

Replacing an NVRAM adapter

You can replace the battery FRU, the NVRAM8 adapter FRU, or, if necessary, both. To replace the NVRAM adapter you must remove the faulty adapter from the system and install the new one in the system chassis. To replace only the battery, you must remove the NVRAM adapter, replace the battery on the adapter, and reinstall the adapter. Because the system ID is derived from the NVRAM adapter, if replacing the adapter, disks belonging to the system are reassigned to the new system ID.

This procedure applies only to systems running
Data ONTAP® 8.2
or later versions

Before you begin

- All disk shelves must be working properly.
- If your system is in an HA pair, the partner node must be able to take over the node containing the adapter that is being replaced.

About this task

The steps for verifying the system ID change are required only if you are replacing the NVRAM adapter. If you are only replacing the battery, the system ID does not change.

- This procedure is for systems running Data ONTAP 8.2 and later.
- This procedure uses the following terminology:
 - The *impaired node* is the node on which you are performing maintenance.
 - The *healthy node* is the HA partner of the impaired node.
- This procedure includes steps for automatically or manually reassigning disks to the controller module with the new NVRAM adapter, depending on your system's configuration.
If required, you should be sure to reassign the disks when directed to in the procedure. Completing the disk reassignment before giveback can cause issues.
- In these procedures, *NVRAM* refers to the NVRAM8 adapter and its components.
- You must replace the failed component with a replacement FRU component you received from your provider.
- You cannot change any disks or disk shelves as part of this procedure.

- The term *system* refers to FAS, V-Series, and SA (FlexCache) systems within this platform family. The procedures apply to all platforms, unless otherwise indicated, except that clustered Data ONTAP procedures do not apply to SA systems.

Choices

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Replacing a NVRAM adapter in 7-Mode environments

You must follow a specific series of steps to replace the NVRAM adapter for your mode and version of Data ONTAP.

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Pre-replacement tasks for Storage Encryption configurations

If the storage system whose NVRAM adapter you are replacing is configured to use Storage Encryption, you must first reset the authentication keys of the disks to their MSID (the default security ID set by the manufacturer). This is a temporary necessity during the NVRAM adapter replacement process to avoid any chance of losing access to the data.

About this task

After resetting the authentication keys to the MSID, the data on the disks is no longer encrypted with secret authentication keys. You must ensure the physical safety of the disks during the replacement or upgrade process.

Steps

1. Display the key ID for each self-encrypting disk on the original system by entering the following command at the system prompt:

```
disk encrypt show
```

Example

```
disk encrypt show
Disk      Key ID                                     Locked?
0c.00.1   0x0                                         No
0c.00.0   080CF0C80000000001000000000000A948EE8604F4598ADFFB185B5BB7FED3  Yes
0c.00.3   080CF0C80000000001000000000000A948EE8604F4598ADFFB185B5BB7FED3  Yes
0c.00.4   080CF0C80000000001000000000000A948EE8604F4598ADFFB185B5BB7FED3  Yes
0c.00.2   080CF0C80000000001000000000000A948EE8604F4598ADFFB185B5BB7FED3  Yes
0c.00.5   080CF0C80000000001000000000000A948EE8604F4598ADFFB185B5BB7FED3  Yes
```

The first disk in the example is associated with an MSID; the others are associated with a non-MSID.

2. Examine the output of the `disk encrypt show` command, and if any disks are associated with a non-MSID key, rekey them to an MSID key by taking one of the following actions:
 - To rekey disks individually, enter the following command, once for each disk:
`disk encrypt rekey 0x0 disk_name`
 - To rekey all disks at once, enter the following command:
`disk encrypt rekey 0x0 *`
3. Ensure that all the self-encrypting disks are associated with an MSID by entering the following command and examining the output:
`disk encrypt show`

Example

The following example shows the output of the `disk encrypt show` command when all self-encrypting disks are associated with an MSID:

```
cluster::> disk encrypt show
Disk      Key ID                                     Locked?
-----
0b.10.23  0x0                                       No
0b.10.18  0x0                                       No
0b.10.0   0x0                                       Yes
0b.10.12  0x0                                       Yes
0b.10.3   0x0                                       No
0b.10.15  0x0                                       No
0a.00.1   0x0                                       Yes
0a.00.2   0x0                                       Yes
```

Shutting down a node operating in 7-Mode

When performing maintenance on a system operating in 7-Mode, you must shut down the node. Depending on your system's configuration, you might also need to turn off the power supplies.

About this task

Your system's configuration determines whether you turn off the power supplies after shutting down the node:

- If you have two controller modules in the same chassis, you must leave the power supplies turned on to provide power to the healthy node.
- If you have one controller module in the chassis that is either part of an HA pair or in a stand-alone configuration, you must turn off the power supplies in the impaired node chassis.

Shutting down a node in an HA pair

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

Steps

1. Check the HA status of the impaired node by entering the following command from either node in the HA pair that is displaying the Data ONTAP prompt:
`cf status`
2. Take the appropriate action based on the takeover status of the node.

If the impaired node...	Then...
Has been taken over by the healthy node and is halted	Go to the next step.
Has not been taken over by the healthy node and is running	Enter the following command from the prompt of the healthy node: cf takeover

- Wait at least two minutes after takeover of the impaired node to ensure that the takeover was completed successfully.
- With the impaired node showing the `waiting for giveback` message or halted, shut it down, depending on your configuration:

If the Service Processor (SP)...	Then...
Is configured	Log in to the SP and enter the following command: system power off
Is not configured, and the system is in a dual-chassis HA pair in which each controller is in a separate chassis	Manually shut down the power supplies on the impaired node.
Is not configured, and the system is in a single-chassis HA pair in which both controllers are in the same chassis and share power supplies	At the prompt of the impaired node, press Ctrl-C and respond Y to halt the node.

- If the nodes are in a dual-chassis HA pair, unplug the impaired node power cords from the power source.

Shutting down a node in a stand-alone configuration

For a node that is not configured with a high-availability (HA) partner, you must perform a clean shutdown (ensuring that all data has been written to disk) and disconnect the power supplies.

Steps

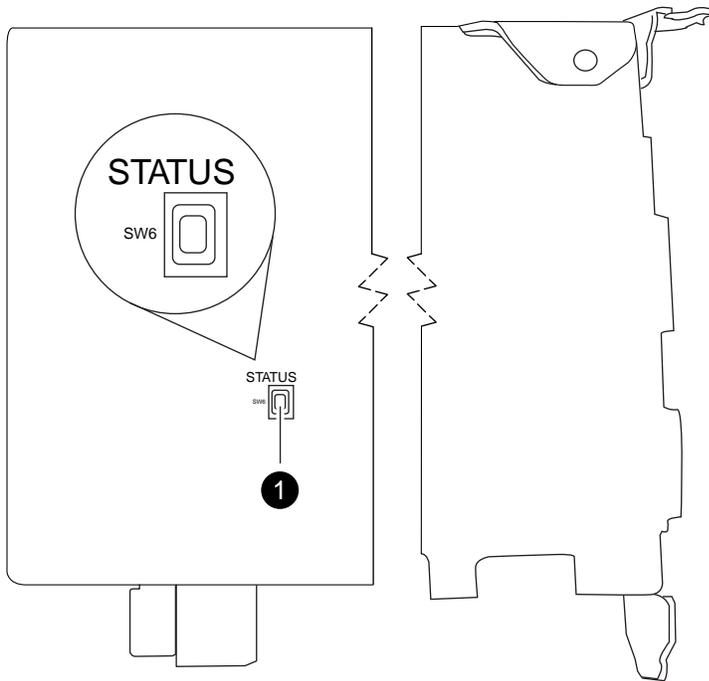
- Shut down the node if it is not already shut down:
`halt -t 0`
- Shut down the power supplies and unplug both power cords from the source.
The system is ready for maintenance.

Verifying that the new NVRAM adapter has no content in memory

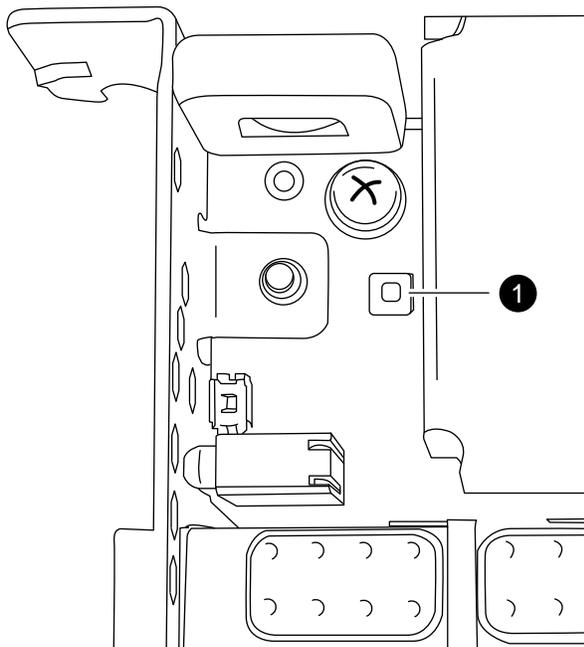
Before installing a replacement NVRAM adapter, you must ensure that the *new* NVRAM adapter (the adapter that is going to replace the bad adapter) has no content in the memory to avoid problems that might occur when it is installed in the system.

Steps

- While pressing down the status button on the bottom of the NVRAM adapter, check the destage status LED on the board.



