



Replacing a boot device in a FAS22xx system running Data ONTAP 8.x

The boot device stores a primary and secondary set of system files on it (also called the *boot image*) that the system uses when it boots. The steps you follow to replace a boot device differ, depending on whether your system is running Data ONTAP 8.x in 7-Mode or Cluster-Mode.

Before you begin

Before extracting the compressed system files during the boot device installation process, make sure that the utility you use is set to suppress any automatic CR/LF conversions in the extracted files.

If you experience any problems during netboot, you can verify the integrity of the files extracted from the package by comparing the *md5sum* values stored in the *MD5SUMS* file.

About this task

- The steps for replacing a boot device in a system running 7-Mode are different than for a system running Cluster-Mode. You must use the correct procedure for your version of Data ONTAP 8.x.
- The term *boot device* refers to the USB boot media.
- *Cluster-Mode* refers to a system running Data ONTAP in clustered Data ONTAP.
- *7-Mode* refers to a system running Data ONTAP in 7-Mode.

Choices

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Replacing a boot device in a system running ONTAP

Replacing a boot device in ONTAP involves shutting down the node, removing the old boot device, and transferring the system files to the new boot device.

About this task

This procedure is for systems running ONTAP. If your system is running Data ONTAP operating in 7-Mode, you must use that procedure instead.

Steps

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Shutting down the target controller

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

Choices

- [Shutting down a node in a high-availability configuration](#) on page 2
- [Shutting down a node in a two-node MetroCluster configuration running ONTAP](#) on page 2

Shutting down a node in a high-availability configuration

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.

About this task

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

Steps

1. Check the status of the target node (the node you want to perform maintenance on) by entering the following command at the system console of either node:

```
storage failover show
```

2. Take one of the following actions, depending on the result of the `storage failover show` command:

If...	Then...
Neither node is in takeover mode	Go to the next step in this procedure.
The partner node took over the target node	The target node is in a state where you can begin removing it from the system chassis.
The target node took over the partner node	<ol style="list-style-type: none">a. Correct the problem that caused the takeover.b. Enter the following command from the target node console: <pre>storage failover giveback -fromnode target_node_name</pre>c. Go back to the beginning of this procedure.

3. Take over the target node by entering the following command from the partner node's console:

```
storage failover takeover -bynode partner_node_name
```

4. Set the following boot environment variable on the target node at the boot environment prompt:

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

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

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

About this task

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

Steps

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

2. Depending on whether an automatic switchover has occurred, perform one of the following actions:

If the impaired node...	Then...
Has automatically switched over	Proceed to the next step.
Has not automatically switched over	Perform a planned switchover operation from the healthy node: metrocluster switchover
Has not automatically switched over and planned switchover with the metrocluster switchover command fails	<ol style="list-style-type: none">a. Halt the impaired node: system node haltb. Perform a forced switchover operation: metrocluster switchover -forced on disaster true

3. Resynchronize the data aggregates from the surviving cluster: **metrocluster heal -phase aggregates**

Example

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

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

4. Verify that the heal-aggregates operation is completed: **metrocluster operation show**

Example

```
controller_A_1::> metrocluster operation show
Operation: heal-aggregates
State: successful
Start Time: 7/25/2014 18:45:55
End Time: 7/25/2014 18:45:56
Errors: -
```

5. Check the state of the aggregates: **storage aggregate show**

Example

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

6. Heal the root aggregates: **metrocluster heal -phase root-aggregates**

Example

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

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

7. Verify that the healing operation is completed on the destination cluster: `metrocluster operation show`

Example

```
cluster_A::> metrocluster operation show
Operation: heal-root-aggregates
State: successful
Start Time: 7/29/2014 20:54:41
End Time: 7/29/2014 20:54:42
Errors: -
```

Opening the system

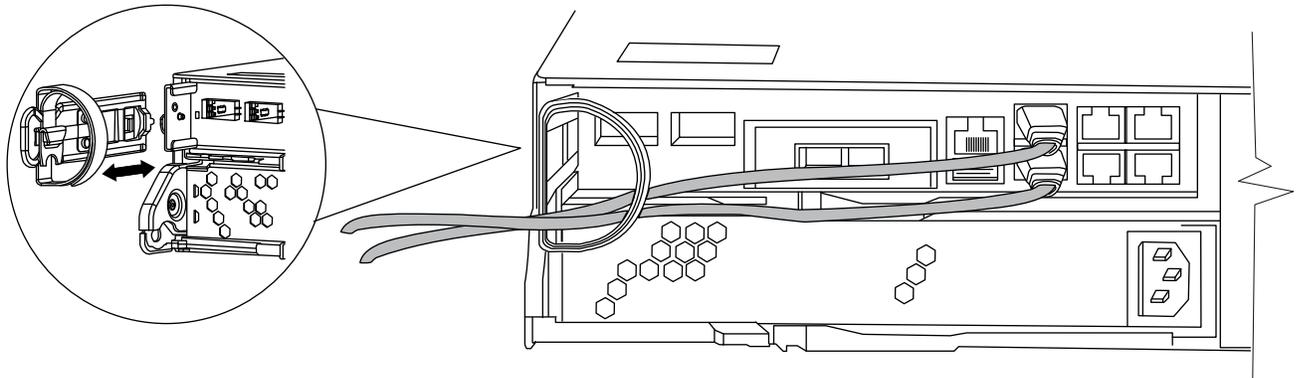
If you want to access components inside the controller module, you must open the system.

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 arm, and then unplug the system cables and SFPs (if needed) from the controller module, and keep track of where the cables were connected.

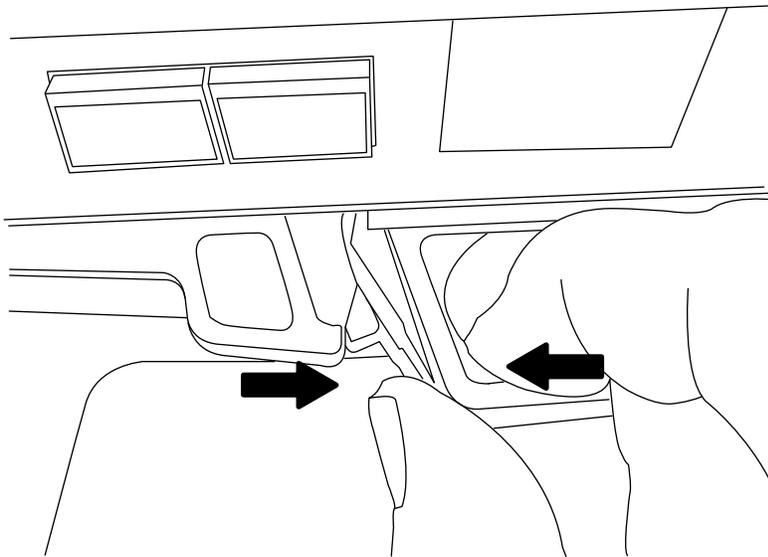
Leave the cables in the cable management arm so that when you reinstall the cable management arm, the cables are organized.

