Maintaining the SG6000 appliance

StorageGRID 11.5

NetApp
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Maintaining the SG6000 appliance

You might need to perform maintenance procedures on the SG6000 appliance. The procedures in this section assume that the appliance has already been deployed as a Storage Node in a StorageGRID system.

Steps

Placing an appliance into maintenance mode

You must place the appliance into maintenance mode before performing specific maintenance procedures.

What you'll need

- You must be signed in to the Grid Manager using a supported browser.
- You must have the Maintenance or Root Access permission. For details, see the instructions for administering StorageGRID.

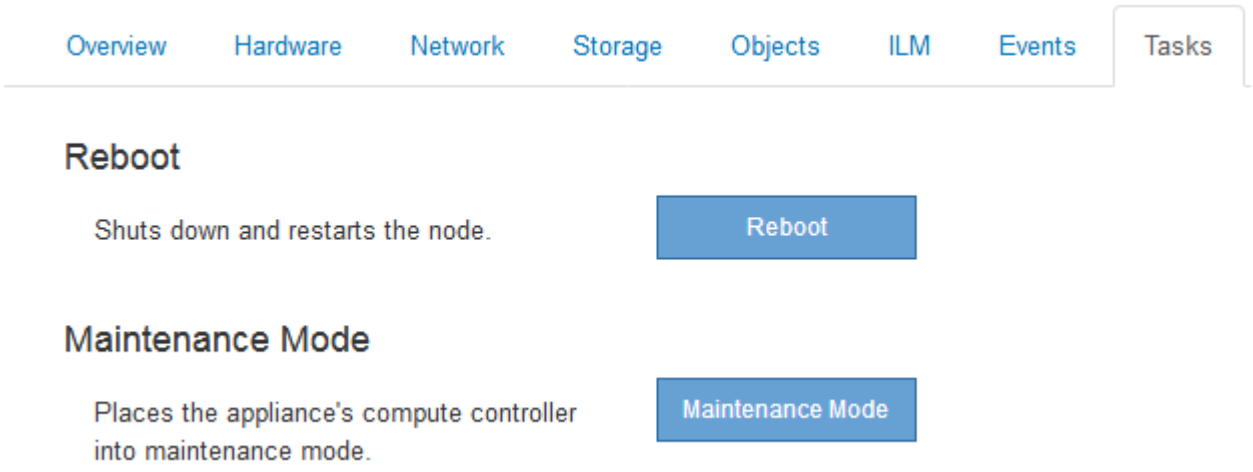
About this task

Placing a StorageGRID appliance into maintenance mode might make the appliance unavailable for remote access.

> The password and host key for a StorageGRID appliance in maintenance mode remain the same as they were when the appliance was in service.

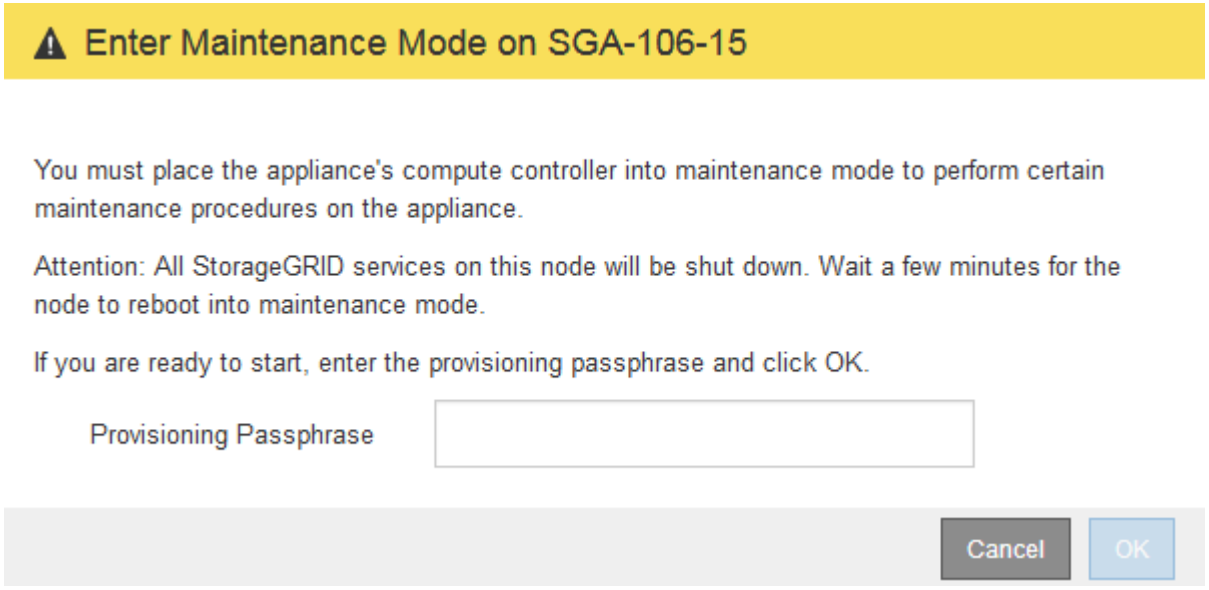
Steps

1. From the Grid Manager, select **Nodes**.
2. From the tree view of the Nodes page, select the appliance Storage Node.
3. Select **Tasks**.



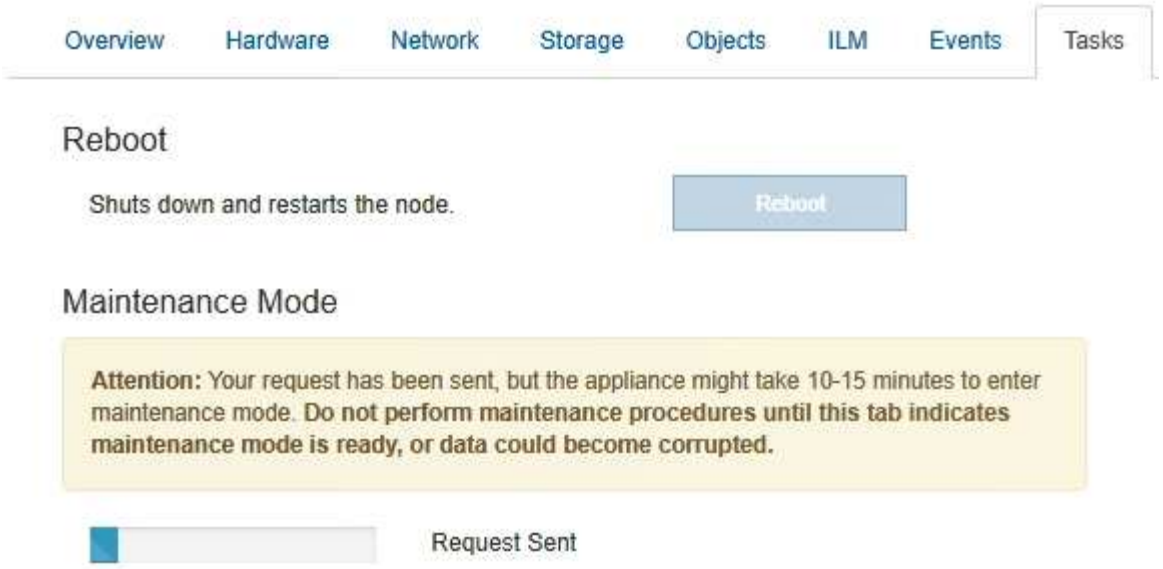
4. Select **Maintenance Mode**.

   A confirmation dialog box appears.

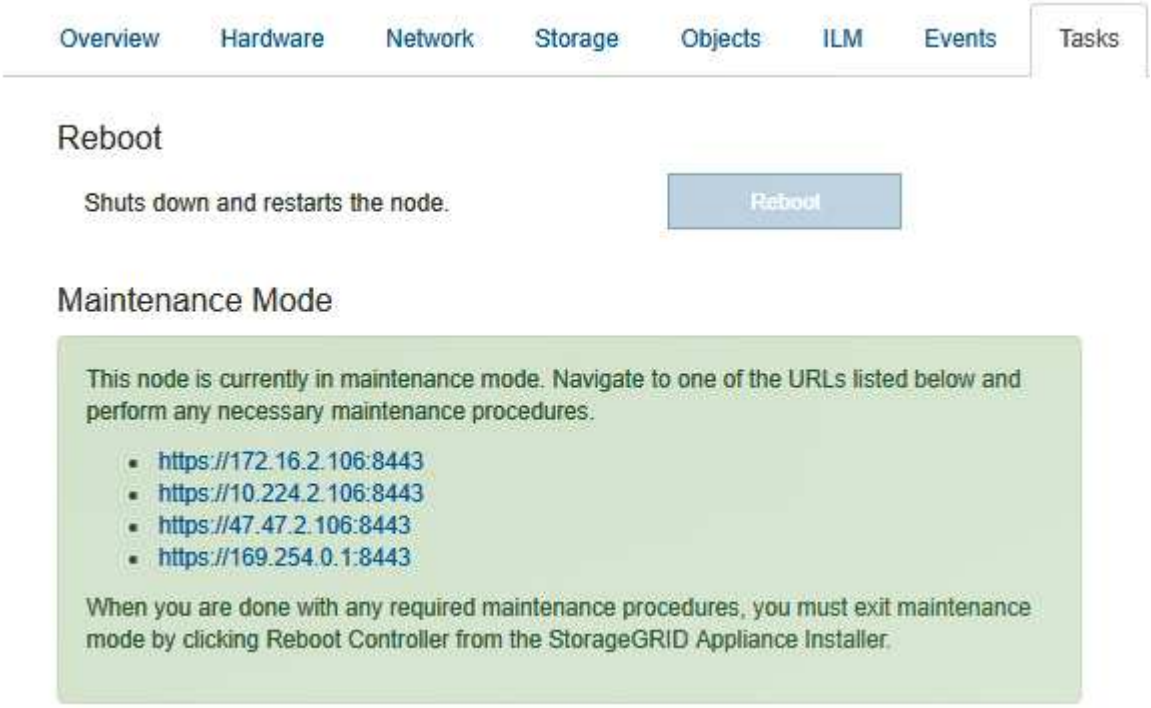


5. Enter the provisioning passphrase, and select **OK**.

   A progress bar and a series of messages, including including "Request Sent," "Stopping StorageGRID," and "Rebooting," indicate that the appliance is completing the steps for entering maintenance mode.



When the appliance is in maintenance mode, a confirmation message lists the URLs you can use to access the StorageGRID Appliance Installer.



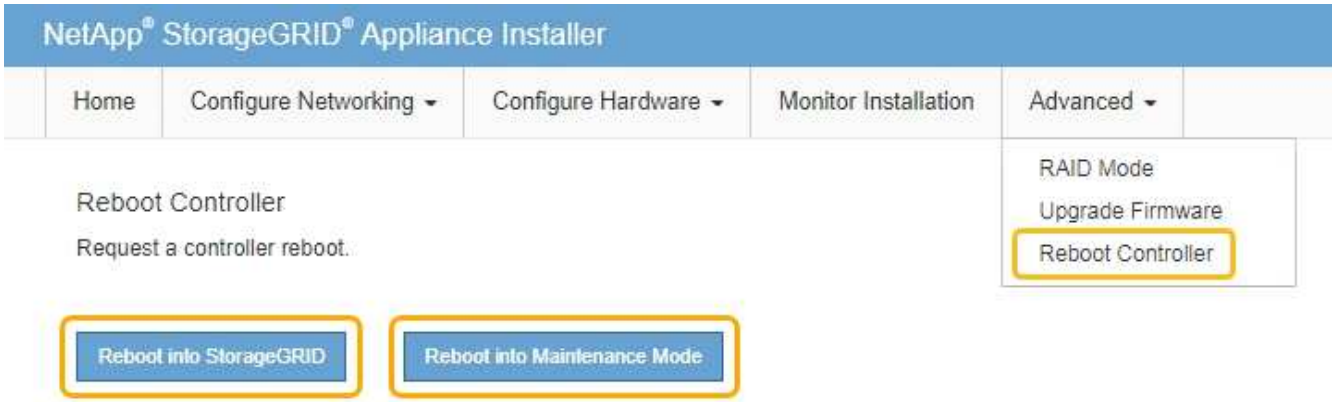
6. To access the StorageGRID Appliance Installer, browse to any of the URLs displayed.

   If possible, use the URL containing the IP address of the appliance's Admin Network port.

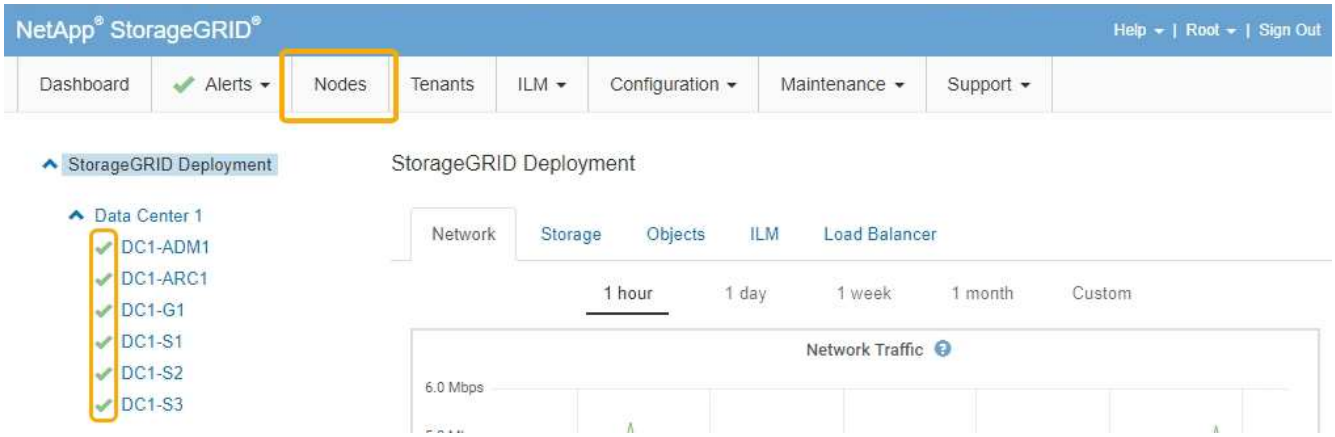
   > Accessing `https://169.254.0.1:8443` requires a direct connection to the local management port.

7. From the StorageGRID Appliance Installer, confirm that the appliance is in maintenance mode.

8. Perform any required maintenance tasks.
9. After completing maintenance tasks, exit maintenance mode and resume normal node operation. From the StorageGRID Appliance Installer, select **Advanced** > **Reboot Controller**, and then select **Reboot into StorageGRID**.



It can take up to 20 minutes for the appliance to reboot and rejoin the grid. To confirm that the reboot is complete and that the node has rejoined the grid, go back to the Grid Manager. The **Nodes** tab should display a normal status ✔ for the appliance node, indicating that no alerts are active and the node is connected to the grid.



Upgrading SANtricity OS on the storage controllers

To ensure optimal functioning of the storage controller, you must upgrade to the latest maintenance release of the SANtricity OS that is qualified for your StorageGRID appliance. Consult the NetApp Interoperability Matrix Tool (IMT) to determine which version you should be using. If you need assistance, contact technical support.

Use one of the following procedures based on the version of SANtricity OS currently installed:

- If the storage controller is using SANtricity OS 08.42.20.00 (11.42) or newer, use the Grid Manager to perform the upgrade.

  Upgrading SANtricity OS on the storage controllers using the Grid Manager

- If the storage controller is using a SANtricity OS version older than 08.42.20.00 (11.42), use maintenance mode to perform the upgrade.

  Upgrading SANtricity OS on the storage controllers using maintenance mode

When upgrading the SANtricity OS for your storage appliance, you must follow the instructions in the StorageGRID documentation. If you use any other instructions, your appliance could become inoperable.

Related information

NetApp Interoperability Matrix Tool

NetApp Downloads: SANtricity OS

Monitor & troubleshoot

Upgrading SANtricity OS on the storage controllers using the Grid Manager

For storage controllers currently using SANtricity OS 08.42.20.00 (11.42) or newer, you must use the Grid Manager to apply an upgrade.

What you'll need

- You have consulted the NetApp Interoperability Matrix Tool (IMT) to confirm that the SANtricity OS version you are using for the upgrade is compatible with your appliance.
- You must have the Maintenance permission.
- You must be signed in to the Grid Manager using a supported browser.
- You must have the provisioning passphrase.
- You must have access to the NetApp downloads page for SANtricity OS.

About this task

You cannot perform other software updates (StorageGRID software upgrade or a hotfix) until you have completed the SANtricity OS upgrade process. If you attempt to start a hotfix or a StorageGRID software upgrade before the SANtricity OS upgrade process has finished, you are redirected to the SANtricity OS upgrade page.

The procedure will not be complete until the SANtricity OS upgrade has been successfully applied to all applicable nodes. It might take more than 30 minutes to load the SANtricity OS on each node and up to 90 minutes to reboot each StorageGRID storage appliance.

The following steps are only applicable when you are using the Grid Manager to perform the upgrade. The storage controllers in the SG6000 series appliances cannot be upgraded using the Grid Manager when the controllers are using SANtricity OS older than 08.42.20.00 (11.42).

This procedure will automatically upgrade the NVSRAM to the most recent version associated with the SANtricity OS upgrade. You do not need to apply a separate NVSRAM upgrade file.

Steps

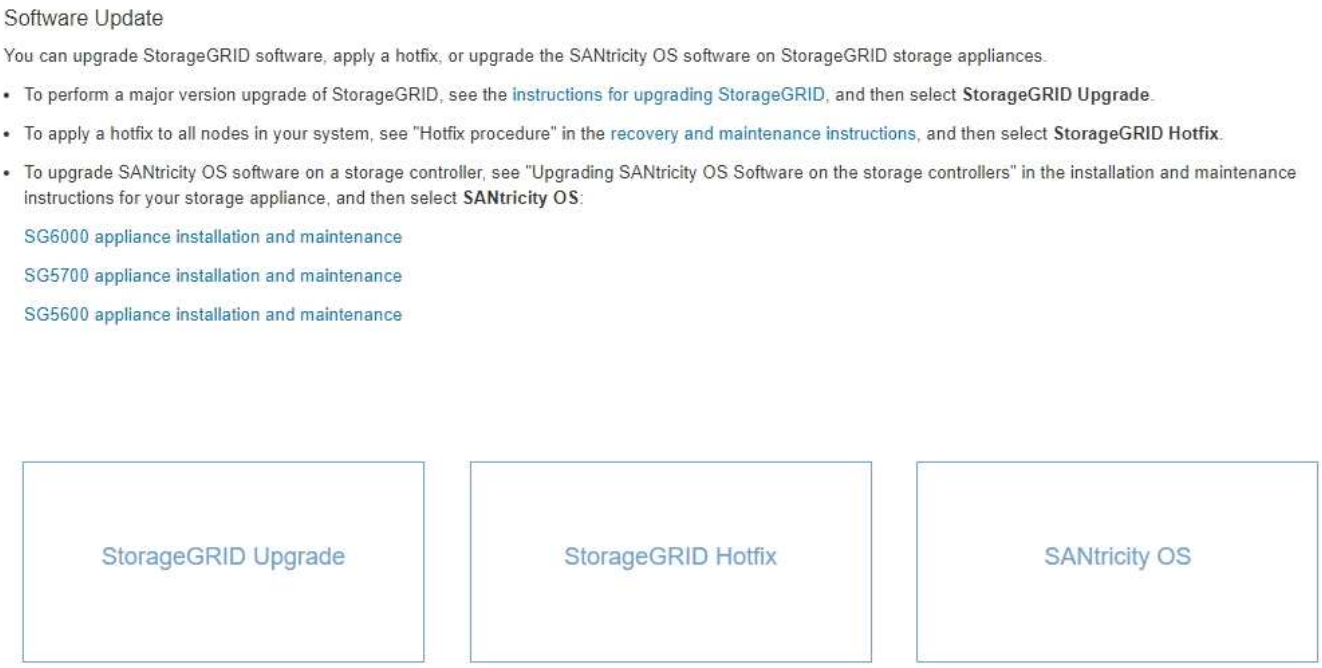
1. From a service laptop, download the new SANtricity OS Software file from the NetApp support site.

   Be sure to choose the correct SANtricity OS version for the storage controllers in your appliance. The SG6060 uses the E2800 controller, and the SGF6024 uses the EF570 controller.