1 Button for activating the destage status LED

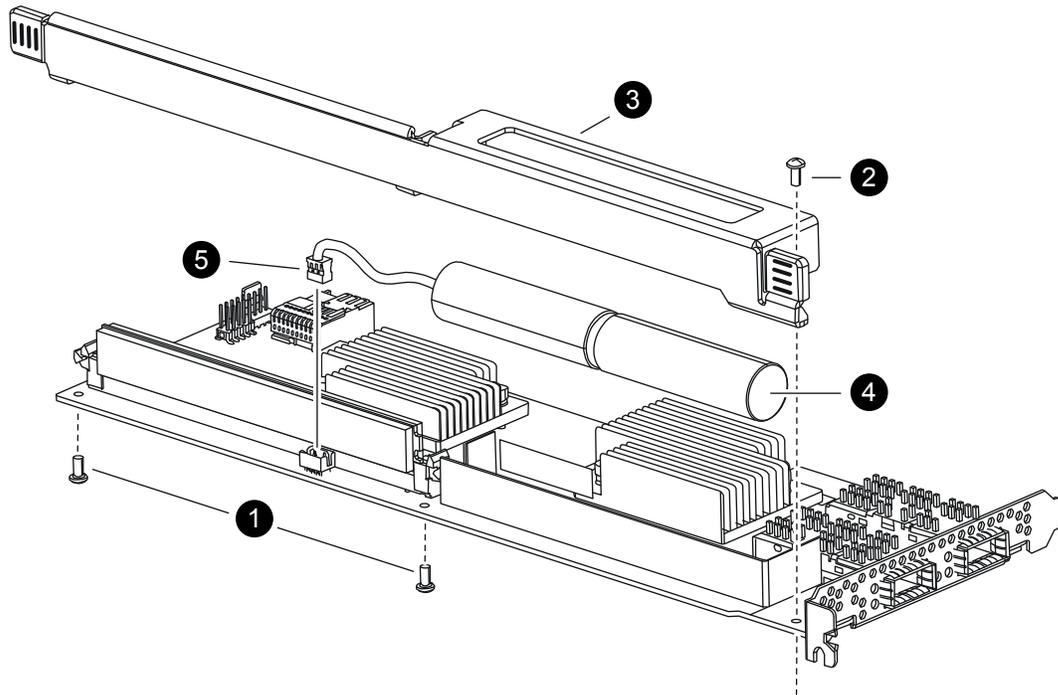


1 Destage status LED
The LED remains illuminated while the destage status button is pressed.

If the LED is...	Then...
Green	The system was cleanly shut down and there is no customer data on the adapter.
Red	The adapter has content in the onboard flash.

If the LED is...	Then...
Amber	This adapter is in an illegal or undefined state, typically caused by an unknown failure. You should not use the adapter when you encounter this status.

2. If the NVRAM adapter has content in the onboard flash, disconnect the battery to clear the flash:
 - a. Using the Phillips screwdriver, remove the three battery cover screws; there are two screws on the back of the adapter and one on the front near the lifting tab. After removing the screws, set them aside.



1	Back battery cover screws
2	Front battery cover screw
3	Battery cover
4	NVRAM battery
5	NVRAM battery plug

- b. Slide the battery cover toward the top of the adapter until the screw mounting tabs clear the adapter, and then lift the battery cover clear.
- c. Unplug the battery cable from the NVRAM adapter.
- d. Wait a few seconds and then reattach the battery cable.

Align the battery plug with the edge of the socket on the NVRAM adapter, and then plug in the battery and make sure that the cable connector has Pin 1 (arrow) facing toward the NVRAM adapter when installing it.

- e. Press the status button and recheck the destage LED as described in Step 1 to confirm the onboard flash is clear.
- f. Secure the battery holder to the NVRAM adapter using the screws you removed when detaching the battery holder.

Attention: Do not over-tighten the cover screws because doing so could crack the adapter.

Removing cables and media adapters from the NVRAM adapter

Before you remove the old NVRAM adapter from the controller module, you must remove the cables and, if you are using fiber interconnect cables, the media adapters.

Steps

1. If you are not already grounded, properly ground yourself.
2. Remove the cables and carefully remove any media converters (QSFPs) from the NVRAM adapter.
Leave the cables in the cable management tray so that when you reinstall the cable management tray, the cables are already aligned.

Opening the system

If you want to access components inside the controller module, you must open the system.

Steps

1. If you are not already grounded, properly ground yourself.
2. Loosen the hook and loop strap binding the cables to the cable management tray, and then unplug the system cables and SFPs (if needed) from the controller module, and keep track of where the cables were connected.
Leave the cables in the cable management tray so that when you reinstall the cable management tray, the cables are organized.
3. Grasp the cable management tray by the side, gently push one side of the tray so that the arm slides across and off the retaining pin, slide the other arm off the retaining pin on the other side of the controller module, and then lift it off the back of the controller module and set it aside.
4. Loosen the screw on the cam handle.
5. Pull the cam handle downward and slide the controller module out of the system until it catches.
6. Push in the release latch on the left side of the controller module and slide the controller module out of the system and set it on a stable, antistatic surface.

Make sure that you support the bottom of the controller module with your free hand.

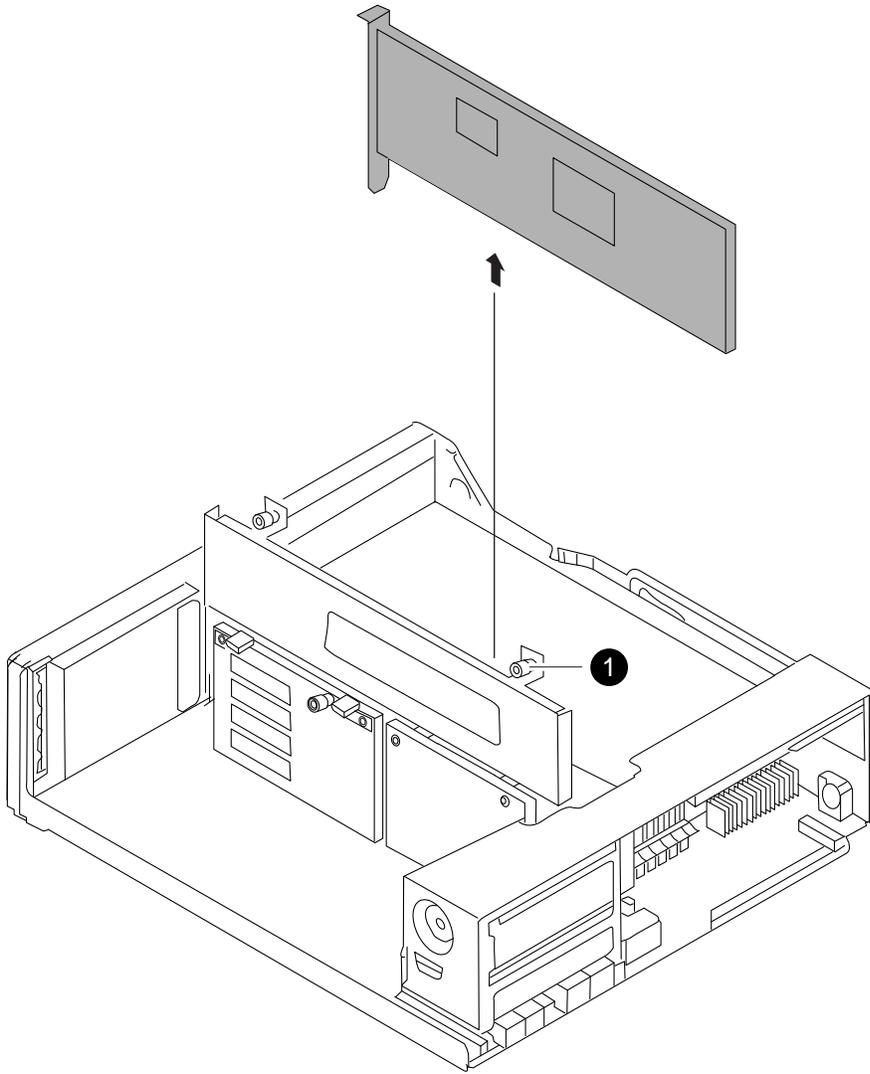
Removing the NVRAM adapter

When you remove the NVRAM adapter from the controller module, you must perform a specific sequence of steps.

Steps

1. Check the NVRAM adapter to make sure that all LEDs are off, and then loosen the two thumbscrews on the NVRAM/storage adapter cover and remove the cover.

The NVRAM/storage adapter cover is located in the middle of the controller module in slot 2.



1

NVRAM/storage adapter cover thumbscrew

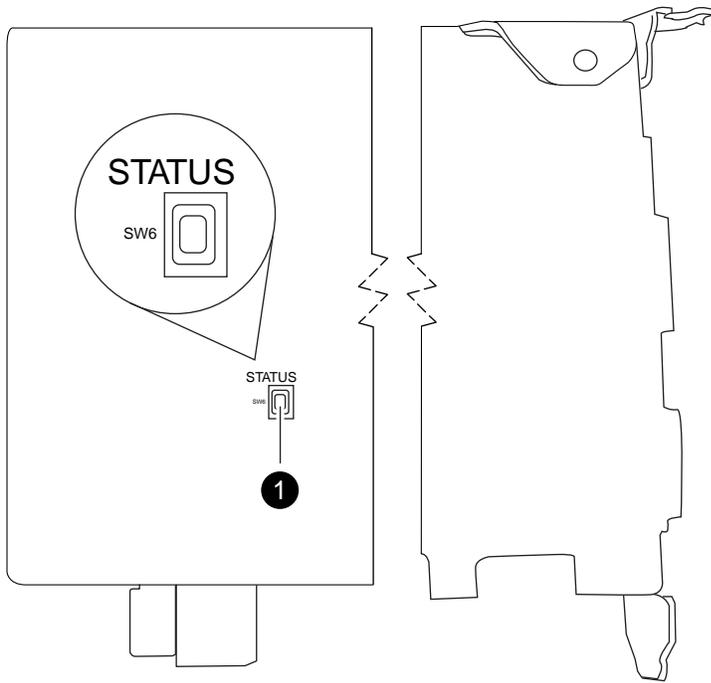
There are two thumbscrews on the cover.

Note: The NVRAM8 adapter is shown as the gray card lifted out of the controller module.

