Decommission nodes

StorageGRID

NetApp
December 03, 2025

This PDF was generated from https://docs.netapp.com/us-en/storagegrid-118/maintain/grid-node-decommissioning.html on December 03, 2025. Always check docs.netapp.com for the latest.

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Decommission nodes

Grid node decommission: Overview

You can use the node decommission procedure to remove one or more grid nodes at one or more sites. You can't decommission the primary Admin Node.

When to decommission a node

Use the node decommission procedure when any of the following are true:

- You added a larger Storage Node in an expansion and you want to remove one or more smaller Storage Nodes, while at the same time preserving objects.

  If you want to replace an older appliance with a newer appliance, consider cloning the appliance node instead of adding a new appliance in an expansion and then decommissioning the old appliance.

- You require less total storage.
- You no longer require a Gateway Node.
- You no longer require a non-primary Admin Node.
- Your grid includes a disconnected node that you can't recover or bring back online.
- Your grid includes an Archive Node.

How to decommission a node

You can decommission connected grid nodes or disconnected grid nodes.

Decommission connected nodes

In general, you should decommission grid nodes only when they are connected to the StorageGRID system and only when all nodes are in normal health (have green icons on the **NODES** pages and on the **Decommission Nodes** page).

For instructions, see Decommission connected grid nodes.

Decommission disconnected nodes

In some cases, you might need to decommission a grid node that is not currently connected to the grid (one whose Health is Unknown or Administratively Down). For example, you can only decommission an Archive Node if it is disconnected.

For instructions, see Decommission disconnected grid nodes.

What to consider before decommissioning a node

Before performing either procedure, review the considerations for each type of node:

- Considerations for Admin, Gateway, or Archive Node decommission
- Considerations for Storage Node decommission

Considerations for decommissioning Admin, Gateway, or Archive Nodes

Review the considerations for decommissioning an Admin Node, Gateway Node, or Archive Node.

Considerations for Admin Node

- You can't decommission the primary Admin Node.
- You can't decommission an Admin Node if one of its network interfaces is part of a high availability (HA) group. You must first remove the network interfaces from the HA group. See the instructions for managing HA groups.
- As required, you can safely change ILM policies while decommissioning an Admin Node.
- If you decommission an Admin Node and single sign-on (SSO) is enabled for your StorageGRID system, you must remember to remove the node's relying party trust from Active Directory Federation Services (AD FS).
- If you use grid federation, ensure that the IP address of the node you are decommissioning was not specified for a grid federation connection.
- When you decommission a disconnected Admin Node, you will lose the audit logs from that node; however, these logs should also exist on the primary Admin Node.

Considerations for Gateway Node

- You can't decommission a Gateway Node if one of its network interfaces is part of a high availability (HA) group. You must first remove the network interfaces from the HA group. See the instructions for managing HA groups.
- As required, you can safely change ILM policies while decommissioning a Gateway Node.
- If you use grid federation, ensure that the IP address of the node you are decommissioning was not specified for a grid federation connection.
- You can safely decommission a Gateway Node while it is disconnected.

Considerations for Archive Node

> Support for Archive Nodes and the Cloud Tiering - Simple Storage Service (S3) option have been deprecated. Archive Node support will be removed completely in a future release.

- You can't decommission an Archive Node if it is still connected to the grid. To remove an Archive Node, confirm that the node is no longer being used, data has been migrated to a different location, and the node is powered off. Then, use the decommission procedure for disconnected nodes.
- If the Archive Node is still in use, make sure your schedule includes enough time to move any existing data to Storage Nodes or a Cloud Storage Pool. Moving the data from an Archive Node might take several days or weeks.

Steps

1. If you are currently using an Archive Node with the Cloud Tiering - Simple Storage Service (S3) option, migrate your objects to a Cloud Storage Pool.
2. Confirm that the Archive Node is no longer being used by any ILM rules in the active ILM policies.

a. Go to the **ILM** > **Storage pools** page.

b. From the list of storage pools, select any storage pools that contain only Archive Nodes.

c. Select the **ILM usage** tab.

d. If any ILM rules are listed, look at the **Used in active policy** column to determine if the Archive Node storage pool is being used in an active policy.

e. If the storage pool is being used, create a new ILM policy that no longer uses the Archive Node.

f. Activate the new policy.

g. Wait for all objects to be moved from the Archive Node storage pool. This might take several days or weeks.

3. After you are certain all objects have been moved from the Archive Node, power down the node.
4. Perform the decommission procedure for disconnected nodes.

Considerations for Storage Nodes

Considerations for decommissioning Storage Nodes

Before decommissioning a Storage Node, consider whether you can clone the node instead. Then, if you do decide to decommission the node, review how StorageGRID manages objects and metadata during the decommission procedure.

When to clone a node instead of decommissioning it

If you want to replace an older appliance Storage Node with a newer or larger appliance, consider cloning the appliance node instead of adding a new appliance in an expansion and then decommissioning the old appliance.

Appliance node cloning lets you easily replace an existing appliance node with a compatible appliance at the same StorageGRID site. The cloning process transfers all data to the new appliance, places the new appliance in service, and leaves the old appliance in a pre-install state.

