



Maintain SG5700 appliance

StorageGRID

NetApp
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Maintain SG5700 appliance

You might need to upgrade the SANtricity OS Software on the E2800 controller, change the Ethernet link configuration of the E5700SG controller, replace the E2800 controller or the E5700SG controller, or replace specific components. The procedures in this section assume that the appliance has already been deployed as a Storage Node in a StorageGRID system.

Place appliance into maintenance mode

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

What you'll need

- You are signed in to the Grid Manager using a [supported web browser](#).
- You have the Maintenance or Root access permission. For details, see the instructions for administering StorageGRID.

About this task

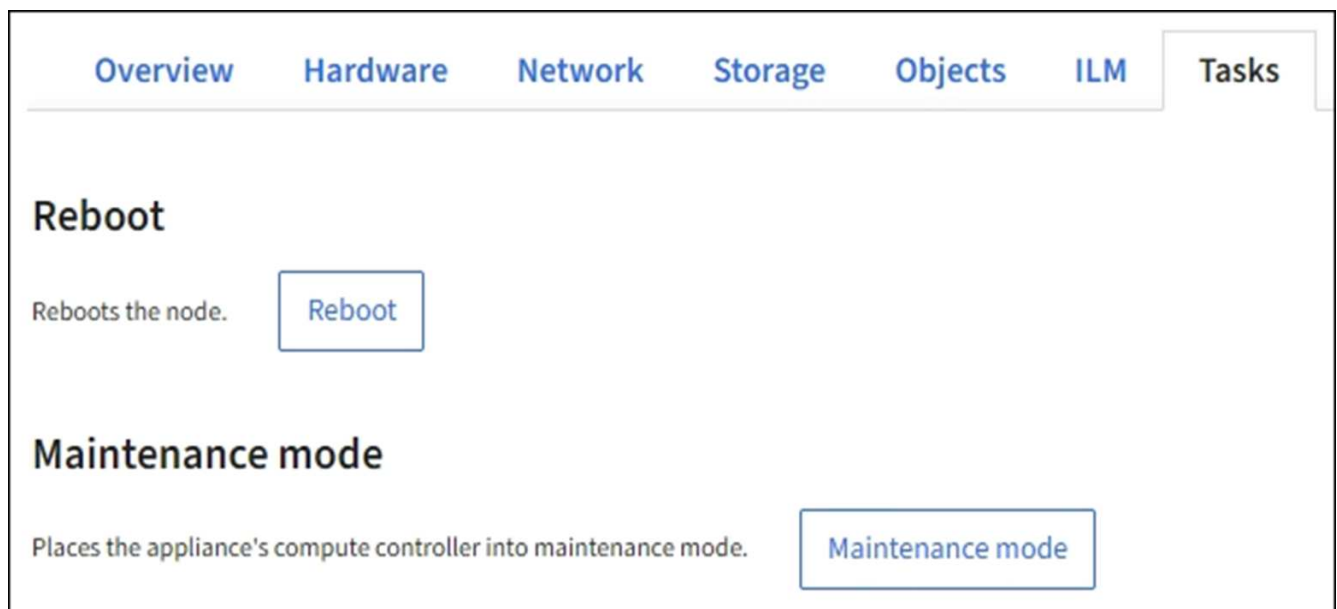
In rare instances, placing a StorageGRID appliance into maintenance mode might make the appliance unavailable for remote access.



The admin account password and SSH host keys 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.

 **Enter maintenance mode on S2-10-224-2-24**


You must place the appliance's compute controller into maintenance mode to perform certain maintenance procedures on the appliance.

Attention: All StorageGRID services on this node will be shut down. Wait a few minutes for the node to reboot into maintenance mode.

If you are ready to start, enter the provisioning passphrase and select OK.

Provisioning passphrase

.....



Cancel

OK

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

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

S2-10-224-2-24 (Storage Node)

Overview

Hardware

Network

Storage

Objects

ILM

Tasks

Reboot


Reboots the node.

Reboot


Maintenance mode

Places the appliance's compute controller into maintenance mode.

Maintenance mode

 **Attention**

Your request has been sent, but the appliance might take 10-15 minutes to enter maintenance mode. **Do not perform maintenance procedures until this tab indicates maintenance mode is ready, or data could become corrupted.**

 Rebooting...

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

S2-10-224-2-24 (Storage Node)

Overview

Hardware

Network

Storage

Objects

ILM

Tasks

Reboot

Reboots the node.

Reboot

Maintenance mode

Places the appliance's compute controller into maintenance mode.

Maintenance mode

This node is currently in maintenance mode. Navigate to one of the URLs listed below and perform any necessary maintenance procedures.

- <https://172.16.2.24:8443>
- <https://10.224.2.24:8443>

When you are done with any required maintenance procedures, you must exit maintenance mode by selecting Reboot Controller from 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.



If you have a direct connection to the appliance's management port, use `https://169.254.0.1:8443` to access the StorageGRID Appliance Installer page.

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

This node is in maintenance mode. Perform any required maintenance procedures. If you want to exit maintenance mode manually to resume normal operation, go to **Advanced > Reboot Controller** to **reboot** the controller.

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** page should display a normal status (no icon) for the appliance node, indicating that no alerts are active and the node is connected to the grid.



Upgrade SANtricity OS on storage controller

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.

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

[Upgrade SANtricity OS on storage controllers using 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.

[Upgrade SANtricity OS on E2800 controller using maintenance mode](#)

Related information

[NetApp Interoperability Matrix Tool](#)

[NetApp Downloads: StorageGRID Appliance](#)

[Monitor and troubleshoot](#)

Upgrade SANtricity OS on storage controllers using 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 have the Maintenance or Root access permission.
- You are signed in to the Grid Manager using a [supported web browser](#).
- You have the provisioning passphrase.
- You 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 that have been selected for the upgrade. It might take more than 30 minutes to load the SANtricity OS on each node (sequentially) 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 appliance 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. Download the new SANtricity OS Software file from the NetApp support site.

Be sure to choose the SANtricity OS version for your storage controllers.

[NetApp Downloads: StorageGRID Appliance](#)

2. Select **MAINTENANCE > System > Software update**.

Software update

You can upgrade StorageGRID software, apply a hotfix, or upgrade the SANtricity OS software on StorageGRID storage appliances.

| StorageGRID upgrade | StorageGRID hotfix | SANtricity OS update |
|---|--|---|
| Upgrade to the next StorageGRID version and apply the latest hotfix for that version. | Apply a hotfix to your current StorageGRID software version. | Update the SANtricity OS software on your StorageGRID storage appliances. |
| Upgrade → | Apply hotfix → | Update → |

3. In the SANtricity OS update section, select **Update**.

The SANtricity OS upgrade page appears.

SANtricity OS

Use this procedure to upgrade the SANtricity OS software (controller firmware) on the storage controllers in your storage appliances.

1. Download the SANtricity OS version that is compatible with the storage controllers. If you use different appliance models, repeat these steps for each model.
2. Confirm the storage controllers are Nominal (**NODES > appliance node > Hardware**) and ready to upgrade.
3. Start the upgrade and approve the nodes you want to upgrade. Nodes are upgraded one at a time.
During the upgrade, a health check is performed and valid NVSRAM is installed. When the upgrade is complete, the appliance is rebooted. The upgrade can take up to 30 minutes for each appliance.
4. Select **Skip Nodes and Finish** if you only want to apply this upgrade to some nodes or if you want to upgrade some nodes later.

SANtricity OS Upgrade File

SANtricity OS Upgrade File ⓘ [Browse](#)

Passphrase

Provisioning Passphrase ⓘ [Start](#)

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

The file is uploaded and validated. When the validation process is done, the file name is shown next to

the **Browse** button.



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

5. Enter the provisioning passphrase.

The **Start** button is enabled.

The screenshot shows the 'SANtricity OS' upgrade interface. It includes a list of instructions for upgrading the software. Below the instructions, there is a section titled 'SANtricity OS Upgrade File' with a 'Browse' button. A file named 'RCB_00-72-00-00-000_0000.dlp' is listed with a green checkmark. Below this, there is a 'Passphrase' section with a 'Provisioning Passphrase' field containing masked characters and a 'Start' button.

6. Select **Start**.

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

The screenshot shows a yellow warning dialog box with a warning icon and the text 'Warning'. Below the warning, it states 'Nodes can disconnect and services might be affected'. The main text of the dialog reads: 'The node will be automatically rebooted at the end of upgrade and services will be affected. Are you sure you want to start the SANtricity OS upgrade?'. At the bottom right, there are 'Cancel' and 'OK' buttons.

7. Select **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 select **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 appliance Storage Nodes. Software-based Storage Nodes are not displayed. Select **Approve** for all nodes that require the upgrade.

SANtricity OS

Use this procedure to upgrade the SANtricity OS software (controller firmware) on the storage controllers in your storage appliances.

1. Download the SANtricity OS version that is compatible with the storage controllers. If you use different appliance models, repeat these steps for each model.
2. Confirm the storage controllers are Nominal (**NODES > appliance node > Hardware**) and ready to upgrade.
3. Start the upgrade and approve the nodes you want to upgrade. Nodes are upgraded one at a time.
During the upgrade, a health check is performed and valid NVSRAM is installed. When the upgrade is complete, the appliance is rebooted. The upgrade can take up to 30 minutes for each appliance.
4. Select **Skip Nodes and Finish** if you only want to apply this upgrade to some nodes or if you want to upgrade some nodes later.

