



Recovering from primary Admin Node failures

StorageGRID 11.5

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Table of Contents

- Recovering from primary Admin Node failures. 1
 - Copying audit logs from the failed primary Admin Node 1
 - Replacing the primary Admin Node 2
 - Configuring the replacement primary Admin Node 3
 - Restoring the audit log on the recovered primary Admin Node 5
 - Resetting the preferred sender on the recovered primary Admin Node. 6
 - Restoring the Admin Node database when recovering a primary Admin Node 6
 - Restoring Prometheus metrics when recovering a primary Admin Node. 8

Recovering from primary Admin Node failures

You must complete a specific set of tasks to recover from a primary Admin Node failure. The primary Admin Node hosts the Configuration Management Node (CMN) service for the grid.

About this task

A failed primary Admin Node should be replaced promptly. The Configuration Management Node (CMN) service on the primary Admin Node is responsible for issuing blocks of object identifiers for the grid. These identifiers are assigned to objects as they are ingested. New objects cannot be ingested unless there are identifiers available. Object ingest can continue while the CMN is unavailable because approximately one month's supply of identifiers is cached in the grid. However, after cached identifiers are exhausted, no new objects can be added.



You must repair or replace a failed primary Admin Node within approximately a month or the grid might lose its ability to ingest new objects. The exact time period depends on your rate of object ingest: if you need a more accurate assessment of the time frame for your grid, contact technical support.

Steps

- [Copying audit logs from the failed primary Admin Node](#)
- [Replacing the primary Admin Node](#)
- [Configuring the replacement primary Admin Node](#)
- [Restoring the audit log on the recovered primary Admin Node](#)
- [Resetting the preferred sender on the recovered primary Admin Node](#)
- [Restoring the Admin Node database when recovering a primary Admin Node](#)
- [Restoring Prometheus metrics when recovering a primary Admin Node](#)

Copying audit logs from the failed primary Admin Node

If you are able to copy audit logs from the failed primary Admin Node, you should preserve them to maintain the grid's record of system activity and usage. You can restore the preserved audit logs to the recovered primary Admin Node after it is up and running.

This procedure copies the audit log files from the failed Admin Node to a temporary location on a separate grid node. These preserved audit logs can then be copied to the replacement Admin Node. Audit logs are not automatically copied to the new Admin Node.

Depending on the type of failure, you might not be able to copy audit logs from a failed Admin Node. If the deployment has only one Admin Node, the recovered Admin Node starts recording events to the audit log in a new empty file and previously recorded data is lost. If the deployment includes more than one Admin Node, you can recover the audit logs from another Admin Node.



If the audit logs are not accessible on the failed Admin Node now, you might be able to access them later, for example, after host recovery.

1. Log in to the failed Admin Node if possible. Otherwise, log in to the primary Admin Node or another Admin Node, if available.

- a. Enter the following command: `ssh admin@grid_node_IP`
- b. Enter the password listed in the `Passwords.txt` file.
- c. Enter the following command to switch to root: `su -`
- d. Enter the password listed in the `Passwords.txt` file.

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

2. Stop the AMS service to prevent it from creating a new log file: `service ams stop`
3. Rename the `audit.log` file so that it does not overwrite the existing file when you copy it to the recovered Admin Node.

Rename `audit.log` to a unique numbered file name such as `yyyy-mm-dd.txt.1`. For example, you can rename the `audit.log` file to `2015-10-25.txt.1`

```
cd /var/local/audit/exportls -l`mv audit.log 2015-10-25.txt.1
```

4. Restart the AMS service: `service ams start`
5. Create the directory to copy all audit log files to a temporary location on a separate grid node: `ssh admin@grid_node_IP mkdir -p /var/local/tmp/saved-audit-logs`

When prompted, enter the password for admin.

6. Copy all audit log files: `scp -p * admin@grid_node_IP:/var/local/tmp/saved-audit-logs`

When prompted, enter the password for admin.

7. Log out as root: `exit`

Replacing the primary Admin Node

To recover a primary Admin Node, you must first replace the physical or virtual hardware.

You can replace a failed primary Admin Node with a primary Admin Node running on the same platform, or you can replace a primary Admin Node running on VMware or a Linux host with a primary Admin Node hosted on a services appliance.

Use the procedure that matches the replacement platform you select for the node. After you complete the node replacement procedure (which is suitable for all node types), that procedure will direct you to the next step for primary Admin Node recovery.

Replacement platform	Procedure
VMware	Replacing a VMware node
Linux	Replacing a Linux node
SG100 and SG1000 services appliances	Replacing a services appliance

Replacement platform	Procedure
OpenStack	NetApp-provided virtual machine disk files and scripts for OpenStack are no longer supported for recovery operations. If you need to recover a node running in an OpenStack deployment, download the files for your Linux operating system. Then, follow the procedure for replacing a Linux node.

Configuring the replacement primary Admin Node

The replacement node must be configured as the primary Admin Node for your StorageGRID system.