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

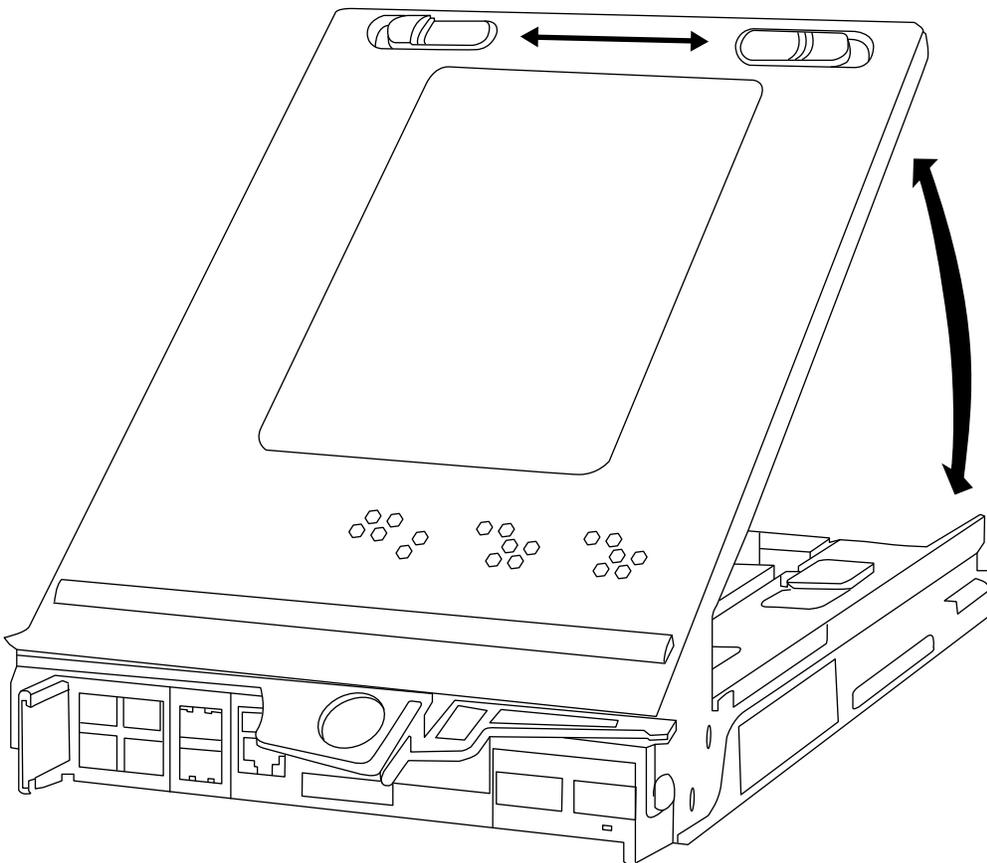


The illustration shows a FAS2220 or FAS2240-2 system. The procedure is the same for all FAS22xx systems.

4. 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 sliding the blue tabs to release the cover, and then swing the cover up and open.



Removing the boot device from the controller module

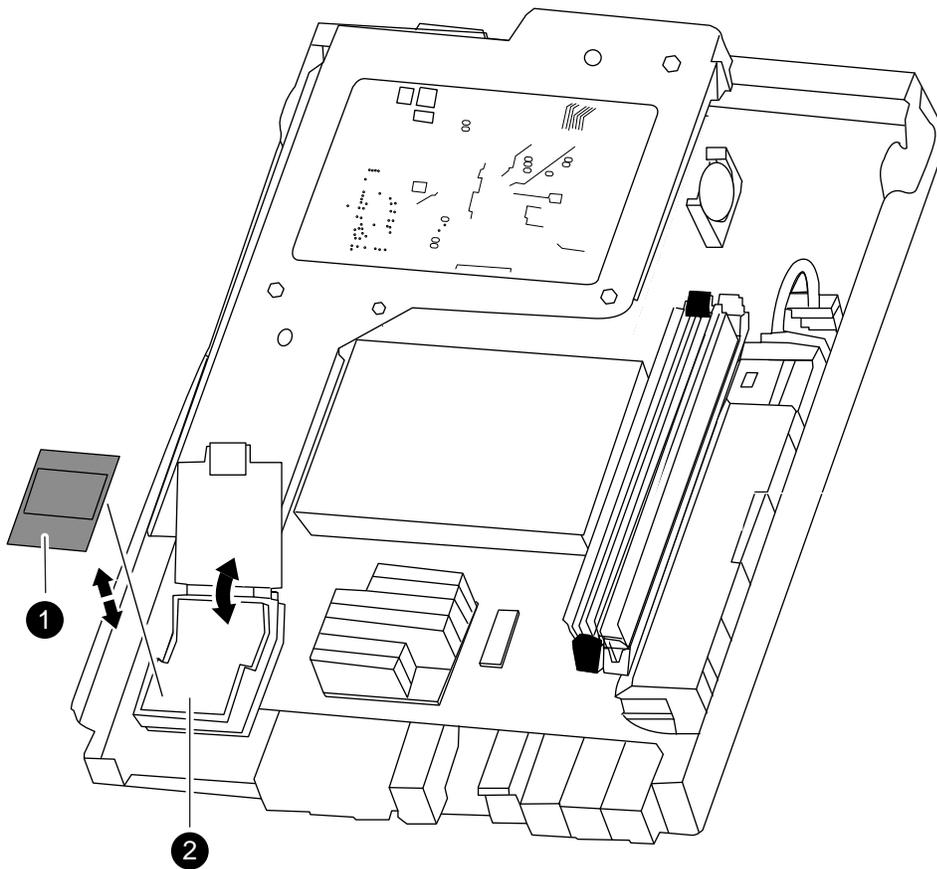
You must remove the old or failed boot device from the impaired node in your system prior to installing the new or replacement boot device.

Steps

1. If you are not already grounded, properly ground yourself.
2. Turn the controller module so that you can see where the boot device is located.

Use the FRU map on the controller module or the following illustration to help you locate the boot device enclosure.

Note: The illustration shows a controller module with a mezzanine card. Your system might have a mezzanine card or a blank.



1	Boot device
2	Boot device holder

3. Open the boot device cover and hold the boot device by its edges at the notches in the boot device housing, gently lift it straight up and out of the housing.

Attention: Always lift the boot device straight up out of the housing. Lifting it out at an angle can bend or break the connector pins in the boot device.

4. Set the boot device aside.

Installing the boot device

After you remove the old boot device, you must transfer system files and restore configuration information to your replacement boot device using one of several methods.

Before you begin

Note: For systems running 7-Mode, NetApp recommends using the nondisruptive procedure for HA pair running Data ONTAP 8.0.1 and later. For systems running clustered Data ONTAP, NetApp recommends using the nondisruptive procedure for HA pair running Data ONTAP 8.1.1 and later.

Choices

- [Installing the boot device and transferring system files nondisruptively using netboot in systems running Data ONTAP 8.1.1 and later](#) on page 7
- [Installing the boot device and transferring system files disruptively using netboot](#) on page 11

Installing the boot device and transferring system files nondisruptively using netboot in systems running Data ONTAP 8.1.1 and later

You can transfer the system files and restore configuration information to your HA pair nondisruptively by using netboot and the healthy node.

Before you begin

- You must have the blank replacement boot device you received from your provider.
- You must have a network interface to the HA pair healthy node.
- You must have a separate IP address to use to netboot the impaired node.

About this task

The following procedure is written with the assumption that the impaired node has been taken over by the healthy node, and that the impaired node has booted to the LOADER prompt after the takeover has been completed.

Attention: You can only use this nondisruptive procedure in an HA pair that is running Data ONTAP 8.1.1 and later. If your system is running clustered Data ONTAP 8.1, you can only use the disruptive procedure.

Steps

1. Download and extract the `netboot.tgz` file from the NetApp Support Site.

The `netboot.tgz` file is used for performing a netboot of your system. You should download the file contents to a web-accessible directory.

- a. Download the `netboot.tgz` file from the NetApp Support Site to a web-accessible directory.
- b. Switch to the web-accessible directory.
- c. Extract the contents of the `netboot.tgz` file to the target directory `tar -zxvf netboot.tgz`.

Your directory listing should contain the following directory:

```
netboot/
```

Note: If you are extracting the contents using Windows, do not use winzip to extract the netboot image. Use another extraction tool, such as 7-Zip or WinRAR.

2. Download the `image.tgz` file from the NetApp Support Site to the web-accessible directory.

Your directory listing should contain the following file and directory:

```
image.tgz
netboot/
```

3. If you are not already grounded, properly ground yourself.
4. Turn the controller module so that you can locate the boot device holder.
You can use the FRU map on the controller module to locate the boot device holder.
5. Open the boot device cover, if applicable.
6. Align the boot device with the boot device socket or connector, and then firmly push the boot device straight down into the socket or connector.

Important: Always install the boot device by aligning the front of the boot device squarely over the pins in the socket at the front of the boot device housing. Installing the boot device at an angle or over the rear plastic pin first can bend or damage the pins in the boot device connector.

