



Decommission nodes or site

StorageGRID

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Decommission nodes or site

Decommission procedure: Overview

You can perform a decommission procedure to permanently remove grid nodes or an entire site from the StorageGRID system.

To remove a grid node or a site, you perform one of the following decommission procedures:

- Perform a [grid node decommission](#) to remove one or more nodes, which can be at one or more sites. The nodes you remove can be online and connected to the StorageGRID system, or they can be offline and disconnected.
- Perform a [site decommission](#) to remove a site. You perform a **connected site decommission** if all nodes are connected to StorageGRID. You perform a **disconnected site decommission** if all nodes are disconnected from StorageGRID. If the site contains a mixture of connected and disconnected nodes, you must bring all offline nodes back online.



Before performing a disconnected site decommission, contact your NetApp account representative. NetApp will review your requirements before enabling all steps in the Decommission Site wizard. You should not attempt a disconnected site decommission if you believe it might be possible to recover the site or to recover object data from the site.

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: $((0.5 * \text{Storage Nodes with ADC}) + 1)$

 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	<p>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?</p> <p>Will there be enough capacity to handle the anticipated growth in stored object data for a reasonable interval of time after decommissioning is complete?</p>
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	<p>Will there be enough storage of the appropriate type after decommissioning is complete?</p> <p>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.</p>

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.

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	2022-08-17T21:37:37.328998	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 (<code>sgws-recovery-package-id-revision.zip</code>). 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 <code>Passwords.txt</code> 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.
<input type="checkbox"/> 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.
<input type="checkbox"/> 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
<p>No, at least one grid node is disconnected.</p> <p>Note: This message is shown for connected grid nodes only.</p>	<p>You can't decommission a connected grid node if any grid node is disconnected.</p> <p>The Health column includes one of these icons for grid nodes that are disconnected:</p> <ul style="list-style-type: none"> •  (gray): Administratively Down •  (blue): Unknown 	<p>You must bring all disconnected nodes back online or decommission all disconnected nodes before you can remove a connected node.</p> <p>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.</p>
<p>No, one or more required nodes is currently disconnected and must be recovered.</p> <p>Note: This message is shown for disconnected grid nodes only.</p>	<p>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).</p>	<ol style="list-style-type: none"> Review the Decommission Possible messages for all disconnected nodes. Determine which nodes can't be decommissioned because they are required. <ul style="list-style-type: none"> • 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.
<p>No, member of HA group(s): <i>group name</i>. Before you can decommission this node, you must remove it from all HA groups.</p>	<p>You can't decommission an Admin Node or a Gateway Node if a node interface belongs to a high availability (HA) group.</p>	<p>Edit the HA group to remove the node's interface or remove the entire HA group. See Configure high availability groups.</p>
<p>No, site x requires a minimum of <i>n</i> Storage Nodes with ADC services.</p>	<p>Storage Nodes only. You can't decommission a Storage Node if insufficient nodes would remain at the site to support ADC quorum requirements.</p>	<p>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.</p>

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.	<p>Storage Nodes only. You can't decommission a Storage Node unless enough nodes would remain for the existing erasure-coding profiles.</p> <p>For example, if an erasure-coding profile exists for 4+2 erasure coding, at least 6 Storage Nodes must remain.</p>	<p>For each affected erasure-coding profile, perform one of the following steps, based on how the profile is being used:</p> <ul style="list-style-type: none"> • 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. <p>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.</p> <p>Learn about deactivating an erasure-coding profile.</p>
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.
<input type="checkbox"/> 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.

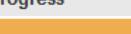
The current stage is paused, and the **Resume** button is enabled.

Decommission Nodes

! A new Recovery Package has been generated as a result of the configuration change. Go to the [Recovery Package page](#) to download it.

! Decommissioning procedure has been paused. Click 'Resume' to resume the procedure.

The progress for each node is displayed while the decommission procedure is running. When all tasks are complete, the node selection list is redisplayed.

						Search 
Name	Type	Progress	Stage			
DC1-S5	Storage Node		Evaluating ILM			

Pause **Resume**

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.

Decommission site

Considerations for removing a site

Before using the site decommission procedure to remove a site, you must review the considerations.

What happens when you decommission a site

When you decommission a site, StorageGRID permanently removes all nodes at the site and the site itself from the StorageGRID system.

