
Replacing an NVRAM or NVMEM battery

To replace an NVRAM battery in the system, you must remove the controller module from the system, open it, replace the battery, and close and replace the controller module.

About this task

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

Steps

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Shutting down the target controller

You shut down or take over the target controller using different procedures, depending on whether it is part of an HA pair or a stand-alone system.

Choices

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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 a stand-alone configuration, you must turn off the power supplies.

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: <pre>cf takeover</pre>

3. Wait at least two minutes after takeover of the impaired node to ensure that the takeover was completed successfully.
4. 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: <pre>system power off</pre>
Is not configured	At the prompt of the impaired node, press Ctrl-C and respond Y to halt the node.

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

1. Shut down the node if it is not already shut down:

```
halt -t 0
```
2. Shut down the power supplies and unplug both power cords from the source.
The system is ready for maintenance.

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's 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 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. Enter the following command at the console:</p> <pre>system node halt <i>impaired_node_name</i></pre> <p>b. Go to step 6.</p>
A stand-alone configuration and is not running	Go to step 6.
An HA pair	<p>a. Check the status of the impaired node by entering the following command from the healthy node's console:</p> <pre>storage failover show</pre> <p>b. If the impaired node is not running or has been taken over by the healthy node, go to Step 4.</p>

3. Take over the impaired node by entering the following command:

```
storage failover takeover -ofnode impaired_node_name
```

When it is taken over, the impaired node automatically reboots and displays the `Waiting for giveback...` message.

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 in an HA pair, the impaired node's console should be showing the `Waiting for giveback...` message. The method you use to shut down the node depends on whether remote management through a Service Processor (SP) is used.

Is the SP configured?	Then...
Yes	<p>Log in to the impaired node's SP and issue the following command:</p> <pre>system power off</pre>

Is the SP configured?	Then...
No	At the impaired node's prompt, press Ctrl-C and respond Y to halt the node.

- If in a stand-alone configuration, shut down the power supplies and unplug both the power cords from the power source.

Opening the system

To access components inside the controller module, you must open the system.

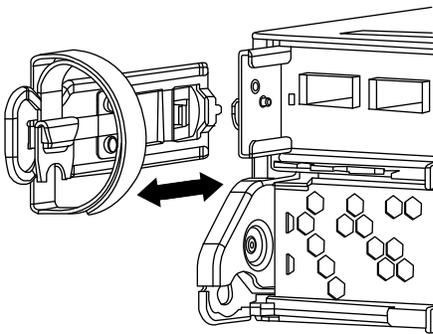
Steps

- If you are not already grounded, properly ground yourself.
- Loosen the hook and loop strap binding the cables to the cable management arm, and then unplug the system cables and SFPs (if needed), from the controller module, and keep track of where the cables were connected.

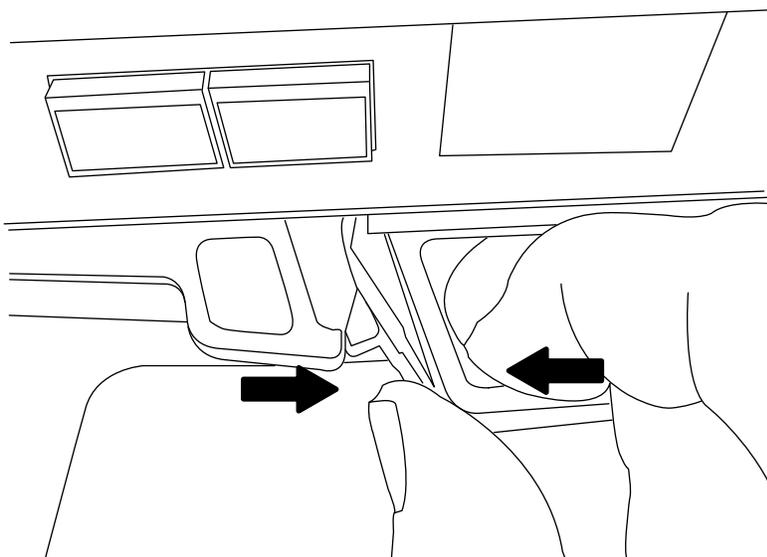
Leave the cables in the cable management arm so that when you reinstall the cable management arm, the cables are organized.