What you'll need

- For primary Admin Nodes hosted on virtual machines, the virtual machine must be deployed, powered on, and initialized.
- For primary Admin Nodes hosted on a services appliance, you have replaced the appliance and have installed software. See the installation guide for your appliance.

[SG100 & SG1000 services appliances](#)

- You must have the latest backup of the Recovery Package file (`sgws-recovery-package-id-revision.zip`).
- You must have the provisioning passphrase.

Steps

1. Open your web browser and navigate to `https://primary_admin_node_ip`.

Welcome

Use this page to install a new StorageGRID system, or recover a failed primary Admin Node for an existing system.

Note: You must have access to a StorageGRID license, network configuration and grid topology information, and NTP settings to complete the installation. You must have the latest version of the Recovery Package file to complete a primary Admin Node recovery.



Install a StorageGRID system



Recover a failed primary Admin
Node

2. Click **Recover a failed primary Admin Node**.
3. Upload the most recent backup of the Recovery Package:
 - a. Click **Browse**.
 - b. Locate the most recent Recovery Package file for your StorageGRID system, and click **Open**.
4. Enter the provisioning passphrase.
5. Click **Start Recovery**.

The recovery process begins. The Grid Manager might become unavailable for a few minutes as the required services start. When the recovery is complete, the sign in page is displayed.

6. If single sign-on (SSO) is enabled for your StorageGRID system and the relying party trust for the Admin Node you recovered was configured to use the default Management Interface Server Certificate, update (or delete and recreate) the node's relying party trust in Active Directory Federation Services (AD FS). Use the new default server certificate that was generated during the Admin Node recovery process.



To configure a relying party trust, see the instructions for administering StorageGRID. To access the default server certificate, log in to the command shell of the Admin Node. Go to the `/var/local/mgmt-api` directory, and select the `server.crt` file.

7. Determine if you need to apply a hotfix.
 - a. Sign in to the Grid Manager using a supported browser.
 - b. Select **Nodes**.
 - c. From the list on the left, select the primary Admin Node.
 - d. On the Overview tab, note the version displayed in the **Software Version** field.
 - e. Select any other grid node.

- f. On the Overview tab, note the version displayed in the **Software Version** field.
 - If the versions displayed in the **Software Version** fields are the same, you do not need to apply a hotfix.
 - If the versions displayed in the **Software Version** fields are different, you must apply a hotfix to update the recovered primary Admin Node to the same version.

Related information

[Administer StorageGRID](#)

[StorageGRID hotfix procedure](#)

Restoring the audit log on the recovered primary Admin Node

If you were able to preserve the audit log from the failed primary Admin Node, you can copy it to the primary Admin Node you are recovering.

- The recovered Admin Node must be installed and running.
- You must have copied the audit logs to another location after the original Admin Node failed.

If an Admin Node fails, audit logs saved to that Admin Node are potentially lost. It might be possible to preserve data from loss by copying audit logs from the failed Admin Node and then restoring these audit logs to the recovered Admin Node. Depending on the failure, it might not be possible to copy audit logs from the failed Admin Node. In that case, if the deployment has more than one Admin Node, you can recover audit logs from another Admin Node as audit logs are replicated to all Admin Nodes.

If there is only one Admin Node and the audit log cannot be copied from the failed node, the recovered Admin Node starts recording events to the audit log as if the installation is new.

You must recover an Admin Node as soon as possible to restore logging functionality.

1. Log in to the recovered Admin Node:

- a. Enter the following command: `ssh admin@recovery_Admin_Node_IP`
- b. Enter the password listed in the `Passwords.txt` file.
- c. Enter the following command to switch to root: `su -`
- d. Enter the password listed in the `Passwords.txt` file.

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

2. Check which audit files have been preserved: `cd /var/local/audit/export`
3. Copy the preserved audit log files to the recovered Admin Node: `scp admin@grid_node_IP:/var/local/tmp/saved-audit-logs/YYYY* .`

When prompted, enter the password for admin.

4. For security, delete the audit logs from the failed grid node after verifying that they have been copied successfully to the recovered Admin Node.
5. Update the user and group settings of the audit log files on the recovered Admin Node: `chown ams-`

```
user:bycast *
```

6. Log out as root: `exit`

You must also restore any pre-existing client access to the audit share. For more information, see the instructions for administering StorageGRID.

Related information

[Administer StorageGRID](#)

Resetting the preferred sender on the recovered primary Admin Node

If the primary Admin Node you are recovering is currently set as the preferred sender of alert notifications, alarm notifications, and AutoSupport messages, you must reconfigure this setting.

What you'll need

- You must be signed in to the Grid Manager using a supported browser.
- You must have specific access permissions.
- The recovered Admin Node must be installed and running.

Steps

1. Select **Configuration > System Settings > Display Options**.
2. Select the recovered Admin Node from the **Preferred Sender** drop-down list.
3. Click **Apply Changes**.