When the site decommission procedure is complete:

- You can no longer use StorageGRID to view or access the site or any of the nodes at the site.
- You can no longer use any storage pools or erasure-coding profiles that referred to the site. When StorageGRID decommissions a site, it automatically removes these storage pools and deactivates these erasure-coding profiles.

Differences between connected site and disconnected site decommission procedures

You can use the site decommission procedure to remove a site in which all nodes are connected to StorageGRID (referred to as a connected site decommission) or to remove a site in which all nodes are disconnected from StorageGRID (referred to as a disconnected site decommission). Before you begin, you must understand the differences between these procedures.



If a site contains a mixture of connected (✓) and disconnected nodes (🕒 or ✅), you must bring all offline nodes back online.

- A connected site decommission allows you to remove an operational site from the StorageGRID system. For example, you can perform a connected site decommission to remove a site that is functional but no longer needed.

- When StorageGRID removes a connected site, it uses ILM to manage the object data at the site. Before you can start a connected site decommission, you must remove the site from all ILM rules and activate a new ILM policy. The ILM processes to migrate object data and the internal processes to remove a site can occur at the same time, but the best practice is to allow the ILM steps to complete before you start the actual decommission procedure.
- A disconnected site decommission allows you to remove a failed site from the StorageGRID system. For example, you can perform a disconnected site decommission to remove a site that has been destroyed by a fire or flood.

When StorageGRID removes a disconnected site, it considers all nodes to be unrecoverable and makes no attempt to preserve data. However, before you can start a disconnected site decommission, you must remove the site from all ILM rules and activate a new ILM policy.



Before performing a disconnected site decommission procedure, you must contact your NetApp account representative. NetApp will review your requirements before enabling all steps in the Decommission Site wizard. You should not attempt a disconnected site decommission if you believe it might be possible to recover the site or to recover object data from the site.

General requirements for removing a connected or a disconnected site

Before removing a connected or disconnected site, you must be aware of the following requirements:

- You can't decommission a site that includes the primary Admin Node.
- You can't decommission a site that includes an Archive Node.
- You can't decommission a site if any of the nodes have an interface that belongs to a high availability (HA) group. You must either edit the HA group to remove the node's interface or remove the entire HA group.
- You can't decommission a site if it contains a mixture of connected (✓) and disconnected (🔗 or 🔒) nodes.
- You can't decommission a site if any node at any other site is disconnected (🔗 or 🔒).
- You can't start the site decommission procedure if an ec-node-repair operation is in progress. See [Check data repair jobs](#) to track repairs of erasure-coded data.
- While the site decommission procedure is running:
 - You can't create ILM rules that refer to the site being decommissioned. You also can't edit an existing ILM rule to refer to the site.
 - You can't perform other maintenance procedures, such as expansion or upgrade.



If you need to perform another maintenance procedure during a connected site decommission, you can [pause the procedure while the Storage Nodes are being removed](#). 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. After the second maintenance procedure is complete, you can resume decommissioning.

- If you need to recover any node after starting the site decommission procedure, you must contact support.
- You can't decommission more than one site at a time.

- If the site includes one or more Admin Nodes and single sign-on (SSO) is enabled for your StorageGRID system, you must remove all relying party trusts for the site from Active Directory Federation Services (AD FS).

Requirements for information lifecycle management (ILM)

As part of removing a site, you must update your ILM configuration. The Decommission Site wizard guides you through a number of prerequisite steps to ensure the following:

- The site is not referred to by any ILM policy. If it is, you must edit the policies or create and activate policies with new ILM rules.
- No ILM rules refer to the site, even if those rules aren't used in any policy. You must delete or edit all rules that refer to the site.

When StorageGRID decommissions the site, it will automatically deactivate any unused erasure-coding profiles that refer to the site, and it will automatically delete any unused storage pools that refer to the site. If the All Storage Nodes storage pool exists (StorageGRID 11.6 and earlier), it is removed because it uses all sites.

 Before you can remove a site, you might be required to create new ILM rules and activate a new ILM policy. These instructions assume that you have a good understanding of how ILM works and that you are familiar with creating storage pools, erasure-coding profiles, ILM rules, and simulating and activating an ILM policy. See [Manage objects with ILM](#).

Considerations for the object data at a connected site

If you are performing a connected site decommission, you must decide what to do with existing object data at the site when you create new ILM rules and a new ILM policy. You can do either or both of the following:

- Move object data from the selected site to one or more other sites in your grid.