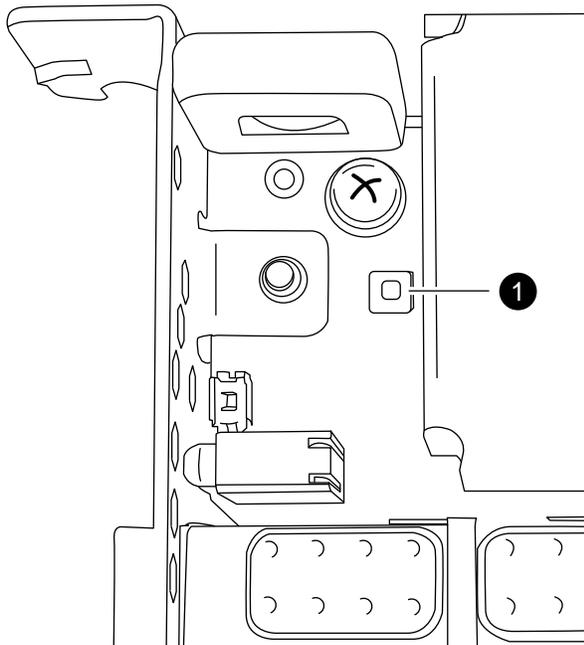
2. Remove the NVRAM adapter by grasping the adapter tabs, and lift the adapter straight out of the controller module and place it on an antistatic surface.

Note: The replacement NVRAM adapter is not shipped with a battery. You must remove the battery from the old NVRAM adapter and install it in the replacement NVRAM adapter.

3. Press the status button on the bottom of the NVRAM adapter and check the destage status LED on the board.



1 Button for activating the destage status LED



1 Destage status LED

If the LED is...	Then...
Green	The system was cleanly shut down and there is no customer data on the adapter.

If the LED is...	Then...
Red	<p>The system was not cleanly shut down and the adapter failed to erase the onboard flash. Complete the following substeps when you encounter this status:</p> <ul style="list-style-type: none"> a. Reinstall the NVRAM adapter into the controller module. b. Reinstall the controller module into the system and recable it, making sure that you recable the power cables last. <ul style="list-style-type: none"> Note: If the controller module is part of an HA configuration, the controller module begins to boot as soon as it is inserted back into the chassis. c. Cleanly shut down the controller module using the <code>halt</code> command and wait until the LEDs are off on the NVRAM adapter. d. Remove the appropriate cables and open the system. e. Remove the NVRAM adapter, press the Status button, and check the LED again. <ul style="list-style-type: none"> If the LED is green, there is no data on the adapter and you can complete the RMA process. If the LED is red, there might still be data present on the adapter. If you are replacing the adapter, you should consider destroying it. If you are replacing the battery, complete that procedure. Contact technical support for more information.
Amber	<p>This adapter is in an illegal or undefined state, typically caused by an unknown failure. You should always replace the adapter when you encounter this status.</p>

Removing the NVRAM battery

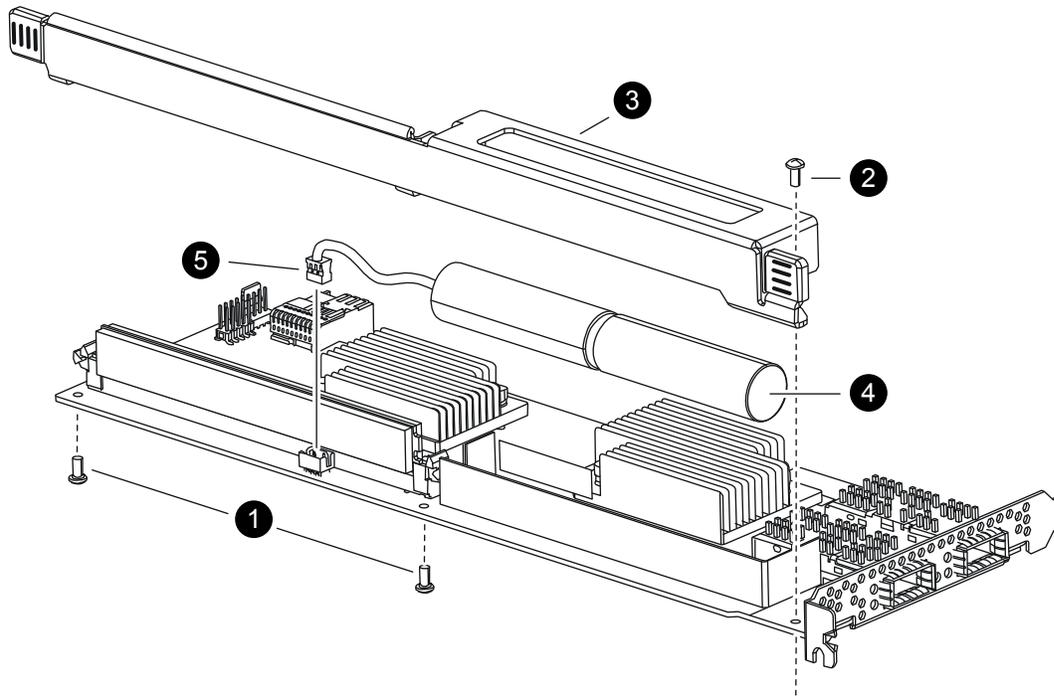
When you want remove the NVRAM battery in a controller module, you must perform a specific sequence of steps.

About this task

You need a Phillips screwdriver to remove the battery housing.

Steps

1. Using the Phillips screwdriver, remove the three battery cover screws; there are two screws on the back of the adapter and one on the front near the lifting tab. After removing the screws, set them aside.



①	Back battery cover screws
②	Front battery cover screw
③	Battery cover
④	NVRAM battery
⑤	NVRAM battery plug

2. Slide the battery cover toward the top of the adapter until the screw mounting tabs clear the adapter, and then lift the battery cover clear.
3. Unplug the battery cable from the NVRAM adapter.
4. Lift the battery cable out of the holder and then lift the battery from the holder.

Installing the NVRAM battery

To install the NVRAM battery in a controller module, you must perform a specific sequence of steps.

Before you begin

You need a Phillips screwdriver to install the battery housing.

Steps

1. Remove the battery cover on the adapter, if necessary.

2. Seat the battery in the battery holder on the controller module.
3. Thread the battery cable into the retaining bracket on the battery holder.
4. Align the battery plug with the edge of the socket on the NVRAM adapter, and then plug in the battery.
Make sure that the cable connector has Pin 1 (arrow) facing toward the NVRAM adapter when installing it.
5. Slide the battery holder onto the adapter with the battery side facing the adapter, and align the screw-mounting tabs on the board with the screw holes on the battery holder.
6. Secure the battery holder to the NVRAM adapter using the screws you removed when removing the battery holder.

Attention: Do not over-tighten the cover screws because doing so could crack the adapter.

Installing the NVRAM adapter

When you install the new NVRAM adapter, you must select the correct slot.

Steps

1. Open the NVRAM/storage adapter cover in the center of the controller module, if necessary.
2. Align the NVRAM adapter with the slot 2 slot guides furthest from the cam handle, and exert even pressure to seat the adapter in the socket.
3. Close the NVRAM/storage adapter cover and tighten the cover thumbscrews.

Reinstalling the controller

After you replace a component within the controller module, you must reinstall the controller module in the system chassis and boot it to a state where you can run diagnostic tests on the replaced component.

About this task

Note: For HA pairs with two controller modules in the same chassis, the sequence in which you reinstall the controller module is especially important because it attempts to reboot as soon as you completely seat it in the chassis.

Steps

1. Align the end of the controller module with the opening in the chassis, and then gently push the controller module halfway into the system.

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

2. Recable the system, as needed.
If you removed the media converters (SFPs), remember to reinstall them if you are using fiber optic cables.
3. Install the new controller module and boot it:

If your system is in...	Then perform these steps...
An HA pair	<ul style="list-style-type: none"> a. If the system is not in a controller-controller configuration, reconnect the power cables to the power supplies and to the power sources, turn on the power. b. With the cam handle in the open position, insert the new controller module into the chassis, firmly pushing until the controller module meets the midplane, and then close the cam handle so that the latch clicks into the locked position and the controller module is fully seated. <ul style="list-style-type: none"> Attention: Do not use excessive force when sliding the controller module into the chassis; you might damage the connectors. c. If necessary, enter y when prompted to override the system ID due to a system ID mismatch. The new controller module displays the <code>Waiting for giveback...</code> message.
A stand-alone configuration	<ul style="list-style-type: none"> a. With the cam handle in the open position, insert the new controller module into the chassis, firmly pushing until the controller module meets the midplane, and then close the cam handle so that the latch clicks into the locked position and the controller module is fully seated. <ul style="list-style-type: none"> Attention: Do not use excessive force when sliding the controller module into the chassis; you might damage the connectors. b. Reconnect the power cables to the power supplies and to the power sources, turn on the power to start the boot process, and then press Ctrl-C to interrupt the boot process when you see the message <code>Press Ctrl-C for Boot Menu</code>. c. If necessary, enter y when prompted to override the system ID due to a system ID mismatch. d. From the boot menu, select the option for Maintenance mode.

4. Tighten the thumbscrew on the cam handle.

Reassigning disks

If the storage system is in an HA pair, the system ID of the new NVRAM adapter is automatically assigned to the disks when the giveback occurs at the end of the procedure. In a stand-alone system, you must manually reassign the ID to the disks.

About this task

If you are only changing the NVRAM battery and are not replacing the NVRAM adapter, you do not need to reassign disks.

You must use the correct procedure for your configuration:

If the controller is in...	Then use this procedure...
An HA pair	<i>Verifying the system ID change on a system operating in 7-Mode on page 14</i>
A stand-alone configuration	<i>Manually reassigning the system ID on a stand-alone system in 7-mode on page 15</i>

Verifying the system ID change on an HA system operating in 7-Mode

You must confirm the system ID change when you boot the replacement node, and then verify that the change was implemented.