You can clone an appliance node if you need to:

- Replace an appliance that is reaching end-of-life.
- Upgrade an existing node to take advantage of improved appliance technology.
- Increase grid storage capacity without changing the number of Storage Nodes in your StorageGRID system.
- Improve storage efficiency, such as by changing the RAID mode.

See Appliance node cloning: Overview for details.

Considerations for connected Storage Nodes

Review the considerations for decommissioning a connected Storage Node.

- You should not decommission more than 10 Storage Nodes in a single Decommission Node procedure.
- The system must, at all times, include enough Storage Nodes to satisfy operational requirements, including the ADC quorum and the active ILM policy. To satisfy this restriction, you might need to add a new Storage

Node in an expansion operation before you can decommission an existing Storage Node.

Use caution when you decommission Storage Nodes in a grid containing software-based metadata-only nodes. If you decommission all nodes configured to store *both* objects and metadata, the ability to store objects is removed from the grid. See Types of Storage Nodes for more information about metadata-only Storage Nodes.

- When you remove a Storage Node, large volumes of object data are transferred over the network. Although these transfers should not affect normal system operations, they can affect the total amount of network bandwidth consumed by the StorageGRID system.
- Tasks associated with Storage Node decommissioning are given a lower priority than tasks associated with normal system operations. This means that decommissioning does not interfere with normal StorageGRID system operations, and does not need to be scheduled for a period of system inactivity. Because decommissioning is performed in the background, it is difficult to estimate how long the process will take to complete. In general, decommissioning finishes more quickly when the system is quiet, or if only one Storage Node is being removed at a time.
- It might take days or weeks to decommission a Storage Node. Plan this procedure accordingly. While the decommission process is designed to not impact system operations, it can limit other procedures. In general, you should perform any planned system upgrades or expansions before you remove grid nodes.
- If you need to perform another maintenance procedure while Storage Nodes are being removed, you can pause the decommission procedure and resume it after the other procedure is complete.

> The **Pause** button is enabled only when the ILM evaluation or erasure-coded data decommissioning stages are reached; however, ILM evaluation (data migration) will continue to run in the background.

- You can’t run data repair operations on any grid nodes when a decommission task is running.
- You should not make any changes to an ILM policy while a Storage Node is being decommissioned.
- When you decommission a Storage Node, the following alerts and alarms might be triggered and you might receive related email and SNMP notifications:
  - **Unable to communicate with node** alert. This alert is triggered when you decommission a Storage Node that includes the ADC service. The alert is resolved when the decommission operation completes.
  - VSTU (Object Verification Status) alarm. This notice-level alarm indicates that the Storage Node is going into maintenance mode during the decommission process.
  - CASA (Data Store Status) alarm. This major-level alarm indicates that the Cassandra database is going down because services have stopped.
- To permanently and securely remove data, you must wipe the Storage Node’s drives after the decommission procedure is complete.

Considerations for disconnected Storage Nodes

Review the considerations for decommissioning a disconnected Storage Node.

- Never decommission a disconnected node unless you are sure it can’t be brought online or recovered.

> Don’t perform this procedure if you believe it might be possible to recover object data from the node. Instead, contact technical support to determine if node recovery is possible.

- When you decommission a disconnected Storage Node, StorageGRID uses data from other Storage Nodes to reconstruct the object data and metadata that was on the disconnected node.
- Data loss might occur if you decommission more than one disconnected Storage Node. The system might not be able to reconstruct data if not enough object copies, erasure-coded fragments, or object metadata remain available. When decommissioning Storage Nodes in a grid with software-based metadata-only nodes, decommissioning all nodes configured to store both objects and metadata removes all object storage from the grid. See Types of Storage Nodes for more information about metadata-only Storage Nodes.

> If you have more than one disconnected Storage Node that you can't recover, contact technical support to determine the best course of action.

- When you decommission a disconnected Storage Node, StorageGRID starts data repair jobs at the end of the decommissioning process. These jobs attempt to reconstruct the object data and metadata that was stored on the disconnected node.
- When you decommission a disconnected Storage Node, the decommission procedure completes relatively quickly. However, the data repair jobs can take days or weeks to run and aren't monitored by the decommission procedure. You must manually monitor these jobs and restart them as needed. See Check data repair jobs.
- If you decommission a disconnected Storage Node that contains the only copy of an object, the object will be lost. The data repair jobs can only reconstruct and recover objects if at least one replicated copy or enough erasure-coded fragments exist on Storage Nodes that are currently connected.

What is the ADC quorum?

You might not be able to decommission certain Storage Nodes at a site if too few Administrative Domain Controller (ADC) services would remain after the decommissioning.

The ADC service, which is found on some Storage Nodes, maintains grid topology information and provides configuration services to the grid. The StorageGRID system requires a quorum of ADC services to be available at each site and at all times.

You can't decommission a Storage Node if removing the node would cause the ADC quorum to no longer be met. To satisfy the ADC quorum during a decommissioning, a minimum of three Storage Nodes at each site must have the ADC service. If a site has more than three Storage Nodes with the ADC service, a simple majority of those nodes must remain available after the decommissioning: `((0.5 * Storage Nodes with ADC) + 1)`

> Use caution when you decommission Storage Nodes in a grid containing software-based metadata-only nodes. If you decommission all nodes configured to store *both* objects and metadata, the ability to store objects is removed from the grid. See Types of Storage Nodes for more information about metadata-only Storage Nodes.