Example for moving data: Suppose you want to decommission a site in Raleigh because you added a new site in Sunnyvale. In this example, you want to move all object data from the old site to the new site. Before updating your ILM rules and ILM policies, you must review the capacity at both sites. You must ensure that the Sunnyvale site has enough capacity to accommodate the object data from the Raleigh site and that adequate capacity will remain in Sunnyvale for future growth.



To ensure that adequate capacity is available, you might need to [expand a grid](#) by adding storage volumes or Storage Nodes to an existing site or adding a new site before you perform this procedure.

- Delete object copies from the selected site.

Example for deleting data: Suppose you currently use a 3-copy ILM rule to replicate object data across three sites. Before decommissioning a site, you can create an equivalent 2-copy ILM rule to store data at only two sites. When you activate a new ILM policy that uses the 2-copy rule, StorageGRID deletes the copies from the third site because they no longer satisfy ILM requirements. However, the object data will still be protected and the capacity of the two remaining sites will stay the same.



Never create a single-copy ILM rule to accommodate the removal of a site. An ILM rule that creates only one replicated copy for any time period puts data at risk of permanent loss. If only one replicated copy of an object exists, that object is lost if a Storage Node fails or has a significant error. You also temporarily lose access to the object during maintenance procedures such as upgrades.

Additional requirements for a connected site decommission

Before StorageGRID can remove a connected site, you must ensure the following:

- All nodes in your StorageGRID system must have a Connection State of **Connected** (✓); however, the nodes can have active alerts.



You can complete Steps 1-4 of the Decommission Site wizard if one or more nodes are disconnected. However, you can't complete Step 5 of the wizard, which starts the decommission process, unless all nodes are connected.

- If the site you plan to remove contains a Gateway Node or an Admin Node that is used for load balancing, you might need to [expand a grid](#) to add an equivalent new node at another site. Be sure clients can connect to the replacement node before starting the site decommission procedure.
- If the site you plan to remove contains any Gateway Node or Admin Nodes that are in an high availability (HA) group, you can complete Steps 1-4 of the Decommission Site wizard. However, you can't complete Step 5 of the wizard, which starts the decommission process, until you remove these nodes from all HA groups. If existing clients connect to an HA group that includes nodes from the site, you must ensure they can continue to connect to StorageGRID after the site is removed.
- If clients connect directly to Storage Nodes at the site you are planning to remove, you must ensure that they can connect to Storage Nodes at other sites before starting the site decommission procedure.
- You must provide sufficient space on the remaining sites to accommodate any object data that will be moved because of changes to any active ILM policy. In some cases, you might need to [expand a grid](#) by adding Storage Nodes, storage volumes, or new sites before you can complete a connected site decommission.
- You must allow adequate time for the decommission procedure to complete. StorageGRID ILM processes might take days, weeks, or even months to move or delete object data from the site before the site can be decommissioned.



Moving or deleting object data from a site might take days, weeks, or even months, depending on the amount of data at the site, the load on your system, network latencies, and the nature of the required ILM changes.

- Whenever possible, you should complete Steps 1-4 of the Decommission Site wizard as early as you can. The decommission procedure will complete more quickly and with fewer disruptions and performance impacts if you allow data to be moved from the site before starting the actual decommission procedure (by selecting **Start Decommission** in Step 5 of the wizard).

Additional requirements for a disconnected site decommission

Before StorageGRID can remove a disconnected site, you must ensure the following:

- You have contacted your NetApp account representative. NetApp will review your requirements before enabling all steps in the Decommission Site wizard.



You should not attempt a disconnected site decommission if you believe it might be possible to recover the site or to recover any object data from the site. See [How technical support recovers a site](#).

- All nodes at the site must have a Connection State of one of the following:
 - **Unknown** (🔗): For an unknown reason, a node is disconnected or services on the node are unexpectedly down. For example, a service on the node might be stopped, or the node might have lost its network connection because of a power failure or unexpected outage.
 - **Administratively Down** (🔴): The node is not connected to the grid for an expected reason. For example, the node or services on the node have been gracefully shut down.
- All nodes at all other sites must have a Connection State of **Connected** (✓); however, these other nodes can have active alerts.
- You must understand that you will no longer be able to use StorageGRID to view or retrieve any object data that was stored at the site. When StorageGRID performs this procedure, it makes no attempt to preserve any data from the disconnected site.



If your ILM rules and policy were designed to protect against the loss of a single site, copies of your objects still exist on the remaining sites.

- You must understand that if the site contained the only copy of an object, the object is lost and can't be retrieved.