   NetApp Downloads: SANtricity OS

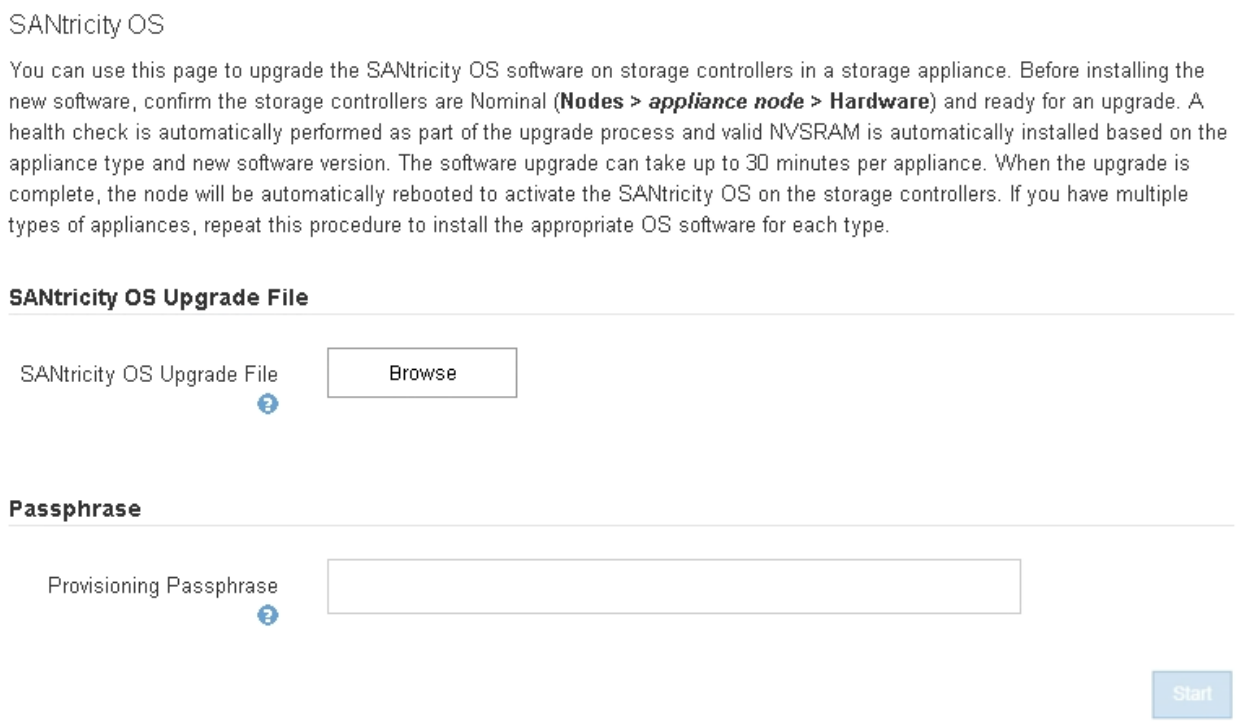
2. Sign in to the Grid Manager using a supported browser.
3. Select **Maintenance**. Then, in the System section of the menu, select **Software Update**.

   The Software Update page appears.



4. Click **SANtricity OS**.

   The SANtricity OS page appears.



5. Select the SANtricity OS upgrade file you downloaded from the NetApp support site.
   a. Click **Browse**.
   b. Locate and select the file.
   c. Click **Open**.

   The file is uploaded and validated. When the validation process is done, the file name is shown in the Details field.

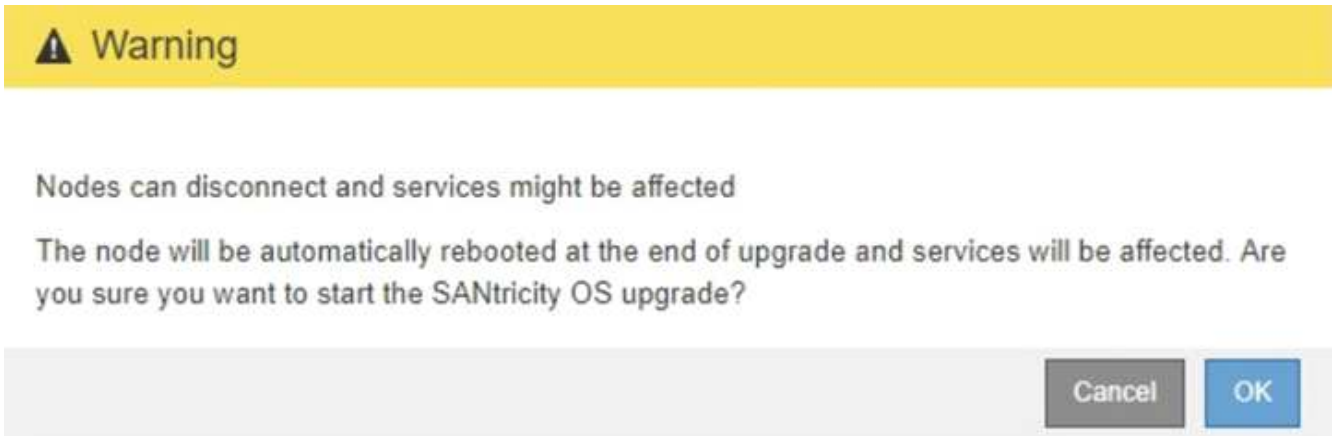
   > Do not change the file name since it is part of the verification process.

6. Enter the provisioning passphrase.

   The **Start** button is enabled.

7. Click **Start**.

A warning box appears stating that your browser's connection might be lost temporarily as services on nodes that are upgraded are restarted.



8. Click **OK** to stage the SANtricity OS upgrade file to the primary Admin Node.

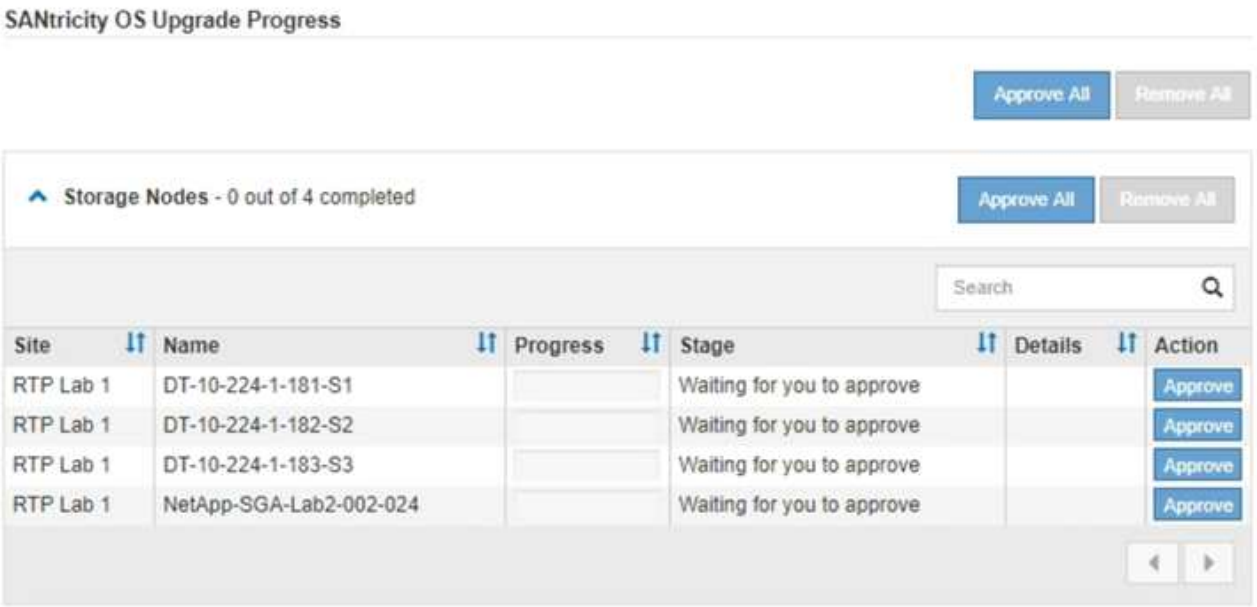
   When the SANtricity OS upgrade starts:

   a. The health check is run. This process checks that no nodes have the status of Needs Attention.

      If any errors are reported, resolve them and click **Start** again.

   b. The SANtricity OS Upgrade Progress table appears. This table shows all Storage Nodes in your grid and the current stage of the upgrade for each node.

      The table shows all Storage Nodes, including software-based Storage Nodes. You must approve the upgrade for all Storage Nodes, even though a SANtricity OS upgrade has no effect on software-based Storage Nodes. The upgrade message returned for software-based Storage Nodes is "SANtricity OS upgrade is not applicable to this node."



9. Optionally, sort the list of nodes in ascending or descending order by **Site**, **Name**, **Progress**, **Stage**, or **Details**. Or, enter a term in the **Search** box to search for specific nodes.

You can scroll through the list of nodes by using the left and right arrows at the bottom right corner of the section.

10. Approve the grid nodes you are ready to add to the upgrade queue. Approved nodes of the same type are upgraded one at a time.

    > Do not approve the SANtricity OS upgrade for an appliance storage node unless you are sure the node is ready to be stopped and rebooted.When the SANtricity OS upgrade is approved on a node, the services on that node are stopped. Later, when the node is upgraded, the appliance node is rebooted. These operations might cause service interruptions for clients that are communicating with the node.

    - Click either of the **Approve All** buttons to add all Storage Nodes to the SANtricity OS upgrade queue.

      > If the order in which nodes are upgraded is important, approve nodes or groups of nodes one at a time and wait until the upgrade is complete on each node before approving the next node(s).

    - Click one or more **Approve** buttons to add one or more nodes to the SANtricity OS upgrade queue.

      > You can delay applying a SANtricity OS upgrade to a node, but the SANtricity OS upgrade process will not be complete until you approve the SANtricity OS upgrade on all the listed Storage Nodes.

      After you click **Approve**, the upgrade process determines if the node can be upgraded. If a node can be upgraded, it is added to the upgrade queue.

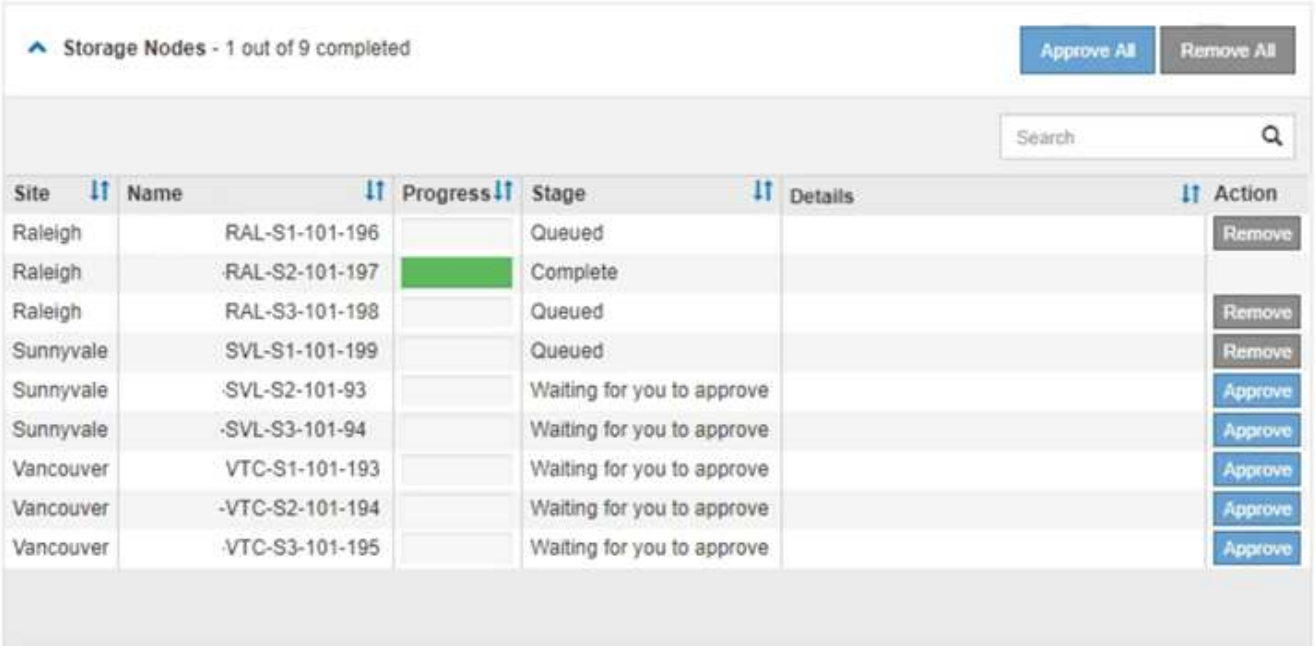
      For some nodes, the selected upgrade file is intentionally not applied and you can complete the upgrade process without upgrading these specific nodes. For nodes intentionally not upgraded, the process will show stage of Complete with one of the following messages in the Details column:

      - Storage Node was already upgraded.
      - SANtricity OS upgrade is not applicable to this node.
      - SANtricity OS file is not compatible with this node.

    The message “SANtricity OS upgrade is not applicable to this node” indicates that the node does not have a storage controller that can be managed by the StorageGRID system. This message will appear for non-appliance Storage Nodes. You can complete the SANtricity OS upgrade process without upgrading the node displaying this message.
    The message “SANtricity OS file is not compatible with this node” indicates that the node requires a SANtricity OS file different than the one the process is attempting to install. After you complete the current SANtricity OS upgrade, download the SANtricity OS appropriate for the node and repeat the upgrade process.

11. If you need to remove a node or all nodes from the SANtricity OS upgrade queue, click **Remove** or **Remove All**.

    As shown in the example, when the stage progresses beyond Queued, the **Remove** button is hidden and you can no longer remove the node from the SANtricity OS upgrade process.



12. Wait while the SANtricity OS upgrade is applied to each approved grid node.

> If any node shows a stage of Error while the SANtricity OS upgrade is being applied, the upgrade has failed for that node. The appliance might need to be placed in maintenance mode to recover from the failure. Contact technical support before continuing.

If the firmware on the node is too old to be upgraded with the Grid Manager, the node shows a stage of Error with the details: “You must use maintenance mode to upgrade SANtricity OS on this node. See the installation and maintenance instructions for your appliance. After the upgrade, you can use this utility for future upgrades.” To resolve the error, do the following:

a. Use maintenance mode to upgrade SANtricity OS on the node that shows a stage of Error.
b. Use the Grid Manager to re-start and complete the SANtricity OS upgrade.

   When the SANtricity OS upgrade is complete on all approved nodes, the SANtricity OS Upgrade Progress table closes and a green banner shows the date and time the SANtricity OS upgrade was completed.

13. Repeat this upgrade procedure for any nodes with a stage of Complete that require a different SANtricity OS upgrade file.

For any nodes with a status of Needs Attention, use maintenance mode to perform the upgrade.

Related information

NetApp Interoperability Matrix Tool

Upgrading SANtricity OS on the storage controllers using maintenance mode

Upgrading SANtricity OS on the storage controllers using maintenance mode

For storage controllers currently using SANtricity OS older than 08.42.20.00 (11.42), you must use the maintenance mode procedure to apply an upgrade.

What you'll need

- You have consulted the NetApp Interoperability Matrix Tool (IMT) to confirm that the SANtricity OS version you are using for the upgrade is compatible with your appliance.
- If the StorageGRID appliance is running in a StorageGRID system, the SG6000-CN controller has been placed in maintenance mode.

  Maintenance mode interrupts the connection to the storage controller.

  Placing an appliance into maintenance mode

About this task

Do not upgrade the SANtricity OS or NVSRAM in the E-Series controller on more than one StorageGRID appliance at a time.

Upgrading more than one StorageGRID appliance at a time might cause data unavailability, depending on your deployment model and ILM policies.

Steps

1. From a service laptop, access SANtricity System Manager and sign in.
2. Download the new SANtricity OS Software file and NVSRAM file to the management client.

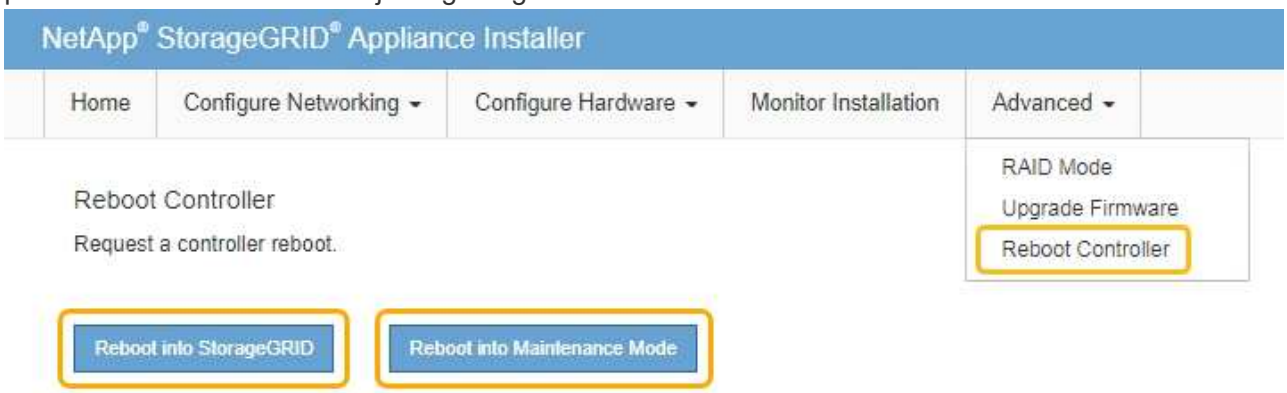
   The NVSRAM is specific to the StorageGRID appliance. Do not use the standard NVSRAM download.

3. Follow the instructions in the *Upgrading SANtricity OS* guide or the SANtricity System Manager online help to upgrade the firmware and NVSRAM.

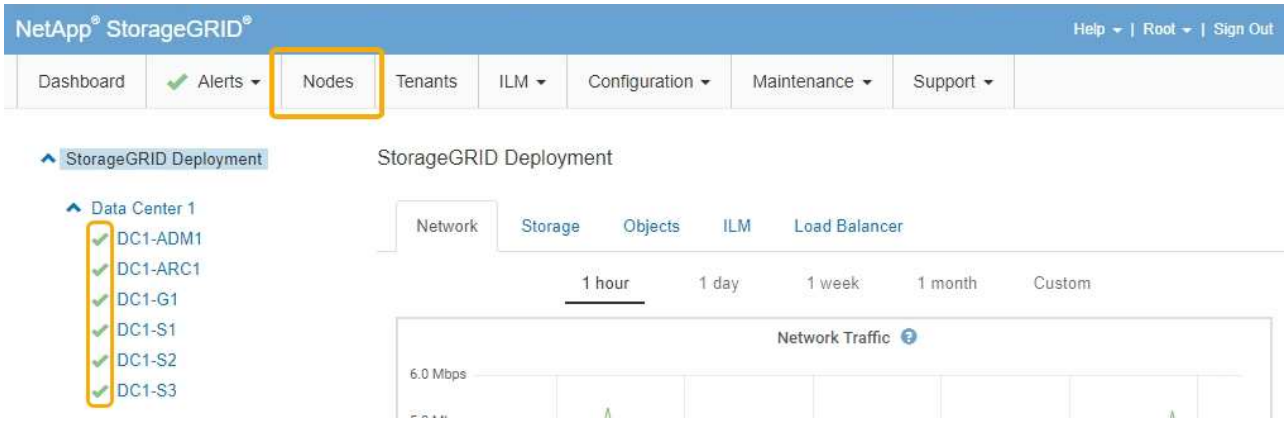
   Activate the upgrade files immediately. Do not defer activation.

4. Once the upgrade operation has completed, reboot the node. From the StorageGRID Appliance Installer, select **Advanced** > **Reboot Controller**, and then select one of these options:
   - Select **Reboot into StorageGRID** to reboot the controller with the node rejoining the grid. Select this option if you are done working in maintenance mode and are ready to return the node to normal operation.

◦ Select **Reboot into Maintenance Mode** to reboot the controller with the node remaining in maintenance mode. Select this option if there are additional maintenance operations you need to perform on the node before rejoining the grid.



It can take up to 20 minutes for the appliance to reboot and rejoin the grid. To confirm that the reboot is complete and that the node has rejoined the grid, go back to the Grid Manager. The **Nodes** tab should display a normal status ✔ for the appliance node, indicating that no alerts are active and the node is connected to the grid.



Related information

NetApp Interoperability Matrix Tool

Upgrading SANtricity OS on the storage controllers using the Grid Manager

Upgrading drive firmware using SANtricity System Manager

You upgrade your drive firmware to make sure you have all the latest features and bug fixes.

What you'll need

- The storage appliance has an Optimal status.
- All drives have an Optimal status.
- You have the latest version of SANtricity System Manager installed that is compatible with your StorageGRID version.

- You have placed the StorageGRID appliance in maintenance mode.

  Placing an appliance into maintenance mode

  > Maintenance mode interrupts the connection to the storage controller, stopping all I/O activity and placing all drives offline.

  > Do not upgrade the drive firmware on more than one StorageGRID appliance at a time. Doing so might cause data unavailability, depending on your deployment model and ILM policies.