For example, suppose a site currently includes six Storage Nodes with ADC services and you want to decommission three Storage Nodes. Because of the ADC quorum requirement, you must complete two decommission procedures, as follows:

- In the first decommission procedure, you must ensure that four Storage Nodes with ADC services remain available: `((0.5 * 6) + 1)`. This means that you can only decommission two Storage Nodes initially.

- In the second decommission procedure, you can remove the third Storage Node because the ADC quorum now only requires three ADC services to remain available: `((0.5 * 4) + 1)`.

If you need to decommission a Storage Node but are unable to because of the ADC quorum requirement, add a new Storage Node in an expansion and specify that it should have an ADC service. Then, decommission the existing Storage Node.

Review ILM policy and storage configuration

If you plan to decommission a Storage Node, you should review your StorageGRID system's ILM policy before starting the decommissioning process.

During decommissioning, all object data is migrated from the decommissioned Storage Node to other Storage Nodes.

> The ILM policy you have *during* the decommission will be the one used *after* the decommission. You must ensure this policy meets your data requirements both before you start the decommission and after the decommission is complete.

You should review the rules in each active ILM policy to ensure that the StorageGRID system will continue to have enough capacity of the correct type and in the correct locations to accommodate the decommissioning of a Storage Node.

Consider the following:

- Will it be possible for ILM evaluation services to copy object data such that ILM rules are satisfied?
- What happens if a site becomes temporarily unavailable while decommissioning is in progress? Can additional copies be made in an alternate location?
- How will the decommissioning process affect the final distribution of content? As described in Consolidate Storage Nodes, you should add new Storage Nodes before decommissioning old ones. If you add a larger replacement Storage Node after decommissioning a smaller Storage Node, the old Storage Nodes could be close to capacity and the new Storage Node could have almost no content. Most write operations for new object data would then be directed at the new Storage Node, reducing the overall efficiency of system operations.
- Will the system, at all times, include enough Storage Nodes to satisfy the active ILM policies?

> An ILM policy that can't be satisfied will lead to backlogs and alerts, and might halt operation of the StorageGRID system.

Verify that the proposed topology that will result from the decommissioning process satisfies the ILM policy by assessing the areas listed in the table.

Area to assess	What to consider
Available capacity	Will there be enough storage capacity to accommodate all of the object data stored in the StorageGRID system, including the permanent copies of object data currently stored on the Storage Node to be decommissioned? Will there be enough capacity to handle the anticipated growth in stored object data for a reasonable interval of time after decommissioning is complete?
Location of storage	If enough capacity remains in the StorageGRID system as a whole, is the capacity in the right locations to satisfy the StorageGRID system's business rules?
Storage type	Will there be enough storage of the appropriate type after decommissioning is complete? For example, ILM rules might move content from one type of storage to another as content ages. In this case, you must ensure that enough storage of the appropriate type is available in the final configuration of the StorageGRID system.

Consolidate Storage Nodes

You can consolidate Storage Nodes to reduce the Storage Node count for a site or deployment while increasing storage capacity.

When you consolidate Storage Nodes, you expand the StorageGRID system by adding new, larger capacity Storage Nodes and then decommission the old, smaller capacity Storage Nodes. During the decommission procedure, objects are migrated from the old Storage Nodes to the new Storage Nodes.

> If you are consolidating older and smaller appliances with new models or larger capacity appliances, consider cloning the appliance node (or use appliance node cloning and the decommission procedure if you aren't doing a one-to-one replacement).

For example, you might add two new, larger capacity Storage Nodes to replace three older Storage Nodes. You would first use the expansion procedure to add the two new, larger Storage Nodes, and then use the decommission procedure to remove the three old, smaller capacity Storage Nodes.

By adding new capacity before removing existing Storage Nodes, you ensure a more balanced distribution of data across the StorageGRID system. You also reduce the possibility that an existing Storage Node might be pushed beyond the storage watermark level.

Decommission multiple Storage Nodes

If you need to remove more than one Storage Node, you can decommission them either sequentially or in parallel.

Use caution when you decommission Storage Nodes in a grid containing software-based metadata-only nodes. If you decommission all nodes configured to store *both* objects and metadata, the ability to store objects is removed from the grid. See Types of Storage Nodes for more information about metadata-only Storage Nodes.

- If you decommission Storage Nodes sequentially, you must wait for the first Storage Node to complete decommissioning before starting to decommission the next Storage Node.
- If you decommission Storage Nodes in parallel, the Storage Nodes simultaneously process decommission tasks for all Storage Nodes being decommissioned. This can result in a situation where all permanent copies of a file are marked as "read-only," temporarily disabling deletion in grids where this functionality is enabled.

Check data repair jobs

Before decommissioning a grid node, you must confirm that no data repair jobs are active. If any repairs have failed, you must restart them and allow them to complete before performing the decommission procedure.

About this task

If you need to decommission a disconnected Storage Node, you will also complete these steps after the decommission procedure completes to ensure the data repair job has completed successfully. You must ensure that any erasure-coded fragments that were on the removed node have been restored successfully.

