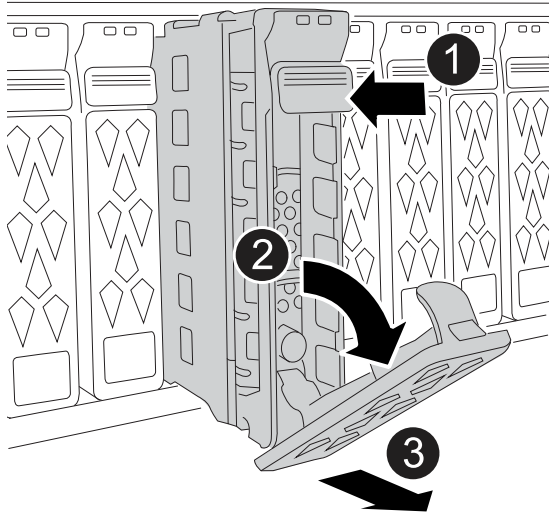
2. Properly ground yourself.
3. Physically identify the failed drive.


When a drive fails, the system logs a warning message to the system console indicating which drive failed. Additionally, the attention (amber) LED on the drive shelf operator display panel and the failed drive illuminate.



The activity (green) LED on a failed drive can be illuminated (solid), which indicates that the drive has power, but should not be blinking, which indicates I/O activity. A failed drive has no I/O activity.

4. Remove the failed drive:



<p>1</p>	<p>Press the release button on the drive face to open the cam handle.</p>
<p>2</p>	<p>Rotate the cam handle downward to disengage the drive from the midplane.</p>
<p>3</p>	<p>Slide the drive out of the drive bay using the cam handle and supporting the drive with your other hand.</p> <p>When removing a drive, always use two hands to support its weight.</p> <div style="border-left: 1px solid black; padding-left: 10px; margin-top: 10px;"> <p> Because drives are fragile, minimize handling to avoid damaging them.</p> </div>

5. Wait a minimum of 70 seconds before inserting the replacement drive.

6. Insert the replacement drive:

- a. With the cam handle in the open position, use both hands to insert the drive.
- b. Gently push until the drive stops.
- c. Close the cam handle so that the drive is fully seated into the midplane and the handle clicks into place.

Be sure to close the cam handle slowly so that it aligns correctly with the face of the drive.

7. Verify that the drive's activity (green) LED is illuminated.

When the drive's activity LED is solid, it means that the drive has power. When the drive's activity LED is blinking, it means that the drive has power and I/O is in progress. If the drive firmware is automatically updating, the LED blinks.

8. If you are replacing another drive, repeat steps 3 through step 7.

9. If you disabled automatic drive assignment in step 1, manually assign drive ownership, and then reenable automatic drive assignment if needed:

- a. Display all unowned drives:

```
storage disk show -container-type unassigned
```

You can enter the command on either controller.

b. Assign each drive:

```
storage disk assign -disk disk_name -owner owner_name
```

You can enter the command on either controller.

You can use the wildcard character to assign more than one drive at once.

c. Reenable automatic drive assignment if needed:

```
storage disk option modify -node node_name -autoassign on
```

You must reenable automatic drive assignment on both controllers.

10. 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.

Replace a fan module - ASA A20, ASA A30, and ASA A50

To replace a fan, you must remove the controller, remove the faulty fan, install the replacement fan, and then reinstall the controller.

About this task

If needed, you can turn on the storage system location (blue) LEDs to aid in physically locating the affected storage system. Log into the BMC using SSH and enter the `system location-led on` command.

A storage system has three location LEDs: one on the operator display panel and one on each controller. Location LEDs remain illuminated for 30 minutes.

You can turn them off by entering the `system location-led off` command. If you are unsure if the LEDs are on or off, you can check their state by entering the `system location-led show` command.

Step 1: Shut down the impaired controller

Shut down or take over the impaired controller.

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.

About this task

- If you have a SAN system, you must have checked event messages (`cluster kernel-service show`) for the impaired controller SCSI blade. The `cluster kernel-service show` command (from `priv advanced` mode) displays the node name, [quorum status](#) of that node, availability status of that node, and operational status of that node.

Each SCSI-blade process should be in quorum with the other nodes in the cluster. Any issues must be resolved before you proceed with the replacement.

- 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:
`system node autosupport invoke -node * -type all -message MAINT=<# of hours>h`

The following AutoSupport message 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`



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

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 <code>y</code> when prompted.
System prompt or password prompt	Take over or halt the impaired controller from the healthy controller: <code>storage failover takeover -ofnode impaired_node_name</code> When the impaired controller shows Waiting for giveback..., press Ctrl-C, and then respond <code>y</code> .

Step 2: Remove the controller

You must remove the controller from the chassis when you replace the controller or replace a component inside the controller.

Before you begin

All other components in the storage system must be functioning properly; if not, you must contact [NetApp Support](#) before continuing with this procedure.

Steps

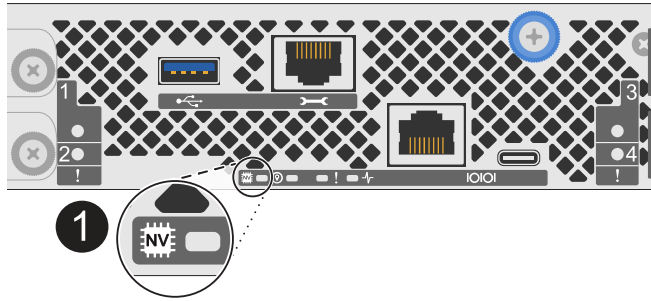
1. On the impaired controller, make sure the NV LED is off.

When the NV LED is off, destaging is complete and it is safe to remove the impaired controller.



If the NV LED is flashing (green), destage is in progress. You must wait for the NV LED to turn off. However, if the flashing continues for longer than five minutes, contact [NetApp Support](#) before continuing with this procedure.

The NV LED is located next to the NV icon on the controller.



1	NV icon and LED on the controller
----------	-----------------------------------

2. If you are not already grounded, properly ground yourself.
3. Disconnect the power on the impaired controller:



Power supplies (PSUs) do not have a power switch.

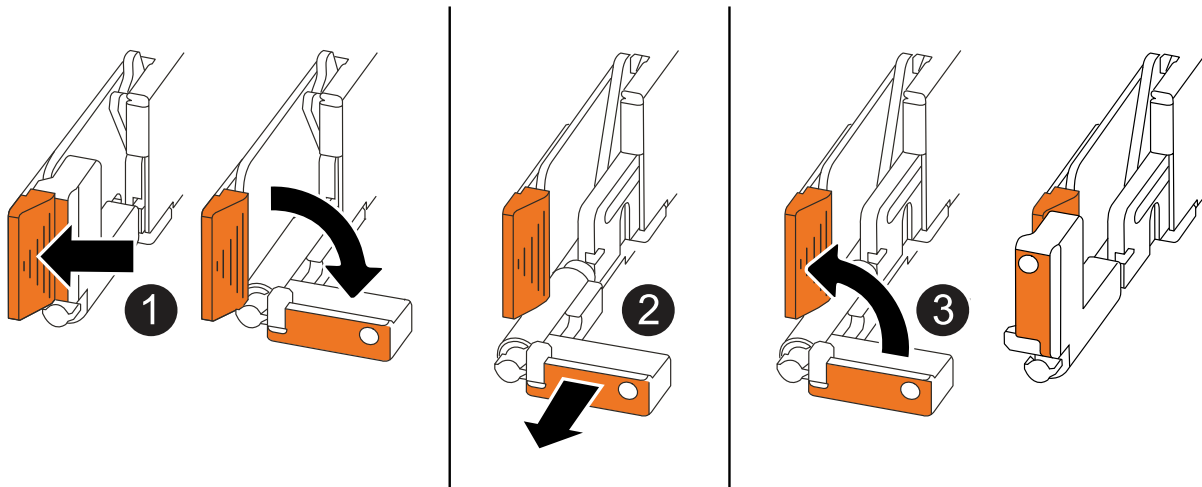
If you are disconnecting a...	Then...
AC PSU	<ol style="list-style-type: none"> 1. Open the power cord retainer. 2. Unplug the power cord from the PSU and set it aside.
DC PSU	<ol style="list-style-type: none"> 1. Unscrew the two thumb screws on the D-SUB DC power cord connector. 2. Unplug the power cord from the PSU and set it aside.