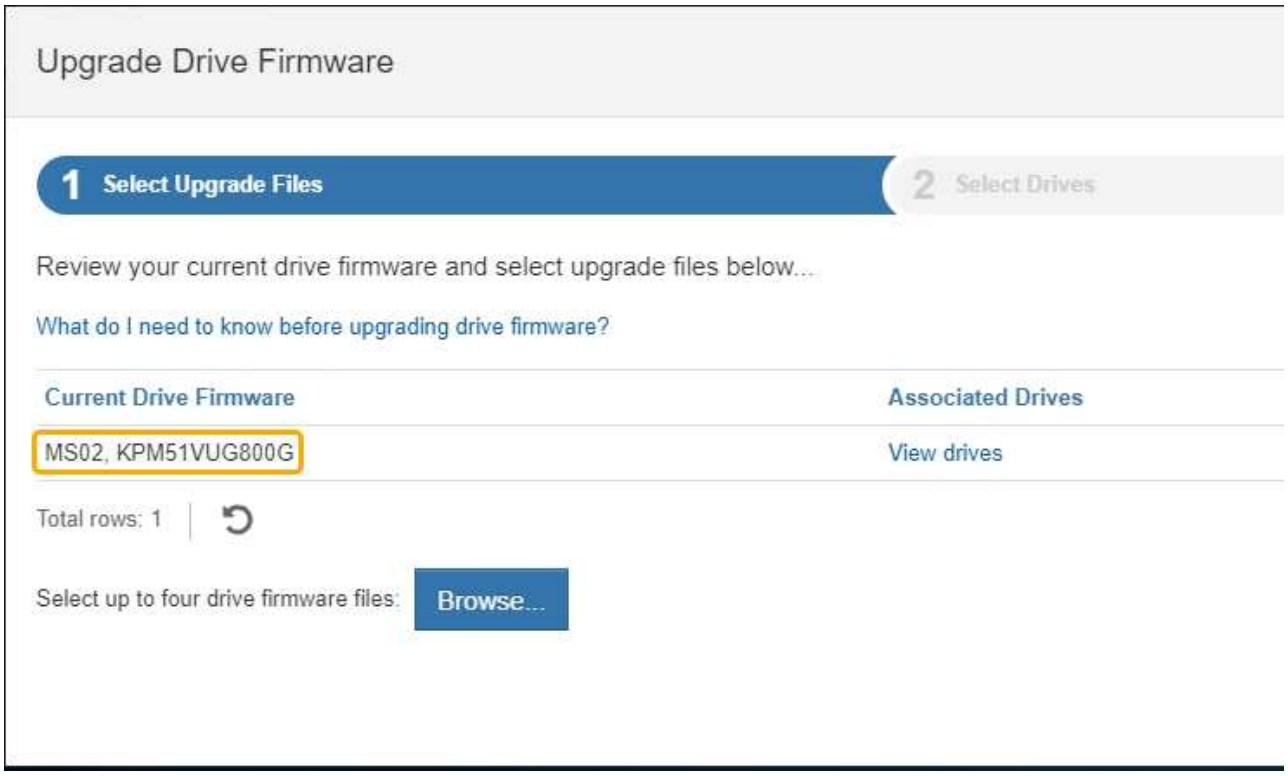
Steps

1. Access SANtricity System Manager using one of these methods:
   - Use the StorageGRID Appliance Installer and select **Advanced** > **SANtricity System Manager**
   - Use the Grid Manager and select **Nodes** > ***appliance Storage Node*** > **SANtricity System Manager**

     > If these options are not available or the SANtricity System Manager login page does not appear, access SANtricity System Manager by browsing to the storage controller IP: **`https://`*`Storage_Controller_IP`***
2. Enter the SANtricity System Manager administrator username and password, if required.
3. Verify the drive firmware version currently installed in the storage appliance:
   a. From SANtricity System Manager, select **Support** > **Upgrade Center**.
   b. Under Drive Firmware upgrade, select **Begin Upgrade**.

      The Upgrade Drive Firmware displays the drive firmware files currently installed.

   c. Note the current drive firmware revisions and drive identifiers in the Current Drive Firmware column.



In this example:

- The drive firmware revision is **MS02**.
- The drive identifier is **KPM51VUG800G**.

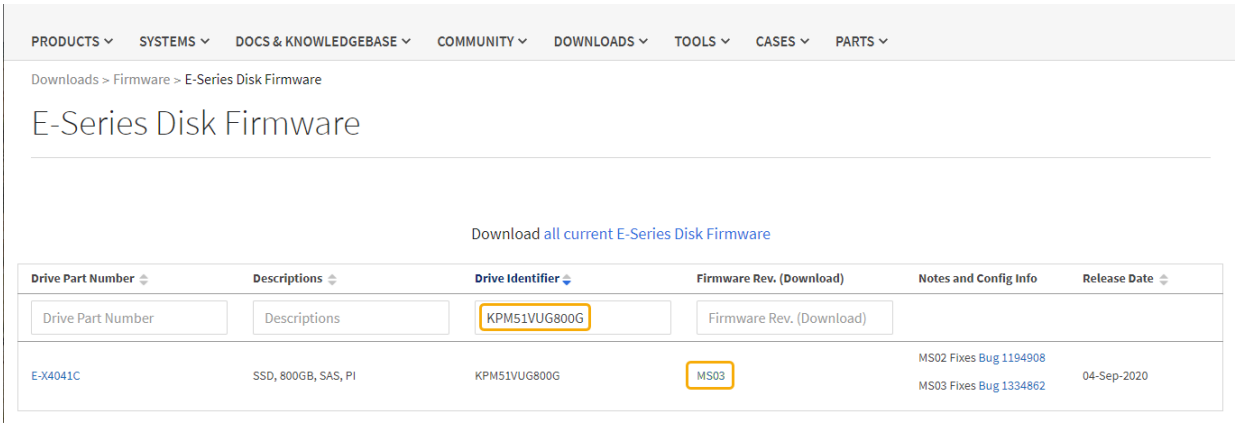
Select **View drives** in the Associated Drives column to display where these drives are installed in your storage appliance.

d. Close the Upgrade Drive Firmware window.

4. Download and prepare the available drive firmware upgrade:
   a. Under Drive Firmware upgrade, select **NetApp Support**.
   b. On the NetApp Support web site, select the **Downloads** tab, and then select **E-Series Disk Drive Firmware**.

      The E-Series Disk Firmware page displays.

   c. Search for each **Drive Identifier** installed in your storage appliance and verify that each drive identifier has the latest firmware revision.
      - If the firmware revision is not a link, this drive identifier has the latest firmware revision.
      - If one or more drive part numbers are listed for a drive identifier, a firmware upgrade is available for these drives. You can select any link to download the firmware file.



d. If a later firmware revision is listed, select the link in the Firmware Rev. (Download) column to download a `.zip` archive containing the firmware file.

e. Extract (unzip) the drive firmware archive files you downloaded from the Support site.

5. Install the drive firmware upgrade:

a. From SANtricity System Manager, under Drive Firmware upgrade, select **Begin Upgrade**.

b. Select **Browse**, and select the new drive firmware files that you downloaded from the Support site.

Drive firmware files have a filename similar to `D_HUC101212CSS600_30602291_MS01_2800_0002.dlp`.

You can select up to four drive firmware files, one at a time. If more than one drive firmware file is compatible with the same drive, you get a file conflict error. Decide which drive firmware file you want to use for the upgrade and remove the other one.

c. Select **Next**.

Select Drives lists the drives that you can upgrade with the selected firmware files.

Only drives that are compatible appear.

The selected firmware for the drive appears in **Proposed Firmware**. If you must change this firmware, select **Back**.

d. Select **Offline (parallel)** upgrade.

You can use the offline upgrade method because the appliance is in maintenance mode, where I/O activity is stopped for all drives and all volumes.

e. In the first column of the table, select the drive or drives you want to upgrade.

The best practice is to upgrade all drives of the same model to the same firmware revision.

f. Select **Start**, and confirm that you want to perform the upgrade.

If you need to stop the upgrade, select **Stop**. Any firmware downloads currently in progress complete. Any firmware downloads that have not started are canceled.

Stopping the drive firmware upgrade might result in data loss or unavailable drives.

g. (Optional) To see a list of what was upgraded, select **Save Log**.

The log file is saved in the downloads folder for your browser with the name `latest-upgrade-log-timestamp.txt`.

If any of the following errors occur during the upgrade procedure, take the appropriate recommended action.

- **Failed assigned drives**

  One reason for the failure might be that the drive does not have the appropriate signature. Make sure that the affected drive is an authorized drive. Contact technical support for more information.

  When replacing a drive, make sure that the replacement drive has a capacity equal to or greater than the failed drive you are replacing.

  You can replace the failed drive while the storage array is receiving I/O.

- **Check storage array**
  - Make sure that an IP address has been assigned to each controller.
  - Make sure that all cables connected to the controller are not damaged.
  - Make sure that all cables are tightly connected.
- **Integrated hot spare drives**

  This error condition must be corrected before you can upgrade the firmware.

- **Incomplete volume groups**

  If one or more volume groups or disk pools are incomplete, you must correct this error condition before you can upgrade the firmware.

- **Exclusive operations (other than background media/parity scan) currently running on any volume groups**

  If one or more exclusive operations are in progress, the operations must complete before the firmware can be upgraded. Use System Manager to monitor the progress of the operations.

- **Missing volumes**

  You must correct the missing volume condition before the firmware can be upgraded.

- **Either controller in a state other than Optimal**

  One of the storage array controllers needs attention. This condition must be corrected before the firmware can be upgraded.

- **Mismatched Storage Partition information between Controller Object Graphs**

  An error occurred while validating the data on the controllers. Contact technical support to resolve this issue.

- **SPM Verify Database Controller check fails**

  A storage partitions mapping database error occurred on a controller. Contact technical support to resolve this issue.

- **Configuration Database Validation (If supported by the storage array's controller version)**

  A configuration database error occurred on a controller. Contact technical support to resolve this issue.

- **MEL Related Checks**

  Contact technical support to resolve this issue.

- **More than 10 DDE Informational or Critical MEL events were reported in the last 7 days**

  Contact technical support to resolve this issue.

- **More than 2 Page 2C Critical MEL Events were reported in the last 7 days**

  Contact technical support to resolve this issue.

- **More than 2 Degraded Drive Channel Critical MEL events were reported in the last 7 days**

  Contact technical support to resolve this issue.

- **More than 4 critical MEL entries in the last 7 days**

  Contact technical support to resolve this issue.

6. Once the upgrade operation has completed, reboot the appliance. From the StorageGRID Appliance Installer, select **Advanced** > **Reboot Controller**, and then select one of these options:
   - Select **Reboot into StorageGRID** to reboot the controller with the node rejoining the grid. Select this option if you are done working in maintenance mode and are ready to return the node to normal operation.
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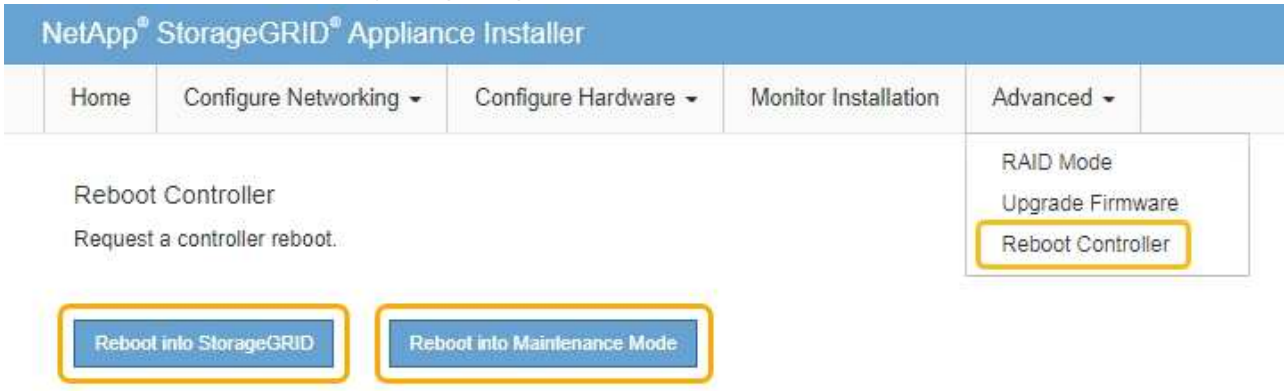

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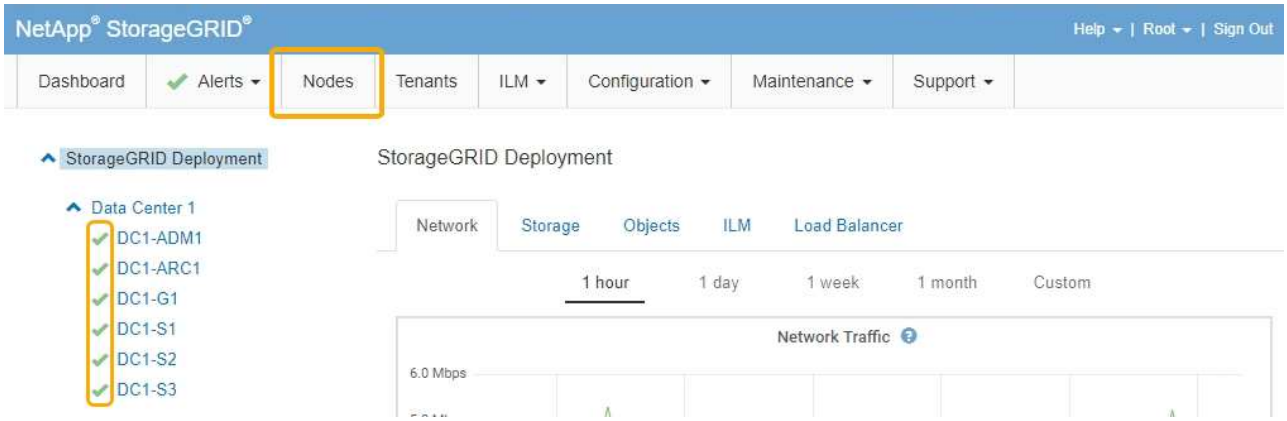


Related information

Upgrading SANtricity OS on the storage controllers

Adding an expansion shelf to a deployed SG6060

To increase storage capacity, you can add one or two expansion shelves to an SG6060 that is deployed in a StorageGRID system.

What you'll need

- You must have the provisioning passphrase.
- You must be running StorageGRID 11.4 or later.
- You have the expansion shelf and two SAS cables for each expansion shelf.
- You have physically located the storage appliance where you are adding the expansion shelf in the data center.

  Locating the controller in a data center

About this task

To add an expansion shelf, you perform these high-level steps:

- Install the hardware in the cabinet or rack.
- Place the SG6060 into maintenance mode.
- Connect the expansion shelf to the E2860 controller shelf or to another expansion shelf.
- Start the expansion using the StorageGRID Appliance Installer
- Wait until the new volumes are configured.

Completing the procedure for one or two expansion shelves should take one hour or less per appliance node. To minimize downtime, the following steps instruct you to install the new expansion shelves and drives before placing the SG6060 into maintenance mode. The remaining steps should take approximately 20 to 30 minutes per appliance node.

Steps

1. Follow the instructions for installing 60-drive shelves into a cabinet or rack.

   SG6060: Installing 60-drive shelves into a cabinet or rack

2. Follow the instructions for installing the drives.

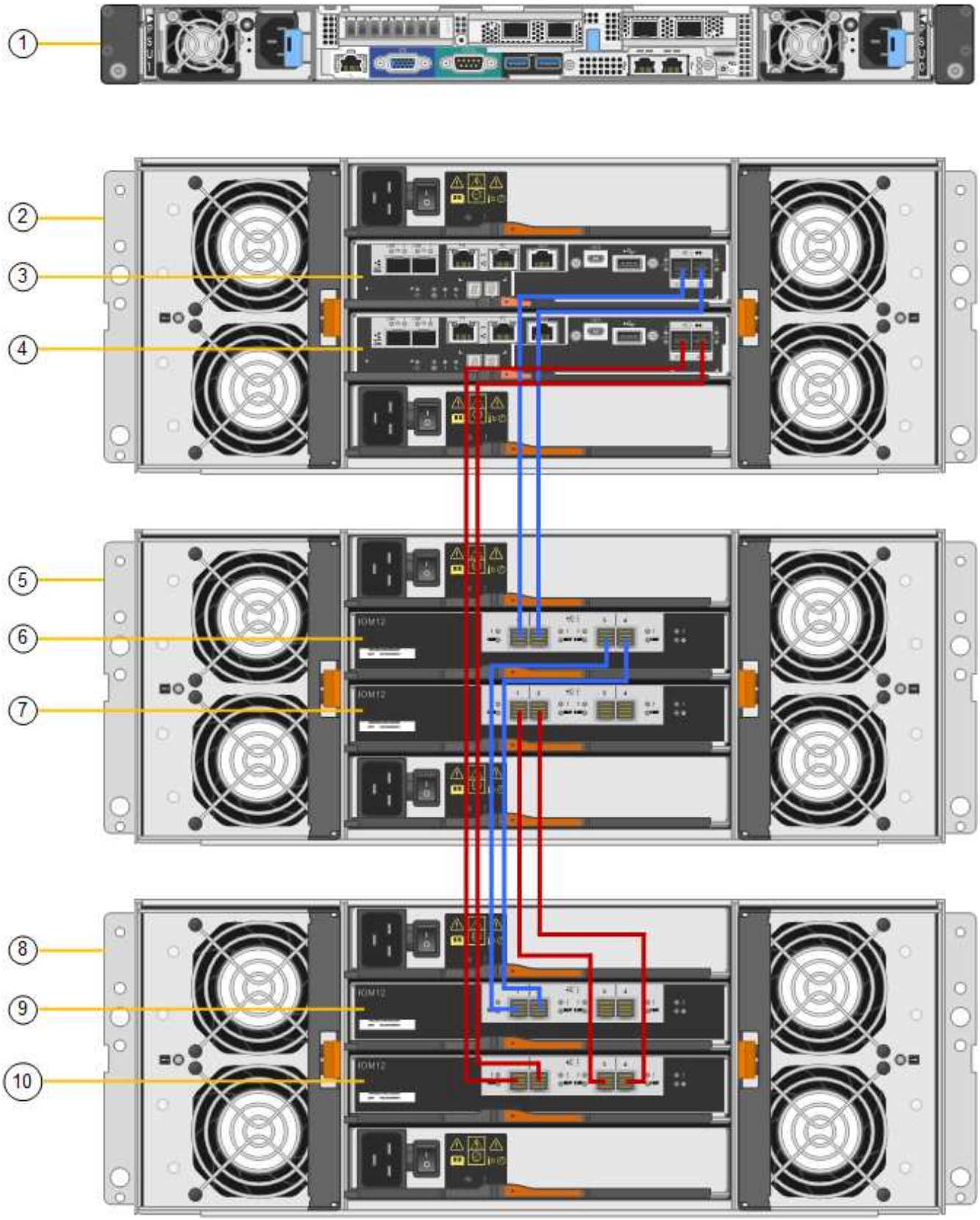
   SG6060: Installing the drives

3. From the Grid Manager, place the SG6000-CN controller into maintenance mode.

   Placing an appliance into maintenance mode

4. Connect each expansion shelf to the E2860 controller shelf as shown in the diagram.

   This drawing shows two expansion shelves. If you have only one, connect IOM A to controller A and connect IOM B to controller B.



	Description
1	SG6000-CN

	Description
2	E2860 controller shelf
3	Controller A
4	Controller B
5	Expansion shelf 1
6	IOM A for expansion shelf 1
7	IOM B for expansion shelf 1
8	Expansion shelf 2
9	IOM A for expansion shelf 2
10	IOM B for expansion shelf 2

5. Connect the power cords and apply power to the expansion shelves.
   a. Connect a power cord to each of the two power supply units in each expansion shelf.
   b. Connect the two power cords in each expansion shelf to two different PDUs in the cabinet or rack.
   c. Turn on the two power switches for each expansion shelf.
      - Do not turn off the power switches during the power-on process.
      - The fans in the expansion shelves might be very loud when they first start up. The loud noise during start-up is normal.
6. Monitor the Home page of the StorageGRID Appliance Installer.

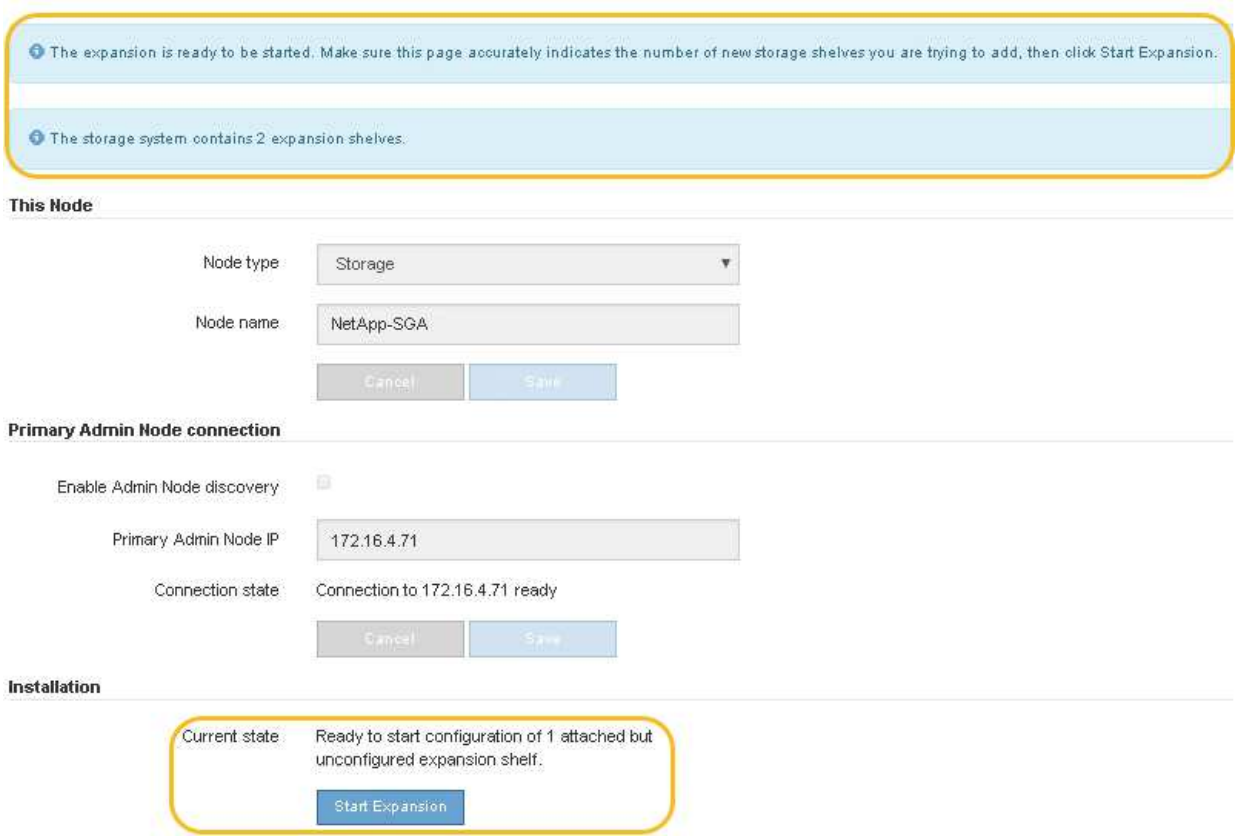
   In approximately five minutes, the expansion shelves finish powering up and are detected by the system. The Home page shows the number of new expansion shelves detected, and the Start Expansion button is enabled.