About this task

This procedure applies only to systems that meet the following conditions:

- Running Data ONTAP operating in 7-Mode
- In an HA pair

Steps

1. If the replacement node is in Maintenance mode (showing the `*>` prompt), exit Maintenance mode by entering the following command:

```
halt
```

After you issue the command, wait until the system stops at the LOADER prompt.

2. From the LOADER prompt on the replacement node, complete the following substeps:

- a. Enter the following command:

```
boot_ontap
```

- b. Press **Ctrl-C** when prompted to display the boot menu.

3. Wait until the `waiting for giveback...` message is displayed on the replacement node's console and then, on the healthy node, enter the following command to verify that the NVRAM adapter replacement has been detected and that the new partner system ID has been automatically assigned:

```
cf status
```

You should see a message similar to the following, which indicates that the system ID change has been detected:

```
HA mode.  
System ID changed on partner (Old: 1873774576, New: 1873774574).  
partner_node has taken over target_node.  
target_node is ready for giveback.
```

The message shows the new system ID of the replacement node. In this example, the new system ID is 1873774574.

4. From the healthy node, ensure that any coredumps are saved:

- a. Enter the following command:

```
partner savecore
```

- b. If the command output indicates that savecore is in progress, wait for savecore to complete before issuing the giveback.

You can enter the following command to monitor the progress of the savecore:

```
partner savecore -s
```

5. Enter the following command from the healthy node after the replacement node is displaying the `waiting for Giveback...` message:

```
cf giveback
```

You should see a message similar to the following noting the system ID change and prompting you to continue:

```
System ID changed on partner. Giveback will update the ownership of partner disks with
system ID: 1873774574.
Do you wish to continue {y|n}?
```

Enter **y** to proceed. If the giveback is vetoed, you can consider overriding the veto.

Find the High-Availability Configuration Guide for your version of Data ONTAP 8

Find the Active/Active Configuration Guide for your version of Data ONTAP 7G

6. Verify that the disks were assigned correctly:

```
disk show
```

Example

Make sure that the disks belonging to the replacement node show the new system ID for the replacement node. In the following example, the disks owned by node2 now show the new system ID, 1873774574:

```
system-1> disk show
  DISK          OWNER                POOL  SERIAL NUMBER  HOME                DR HOME
-----
disk_name node2    (1873774574) Pool10  J8Y0TDZC      system-2 (1873774574)
disk_name node1    (118065578) Pool10  J8Y09DXC      system-1 (118065578)
.
.
.
```

7. Verify that the expected volumes are present and online for each node:

```
vol status
```

Manually reassigning the system ID on a stand-alone system operating in 7-Mode

In a stand-alone system, you must manually reassign disks to the new controller's system ID before you return the system to normal operating condition.

About this task

This procedure applies only to systems that are:

- Operating in 7-Mode
- In a stand-alone system

Steps

1. If you have not already done so, reboot the replacement node, interrupt the boot process by entering **Ctrl-C**, and then select the option to boot to Maintenance mode from the displayed menu.

You must enter **y** when prompted to override the system ID due to a system ID mismatch.

2. View the system IDs by entering the following command:

```
disk show -a
```

Note: Make note of the old system ID, which is displayed as part of the disk owner column.

Example

The following example shows the old system ID of 118073209:

```
*> disk show -a
Local System ID: 118065481

  DISK      OWNER                POOL  SERIAL NUMBER  HOME
  -----  -
disk_name  system-1 (118073209) Pool0  J8XJE9LC      system-1 (118073209)
disk_name  system-1 (118073209) Pool0  J8Y478RC      system-1 (118073209)
.
.
.
```

3. Reassign disk ownership (for FAS systems) or LUN ownership (for V-Series systems), by using the system ID information obtained from the `disk show` command:

```
disk reassign -s old system ID
```

In the case of the preceding example, the command is:

```
disk reassign -s 118073209
```

You can respond **Y** when prompted to continue.

4. Verify that the disks (or V-Series LUNs) were assigned correctly by entering the following command:

```
disk show -a
```

Example

Make sure that the disks belonging to the replacement node show the new system ID for the replacement node. In the following example, the disks owned by `system-1` now show the new system ID, 118065481:

```
*> disk show -a
Local System ID: 118065481

  DISK      OWNER                POOL  SERIAL NUMBER  HOME
  -----  -
disk_name  system-1 (118065481) Pool0  J8Y0TDZC      system-1 (118065481)
disk_name  system-1 (118065481) Pool0  J8Y09DXC      system-1 (118065481)
.
.
.
```

5. If the replacement node is in Maintenance mode (showing the `*>` prompt), exit Maintenance mode by entering the following command:

```
halt
```

After you issue the command, wait until the system stops at the `LOADER` prompt.

6. Enter the following command to boot the operating system:

```
boot_ontap
```

Restoring Storage Encryption functionality after NVRAM adapter module replacement

After replacing the NVRAM adapter module for a storage system that you previously configured to use Storage Encryption, you must perform additional steps to ensure uninterrupted Storage Encryption functionality. You can skip this task on storage systems that do not have Storage Encryption enabled or if you only replaced the NVRAM battery on applicable controller modules.

Steps

1. Enter the following command at the storage system prompt:

```
key_manager setup
```

2. Complete the steps in the wizard to configure Storage Encryption.
Ensure that a new passphrase is generated and that you select **Yes** to lock all drives.
3. Repeat Steps 1 and 2 on the partner node.
Do not proceed to the next step until you have completed the Storage Encryption setup wizard on each node.
4. On each node, verify that all disks are rekeyed:
`disk encrypt show`
None of the disks should list a key ID of 0x0.
5. On each node, load all authentication keys:
`key_manager restore -all`
6. On each node, verify that all keys are stored on their key management servers:
`key_manager query`
None of the key IDs should have an asterisk next to it.

Completing the replacement process

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

Disposing of batteries

Dispose of batteries according to local regulations regarding battery recycling or disposal. If you cannot properly dispose of the battery, return it to NetApp, as described in the RMA instructions shipped with the kit.

Related information

[Warranty Agreement, Safety Information, and Regulatory Notices at support.netapp.com](#)

Replacing a NVRAM adapter in clustered Data ONTAP

You must follow a specific series of steps to replace the NVRAM adapter for your mode and version of Data ONTAP.

About this task

If the nodes undergoing replacement are part of a MetroCluster site that has experienced a disaster, and both nodes have failed, do not use this procedure. Use the procedures for switchover and disaster recovery in the [Clustered Data ONTAP 8.3 MetroCluster Management and Disaster Recovery Guide](#).

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11. [Reassigning disks](#) on page 30
12. [Restoring Storage Encryption functionality after NVRAM adapter module replacement](#) on page 36
13. [Completing the replacement process](#) on page 37

Pre-replacement tasks for Storage Encryption configurations

If the storage system whose NVRAM adapter you are replacing is configured to use Storage Encryption, you must first reset the authentication keys of the disks to their MSID (the default security ID set by the manufacturer). This is a temporary necessity during the NVRAM adapter replacement process to avoid any chance of losing access to the data.

About this task

After resetting the authentication keys to the MSID, the data on the disks is no longer encrypted with secret authentication keys. You must ensure the physical safety of the disks during the replacement or upgrade process.

Steps

1. Access the nodeshell by entering the following command:


```
system node run -node node_name
```
2. Display the key ID for each self-encrypting disk on the original system by entering the following command at the system prompt:

```
disk encrypt show
```

Example

```
disk encrypt show
Disk      Key ID                                     Locked?
0c.00.1   0x0                                         No
0c.00.0   080CF0C80000000001000000000000A948EE8604F4598ADFFB185B5BB7FED3 Yes
0c.00.3   080CF0C80000000001000000000000A948EE8604F4598ADFFB185B5BB7FED3 Yes
0c.00.4   080CF0C80000000001000000000000A948EE8604F4598ADFFB185B5BB7FED3 Yes
0c.00.2   080CF0C80000000001000000000000A948EE8604F4598ADFFB185B5BB7FED3 Yes
0c.00.5   080CF0C80000000001000000000000A948EE8604F4598ADFFB185B5BB7FED3 Yes
```

The first disk in the example is associated with an MSID; the others are associated with a non-MSID.

3. Examine the output of the `disk encrypt show` command, and if any disks are associated with a non-MSID key, rekey them to an MSID key by taking one of the following actions:
 - To rekey disks individually, enter the following command, once for each disk:


```
disk encrypt rekey 0x0 disk_name
```
 - To rekey all disks at once, enter the following command:


```
disk encrypt rekey 0x0 *
```
4. Ensure that all the self-encrypting disks are associated with an MSID by entering the following command and examining the output:

```
disk encrypt show
```

Example

The following example shows the output of the `disk encrypt show` command when all self-encrypting disks are associated with an MSID:

```
cluster::> disk encrypt show
Disk      Key ID                                     Locked?
-----
0b.10.23  0x0                                         No
```

0b.10.18	0x0	No
0b.10.0	0x0	Yes
0b.10.12	0x0	Yes
0b.10.3	0x0	No
0b.10.15	0x0	No
0a.00.1	0x0	Yes
0a.00.2	0x0	Yes

5. Exit the nodeshell and return to the clustershell by entering the following command:

```
exit
```

Shutting down a node operating in clustered Data ONTAP

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

About this task

Note: Leave the power supplies turned on at the end of this procedure to provide power to the healthy node.

Steps

1. If the system is running clustered Data ONTAP, check the status of the nodes in the cluster:

a. Enter the following command at the system console of either node:

```
cluster show
```

The command produces output similar to the following:

```
Node Health Eligibility
-----
node1 true true
node2 true true
node3 true true
node4 true true
4 entries were displayed.
```

b. Take one of the following actions, depending on the result of the command:

If...	Then...
All nodes show <code>true</code> for both health and eligibility.	Proceed to Step 3.
The impaired node shows <code>false</code> for health.	Proceed to the next step.
Any nodes show <code>false</code> for eligibility.	Resolve any cluster issues as needed before continuing with this procedure.
Any nodes other than the impaired node show <code>false</code> for health.	Correct the problems that cause the health issues on the nodes before continuing with this procedure.