Considerations for consistency when you remove a site

The consistency for an S3 bucket or Swift container determines whether StorageGRID fully replicates object metadata to all nodes and sites before telling a client that object ingest was successful. Consistency provides a balance between the availability of the objects and the consistency of those objects across different Storage Nodes and sites.

When StorageGRID removes a site, it needs to ensure that no data is written to the site being removed. As a result, it temporarily overrides the consistency for each bucket or container. After you start the site decommission process, StorageGRID temporarily uses strong-site consistency to prevent object metadata from being written to the site being removed.

As a result of this temporary override, be aware that any client write, update, and delete operations that occur during a site decommission can fail if multiple nodes become unavailable at the remaining sites.

Gather required materials

Before you decommission a site, you must obtain the following materials.

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. Download the Recovery Package

Item	Notes
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](#)

Step 1: Select Site

To determine if a site can be decommissioned, start by accessing the Decommission Site wizard.

Before you begin

- You have obtained all required materials.
- You have reviewed the considerations for removing a site.
- You are signed in to the Grid Manager using a [supported web browser](#).
- You have the [Root access permission or the Maintenance and ILM permissions](#).

Steps

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

Step 1 (Select Site) of the Decommission Site wizard appears. This step includes an alphabetic list of the sites in your StorageGRID system.

Decommission Site



When you decommission a site, all nodes at the site and the site itself are permanently removed from the StorageGRID system.

Review the table for the site you want to remove. If Decommission Possible is Yes, select the site. Then, select **Next** to ensure that the site is not referred to by ILM and that all StorageGRID nodes are in the correct state.

You might not be able to remove certain sites. For example, you cannot decommission the site that contains the primary Admin Node or a site that contains an Archive Node.

Sites

	Site Name	Used Storage Capacity <small>?</small>	Decommission Possible
<input type="radio"/>	Raleigh	3.93 MB	<input checked="" type="checkbox"/>
<input type="radio"/>	Sunnyvale	3.97 MB	<input checked="" type="checkbox"/>
	Vancouver	3.90 MB	No. This site contains the primary Admin Node.

Next

3. View the values in the **Used Storage Capacity** column to determine how much storage is currently being used for object data at each site.

The Used Storage Capacity is an estimate. If nodes are offline, the Used Storage Capacity is the last known value for the site.

- For a connected site decommission, this value represents how much object data will need to be moved to other sites or deleted by ILM before you can safely decommission this site.
- For a disconnected site decommission, this value represents how much of your system's data storage will become inaccessible when you decommission this site.



If your ILM policy was designed to protect against the loss of a single site, copies of your object data should still exist on the remaining sites.

4. Review the reasons in the **Decommission Possible** column to determine which sites can be decommissioned currently.



If there is more than one reason a site can't be decommissioned, the most critical reason is shown.

Decommission Possible reason	Description	Next step
Green check mark (✓)	You can decommission this site.	Go to the next step .
No. This site contains the primary Admin Node.	You can't decommission a site containing the primary Admin Node.	None. You can't perform this procedure.

Decommission Possible reason	Description	Next step
No. This site contains one or more Archive Nodes.	You can't decommission a site containing an Archive Node.	None. You can't perform this procedure.
No. All nodes at this site are disconnected. Contact your NetApp account representative.	You can't perform a connected site decommission unless every node in the site is connected ().	If you want to perform a disconnected site decommission, you must contact your NetApp account representative, who will review your requirements and enable the rest of the Decommission Site wizard. IMPORTANT: Never take online nodes offline so that you can remove a site. You will lose data.

The example shows a StorageGRID system with three sites. The green check mark () for the Raleigh and Sunnyvale sites indicates that you can decommission those sites. However, you can't decommission the Vancouver site because it contains the primary Admin Node.

5. If decommission is possible, select the radio button for the site.

The **Next** button is enabled.

6. Select **Next**.

Step 2 (View Details) appears.

Step 2: View Details

From Step 2 (View Details) of the Decommission Site wizard, you can review which nodes are included at the site, see how much space has been used on each Storage Node, and assess how much free space is available at the other sites in your grid.

Before you begin

Before decommissioning a site, you must review how much object data exists at the site.