   The screenshot shows examples of the messages that could appear on the Home page, depending on the number of existing or new expansion shelves, as follows:

   - The banner circled at the top of the page indicates the total number of expansion shelves detected.
     - The banner indicates the total number of expansion shelves, whether the shelves are configured and deployed or new and unconfigured.
     - If no expansion shelves are detected, the banner will not appear.
   - The message circled at the bottom of the page indicates an expansion is ready to be started.
     - The message indicates the number of new expansion shelves StorageGRID detects. “Attached” indicates that the shelf is detected. “Unconfigured” indicates that the shelf is new and not yet configured using the StorageGRID Appliance Installer.

Expansion shelves that are already deployed are not included in this message. They are included in the count in the banner at the top of the page.

- The message will not appear if new expansion shelves are not detected.



7. As necessary, resolve any issues described in the messages on the Home page.

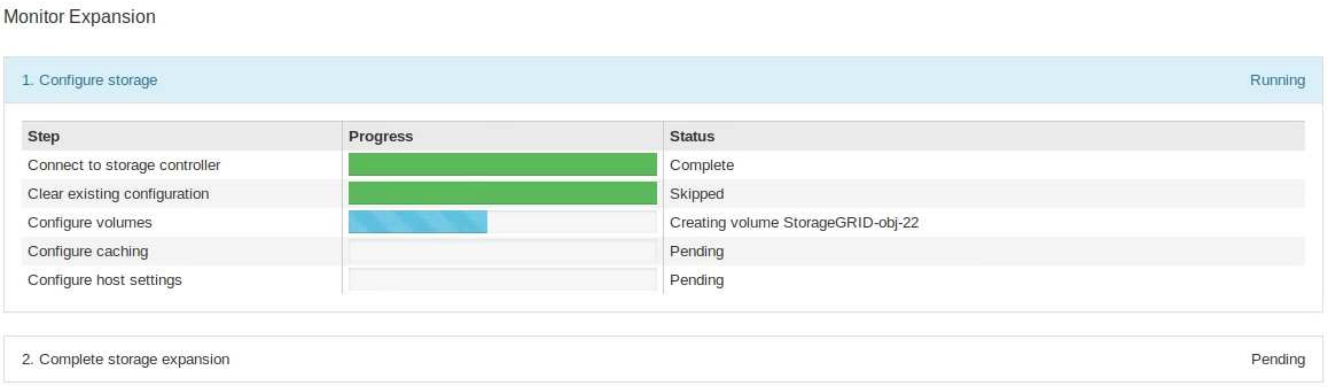
   For example, use SANtricity System Manager to resolve any storage hardware issues.

8. Verify that the number of expansion shelves displayed on the Home page matches the number of expansion shelves you are adding.

   If the new expansion shelves have not been detected, verify that they are properly cabled and powered up.

9. Click **Start Expansion** to configure the expansion shelves and make them available for object storage.
10. Monitor the progress of the expansion shelf configuration.

    Progress bars appear on the web page, just as they do during initial installation.



When configuration is complete, the appliance automatically reboots to exit maintenance mode and rejoin the grid. This process can take up to 20 minutes.

> If the appliance does not rejoin the grid, go to the StorageGRID Appliance Installer Home page, select **Advanced** > **Reboot Controller**, and then select **Reboot into Maintenance Mode**.

When the reboot is complete, the **Tasks** tab looks like the following screenshot:

11. Verify the status of the appliance Storage Node and the new expansion shelves.
    a. In the Grid Manager, select **Nodes** and verify that the appliance Storage Node has a green checkmark icon.

       The green checkmark icon means that no alerts are active and the node is connected to the grid. For a description of node icons, see the instructions for monitoring and troubleshooting StorageGRID.

    b. Select the **Storage** tab and confirm that 16 new object stores are shown in the Object Storage table for each expansion shelf you added.
    c. Verify that each new expansion shelf has a shelf status of Nominal and a configuration status of Configured.

Storage Shelves

Shelf Chassis Serial Number	Shelf ID	Shelf Status	IOM Status	Power Supply Status	Drawer Status	Fan Status	Drive Slots	Data Drives	Data Drive Size	Cache Drives	Cache Drive Size	Configuration Status
721924500063	99	Nominal	N/A	Nominal	Nominal	Nominal	60	58	9.80 TB	2	800.17 GB	Configured (in use)
721929500038	0	Nominal	Nominal	Nominal	Nominal	Nominal	60	60	9.80 TB	0	0 bytes	Configured (in use)
721929500039	1	Nominal	Nominal	Nominal	Nominal	Nominal	60	60	9.80 TB	0	0 bytes	Configured (in use)

Related information

Unpacking the boxes (SG6000)

SG6060: Installing 60-drive shelves into a cabinet or rack

SG6060: Installing the drives

Monitor & troubleshoot

Turning the controller identify LED on and off

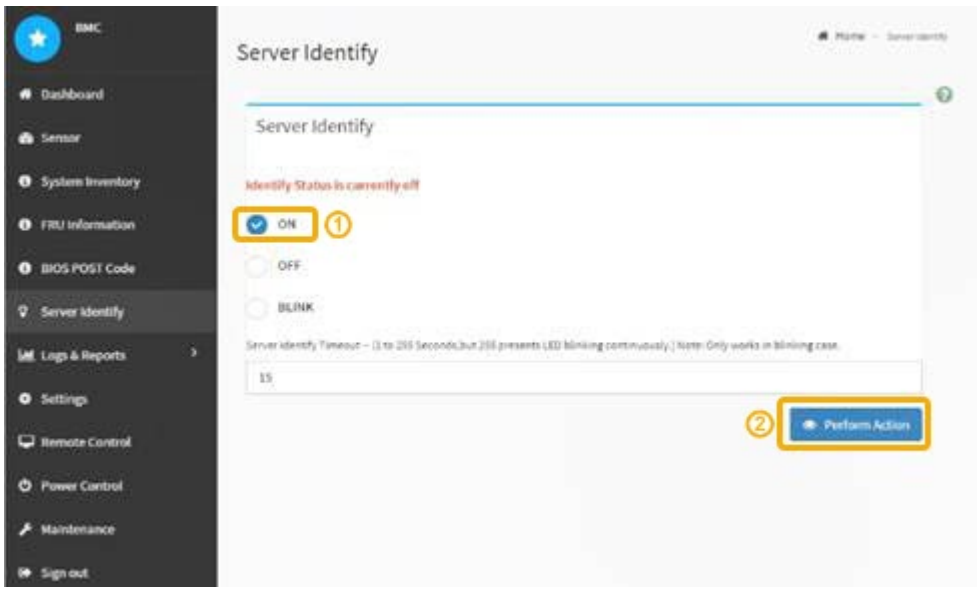
The blue identify LED on the front and back of the controller can be turned on to help locate the appliance in a data center.

What you'll need

You must have the BMC IP address of the controller you want to identify.

Steps

1. Access the controller BMC interface.
2. Select **Server Identify**.
3. Select **ON** and then select **Perform Action**.



Result

The blue identify LEDs light on the front (shown) and rear of the controller.

If a bezel is installed on the controller, it might be difficult to see the front identify LED.

After you finish

To turn off the controller identify LED:

- Press the identify LED switch on the controller front panel.
- From the controller BMC interface, select **Server Identify**, select **OFF** and then select **Perform Action**.

The blue identify LEDs on the front and rear of the controller go off.

Related information

Verifying the Fibre Channel HBA to replace

Locating the controller in a data center

Accessing the BMC interface

Locating the controller in a data center

Locate the controller so that you can perform hardware maintenance or upgrades.

What you'll need

- You have determined which controller requires maintenance.

(Optional) To help locate the controller in your data center, turn on the blue identify LED.

Turning the controller identify LED on and off

Steps

1. Find the controller requiring maintenance in the data center.
   - Look for a lit blue identify LED on the front or rear of the controller.

     The front identify LED is behind the controller front bezel and might be difficult to see if the bezel is installed.

   - Check the tags attached to the front of each controller for a matching part number.
2. Remove the controller front bezel, if one is installed, to access the front panel controls and indicators.
3. Optional: Turn off the blue identify LED if you used it to locate the controller.
   - Press the identify LED switch on the controller front panel.
   - Use the controller BMC interface.

     Turning the controller identify LED on and off

Related information

Removing the Fibre Channel HBA

Removing the SG6000-CN controller from a cabinet or rack

Shutting down the SG6000-CN controller

Replacing a storage controller

You might need to replace an E2800 controller or an EF570 controller if it is not functioning optimally or if it has failed.

What you'll need

- You have a replacement controller with the same part number as the controller you are replacing.
- You have labels to identify each cable that is connected to the controller.
- You have an ESD wristband, or you have taken other antistatic precautions.
- You have a #1 Phillips screwdriver.
- You have the E-Series instructions for replacing a controller in duplex configuration.

> Refer to the E-Series instructions only when directed or if you need more details to perform a specific step. Do not rely on the E-Series instructions to replace a controller in the StorageGRID appliance, because the procedures are not the same.

- You have physically located the storage appliance where you are replacing the controller in the data center.

  Locating the controller in a data center

About this task

You can determine if you have a failed controller in two ways:

- The Recovery Guru in SANtricity System Manager directs you to replace the controller.
- The amber Attention LED on the controller is on, indicating that the controller has a fault.

> If both controllers in the shelf have their Attention LEDs on, contact technical support for assistance.

Because the storage controller shelf contains two storage controllers, you can replace one of the controllers while your appliance is powered on and performing read/write operations, as long as the following conditions are true:

- The second controller in the shelf has Optimal status.
- The “OK to remove” field in the Details area of the Recovery Guru in SANtricity System Manager displays Yes, indicating that it is safe to remove this component.

> If the second controller canister in the shelf does not have Optimal status or if the Recovery Guru indicates that it is not OK to remove the controller canister, contact technical support.

When you replace a controller, you must remove the battery from the original controller and install it in the replacement controller.

> The storage controllers in the appliance do not include host interface cards (HIC).

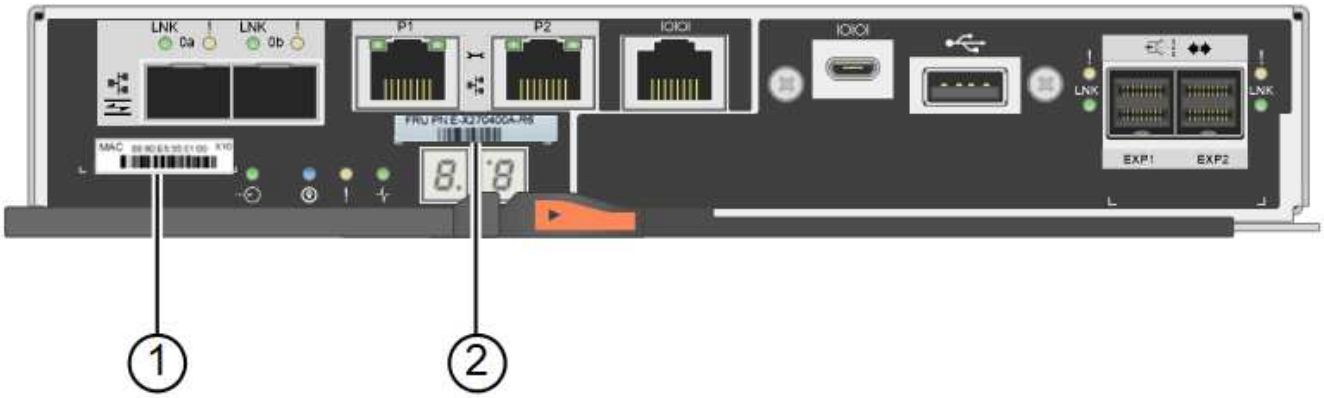
Steps

1. Unpack the new controller, and set it on a flat, static-free surface.

   Save the packing materials to use when shipping the failed controller.

2. Locate the MAC address and FRU part number labels on the back of the replacement controller.

   This figure shows the E2800 controller. The procedure for replacing the EF570 controller is identical.



Label	Label	Description
1	MAC address	The MAC address for management port 1 (“P1”). If you used DHCP to obtain the original controller’s IP address, you will need this address to connect to the new controller.
2	FRU part number	The FRU part number. This number must match the replacement part number for the currently installed controller.

3. Prepare to remove the controller.

   You use SANtricity System Manager to perform these steps. As needed for additional details, reference the E-Series instructions for replacing the storage controller.

   a. Confirm that the replacement part number for the failed controller is the same as the FRU part number for the replacement controller.

      When a controller has a fault and needs to be replaced, the replacement part number is displayed in the Details area of the Recovery Guru. If you need to find this number manually, you can look on the **Base** tab for the controller.

      Possible loss of data access -- If the two part numbers are not the same, do not attempt this procedure.

   b. Back up the configuration database.

      If a problem occurs when you remove a controller, you can use the saved file to restore your configuration.

   c. Collect support data for the appliance.

      Collecting support data before and after replacing a component ensures you can send a full set of logs to technical support in case the replacement does not resolve the problem.

d. Take the controller you plan to replace offline.

4. Remove the controller from the appliance:
   a. Put on an ESD wristband or take other antistatic precautions.
   b. Label the cables and then disconnect the cables and SFPs.

      To prevent degraded performance, do not twist, fold, pinch, or step on the cables.

   c. Release the controller from the appliance by squeezing the latch on the cam handle until it releases, and then open the cam handle to the right.
   d. Using two hands and the cam handle, slide the controller out of the appliance.

      Always use two hands to support the weight of the controller.

   e. Place the controller on a flat, static-free surface with the removable cover facing up.
   f. Remove the cover by pressing down on the button and sliding the cover off.
5. Remove the battery from the failed controller, and install it into the replacement controller:
   a. Confirm that the green LED inside the controller (between the battery and the DIMMs) is off.

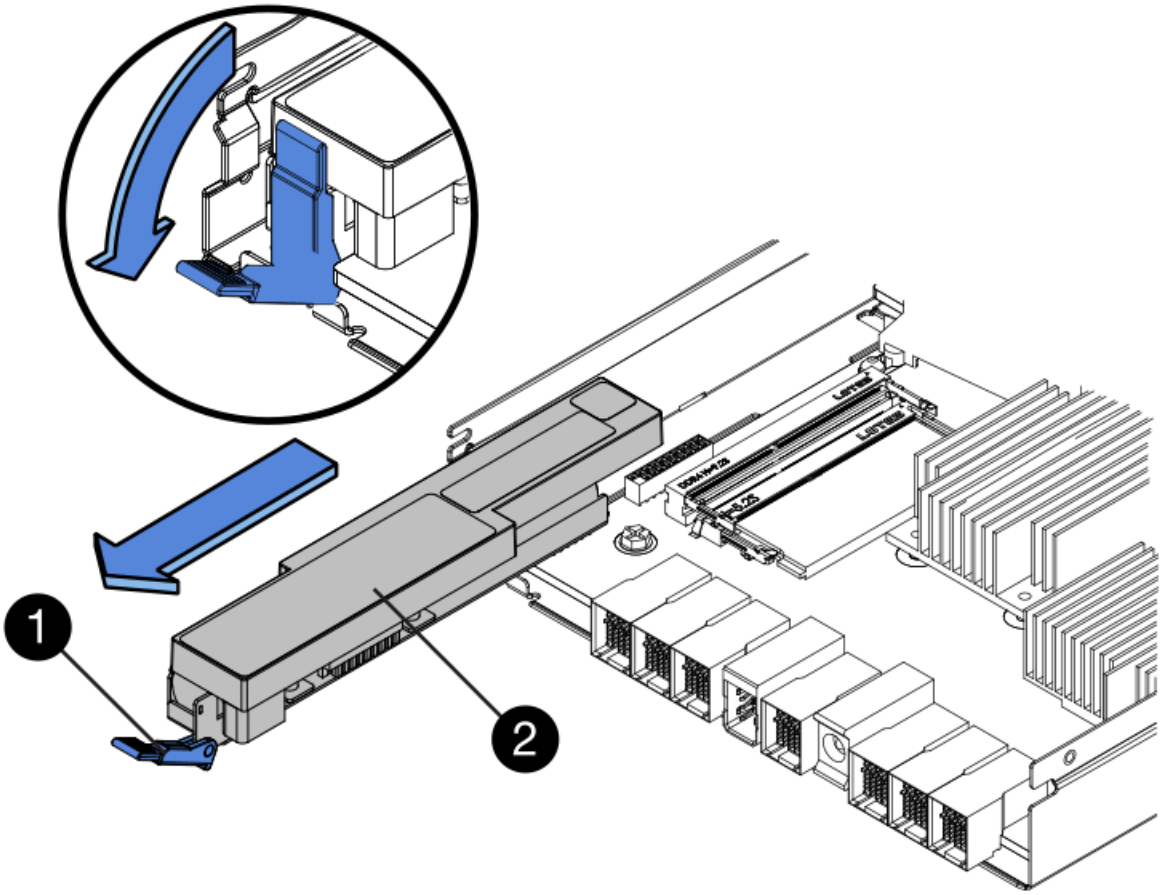
      If this green LED is on, the controller is still using battery power. You must wait for this LED to go off before removing any components.

Item	Description
	Internal Cache Active LED

Item	Description
	Battery

b. Locate the blue release latch for the battery.

c. Unlatch the battery by pushing the release latch down and away from the controller.



Item	Description
	Battery release latch
	Battery

d. Lift up on the battery, and slide it out of the controller.

e. Remove the cover from the replacement controller.

f. Orient the replacement controller so that the slot for the battery faces toward you.

g. Insert the battery into the controller at a slight downward angle.

You must insert the metal flange at the front of the battery into the slot on the bottom of the controller, and slide the top of the battery beneath the small alignment pin on the left side of the controller.

h. Move the battery latch up to secure the battery.

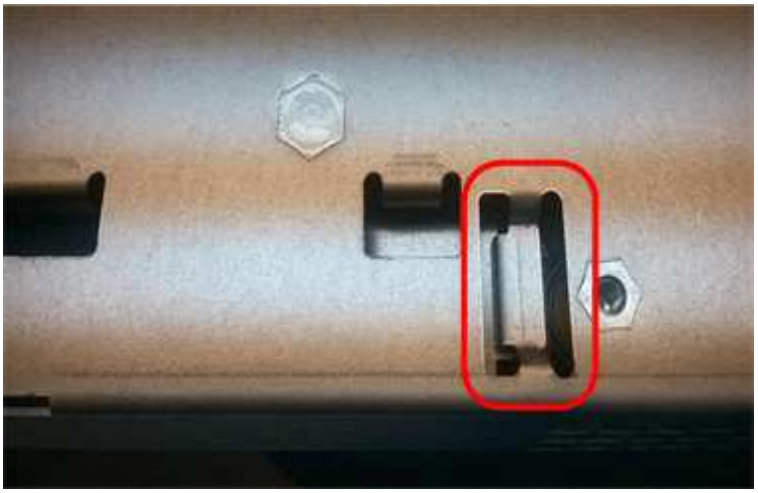
When the latch clicks into place, the bottom of the latch hooks into a metal slot on the chassis.

i. Turn the controller over to confirm that the battery is installed correctly.

Possible hardware damage — The metal flange at the front of the battery must be completely inserted into the slot on the controller (as shown in the first figure). If the battery is not installed correctly (as shown in the second figure), the metal flange might contact the controller board, causing damage.

- **Correct — The battery's metal flange is completely inserted in the slot on the controller:**

- **Incorrect — The battery's metal flange is not inserted into the slot on the controller:**



j. Replace the controller cover.