7. Verify that the boot device is seated squarely and completely in the socket or connector.
If necessary, remove the boot device and reseal it into the socket.
8. Close the boot device cover.
9. Close the controller module cover, and then turn the controller module over.
10. Align the end of the controller module with the opening in the chassis, and then gently push the controller module halfway into the system.
11. Reinstall the cable management arms and recable the system, as needed.
When recabling, remember to reinstall the media converters (SFPs) if they were removed.
12. Push the controller module all the way into the system, firmly push the cam handle to finish seating it, and then push the cam handle to the closed position.
13. The next step depends on your system configuration:

If your system has...	Then...
One controller module in the chassis	Complete the following substeps: <ol style="list-style-type: none"> a. Reconnect the power cables to the power supplies and to the power sources, and then turn on the power. The system begins to boot and stops at the <code>LOADER</code> prompt. b. Go to the next step.
Two controller modules in the chassis	The node already began rebooting and stops at the <code>LOADER</code> prompt; go to the next step.

14. If you have a switchless cluster, then set the following cluster environment:
 - a. Display the attributes of a switchless cluster from the healthy HA partner:


```
network options switchless-cluster show
```

Note: This is an advanced privilege command.
 - b. Set the switchless cluster environment variable at the `LOADER` prompt on the impaired node console:


```
setenv bootarg.init.switchless_cluster.enable true
```

15. If you are using Storage Encryption (NSE) check with Self-Encrypting Drives (SED), then contact technical support for assistance with the required bootargs.
16. Set boot environment variables as needed:

If you are running...	Then...
Running Clustered Data ONTAP 8.2.x and later	Set the following boot environment variable at the LOADER prompt on the impaired node console: setenv bootarg.init.boot_clustered true
Running ONTAP 8.3 and later on an AFF system	Set the following boot environment variable on the impaired node: setenv bootarg.init.flash_optimized false

17. Depending on your network configuration, execute one of the following commands at the LOADER prompt:

If you...	Then...
Have DHCP enabled	Use the following command: ifconfig e0M -auto
Do not have DHCP enabled	Use the following command: ifconfig e0M -addr=<i>filer_addr</i> -mask=<i>netmask</i> -gw=<i>gateway</i> - dns=<i>dns_addr</i> -domain=<i>dns_domain</i> <i>filer_addr</i> is the IP address of the storage system. <i>netmask</i> is the network mask of the storage system. <i>gateway</i> is the gateway for the storage system. <i>dns_addr</i> is the IP address of a name server on your network. <i>dns_domain</i> is the Domain Name System (DNS) domain name. If you use this optional parameter, you do not need a fully qualified domain name in the netboot server URL; you need only the server's host name. Note: To netboot the node when your system is running in Data ONTAP operating in 7-Mode, use an IP address that is not the management IP address for the target. If your system is running ONTAP, you can use the management IP address. Note: Other parameters might be necessary for your interface. For details, use the <code>help ifconfig</code> command at the LOADER prompt.

18. At the LOADER prompt, go to the following web page to install the new software:

```
netboot http://path_to_web-accessible_directory/netboot/kernel
```

19. Select the **Install new software first** option from the displayed menu.

This menu option downloads and installs the new ONTAP image to the boot device.

- You should enter **y** when prompted with the message that this procedure is not supported for nondisruptive upgrade on an HA pair.
- You should enter **y** when warned that this process replaces the existing ONTAP software with new software.
- You should enter the path as follows when prompted for the URL of the *image.tgz* file:

```
http://path_to_the_web-accessible_directory/image.tgz
```

20. Enter **y** when prompted regarding nondisruptive upgrade or replacement of the software.

21. Enter the path to the *image.tgz* file when prompted for the URL of the package.

Example

```
What is the URL for the package?  
http://path_to_web-accessible_directory/image.tgz
```

22. Restore the backup configuration by entering **y** when you see the following screen:

Example

```
*****  
*           Restore Backup Configuration           *  
* This procedure only applies to storage controllers that *  
* are configured as an HA pair.                       *  
*                                                     *  
* Choose Yes to restore the "varfs" backup configuration *  
* from the SSH server. Refer to the Boot Device Replacement *  
* guide for more details.                             *  
* Choose No to skip the backup recovery and return to the *  
* boot menu.                                           *  
*****  
  
Do you want to restore the backup configuration  
now? {y|n} y  
  
*****  
Perform the restore backup procedure on this node's HA partner *  
*****  
  
Do you want to restore the backup configuration  
now? {y|n} y  
  
Start the restore_backup procedure on this node's HA partner.
```

23. In advanced mode, restore the backup from the HA partner:

- a. Set the healthy node to advanced privilege level:

```
set -privilege advanced
```

- b. Restore the backup:

```
system node restore-backup -node healthy_node_name -target_address  
impaired_node_IP_address
```

- c. Return the node to admin level:

```
set -privilege admin
```

24. Restore the configuration from the `varfs.tgz` file, and then reboot the impaired node.

Example

```
The restore configuration has been copied  
from the HA partner to this node,  
would you like to use this restored copy  
now? {y|n} y  
Boot device: /dev/da0 found...  
Checking /dev/da0s1 file system... success.  
Mounting /dev/da0s1 to /cfcard... success.  
Checking /cfcard/x86_64/freebsd mount point... success.  
Gzip checking /var/home/root/varfs.tgz... success.  
Restoring backup configuration...
```

```
Backup Configuration from Thu Jun 19 18:01:53 UTC 2014 successfully restored
```

```
The node must be rebooted to start using the newly installed software. Do you  
want to reboot now? {y|n} y
```

25. After the impaired node has rebooted, perform a giveback from the healthy node:

```
storage failover giveback -ofnode partner_node_name
```

Installing the boot device and transferring system files disruptively using netboot

You can transfer the system files and restore the configuration information to your HA pair disruptively by performing a netboot to copy the system files to the replacement boot device.

Before you begin

- You must have the blank replacement boot device that you received from your provider.
- You must have access to an HTTP server.
- You must have access to the NetApp Support Site to download the necessary system files for your platform and version of ONTAP software that is running on it.

About this task

You can use this disruptive procedure in either a stand-alone system or an HA configuration during scheduled maintenance on the system, or if the controller module is not fully functional.

This procedure is disruptive, even when using it with a system in an HA configuration because an immediate giveback and re-takeover occur during the procedure. If possible, you should use the nondisruptive procedure for HA configurations for your version of ONTAP software.

Steps

1. Download and extract the `netboot.tgz` file from the NetApp Support Site.

The `netboot.tgz` file is used for performing a netboot of your system. You should download the file contents to a web-accessible directory.

- a. Download the `netboot.tgz` file from the NetApp Support Site to a web-accessible directory.
- b. Switch to the web-accessible directory.
- c. Extract the contents of the `netboot.tgz` file to the target directory `tar -zxvf netboot.tgz`.

Your directory listing should contain the following directory:

```
netboot/
```

Note: If you are extracting the contents using Windows, do not use winzip to extract the netboot image. Use another extraction tool, such as 7-Zip or WinRAR.

2. Download the `image.tgz` file from the NetApp Support Site to the web-accessible directory.

Your directory listing should contain the following file and directory:

```
image.tgz  
netboot/
```

3. If you are not already grounded, properly ground yourself.
4. Turn the controller module so that you can locate the boot device holder.

You can use the FRU map on the controller module to locate the boot device holder.

5. Open the boot device cover, if applicable.
6. Align the boot device with the boot device socket or connector, and then firmly push the boot device straight down into the socket or connector.
Important: Always install the boot device by aligning the front of the boot device squarely over the pins in the socket at the front of the boot device housing. Installing the boot device at an angle or over the rear plastic pin first can bend or damage the pins in the boot device connector.
7. Verify that the boot device is seated squarely and completely in the socket or connector.
If necessary, remove the boot device and reseal it into the socket.
8. Close the boot device cover.
9. Close the controller module cover, and then turn the controller module over.
10. Align the end of the controller module with the opening in the chassis, and then gently push the controller module halfway into the system.
11. Reinstall the cable management arms and recable the system, as needed.
When recabling, remember to reinstall the media converters (SFPs) if they were removed.
12. Push the controller module all the way into the system, firmly push the cam handle to finish seating it, and then push the cam handle to the closed position.
13. The next step depends on your system configuration:

If your system has...	Then...
One controller module in the chassis	Complete the following substeps: <ol style="list-style-type: none">a. Reconnect the power cables to the power supplies and to the power sources, and then turn on the power. The system begins to boot and stops at the LOADER prompt.b. Go to the next step.
Two controller modules in the chassis	The node already began rebooting and stops at the LOADER prompt; go to the next step.