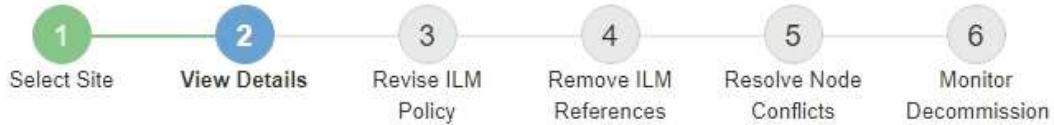
- If you are performing a connected site decommission, you must understand how much object data currently exists at the site before updating ILM. Based on site capacities and your data protection needs, you can create new ILM rules to move data to other sites or to delete object data from the site.
- Perform any required Storage Node expansions before starting the decommission procedure if possible.
- If you are performing a disconnected site decommission, you must understand how much object data will become permanently inaccessible when you remove the site.

 If you are performing a disconnected site decommission, ILM can't move or delete object data. Any data that remains at the site will be lost. However, if your ILM policy was designed to protect against the loss of a single site, copies of your object data still exist on the remaining sites. See [Enable site-loss protection](#).

Steps

1. From Step 2 (View Details), review any warnings related to the site you selected to remove.

Decommission Site



Data Center 2 Details

⚠ This site includes a Gateway Node. If clients are currently connecting to this node, you must configure an equivalent node at another site. Be sure clients can connect to the replacement node before starting the decommission procedure.

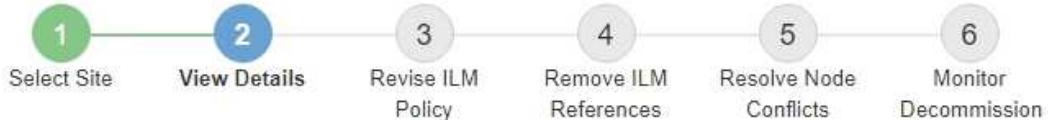
⚠ This site contains a mixture of connected and disconnected nodes. Before you can remove this site, you must bring all offline (blue or gray) nodes back online. Contact technical support if you need assistance.

A warning appears in these cases:

- The site includes a Gateway Node. If S3 and Swift clients are currently connecting to this node, you must configure an equivalent node at another site. Be sure clients can connect to the replacement node before continuing with the decommission procedure.
- The site contains a mixture of connected (✓) and disconnected nodes (🌙 or ⚡). Before you can remove this site, you must bring all offline nodes back online.

2. Review details about the site you selected to remove.

Decommission Site



Raleigh Details

Number of Nodes: 3 Free Space: 475.38 GB
Used Space: 3.93 MB Site Capacity: 475.38 GB

Node Name	Node Type	Connection State	Details
RAL-S1-101-196	Storage Node	✓	1.30 MB used space
RAL-S2-101-197	Storage Node	✓	1.30 MB used space
RAL-S3-101-198	Storage Node	✓	1.34 MB used space

Details for Other Sites

Total Free Space for Other Sites: 950.76 GB
Total Capacity for Other Sites: 950.77 GB

Site Name	Free Space	Used Space	Site Capacity
Sunnyvale	475.38 GB	3.97 MB	475.38 GB
Vancouver	475.38 GB	3.90 MB	475.38 GB
Total	950.76 GB	7.87 MB	950.77 GB

[Previous](#)

[Next](#)

The following information is included for the selected site:

- Number of nodes
- The total used space, free space, and capacity of all Storage Nodes in the site.
 - For a connected site decommission, the **Used Space** value represents how much object data must be moved to other sites or deleted with ILM.
 - For a disconnected site decommission, the **Used Space** value indicates how much object data will become inaccessible when you remove the site.
- Node names, types, and connection states:
 - (Connected)
 - (Administratively Down)
 - (Unknown)
- Details about each node:
 - For each Storage Node, the amount of space that has been used for object data.

- For Admin Nodes and Gateway Nodes, whether the node is currently used in a high availability (HA) group. You can't decommission an Admin Node or a Gateway Node that is used in an HA group. Before you start the decommission, edit HA groups to remove all nodes at the site or remove the HA group if it only includes nodes from this site. For instructions, see [Manage high availability \(HA\) groups](#).

3. In the Details for Other Sites section of the page, assess how much space is available at the other sites in your grid.

Details for Other Sites

Total Free Space for Other Sites: 950.76 GB

Total Capacity for Other Sites: 950.77 GB

Site Name	Free Space 	Used Space 	Site Capacity 
Sunnyvale	475.38 GB	3.97 MB	475.38 GB
Vancouver	475.38 GB	3.90 MB	475.38 GB
Total	950.76 GB	7.87 MB	950.77 GB

If you are performing a connected site decommission and you plan to use ILM to move object data from the selected site (instead of just deleting it), you must ensure that the other sites have enough capacity to accommodate the moved data and that adequate capacity remains for future growth.