4. Unplug all cables from the impaired controller.

Keep track of where the cables were connected.

5. Remove the impaired controller:

The following illustration shows the operation of the controller handles (from the left side of the controller) when removing a controller:



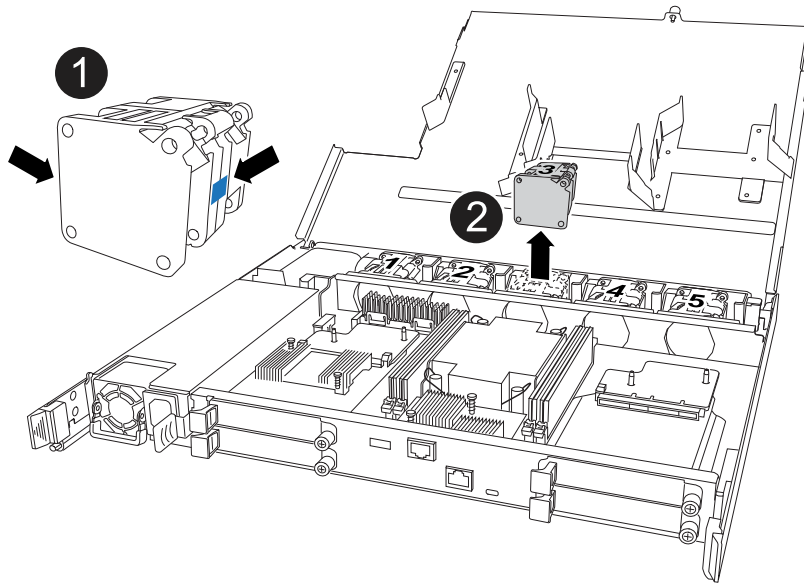
<p>1</p>	<p>On both ends of the controller, push the vertical locking tabs outward to release the handles.</p>
<p>2</p>	<ul style="list-style-type: none"> • Pull the handles towards you to unseat the controller from the midplane. <p>As you pull, the handles extend out from the controller and then you feel some resistance, keep pulling.</p> <ul style="list-style-type: none"> • Slide the controller out of the chassis while supporting the bottom of the controller, and place it on a flat, stable surface.
<p>3</p>	<p>If needed, rotate the handles upright (next to the tabs) to move them out of the way.</p>

6. Open the controller cover by turning the thumbscrew counterclockwise to loosen, and then open the cover.

Step 3: Replace fan

To replace a fan, remove the failed fan and replace it with a new fan.

1. Identify the fan that you must replace by checking the console error messages.
2. Remove the failed fan:



<p>1</p>	<p>Hold both sides of the fan at the blue touch points.</p>
<p>2</p>	<p>Pull the fan straight up and out its socket.</p>

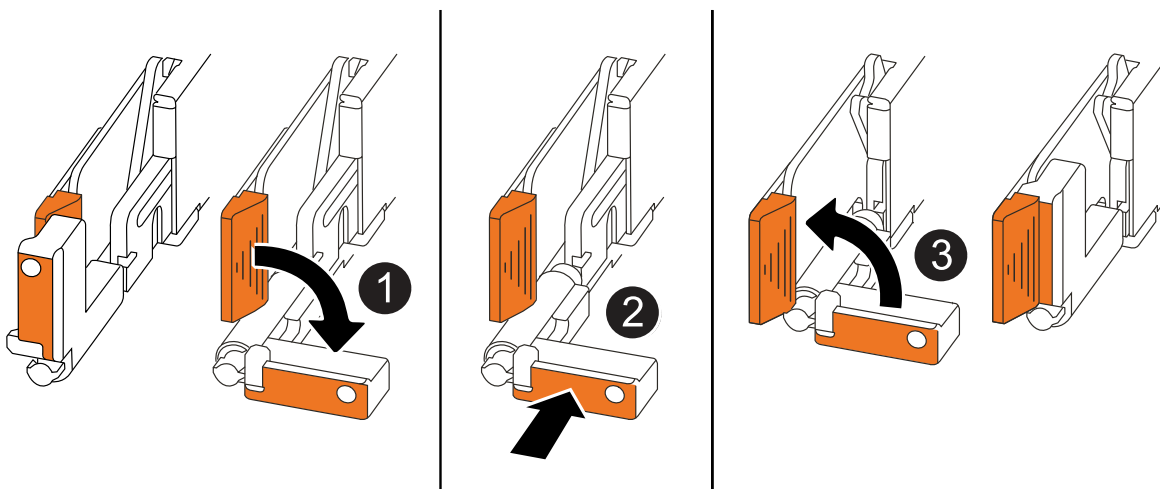
3. Insert the replacement fan by aligning it within the guides, and then push down until the fan connector is fully seated in the socket.

Step 4: Reinstall the controller module

Reinstall the controller into the chassis and reboot it.

About this task

The following illustration shows the operation of the controller handles (from the left side of a controller) when reinstalling the controller, and can be used as a reference for the rest of the controller reinstallation steps.



1	If you rotated the controller handles upright (next to the tabs) to move them out of the way while you serviced the controller, rotate them down to the horizontal position.
2	Push the handles to reinsert the controller into the chassis halfway and then, when instructed, push until the controller is fully seated.
3	Rotate the handles to the upright position and lock in place with the locking tabs.

Steps

1. Close the controller cover and turn the thumbscrew clockwise until tightened.
2. Insert the controller halfway into the chassis.

Align the rear of the controller with the opening in the chassis, and then gently push the controller using the handles.



Do not completely insert the controller in the chassis until instructed to do so.

3. Connect the console cable to the console port on the controller and to the laptop so that the laptop receives console messages when the controller reboots.
4. Fully seat the controller in the chassis:
 - a. Firmly push on the handles until the controller meets the midplane and is fully seated.



Do not use excessive force when sliding the controller into the chassis; it could damage the connectors.

- b. Rotate the controller handles up and lock in place with the tabs.



The controller begins to boot as soon as it is fully seated in the chassis.

5. Take the controller to the LOADER prompt by pressing CTRL-C to abort AUTOBOOT.
6. Set the time and date on the controller:

Make sure you are at the controller's LOADER prompt.

- a. Display the date and time on the controller:

```
show date
```



Time and date default is in GMT. You have the option to display in local time and in 24hr mode.

- b. Set the current time in GMT:

```
set time hh:mm:ss
```

You can get the current GMT from the healthy node:

```
date -u
```

c. Set the current date in GMT:

```
set date mm/dd/yyyy
```

You can get the current GMT from the healthy node:

```
date -u
```

7. Recable the controller as needed.
8. Reconnect the power cord to the power supply (PSU).

Once power is restored to the PSU, the status LED should be green.