2. Either shut down or perform a takeover of the impaired node, depending on your configuration:

If the impaired node is in...	Then...
A stand-alone configuration and is running	<p>a. Halt the impaired node:</p> <pre>system -node halt <i>impaired_node_name</i></pre> <p>b. Go to step 6.</p>

If the impaired node is in...	Then...
A stand-alone configuration and is not running	Go to step 6.
An HA pair	<ol style="list-style-type: none"> a. Check the status of the impaired node from the healthy node console: <code>storage failover show</code> b. If the impaired node is not running or has been taken over by the healthy node, go to Step 4. c. If the impaired node is running or has not been taken over, go to the next step.

3. Halt the impaired node from the impaired node console:

```
system -node halt impaired_node_name -reason reason_text
```

The impaired node shuts down and is taken over by the healthy node.

4. Wait at least two minutes after takeover of the impaired node to ensure that the takeover was completed successfully.
5. Shut down the impaired node.

Note: If the system is in an HA pair the node should be at the LOADER prompt.

The method you use to shut down the node depends on whether remote management through a Service Processor (SP) is used, and whether the system is in a dual-chassis or single-chassis configuration.

If the SP is...	Then...
Configured	Log in to the impaired node SP and turn off the power using the following command: <code>system power off</code>
Not configured, and the system is in a dual-chassis HA pair in which each controller is in a separate chassis	Manually shut down the power supplies on the impaired node.
Not configured, and the system is in a single-chassis HA pair in which both controllers are in the same chassis and share power supplies	At the impaired node prompt, press Ctrl-C and respond Y to halt the node.

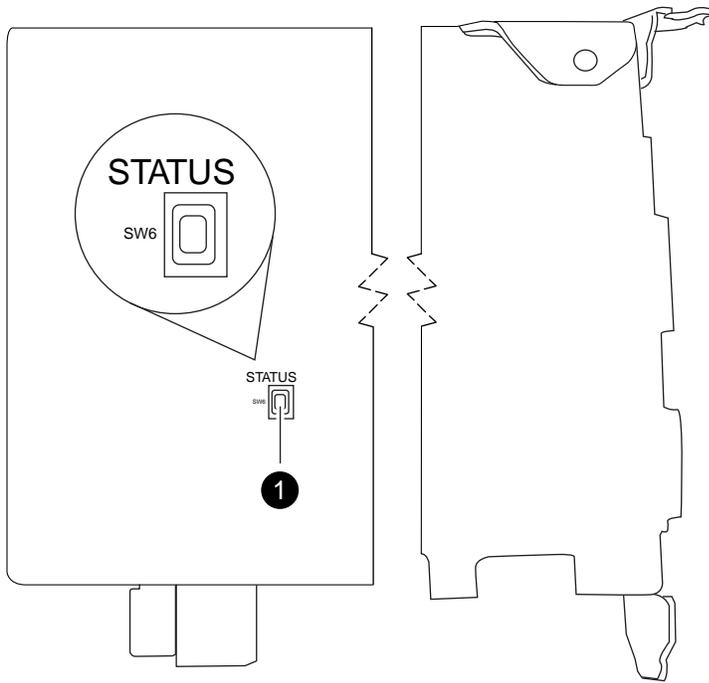
6. If the system is in a dual-chassis HA pair or stand-alone configuration, turn off the power supplies, and then unplug the impaired node power cords from the power source.

Verifying that the new NVRAM adapter has no content in memory

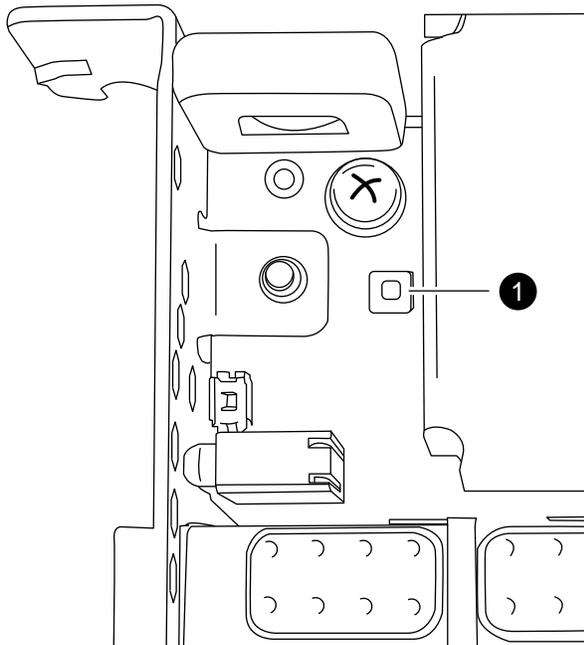
Before installing a replacement NVRAM adapter, you must ensure that the *new* NVRAM adapter (the adapter that is going to replace the bad adapter) has no content in the memory to avoid problems that might occur when it is installed in the system.

Steps

1. While pressing down the status button on the bottom of the NVRAM adapter, check the destage status LED on the board.



1 Button for activating the destage status LED

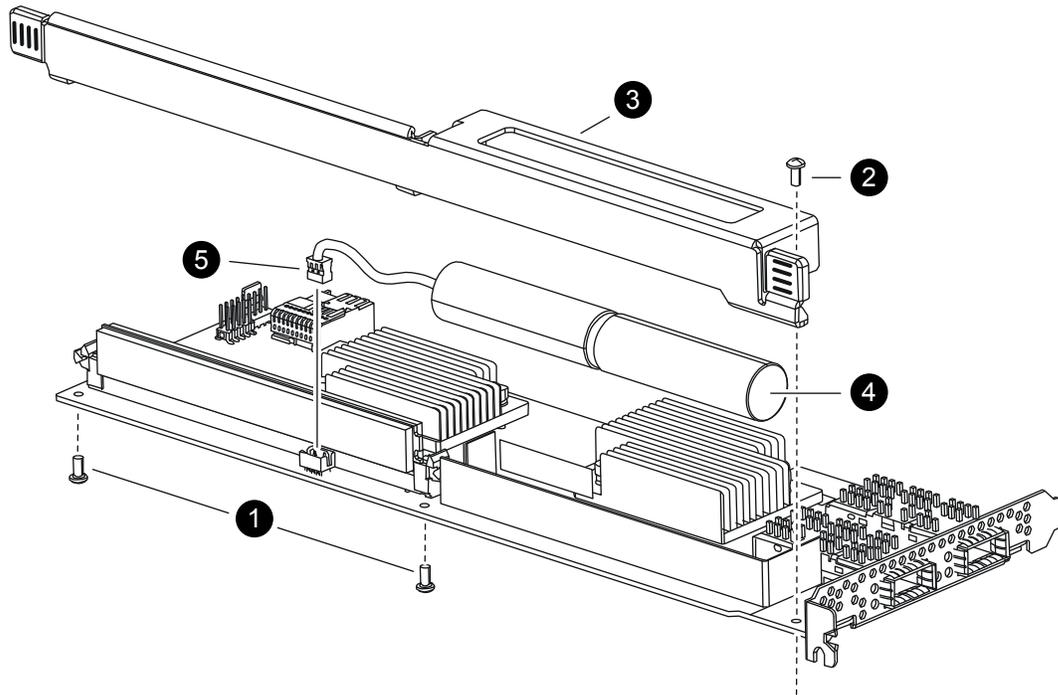


1 Destage status LED
The LED remains illuminated while the destage status button is pressed.

If the LED is...	Then...
Green	The system was cleanly shut down and there is no customer data on the adapter.
Red	The adapter has content in the onboard flash.

If the LED is...	Then...
Amber	This adapter is in an illegal or undefined state, typically caused by an unknown failure. You should not use the adapter when you encounter this status.

2. If the NVRAM adapter has content in the onboard flash, disconnect the battery to clear the flash:
 - a. Using the Phillips screwdriver, remove the three battery cover screws; there are two screws on the back of the adapter and one on the front near the lifting tab. After removing the screws, set them aside.



1	Back battery cover screws
2	Front battery cover screw
3	Battery cover
4	NVRAM battery
5	NVRAM battery plug

- b. Slide the battery cover toward the top of the adapter until the screw mounting tabs clear the adapter, and then lift the battery cover clear.
- c. Unplug the battery cable from the NVRAM adapter.
- d. Wait a few seconds and then reattach the battery cable.

Align the battery plug with the edge of the socket on the NVRAM adapter, and then plug in the battery and make sure that the cable connector has Pin 1 (arrow) facing toward the NVRAM adapter when installing it.

- e. Press the status button and recheck the destage LED as described in Step 1 to confirm the onboard flash is clear.
- f. Secure the battery holder to the NVRAM adapter using the screws you removed when detaching the battery holder.

Attention: Do not over-tighten the cover screws because doing so could crack the adapter.

Removing cables and media adapters from the NVRAM adapter

Before you remove the old NVRAM adapter from the controller module, you must remove the cables and, if you are using fiber interconnect cables, the media adapters.

Steps

1. If you are not already grounded, properly ground yourself.
2. Remove the cables and carefully remove any media converters (QSFPs) from the NVRAM adapter.
Leave the cables in the cable management tray so that when you reinstall the cable management tray, the cables are already aligned.

Opening the system

If you want to access components inside the controller module, you must open the system.