SANtricity OS Upgrade Progress

▲ Storage Nodes - 0 out of 4 completed

Search Q

| Site | Name | Progress | Stage | Details | Current Controller Firmware Version | Action |
|----------|--------|--|----------------------------|---------|-------------------------------------|--|
| DC1-SGAs | SG6060 | <div style="width: 0%; height: 10px; background-color: #ccc;"></div> | Waiting for you to approve | | 98.72.02.00 | <input type="button" value="Approve"/> |
| DC1-SGAs | SG6060 | <div style="width: 0%; height: 10px; background-color: #ccc;"></div> | Waiting for you to approve | | 98.72.02.00 | <input type="button" value="Approve"/> |
| DC1-SGAs | SG5712 | <div style="width: 0%; height: 10px; background-color: #ccc;"></div> | Waiting for you to approve | | 98.72.02.00 | <input type="button" value="Approve"/> |
| DC1-SGAs | SG5660 | <div style="width: 0%; height: 10px; background-color: #ccc;"></div> | Waiting for you to approve | | 08.40.50.00 | <input type="button" value="Approve"/> |

8. Optionally, sort the list of nodes in ascending or descending order by **Site**, **Name**, **Progress**, **Stage**, **Details**, or **Current Controller Firmware Version**. 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.

9. 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 and the upgrade process begins. Later, when the node is finished upgrading, the appliance node is rebooted. These operations might cause service interruptions for clients that are communicating with the node.

- Select 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).

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

After you select **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. Nodes intentionally not upgraded show a stage of Complete (upgrade attempted) and list the reason the node was not upgraded in the Details column.

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

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.

11. 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 the node. With the assistance of technical support, you might need to place the appliance in maintenance mode to recover it.
 - 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 restart 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.

SANtricity OS upgrade completed on 2 nodes at 2021-10-04 15:43:23 EDT.

SANtricity OS Upgrade File

SANtricity OS Upgrade File


Browse

Passphrase

Provisioning Passphrase

Start

12. If a node cannot be upgraded, note the reason shown in the Details column and take the appropriate action:
- “Storage Node was already upgraded.” No further action required.
 - “SANtricity OS upgrade is not applicable to this node.” The node does not have a storage controller that can be managed by the StorageGRID system. Complete the upgrade process without upgrading the node displaying this message.
 - “SANtricity OS file is not compatible with this node.” The node requires a SANtricity OS file different than the one you selected. After completing the current upgrade, download the correct SANtricity OS file for the node and repeat the upgrade process.

 The SANtricity OS upgrade process will not be complete until you approve the SANtricity OS upgrade on all the listed Storage Nodes.

13. If you want to end approving nodes and return to the SANtricity OS page to allow for an upload of a new SANtricity OS file, do the following:

- a. Select **Skip Nodes and Finish**.


A warning appears asking if you are sure you want to finish the upgrade process without upgrading all nodes.

- b. Select **OK** to return to the **SANtricity OS** page.

- c. When you are ready to continue approving nodes, go to [Download the SANtricity OS](#) to restart the upgrade process.

 Nodes already approved and upgraded without errors remain upgraded.

14. 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.



When you repeat the upgrade procedure, you have to approve previously upgraded nodes.

Related information

[NetApp Interoperability Matrix Tool](#)

[Upgrade SANtricity OS on E2800 controller using maintenance mode](#)

Upgrade SANtricity OS on E2800 controller 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.
- You must place the E5700SG controller into [maintenance mode](#), which interrupts the connection to the E2800 controller.



In rare instances, placing a StorageGRID appliance into maintenance mode might make the appliance unavailable for remote access.

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. Confirm the appliance is in [maintenance mode](#).
2. From a service laptop, access SANtricity System Manager and sign in.
3. 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.

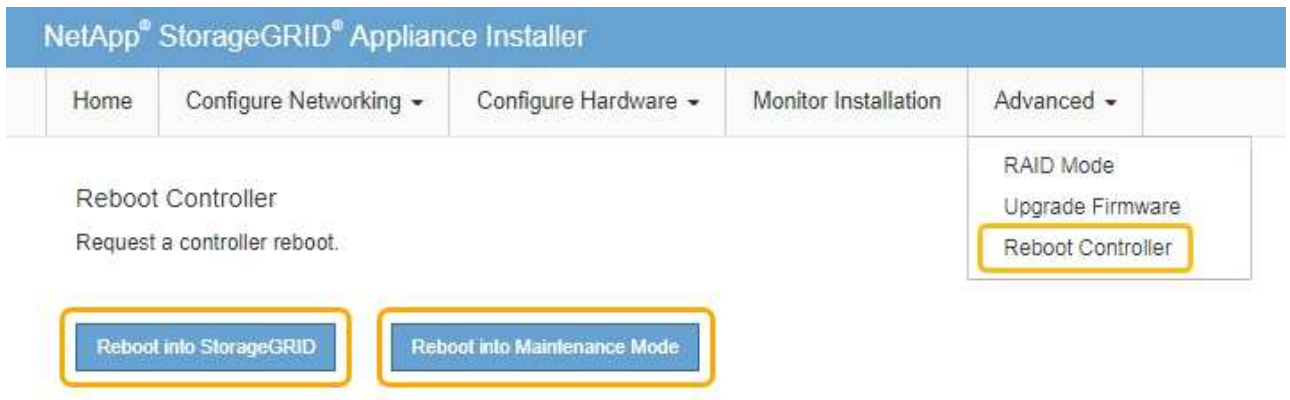
4. Follow the instructions in the *E2800 and E5700 SANtricity Software and Firmware Upgrade Guide* or the SANtricity System Manager online help to upgrade the E2800 controller's firmware and NVSRAM.



Activate the upgrade files immediately. Do not defer activation.

5. If this procedure completed successfully and you have additional procedures to perform while the node is in maintenance mode, perform them now. When you are done, or if you experienced any failures and want to start over, select **Advanced > Reboot Controller**, and then select one of these options:
 - Select **Reboot into StorageGRID**
 - Select **Reboot into Maintenance Mode** to reboot the controller with the node remaining in maintenance mode. Select this option if you experienced any failures during the procedure and want to

start over. After the node finishes rebooting into maintenance mode, restart from the appropriate step in the procedure that failed.



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 page should display a normal status (no icons to the left of the node name) for the appliance node, indicating that no alerts are active and the node is connected to the grid.

Nodes

View the list and status of sites and grid nodes.

Search... Q Total node count: 14

| Name ▾ | Type ▾ | Object data used ⓘ ▾ | Object metadata used ⓘ ▾ | CPU usage ⓘ ▾ |
|------------------------|--------------------|----------------------|--------------------------|---------------|
| StorageGRID Deployment | Grid | 0% | 0% | — |
| ▲ Data Center 1 | Site | 0% | 0% | — |
| DC1-ADM1 | Primary Admin Node | — | — | 5% |
| DC1-ARC1 | Archive Node | — | — | 2% |
| DC1-G1 | Gateway Node | — | — | 2% |
| DC1-S1 | Storage Node | 0% | 0% | 12% |
| DC1-S2 | Storage Node | 0% | 0% | 11% |
| DC1-S3 | Storage Node | 0% | 0% | 11% |

Related information

[Upgrade SANtricity OS on storage controllers using Grid Manager](#)

Upgrade 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](#).



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. Confirm that the appliance is in [maintenance mode](#).
2. Access SANtricity System Manager using one of these methods:
 - Use the StorageGRID Appliance Installer and select **Advanced > SANtricity System Manager**
 - Use SANtricity System Manager by browsing to the storage controller IP:
`https://Storage_Controller_IP`
3. Enter the SANtricity System Manager administrator username and password, if required.
4. 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.

Upgrade Drive Firmware

1 Select Upgrade Files

2 Select Drives

Review your current drive firmware and select upgrade files below...

[What do I need to know before upgrading drive firmware?](#)

| Current Drive Firmware | Associated Drives |
|------------------------|-----------------------------|
| MS02, KPM51VUG800G | View drives |

Total rows: 1 |

Select up to four drive firmware files: [Browse...](#)

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.
5. 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.

PRODUCTS ▾ SYSTEMS ▾ DOCS & KNOWLEDGEBASE ▾ COMMUNITY ▾ DOWNLOADS ▾ TOOLS ▾ CASES ▾ PARTS ▾

Downloads > Firmware > E-Series Disk Firmware

E-Series Disk Firmware

Download all current E-Series Disk Firmware

| Drive Part Number ▾ | Descriptions ▾ | Drive Identifier ▾ | Firmware Rev. (Download) | Notes and Config Info | Release Date ▾ |
|---------------------|---------------------|--------------------|--------------------------|--|----------------|
| Drive Part Number | Descriptions | KPM51VUG800G | Firmware Rev. (Download) | | |
| E-X4041C | SSD, 800GB, SAS, PI | KPM51VUG800G | MS03 | MS02 Fixes Bug 1194908 MS03 Fixes Bug 1334862 | 04-Sep-2020 |

- 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.
6. 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.



Do not proceed unless you are certain that the appliance is in maintenance mode. Failure to place the appliance into maintenance mode prior to initiating an offline drive firmware update might cause data loss.

- 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.

7. . If this procedure completed successfully and you have additional procedures to perform while the node is in maintenance mode, perform them now. When you are done, or if you experienced any failures and want to start over, select **Advanced > Reboot Controller**, and then select one of these options:

- Select **Reboot into StorageGRID**
- Select **Reboot into Maintenance Mode** to reboot the controller with the node remaining in maintenance mode. Select this option if you experienced any failures during the procedure and want to start over. After the node finishes rebooting into maintenance mode, restart from the appropriate step in the procedure that failed.