- Remove the cable management arms from the left and right sides of the controller module and set them aside.

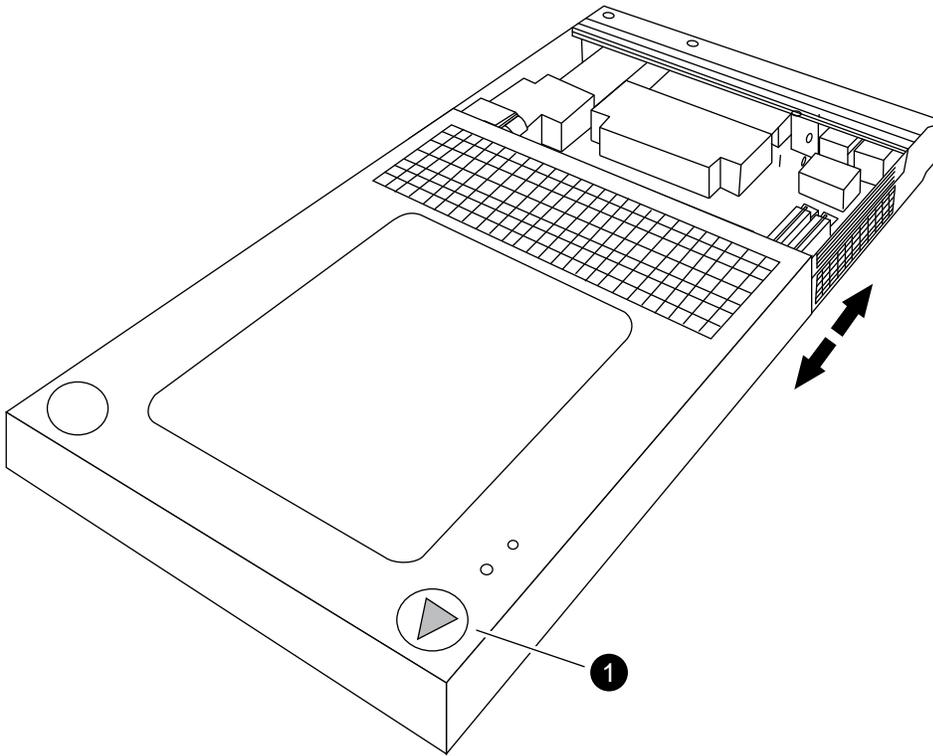
The illustration shows the cable management arms on a FAS2552 system. The procedure is the same for all FAS2500 systems.



- Squeeze the latch on the cam handle until it releases, as shown in the following illustration. Open the cam handle fully to release the controller module from the midplane, and then, using two hands, pull the controller module out of the chassis.



5. Turn the controller module over and open it by pressing the button to release the cover, and then slide the cover out.