Steps

1. If you are not already grounded, properly ground yourself.
2. Loosen the hook and loop strap binding the cables to the cable management tray, and then unplug the system cables and SFPs (if needed) from the controller module, and keep track of where the cables were connected.
Leave the cables in the cable management tray so that when you reinstall the cable management tray, the cables are organized.
3. Grasp the cable management tray by the side, gently push one side of the tray so that the arm slides across and off the retaining pin, slide the other arm off the retaining pin on the other side of the controller module, and then lift it off the back of the controller module and set it aside.
4. Loosen the screw on the cam handle.
5. Pull the cam handle downward and slide the controller module out of the system until it catches.
6. Push in the release latch on the left side of the controller module and slide the controller module out of the system and set it on a stable, antistatic surface.

Make sure that you support the bottom of the controller module with your free hand.

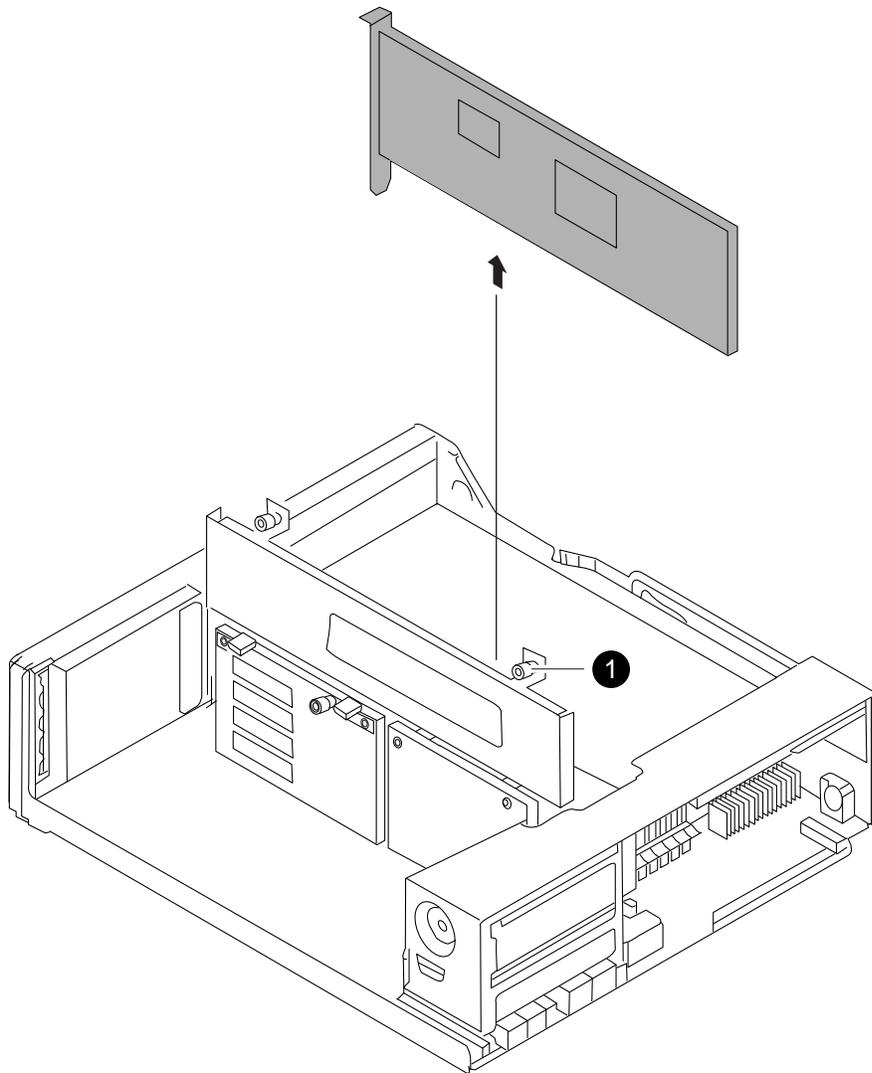
Removing the NVRAM adapter

When you remove the NVRAM adapter from the controller module, you must perform a specific sequence of steps.

Steps

1. Check the NVRAM adapter to make sure that all LEDs are off, and then loosen the two thumbscrews on the NVRAM/storage adapter cover and remove the cover.

The NVRAM/storage adapter cover is located in the middle of the controller module in slot 2.



1

NVRAM/storage adapter cover thumbscrew

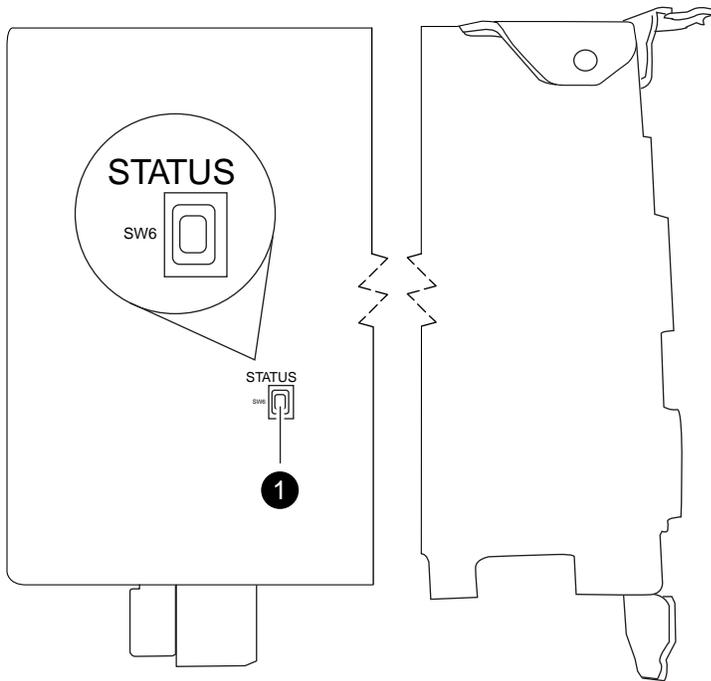
There are two thumbscrews on the cover.

Note: The NVRAM8 adapter is shown as the gray card lifted out of the controller module.

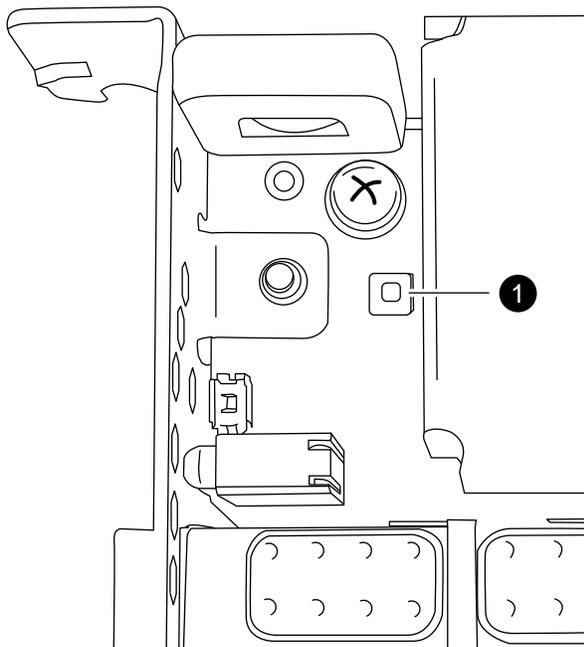
2. Remove the NVRAM adapter by grasping the adapter tabs, and lift the adapter straight out of the controller module and place it on an antistatic surface.

Note: The replacement NVRAM adapter is not shipped with a battery. You must remove the battery from the old NVRAM adapter and install it in the replacement NVRAM adapter.

3. Press the status button on the bottom of the NVRAM adapter and check the destage status LED on the board.



1 Button for activating the destage status LED



1 Destage status LED

If the LED is...	Then...
Green	The system was cleanly shut down and there is no customer data on the adapter.

If the LED is...	Then...
Red	<p>The system was not cleanly shut down and the adapter failed to erase the onboard flash. Complete the following substeps when you encounter this status:</p> <ul style="list-style-type: none"> a. Reinstall the NVRAM adapter into the controller module. b. Reinstall the controller module into the system and recable it, making sure that you recable the power cables last. <ul style="list-style-type: none"> Note: If the controller module is part of an HA configuration, the controller module begins to boot as soon as it is inserted back into the chassis. c. Cleanly shut down the controller module using the <code>halt</code> command and wait until the LEDs are off on the NVRAM adapter. d. Remove the appropriate cables and open the system. e. Remove the NVRAM adapter, press the Status button, and check the LED again. <ul style="list-style-type: none"> If the LED is green, there is no data on the adapter and you can complete the RMA process. If the LED is red, there might still be data present on the adapter. If you are replacing the adapter, you should consider destroying it. If you are replacing the battery, complete that procedure. Contact technical support for more information.
Amber	<p>This adapter is in an illegal or undefined state, typically caused by an unknown failure. You should always replace the adapter when you encounter this status.</p>

Removing the NVRAM battery

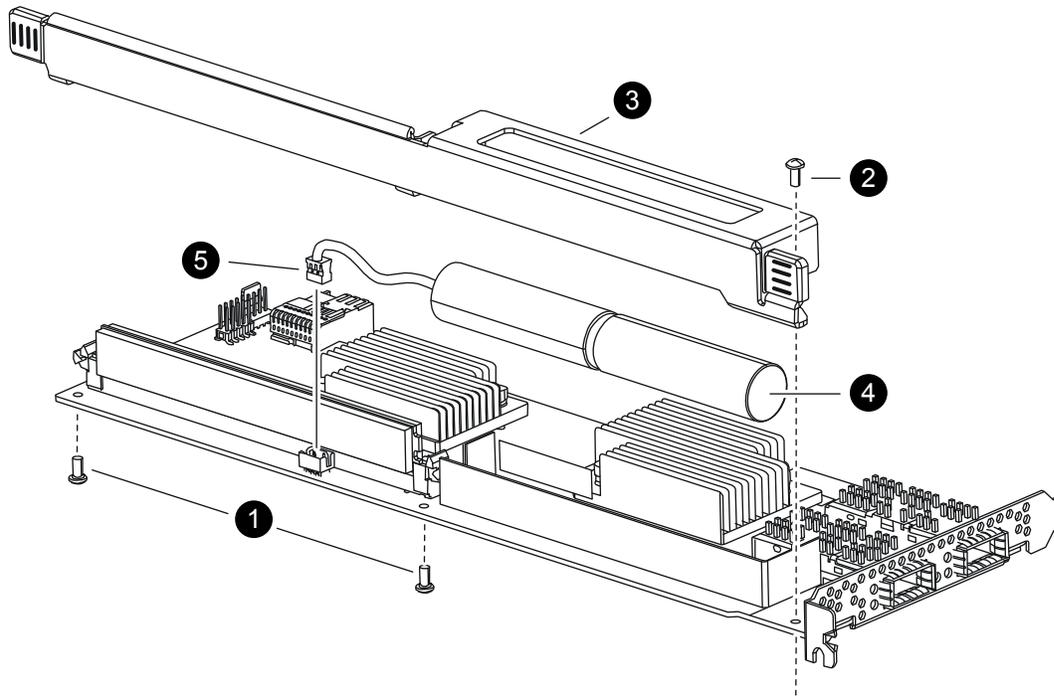
When you want remove the NVRAM battery in a controller module, you must perform a specific sequence of steps.