14. Display the attributes of a switchless cluster from the healthy HA partner:
`network options switchless-cluster show`
15. If your node is in a switchless cluster, set the switchless cluster environment variable at the LOADER prompt on the impaired node console:
`setenv bootarg.init.switchless_cluster.enable true`
Note: This is an advanced privilege command.
16. To set the NetApp Storage Encryption (NSE) boot environment variables, contact technical support.
17. Set boot environment variables as needed:

If you are...	Then...
Running Data ONTAP 8.0 to 8.1.x	Set the following boot environment variable at the LOADER prompt on the impaired node console: <code>setenv bootarg.init.usebootp false</code>

18. Depending on your network configuration, execute one of the following commands at the LOADER prompt:

If you...	Then...
Have DHCP enabled	Use the following command: ifconfig e0M -auto
Do not have DHCP enabled	Use the following command: ifconfig e0M -addr=<i>filer_addr</i> -mask=<i>netmask</i> -gw=<i>gateway</i> - dns=<i>dns_addr</i> -domain=<i>dns_domain</i> <i>filer_addr</i> is the IP address of the storage system. <i>netmask</i> is the network mask of the storage system. <i>gateway</i> is the gateway for the storage system. <i>dns_addr</i> is the IP address of a name server on your network. <i>dns_domain</i> is the Domain Name System (DNS) domain name. If you use this optional parameter, you do not need a fully qualified domain name in the netboot server URL; you need only the server's host name. Note: To netboot the node when your system is running in Data ONTAP operating in 7-Mode, use an IP address that is not the management IP address for the target. If your system is running ONTAP, you can use the management IP address. Note: Other parameters might be necessary for your interface. For details, use the <code>help ifconfig</code> command at the LOADER prompt.

19. At the LOADER prompt, boot the system:

```
netboot http://path_to_the_web_accessible_directory/netboot/kernel
```

The system begins to boot, but stops at the Boot menu.

20. Select the **Install new software first** option from the displayed menu.

This menu option downloads and installs the new ONTAP image to the boot device.

- You should enter **y** when prompted with the message that this procedure is not supported for nondisruptive upgrade on an HA pair.
- You should enter **y** when warned that this process replaces the existing ONTAP software with new software.
- You should enter the path as follows when prompted for the URL of the *image.tgz* file:

```
http://path_to_the_web_accessible_directory/image.tgz
```

21. Your next step depends on which version of ONTAP is installed on your system.

If your system is running...	Then...
Data ONTAP 8.0	Reboot the node by entering y when you see the following prompt: <div style="background-color: #f0f0f0; padding: 10px; border: 1px solid #ccc;"> <pre>The node must be rebooted to start using the newly installed software. Do you want to reboot now? [y/n] y</pre> </div> The controller module reboots, but stops at the Boot menu because the boot device was reformatted and the configuration data needs to be restored.

If your system is running...**Then...**

ONTAP 8.0.1 and later

Complete the following substeps:

- a. Enter **n** to skip the backup recovery when you see the following prompt:

```
*****
****
*           Restore Backup
Configuration          *
* This procedure only applies to storage controllers
that *
* are configured as an HA
pair. *
*
* Choose Yes to restore the 'varfs' backup
configuration *
* from a TFTP server. Refer to the Boot Device
Replacement *
* guide for more
details. *
* Choose No to skip the back up recovery and return to
the *
* boot
menu. *
*****
****

Do you want to restore the backup configuration
now? {y|n} n
```

Note: If your system is running ONTAP 8.1.1 and later, the prompt says SSH server

- b. Reboot the node by entering **y** when you see the following prompt:

```
The node must be rebooted to start using the newly
installed
software. Do you want to reboot now? {y/n} y
```

The controller module reboots, but stops at the boot environment prompt.

- c. Boot ONTAP by entering the following command at the boot environment prompt:

boot_ontap

The controller module reboots, but stops at the Boot menu because the boot device was reformatted and the configuration data needs to be restored.

-
22. 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.

23. Your next step depends on your system configuration.

If your system is in...**Description**

A stand-alone configuration

You can begin using your system after the node reboots to complete restoring the backup configuration.

If your system is in...	Description
An HA pair	<p data-bbox="609 216 1511 279">Complete the following substeps after the impaired node is displaying the <code>Waiting for Giveback...</code> message:</p> <p data-bbox="609 300 1511 331">a. Enter the following command from the healthy node:</p> <ul data-bbox="649 352 1511 520" style="list-style-type: none"> <li data-bbox="649 352 1511 426">• In Data ONTAP 8.1.0 or earlier: <code>storage failover giveback -fromnode <i>partner_node_name</i></code> <li data-bbox="649 447 1511 520">• In ONTAP 8.1.1 or later: <code>storage failover giveback -ofnode <i>partner_node_name</i></code> <p data-bbox="646 541 1511 604">The impaired node takes back its storage, finishes booting up, and then reboots and is again taken over by the healthy node.</p> <p data-bbox="609 625 1511 657">b. Perform a giveback from the healthy node:</p> <ul data-bbox="649 678 1511 846" style="list-style-type: none"> <li data-bbox="649 678 1511 751">• In Data ONTAP 8.1.0 or earlier: <code>storage failover giveback -fromnode <i>healthy_node_name</i></code> <li data-bbox="649 772 1511 846">• In ONTAP 8.1.1 or later: <code>storage failover giveback -ofnode <i>replacement_node_name</i></code> <p data-bbox="646 867 1511 930">The impaired node takes back its storage and finishes booting up with the restored configuration.</p> <p data-bbox="673 930 1511 961">Note: If the giveback is vetoed, you can consider overriding the vetoes.</p> <p data-bbox="609 1056 1511 1108">c. Monitor the progress of the giveback operation by using the <code>storage failover show-giveback</code> command.</p> <p data-bbox="609 1129 1511 1186">d. After the giveback operation is complete, confirm that the HA pair is healthy and takeover is possible by using the <code>storage failover show</code> command.</p>

Replacing a boot device in a system running in 7-Mode

Replacing a boot device in 7-Mode involves shutting down the system, removing the old boot device, and transferring the system files to the new boot device.

About this task

This procedure is for systems running in 7-Mode. If your system is running in Cluster-Mode, you must use that procedure instead.

Steps

1. [Shutting down a node](#) on page 16
2. [Opening the system](#) on page 16
3. [Removing the boot device from the controller module](#) on page 18
4. [Installing the boot device](#) on page 19

Shutting down a node

When replacing the boot device in a system running 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 your 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 partner 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 target node chassis.

Steps

1. Shut down the system or node:

If the system is in...	Then...
A stand-alone configuration and is running	<ol style="list-style-type: none">a. Enter the following command at the console: <pre>halt -t 0</pre>b. Go to the next step.
A stand-alone configuration and is not running	Go to the next step.
An HA pair	<ol style="list-style-type: none">a. Check the status of the target node by entering the following command from the partner node's console: <pre>cf status</pre>b. Take one of the following actions, depending on the result of the <code>cf status</code> command:<ul style="list-style-type: none">• If the target node is not running or has been taken over by the partner node, go to the next step.• If the target node took over the partner node, give back the partner node using the <code>cf giveback</code> command from the target node, initiate the takeover from the partner node using the <code>cf takeover</code> command, and then go to the next step.• If the target node has not been taken over by the partner node and is running, enter the following command from the partner node, and then go to the next step: <pre>cf takeover</pre>