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 page should display a normal status (no icons to the left of the node name) for the appliance node, indicating that no alerts are active and the node is connected to the grid.

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Search...

Total node count: 14

| Name | Type | Object data used | Object metadata used | CPU usage |
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| StorageGRID Deployment | Grid | 0% | 0% | — |
| ▲ Data Center 1 | Site | 0% | 0% | — |
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| DC1-G1 | Gateway Node | — | — | 2% |
| DC1-S1 | Storage Node | 0% | 0% | 12% |
| DC1-S2 | Storage Node | 0% | 0% | 11% |
| DC1-S3 | Storage Node | 0% | 0% | 11% |

Related information

[Upgrade SANtricity OS on the storage controller](#)

Replace E2800 series storage controller in the SG5700

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

About this task

- You have a replacement controller with the same part number as the controller you are replacing.



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 labels to identify each cable that is connected to the controller.
- If all drives are secured, you have reviewed the steps in the simplex E2800 series controller replacement procedure, which include downloading and installing E-Series SANtricity Storage Manager from the NetApp Support Site and then using the Enterprise Management Window (EMW) to unlock the secured drives after you have replaced the controller.



You will not be able to use the appliance until you unlock the drives with the saved key.

- You must have specific access permissions.
- You must be signed in to the Grid Manager using a [supported web browser](#).

About this task

You can determine if you have a failed controller canister 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.

The appliance Storage Node will not be accessible when you replace the controller. If the E2800 series controller is functioning sufficiently, you can [place the E5700SG controller into maintenance mode](#).

When you replace a controller, you must remove the battery from the original controller and install it in the replacement controller. In some cases, you might also need to remove the host interface card from the original controller and install it in the replacement controller.



The storage controllers in most appliance models do not include host interface cards (HIC).

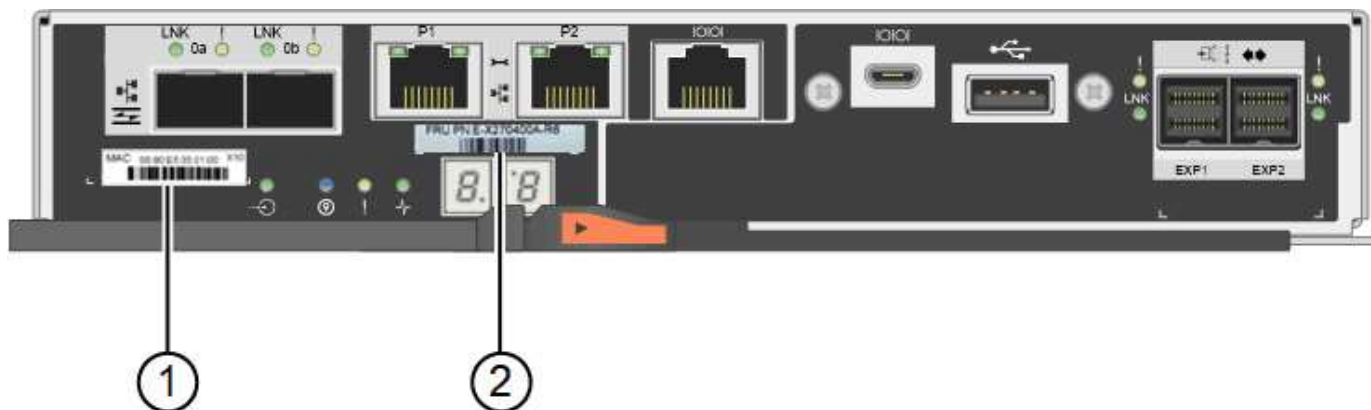
This task has the following parts:

1. Prepare
2. Take controller offline
3. Remove controller
4. Move battery to new controller
5. Move HIC to new controller, if needed
6. Replace controller

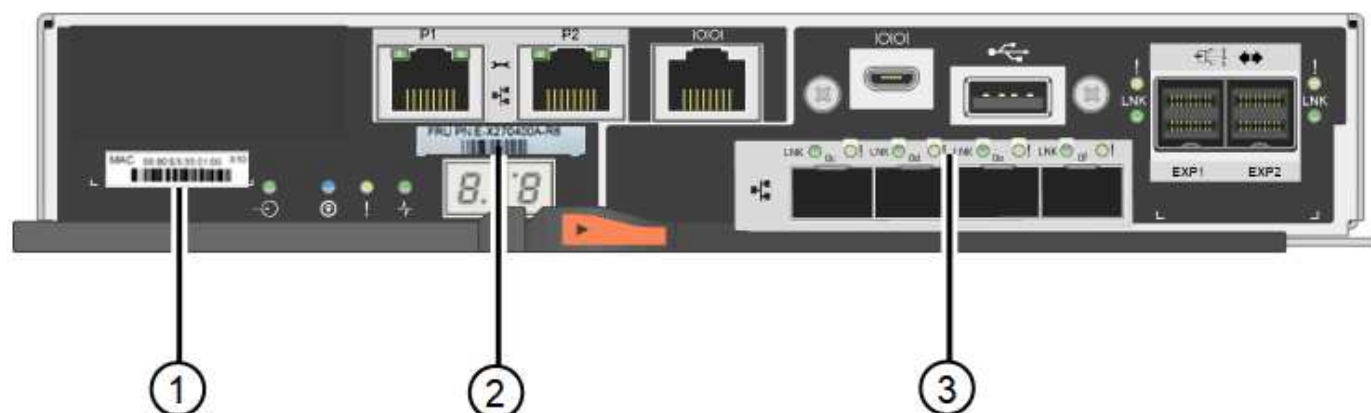
Prepare

These figures show the E2800A controller and the E2800B controller. The procedure for replacing the E2800 series controllers and the EF570 controller is identical.

E2800A storage controller



E2800B storage controller



| Label | component | 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 | 4-port HIC | The 4-port host interface card (HIC). This card must be moved to the new controller when you perform the replacement. Note: the E2800A controller does not have a HIC. |

Steps

1. Follow the instructions in the E2800 controller replacement procedure to prepare to remove the controller.

You use SANtricity System Manager to perform these steps.

- a. Make a note of which version of SANtricity OS software is currently installed on the controller.
- b. Make a note of which version of NVSRAM is currently installed.

- c. If the Drive Security feature is enabled, be sure a saved key exists and that you know the pass phrase required to install it.



Possible loss of data access — If all drives in the appliance are security enabled, the new controller will not be able to access the appliance until you unlock the secured drives using the Enterprise Management Window in SANtricity Storage Manager.

- d. Back up the configuration database.

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

- e. 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.

Take the controller offline

Steps

1. If the StorageGRID appliance is running in a StorageGRID system, [place the E5700SG controller into maintenance mode](#).
2. If the E2800 controller is functioning sufficiently to allow for a controlled shutdown, confirm that all operations have completed.
 - a. From the home page of SANtricity System Manager, select **View Operations in Progress**.
 - b. Confirm that all operations have completed.

Remove the controller

Steps

1. 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.

Move battery to the new controller

Steps

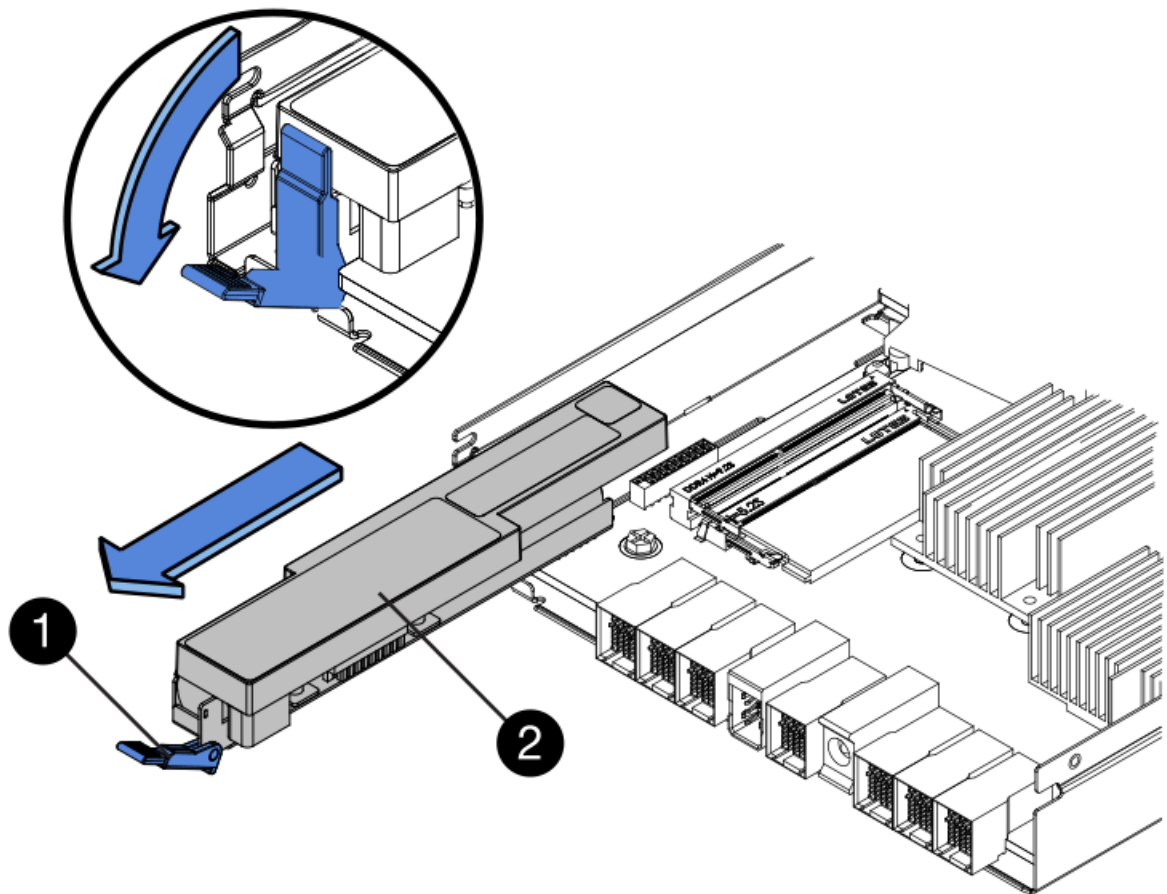
- 1. Remove the battery from the failed controller, and install it into the replacement controller:
 - a. Confirm that the green LED inside the controller (between the battery and the DIMMs) is off.