If you are reconnecting a...	Then...
AC PSU	<ol style="list-style-type: none">1. Plug the power cord into the PSU.2. Secure the power cord with the power cord retainer.
DC PSU	<ol style="list-style-type: none">1. Plug the D-SUB DC power cord connector into the PSU.2. Tighten the two thumb screws to secure the D-SUB DC power cord connector to the PSU.

Step 5: 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.

I/O module

Overview of add and replace I/O module - ASA A20, ASA A30, and ASA A50

You can replace a failed I/O module in your storage system with the same type of I/O module, or with a different type of I/O module. You can also add an I/O module to a storage system with available slots.

- [Add an I/O module](#)

Adding additional I/O modules can improve redundancy, helping to ensure that the storage system remains operational even if one I/O module fails.

- [Replace an I/O module](#)

Replacing a failing I/O module can restore the storage system to its optimal operating state.

Add I/O module - ASA A20, ASA A30, and ASA A50

You can add an I/O module to your ASA A20, ASA A30, and ASA A50 storage systems when there are slots available or when all slots are fully populated.

About this task

If needed, you can turn on the storage system location (blue) LEDs to aid in physically locating the affected storage system. Log into the BMC using SSH and enter the `system location-led on` command.

A storage system has three location LEDs: one on the operator display panel and one on each controller. Location LEDs remain illuminated for 30 minutes.

You can turn them off by entering the `system location-led off` command. If you are unsure if the LEDs are on or off, you can check their state by entering the `system location-led show` command.

Step 1: Shut down the impaired controller module

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 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 <code>y</code> when prompted.
System prompt or password prompt (enter system password)	Halt or take over the impaired controller from the healthy controller: <pre>storage failover takeover -ofnode impaired_node_name</pre> When the impaired controller shows Waiting for giveback..., press Ctrl-C, and then respond <code>y</code> .

Step 2: Add the new I/O module

If the storage system has available 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 storage 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.
- All other components in the storage system must be functioning properly; if not, you must contact [NetApp Support](#) before continuing with this procedure.

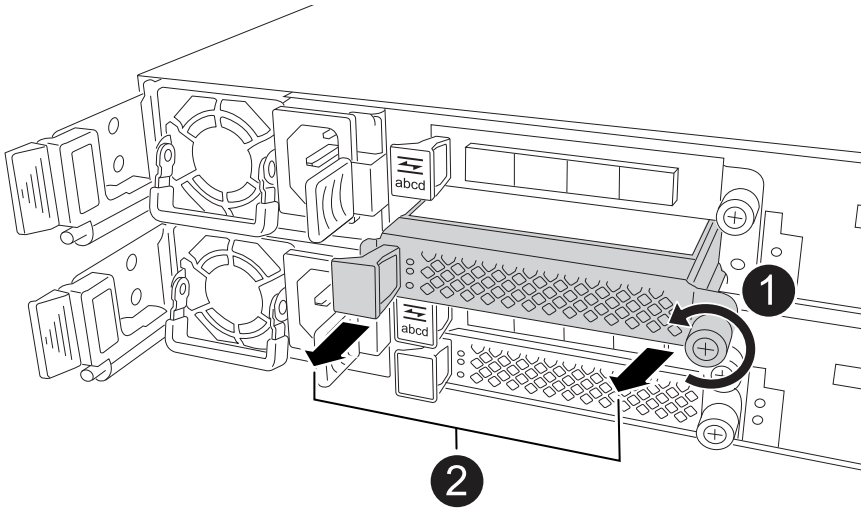
Add I/O module to an available slot

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

Steps

1. If you are not already grounded, properly ground yourself.
2. On the impaired controller, remove the I/O blanking module from the target slot.

Unused I/O slots should have blanking module installed to prevent possible thermal issues.



1	On the I/O blanking module, turn the thumbscrew counterclockwise to loosen.
2	Pull the I/O blanking module out of the controller using the tab on the left and the thumbscrew.

3. Install the new I/O module:
 - a. Align the I/O module with the edges of the controller slot opening.
 - b. Gently push the I/O module all the way into the slot, making sure to properly seat the module into the connector.

You can use the tab on the left and the thumbscrew to push in the I/O module.

- c. Turn the thumbscrew clockwise to tighten.

4. Cable the I/O module to the designated devices.

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

5. Reboot the impaired controller from the LOADER prompt: `bye`

Rebooting the impaired controller also reinitializes the I/O modules and other components.

6. Give back the impaired controller from the partner controller: `storage failover giveback -ofnode impaired_node_name`

7. Repeat these steps to add an I/O module to the other controller.
8. Restore automatic giveback from the console of the healthy controller: `storage failover modify -node local -auto-giveback true`
9. If AutoSupport is enabled, restore (unsuppress) automatic case creation: `system node autosupport invoke -node * -type all -message MAINT=END`

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.

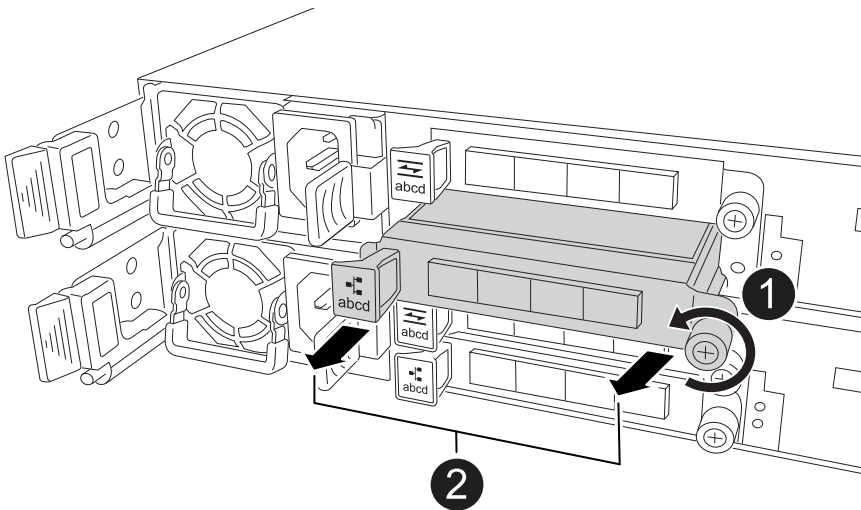
About this task

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. On the impaired controller, unplug any cabling on the target I/O module.
3. Remove the target I/O module from the controller:



- | | |
|----------|--|
| 1 | Turn the I/O module thumbscrew counterclockwise to loosen. |
|----------|--|

2

Pull the I/O module out of the controller using the port label tab on the left and the thumbscrew.

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

- a. Align the I/O module with the edges of the slot.
- b. Gently push the I/O module all the way into the slot, making sure to properly seat the module into the connector.

You can use the tab on the left and the thumbscrew to push in the I/O Module.

- c. Turn the thumbscrew clockwise to tighten.

5. Cable the I/O module to the designated devices.

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

6. Repeat the I/O module remove and install steps to add any additional I/O modules in the controller.

7. Reboot the impaired controller from the LOADER prompt: `bye`

Rebooting the impaired controller also reinitializes the I/O modules and other components.

8. Give back the impaired controller from the partner controller: `storage failover giveback -ofnode impaired_node_name`

9. Restore automatic giveback from the console of the healthy controller: `storage failover modify -node local -auto-giveback true`

10. If AutoSupport is enabled, restore (unsuppress) automatic case creation: `system node autosupport invoke -node * -type all -message MAINT=END`

11. If you installed a NIC module, specify the usage mode for each port as *network*: `storage port modify -node *<node name> -port *<port name> -mode network`

12. Repeat these steps for the other controller.

Replace I/O module - ASA A20, ASA A30, and ASA A50

Use this procedure to replace a failed I/O module.