2. If applicable, turn off the power supplies and unplug both power cords from the power source.

Opening the system

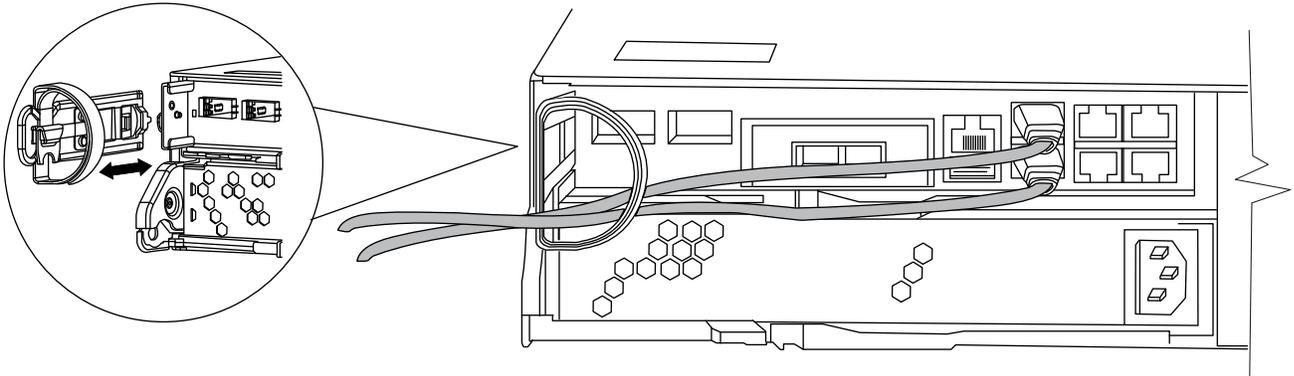
If you want to access components inside the controller module, you must open the system.

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 arm, and then unplug the system cables and SFPs (if needed) from the controller module, and keep track of where the cables were connected.

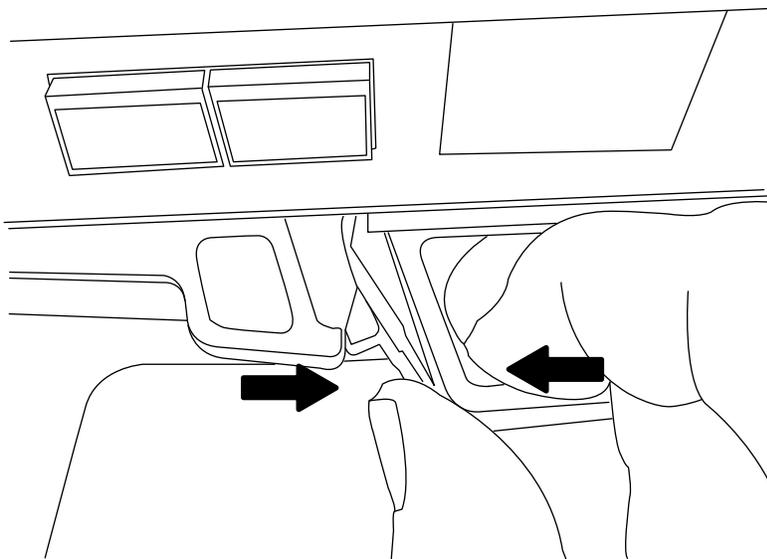
Leave the cables in the cable management arm so that when you reinstall the cable management arm, the cables are organized.

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

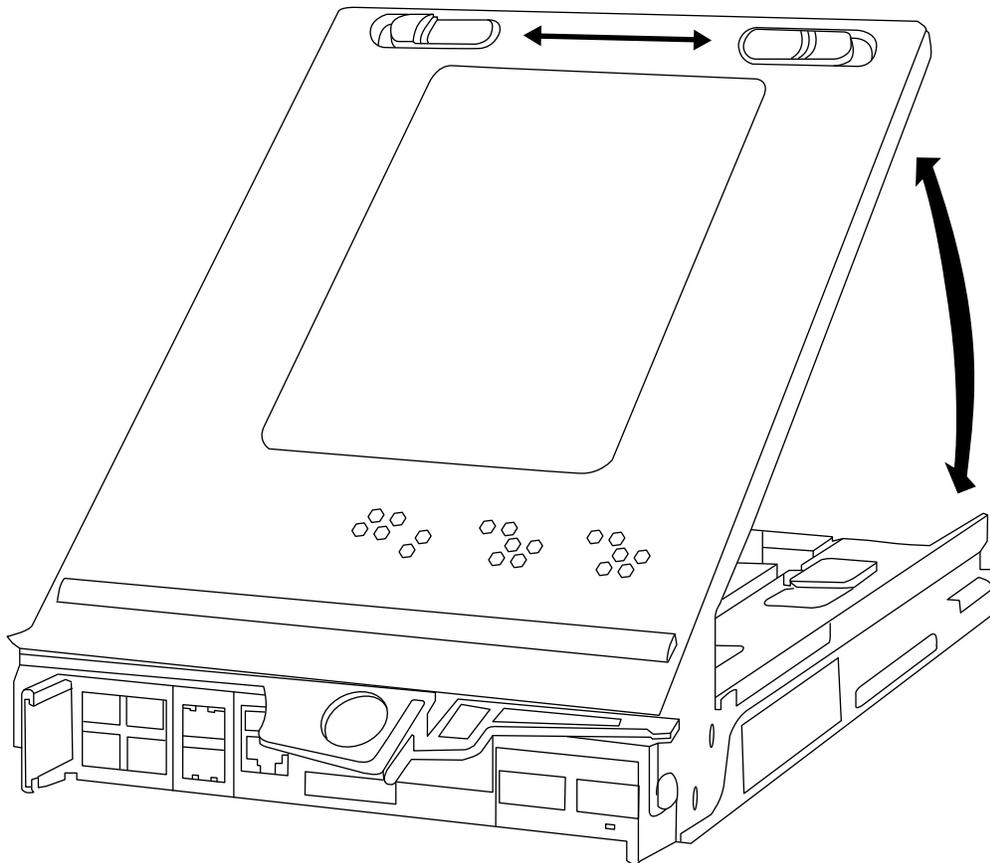


The illustration shows a FAS2220 or FAS2240-2 system. The procedure is the same for all FAS22xx systems.

4. 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 sliding the blue tabs to release the cover, and then swing the cover up and open.



Removing the boot device from the controller module

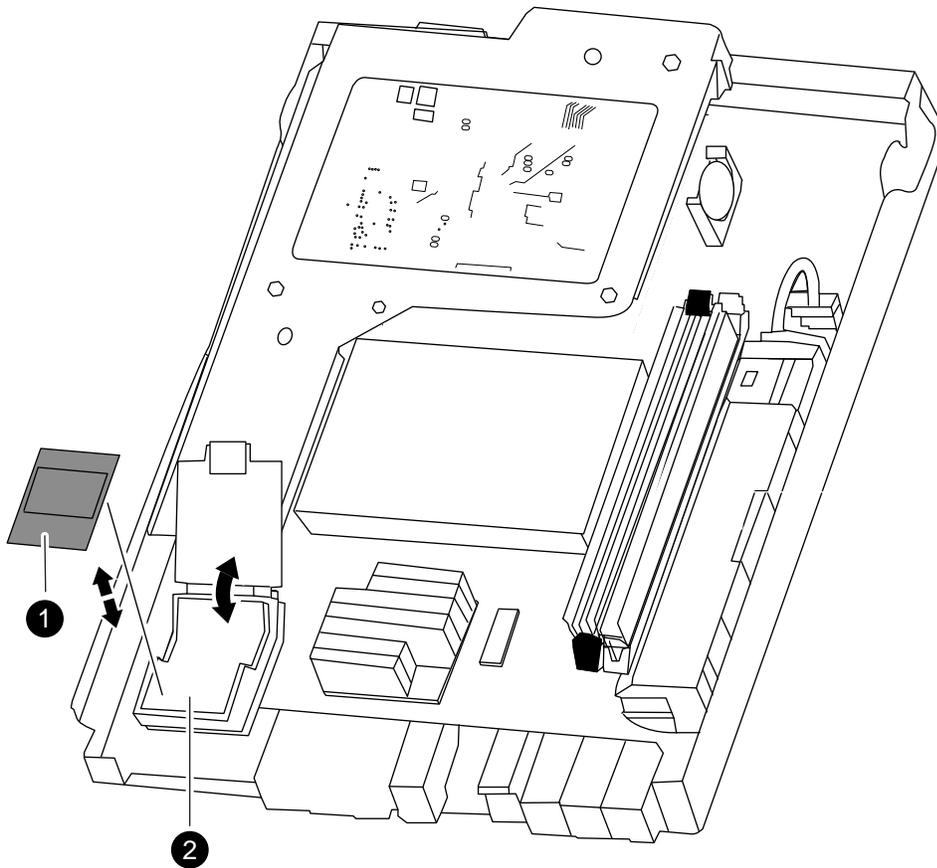
You must remove the old or failed boot device from the impaired node in your system prior to installing the new or replacement boot device.