About this task

You need a Phillips screwdriver to remove the battery housing.

Steps

1. Using the Phillips screwdriver, remove the three battery cover screws; there are two screws on the back of the adapter and one on the front near the lifting tab. After removing the screws, set them aside.



1	Back battery cover screws
2	Front battery cover screw
3	Battery cover
4	NVRAM battery
5	NVRAM battery plug

2. Slide the battery cover toward the top of the adapter until the screw mounting tabs clear the adapter, and then lift the battery cover clear.
3. Unplug the battery cable from the NVRAM adapter.
4. Lift the battery cable out of the holder and then lift the battery from the holder.

Installing the NVRAM battery

To install the NVRAM battery in a controller module, you must perform a specific sequence of steps.

Before you begin

You need a Phillips screwdriver to install the battery housing.

Steps

1. Remove the battery cover on the adapter, if necessary.

2. Seat the battery in the battery holder on the controller module.
3. Thread the battery cable into the retaining bracket on the battery holder.
4. Align the battery plug with the edge of the socket on the NVRAM adapter, and then plug in the battery.
Make sure that the cable connector has Pin 1 (arrow) facing toward the NVRAM adapter when installing it.
5. Slide the battery holder onto the adapter with the battery side facing the adapter, and align the screw-mounting tabs on the board with the screw holes on the battery holder.
6. Secure the battery holder to the NVRAM adapter using the screws you removed when removing the battery holder.

Attention: Do not over-tighten the cover screws because doing so could crack the adapter.

Installing the NVRAM adapter

When you install the new NVRAM adapter, you must select the correct slot.

Steps

1. Open the NVRAM/storage adapter cover in the center of the controller module, if necessary.
2. Align the NVRAM adapter with the slot 2 slot guides furthest from the cam handle, and exert even pressure to seat the adapter in the socket.
3. Close the NVRAM/storage adapter cover and tighten the cover thumbscrews.

Reinstalling the controller module and entering Maintenance mode

After you replace a component within the controller module, you must reinstall the controller module in the system chassis and boot it to a state where you can run diagnostic tests on the replaced component.

Steps

1. Align the end of the controller module with the opening in the chassis, and then gently push the controller module halfway into the system.
2. Recable the system, as needed.
If you removed the media converters (SFPs), remember to reinstall them if you are using fiber optic cables.
3. Complete the reinstall of the controller module:

If your system is in...	Then perform these steps...
An HA pair	<p>a. Be prepared to interrupt the boot process. The controller module begins to boot as soon as it is fully seated in the chassis.</p> <p>b. With the cam handle in the open position, firmly push the controller module in until it meets the midplane and is fully seated, and then close the cam handle to the locked position.</p> <p>Attention: Do not use excessive force when sliding the controller module into the chassis; you might damage the connectors.</p> <p>c. Boot to Maintenance mode by entering halt to go to the LOADER prompt:</p> <ul style="list-style-type: none"> • If you are running Data ONTAP 8.2.1 and earlier, enter boot_ontap, and press Ctrl-C when prompted to go to the boot menu, and then select Maintenance mode from the menu. • If you are running Data ONTAP 8.2.2 and later, enter boot_ontap maint at the LOADER prompt. <p>d. If you have not already done so, reinstall the cable management , and then tighten the thumbscrew on the cam handle on back of the controller module.</p> <p>e. Bind the cables to the cable management device with the hook and loop strap.</p>
A stand-alone configuration	<p>a. With the cam handle in the open position, firmly push the controller module in until it meets the midplane and is fully seated, and then close the cam handle to the locked position.</p> <p>Attention: Do not use excessive force when sliding the controller module into the chassis; you might damage the connectors.</p> <p>b. Reconnect the power cables to the power supplies and to the power sources, turn on the power to start the boot process, and then press Ctrl-C to interrupt the boot process when you see the message <code>Press Ctrl-C for Boot Menu</code>.</p> <p>Note: If you miss the prompt and the controller module boots to Data ONTAP, enter halt and at the LOADER prompt enter boot_ontap, and press Ctrl-C when prompted, and then repeat this step.</p> <p>c. From the boot menu, select the option for Maintenance mode.</p> <p>d. If you have not already done so, reinstall the cable management , and then tighten the thumbscrew on the cam handle on back of the controller module.</p> <p>e. Bind the cables to the cable management device with the hook and loop strap.</p>

Important: During the boot process, you might see the following prompts:

- A prompt warning of a system ID mismatch and asking to override the system ID.
- A prompt warning that when entering Maintenance mode in a HA configuration you must ensure that the healthy node remains down.

You can safely respond **Y** to these prompts.

Reassigning disks

If the storage system is in an HA pair, the system ID of the new NVRAM adapter is automatically assigned to the disks when the giveback occurs at the end of the procedure. In a stand-alone system, you must manually reassign the ID to the disks.

About this task

If you are only changing the NVRAM battery and are not replacing the NVRAM adapter, you do not need to reassign disks.

You must use the correct procedure for your configuration:

Controller redundancy	Then use this procedure...
HA pair	<i>Verifying the system ID change on a system operating in clustered Data ONTAP</i> on page 30
Stand-alone	<i>Manually reassigning the system ID on a stand-alone system in clustered Data ONTAP</i> on page 34

Verifying the system ID change on an HA system operating in clustered Data ONTAP

If you are running Data ONTAP 8.2 or later, you must confirm the system ID change when you boot the replacement node and then verify that the change was implemented.

About this task

This procedure applies only to systems with the following characteristics:

- Operating in clustered Data ONTAP
- In an HA pair

Steps

1. If the replacement node is in Maintenance mode (showing the `*>` prompt), exit Maintenance mode by entering the following command:

```
halt
```

After you issue the command, wait until the system stops at the LOADER prompt.

2. If you are running Data ONTAP 8.2.2 or earlier, enter the following command on the replacement node at the LOADER prompt to ensure that the new controller module boots in clustered Data ONTAP:

```
setenv bootarg.init.boot_clustered true
```

3. From the LOADER on the replacement node, enter the following command at the prompt to boot the node to the boot menu:

If you are running Data ONTAP...	Complete the following steps...
8.2.x and earlier	<ol style="list-style-type: none">a. Enter the following command: <pre>boot_ontap</pre>b. Press Ctrl-C when prompted to display the boot menu.
8.3 and later	Enter the following command: <pre>boot_ontap menu</pre>

If you are prompted to override the system ID due to a system ID mismatch, enter **y**.

4. Select the **Update flash from backup config** option from the displayed menu.

If you are asked to continue with the update, enter **y** when prompted.

The replacement node boots up and displays the `Waiting for Giveback...` message.

5. Wait until the `waiting for giveback...` message is displayed on the replacement node console and then, on the healthy node, enter the following command to verify that the NVRAM adapter replacement has been detected and the new partner system ID automatically assigned:

```
node1::*> storage failover show
```

Node	Partner	Takeover Possible	State Description
node1	node2	false	System ID changed on partner (Old: 151759755, New: 151759706), In
takeover node2	node1	-	Waiting for giveback (HA mailboxes)

6. From the healthy node, ensure that any coredumps are saved:

- a. From the healthy node, enter the following command to change to the advanced privilege level:

```
set -privilege advanced
```

You can respond **y** when prompted to continue into advanced mode. The advanced mode prompt appears (`*>`).

- b. From the healthy node, enter the following command:

```
system node run -node local-node-name partner savecore
```

- c. Wait for `savecore` command to complete before issuing the giveback.