Before you begin

All other components in the storage system must be functioning properly; if not, you must contact [NetApp Support](#) before continuing with this procedure.

About this task

If needed, you can turn on the storage system location (blue) LEDs to aid in physically locating the affected storage system. Log into the BMC using SSH and enter the `system location-led on` command.

A storage system has three location LEDs: one on the operator display panel and one on each controller. Location LEDs remain illuminated for 30 minutes.

You can turn them off by entering the `system location-led off` command. If you are unsure if the LEDs

are on or off, you can check their state by entering the `system location-led show` command.

Step 1: Shut down the impaired controller

Shut down or take over the impaired controller.

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.

About this task

- If you have a SAN system, you must have checked event messages (`cluster kernel-service show`) for the impaired controller SCSI blade. The `cluster kernel-service show` command (from `priv advanced` mode) displays the node name, **quorum status** of that node, availability status of that node, and operational status of that node.

Each SCSI-blade process should be in quorum with the other nodes in the cluster. Any issues must be resolved before you proceed with the replacement.

- 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:
`system node autosupport invoke -node * -type all -message MAINT=<# of hours>h`

The following AutoSupport message 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`



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

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 <code>y</code> when prompted.
System prompt or password prompt	Take over or halt the impaired controller from the healthy controller: <code>storage failover takeover -ofnode impaired_node_name</code> When the impaired controller shows <code>Waiting for giveback...</code> , press Ctrl-C, and then respond <code>y</code> .

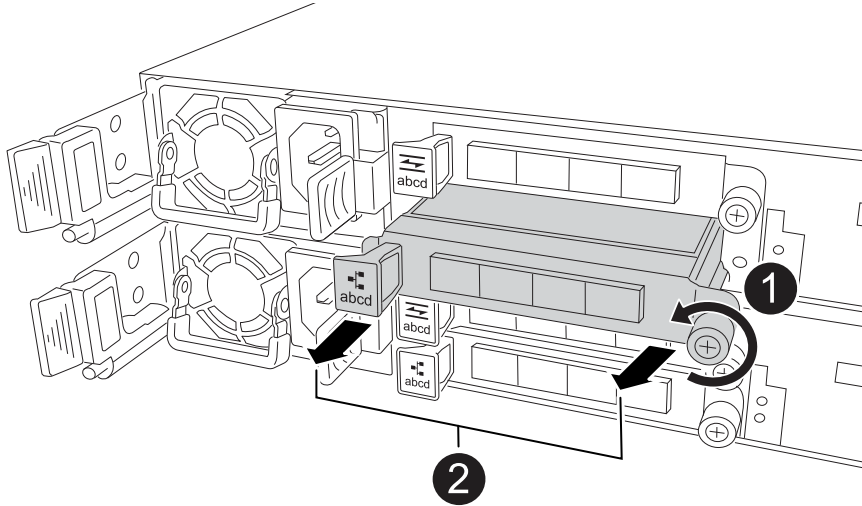
Step 2: Replace a failed I/O module

To replace a failed I/O module, locate it in the controller and follow the specific sequence of steps.

1. If you are not already grounded, properly ground yourself.
2. Unplug cabling from the failed I/O module.

Make sure to label the cables so that you know where they came from.

3. Remove the failed I/O module from the controller:



1	Turn the I/O module thumbscrew counterclockwise to loosen.
2	Pull the I/O module out of the controller using the port label tab on the left and the thumbscrew.

4. Install the replacement I/O module into the target slot:
 - a. Align the I/O module with the edges of the slot.
 - b. Gently push the I/O module all the way into the slot, making sure to properly seat the module into the connector.

You can use the tab on the left and the thumbscrew to push in the I/O Module.

- c. Turn the thumbscrew clockwise to tighten.

5. Cable the I/O module.

Step 3: Reboot the controller

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

Steps

1. Reboot the controller from the LOADER prompt: `bye`

Rebooting the impaired controller also reinitializes the I/O modules and other components.

2. Return the node to normal operation: `storage failover giveback -ofnode impaired_node_name`
3. Restore automatic giveback from the console of the healthy controller: `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.

Replace the NV battery - ASA A20, ASA A30, and ASA A50

To replace the NV battery, you must remove the controller, remove the faulty battery, install the replacement battery, and then reinstall the controller.

Before you begin

All other components in the storage system must be functioning properly; if not, you must contact [NetApp Support](#) before continuing with this procedure.

About this task

If needed, you can turn on the storage system location (blue) LEDs to aid in physically locating the affected storage system. Log into the BMC using SSH and enter the `system location-led on` command.

A storage system has three location LEDs: one on the operator display panel and one on each controller. Location LEDs remain illuminated for 30 minutes.

You can turn them off by entering the `system location-led off` command. If you are unsure if the LEDs are on or off, you can check their state by entering the `system location-led show` command.

Step 1: Shut down the impaired controller

Shut down or take over the impaired controller.

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.

About this task

- If you have a SAN system, you must have checked event messages (`cluster kernel-service show`) for the impaired controller SCSI blade. The `cluster kernel-service show` command (from `priv advanced` mode) displays the node name, [quorum status](#) of that node, availability status of that node, and operational status of that node.

Each SCSI-blade process should be in quorum with the other nodes in the cluster. Any issues must be resolved before you proceed with the replacement.

- 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:

```
system node autosupport invoke -node * -type all -message MAINT=<# of hours>h
```

The following AutoSupport message 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`



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

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 <i>y</i> when prompted.
System prompt or password prompt	Take over or halt the impaired controller from the healthy controller: <code>storage failover takeover -ofnode impaired_node_name</code> When the impaired controller shows Waiting for giveback..., press Ctrl-C, and then respond <i>y</i> .

Step 2: Remove the controller

You must remove the controller from the chassis when you replace the controller or replace a component inside the controller.

Before you begin

All other components in the storage system must be functioning properly; if not, you must contact [NetApp Support](#) before continuing with this procedure.

Steps

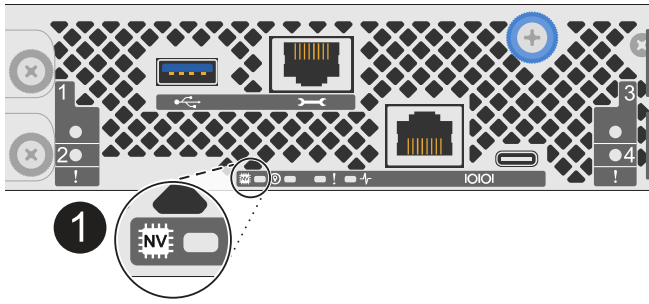
1. On the impaired controller, make sure the NV LED is off.

When the NV LED is off, destaging is complete and it is safe to remove the impaired controller.




If the NV LED is flashing (green), destage is in progress. You must wait for the NV LED to turn off. However, if the flashing continues for longer than five minutes, contact [NetApp Support](#) before continuing with this procedure.

The NV LED is located next to the NV icon on the controller.



1	NV icon and LED on the controller
----------	-----------------------------------

2. If you are not already grounded, properly ground yourself.
3. Disconnect the power on the impaired controller:

 Power supplies (PSUs) do not have a power switch.