These steps only apply to systems that have erasure-coded objects.

Steps

1. Log in to the primary 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.

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

2. Check for running repairs: `repair-data show-ec-repair-status`
   - If you have never run a data repair job, the output is `No job found`. You don't need to restart any repair jobs.
   - If the data repair job was run previously or is running currently, the output lists information for the repair. Each repair has a unique repair ID.

```
root@ADM1-0:~ # repair-data show-ec-repair-status
              Repair ID    Affected Nodes / Volumes                  Start Time                    End Time       State   Estimated Bytes Affected   Bytes Repaired   Percentage
==================================================================================================================================================================================
    4216507958013005550   DC1-S1-0-182 (Volumes: 2)   2022-08-17T21:37:30.051543   2022-08-17T21:37:37.320998   Completed                 1015788876                0            0
   18214680851049518682   DC1-S1-0-182 (Volumes: 1)   2022-08-17T20:37:58.869362   2022-08-17T20:38:45.299688   Completed                          0                0          100
    7962734388032289010   DC1-S1-0-182 (Volumes: 0)   2022-08-17T20:42:29.578740                                 Stopped                                                  Unknown
```

Optionally, you can use the Grid Manager to monitor restoration processes in progress and display a restoration history. See Restore object data using Grid Manager.

3. If the State for all repairs is `Completed`, you don't need to restart any repair jobs.
4. If the State for any repair is `Stopped`, you must restart that repair.
   a. Obtain the repair ID for the failed repair from the output.
   b. Run the `repair-data start-ec-node-repair` command.

      Use the `--repair-id` option to specify the Repair ID. For example, if you want to retry a repair with repair ID 949292, run this command: `repair-data start-ec-node-repair --repair-id 949292`

   c. Continue to track the status of EC data repairs until the State for all repairs is `Completed`.

Gather required materials

Before performing a grid node decommission, you must obtain the following information.

Item	Notes
Recovery Package `.zip` file	You must download the most recent Recovery Package `.zip` file (`sgws-recovery-package-id-revision.zip`). You can use the Recovery Package file to restore the system if a failure occurs.
`Passwords.txt` file	This file contains the passwords required to access grid nodes on the command line and is included in the Recovery Package.
Provisioning passphrase	The passphrase is created and documented when the StorageGRID system is first installed. The provisioning passphrase is not in the `Passwords.txt` file.
Description of StorageGRID system's topology before decommissioning	If available, obtain any documentation that describes the system's current topology.

Related information

Web browser requirements

Access Decommission Nodes page

When you access the Decommission Nodes page in the Grid Manager, you can see at a glance which nodes can be decommissioned.

Before you begin

- You are signed in to the Grid Manager using a supported web browser.
- You have the Maintenance or Root access permission.

Use caution when you decommission Storage Nodes in a grid containing software-based metadata-only nodes. If you decommission all nodes configured to store *both* objects and metadata, the ability to store objects is removed from the grid. See Types of Storage Nodes for more information about metadata-only Storage Nodes.

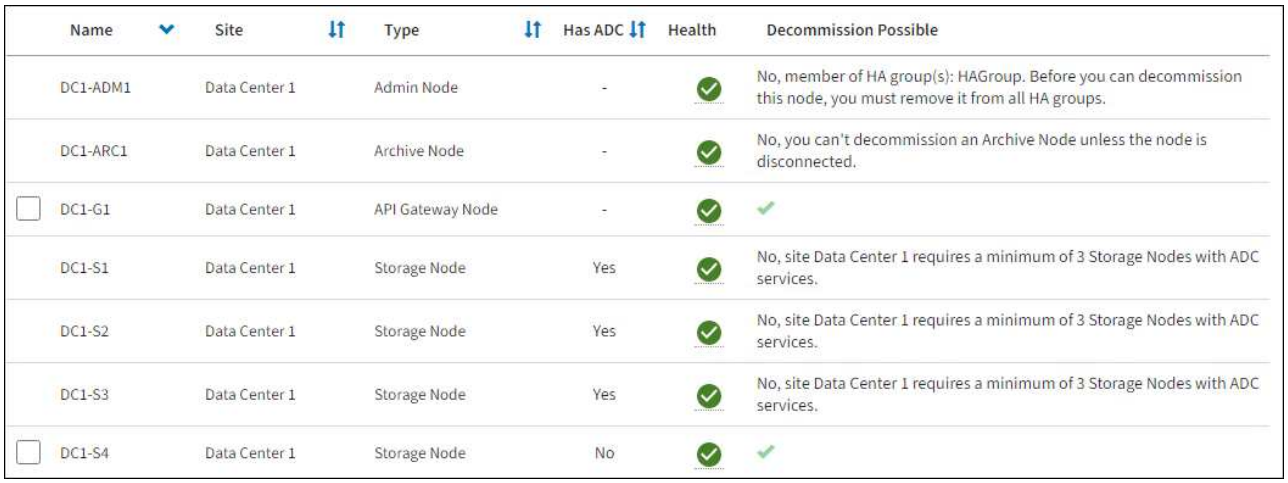
Steps

1. Select **MAINTENANCE** > **Tasks** > **Decommission**.
2. Select **Decommission Nodes**.

   The Decommission Nodes page appears. From this page, you can:

   - Determine which grid nodes can be decommissioned currently.
   - See the health of all grid nodes
   - Sort the list in ascending or descending order by **Name**, **Site**, **Type**, or **Has ADC**.
   - Enter search terms to quickly find particular nodes.