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 |
|------|---------------------------|
| 1 | Internal Cache Active LED |
| 2 | 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 |
|------|-----------------------|
| 1 | Battery release latch |
| 2 | 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 into the slot on the controller:



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



2. Replace the controller cover.

Move HIC to new controller, if needed

Steps

1. If the failed controller includes a host interface card (HIC), move the HIC from the failed controller to the replacement controller.

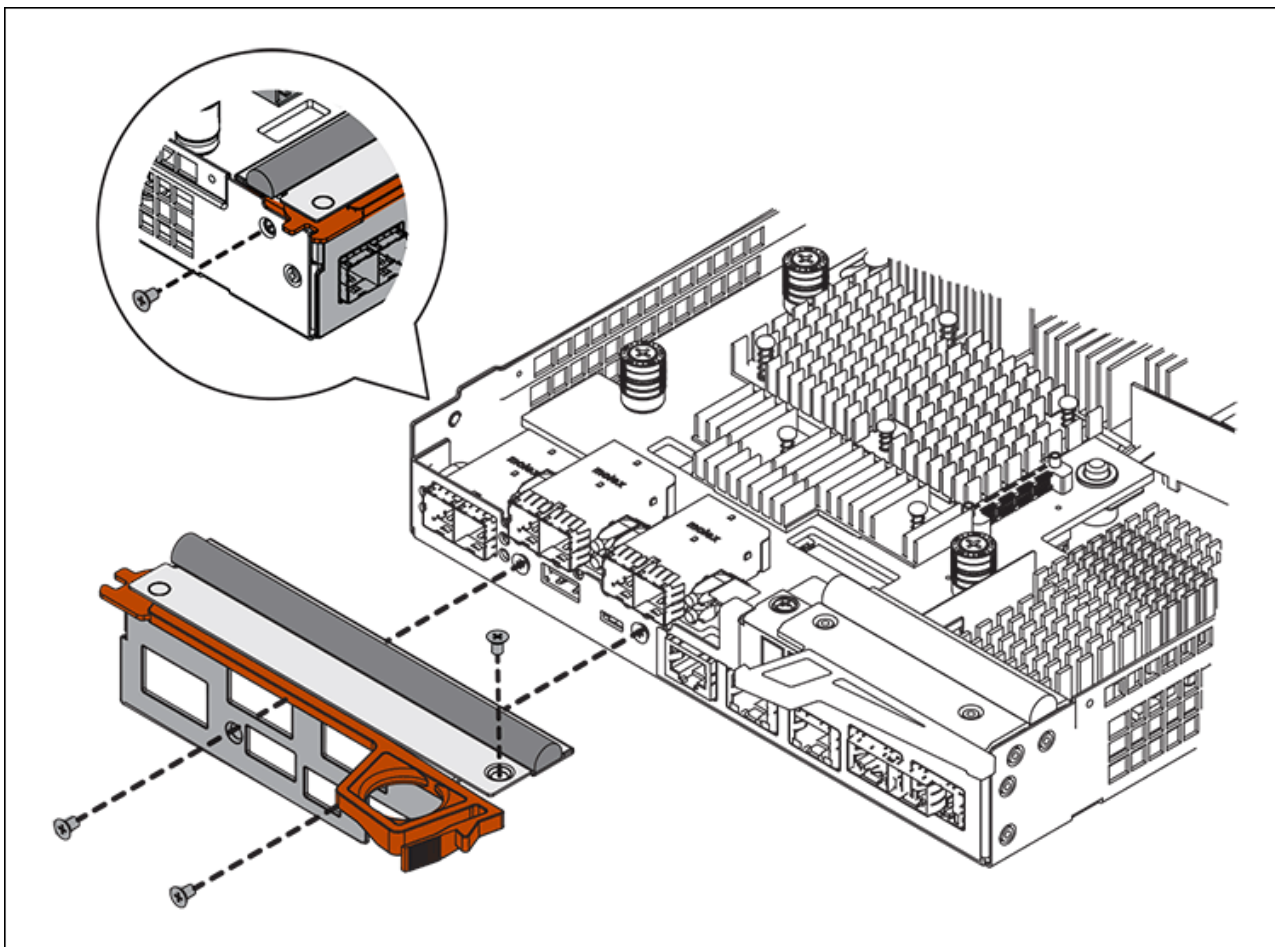
A separate HIC is used for the E2800B controller only. The HIC is mounted to the main controller board and includes two SPF connectors.



The illustrations in this procedure show a 2-port HIC. The HIC in your controller might have a different number of ports.

2. If the controller does not have a HIC (E2800A), replace the controller cover. If the controller does have a HIC (E2800B), proceed to [move the HIC from the failed controller to the replacement controller](#).
 - a. If equipped with a HIC, move the HIC from the failed controller to the replacement controller.
 - b. Remove any SFPs from the HIC.
 - c. Using a #1 Phillips screwdriver, remove the screws that attach the HIC faceplate to the controller.

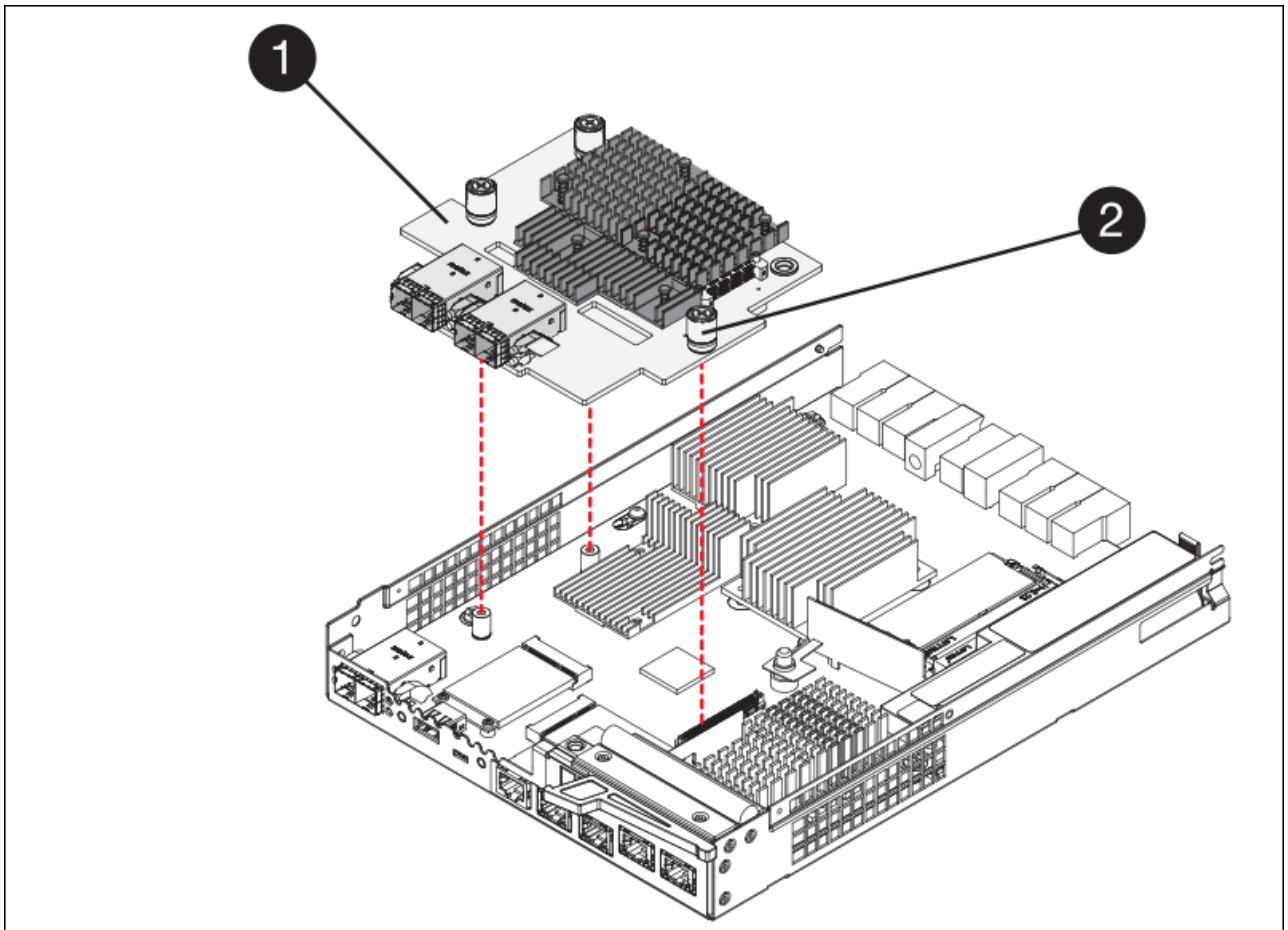
There are four screws: one on the top, one on the side, and two on the front.