A warning appears if the **Used Space** for the site you want to remove is greater than the **Total Free Space for Other Sites**. To ensure that adequate storage capacity is available after the site is removed, you might need to perform an expansion before performing this procedure.

4. Select **Next**.

Step 3 (Revise ILM Policy) appears.

Step 3: Revise ILM Policies

From Step 3 (Revise ILM Policies) of the Decommission Site wizard, you can determine if the site is referred to by any ILM policy.

Before you begin

You have a good understanding of how to [manage objects with ILM](#). You are familiar with creating storage pools and ILM rules and with simulating and activating an ILM policy.

About this task

StorageGRID can't decommission a site if any ILM rule in any policy (active or inactive) references that site.

If any ILM policy refers to the site you want to decommission, you must remove those policies or edit them so that they meet these requirements:

- Fully protect all object data.
- Don't refer to the site you're decommissioning.
- Don't use storage pools that refer to the site or use the All Sites option.

- Don't use erasure-coding profiles that refer to the site.
- Don't use the Make 2 Copies rule from StorageGRID 11.6 or earlier installations.

 Never create a single-copy ILM rule to accommodate the removal of a site. An ILM rule that creates only one replicated copy for any time period puts data at risk of permanent loss. If only one replicated copy of an object exists, that object is lost if a Storage Node fails or has a significant error. You also temporarily lose access to the object during maintenance procedures such as upgrades.

 If you're performing a *connected site decommission*, you must consider how StorageGRID should manage the object data currently at the site you want to remove. Depending on your data protection requirements, new rules can move existing object data to different sites or they can delete any extra object copies that are no longer needed.

Contact technical support if you need assistance designing a new policy.

Steps

1. From Step 3 (Revise ILM Policies), determine if any ILM policies refer to the site you selected to decommission.
2. If no policies are listed, select **Next** to go to [Step 4: Remove ILM References](#).
3. If one or more *active* ILM policies are listed, clone each existing policy or create new policies that don't reference the site being decommissioned:
 - a. Select the link for the policy in the Policy Name column.

The ILM policy details page for the policy appears in a new browser tab. The Decommission Site page will remain open on the other tab.

- b. Follow these guidelines and instructions as needed:

- Work with ILM rules:
 - [Create one or more storage pools](#) that don't refer to the site.
 - [Edit or replace rules](#) that refer to the site.



Don't select the **Make 2 Copies** rule because that rule uses the **All Storage Nodes** storage pool, which is not allowed.

- Work with ILM policies:
 - [Clone an existing ILM policy](#) or [create a new ILM policy](#).
 - Ensure the default rule and other rules don't refer to the site.



You must confirm that the ILM rules are in the correct order. When the policy is activated, new and existing objects are evaluated by the rules in the order listed, starting at the top.

- c. Ingest test objects and simulate the policy to ensure that the correct rules are applied.



Errors in an ILM policy can cause unrecoverable data loss. Carefully review and simulate the policy before activating it to confirm that it will work as intended.



When you activate a new ILM policy, StorageGRID uses it to manage all objects, including existing objects and newly ingested objects. Before activating a new ILM policy, review any changes to the placement of existing replicated and erasure-coded objects. Changing an existing object's location might result in temporary resource issues when the new placements are evaluated and implemented.

- d. Activate the new policies and ensure the old policies are now inactive.

If you want to activate multiple policies, [follow the steps to create ILM policy tags](#).

If you are performing a connected site decommission, StorageGRID begins to remove object data from the selected site as soon as you activate the new ILM policy. Moving or deleting all object copies might take weeks. Although you can safely start a site decommission while object data still exists at the site, the decommission procedure will complete more quickly and with fewer disruptions and performance impacts if you allow data to be moved from the site before starting the actual decommission procedure (by selecting **Start Decommission** in Step 5 of the wizard).

4. For each *inactive* policy, edit or remove it by first selecting the link for each policy as described in the previous steps.
 - [Edit the policy](#) so it doesn't refer to the site to be decommissioned.
 - [Remove a policy](#).
5. When you finish making changes to ILM rules and policies, there should be no more policies listed in Step 3 (Revise ILM Policies). Select **Next**.

Step 4 (Remove ILM References) appears.