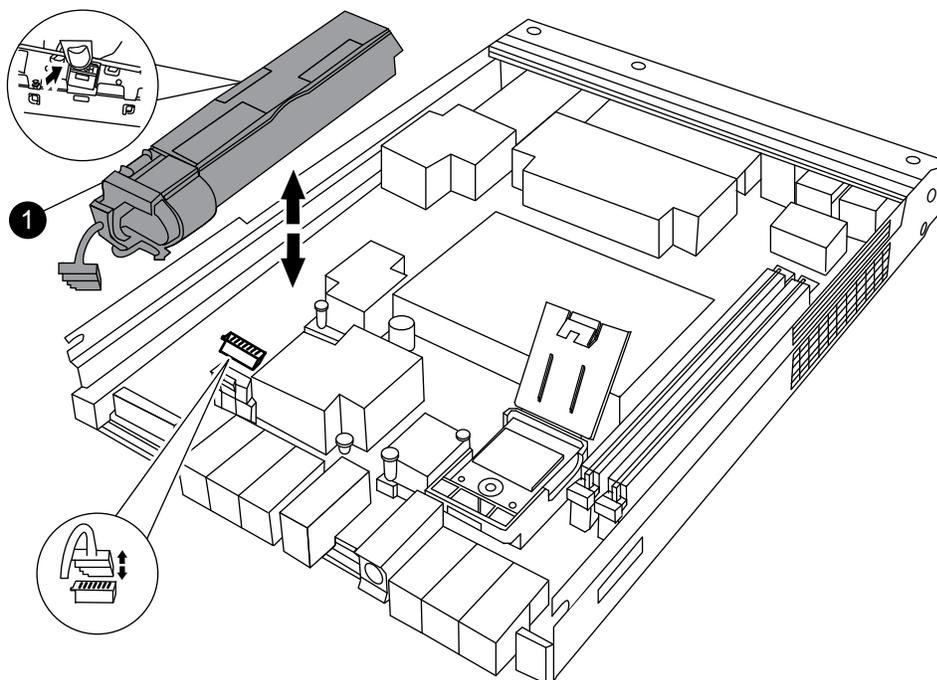
1	Button to release controller module cover
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Replacing the NVMEM battery in a FAS2500 system

You must complete a specific sequence of steps to remove the NVMEM battery from a FAS2500 controller module.

Steps

1. Locate the battery, press the clip on the face of the battery cable plug to release the lock clip from the plug socket, and unplug the battery cable from the socket.



1	NVMEM battery
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2. Grasp the battery and press the tab marked PUSH, and then lift the battery out of the holder and controller module.

Installing the NVMEM battery

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

Steps

1. Loop the cable around the cable channel on the side of the battery holder.
2. Position the battery pack by aligning the battery holder key ribs to the “V” notches on the sheet metal side wall.
3. Slide the battery pack down along the sheet metal side wall until the support tabs on the side wall hook into the slots on the battery pack, and the battery pack latch engages and clicks into the opening on the side wall.
4. Plug the battery into the controller module.

Reinstalling the controller module and booting the system

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

For HA pairs, 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. Close the controller module by sliding the cover over it until the release button clicks to confirm the closure.

2. 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.

3. Reinstall the cable management arms and recable the controller module, as needed.

If you removed the media converters (SFPs), remember to reinstall them if you are using fiber optic cables.

4. Complete the reinstall of the controller module:

If your system is in...	Then perform these steps...
-------------------------	-----------------------------

An HA pair

- a. Be prepared to interrupt the boot process.
The controller module begins to boot as soon as it is fully seated in the chassis.
- 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.
Attention: Do not use excessive force when sliding the controller module into the chassis; you might damage the connectors.
- c. As the system begins to boot, press **Ctrl-C** to interrupt the boot process when you see the message `Press Ctrl-C for Boot Menu`.
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.
- d. From the boot menu, select the option for Maintenance mode.
- e. 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.
- f. Bind the cables to the cable management device with the hook and loop strap.

A stand-alone configuration

- 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.
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 `Press Ctrl-C for Boot Menu`.
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.
 - c. From the boot menu, select the option for Maintenance mode.
 - 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.
 - e. Bind the cables to the cable management device with the hook and loop strap.
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Checking the status of the NVMEM battery and running diagnostics

After installing a new NVMEM battery, you should run diagnostics and check the status of the battery.

Steps

1. If the boot process was interrupted too late and the Boot Menu appeared, perform the following steps:
 - a. Select the Maintenance mode option from the displayed menu.

b. After the system boots to Maintenance mode, enter the following command at the prompt:

```
halt
```

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

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

- A prompt warning that when entering Maintenance mode in an HA configuration you must ensure that the healthy node remains down.