- d. Remove the HIC faceplate.
- e. Using your fingers or a Phillips screwdriver, loosen the three thumbscrews that secure the HIC to the controller card.
- f. Carefully detach the HIC from the controller card by lifting the card up and sliding it back.



Be careful not to scratch or bump the components on the bottom of the HIC or on the top of the controller card.



| Label | Description |
|-------|---------------------|
| 1 | Host interface card |
| 2 | Thumbscrews |

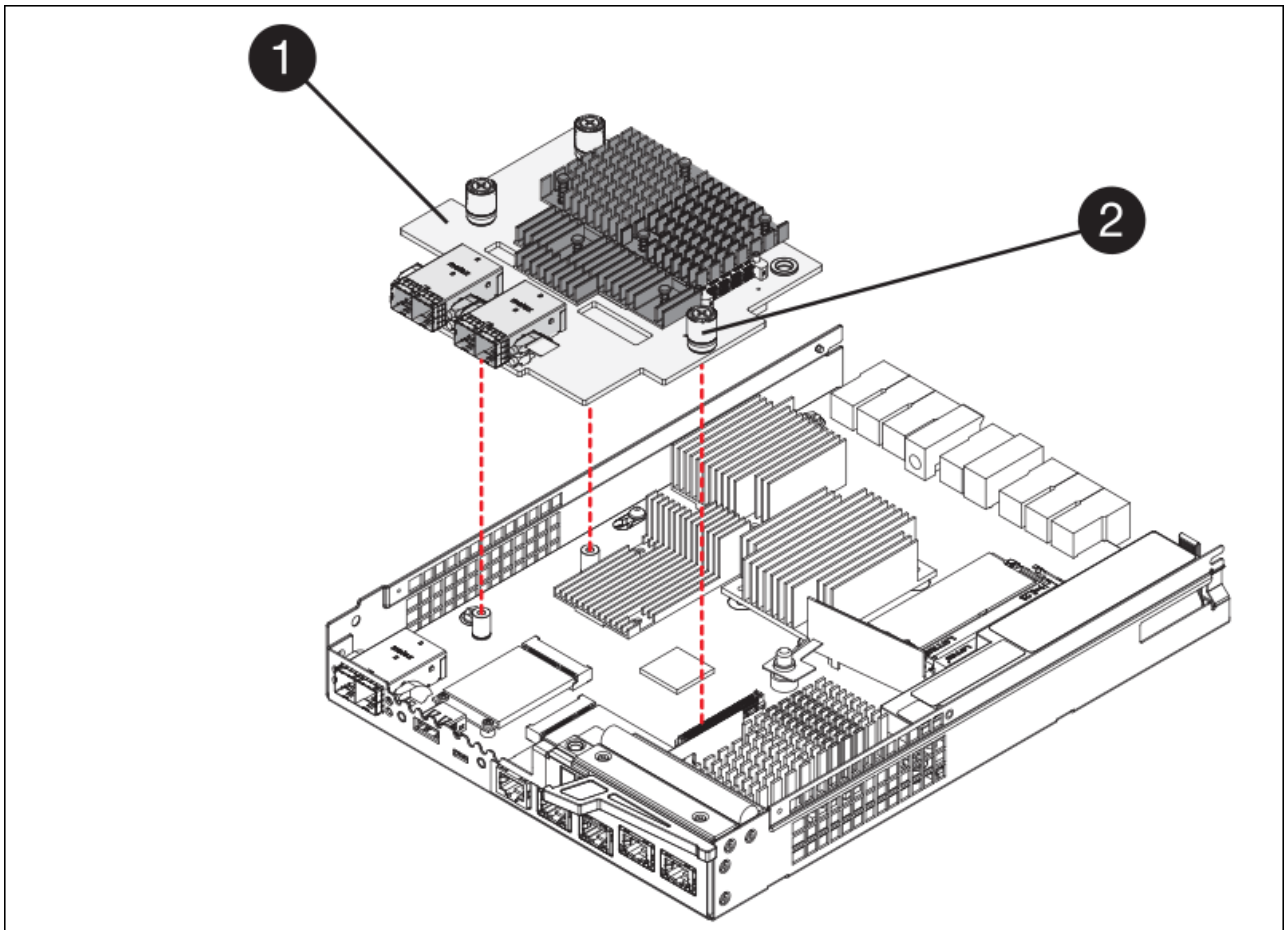
- g. Place the HIC on a static-free surface.
- h. Using a #1 Phillips screwdriver, remove the four screws that attach the blank faceplate to the replacement controller, and remove the faceplate.
- i. Align the three thumbscrews on the HIC with the corresponding holes on the replacement controller, and align the connector on the bottom of the HIC with the HIC interface connector on the controller card.

Be careful not to scratch or bump the components on the bottom of the HIC or on the top of the controller card.

- j. Carefully lower the HIC into place, and seat the HIC connector by pressing gently on the HIC.



Possible equipment damage — Be very careful not to pinch the gold ribbon connector for the controller LEDs between the HIC and the thumbscrews.

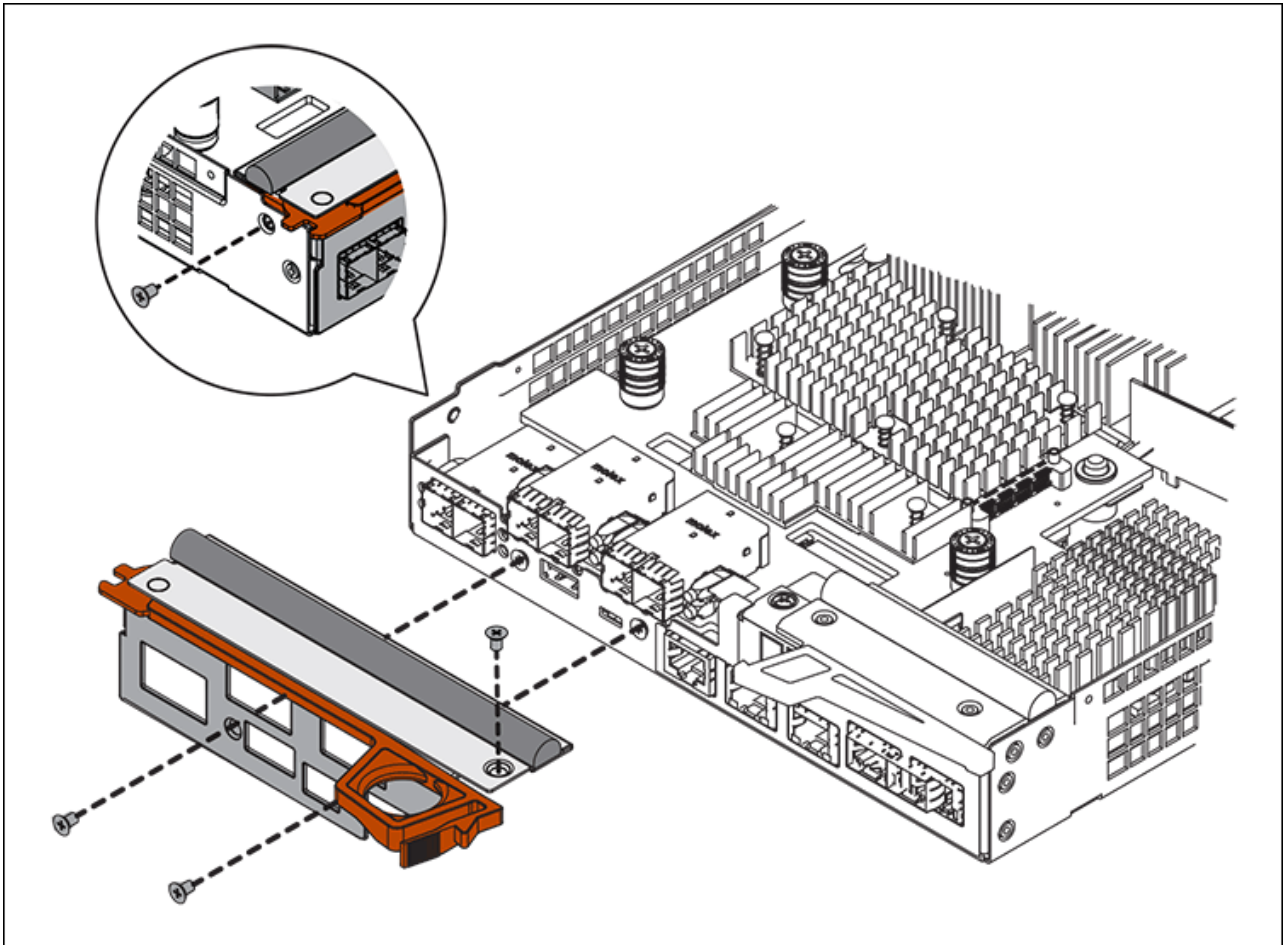


| Label | Description |
|-------|---------------------|
| 1 | Host interface card |
| 2 | Thumbscrews |

k. Hand-tighten the HIC thumbscrews.