   In this example, the Decommission Possible column indicates that you can decommission the Gateway Node and one of the four Storage Nodes.



Name	Site	Type	Has ADC	Health	Decommission Possible
DC1-ADM1	Data Center 1	Admin Node	-		No, member of HA group(s): HAGroup. Before you can decommission this node, you must remove it from all HA groups.
DC1-ARC1	Data Center 1	Archive Node	-		No, you can't decommission an Archive Node unless the node is disconnected.
DC1-G1	Data Center 1	API Gateway Node	-		✓
DC1-S1	Data Center 1	Storage Node	Yes		No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
DC1-S2	Data Center 1	Storage Node	Yes		No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
DC1-S3	Data Center 1	Storage Node	Yes		No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
DC1-S4	Data Center 1	Storage Node	No		✓

3. Review the **Decommission Possible** column for each node you want to decommission.

   If a grid node can be decommissioned, this column includes a green check mark, and the left column includes a checkbox. If a node can't be decommissioned, this column describes the issue. If there is more than one reason a node can't be decommissioned, the most critical reason is shown.

Decommission Possible reason	Description	Steps to resolve
No, *node type* decommissioning is not supported.	You can't decommission the primary Admin Node.	None.

Decommission Possible reason	Description	Steps to resolve
No, at least one grid node is disconnected. **Note:** This message is shown for connected grid nodes only.	You can't decommission a connected grid node if any grid node is disconnected. The **Health** column includes one of these icons for grid nodes that are disconnected: • (gray): Administratively Down • (blue): Unknown	You must bring all disconnected nodes back online or decommission all disconnected nodes before you can remove a connected node. **Note**: If your grid contains multiple disconnected nodes, the software requires you to decommission them all at the same time, which increases the potential for unexpected results.
No, one or more required nodes is currently disconnected and must be recovered. **Note:** This message is shown for disconnected grid nodes only.	You can't decommission a disconnected grid node if one or more required nodes is also disconnected (for example, a Storage Node that is required for the ADC quorum).	a. Review the Decommission Possible messages for all disconnected nodes. b. Determine which nodes can't be decommissioned because they are required. ◦ If the Health of a required node is Administratively Down, bring the node back online. ◦ If the health of a required node is Unknown, perform a node recovery procedure to recover the required node.
No, member of HA group(s): *group name*. Before you can decommission this node, you must remove it from all HA groups.	You can't decommission an Admin Node or a Gateway Node if a node interface belongs to a high availability (HA) group.	Edit the HA group to remove the node's interface or remove the entire HA group. See Configure high availability groups.
No, site *x* requires a minimum of *n* Storage Nodes with ADC services.	**Storage Nodes only.** You can't decommission a Storage Node if insufficient nodes would remain at the site to support ADC quorum requirements.	Perform an expansion. Add a new Storage Node to the site, and specify that it should have an ADC service. See information about the ADC quorum.

Decommission Possible reason	Description	Steps to resolve
No, one or more erasure-coding profiles need at least *n* Storage Nodes. If the profile is not used in an ILM rule, you can deactivate it.	**Storage Nodes only.** You can't decommission a Storage Node unless enough nodes would remain for the existing erasure-coding profiles. For example, if an erasure-coding profile exists for 4+2 erasure coding, at least 6 Storage Nodes must remain.	For each affected erasure-coding profile, perform one of the following steps, based on how the profile is being used: • **Used in active ILM policies**: Perform an expansion. Add enough new Storage Nodes to allow erasure coding to continue. See the instructions for expanding your grid. • **Used in an ILM rule but not in active ILM policies**: Edit or delete the rule and then deactivate the erasure-coding profile. • **Not used in any ILM rule**: Deactivate the erasure-coding profile. **Note:** An error message appears if you attempt to deactivate an erasure-coding profile and object data is still associated with the profile. You might need to wait several weeks before trying the deactivation process again. Learn about deactivating an erasure-coding profile.
No, you can't decommission an Archive Node unless the node is disconnected.	If an Archive Node is still connected, you can't remove it.	Complete the steps in Considerations for Archive Node and then decommission the disconnected node.

Decommission disconnected grid nodes

You might need to decommission a node that is not currently connected to the grid (one whose Health is Unknown or Administratively Down).

Before you begin

- You understand the considerations for decommissioning Admin, Gateway, and Archive Nodes and the considerations for decommissioning Storage Nodes.
- You have obtained all prerequisite items.
- You have ensured that no data repair jobs are active. See Check data repair jobs.
- You have confirmed that Storage Node recovery is not in progress anywhere in the grid. If it is, you must

wait until any Cassandra rebuild performed as part of the recovery is complete. You can then proceed with decommissioning.

- You have ensured that other maintenance procedures will not be run while the node decommission procedure is running, unless the node decommission procedure is paused.
- The **Decommission Possible** column for the disconnected node or nodes you want to decommission includes a green check mark.
- You have the provisioning passphrase.