6. Install the replacement controller into the appliance.
   a. Turn the controller over, so that the removable cover faces down.
   b. With the cam handle in the open position, slide the controller all the way into the appliance.

c. Move the cam handle to the left to lock the controller in place.

d. Replace the cables and SFPs.

e. If the original controller used DHCP for the IP address, locate the MAC address on the label on the back of the replacement controller. Ask your network administrator to associate the DNS/network and IP address for the controller you removed with the MAC address for the replacement controller.

> If the original controller did not use DHCP for the IP address, the new controller will adopt the IP address of the controller you removed.

7. Bring the controller online using SANtricity System Manager:

   a. Select **Hardware**.

   b. If the graphic shows the drives, select **Show back of shelf**.

   c. Select the controller you want to place online.

   d. Select **Place Online** from the context menu, and confirm that you want to perform the operation.

   e. Verify that the seven-segment display shows a state of `99`.

8. Confirm that the new controller is Optimal, and collect support data.

Related information

NetApp E-Series Systems Documentation Site

Replacing hardware components in the storage controller shelf

If a hardware problem occurs, you might need to replace a component in the storage controller shelf.

What you'll need

- You have the E-Series hardware replacement procedure.
- You have physically located the storage appliance where you are replacing storage shelf hardware components in the data center.

  Locating the controller in a data center

About this task

To replace the battery in the storage controller, see the instructions in these instructions for replacing a storage controller. Those instructions describe how to remove a controller from the appliance, remove the battery from the controller, install the battery, and replace the controller.

For instructions for the other field replaceable units (FRUs) in the controller shelves, access the E-Series procedures for system maintenance.

FRU	See instructions
Battery	StorageGRID (these instructions): Replacing a storage controller

FRU	See instructions
Drive	E-Series: • Replace drive (60-drive) • Replace drive (12-drive or 24-drive)
Power canister	E-Series • Replace power canister (60-drive) • Replace power supply (12-drive or 24-drive)
Fan canister (60-drive shelves only)	E-Series: Replace fan canister (60-drive)
Drive drawer (60-drive shelves only)	E-Series: Replace drive drawer (60-drive)

Related information

NetApp E-Series Systems Documentation Site

Replacing a storage controller

Replacing hardware components in the optional 60-drive expansion shelf

You might need to replace an input/output module, a power supply, or a fan in the expansion shelf.

What you'll need

- You have the E-Series hardware replacement procedure.
- You have physically located the storage appliance where you are replacing expansion shelf hardware components in the data center.

  Locating the controller in a data center

About this task

To replace an input/output module (IOM) in a 60-drive expansion shelf, see the instructions in these instructions for replacing a storage controller.

To replace a power supply or a fan in a 60-drive expansion shelf, access the E-Series procedures for maintaining 60-drive hardware.

FRU	See E-Series instructions for
Input/output module (IOM)	Replacing an IOM
Power canister	Replace power canister (60-drive)

FRU	See E-Series instructions for
Fan canister	Replace fan canister (60-drive)

Shutting down the SG6000-CN controller

Shut down the SG6000-CN controller to perform hardware maintenance.

What you'll need

- You have physically located the SG6000-CN controller requiring maintenance in the data center.

  Locating the controller in a data center

- The appliance has been placed maintenance mode.

  Placing an appliance into maintenance mode

About this task

To prevent service interruptions, confirm that all other Storage Nodes are connected to the grid before shutting down the controller or shut down the controller during a scheduled maintenance window when periods of service disruption are normally expected. See the information about determining node connection states in the instructions for managing objects with information lifecycle management.

> If you have ever used an ILM rule that creates only one copy of an object, you must shut down the controller during a scheduled maintenance window. Otherwise, you might temporarily lose access to those objects during this procedure.
> See information about managing objects with information lifecycle management.

Steps

1. When the appliance has been placed maintenance mode, shut down the SG6000-CN controller:

   > You must perform a controlled shut down of the controller by entering the commands specified below. Shutting down the controller using the power switch will result in data loss.

   a. Log in to the grid node using PuTTY or another ssh client:
      i. Enter the following command: `ssh admin@grid_node_IP`
      ii. Enter the password listed in the `Passwords.txt` file.
      iii. Enter the following command to switch to root: `su -`
      iv. Enter the password listed in the `Passwords.txt` file.

      When you are logged in as root, the prompt changes from `$` to `#`.

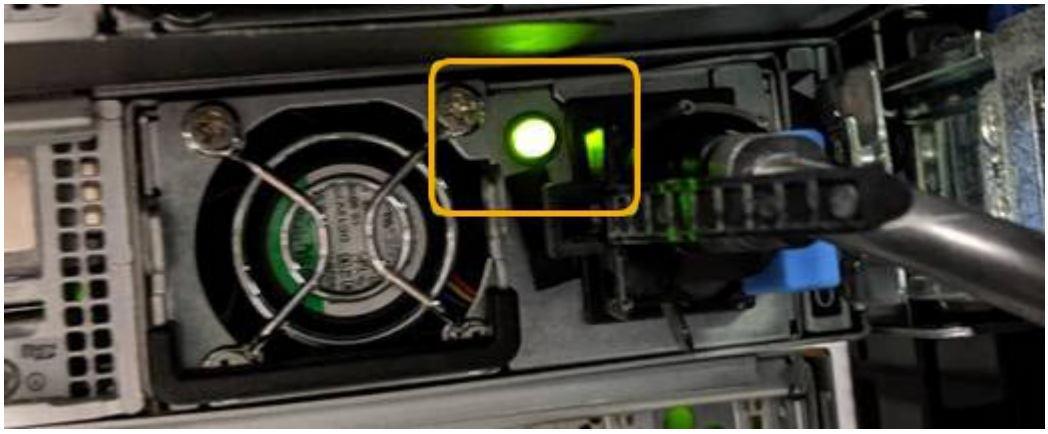
   b. Shut down the SG6000-CN controller:
      `shutdown -h now`

      This command might take up to 10 minutes to complete.

2. Use one of the following methods to verify that the SG6000-CN controller is powered off:

- Look at the blue power LED on the front of the controller and confirm that it is off.

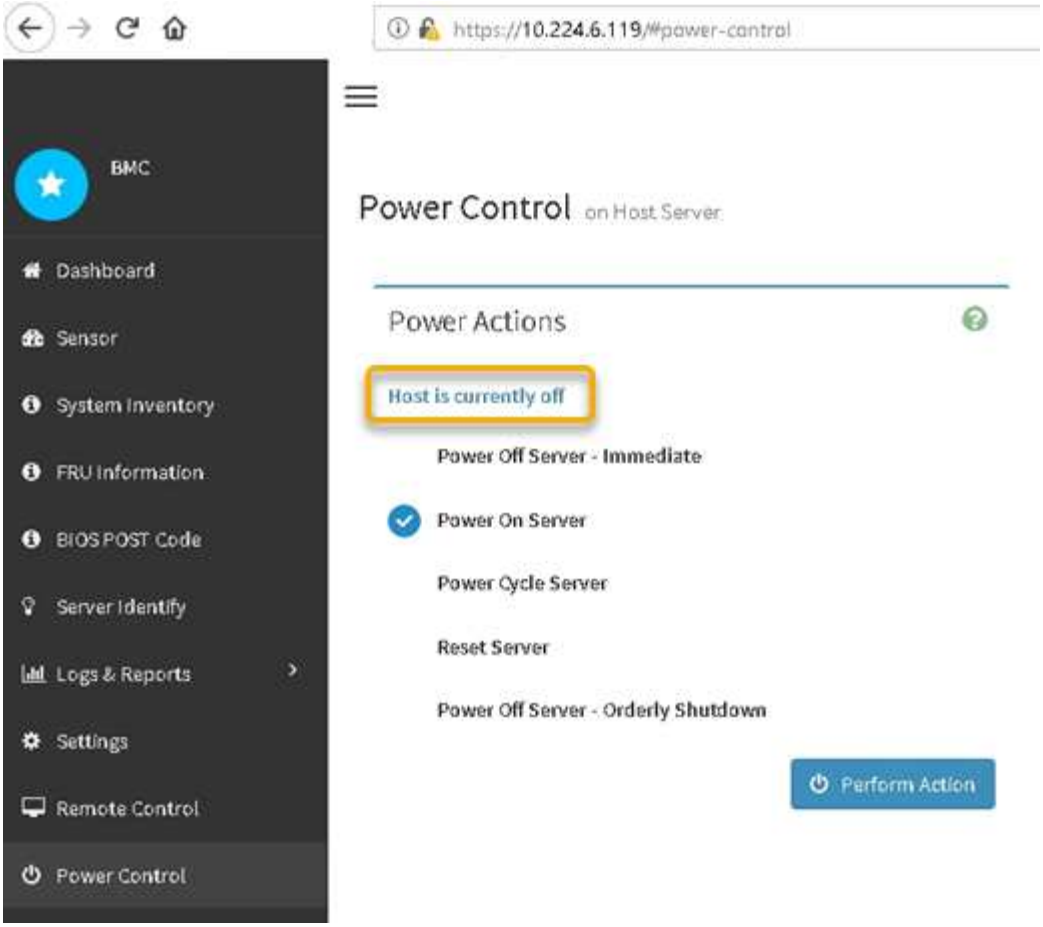
- Look at the green LEDs on both power supplies in the rear of the controller and confirm that they blink at a regular rate (approximately one blink per second).



- Use the controller BMC interface:
  i. Access the controller BMC interface.

     Accessing the BMC interface

  ii. Select **Power Control**.
  iii. Verify that the Power Actions indicates that the host is currently off.



Related information

Removing the SG6000-CN controller from a cabinet or rack

Powering on the SG6000-CN controller and verifying operation

Power on the controller after completing maintenance.

What you'll need

- You have installed the controller in a cabinet or rack and connected the data and power cables.

  Reinstalling the SG6000-CN controller into a cabinet or rack

- You have physically located the controller in the data center.

  Locating the controller in a data center

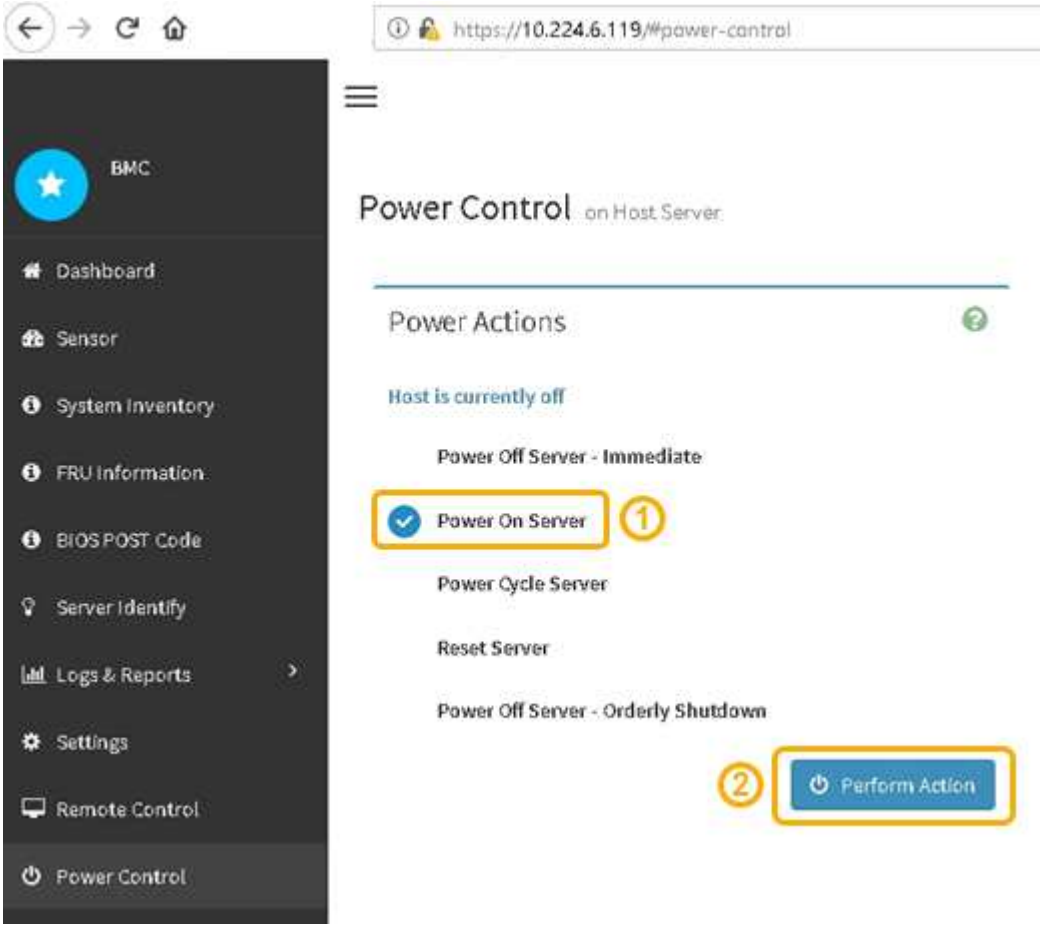
Steps

1. Power on the SG6000-CN controller and monitor the controller LEDs and boot-up codes using one of the following methods:
   - Press the power switch on the front of the controller.

- Use the controller BMC interface:
  i. Access the controller BMC interface.

     Accessing the BMC interface

  ii. Select **Power Control**.
  iii. Select **Power On Server** and then select **Perform Action**.



  Use the BMC interface to monitor start-up status.

2. Confirm that the appliance controller displays in the Grid Manager and with no alerts.

   It might take up to 20 minutes for the controller to display in the Grid Manager.

3. Confirm that the new SG6000-CN controller is fully operational:
   a. Log in to the grid node using PuTTY or another ssh client:
      i. Enter the following command: `ssh admin@grid_node_IP`
      ii. Enter the password listed in the `Passwords.txt` file.
      iii. Enter the following command to switch to root: `su -`
      iv. Enter the password listed in the `Passwords.txt` file.

      When you are logged in as root, the prompt changes from `$` to `#`.

   b. Enter the following command and verify that it returns the expected output:
   `cat /sys/class/fc_host/*/port_state`

      Expected output:

      ```
      Online
      Online
      Online
      ```

      If the expected output is not returned, contact technical support.

   c. Enter the following command and verify that it returns the expected output:
   `cat /sys/class/fc_host/*/speed`

      Expected output:

      ```
      16 Gbit
      16 Gbit
      16 Gbit16 Gbit
      16 Gbit
      ```

      If the expected output is not returned, contact technical support.

   d. From the Nodes page in Grid Manager, make sure that the appliance node is connected to the grid and does not have any alerts.

      Do not take another appliance node offline unless this appliance has a green icon.

4. Optional: Install the front bezel, if one was removed.

Related information

Viewing status indicators and buttons on the SG6000-CN controller

Viewing boot-up status codes for the SG6000 storage controllers

Replacing the SG6000-CN controller

You might need to replace the SG6000-CN controller if it is not functioning optimally or if it has failed.

What you'll need

- You have a replacement controller with the same part number as the controller you are replacing.
- You have labels to identify each cable that is connected to the controller.
- You have physically located the controller to replace in the data center.

  Locating the controller in a data center

About this task

The appliance Storage Node will not be accessible when you replace the SG6000-CN controller. If the SG6000-CN controller is functioning sufficiently, you can perform a controlled shutdown at the start of this procedure.

> If you are replacing the controller before installing StorageGRID software, you might not be able to access the StorageGRID Appliance Installer immediately after completing this procedure. While you can access the StorageGRID Appliance Installer from other hosts on the same subnet as the appliance, you cannot access it from hosts on other subnets. This condition should resolve itself within 15 minutes (when any ARP cache entries for the original controller time out), or you can clear the condition immediately by purging any old ARP cache entries manually from the local router or gateway.

Steps

1. If the SG6000-CN controller is functioning sufficiently to allow for a controlled shutdown, shut down the SG6000-CN controller.

   Shutting down the SG6000-CN controller

   The green Cache Active LED on the back of the E2800 controller is on when cached data needs to be written to the drives. You must wait for this LED to turn off.

2. Use one of two methods to verify that the power for the SG6000-CN controller is off:
   - The power indicator LED on the front of the controller is off.
   - The Power Control page of the BMC interface indicates that the controller is off.
3. If the StorageGRID networks attached to the controller use DHCP servers, update DNS/network and IP address settings.
   a. Locate the MAC address label on the front of the SG6000-CN controller, and determine the MAC address for the Admin Network port.

      > The MAC address label lists the MAC address for the BMC management port.
      > To determine the MAC address for the Admin Network port, you must add **2** to the hexadecimal number on the label. For example, if the MAC address on the label ends in **09**, the MAC address for the Admin Port would end in **0B**. If the MAC address on the label ends in **(*y*)FF**, the MAC address for the Admin Port would end in **(*y*+1)01**. You can easily make this calculation by opening Calculator in Windows, setting it to Programmer mode, selecting Hex, typing the MAC address, then typing **+ 2 =**.

b. Ask your network administrator to associate the DNS/network and IP address for the controller you removed with the MAC address for the replacement controller.

> You must ensure that all IP addresses for the original controller have been updated before you apply power to the replacement controller. Otherwise, the controller will obtain new DHCP IP addresses when it boots up and might not be able to reconnect to StorageGRID. This step applies to all StorageGRID networks that are attached to the controller.

> If the original controller used static IP address, the new controller will automatically adopt the IP addresses of the controller you removed.

4. Remove and replace the SG6000-CN controller:
   a. Label the cables and then disconnect the cables and any SFP+ or SFP28 transceivers.

   > To prevent degraded performance, do not twist, fold, pinch, or step on the cables.

   b. Remove the failed controller from the cabinet or rack.
   c. Install the replacement controller into the cabinet or rack.
   d. Replace the cables and any SFP+ or SFP28 transceivers.
   e. Power on the controller and monitor the controller LEDs and boot-up codes.
5. Confirm that the appliance Storage Node appears in the Grid Manager and that no alarms appear.
6. From the Grid Manager, select **Nodes**, and verify that the BMC IP address for the node controller is correct.

   If the node controller IP address is not valid or is not in the expected range, reconfigure the IP address as described in the recovery and maintenance instructions.

   Maintain & recover

Related information

SG6000-CN: Installing into a cabinet or rack

Viewing status indicators and buttons on the SG6000-CN controller

Viewing boot-up codes for the SG6000-CN controller

Replacing a power supply in the SG6000-CN controller

The SG6000-CN controller has two power supplies for redundancy. If one of the power supplies fails, you must replace it as soon as possible to ensure that the compute controller has redundant power.

What you'll need

- You have unpacked the replacement power supply unit.
- You have physically located the controller where you are replacing the power supply in the data center.

  Locating the controller in a data center

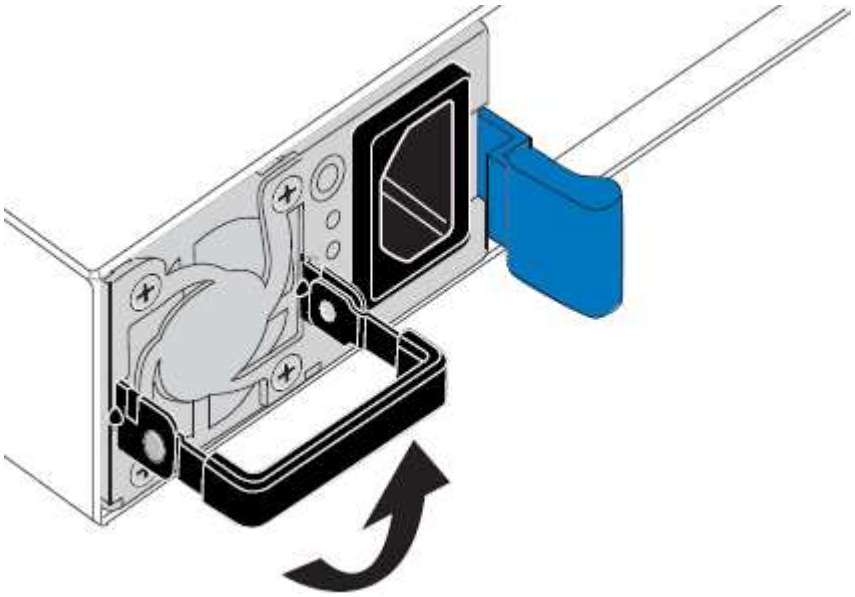
- You have confirmed that the other power supply is installed and running.

About this task

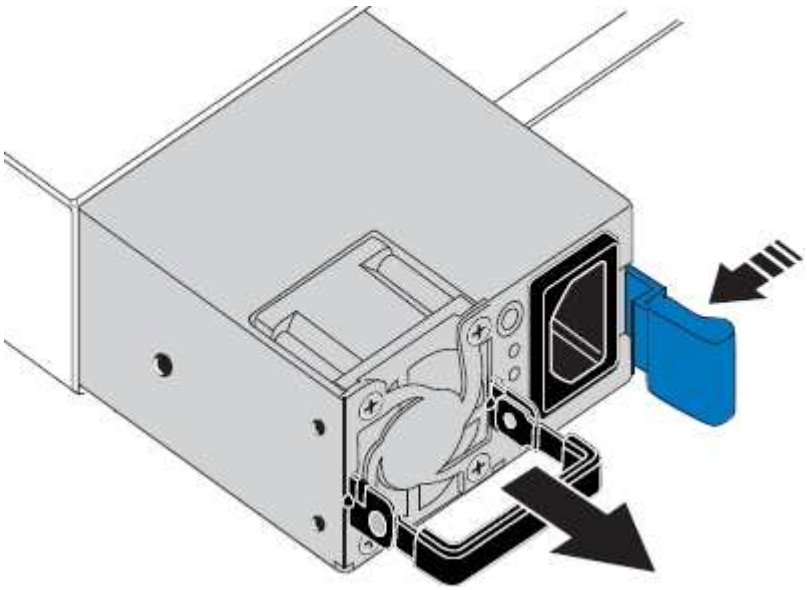
The figure shows the two power supply units for the SG6000-CN controller, which are accessible from the back of the controller.