Do not use a screwdriver, or you might over tighten the screws.

l. Using a #1 Phillips screwdriver, attach the HIC faceplate you removed from the original controller to the new controller with four screws.



m. Reinstall any removed SFPs into the HIC.

Replace controller

Steps

1. 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. Wait for the E2800 controller to reboot. Verify that the seven-segment display shows a state of 99.
 - f. Determine how you will assign an IP address to the replacement controller.



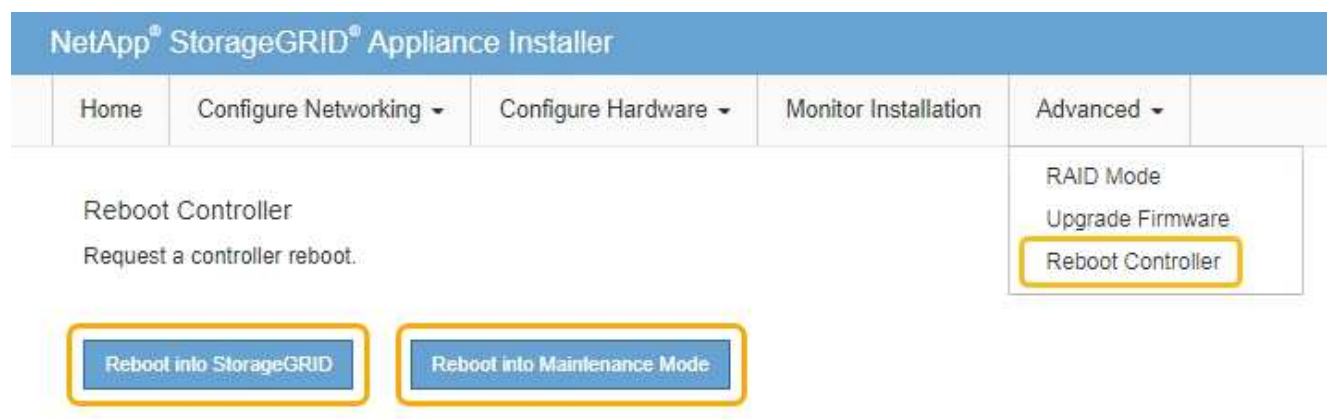
The steps for assigning an IP address to the replacement controller depend on whether you connected management port 1 to a network with a DHCP server and on whether all drives are secured.

If management port 1 is connected to a network with a DHCP server, the new controller will obtain its IP address from the DHCP server. This value might be different than the original controller's IP address.

2. If the appliance uses secured drives, follow the instructions in the E2800 controller replacement procedure

to import the drive security key.

- Return the appliance to normal operating mode. From the StorageGRID Appliance Installer, select **Advanced > Reboot Controller**, and then select **Reboot into StorageGRID**.



- During the reboot, monitor the node's status to determine when it has rejoined the grid.

The appliance reboots and rejoins the grid. This process can take up to 20 minutes.

- Confirm that the reboot is complete and that the node has rejoined the grid. In the Grid Manager, verify that the Nodes page displays a normal status (no icons to the left of the node name) for the appliance node, indicating that no alerts are active and the node is connected to the grid.

Nodes

View the list and status of sites and grid nodes.

Search... Q Total node count: 14

| Name | Type | Object data used | Object metadata used | CPU usage |
|------------------------|--------------------|------------------|----------------------|-----------|
| StorageGRID Deployment | Grid | 0% | 0% | — |
| ^ Data Center 1 | Site | 0% | 0% | — |
| DC1-ADM1 | Primary Admin Node | — | — | 5% |
| DC1-ARC1 | Archive Node | — | — | 2% |
| DC1-G1 | Gateway Node | — | — | 2% |
| DC1-S1 | Storage Node | 0% | 0% | 12% |
| DC1-S2 | Storage Node | 0% | 0% | 11% |
| DC1-S3 | Storage Node | 0% | 0% | 11% |

- From SANtricity System Manager, confirm that the new controller is Optimal, and collect support data.

After replacing the part, return the failed part to NetApp, as described in the RMA instructions shipped with the kit. See the [Part Return & Replacements](#) page for further information.

Related information

[NetApp E-Series Systems Documentation Site](#)

Replace E5700SG controller

You might need to replace the E5700SG 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 downloaded the E-Series instructions for replacing a failed E5700 controller.



Use the E-Series instructions for reference only 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. For example, the E-Series instructions for the E5700 controller describe how to remove the battery and the host interface card (HIC) from a failed controller and install them in a replacement controller. These steps do not apply to the E5700SG controller.

- You have labels to identify each cable that is connected to the controller.
- The appliance has been [placed maintenance mode](#).

About this task

The appliance Storage Node will not be accessible when you replace the controller. If the E5700SG 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. When the appliance has been placed maintenance mode, shut down the E5700SG controller.
 - a. Log in to the grid node:
 - 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 E5700SG controller:

shutdown -h now

- c. Wait for any data in cache memory to be written to the drives.

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. Turn off the power.

- a. From the home page of SANtricity System Manager, select **View Operations in Progress**.
- b. Confirm that all operations have completed.
- c. Turn off both power switches on the appliance.
- d. Wait for all LEDs to turn off.

3. If the StorageGRID networks attached to the controller use DHCP servers:

- a. Note the MAC addresses for the ports on the replacement controller (located on labels on the controller).
- b. Ask your network administrator to update the IP address settings for the original controller to reflect the MAC addresses for the replacement controller.



You must ensure that the 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.

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.

5. 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.

6. Power on the appliance, and monitor the controller LEDs and seven-segment displays.

After the controllers have successfully booted up, the seven-segment displays should show the following:

- E2800 controller:

The final state is 99.

- E5700SG controller:

The final state is HA.

7. Confirm that the appliance Storage Node appears in the Grid Manager and that no alarms appear.

Related information

[NetApp E-Series Systems Documentation Site](#)

Replace other hardware components

You might need to replace a controller battery, drive, fan, or power supply, in the StorageGRID appliance.

What you'll need

- You have the E-Series hardware replacement procedure.
- The appliance has been [placed maintenance mode](#) if the component replacement procedure requires that you shut down the appliance.

About this task

To replace the battery in the E2800 controller, see the instructions in these instructions for replacing the E2800 controller. Those instructions describe how to remove the controller from the appliance, remove the battery from the controller, install the battery, and replace the controller.

To replace a drive, power-fan canister, fan canister, power canister, or drive drawer in the appliance, access the E-Series procedures for maintaining E2800 hardware.

SG5712 component replacement instructions

| FRU | See E-Series instructions for |
|--------------------|---|
| Drive | Replacing a drive in E2800 12-drive or 24-drive shelves |
| Power-fan canister | Replacing a power-fan canister in E2800 shelves |

SG5760 component replacement instructions

| FRU | See E-Series instructions for |
|----------------|---|
| Drive | Replacing a drive in E2860 shelves |
| Power canister | Replacing a power canister in E2860 shelves |
| Fan canister | Replacing a fan canister in E2860 shelves |

| FRU | See E-Series instructions for |
|--------------|---|
| Drive drawer | Replacing a drive drawer in E2860 shelves |

Related information

[Replace E2800 controller](#)

[NetApp E-Series Systems Documentation Site](#)

Change link configuration of E5700SG controller

You can change the Ethernet link configuration of the E5700SG controller. You can change the port bond mode, the network bond mode, and the link speed.

What you'll need

[Place E5700SG controller into maintenance mode.](#)



In rare instances, placing a StorageGRID appliance into maintenance mode might make the appliance unavailable for remote access.

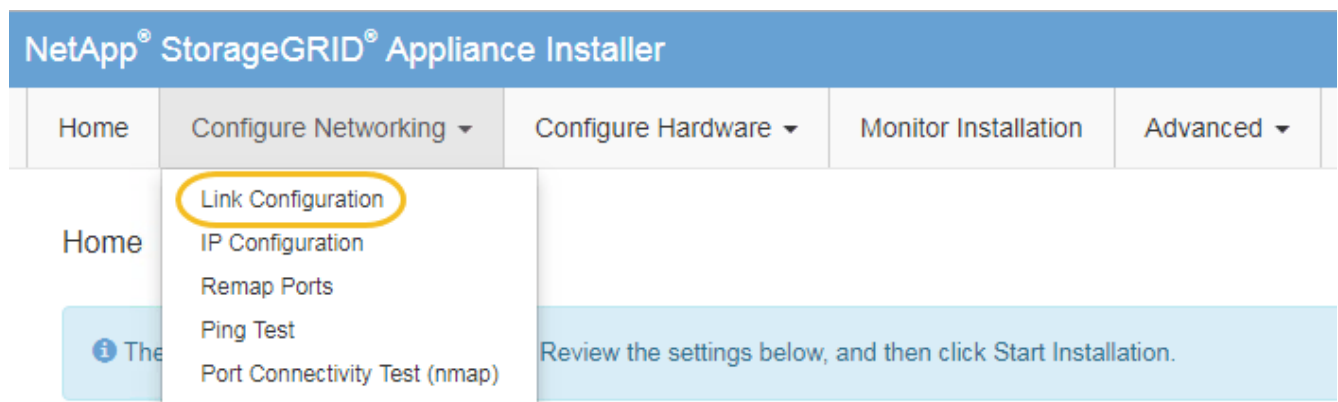
About this task

Options for changing the Ethernet link configuration of the E5700SG 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 from 10-GbE to 25-GbE, or from 25-GbE to 10-GbE

Steps

1. Select **Configure Networking > Link Configuration** from the menu.



2. Make the desired changes to the link configuration.

For more information on the options, see “Configuring network links.”