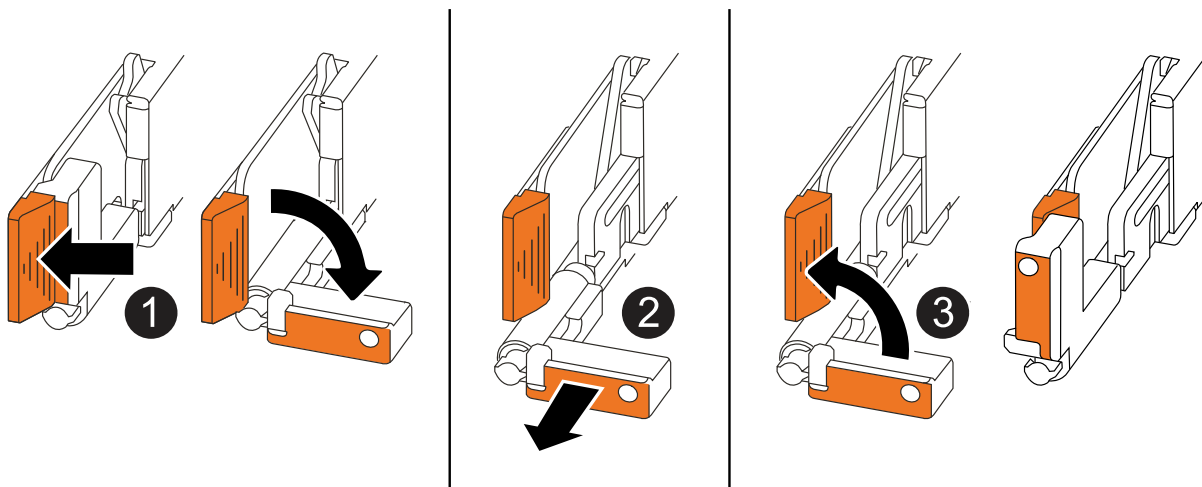
If you are disconnecting a...	Then...
AC PSU	<ol style="list-style-type: none"> 1. Open the power cord retainer. 2. Unplug the power cord from the PSU and set it aside.
DC PSU	<ol style="list-style-type: none"> 1. Unscrew the two thumb screws on the D-SUB DC power cord connector. 2. Unplug the power cord from the PSU and set it aside.

4. Unplug all cables from the impaired controller.

Keep track of where the cables were connected.

5. Remove the impaired controller:

The following illustration shows the operation of the controller handles (from the left side of the controller) when removing a controller:



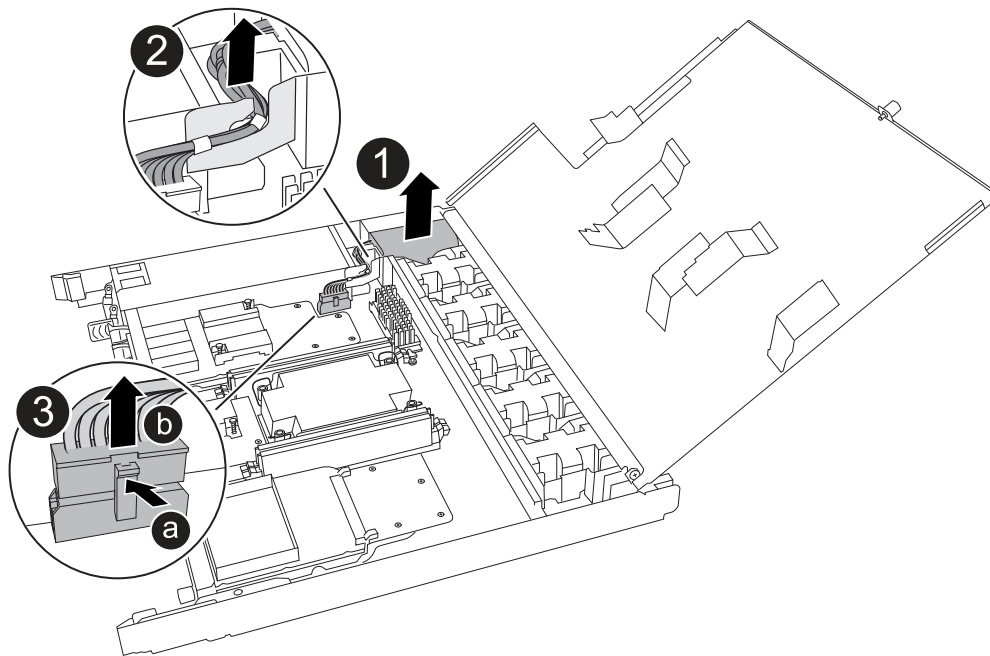
<p>1</p>	<p>On both ends of the controller, push the vertical locking tabs outward to release the handles.</p>
<p>2</p>	<ul style="list-style-type: none"> • Pull the handles towards you to unseat the controller from the midplane. <p>As you pull, the handles extend out from the controller and then you feel some resistance, keep pulling.</p> <ul style="list-style-type: none"> • Slide the controller out of the chassis while supporting the bottom of the controller, and place it on a flat, stable surface.
<p>3</p>	<p>If needed, rotate the handles upright (next to the tabs) to move them out of the way.</p>

6. Open the controller cover by turning the thumbscrew counterclockwise to loosen, and then open the cover.

Step 3: Replace the NV battery

Remove the failed NV battery from the controller and install the replacement NV battery.

1. If you are not already grounded, properly ground yourself.
2. Locate the NV battery.
3. Remove the NV battery:



<p>1</p>	<p>Lift the NV battery up and out of its compartment.</p>
<p>2</p>	<p>Remove the wiring harness from its retainer.</p>

3

1. Push in and hold the tab on the connector.
2. Pull the connector up and out of the socket.

As you pull up, gently rock the connector from end to end (lengthwise) to unseat it.

4. Install the replacement NV battery:

- a. Remove the replacement battery from its package.
- b. Plug the wiring connector into its socket.
- c. Route the wiring along the side of the power supply, into its retainer, and then through the channel in front of the NV battery compartment.
- d. Place the NV battery into its compartment.

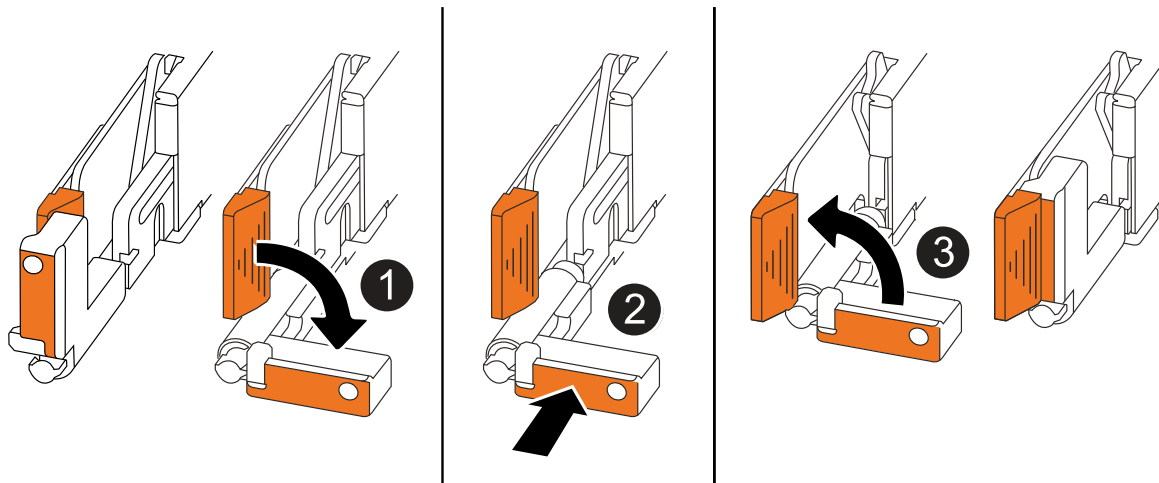
The NV battery should sit flush in its compartment.