Steps

1. If you are not already grounded, properly ground yourself.
2. Turn the controller module so that you can see where the boot device is located.

Use the FRU map on the controller module or the following illustration to help you locate the boot device enclosure.

Note: The illustration shows a controller module with a mezzanine card. Your system might have a mezzanine card or a blank.



1	Boot device
2	Boot device holder

- Open the boot device cover and hold the boot device by its edges at the notches in the boot device housing, gently lift it straight up and out of the housing.

Attention: Always lift the boot device straight up out of the housing. Lifting it out at an angle can bend or break the connector pins in the boot device.

- Set the boot device aside.

Installing the boot device

After you remove the old boot device, you must transfer system files and restore configuration information to your replacement boot device using one of several methods.

Before you begin

Note: For systems running 7-Mode, NetApp recommends using the nondisruptive procedure for HA pair running Data ONTAP 8.0.1 and later. For systems running clustered Data ONTAP, NetApp recommends using the nondisruptive procedure for HA pair running Data ONTAP 8.1.1 and later.

Choices

- [Installing the boot device and transferring system files nondisruptively using netboot in systems running Data ONTAP 8.1](#) on page 20

- [Installing the boot device and transferring system files nondisruptively using netboot in systems running ONTAP 8.1.1 and later](#) on page 23
- [Installing the boot device and transferring system files disruptively using netboot](#) on page 26

Installing the boot device and transferring system files nondisruptively using netboot in systems running Data ONTAP 8.1

You can transfer the system files and restore configuration information to your HA pair nondisruptively by using netboot and the partner node.

Before you begin

- You must have the blank replacement boot device that you received from your provider.
- You must have a network interface to the HA pair partner node.
- You must have a separate IP address to use to netboot the target node.

About this task

The following procedure is written with the assumption that the target node has been taken over by the partner node and that the target node has booted to the LOADER after the takeover has been completed.

Attention: You can only use this nondisruptive procedure in an HA pair that is running Data ONTAP 8.1.

Steps

1. Download and extract the `netboot.tgz` file from the NetApp Support Site.

The `netboot.tgz` file is used for performing a netboot of your system. You should download the file contents to a web-accessible directory.

- a. Download the `netboot.tgz` file from the NetApp Support Site to a web-accessible directory.
- b. Switch to the web-accessible directory.
- c. Extract the contents of the `netboot.tgz` file to the target directory `tar -zxvf netboot.tgz`.

Your directory listing should contain the following directory:

```
netboot/
```

Note: If you are extracting the contents using Windows, do not use winzip to extract the netboot image. Use another extraction tool, such as 7-Zip or WinRAR.

2. Download the `image.tgz` file from the NetApp Support Site to the web-accessible directory.

Your directory listing should contain the following file and directory:

```
image.tgz
netboot/
```

3. If you are not already grounded, properly ground yourself.
4. Open the boot device cover, if applicable.
5. Align the boot device with the boot device socket or connector, and then firmly push the boot device straight down into the socket or connector.

Important: Always install the boot device by aligning the front of the boot device squarely over the pins in the socket at the front of the boot device housing. Installing the boot device at an angle or over the rear plastic pin first can bend or damage the pins in the boot device connector.

6. Verify that the boot device is seated squarely and completely in the socket or connector.
If necessary, remove the boot device and reseal it into the socket.
7. Close the boot device cover.
8. Close the controller module cover, and then turn the controller module over.
9. Align the end of the controller module with the opening in the chassis, and then gently push the controller module halfway into the system.
10. Reinstall the cable management arms and recable the system, as needed.
When recabling, remember to reinstall the media converters (SFPs) if they were removed.
11. Push the controller module all the way into the system, firmly push the cam handle to finish seating it, and then push the cam handle to the closed position.
12. The next step depends on your system configuration:

If your system has...	Then...
One controller module in the chassis	Complete the following substeps: <ol style="list-style-type: none"> a. Reconnect the power cables to the power supplies and to the power sources, and then turn on the power. The system begins to boot and stops at the LOADER prompt. b. Go to the next step.
Two controller modules in the chassis	The node already began rebooting and stops at the LOADER prompt; go to the next step.

13. Set up the TFTP server on the partner node by entering the following commands on the partner node console:

```
partner options tftpd.enable off
partner options tftpd.rootdir /etc
partner options tftpd.enable on
```

14. Depending on your network configuration, execute one of the following commands at the LOADER prompt:

If you...	Then...
Have DHCP enabled	Use the following command: ifconfig e0M -auto

If you...	Then...
Do not have DHCP enabled	<p>Use the following command:</p> <pre data-bbox="600 262 1536 325">ifconfig e0M -addr=<i>filer_addr</i> -mask=<i>netmask</i> -gw=<i>gateway</i> - dns=<i>dns_addr</i> -domain=<i>dns_domain</i></pre> <p><i>filer_addr</i> is the IP address of the storage system.</p> <p><i>netmask</i> is the network mask of the storage system.</p> <p><i>gateway</i> is the gateway for the storage system.</p> <p><i>dns_addr</i> is the IP address of a name server on your network.</p> <p><i>dns_domain</i> is the Domain Name System (DNS) domain name. If you use this optional parameter, you do not need a fully qualified domain name in the netboot server URL; you need only the server's host name.</p> <p>Note: To netboot the node when your system is running in Data ONTAP operating in 7-Mode, use an IP address that is not the management IP address for the target. If your system is running ONTAP, you can use the management IP address.</p> <p>Note: Other parameters might be necessary for your interface. For details, use the <code>help ifconfig</code> command at the LOADER prompt.</p>

15. At the LOADER, enter the following command:

```
netboot http://path_to_web-accessible_directory/netboot/kernel
```

16. Select the **Install new software first** option from the displayed menu.

This menu option downloads and installs the new ONTAP image to the boot device.

- You should enter **y** when prompted with the message that this procedure is not supported for nondisruptive upgrade on an HA pair.
- You should enter **y** when warned that this process replaces the existing ONTAP software with new software.
- You should enter the path as follows when prompted for the URL of the *image.tgz* file:

```
http://path_to_the_web-accessible_directory/image.tgz
```

17. Enter **y** when prompted regarding nondisruptive upgrade or replacement of the software.

18. Enter the path to the *image.tgz* file when prompted for the URL of the package.

Example

```
What is the URL for the package?  
http://path_to_web-accessible_directory/image.tgz
```

19. Restore the backup configuration on the target node by entering **y** and then entering the IP address of the server containing the *varfs.tgz* file when you see the following screen:

Example

```
*****  
*                               *  
*       Restore Backup Configuration       *  
* This procedure only applies to storage controllers that *  
* are configured as an HA pair.           *  
*                               *  
* Choose Yes to restore the "varfs" backup configuration *  
* from the TFTP server. Refer to the Boot Device Replacement *  
* guide for more details.                 *  
*****
```

```

* Choose No to skip the backup and recovery and return to the *
* boot menu. *
*****

Do you want to restore the backup configuration
now? {y|n} y

Enter the IP address of the server: target_node.management_IP.address
Checking network link... success.
Checking route to host "target_node.management_IP.address"... success.
Attempting to reach "target_node.management_IP.address"... success.
Checking boot device file system... success.
Mounting boot device to /tmp/mnt... success.
Checking boot device mount point... success.
Restoring backup configuration... Received 82481 bytes in 0.1 seconds

Backup Configuration from $BACKUP_DATE successfully restored

```

20. Reboot the target node by entering **y** when you see the following prompt:

```

The node must be rebooted to start using the newly installed
software. Do you want to reboot now? {y|n} y

```

21. While the target node is rebooting, restore the TFTP settings on the partner node by entering the following commands from the partner node console:

```

partner options tftpd.enable off
partner options tftpd.rootdir /etc/tftpboot

```

22. Reboot the target node by entering the following command on the target node console:

```

boot_ontap

```

23. After the target node has rebooted, complete the procedure by entering the following command on the partner node's console:

```

cf giveback

```

Installing the boot device and transferring system files nondisruptively using netboot in systems running ONTAP 8.1.1 and later

You can transfer the system files and restore configuration information to your HA pair nondisruptively by using netboot and the healthy node.