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

2. On the node with the replaced component, enter the following command at the LOADER prompt:

```
boot_diags
```

Note: You must enter this command from the LOADER prompt for system-level diagnostics to function properly. The `boot_diags` command starts special drivers designed specifically for system-level diagnostics.

Important: During the `boot_diags` process, you might see the following prompts:

- A prompt warning that when entering Maintenance mode in an HA configuration you must ensure that the partner remains down.

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

The Maintenance mode prompt (`*>`) appears.

3. Clear the status logs by entering the following command:

```
sldiag device clearstatus
```

4. Verify that the log is cleared by entering the following command:

```
sldiag device status
```

The following default response is displayed:

```
SLDIAG: No log messages are present.
```

5. Enter the following command at the prompt:

```
sldiag device run -dev nvmem
```

6. View the status of the test by entering the following command:

```
sldiag device status
```

Your storage system provides the following output while the tests are still running:

```
There are still test(s) being processed.
```

After all the tests are complete, the following response appears by default:

```
*> <SLDIAG: _ALL_TESTS_COMPLETED>
```

7. Verify that no hardware problems resulted from the addition or replacement of hardware components on your system by entering the following command:

```
sldiag device status [-dev devtype] [-name device] -long -state failed
```

System-level diagnostics returns you to the prompt if there are no test failures, or lists the full status of failures resulting from testing the component.

8. Proceed based on the result of the preceding step:

If the system-level diagnostics tests...	Then...
Were completed without any failures	<p>a. Clear the status logs by entering the following command:</p> <pre>sldiag device clearstatus</pre> <p>b. Verify that the log is cleared by entering the following command:</p> <pre>sldiag device status</pre> <p>The following default response is displayed: SLDIAG: No log messages are present.</p> <p>c. Exit Maintenance mode by entering the following command:</p> <pre>halt</pre> <p>d. Enter the following command at the LOADER prompt to boot the storage system:</p> <pre>boot_ontap</pre> <p>e. If your system is in an HA pair, enter the <code>cf giveback</code> command (7-Mode Data ONTAP) or <code>storage failover giveback</code> command (clustered Data ONTAP) from the partner node's console.</p> <p>You have completed system-level diagnostics.</p>
Resulted in some test failures	<p>Determine the cause of the problem:</p> <p>a. Exit Maintenance mode by entering the following command:</p> <pre>halt</pre> <p>After you issue the command, wait until the system stops at the LOADER prompt.</p> <p>b. Turn off or leave on the power supplies, depending on how many controller modules are in the chassis:</p> <ul style="list-style-type: none"> • If you have two controller modules in the chassis, leave the power supplies turned on to provide power to the other controller module. • If you have one controller module in the chassis, turn off the power supplies and unplug them from the power sources. <p>c. Check the controller module you are servicing and verify that you have observed all the considerations identified for running system-level diagnostics, that cables are securely connected, and that hardware components are properly installed in the storage system.</p> <p>d. Boot the controller module you are servicing, interrupting the boot by pressing Ctrl-C when prompted. This takes you to the Boot Menu:</p> <ul style="list-style-type: none"> • If you have two controller modules in the chassis, fully seat the controller module you are servicing in the chassis. The controller module boots up when fully seated. • If you have one controller module in the chassis, connect the power supplies and turn them on. <p>e. Select Boot to maintenance mode from the menu.</p> <p>f. Exit Maintenance mode by entering the following command:</p> <pre>halt</pre> <p>After you issue the command, wait until the system stops at the LOADER prompt.</p> <p>g. Enter <code>boot_diags</code> at the prompt and rerun the system-level diagnostic test.</p>

Related information

[System-Level Diagnostics Guide](#)

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 the NetApp Support Site, 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](http://support.netapp.com)

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