Step 4: Reinstall the controller

Reinstall the controller into the chassis and reboot it.

About this task

The following illustration shows the operation of the controller handles (from the left side of a controller) when reinstalling the controller, and can be used as a reference for the rest of the controller reinstallation steps.



1	If you rotated the controller handles upright (next to the tabs) to move them out of the way while you serviced the controller, rotate them down to the horizontal position.
2	Push the handles to reinsert the controller into the chassis halfway and then, when instructed, push until the controller is fully seated.
3	Rotate the handles to the upright position and lock in place with the locking tabs.

Steps

1. Close the controller cover and turn the thumbscrew clockwise until tightened.
2. Insert the controller halfway into the chassis.

Align the rear of the controller with the opening in the chassis, and then gently push the controller using the handles.



Do not completely insert the controller in the chassis until instructed to do so.

3. Connect the console cable to the console port on the controller and to the laptop so that the laptop receives console messages when the controller reboots.
4. Fully seat the controller in the chassis:
 - a. Firmly push on the handles until the controller meets the midplane and is fully seated.



Do not use excessive force when sliding the controller into the chassis; it could damage the connectors.

- b. Rotate the controller handles up and lock in place with the tabs.



The controller begins to boot as soon as it is fully seated in the chassis.

5. Take the controller to the LOADER prompt by pressing CTRL-C to abort AUTOBOOT.
6. Set the time and date on the controller:

Make sure you are at the controller's LOADER prompt.

- a. Display the date and time on the controller:

```
show date
```



Time and date default is in GMT. You have the option to display in local time and in 24hr mode.

- b. Set the current time in GMT:

```
set time hh:mm:ss
```

You can get the current GMT from the healthy node:

```
date -u
```

- c. Set the current date in GMT:

```
set date mm/dd/yyyy
```

You can get the current GMT from the healthy node:

```
date -u
```

7. Recable the controller as needed.
8. Reconnect the power cord to the power supply (PSU).

Once power is restored to the PSU, the status LED should be green.

If you are reconnecting a...	Then...
AC PSU	<ol style="list-style-type: none">1. Plug the power cord into the PSU.2. Secure the power cord with the power cord retainer.
DC PSU	<ol style="list-style-type: none">1. Plug the D-SUB DC power cord connector into the PSU.2. Tighten the two thumb screws to secure the D-SUB DC power cord connector to the PSU.

Step 5: 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.

Replace a power supply - ASA A20, ASA A30, and ASA A50

Replacing a power supply (PSU) involves disconnecting the faulty PSU from the power source, unplugging the power cord, removing the faulty PSU and installing the replacement PSU, and then reconnecting it to the power source.

About this task

- This procedure is written for replacing one PSU at a time.

The PSUs are redundant and hot-swappable.

- **IMPORTANT:** Do not mix PSUs with different efficiency ratings or different input types. Always replace like for like.
- Use the appropriate procedure for your type of PSU: AC or DC.
- If needed, you can turn on the storage system location (blue) LEDs to aid in physically locating the affected storage system. Log into the BMC using SSH and enter the `system location-led on` command.

A storage system has three location LEDs: one on the operator display panel and one on each controller. Location LEDs remain illuminated for 30 minutes.

You can turn them off by entering the `system location-led off` command. If you are unsure if the LEDs are on or off, you can check their state by entering the `system location-led show` command.

Option 1: Replace an AC PSU

To replace an AC PSU, complete the following steps.

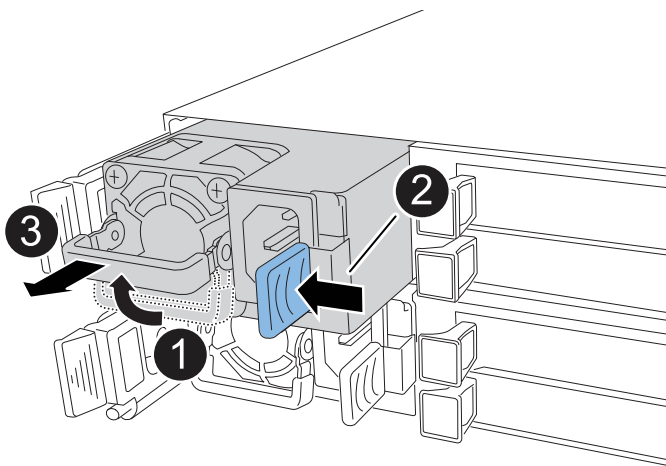
Steps

1. If you are not already grounded, properly ground yourself.
2. Identify the faulty PSU based on console error messages or through the red Attention LED on the PSU.
3. Disconnect the power cord from the PSU by opening the power cord retainer, and then unplug the power cord from the PSU.



PSUs do not have a power switch.

4. Remove the PSU:



1	Rotate the PSU handle up, to its horizontal position, and then grasp it.
2	With your thumb, press the blue tab to release the PSU from the controller.
3	<p>Pull the PSU out of the controller while using your other hand to support its weight.</p> <div data-bbox="495 1493 550 1549"></div> <p>The PSU is short. Always use two hands to support it when removing it from the controller so that it does not suddenly swing free from the controller and injure you.</p>

5. Install the replacement PSU:
 - a. Using both hands, support and align the edges of the PSU with the opening in the controller.
 - b. Gently push the PSU into the controller until the locking tab clicks into place.

A PSU will only properly engage with the internal connector and lock in place one way.



To avoid damaging the internal connector, do not use excessive force when sliding the PSU into the controller.

- c. Rotate the handle down, so it is out of the way of normal operations.
6. Reconnect the power cord to the PSU and secure the power cord with the power cord retainer.

Once power is restored to the PSU, the status LED should be green.

7. 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.

Option 2: Replace a DC PSU

To replace a DC PSU, complete the following steps.

Steps

1. If you are not already grounded, properly ground yourself.
2. Identify the faulty PSU based on console error messages or through the red Attention LED on the PSU.
3. Disconnect the PSU:



PSUs do not have a power switch.

- a. Unscrew the two thumb screws on the D-SUB DC power cord connector.

The illustration and table in step 4 shows the two thumb screws (item #1) and the D-SUB DC power cord connector (item #2).

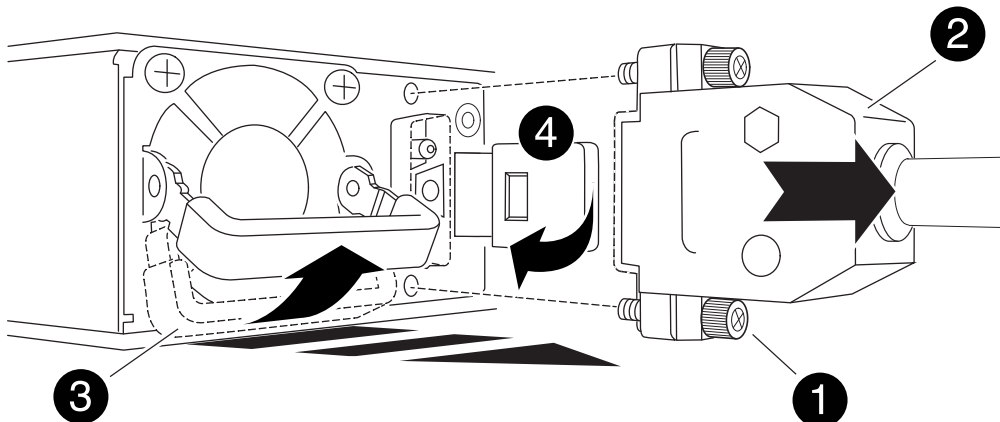
- b. Unplug the cord from the PSU and set it aside.