Before you begin

- You must have the blank replacement boot device that you received from your provider.
- You must have a network interface to the HA pair healthy node.
- You must have a separate IP address to use to netboot the impaired node.

About this task

The following procedure is written with the assumption that the impaired node has been taken over by the healthy node, and that the impaired node has booted to the LOADER prompt after the takeover has been completed.

Attention: You can only use this nondisruptive procedure in an HA pair that is running ONTAP 8.1.1 and later.

Steps

1. Download and extract the `netboot.tgz` file from the NetApp Support Site.

The `netboot.tgz` file is used for performing a netboot of your system. You should download the file contents to a web-accessible directory.

- a. Download the `netboot.tgz` file from the NetApp Support Site to a web-accessible directory.
- b. Switch to the web-accessible directory.
- c. Extract the contents of the `netboot.tgz` file to the target directory `tar -zxvf netboot.tgz`.

Your directory listing should contain the following directory:

```
netboot/
```

Note: If you are extracting the contents using Windows, do not use winzip to extract the netboot image. Use another extraction tool, such as 7-Zip or WinRAR.

2. Download the `image.tgz` file from the NetApp Support Site to the web-accessible directory.

Your directory listing should contain the following file and directory:

```
image.tgz  
netboot/
```

3. If you are not already grounded, properly ground yourself.
4. Turn the controller module so that you can locate the boot device holder.
You can use the FRU map on the controller module to locate the boot device holder.
5. Open the boot device cover, if applicable.
6. Align the boot device with the boot device socket or connector, and then firmly push the boot device straight down into the socket or connector.
Important: Always install the boot device by aligning the front of the boot device squarely over the pins in the socket at the front of the boot device housing. Installing the boot device at an angle or over the rear plastic pin first can bend or damage the pins in the boot device connector.
7. Verify that the boot device is seated squarely and completely in the socket or connector.
If necessary, remove the boot device and reseal it into the socket.
8. Close the boot device cover.
9. Close the controller module cover, and then turn the controller module over.
10. Align the end of the controller module with the opening in the chassis, and then gently push the controller module halfway into the system.
11. Reinstall the cable management arms and recable the system, as needed.
When recabling, remember to reinstall the media converters (SFPs) if they were removed.
12. Push the controller module all the way into the system, firmly push the cam handle to finish seating it, and then push the cam handle to the closed position.
13. The next step depends on your system configuration:

If your system has...	Then...
One controller module in the chassis	Complete the following substeps: <ol style="list-style-type: none"> a. Reconnect the power cables to the power supplies and to the power sources, and then turn on the power. The system begins to boot and stops at the LOADER prompt. b. Go to the next step.
Two controller modules in the chassis	The node already began rebooting and stops at the LOADER prompt; go to the next step.

14. Depending on your network configuration, execute one of the following commands at the LOADER prompt:

If you...	Then...
Have DHCP enabled	Use the following command: ifconfig e0M -auto
Do not have DHCP enabled	Use the following command: ifconfig e0M -addr=<i>filer_addr</i> -mask=<i>netmask</i> -gw=<i>gateway</i> - dns=<i>dns_addr</i> -domain=<i>dns_domain</i> <i>filer_addr</i> is the IP address of the storage system. <i>netmask</i> is the network mask of the storage system. <i>gateway</i> is the gateway for the storage system. <i>dns_addr</i> is the IP address of a name server on your network. <i>dns_domain</i> is the Domain Name System (DNS) domain name. If you use this optional parameter, you do not need a fully qualified domain name in the netboot server URL; you need only the server's host name. Note: To netboot the node when your system is running in Data ONTAP operating in 7-Mode, use an IP address that is not the management IP address for the target. If your system is running ONTAP, you can use the management IP address. Note: Other parameters might be necessary for your interface. For details, use the <code>help ifconfig</code> command at the LOADER prompt.

15. At the LOADER prompt, netboot the kernel:

```
netboot http://path_to_web-accessible_directory/netboot/kernel
```

16. Select the **Install new software first** option from the displayed menu.

This menu option downloads and installs the new ONTAP image to the boot device.

- You should enter **y** when prompted with the message that this procedure is not supported for nondisruptive upgrade on an HA pair.
- You should enter **y** when warned that this process replaces the existing ONTAP software with new software.
- You should enter the path as follows when prompted for the URL of the *image.tgz* file:

```
http://path_to_the_web-accessible_directory/image.tgz
```

17. Enter **y** when prompted regarding nondisruptive upgrade or replacement of the software.

18. Enter the path to the *image.tgz* file when prompted for the URL of the package.

Example

```
What is the URL for the package?  
http://path_to_web-accessible_directory/image.tgz
```

19. Restore the backup configuration on the impaired node by entering **y**, and then entering the IP address of the server containing the `varfs.tgz` file when you see the following screen:

```
*****  
*                Restore Backup Configuration                *  
* This procedure only applies to storage controllers that     *  
* are configured as an HA pair.                               *  
*                                                            *  
* Choose Yes to restore the "varfs" backup configuration     *  
* from the SSH server. Refer to the Boot Device Replacement *  
* guide for more details.                                    *  
* Choose No to skip the backup and recovery and return to the *  
* boot menu.                                                 *  
*****  
  
Do you want to restore the backup configuration  
now? {y|n} y  
  
Start the restore_backup procedure on this node's HA partner.
```

20. Restore the backup configuration from the HA partner:
restore_backup target_node.netboot_ip.address
21. Restore the configuration from the `varfs.tgz` file and reboot the impaired node, as shown in the following example:

Example

```
The restore configuration has been copied  
from the HA partner to this node,  
would you like to use this restored copy  
now? {y|n} y  
Boot device: /dev/da0 found...  
Checking /dev/da0s1 file system... success.  
Mounting /dev/da0s1 to /cfcard... success.  
Checking /cfcard/x86_64/freebsd mount point... success.  
Gzip checking /var/home/root/varfs.tgz... success.  
Restoring backup configuration...  
Backup Configuration from Thu Jun 19 18:01:53 UTC 2014 successfully restored  
  
The node must be rebooted to start using the newly installed software. Do you  
want to reboot now? {y|n} y
```

22. After the impaired node has rebooted and is displaying the `Waiting for giveback` message, complete the procedure by giving back the node from the healthy node console:

```
cf giveback
```

Installing the boot device and transferring system files disruptively using netboot

You can transfer the system files and restore configuration information to your system by using netboot to copy the system files to the replacement boot device.

Before you begin

- You must have the blank replacement boot device that you received from your provider.

- You must have access to an HTTP server.
- You must have access to the NetApp Support Site at mysupport.netapp.com.
This enables you to download the necessary system files for your platform and version of ONTAP running on it.

About this task

You can use this disruptive procedure in either a stand-alone system or an HA configuration during scheduled maintenance on the system or if the healthy node is not fully functional.

This procedure is disruptive even when using it with a system in an HA configuration, because an immediate giveback and re-takeover occur during the procedure. If possible, you should use the nondisruptive procedure for HA configurations for your version of Data ONTAP software operating in 7-Mode.

Steps

1. Download and extract the `netboot.tgz` file from the NetApp Support Site.

The `netboot.tgz` file is used for performing a netboot of your system. You should download the file contents to a web-accessible directory.

- a. Download the `netboot.tgz` file from the NetApp Support Site to a web-accessible directory.
- b. Switch to the web-accessible directory.
- c. Extract the contents of the `netboot.tgz` file to the target directory `tar -zxvf netboot.tgz`.

Your directory listing should contain the following directory:

```
netboot/
```

Note: If you are extracting the contents using Windows, do not use winzip to extract the netboot image. Use another extraction tool, such as 7-Zip or WinRAR.