Steps

1. Unplug the power cord from the power supply.
2. Lift the cam handle.

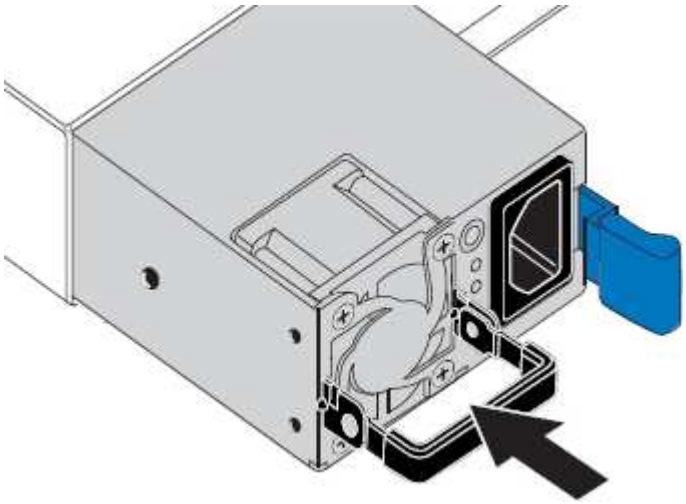


3. Press the blue latch and pull the power supply out.



4. Slide the replacement power supply into the chassis.

   Ensure that the blue latch is on the right side when you slide the unit in.



5. Push the cam handle down to secure the power supply.
6. Attach the power cord to the power supply, and ensure that the green LED comes on.

Removing the SG6000-CN controller from a cabinet or rack

Remove the SG6000-CN controller from a cabinet or rack to access the top cover or to move the controller to a different location.

What you'll need

- You have labels to identify each cable that is connected to the SG6000-CN controller.
- You have physically located the SG6000-CN controller where you are performing maintenance in the data center.

  Locating the controller in a data center

- You have shut down the SG6000-CN controller.

  Shutting down the SG6000-CN controller

  Do not shut down the controller using the power switch.

Steps

1. Label and then disconnect the controller power cables.
2. Wrap the strap end of the ESD wristband around your wrist, and secure the clip end to a metal ground to prevent static discharge.
3. Label and then disconnect the controller data cables and any SFP+ or SFP28 transceivers.

   To prevent degraded performance, do not twist, fold, pinch, or step on the cables.

4. Loosen the two captive screws on the controller front panel.

5. Slide the SG6000-CN controller forward out of the rack until the mounting rails are fully extended and you hear the latches on both sides click.

   The controller top cover is accessible.

6. Optional: If you are fully removing the controller from the cabinet or rack, follow the instructions for the rail kit to remove the controller from the rails.

Related information

Removing the SG6000-CN controller cover

Reinstalling the SG6000-CN controller into a cabinet or rack

Reinstall the controller into a cabinet or rack when hardware maintenance is complete.

What you'll need

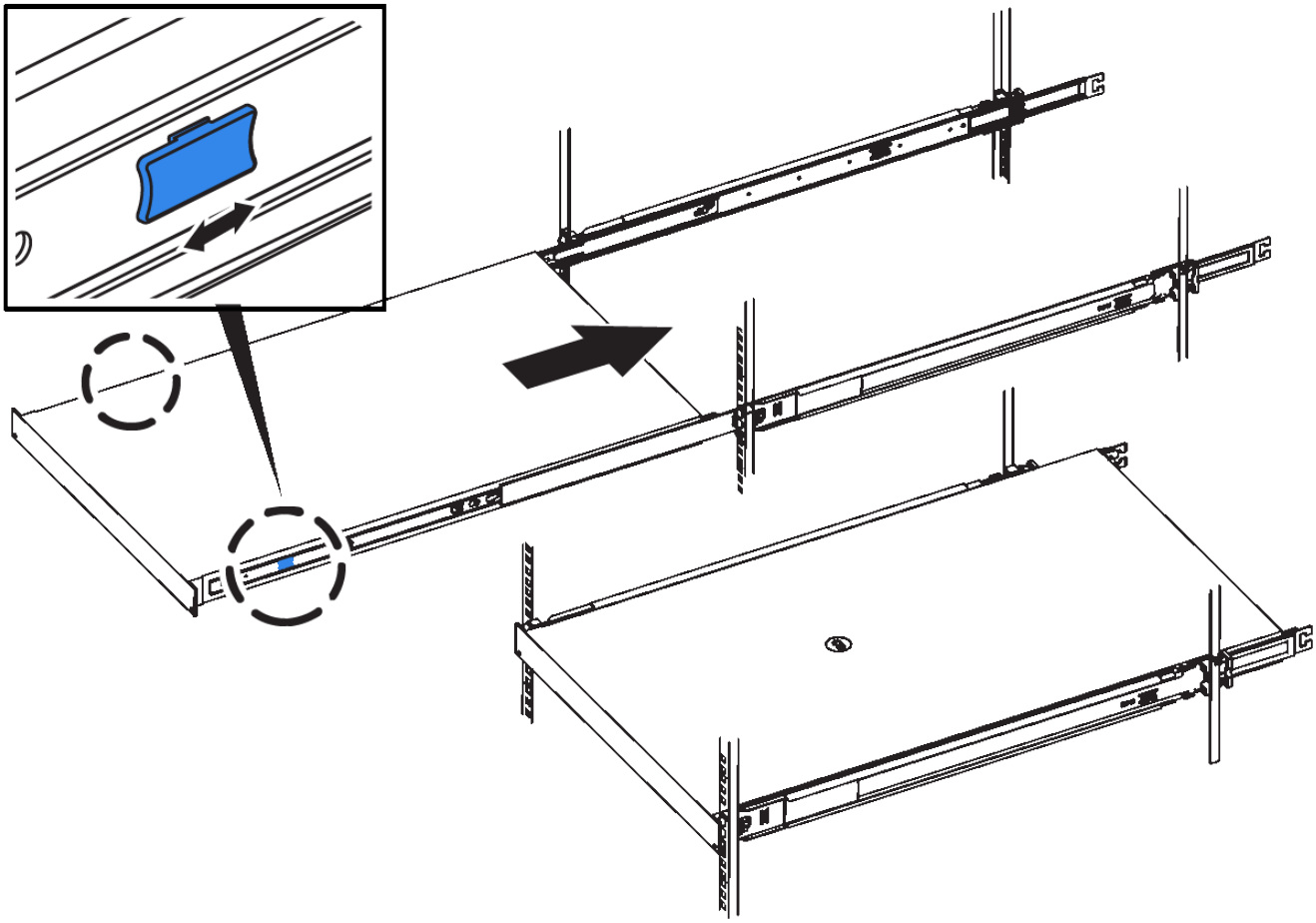
You have reinstalled the controller cover.

Reinstalling the SG6000-CN controller cover

Steps

1. Press the blue rail releases both rack rails at the same time and slide the SG6000-CN controller into the rack until it is fully seated.

   When you cannot move the controller any further, pull the blue latches on both sides of the chassis to slide the controller all the way in.



Do not attach the front bezel until after you power on the controller.

2. Tighten the captive screws on the controller front panel to secure the controller in the rack.

3. Wrap the strap end of the ESD wristband around your wrist, and secure the clip end to a metal ground to prevent static discharge.
4. Reconnect the controller data cables and any SFP+ or SFP28 transceivers.

To prevent degraded performance, do not twist, fold, pinch, or step on the cables.

Cabling the appliance (SG6000)

5. Reconnect the controller power cables.

Connecting power cords and applying power (SG6000)

After you finish

The controller can be restarted.

Powering on the SG6000-CN controller and verifying operation

Removing the SG6000-CN controller cover

Remove the controller cover to access internal components for maintenance.

What you'll need

Remove the controller from the cabinet or rack to access the top cover.

Removing the SG6000-CN controller from a cabinet or rack

Steps

1. Make sure that the SG6000-CN controller cover latch is not locked. If necessary, turn the blue plastic latch lock one-quarter turn in the unlock direction, as shown on the latch lock.
2. Rotate the latch up and back toward the rear of the SG6000-CN controller chassis until it stops; then, carefully lift the cover from the chassis and set it aside.

Wrap the strap end of an ESD wristband around your wrist and secure the clip end to a metal ground to prevent static discharge when working inside the SG6000-CN controller.

Related information

Removing the Fibre Channel HBA

Reinstalling the SG6000-CN controller cover

Reinstall the controller cover when internal hardware maintenance is complete.

What you'll need

You have completed all maintenance procedures inside the controller.

Steps

1. With the cover latch open, hold the cover above the chassis and align the hole in the top cover latch with the pin in the chassis. When the cover is aligned, lower it onto the chassis.

2. Rotate the cover latch forward and down until it stops and the cover fully seats into the chassis. Verify that there are no gaps along the front edge of the cover.

   If the cover is not fully seated, you might not be able to slide the SG6000-CN controller into the rack.

3. Optional: Turn the blue plastic latch lock one-quarter turn in the lock direction, as shown on the latch lock, to lock it.

After you finish

Reinstall the controller in the cabinet or rack.

Reinstalling the SG6000-CN controller into a cabinet or rack

Replacing the Fibre Channel HBA in the SG6000-CN controller

You might need to replace the Fibre Channel host bus adapter (HBA) in the SG6000-CN controller if it is not functioning optimally or if it has failed.

Verifying the Fibre Channel HBA to replace

If you are unsure which Fibre Channel host bus adapter (HBA) to replace, complete this procedure to identify it.

What you'll need

- You have the serial number of the storage appliance or SG6000-CN controller where the Fibre Channel HBA needs to be replaced.

> If the serial number of the storage appliance containing the Fibre Channel HBA you are replacing starts with the letter Q, it will not be listed in the Grid Manager. You must check the tags attached to the front of each SG6000-CN controller in the data center until you find a match.

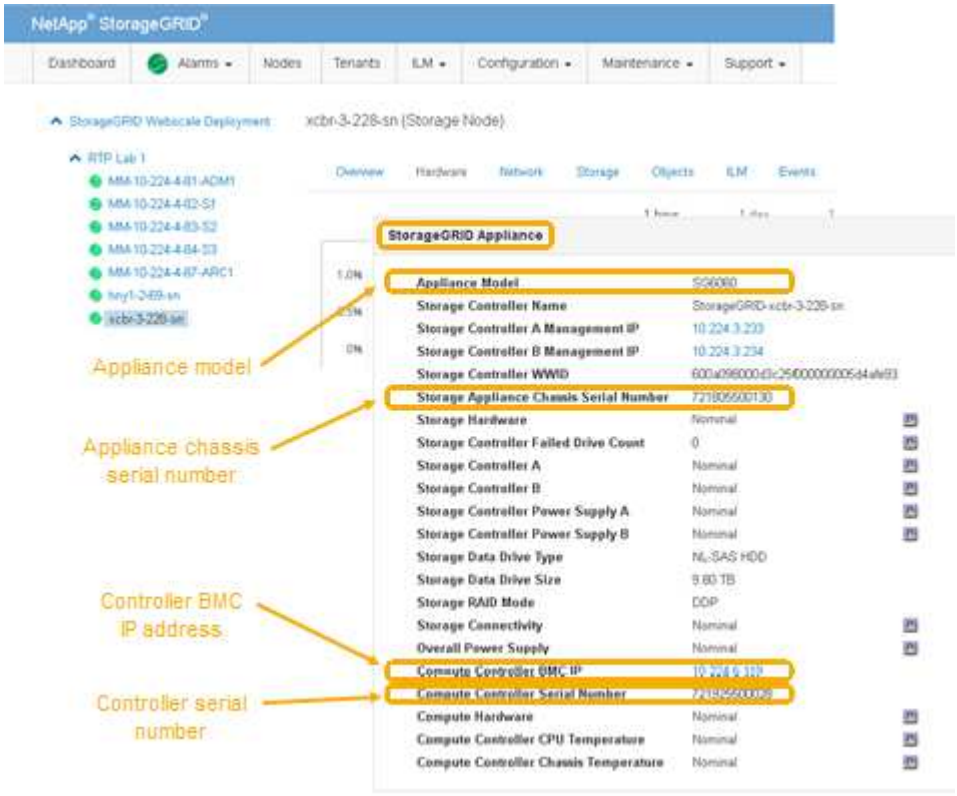
- You must be signed in to the Grid Manager using a supported browser.

Steps

1. From the Grid Manager, select **Nodes**.

2. From the tree view of the Nodes page, select an appliance Storage Node.
3. Select the **Hardware** tab.

   Check the Storage Appliance Chassis Serial Number and the Compute Controller Serial Number in the StorageGRID Appliance section to see if one of these serial numbers matches the serial number of the storage appliance where you are replacing the Fibre Channel HBA. If either serial number matches, you have found the correct appliance.



   - If the StorageGRID Appliance section does not display, the node selected is not a StorageGRID appliance. Select a different node from the tree view.
   - If the Appliance Model is not SG6060, select a different node from the tree view.
   - If the serial numbers do not match, select a different node from the tree view.
4. After you locate the node where the Fibre Channel HBA needs to be replaced, write down the Compute Controller BMC IP address listed the StorageGRID Appliance section.

   You can use this IP address to turn on the compute controller identify LED, to help you locate the appliance in the data center.

   Turning the controller identify LED on and off

Related information

Removing the Fibre Channel HBA

Removing the Fibre Channel HBA

You might need to replace the Fibre Channel host bus adapter (HBA) in the SG6000-CN controller if it is not functioning optimally or if it has failed.

What you'll need

- You have the correct replacement Fibre Channel HBA.
- You have determined which SG6000-CN controller contains the Fibre Channel HBA to replace.

  Verifying the Fibre Channel HBA to replace

- You have physically located the SG6000-CN controller where you are replacing the Fibre Channel HBA in the data center.

  Locating the controller in a data center

- You have removed the controller cover.

  Removing the SG6000-CN controller cover

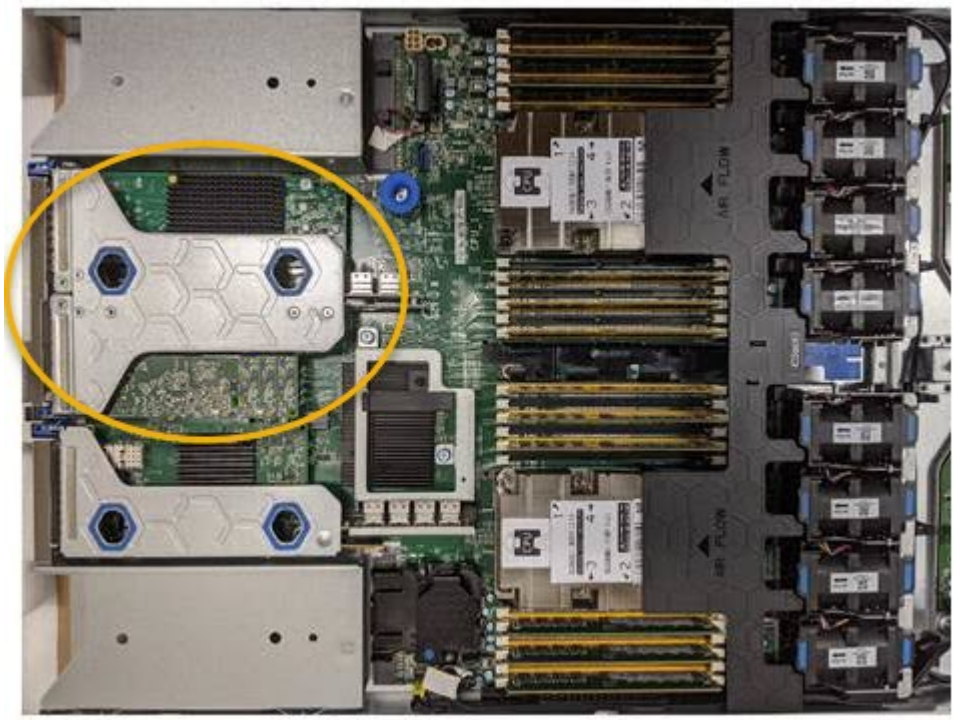
About this task

To prevent service interruptions, confirm that all other Storage Nodes are connected to the grid before starting the Fibre Channel HBA replacement or replace the adapter during a scheduled maintenance window when periods of service disruption are normally expected. See the information about determining node connection states in the instructions for managing objects with information lifecycle management.

If you have ever used an ILM rule that creates only one copy of an object, you must replace the Fibre Channel HBA during a scheduled maintenance window. Otherwise, you might temporarily lose access to those objects during this procedure.
See information about managing objects with information lifecycle management.

Steps

1. Wrap the strap end of the ESD wristband around your wrist, and secure the clip end to a metal ground to prevent static discharge.
2. Locate the riser assembly at the rear of the controller that contains the Fibre Channel HBA.



3. Grasp the riser assembly through the blue-marked holes and carefully lift it upwards. Move the riser assembly toward the front of the chassis as you lift it to allow the external connectors in its installed adapters to clear the chassis.
4. Place the riser card on a flat anti-static surface with the metal frame side down to access the adapters.

There are two adapters in the riser assembly: a Fibre Channel HBA and an Ethernet network adapter. The Fibre Channel HBA is indicated in the illustration.

5. Open the blue adapter latch (circled) and carefully remove the Fibre Channel HBA from the riser assembly. Rock the adapter slightly to help remove the adapter from its connector. Do not use excessive force.
6. Place the adapter on a flat anti-static surface.

After you finish

Install the replacement Fibre Channel HBA.

Reinstalling the Fibre Channel HBA

Related information

Reinstalling the Fibre Channel HBA

Administer StorageGRID

Monitor & troubleshoot

Manage objects with ILM

Reinstalling the Fibre Channel HBA

The replacement Fibre Channel HBA is installed into the same location as the one that was removed.

What you'll need

- You have the correct replacement Fibre Channel HBA.
- You have removed the existing Fibre Channel HBA.

  Removing the Fibre Channel HBA

Steps

1. Wrap the strap end of the ESD wristband around your wrist, and secure the clip end to a metal ground to prevent static discharge.
2. Remove the replacement Fibre Channel HBA from its packaging.
3. With the blue adapter latch in the open position, align the Fibre Channel HBA with its connector on the riser assembly; then, carefully press the adapter into the connector until it is fully seated.

There are two adapters in the riser assembly: a Fibre Channel HBA and an Ethernet network adapter. The Fibre Channel HBA is indicated in the illustration.

4. Locate the alignment hole on the riser assembly (circled) that aligns with a guide pin on the system board to ensure correct riser assembly positioning.

5. Position the riser assembly in the chassis, making sure that it aligns with the connector and guide pin on the system board; then, insert the riser assembly.
6. Carefully press the riser assembly in place along its center line, next to the blue-marked holes, until it is fully seated.
7. Remove the protective caps from the Fibre Channel HBA ports where you will be reinstalling cables.

After you finish

If you have no other maintenance procedures to perform in the controller, reinstall the controller cover.

Reinstalling the SG6000-CN controller cover

Changing the link configuration of the SG6000-CN controller

You can change the Ethernet link configuration of the SG6000-CN controller. You can change the port bond mode, the network bond mode, and the link speed.

What you'll need

The appliance has been placed maintenance mode.

Placing an appliance into maintenance mode

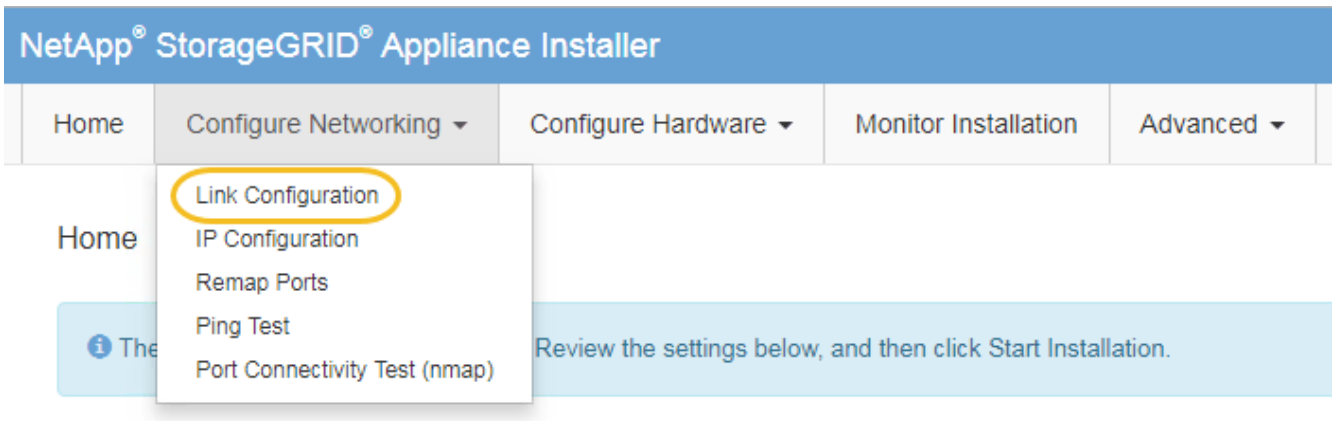
About this task

Options for changing the Ethernet link configuration of the SG6000-CN controller include:

- Changing **Port bond mode** from Fixed to Aggregate, or from Aggregate to Fixed
- Changing **Network bond mode** from Active-Backup to LACP, or from LACP to Active-Backup
- Enabling or disabling VLAN tagging, or changing the value of a VLAN tag
- Changing the link speed.