Step 4: Remove ILM References

From Step 4 (Remove ILM References) of the Decommission Site wizard, you must delete or edit any unused ILM rules that refer to the site, even if the rules are not used in any ILM policy.

Steps

1. Determine whether any unused ILM rules refer to the site.

If any ILM rules are listed, those rules still refer to the site but aren't used in any policy.



When StorageGRID decommissions the site, it will automatically deactivate any unused erasure-coding profiles that refer to the site, and it will automatically delete any unused storage pools that refer to the site. The All Storage Nodes storage pool (StorageGRID 11.6 and earlier) is removed because it uses the All Sites site.

2. Edit or delete each unused rule:

- To edit a rule, go the ILM rules page and update all placements that use an erasure-coding profile or storage pool that refers to the site. Then, return to **Step 4 (Remove ILM References)**.
- To delete a rule, select the trash can icon and select **OK**.



You must delete the **Make 2 Copies** rule before you can decommission a site.

3. Confirm that no unused ILM rules refer to the site, and the **Next** button is enabled.

4. Select **Next**.



Any remaining storage pools and erasure-coding profiles that refer to the site will become invalid when the site is removed. When StorageGRID decommissions the site, it will automatically deactivate any unused erasure-coding profiles that refer to the site, and it will automatically delete any unused storage pools that refer to the site. The All Storage Nodes storage pool (StorageGRID 11.6 and earlier) is removed because it uses the All Sites site.

Step 5 (Resolve Node Conflicts) appears.

Step 5: Resolve Node Conflicts (and start decommission)

From Step 5 (Resolve Node Conflicts) of the Decommission Site wizard, you can determine if any nodes in your StorageGRID system are disconnected or if any nodes at the selected site belong to a high availability (HA) group. After any node conflicts are resolved, you start the decommission procedure from this page.

Before you begin

You must ensure that all nodes in your StorageGRID system are in the correct state, as follows:

- All nodes in your StorageGRID system must be connected (✓).
 - If you are performing a disconnected site decommission, all nodes at the site you are removing must be disconnected, and all nodes at all other sites must be connected.
 - 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.
- No node at the site you are removing can have an interface that belongs to a high availability (HA) group.

About this task

If any node is listed for Step 5 (Resolve Node Conflicts), you must correct the issue before you can start the decommission.

Before starting the site decommission procedure from this page, review the following considerations:

- You must allow adequate time for the decommission procedure to complete.
 - Moving or deleting object data from a site might take days, weeks, or even months, depending on the amount of data at the site, the load on your system, network latencies, and the nature of the required ILM changes.
- While the site decommission procedure is running:
 - You can't create ILM rules that refer to the site being decommissioned. You also can't edit an existing

ILM rule to refer to the site.

- You can't perform other maintenance procedures, such as expansion or upgrade.



If you need to perform another maintenance procedure during a connected site decommission, you can pause the procedure while the Storage Nodes are being removed. The **Pause** button is enabled during the "Decommissioning Replicated and Erasure-Coded Data" stage.

- If you need to recover any node after starting the site decommission procedure, you must contact support.

Steps

1. Review the disconnected nodes section of Step 5 (Resolve Node Conflicts) to determine if any nodes in your StorageGRID system have a Connection State of Unknown (🌐) or Administratively Down (🌙).

Decommission Site



Before you can decommission the site, you must ensure the following:

- All nodes in your StorageGRID system are connected.

Note: If you are performing a disconnected site decommission, all nodes at the site you are removing must be disconnected.

- No node at the selected site belongs to a high availability (HA) group.

If a node is listed in either table, you must correct the issue before you can continue.

1 disconnected node in the grid			
Node Name	Connection State	Site	Type
DC1-S3-99-193 🌐	Administratively Down	Data Center 1	Storage Node

1 node in the selected site belongs to an HA group

Passphrase

Provisioning Passphrase

[Previous](#)

[Start Decommission](#)

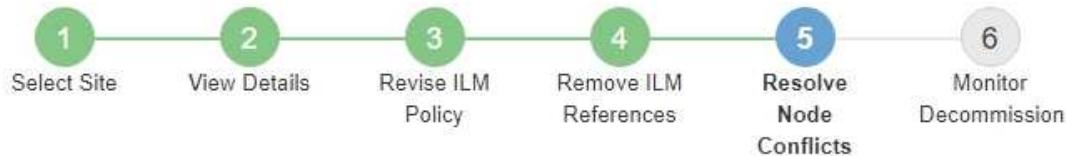
2. If any nodes are disconnected, bring them back online.