Related information

[Administer StorageGRID](#)

Restoring the Admin Node database when recovering a primary Admin Node

If you want to retain the historical information about attributes, alarms, and alerts on a primary Admin Node that has failed, you can restore the Admin Node database. You can only restore this database if your StorageGRID system includes another Admin Node.

- The recovered Admin Node must be installed and running.
- The StorageGRID system must include at least two Admin Nodes.
- You must have the `Passwords.txt` file.
- You must have the provisioning passphrase.

If an Admin Node fails, the historical information stored in its Admin Node database is lost. This database includes the following information:

- Alert history

- Alarm history
- Historical attribute data, which is used in the charts and text reports available from the **Support > Tools > Grid Topology** page.

When you recover an Admin Node, the software installation process creates an empty Admin Node database on the recovered node. However, the new database only includes information for servers and services that are currently part of the system or added later.

If you restored a primary Admin Node and your StorageGRID system has another Admin Node, you can restore the historical information by copying the Admin Node database from a non-primary Admin Node (the *source Admin Node*) to the recovered primary Admin Node. If your system has only a primary Admin Node, you cannot restore the Admin Node database.



Copying the Admin Node database might take several hours. Some Grid Manager features will be unavailable while services are stopped on the source Admin Node.

1. Log in to the source Admin Node:
 - a. Enter the following command: `ssh admin@grid_node_IP`
 - b. Enter the password listed in the `Passwords.txt` file.
 - c. Enter the following command to switch to root: `su -`
 - d. Enter the password listed in the `Passwords.txt` file.
2. From the source Admin Node, stop the MI service: `service mi stop`
3. From the source Admin Node, stop the Management Application Program Interface (mgmt-api) service: `service mgmt-api stop`
4. Complete the following steps on the recovered Admin Node:
 - a. Log in to the recovered Admin 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.
 - b. Stop the MI service: `service mi stop`
 - c. Stop the mgmt-api service: `service mgmt-api stop`
 - d. Add the SSH private key to the SSH agent. Enter: `ssh-add`
 - e. Enter the SSH Access Password listed in the `Passwords.txt` file.
 - f. Copy the database from the source Admin Node to the recovered Admin Node:
`/usr/local/mi/bin/mi-clone-db.sh Source_Admin_Node_IP`
 - g. When prompted, confirm that you want to overwrite the MI database on the recovered Admin Node.

The database and its historical data are copied to the recovered Admin Node. When the copy operation is done, the script starts the recovered Admin Node.

- h. When you no longer require passwordless access to other servers, remove the private key from the SSH agent. Enter: `ssh-add -D`

5. Restart the services on the source Admin Node: `service servermanager start`

Restoring Prometheus metrics when recovering a primary Admin Node

Optionally, you can retain the historical metrics maintained by Prometheus on a primary Admin Node that has failed. The Prometheus metrics can only be restored if your StorageGRID system includes another Admin Node.

- The recovered Admin Node must be installed and running.
- The StorageGRID system must include at least two Admin Nodes.
- You must have the `Passwords.txt` file.
- You must have the provisioning passphrase.

If an Admin Node fails, the metrics maintained in the Prometheus database on the Admin Node are lost. When you recover the Admin Node, the software installation process creates a new Prometheus database. After the recovered Admin Node is started, it records metrics as if you had performed a new installation of the StorageGRID system.

If you restored a primary Admin Node and your StorageGRID system has another Admin Node, you can restore the historical metrics by copying the Prometheus database from a non-primary Admin Node (the *source Admin Node*) to the recovered primary Admin Node. If your system has only a primary Admin Node, you cannot restore the Prometheus database.



Copying the Prometheus database might take an hour or more. Some Grid Manager features will be unavailable while services are stopped on the source Admin Node.

1. Log in to the source Admin Node:
 - a. Enter the following command: `ssh admin@grid_node_IP`
 - b. Enter the password listed in the `Passwords.txt` file.
 - c. Enter the following command to switch to root: `su -`
 - d. Enter the password listed in the `Passwords.txt` file.
2. From the source Admin Node, stop the Prometheus service: `service prometheus stop`
3. Complete the following steps on the recovered Admin Node:
 - a. Log in to the recovered Admin 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.
 - b. Stop the Prometheus service: `service prometheus stop`
 - c. Add the SSH private key to the SSH agent. Enter: `ssh-add`
 - d. Enter the SSH Access Password listed in the `Passwords.txt` file.

e. Copy the Prometheus database from the source Admin Node to the recovered Admin Node:
`/usr/local/prometheus/bin/prometheus-clone-db.sh Source_Admin_Node_IP`

f. When prompted, press **Enter** to confirm that you want to destroy the new Prometheus database on the recovered Admin Node.

The original Prometheus database and its historical data are copied to the recovered Admin Node. When the copy operation is done, the script starts the recovered Admin Node. The following status appears:

Database cloned, starting services

g. When you no longer require passwordless access to other servers, remove the private key from the SSH agent. Enter:`ssh-add -D`

4. Restart the Prometheus service on the source Admin Node.`service prometheus start`

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