About this task

You can identify disconnected nodes by looking for Unknown (blue) or Administratively Down (gray) icons in the **Health** column. In the example, the Archive Node named DC1-ARC1 is disconnected.

Name	Site	Type	Has ADC	Health	Decommission Possible
DC1-ADM1-105-230	Data Center 1	Admin Node	-		No, primary Admin Node decommissioning is not supported.
DC1-ARC1-105-237	Data Center 1	Archive Node	-		✓
DC1-G1-105-231	Data Center 1	API Gateway Node	-		No, at least one grid node is disconnected.

Before decommissioning any disconnected node, note the following:

- This procedure is primarily intended for removing a single disconnected node. If your grid contains multiple disconnected nodes, the software requires you to decommission them all at the same time, which increases the potential for unexpected results.

  Data loss might occur if you decommission more than one disconnected Storage Node at a time. See Considerations for disconnected Storage Nodes.

  Use caution when you decommission Storage Nodes in a grid containing software-based metadata-only nodes. If you decommission all nodes configured to store *both* objects and metadata, the ability to store objects is removed from the grid. See Types of Storage Nodes for more information about metadata-only Storage Nodes.

- If a disconnected node can't be removed (for example, a Storage Node that is required for the ADC quorum), no other disconnected node can be removed.

Steps

1. Unless you are decommissioning an Archive Node (which must be disconnected), attempt to bring any disconnected grid nodes back online or recover them.

   See Grid node recovery procedures for instructions.

2. If you are unable to recover a disconnected grid node and you want to decommission it while it is disconnected, select the checkbox for that node.

   If your grid contains multiple disconnected nodes, the software requires you to decommission them all at the same time, which increases the potential for unexpected results.

> Be careful when choosing to decommission more than one disconnected grid node at a time, especially if you are selecting multiple disconnected Storage Nodes. If you have more than one disconnected Storage Node that you can't recover, contact technical support to determine the best course of action.

3. Enter the provisioning passphrase.

   The **Start Decommission** button is enabled.

4. Click **Start Decommission**.

   A warning appears, indicating that you have selected a disconnected node and that object data will be lost if the node has the only copy of an object.

5. Review the list of nodes, and click **OK**.

   The decommission procedure starts, and the progress is displayed for each node. During the procedure, a new Recovery Package is generated containing the grid configuration change.

6. As soon as the new Recovery Package is available, click the link or select **MAINTENANCE** > **System** > **Recovery package** to access the Recovery Package page. Then, download the `.zip` file.

   See the instructions for downloading the Recovery Package.

   > Download the Recovery Package as soon as possible to ensure you can recover your grid if something goes wrong during the decommission procedure.

   > The Recovery Package file must be secured because it contains encryption keys and passwords that can be used to obtain data from the StorageGRID system.

7. Periodically monitor the Decommission page to ensure that all selected nodes are decommissioned successfully.

   Storage Nodes can take days or weeks to decommission. When all tasks are complete, the node selection list is redisplayed with a success message. If you decommissioned a disconnected Storage Node, an information message indicates that the repair jobs have been started.

8. After the nodes have shut down automatically as part of the decommission procedure, remove any remaining virtual machines or other resources that are associated with the decommissioned node.

   > Don't perform this step until the nodes have shut down automatically.

9. If you are decommissioning a Storage Node, monitor the status of the **replicated data** and **erasure-coded (EC) data** repair jobs that are automatically started during the decommissioning process.

Replicated data

- To get an estimated percent completion for the replicated repair, add the `show-replicated-repair-status` option to the repair-data command.

  ```
  repair-data show-replicated-repair-status
  ```

- To determine if repairs are complete:
  1. Select **NODES** > ***Storage Node being repaired*** > **ILM**.
  2. Review the attributes in the Evaluation section. When repairs are complete, the **Awaiting - All** attribute indicates 0 objects.
- To monitor the repair in more detail:
  1. Select **SUPPORT** > **Tools** > **Grid topology**.
  2. Select ***grid*** > ***Storage Node being repaired*** > **LDR** > **Data Store**.
  3. Use a combination of the following attributes to determine, as well as possible, if replicated repairs are complete.

     Cassandra inconsistencies might be present, and failed repairs aren't tracked.

     - **Repairs Attempted (XRPA)**: Use this attribute to track the progress of replicated repairs. This attribute increases each time a Storage Node tries to repair a high-risk object. When this attribute does not increase for a period longer than the current scan period (provided by the **Scan Period — Estimated** attribute), it means that ILM scanning found no high-risk objects that need to be repaired on any nodes.

       High-risk objects are objects that are at risk of being completely lost. This does not include objects that don't satisfy their ILM configuration.

     - **Scan Period — Estimated (XSCM)**: Use this attribute to estimate when a policy change will be applied to previously ingested objects. If the **Repairs Attempted** attribute does not increase for a period longer than the current scan period, it is probable that replicated repairs are done. Note that the scan period can change. The **Scan Period — Estimated (XSCM)** attribute applies to the entire grid and is the maximum of all node scan periods. You can query the **Scan Period — Estimated** attribute history for the grid to determine an appropriate time frame.