2. Download the `image.tgz` file from the NetApp Support Site to the web-accessible directory.

Your directory listing should contain the following file and directory:

```
image.tgz
netboot/
```

3. If you are not already grounded, properly ground yourself.
4. Turn the controller module so that you can locate the boot device holder.
You can use the FRU map on the controller module to locate the boot device holder.
5. Open the boot device cover, if applicable.
6. Align the boot device with the boot device socket or connector, and then firmly push the boot device straight down into the socket or connector.
Important: Always install the boot device by aligning the front of the boot device squarely over the pins in the socket at the front of the boot device housing. Installing the boot device at an angle or over the rear plastic pin first can bend or damage the pins in the boot device connector.
7. Verify that the boot device is seated squarely and completely in the socket or connector.
If necessary, remove the boot device and reseal it into the socket.
8. Close the boot device cover.

9. Close the controller module cover, and then turn the controller module over.
10. Align the end of the controller module with the opening in the chassis, and then gently push the controller module halfway into the system.
11. Reinstall the cable management arms and recable the system, as needed.
When recabling, remember to reinstall the media converters (SFPs) if they were removed.
12. Push the controller module all the way into the system, firmly push the cam handle to finish seating it, and then push the cam handle to the closed position.
13. The next step depends on your system configuration:

If your system has...	Then...
One controller module in the chassis	Complete the following substeps: <ol style="list-style-type: none"> a. Reconnect the power cables to the power supplies and to the power sources, and then turn on the power. The system begins to boot and stops at the LOADER prompt. b. Go to the next step.
Two controller modules in the chassis	The node already began rebooting and stops at the LOADER prompt; go to the next step.

14. Depending on your network configuration, execute one of the following commands at the LOADER prompt:

If you...	Then...
Have DHCP enabled	Use the following command: ifconfig e0M -auto
Do not have DHCP enabled	Use the following command: ifconfig e0M -addr=<i>filer_addr</i> -mask=<i>netmask</i> -gw=<i>gateway</i> - dns=<i>dns_addr</i> -domain=<i>dns_domain</i> <i>filer_addr</i> is the IP address of the storage system. <i>netmask</i> is the network mask of the storage system. <i>gateway</i> is the gateway for the storage system. <i>dns_addr</i> is the IP address of a name server on your network. <i>dns_domain</i> is the Domain Name System (DNS) domain name. If you use this optional parameter, you do not need a fully qualified domain name in the netboot server URL; you need only the server's host name. <p>Note: To netboot the node when your system is running in Data ONTAP operating in 7-Mode, use an IP address that is not the management IP address for the target. If your system is running ONTAP, you can use the management IP address.</p> <p>Note: Other parameters might be necessary for your interface. For details, use the <code>help ifconfig</code> command at the LOADER prompt.</p>

15. At the LOADER prompt, boot the system:
netboot http://*path_to_the_web_accessible_directory*/netboot/kernel
 The system begins to boot, but stops at the Boot menu.
16. Select the **Install new software first** option from the displayed menu.
 This menu option downloads and installs the new ONTAP image to the boot device.

- You should enter **y** when prompted with the message that this procedure is not supported for nondisruptive upgrade on an HA pair.
- You should enter **y** when warned that this process replaces the existing ONTAP software with new software.
- You should enter the path as follows when prompted for the URL of the *image.tgz* file:
`http://path_to_the_web-accessible_directory/image.tgz`

17. The next step depends on which version of ONTAP is installed on your system:

If your system is running...	Then...
Data ONTAP 8.0	<p data-bbox="609 508 1256 541">Reboot the node by entering y when you see the following prompt:</p> <div data-bbox="609 562 1516 646" style="background-color: #f0f0f0; padding: 5px;"> <pre data-bbox="625 575 1500 634">The node must be rebooted to start using the newly installed software. Do you want to reboot now? [y/n] y</pre> </div> <p data-bbox="609 667 1451 726">The controller module reboots, but stops at the Boot menu because the boot device was reformatted and the configuration data needs to be restored.</p>

If your system is running...

Then...

ONTAP 8.0.1 and later

Complete the following substeps:

- a. Enter **n** to skip the backup recovery when you see the following prompt:

```
*****
****
*                               Restore Backup
Configuration                               *
* This procedure only applies to storage controllers
that *
* are configured as an HA
pair. *
*
* Choose Yes to restore the 'varfs' backup
configuration *
* from a TFTP server. Refer to the Boot Device
Replacement *
* guide for more
details. *
* Choose No to skip the back up recovery and return to
the *
* boot
menu. *
*****
****

Do you want to restore the backup configuration
now? {y|n} n
```

Note: If your system is running ONTAP 8.1.1 and later, the prompt says SSH server.

- b. Reboot the node by entering **y** when you see the following prompt:

```
The node must be rebooted to start using the newly
installed
software. Do you want to reboot now? {y/n} y
```

The controller module reboots, but stops at the boot environment prompt.

- c. Boot ONTAP by entering the following command at the boot environment prompt:

boot_ontap

The controller module reboots, but stops at the Boot menu because the boot device was reformatted and the configuration data needs to be restored.

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

19. Enter **y** when prompted.

The system automatically reboots when the update flash (syncflash) process is complete.

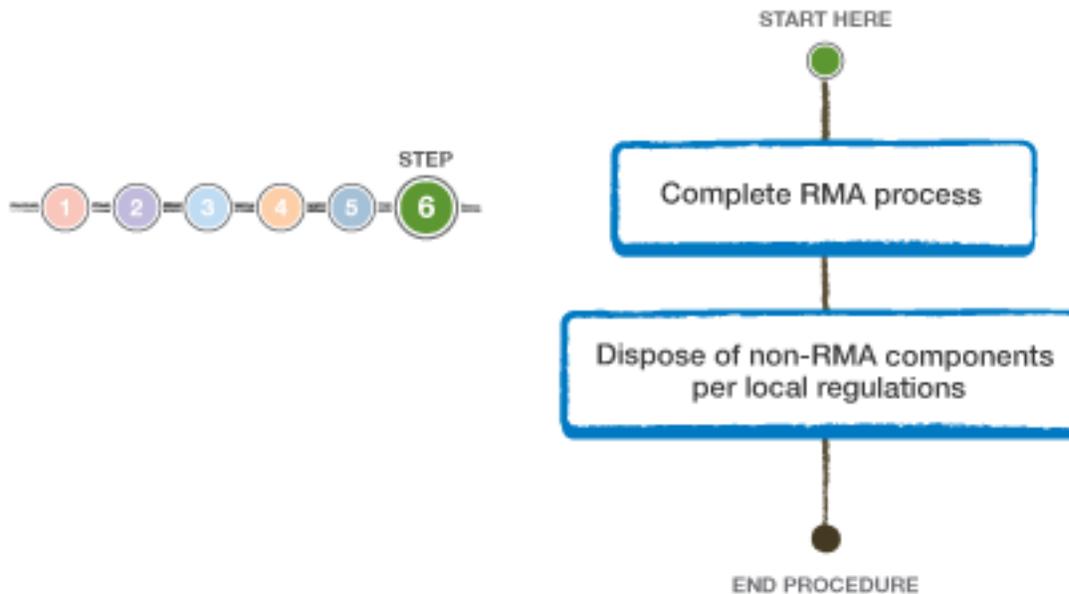
```
This will replace all flash-based configuration with the last backup to
disk. Are you sure you want to continue?: y
```

20. Your next step depends on your system configuration.

If your system is...	Description
A stand-alone configuration	You can begin using your system after the node reboots to complete restoring the backup configuration.
An HA pair	<p>After the impaired node displays the <code>Waiting for Giveback...</code> message, perform a giveback from the healthy node:</p> <pre>cf giveback</pre> <p>Note: The impaired node takes back its storage, finishes booting up, and then reboots and is again taken over by the healthy node.</p>

Completing the replacement process

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



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- NetApp, Inc., 1395 Crossman Ave., Sunnyvale, CA 94089 U.S.
- Telephone: +1 (408) 822-6000
- Fax: +1 (408) 822-4501
- Support telephone: +1 (888) 463-8277

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