Steps

1. From the StorageGRID Appliance Installer, select **Configure Networking** > **Link Configuration**.



2. Make the desired changes to the link configuration.

   For more information on the options, see Configuring network links (SG6000).

3. When you are satisfied with your selections, click **Save**.

   > You might lose your connection if you made changes to the network or link you are connected through. If you are not reconnected within 1 minute, re-enter the URL for the StorageGRID Appliance Installer using one of the other IP addresses assigned to the appliance:
   > `https://Appliance_Controller_IP:8443`

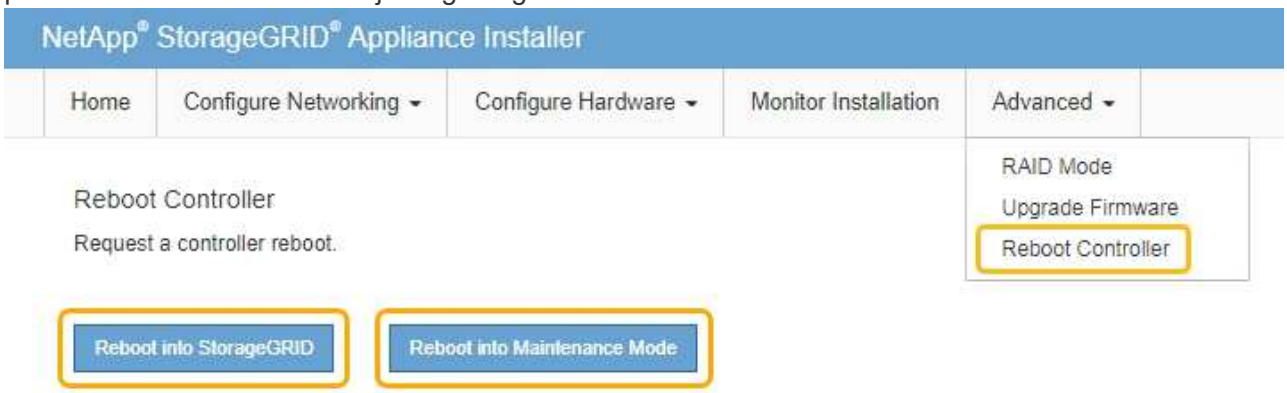
   If you made changes to the VLAN settings, the subnet for the appliance might have changed. If you need to change the IP addresses for the appliance, follow the instructions for configuring IP addresses.

   Configuring StorageGRID IP addresses

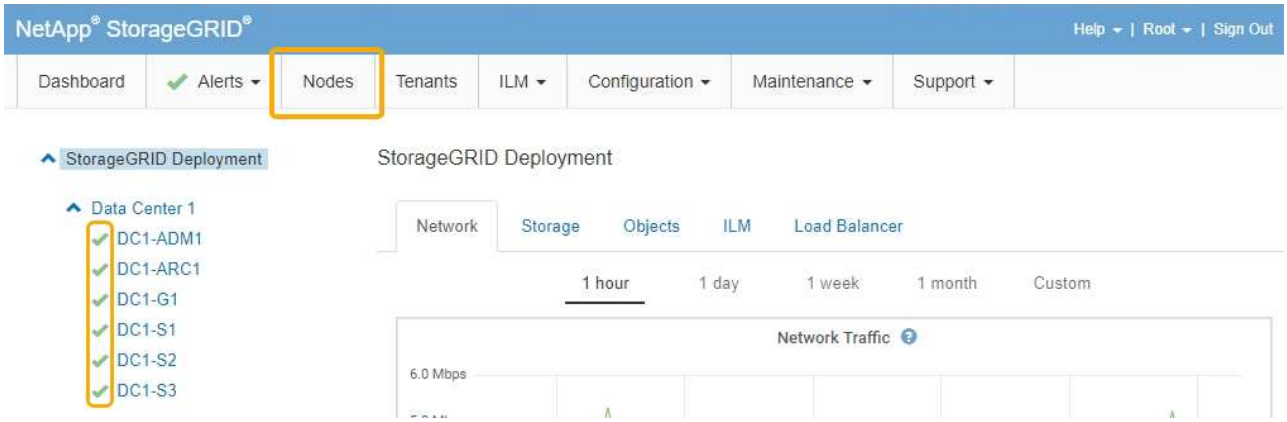
4. Select **Configure Networking** > **Ping Test** from the menu.
5. Use the Ping Test tool to check connectivity to IP addresses on any networks that might have been affected by the link configuration changes you made in the link configuration changes step.

   In addition to any other tests you choose to perform, confirm that you can ping the Grid Network IP address of the primary Admin Node, and the Grid Network IP address of at least one other Storage Node. If necessary, return to the link configuration changes step and correct any link configuration issues.

6. When you are satisfied that your link configuration changes are working, reboot the node. From the StorageGRID Appliance Installer, select **Advanced** > **Reboot Controller**, and then select one of these options:
   - Select **Reboot into StorageGRID** to reboot the controller with the node rejoining the grid. Select this option if you are done working in maintenance mode and are ready to return the node to normal operation.
   - Select **Reboot into Maintenance Mode** to reboot the controller with the node remaining in maintenance mode. Select this option if there are additional maintenance operations you need to perform on the node before rejoining the grid.



   It can take up to 20 minutes for the appliance to reboot and rejoin the grid. To confirm that the reboot is complete and that the node has rejoined the grid, go back to the Grid Manager. The **Nodes** tab should display a normal status ✔ for the appliance node, indicating that no alerts are active and the node is connected to the grid.



Changing the MTU setting

You can change the MTU setting that you assigned when you configured IP addresses for the appliance node.

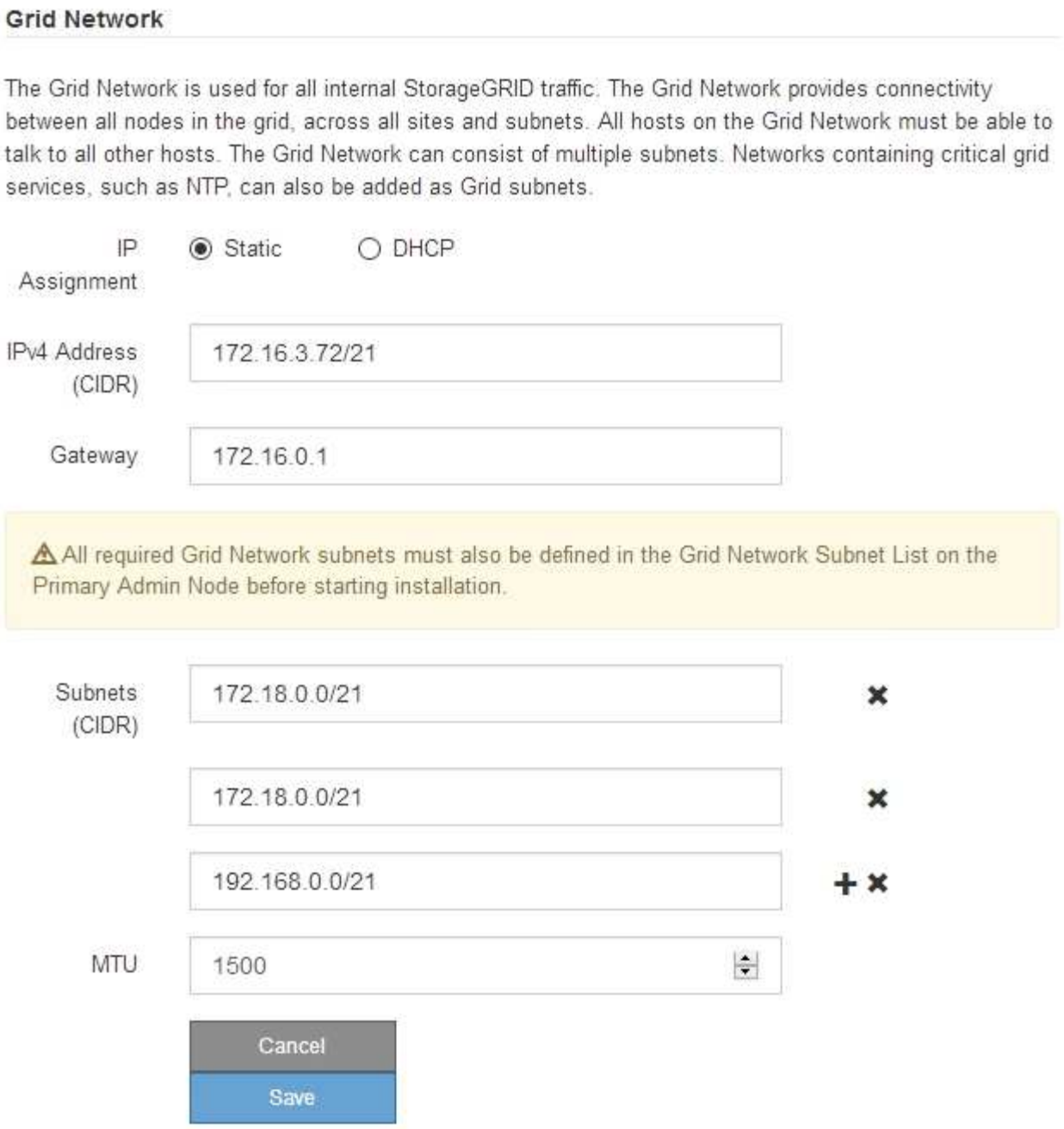
What you'll need

The appliance has been placed maintenance mode.

Placing an appliance into maintenance mode

Steps

1. From the StorageGRID Appliance Installer, select **Configure Networking** > **IP Configuration**.
2. Make the desired changes to the MTU settings for the Grid Network, Admin Network, and Client Network.



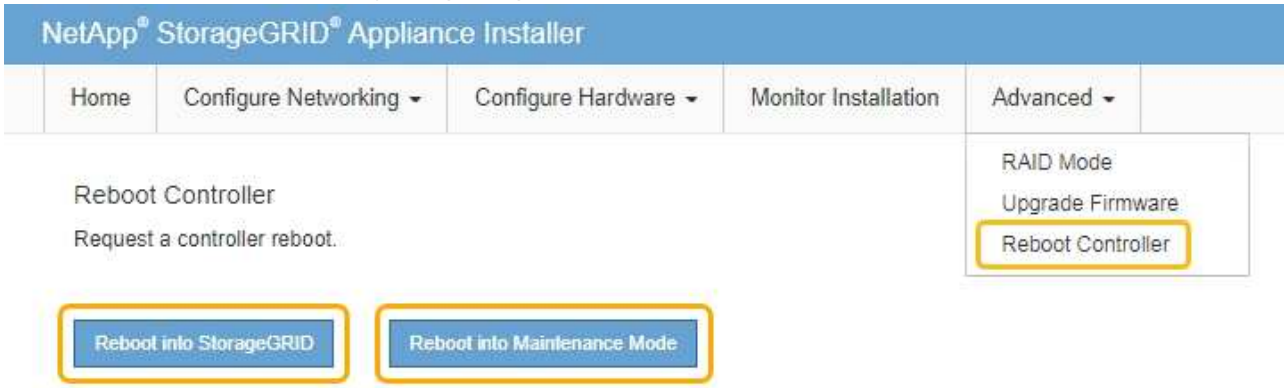
The MTU value of the network must match the value configured on the switch port the node is connected to. Otherwise, network performance issues or packet loss might occur.

For the best network performance, all nodes should be configured with similar MTU values on their Grid Network interfaces. The **Grid Network MTU mismatch** alert is triggered if there is a significant difference in MTU settings for the Grid Network on individual nodes. The MTU values do not have to be the same for all network types.

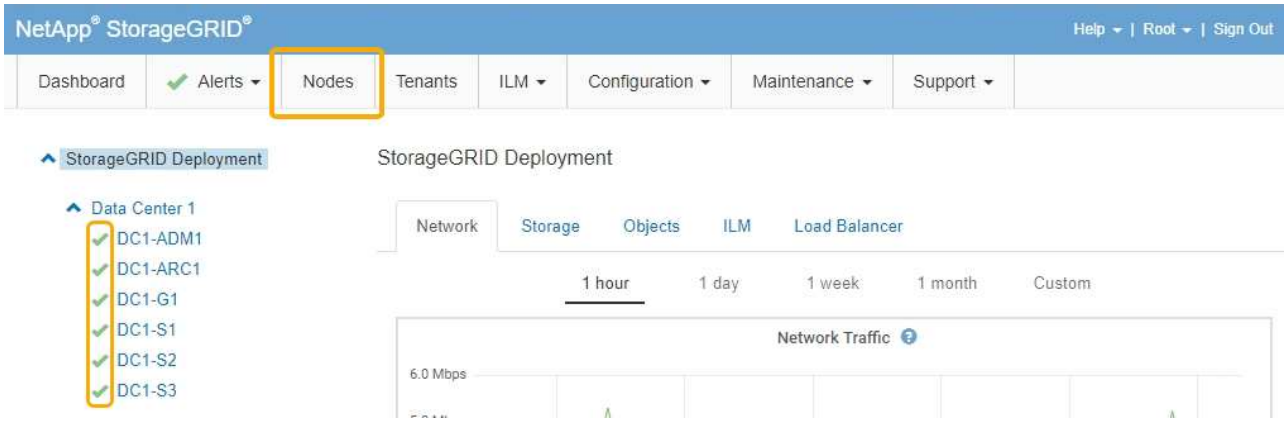
3. When you are satisfied with the settings, select **Save**.
4. Reboot the node. From the StorageGRID Appliance Installer, select **Advanced** > **Reboot Controller**, and then select one of these options:
   - Select **Reboot into StorageGRID** to reboot the controller with the node rejoining the grid. Select this

option if you are done working in maintenance mode and are ready to return the node to normal operation.

- Select **Reboot into Maintenance Mode** to reboot the controller with the node remaining in maintenance mode. Select this option if there are additional maintenance operations you need to perform on the node before rejoining the grid.



It can take up to 20 minutes for the appliance to reboot and rejoin the grid. To confirm that the reboot is complete and that the node has rejoined the grid, go back to the Grid Manager. The **Nodes** tab should display a normal status ✔ for the appliance node, indicating that no alerts are active and the node is connected to the grid.



Related information

Administer StorageGRID

Checking the DNS server configuration

You can check and temporarily change the domain name system (DNS) servers that are currently in use by this appliance node.

What you'll need

The appliance has been placed maintenance mode.

Placing an appliance into maintenance mode

About this task

You might need to change the DNS server settings if an encrypted appliance cannot connect to the key management server (KMS) or KMS cluster because the hostname for the KMS was specified as a domain name instead of an IP address. Any changes that you make to the DNS settings for the appliance are temporary and are lost when you exit maintenance mode. To make these changes permanent, specify the DNS servers in Grid Manager (**Maintenance** > **Network** > **DNS Servers**).

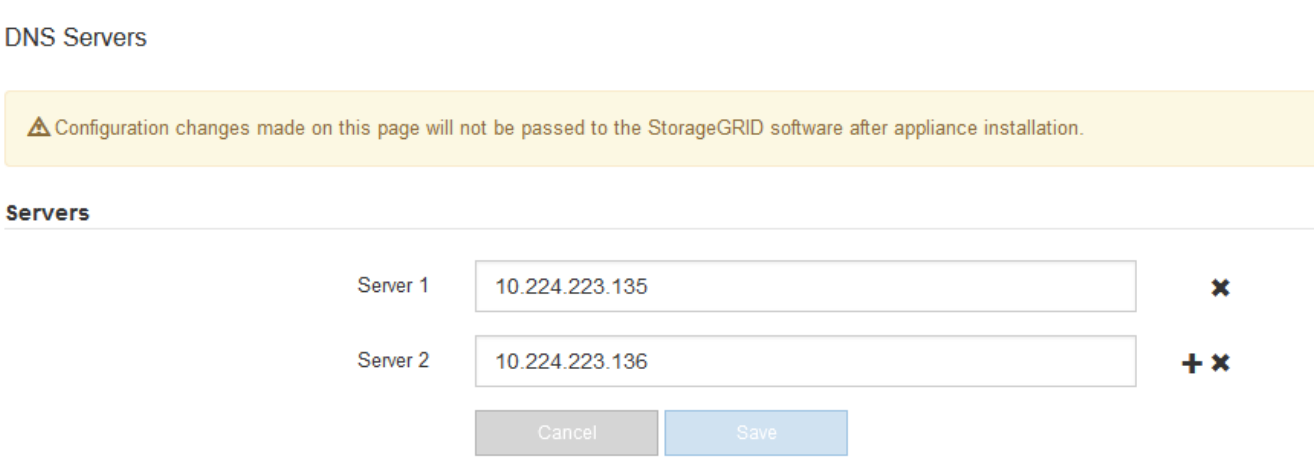
- Temporary changes to the DNS configuration are necessary only for node-encrypted appliances where the KMS server is defined using a fully qualified domain name, instead of an IP address, for the hostname.
- When a node-encrypted appliance connects to a KMS using a domain name, it must connect to one of the DNS servers defined for the grid. One of these DNS servers then translates the domain name into an IP address.
- If the node cannot reach a DNS server for the grid, or if you changed the grid-wide DNS settings when a node-encrypted appliance node was offline, the node is unable to connect to the KMS. Encrypted data on the appliance cannot be decrypted until the DNS issue is resolved.

To resolve a DNS issue preventing KMS connection, specify the IP address of one or more DNS servers in the StorageGRID Appliance Installer. These temporary DNS settings allow the appliance to connect to the KMS and decrypt data on the node.

For example, if the DNS server for the grid changes while an encrypted node was offline, the node will not be able to reach the KMS when it comes back online, since it is still using the previous DNS values. Entering the new DNS server IP address in the StorageGRID Appliance Installer allows a temporary KMS connection to decrypt the node data.

Steps

1. From the StorageGRID Appliance Installer, select **Configure Networking** > **DNS Configuration**.
2. Verify that the DNS servers specified are correct.



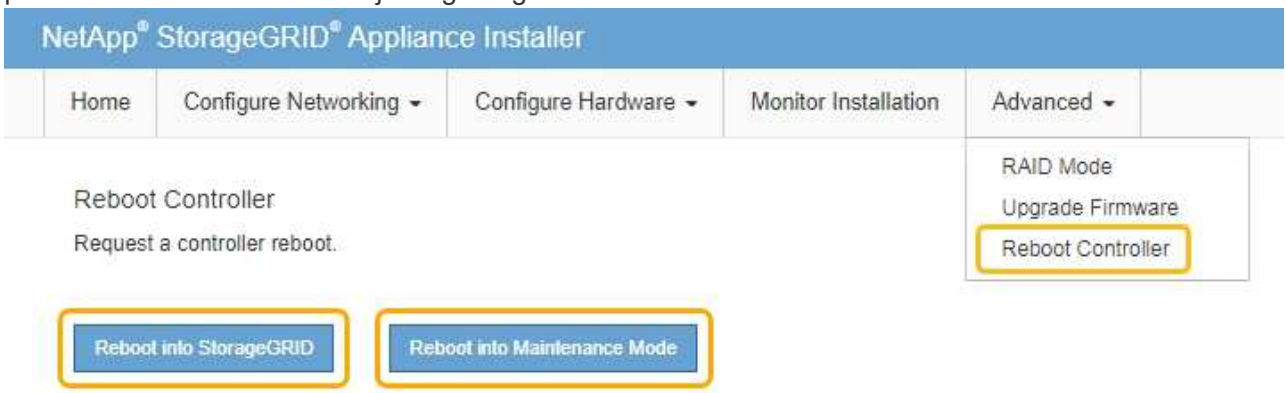
3. If required, change the DNS servers.

> Changes made to the DNS settings are temporary and are lost when you exit maintenance mode.