You can enter the following command to monitor the progress of the `savecore` command:

```
system node run -node local-node-name partner savecore -s
```

- d. From the healthy node, enter the following command to return to the admin privilege level:

```
set -privilege admin
```

7. Your next step depends on the version of Data ONTAP your system is running.

If your system is running Data ONTAP...	Then...
Data ONTAP 8.2.0 and earlier or Data ONTAP 8.2.2 and later	Go to the next step.
Data ONTAP 8.2.1	Disable automatic takeover on reboot by entering the following command from the healthy node: <pre>storage failover modify -node replacement-node-name -onreboot false</pre>

8. Your next step depends on your version of Data ONTAP:

If your system is running...	Then...
Data ONTAP 8.2.0 and earlier or Data ONTAP 8.2.2 and later	<p data-bbox="609 220 1536 283">Complete the following substeps after the replacement node is displaying the <code>Waiting for Giveback...</code> message:</p> <p data-bbox="609 304 1536 336">a. Enter the following command from the healthy node:</p> <pre data-bbox="641 346 1536 378">storage failover giveback -ofnode replacement_node_name</pre> <p data-bbox="641 388 1536 441">As the replacement node boots up, it might again display the prompt warning of a system ID mismatch and asking to override the system ID. You can respond Y.</p> <p data-bbox="641 451 1536 504">The replacement node takes back its storage and completes booting up, and then reboots and id again taken over by the healthy node.</p> <p data-bbox="641 514 1536 588">As the replacement node boots up the second time, it might again display the prompt warning of a system ID mismatch and asking to override the system ID. You can respond Y.</p> <p data-bbox="609 619 1536 672">b. Once the node displays <code>Waiting for Goveback...</code>, enter the following command from the healthy node:</p> <pre data-bbox="641 682 1536 714">storage failover giveback -ofnode replacement_node_name</pre> <p data-bbox="641 724 1536 777">As the replacement node boots up, it might again display the prompt warning of a system ID mismatch and asking to override the system ID. You can respond Y.</p> <p data-bbox="641 787 1536 840">The replacement node takes back its storage and completes booting up to the Data ONTAP prompt.</p> <p data-bbox="673 850 1536 882">Note: If the giveback is vetoed, you can consider overriding the vetoes.</p> <p data-bbox="673 903 1536 934"><i>Find the High-Availability Configuration Guide for your version of Data ONTAP 8</i></p> <p data-bbox="609 976 1536 1029">c. Enter the <code>storage failover show-giveback</code> command to monitor the progress of the giveback operation.</p> <p data-bbox="609 1060 1536 1113">d. Wait until the <code>storage failover show-giveback</code> command output indicates that the giveback operation is complete.</p> <p data-bbox="609 1144 1536 1197">e. Enter the <code>storage failover show</code> command to confirm that the HA pair is healthy and takeover is possible.</p> <p data-bbox="641 1207 1536 1260">The output from the <code>storage failover show</code> command should not include the "System ID changed on partner" message.</p>

If your system is running...	Then...
Data ONTAP 8.2.1 only	<p>Complete the following substeps after the replacement node is displaying the <code>Waiting for Giveback...</code> message:</p> <ol style="list-style-type: none"> a. Enter the following command from the healthy node: <pre>storage failover giveback -ofnode replacement_node_name</pre> <p>As the replacement node boots up, it might display the prompt warning of a system ID mismatch and asking to override the system ID. You can respond <code>Y</code>. The replacement node takes back its storage, completes booting up and then reboots.</p> b. Manually takeover the replacement node by entering the following command: <pre>storage failover takeover -ofnode replacement_node_name</pre> <p>As the replacement node boots up the second time, it might again display the prompt warning of a system ID mismatch and asking to override the system ID. You can respond <code>Y</code>.</p> c. Enter the following command from the healthy node: <pre>storage failover giveback -ofnode replacement_node_name</pre> <p>As the replacement node boots up, it might again display the prompt warning of a system ID mismatch and asking to override the system ID. You can respond <code>y</code>. The replacement node takes back its storage and completes booting up to the Data ONTAP prompt.</p> <p>Note: If the giveback is vetoed, you can consider overriding the vetoes. <i>Find the High-Availability Configuration Guide for your version of Data ONTAP 8</i></p> d. Enter the <code>storage failover show-giveback</code> command to monitor the progress of the giveback operation. e. Wait until the <code>storage failover show-giveback</code> command output indicates that the giveback operation is complete. f. Enter the <code>storage failover show</code> command to confirm that the HA pair is healthy and takeover is possible. The output from the <code>storage failover show</code> command should not include the "System ID changed on partner" message.

9. If the system is in a MetroCluster configuration, monitor the status of the node:

```
metrocluster node show
```

The MetroCluster configuration takes a few minutes after the replacement to return to a normal state. Until then, the `metrocluster node show` command output shows configuration error.

Until the MetroCluster configuration returns to a normal state, the `metrocluster node show -fields node-systemid` command continues to show the old system id.

10. Verify that the disks (or V-Series LUNs) were assigned correctly:

```
storage disk show -ownership
```

Example

Make sure that the disks belonging to the replacement node show the new system ID for the replacement node. In the following example, the disks owned by node2 now show the new system ID, 1873775277:

```
node1> storage disk show -ownership
```

```

Disk   Aggregate Home   Owner  DR Home  Home ID   Owner ID  DR Home ID Reserver  Pool
-----
1.0.0  aggr0_1  node1 node1  -        1873775277 1873775277 -        1873775277 Pool0
1.0.1  aggr0_1  node1 node1  -        1873775277 1873775277 -        1873775277 Pool0
.
.
.

```

11. If the node is in a MetroCluster that is currently in a switchover state and owns the disks on a disaster site, verify that the DR home field indicates the original owner of the disk if the original owner is a node on the disaster site.

Refer to the [Clustered Data ONTAP 8.3 MetroCluster Management and Disaster Recovery Guide](#) for information about how disk ownership can change in a MetroCluster configuration.

12. If your system is a MetroCluster, verify the configuration:

```
metrocluster node show - fields configuration-state
```

Refer to the [Clustered Data ONTAP 8.3 MetroCluster Management and Disaster Recovery Guide](#).

```
node1_siteA:>> metrocluster node show -fields configuration-state
```

```

dr-group-id          cluster node          configuration-state
-----
1 node1_siteA        node1mcc-001         configured
1 node1_siteA        node1mcc-002         configured
1 node1_siteB        node1mcc-003         configured
1 node1_siteB        node1mcc-004         configured

4 entries were displayed.

```

13. Verify the expected volumes are present for each node:

```
vol show -node node-name
```

14. Your next step depends on the version of Data ONTAP your system is running.

If your system is running Data ONTAP...	Then...
Data ONTAP 8.2.0 and earlier or Data ONTAP 8.2.2 and later	Go to the next step.
Data ONTAP 8.2.1	Disable automatic takeover on reboot by entering the following command from the healthy node: storage failover modify -node replacement-node-name -onreboot false

Manually reassigning the system ID on a stand-alone system in clustered Data ONTAP

In a stand-alone system, you must manually reassign disks to the new controller's system ID and set the `bootarg.init.boot_clustered` bootarg before you return the system to normal operating condition.

About this task

This procedure applies only to systems that are:

- Operating in clustered Data ONTAP
- In a stand-alone configuration

Steps

1. If you have not already done so, reboot the replacement node, interrupt the boot process by entering **Ctrl-C**, and then select the option to boot to Maintenance mode from the displayed menu.

You must enter **Y** when prompted to override the system ID due to a system ID mismatch.

2. View the system IDs by entering the following command:

```
disk show -a
```

Note: Make note of the old system ID, which is displayed as part of the disk owner column.

Example

The following example shows the old system ID of 118073209:

```
*> disk show -a
Local System ID: 118065481

  DISK      OWNER                POOL  SERIAL NUMBER  HOME
-----
disk_name  system-1 (118073209) Pool0  J8XJE9LC      system-1 (118073209)
disk_name  system-1 (118073209) Pool0  J8Y478RC      system-1 (118073209)
.
.
.
```

3. Reassign disk ownership (for FAS systems) or LUN ownership (for V-Series systems), by using the system ID information obtained from the `disk show` command:

```
disk reassign -s old system ID
```

In the case of the preceding example, the command is:

```
disk reassign -s 118073209
```

You can respond **Y** when prompted to continue.

4. Verify that the disks (or V-Series LUNs) were assigned correctly by entering the following command:

```
disk show -a
```

Example

Make sure that the disks belonging to the replacement node show the new system ID for the replacement node. In the following example, the disks owned by system-1 now show the new system ID, 118065481:

```
*> disk show -a
Local System ID: 118065481

  DISK      OWNER                POOL  SERIAL NUMBER  HOME
-----
disk_name  system-1 (118065481) Pool0  J8Y0TDZC      system-1 (118065481)
disk_name  system-1 (118065481) Pool0  J8Y09DXC      system-1 (118065481)
.
.
.
```

5. If the replacement node is in Maintenance mode (showing the `*>` prompt), exit Maintenance mode by entering the following command:

```
halt
```

After you issue the command, wait until the system stops at the **LOADER** prompt.

6. If you are running Data ONTAP 8.2.2 or earlier, enter the following command on the replacement node at the LOADER prompt to ensure that the new controller module boots in clustered Data ONTAP:

```
setenv bootarg.init.boot_clustered true
```

7. Enter the following command to boot the operating system:

```
boot_ontap
```

Restoring Storage Encryption functionality after NVRAM adapter module replacement

After replacing the NVRAM adapter module for a storage system that you previously configured to use Storage Encryption, you must perform additional steps to ensure uninterrupted Storage Encryption functionality. You can skip this task on storage systems that do not have Storage Encryption enabled or if you only replaced the NVRAM battery on applicable controller modules.

Steps

1. Access the nodeshell:

```
system node run -node node_name
```

2. Enter the following command at the storage system prompt:

```
key_manager setup
```

3. Complete the steps in the wizard to configure Storage Encryption.

Ensure that a new passphrase is generated and that you select **Yes** to lock all drives.

4. Repeat Steps 1 through 3 on the partner node.

Do not proceed to the next step until you have completed the Storage Encryption setup wizard on each node.

5. On each node, verify that all disks are rekeyed:

```
disk encrypt show
```

None of the disks should list a key ID of 0x0.

6. On each node, load all authentication keys:

```
key_manager restore -all
```

7. On each node, verify that all keys are stored on their key management servers:

```
key_manager query
```

None of the key IDs should have an asterisk next to it.

8. Exit the nodeshell and return to the clustershell:

```
exit
```

Completing the replacement process

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

Disposing of batteries

Dispose of batteries according to local regulations regarding battery recycling or disposal. If you cannot properly dispose of the battery, return it to NetApp, as described in the RMA instructions shipped with the kit.

Related information

[Warranty Agreement, Safety Information, and Regulatory Notices at support.netapp.com](#)

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You can also contact us in the following ways:

- NetApp, Inc., 495 East Java Drive, Sunnyvale, CA 94089 U.S.
- Telephone: +1 (408) 822-6000
- Fax: +1 (408) 822-4501
- Support telephone: +1 (888) 463-8277