Erasure-coded (EC) data

To monitor the repair of erasure-coded data and retry any requests that might have failed:

1. Determine the status of erasure-coded data repairs:
   - Select **SUPPORT** > **Tools** > **Metrics** to view the estimated time to completion and the completion percentage for the current job. Then, select **EC Overview** in the Grafana section. Look at the **Grid EC Job Estimated Time to Completion** and **Grid EC Job Percentage Completed** dashboards.
   - Use this command to see the status of a specific `repair-data` operation:

     ```
     repair-data show-ec-repair-status --repair-id repair ID
     ```

   - Use this command to list all repairs:

```
repair-data show-ec-repair-status
```

The output lists information, including `repair ID`, for all previously and currently running repairs.

2. If the output shows that the repair operation failed, use the `--repair-id` option to retry the repair.

   This command retries a failed node repair, using the repair ID 6949309319275667690:

   ```
   repair-data start-ec-node-repair --repair-id 6949309319275667690
   ```

   This command retries a failed volume repair, using the repair ID 6949309319275667690:

   ```
   repair-data start-ec-volume-repair --repair-id 6949309319275667690
   ```

After you finish

As soon as the disconnected nodes have been decommissioned and all data repair jobs have been completed, you can decommission any connected grid nodes as required.

Then, complete these steps after you complete the decommission procedure:

- Ensure that the drives of the decommissioned grid node are wiped clean. Use a commercially available data wiping tool or service to permanently and securely remove data from the drives.
- If you decommissioned an appliance node and the data on the appliance was protected using node encryption, use the StorageGRID Appliance Installer to clear the key management server configuration (Clear KMS). You must clear the KMS configuration if you want to add the appliance to another grid. For instructions, see Monitor node encryption in maintenance mode.

Decommission connected grid nodes

You can decommission and permanently remove nodes that are connected to the grid.

Before you begin

- You understand the considerations for decommissioning Admin, Gateway, and Archive Nodes and the considerations for decommissioning Storage Nodes.
- You have gathered all required materials.
- You have ensured that no data repair jobs are active.
- You have confirmed that Storage Node recovery is not in progress anywhere in the grid. If it is, wait until any Cassandra rebuild performed as part of the recovery is complete. You can then proceed with decommissioning.
- You have ensured that other maintenance procedures will not be run while the node decommission procedure is running, unless the node decommission procedure is paused.
- You have the provisioning passphrase.
- Grid nodes are connected.
- The **Decommission Possible** column for the node or nodes you want to decommission includes a green check mark.

The decommission will not start if one or more volumes are offline (unmounted) or if they are online (mounted) but in an error state.

If one or more volumes go offline while a decommission is in progress, the decommission process completes after these volumes have come back online.

- All grid nodes have Normal (green) health . If you see one of these icons in the **Health** column, you must try to resolve the issue:

Icon	Color	Severity
	Yellow	Notice
	Light orange	Minor
	Dark orange	Major
	Red	Critical

- If you previously decommissioned a disconnected Storage Node, the data repair jobs have all completed successfully. See Check data repair jobs.

Don’t remove a grid node’s virtual machine or other resources until instructed to do so in this procedure.

Use caution when you decommission Storage Nodes in a grid containing software-based metadata-only nodes. If you decommission all nodes configured to store *both* objects and metadata, the ability to store objects is removed from the grid. See Types of Storage Nodes for more information about metadata-only Storage Nodes.

About this task

When a node is decommissioned, its services are disabled and the node automatically shut down.

Steps

1. From the Decommission Nodes page, select the checkbox for each grid node you want to decommission.
2. Enter the provisioning passphrase.

   The **Start Decommission** button is enabled.

3. Select **Start Decommission**.
4. Review the list of nodes in the confirmation dialog, and select **OK**.

   The node decommission procedure starts, and the progress is displayed for each node.

Don’t take a Storage Node offline after the decommission procedure has started. Changing the state might result in some content not being copied to other locations.

5. As soon as the new Recovery Package is available, select the Recovery Package link in the banner or select **MAINTENANCE** > **System** > **Recovery package** to access the Recovery Package page. Then, download the `.zip` file.

   See downloading the Recovery Package.

   Download the Recovery Package as soon as possible to ensure you can recover your grid if something goes wrong during the decommission procedure.

6. Periodically monitor the Decommission Nodes page to ensure that all selected nodes are decommissioned successfully.

   Storage Nodes can take days or weeks to decommission.

   When all tasks are complete, the node selection list is redisplayed with a success message.

After you finish

Complete these steps after you complete the node decommission procedure:

1. Follow the appropriate step for your platform. For example:
   - **Linux**: You might want to detach the volumes and delete the node configuration files you created during installation. See Install StorageGRID on Red Hat Enterprise Linux and Install StorageGRID on Ubuntu or Debian.
   - **VMware**: You might want to use the vCenter "Delete from Disk" option to delete the virtual machine. You might also need to delete any data disks that are independent of the virtual machine.
   - **StorageGRID appliance**: The appliance node automatically reverts to an undeployed state where you can access the StorageGRID Appliance Installer. You can power off the appliance or add it to another StorageGRID system.
2. Ensure that the drives of the decommissioned grid node are wiped clean. Use a commercially available data wiping tool or service to permanently and securely remove data from the drives.
3. If you decommissioned an appliance node and the data on the appliance was protected using node encryption, use the StorageGRID Appliance Installer to clear the key management server configuration (Clear KMS). You must clear the KMS configuration if you want to add the appliance to another grid. For instructions, see Monitor node encryption in maintenance mode.