4. When you are satisfied with the temporary DNS settings, select **Save**.

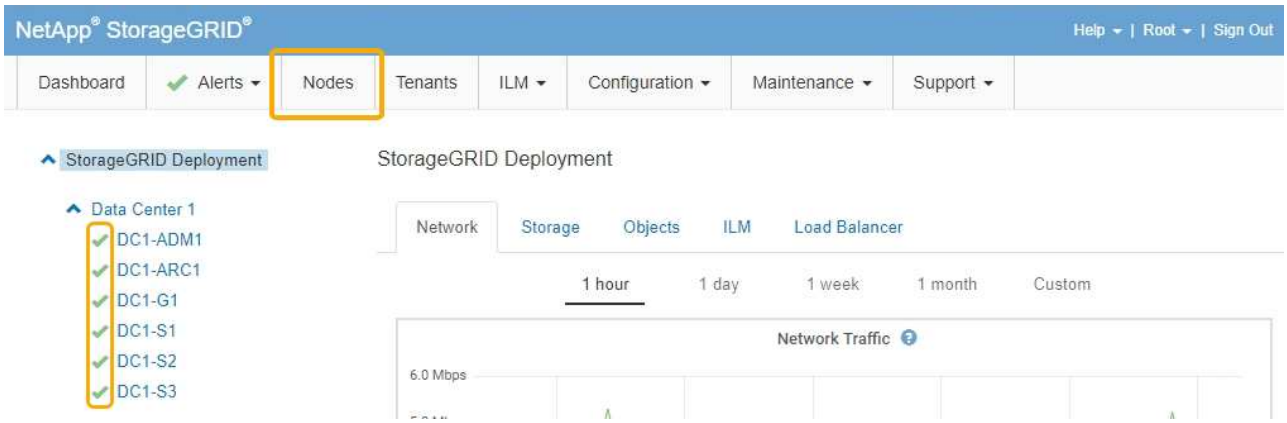
   The node uses the DNS server settings specified on this page to reconnect to the KMS, allowing data on the node to be decrypted.

5. After node data is decrypted, reboot the node. From the StorageGRID Appliance Installer, select **Advanced** > **Reboot Controller**, and then select one of these options:
   - Select **Reboot into StorageGRID** to reboot the controller with the node rejoining the grid. Select this option if you are done working in maintenance mode and are ready to return the node to normal operation.
   - Select **Reboot into Maintenance Mode** to reboot the controller with the node remaining in maintenance mode. Select this option if there are additional maintenance operations you need to perform on the node before rejoining the grid.



> When the node reboots and rejoins the grid, it uses the system-wide DNS servers listed in the Grid Manager. After rejoining the grid, the appliance will no longer use the temporary DNS servers specified in the StorageGRID Appliance Installer while the appliance was in maintenance mode.

It can take up to 20 minutes for the appliance to reboot and rejoin the grid. To confirm that the reboot is complete and that the node has rejoined the grid, go back to the Grid Manager. The **Nodes** tab should display a normal status ✔ for the appliance node, indicating that no alerts are active and the node is connected to the grid.



Monitoring node encryption in maintenance mode

If you enabled node encryption for the appliance during installation, you can monitor the node-encryption status of each appliance node, including the node-encryption state and key management server (KMS) details.

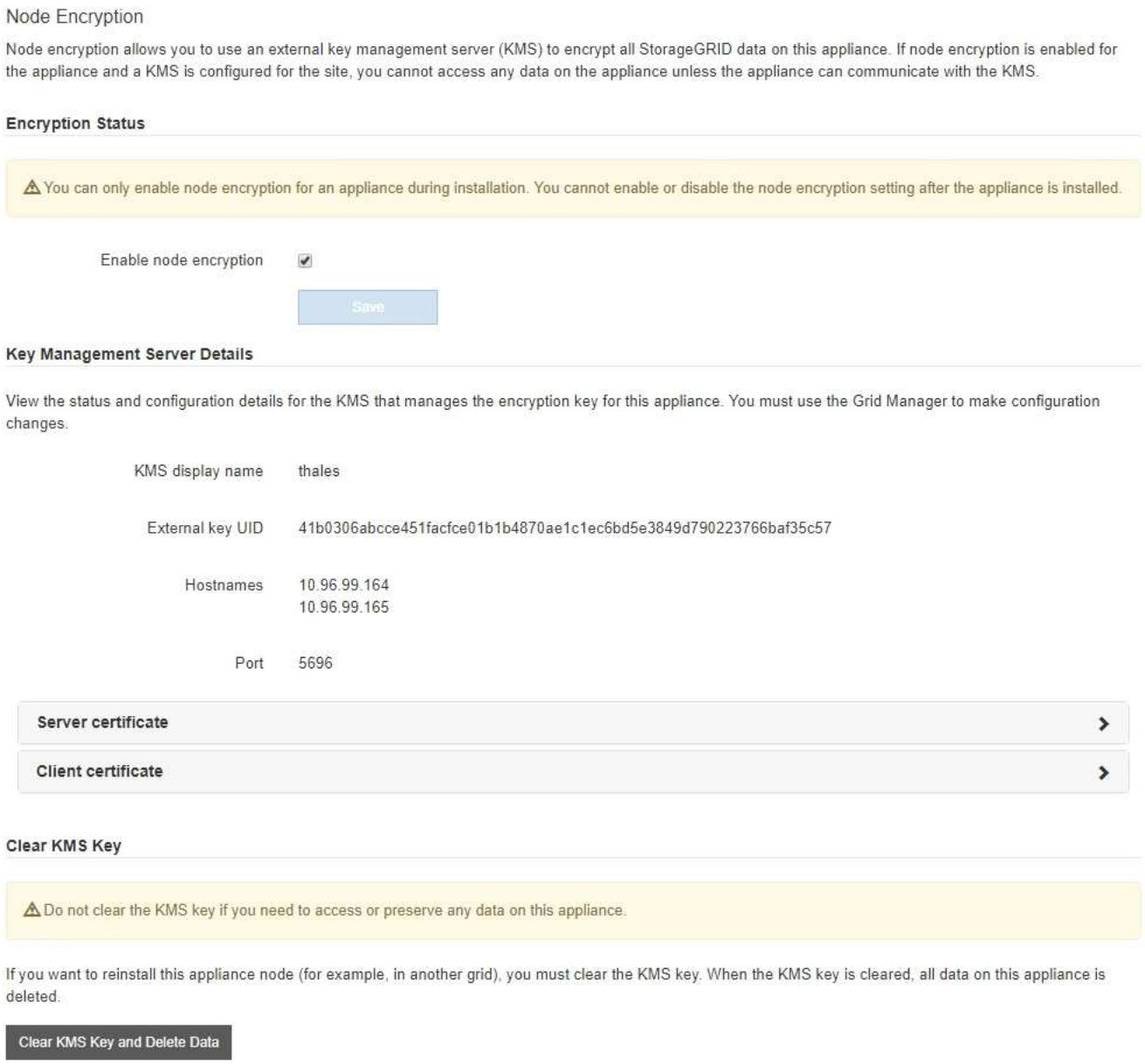
What you'll need

- Node encryption must have been enabled for the appliance during installation. You cannot enable node encryption after the appliance is installed.
- The appliance has been placed into maintenance mode.

  Placing an appliance into maintenance mode

Steps

1. From the StorageGRID Appliance Installer, select **Configure Hardware** > **Node Encryption**.



   The Node Encryption page includes these three sections:

   - Encryption Status shows whether node encryption is enabled or disabled for the appliance.
   - Key Management Server Details shows information about the KMS being used to encrypt the appliance. You can expand the server and client certificate sections to view certificate details and status.

- To address issues with the certificates themselves, such as renewing expired certificates, see the information about KMS in the instructions for administering StorageGRID.
- If there are unexpected problems connecting to KMS hosts, verify that the domain name system (DNS) servers are correct and that appliance networking is correctly configured.

  Checking the DNS server configuration

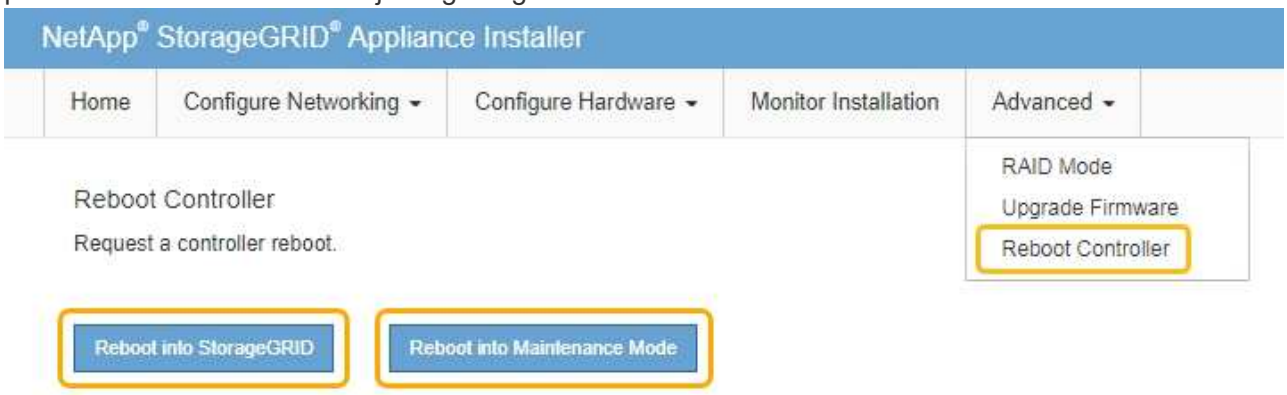
- If you are unable to resolve your certificate issues, contact technical support.

◦ Clear KMS Key disables node encryption for the appliance, removes the association between the appliance and the key management server that was configured for the StorageGRID site, and deletes all data from the appliance. You must clear the KMS key before you can install the appliance into another StorageGRID system.

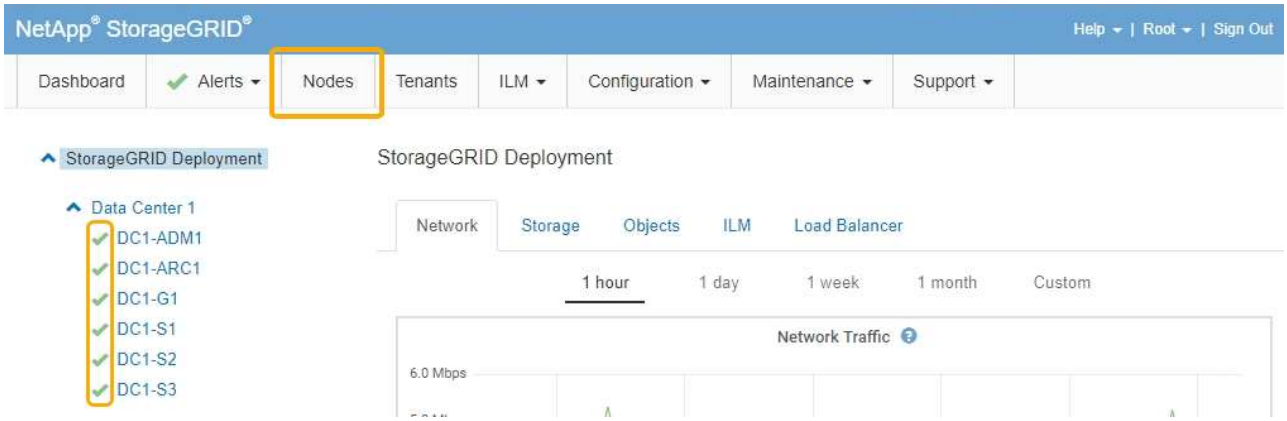
  Clearing the key management server configuration

  Clearing the KMS configuration deletes data from the appliance, rendering it permanently inaccessible. This data is not recoverable.

2. When you are done checking node-encryption status, reboot the node. From the StorageGRID Appliance Installer, select **Advanced** > **Reboot Controller**, and then select one of these options:
   ◦ Select **Reboot into StorageGRID** to reboot the controller with the node rejoining the grid. Select this option if you are done working in maintenance mode and are ready to return the node to normal operation.
   ◦ Select **Reboot into Maintenance Mode** to reboot the controller with the node remaining in maintenance mode. Select this option if there are additional maintenance operations you need to perform on the node before rejoining the grid.



It can take up to 20 minutes for the appliance to reboot and rejoin the grid. To confirm that the reboot is complete and that the node has rejoined the grid, go back to the Grid Manager. The **Nodes** tab should display a normal status ✔ for the appliance node, indicating that no alerts are active and the node is connected to the grid.



Related information

Administer StorageGRID

Clearing the key management server configuration

Clearing the key management server (KMS) configuration disables node encryption on your appliance. After clearing the KMS configuration, the data on your appliance is permanently deleted and is no longer accessible. This data is not recoverable.

What you'll need

If you need to preserve data on the appliance, you must perform a node decommission procedure before you clear the KMS configuration.

> When KMS is cleared, data on the appliance will be permanently deleted and no longer accessible. This data is not recoverable.

Decommission the node to move any data it contains to other nodes in StorageGRID. See the recovery and maintenance instructions for grid node decommissioning.

About this task

Clearing the appliance KMS configuration disables node encryption, removing the association between the appliance node and the KMS configuration for the StorageGRID site. Data on the appliance is then deleted and the appliance is left in a pre-install state. This process cannot be reversed.

You must clear the KMS configuration:

- Before you can install the appliance into another StorageGRID system, that does not use a KMS or that uses a different KMS.

  > Do not clear the KMS configuration if you plan to reinstall an appliance node in a StorageGRID system that uses the same KMS key.

- Before you can recover and reinstall a node where the KMS configuration was lost and the KMS key is not recoverable.
- Before returning any appliance that was previously in use at your site.
- After decommissioning a appliance that had node encryption enabled.

Decommission the appliance before clearing KMS to move its data to other nodes in your StorageGRID system. Clearing KMS before decommissioning the appliance will result in data loss and might render the appliance inoperable.

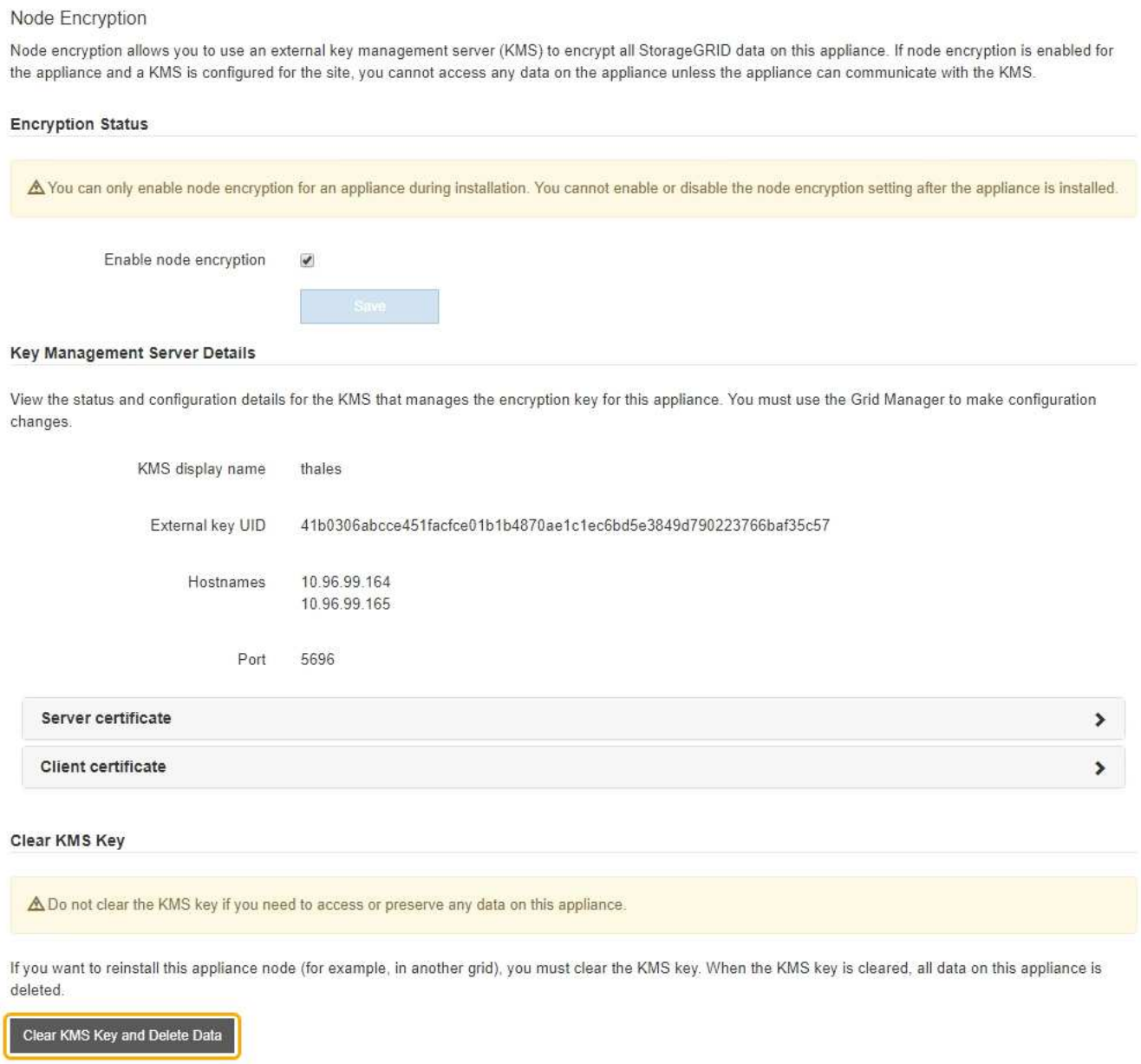
Steps

1. Open a browser, and enter one of the IP addresses for the appliance's compute controller.
   `https://Controller_IP:8443`

   `Controller_IP` is the IP address of the compute controller (not the storage controller) on any of the three StorageGRID networks.

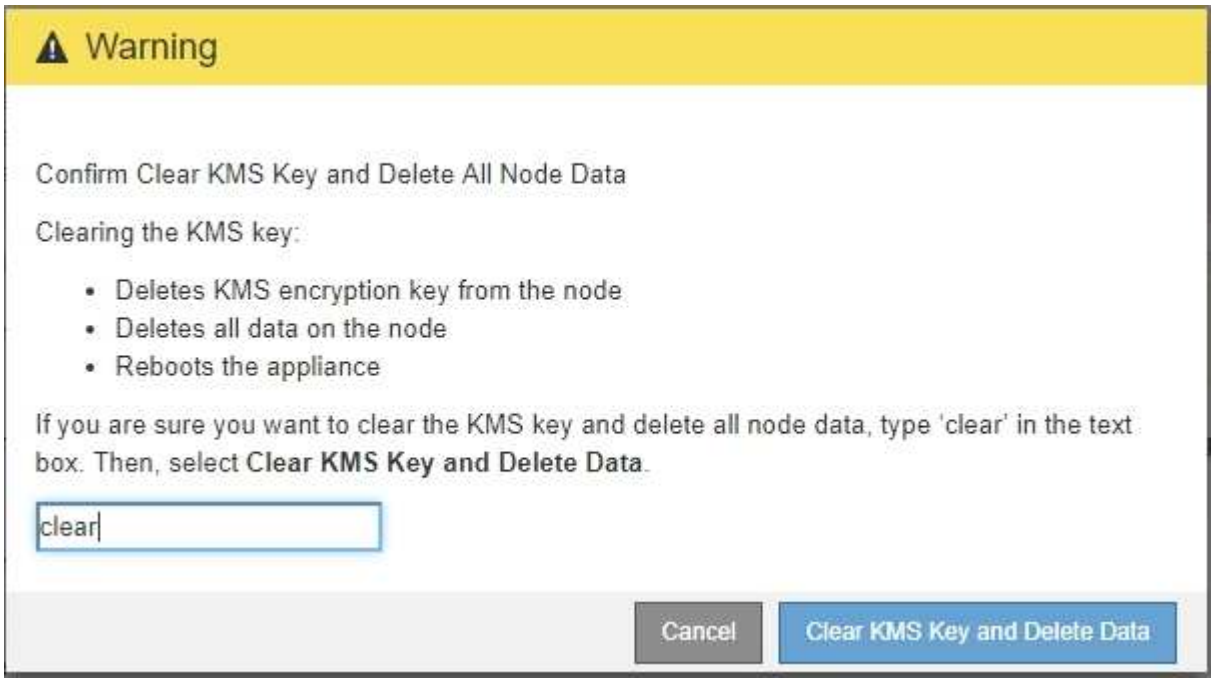
   The StorageGRID Appliance Installer Home page appears.

2. Select **Configure Hardware** > **Node Encryption**.



If the KMS configuration is cleared, data on the appliance will be permanently deleted. This data is not recoverable.

3. At the bottom of the window, select **Clear KMS Key and Delete Data**.
4. If you are sure that you want to clear the KMS configuration, type
   `clear`
   and select **Clear KMS Key and Delete Data**.



   The KMS encryption key and all data are deleted from the node, and the appliance reboots. This can take up to 20 minutes.

5. Open a browser, and enter one of the IP addresses for the appliance's compute controller.
   `https://Controller_IP:8443`

   `Controller_IP` is the IP address of the compute controller (not the storage controller) on any of the three StorageGRID networks.

   The StorageGRID Appliance Installer Home page appears.

6. Select **Configure Hardware** > **Node Encryption**.
7. Verify that node encryption is disabled and that the key and certificate information in **Key Management Server Details** and the **Clear KMS Key and Delete Data** control are removed from the window.

   Node encryption cannot be reenabled on the appliance until it is reinstalled in a grid.

After you finish

After the appliance reboots and you have verified that KMS has been cleared and that the appliance in a pre-install state, you can physically remove the appliance from your StorageGRID system. See the recovery and maintenance instructions for information about preparing an appliance for reinstallation.

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