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:

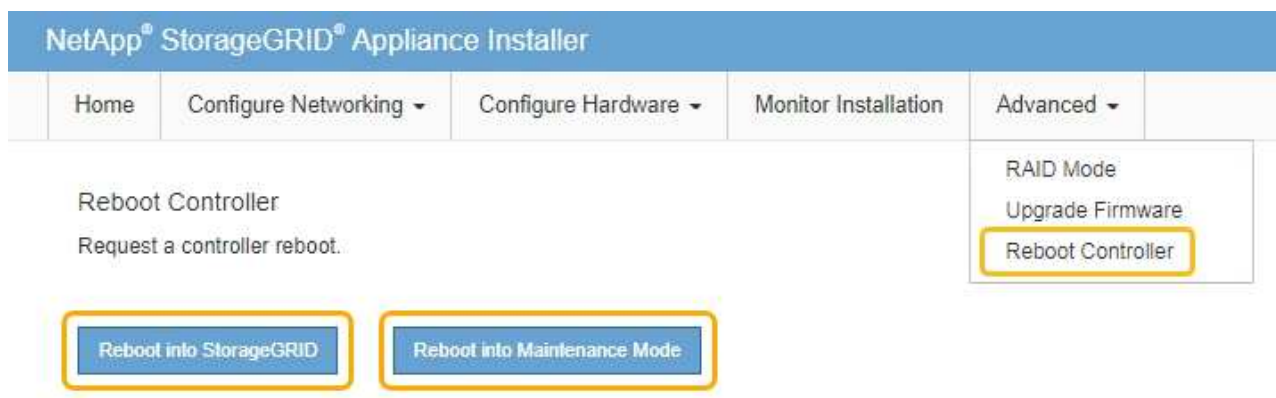
`https://E5700SG_Controller_IP:8443`

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 [set IP configuration](#) instructions.

4. From the StorageGRID Appliance Installer, select **Configure Networking > Ping Test**.
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 [Change link configuration](#) step.

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

6. Once 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. (This option is available only when the controller is 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** page should display a normal status (no icon) for the appliance node, indicating that no alerts are active and the node is connected to the grid.

NetApp | StorageGRID Grid Manager

Search by page title

?

Root

DASHBOARD

ALERTS

NODES

TENANTS

ILM

CONFIGURATION

MAINTENANCE

SUPPORT

Nodes

View the list and status of sites and grid nodes.

Search...

Total node count: 14

| Name | Type | Object data used | Object metadata used | CPU usage |
|------------------------|--------------------|------------------|----------------------|-----------|
| StorageGRID Deployment | Grid | 0% | 0% | — |
| Data Center 1 | Site | 0% | 0% | — |
| DC1-ADM1 | Primary Admin Node | — | — | 5% |
| DC1-ARC1 | Archive Node | — | — | 4% |
| DC1-G1 | Gateway Node | — | — | 2% |
| DC1-S1 | Storage Node | 0% | 0% | 12% |
| DC1-S2 | Storage Node | 0% | 0% | 10% |

Related information
 [Configure network links \(SG5700\)](#)

Change MTU setting

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



About this task

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.

To change the MTU setting without rebooting the appliance node, [use the Change IP tool](#).

If the Client or Admin Network was not configured in the StorageGRID Appliance Installer during the initial installation, [change the MTU setting using maintenance mode](#).

Change the MTU setting using the Change IP tool

What you'll need

You have the `Passwords.txt` file to use the Change IP tool.

Steps

Access the Change IP tool and update the MTU settings as described in [Change node network configuration](#).

Change the MTU setting using maintenance mode

Change the MTU setting using maintenance mode if you are unable to access these settings using the Change IP tool.

What you'll need

The appliance has been [placed 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.

Grid Network


The Grid Network is used for all internal StorageGRID traffic. The Grid Network provides connectivity between all nodes in the grid, across all sites and subnets. All hosts on the Grid Network must be able to talk to all other hosts. The Grid Network can consist of multiple subnets. Networks containing critical grid services, such as NTP, can also be added as Grid subnets.


IP Assignment ☒ Static ☐ DHCP



IPv4 Address (CIDR)


Gateway

 All required Grid Network subnets must also be defined in the Grid Network Subnet List on the Primary Admin Node before starting installation.

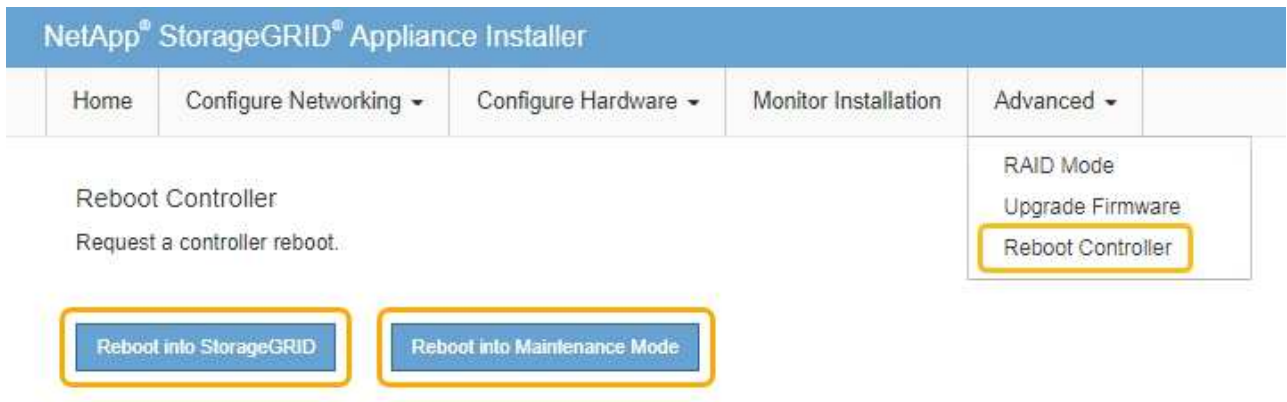
Subnets (CIDR) 



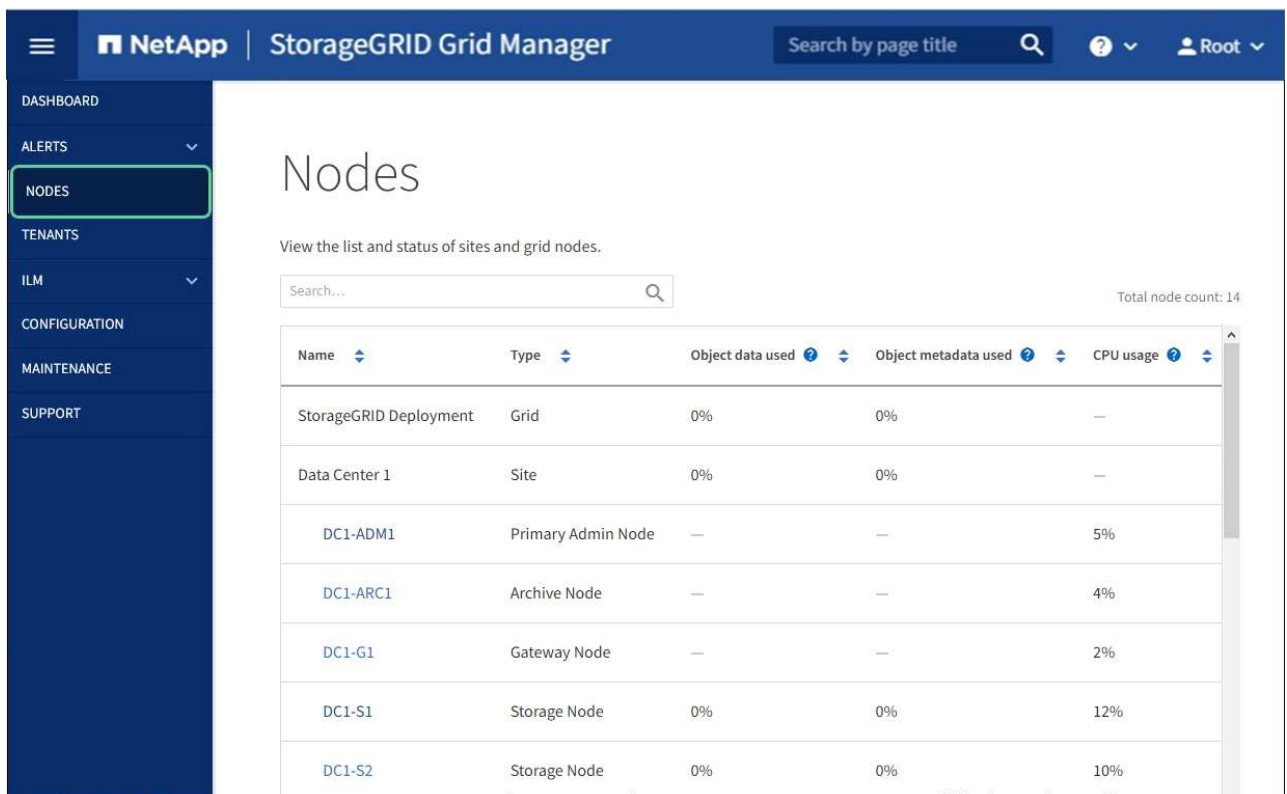
 

MTU 

- When you are satisfied with the settings, select **Save**.
- If this procedure completed successfully and you have additional procedures to perform while the node is in maintenance mode, perform them now. When you are done, or if you experienced any failures and want to start over, select **Advanced > Reboot Controller**, and then select one of these options:
 - Select **Reboot into StorageGRID**
 - Select **Reboot into Maintenance Mode** to reboot the controller with the node remaining in maintenance mode. Select this option if you experienced any failures during the procedure and want to start over. After the node finishes rebooting into maintenance mode, restart from the appropriate step in the procedure that failed.