Pause and resume decommission process for Storage Nodes

If you need to perform a second maintenance procedure, you can pause the decommission procedure for a Storage Node during certain stages. After the other procedure is finished, you can resume decommissioning.

The **Pause** button is enabled only when the ILM evaluation or erasure-coded data decommissioning stages are reached; however, ILM evaluation (data migration) will continue to run in the background.

Before you begin

- You are signed in to the Grid Manager using a supported web browser.
- You have the Maintenance or Root access permission.

Steps

1. Select **MAINTENANCE** > **Tasks** > **Decommission**.

   The Decommission page appears.

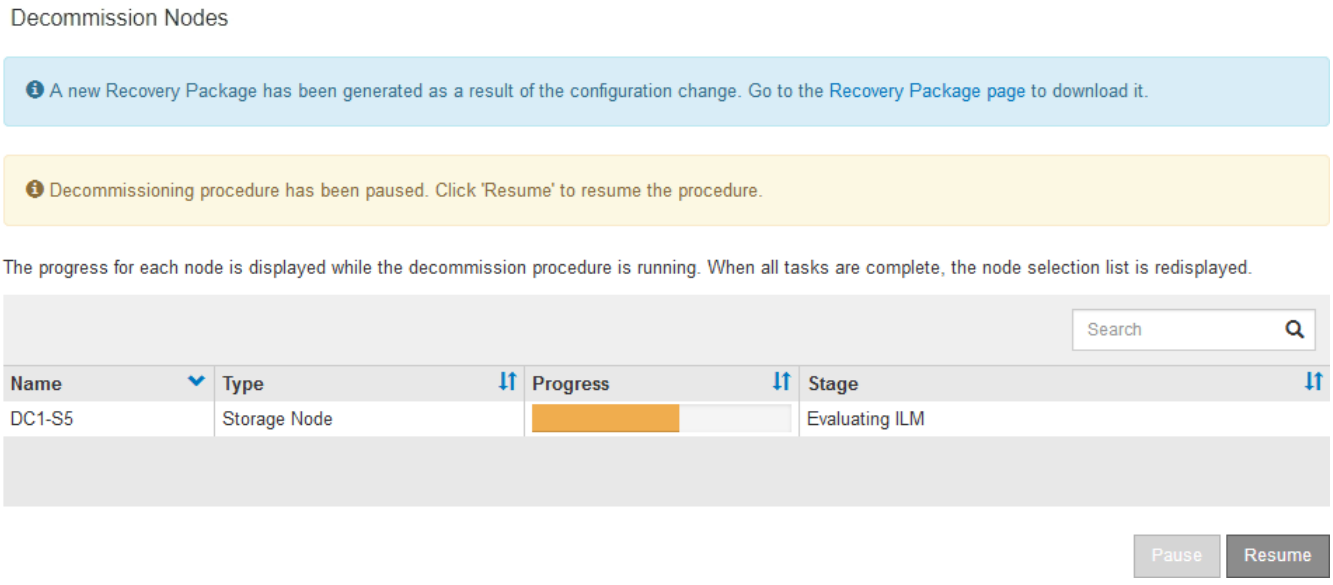
2. Select **Decommission Nodes**.

   The Decommission Nodes page appears. When the decommission procedure reaches either of the following stages, the **Pause** button is enabled.

   - Evaluating ILM
   - Decommissioning Erasure-Coded Data

3. Select **Pause** to suspend the procedure.

   The current stage is paused, and the **Resume** button is enabled.



4. After the other maintenance procedure is finished, select **Resume** to proceed with the decommission.

Troubleshoot node decommissioning

If the node decommission procedure stops because of an error, you can take specific steps to troubleshoot the problem.

Before you begin

You are signed in to the Grid Manager using a supported web browser.

About this task

If you shut down the grid node being decommissioned, the task stops until the grid node is restarted. The grid node must be online.

Steps

1. Select **SUPPORT** > **Tools** > **Grid topology**.
2. In the Grid Topology tree, expand each Storage Node entry, and verify that the DDS and LDR services are both online.

   To perform Storage Node decommissioning, all nodes and all services need to be healthy at the start of an online node/site decommissioning.

3. To view the active grid tasks, select **primary Admin Node** > **CMN** > **Grid Tasks** > **Overview**.
4. Check the status of the decommissioning grid task.
   a. If the status of the decommissioning grid task indicates a problem with saving grid task bundles, select **primary Admin Node** > **CMN** > **Events** > **Overview**.
   b. Check the number of Available Audit Relays.

      If the attribute Available Audit Relay is one or greater, the CMN service is connected to at least one ADC service. ADC services act as Audit Relays.

      The CMN service must be connected to at least one ADC service and a majority (50 percent plus one) of the StorageGRID system's ADC services must be available in order for a grid task to move from one stage of decommissioning to another and finish.

   c. If the CMN service is not connected to enough ADC services, ensure that Storage Nodes are online, and check network connectivity between the primary Admin Node and Storage Nodes.

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