4. Remove the PSU:

- a. Rotate the handle up, to its horizontal position, and then grasp it.
- b. With your thumb, press the terracotta tab to release the locking mechanism.
- c. Pull the PSU out of the controller while using your other hand to support its weight.



The PSU is short. Always use two hands to support it when removing it from the controller so that it does not swing free from the controller and injure you.



1	Thumb screws
2	D-SUB DC power PSU cord connector
3	Power supply handle
4	Terracotta PSU locking tab

5. Insert the replacement PSU:

- a. Using both hands, support and align the edges of the PSU with the opening in the controller.
- b. Gently slide the PSU into the controller until the locking tab clicks into place.

A PSU must properly engage with the internal connector and locking mechanism. Repeat this step if you feel the PSU is not properly seated.



To avoid damaging the internal connector, do not use excessive force when sliding the PSU into the controller.

- c. Rotate the handle down, so it is out of the way of normal operations.

6. Reconnect the D-SUB DC power cord:

Once power is restored to the PSU, the status LED should be green.

- a. Plug the D-SUB DC power cord connector into the PSU.
 - b. Tighten the two thumb screws to secure the D-SUB DC power cord connector to the PSU.
7. 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.

Replace the real-time clock battery - ASA A20, ASA A30, and ASA A50

You replace the real-time clock (RTC) battery in the controller so that your storage system's services and applications that depend on accurate time synchronization continue to function.

Before you begin

All other components in the storage system must be functioning properly; if not, you must contact [NetApp Support](#) before continuing with this procedure.

About this task

- You can use this procedure with all versions of ONTAP supported by your storage system.
- If needed, you can turn on the storage system location (blue) LEDs to aid in physically locating the affected storage system. Log into the BMC using SSH and enter the `system location-led on` command.

A storage system has three location LEDs: one on the operator display panel and one on each controller. Location LEDs remain illuminated for 30 minutes.

You can turn them off by entering the `system location-led off` command. If you are unsure if the LEDs are on or off, you can check their state by entering the `system location-led show` command.

Step 1: Shut down the impaired controller

Shut down or take over the impaired controller.

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.

About this task

- If you have a SAN system, you must have checked event messages (`cluster kernel-service show`) for the impaired controller SCSI blade. The `cluster kernel-service show` command (from `priv advanced` mode) displays the node name, **quorum status** of that node, availability status of that node, and operational status of that node.

Each SCSI-blade process should be in quorum with the other nodes in the cluster. Any issues must be resolved before you proceed with the replacement.

- 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:
`system node autosupport invoke -node * -type all -message MAINT=<# of hours>h`

The following AutoSupport message 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`



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

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 <code>y</code> when prompted.

If the impaired controller is displaying...	Then...
System prompt or password prompt	Take over or halt the impaired controller from the healthy controller: <pre>storage failover takeover -ofnode impaired_node_name</pre> When the impaired controller shows Waiting for giveback..., press Ctrl-C, and then respond <i>y</i> .

Step 2: Remove the controller

You must remove the controller from the chassis when you replace the controller or replace a component inside the controller.

Before you begin

All other components in the storage system must be functioning properly; if not, you must contact [NetApp Support](#) before continuing with this procedure.

Steps

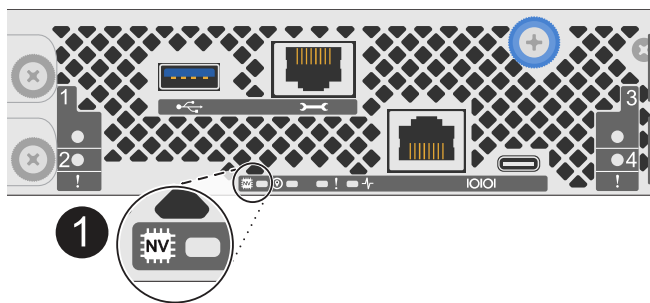
1. On the impaired controller, make sure the NV LED is off.

When the NV LED is off, destaging is complete and it is safe to remove the impaired controller.



If the NV LED is flashing (green), destage is in progress. You must wait for the NV LED to turn off. However, if the flashing continues for longer than five minutes, contact [NetApp Support](#) before continuing with this procedure.

The NV LED is located next to the NV icon on the controller.



	NV icon and LED on the controller
--	-----------------------------------

2. If you are not already grounded, properly ground yourself.
3. Disconnect the power on the impaired controller:



Power supplies (PSUs) do not have a power switch.

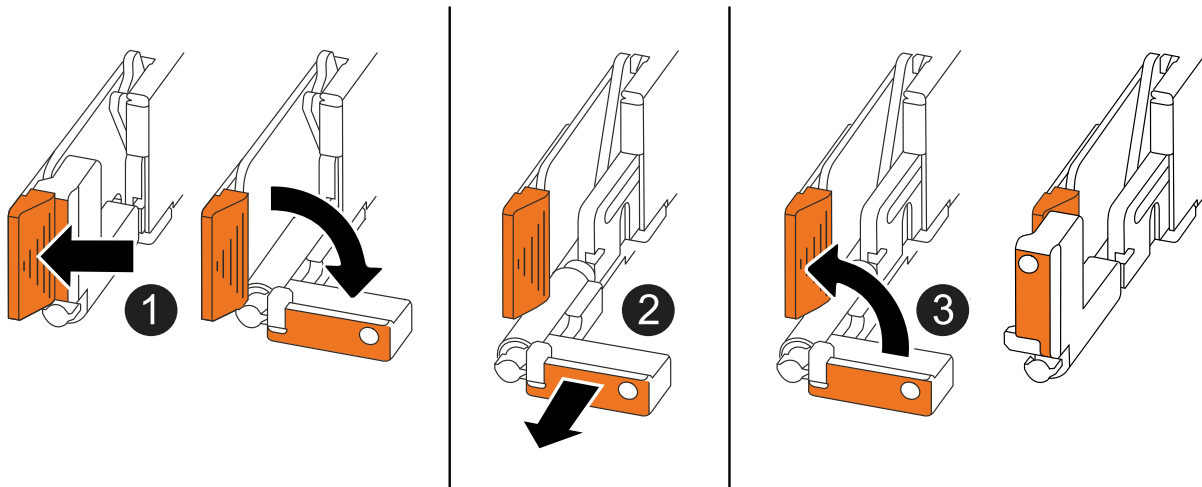
If you are disconnecting a...	Then...
AC PSU	<ol style="list-style-type: none"> 1. Open the power cord retainer. 2. Unplug the power cord from the PSU and set it aside.
DC PSU	<ol style="list-style-type: none"> 1. Unscrew the two thumb screws on the D-SUB DC power cord connector. 2. Unplug the power cord from the PSU and set it aside.

4. Unplug all cables from the impaired controller.

Keep track of where the cables were connected.