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** page should display a normal status (no icon) for the appliance node, indicating that no alerts are active and the node is connected to the grid.



Related information

[Administer StorageGRID](#)

Check 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](#).

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.

DNS Servers

 Configuration changes made on this page will not be passed to the StorageGRID software after appliance installation.

Servers

| | | |
|---------------------------------------|---|---|
| Server 1 | <input type="text" value="10.224.223.135"/> |  |
| Server 2 | <input type="text" value="10.224.223.136"/> |   |
| <input type="button" value="Cancel"/> | | <input type="button" value="Save"/> |

3. If required, change the DNS servers.

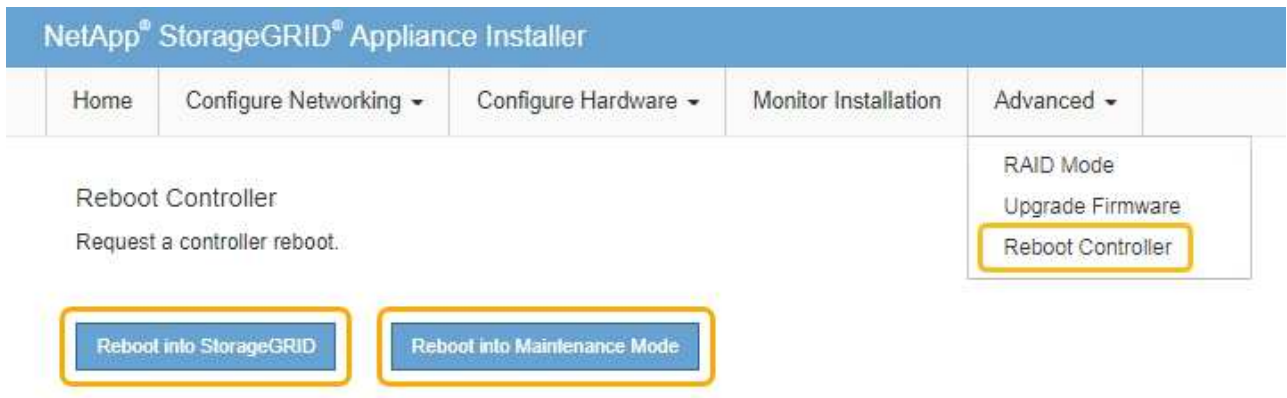


Changes made to the DNS settings are temporary and are lost when you exit maintenance mode.

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. (This option is available only when the controller is 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** page should display a normal status (no icon) for the appliance node, indicating that no alerts are active and the node is connected to the grid.

NetApp | StorageGRID Grid Manager

Search by page title

Root

Nodes

View the list and status of sites and grid nodes.

Search...

Total node count: 14

| Name | Type | Object data used | Object metadata used | CPU usage |
|------------------------|--------------------|------------------|----------------------|-----------|
| StorageGRID Deployment | Grid | 0% | 0% | — |
| Data Center 1 | Site | 0% | 0% | — |
| DC1-ADM1 | Primary Admin Node | — | — | 5% |
| DC1-ARC1 | Archive Node | — | — | 4% |
| DC1-G1 | Gateway Node | — | — | 2% |
| DC1-S1 | Storage Node | 0% | 0% | 12% |
| DC1-S2 | Storage Node | 0% | 0% | 10% |

Monitor node encryption in maintenance mode (SG5700)

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](#).

Steps

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

Node Encryption

Node encryption allows you to use an external key management server (KMS) to encrypt all StorageGRID data on this appliance. If node encryption is enabled for the appliance and a KMS is configured for the site, you cannot access any data on the appliance unless the appliance can communicate with the KMS.

Encryption Status

 You can only enable node encryption for an appliance during installation. You cannot enable or disable the node encryption setting after the appliance is installed.

Enable node encryption ☒

Save

Key Management Server Details

View the status and configuration details for the KMS that manages the encryption key for this appliance. You must use the Grid Manager to make configuration changes.

| | |
|------------------|--|
| KMS display name | thales |
| External key UID | 41b0306abcce451facfce01b1b4870ae1c1ec6bd5e3849d790223766baf35c57 |
| Hostnames | 10.96.99.164 10.96.99.165 |
| Port | 5696 |


Server certificate



Client certificate



Clear KMS Key

 Do not clear the KMS key if you need to access or preserve any data on this appliance.

If you want to reinstall this appliance node (for example, in another grid), you must clear the KMS key. When the KMS key is cleared, all data on this appliance is deleted.

Clear KMS Key and Delete Data

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.
[Check 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

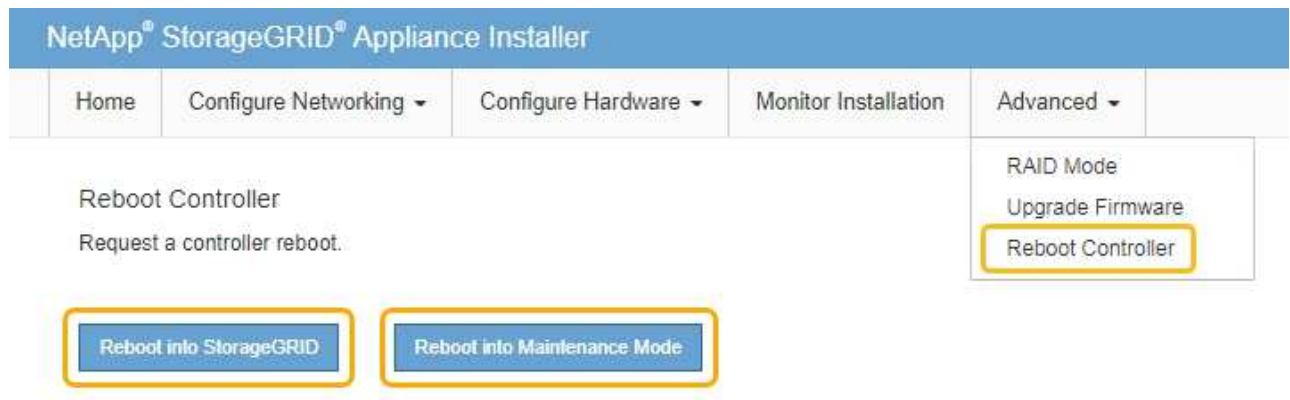
all data from the appliance. You must clear the KMS key before you can install the appliance into another StorageGRID system.

Clear 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. (This option is available only when the controller is 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** page should display a normal status (no icon) for the appliance node, indicating that no alerts are active and the node is connected to the grid.

Nodes

View the list and status of sites and grid nodes.

Search...

Total node count: 14

| Name | Type | Object data used | Object metadata used | CPU usage |
|------------------------|--------------------|------------------|----------------------|-----------|
| StorageGRID Deployment | Grid | 0% | 0% | — |
| Data Center 1 | Site | 0% | 0% | — |
| DC1-ADM1 | Primary Admin Node | — | — | 5% |
| DC1-ARC1 | Archive Node | — | — | 4% |
| DC1-G1 | Gateway Node | — | — | 2% |
| DC1-S1 | Storage Node | 0% | 0% | 12% |
| DC1-S2 | Storage Node | 0% | 0% | 10% |

Related information

[Administer StorageGRID](#)

Clear 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 either perform a node decommission procedure or clone the node 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.

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**.

Node Encryption

Node encryption allows you to use an external key management server (KMS) to encrypt all StorageGRID data on this appliance. If node encryption is enabled for the appliance and a KMS is configured for the site, you cannot access any data on the appliance unless the appliance can communicate with the KMS.

Encryption Status

 You can only enable node encryption for an appliance during installation. You cannot enable or disable the node encryption setting after the appliance is installed.

Enable node encryption ☒

Save

Key Management Server Details

View the status and configuration details for the KMS that manages the encryption key for this appliance. You must use the Grid Manager to make configuration changes.

KMS display name thales

External key UID 41b0306abcce451facfce01b1b4870ae1c1ec6bd5e3849d790223766baf35c57

Hostnames 10.96.99.164
10.96.99.165

Port 5696


Server certificate



Client certificate



Clear KMS Key

 Do not clear the KMS key if you need to access or preserve any data on this appliance.

If you want to reinstall this appliance node (for example, in another grid), you must clear the KMS key. When the KMS key is cleared, all data on this appliance is deleted.

Clear KMS Key and Delete Data



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**.

A warning dialog box with a yellow header bar containing a warning icon and the word "Warning". The main text reads "Confirm Clear KMS Key and Delete All Node Data". Below this, it says "Clearing the KMS key:" followed by a bulleted list: "Deletes KMS encryption key from the node", "Deletes all data on the node", and "Reboots the appliance". A paragraph follows: "If you are sure you want to clear the KMS key and delete all node data, type 'clear' in the text box. Then, select **Clear KMS Key and Delete Data**." Below the text is a text input field containing the word "clear". At the bottom right are two buttons: "Cancel" and "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 is in a pre-install state, you can physically remove the appliance from your StorageGRID system. See the recovery and maintenance instructions for information about [Prepare appliance for reinstallation](#).

Related information

[Administer StorageGRID](#)

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