5. Remove the impaired controller:

The following illustration shows the operation of the controller handles (from the left side of the controller) when removing a controller:



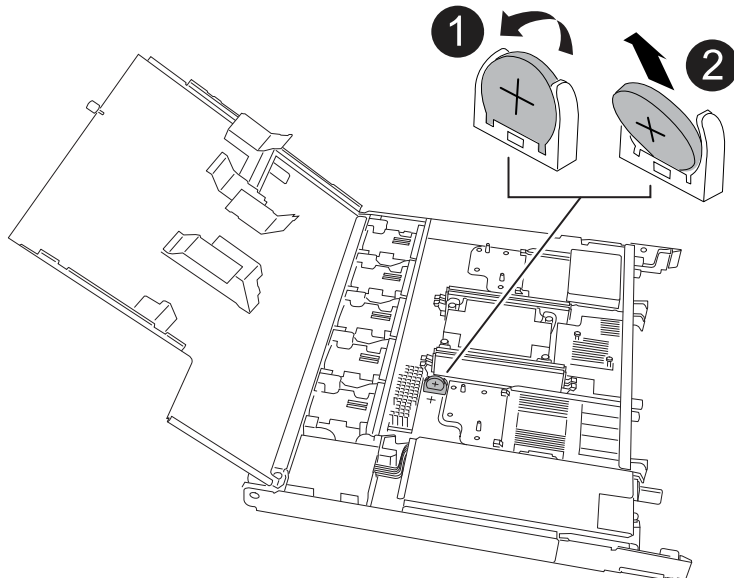
1	On both ends of the controller, push the vertical locking tabs outward to release the handles.
2	<ul style="list-style-type: none"> • Pull the handles towards you to unseat the controller from the midplane. <p>As you pull, the handles extend out from the controller and then you feel some resistance, keep pulling.</p> <ul style="list-style-type: none"> • Slide the controller out of the chassis while supporting the bottom of the controller, and place it on a flat, stable surface.
3	If needed, rotate the handles upright (next to the tabs) to move them out of the way.

6. Open the controller cover by turning the thumbscrew counterclockwise to loosen, and then open the cover.

Step 3: Replace the RTC battery

Remove the failed RTC battery and install the replacement RTC battery.

1. Locate the RTC battery.
2. Remove the RTC battery:



1	Gently rotate the RTC battery at an angle away from its holder.
2	Lift the RTC battery out of its holder.

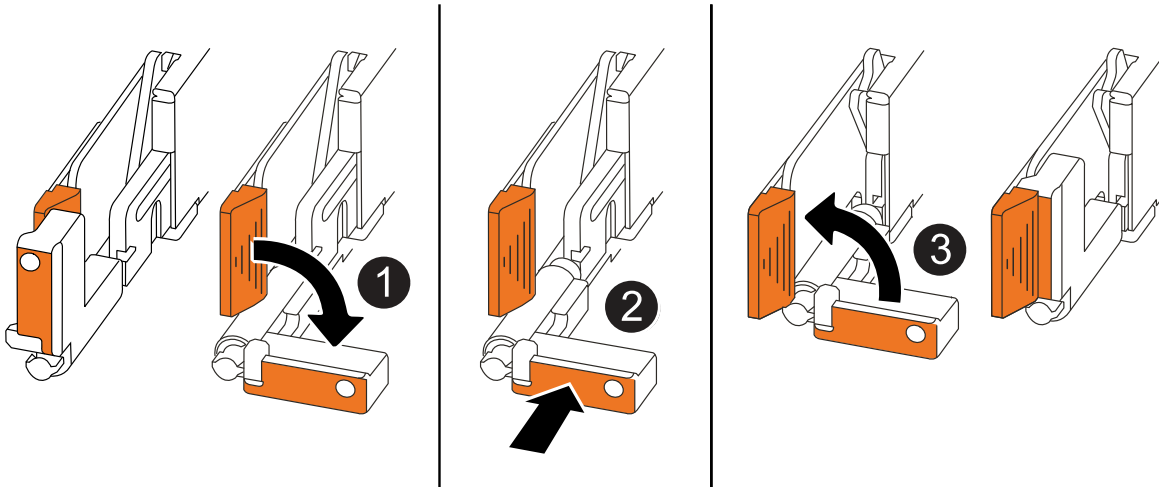
3. Install the replacement RTC battery:
 - a. Remove the replacement battery from the antistatic shipping bag.
 - b. Position the battery so that the plus sign on the battery faces out to correspond with the plus sign on the motherboard.
 - c. Insert the battery into the holder at an angle, and then push it into an upright position so it is fully seated in the holder.
 - d. Visually inspect the battery to make sure that it is completely seated in its holder and that the polarity is correct.

Step 4: Reinstall the controller

Reinstall the controller into the chassis and reboot it.

About this task

The following illustration shows the operation of the controller handles (from the left side of a controller) when reinstalling the controller, and can be used as a reference for the rest of the controller reinstallation steps.



1	If you rotated the controller handles upright (next to the tabs) to move them out of the way while you serviced the controller, rotate them down to the horizontal position.
2	Push the handles to reinsert the controller into the chassis halfway and then, when instructed, push until the controller is fully seated.
3	Rotate the handles to the upright position and lock in place with the locking tabs.

Steps

1. Close the controller cover and turn the thumbscrew clockwise until tightened.
2. Insert the controller halfway into the chassis.

Align the rear of the controller with the opening in the chassis, and then gently push the controller using the handles.



Do not completely insert the controller in the chassis until instructed to do so.

3. Connect the console cable to the console port on the controller and to the laptop so that the laptop receives console messages when the controller reboots.
4. Fully seat the controller in the chassis:
 - a. Firmly push on the handles until the controller meets the midplane and is fully seated.



Do not use excessive force when sliding the controller into the chassis; it could damage the connectors.

- b. Rotate the controller handles up and lock in place with the tabs.



The controller begins to boot as soon as it is fully seated in the chassis.

5. Take the controller to the LOADER prompt by pressing CTRL-C to abort AUTOBOOT.
6. Set the time and date on the controller:

Make sure you are at the controller's LOADER prompt.

a. Display the date and time on the controller:

```
show date
```



Time and date default is in GMT. You have the option to display in local time and in 24hr mode.

b. Set the current time in GMT:

```
set time hh:mm:ss
```

You can get the current GMT from the healthy node:

```
date -u
```

c. Set the current date in GMT:

```
set date mm/dd/yyyy
```

You can get the current GMT from the healthy node:

```
date -u
```

7. Recable the controller as needed.

8. Reconnect the power cord to the power supply (PSU).

Once power is restored to the PSU, the status LED should be green.

If you are reconnecting a...	Then...
AC PSU	<ol style="list-style-type: none">1. Plug the power cord into the PSU.2. Secure the power cord with the power cord retainer.
DC PSU	<ol style="list-style-type: none">1. Plug the D-SUB DC power cord connector into the PSU.2. Tighten the two thumb screws to secure the D-SUB DC power cord connector to the PSU.

Step 5: Reset the time and date on the controller



After replacing the RTC battery, inserting the controller and powering on first BIOS reset, you will see the following error messages: `RTC date/time error. Reset date/time to default` `RTC power failure error` These messages are expected and you can continue with this procedure.

1. On the healthy controller, check the date and time with the `cluster date show` command.



If your storage system stops at the boot menu, select the option for `Reboot node` and respond `y` when prompted, then boot to `LOADER` by pressing `Ctrl-C`.

2. On the impaired controller, at the `LOADER` prompt, check the time and date: `cluster date show`

- a. If necessary, modify the date: `set date mm/dd/yyyy`
 - b. If necessary, set the time, in GMT: `set time hh:mm:ss`
 - c. Confirm the date and time.
3. At the LOADER prompt, enter `bye` to reinitialize the I/O modules, other components, and let the controller reboot.
 4. Return the controller to normal operation by giving back its storage: `storage failover giveback -ofnode impaired_node_name`
 5. If automatic giveback was disabled, reenable it: `storage failover modify -node local -auto-giveback true`

Step 6: 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.

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