See the [Node procedures](#). Contact technical support if you need assistance.

3. When all disconnected nodes have been brought back online, review the HA groups section of Step 5 (Resolve Node Conflicts).

This table lists any nodes at the selected site that belong to a high availability (HA) group.

Decommission Site



Before you can decommission the site, you must ensure the following:

- All nodes in your StorageGRID system are connected.

Note: If you are performing a disconnected site decommission, all nodes at the site you are removing must be disconnected.

- No node at the selected site belongs to a high availability (HA) group.

If a node is listed in either table, you must correct the issue before you can continue.

All grid nodes are connected						
1 node in the selected site belongs to an HA group						
The following nodes in the selected site belong to a high availability (HA) group. You must either edit the HA group to remove the node's interface or remove the entire HA group. Go to HA Groups page						
For information about HA groups, see the instructions for administering StorageGRID						
<table border="1"><thead><tr><th>HA Group Name</th><th>Node Name</th><th>Node Type</th></tr></thead><tbody><tr><td>HA group</td><td>DC1-GW1-99-190</td><td>API Gateway Node</td></tr></tbody></table>	HA Group Name	Node Name	Node Type	HA group	DC1-GW1-99-190	API Gateway Node
HA Group Name	Node Name	Node Type				
HA group	DC1-GW1-99-190	API Gateway Node				

Passphrase

Provisioning Passphrase

[Previous](#)

[Start Decommission](#)

4. If any nodes are listed, do either of the following:

- Edit each affected HA group to remove the node interface.
- Remove an HA group that only includes nodes from this site. See the instructions for administering StorageGRID.

If all nodes are connected and no nodes in the selected site are used in an HA group, the **Provisioning Passphrase** field is enabled.

5. Enter the provisioning passphrase.

The **Start Decommission** button becomes enabled.

Decommission Site



Before you can decommission the site, you must ensure the following:

- All nodes in your StorageGRID system are connected.

Note: If you are performing a disconnected site decommission, all nodes at the site you are removing must be offline.

- No node at the selected site belongs to a high availability (HA) group.

If a node is listed in either table, you must correct the issue before you can continue.

All grid nodes are connected

No nodes in the selected site belong to an HA group

Passphrase

Provisioning Passphrase



.....

Previous

Start Decommission

6. If you are ready to start the site decommission procedure, select **Start Decommission**.

A warning lists the site and nodes that will be removed. You are reminded that it might take days, weeks, or even months to completely remove the site.

⚠ Warning

The following site and its nodes have been selected for decommissioning and will be permanently removed from the StorageGRID system:

Data Center 3

- DC3-S1
- DC3-S2
- DC3-S3

When StorageGRID removes a site, it temporarily uses strong-site consistency to prevent object metadata from being written to the site being removed. Client write and delete operations can fail if multiple nodes become unavailable at the remaining sites.

This procedure might take days, weeks, or even months to complete. Select **Maintenance > Decommission** to monitor the decommission progress.

Do you want to continue?

Cancel **OK**

7. Review the warning. If you are ready to begin, select **OK**.

A message appears as the new grid configuration is generated. This process might take some time, depending on the type and number of decommissioned grid nodes.

Passphrase

Provisioning Passphrase 

.....

 Generating grid configuration. This may take some time depending on the type and the number of decommissioned grid nodes.

Previous

Start Decommission 

When the new grid configuration has been generated, Step 6 (Monitor Decommission) appears.



The **Previous** button remains disabled until the decommission is complete.

Step 6: Monitor Decommission

From Step 6 (Monitor Decommission) of the Decommission Site page wizard, you can monitor the progress as the site is removed.

About this task

When StorageGRID removes a connected site, it removes nodes in this order:

1. Gateway Nodes
2. Admin Nodes
3. Storage Nodes

When StorageGRID removes a disconnected site, it removes nodes in this order:

1. Gateway Nodes
2. Storage Nodes
3. Admin Nodes

Each Gateway Node or Admin Node might only require a few minutes or an hour to remove; however, Storage Nodes might take days or weeks.

Steps

1. As soon as a new Recovery Package has been generated, download the file.

Decommission Site



1 A new Recovery Package has been generated as a result of the configuration change. Go to the Recovery Package page to download it.



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

- a. Select the link in the message, or select **MAINTENANCE > System > Recovery package**.
- b. Download the .zip file.

See the instructions for [downloading the Recovery Package](#).

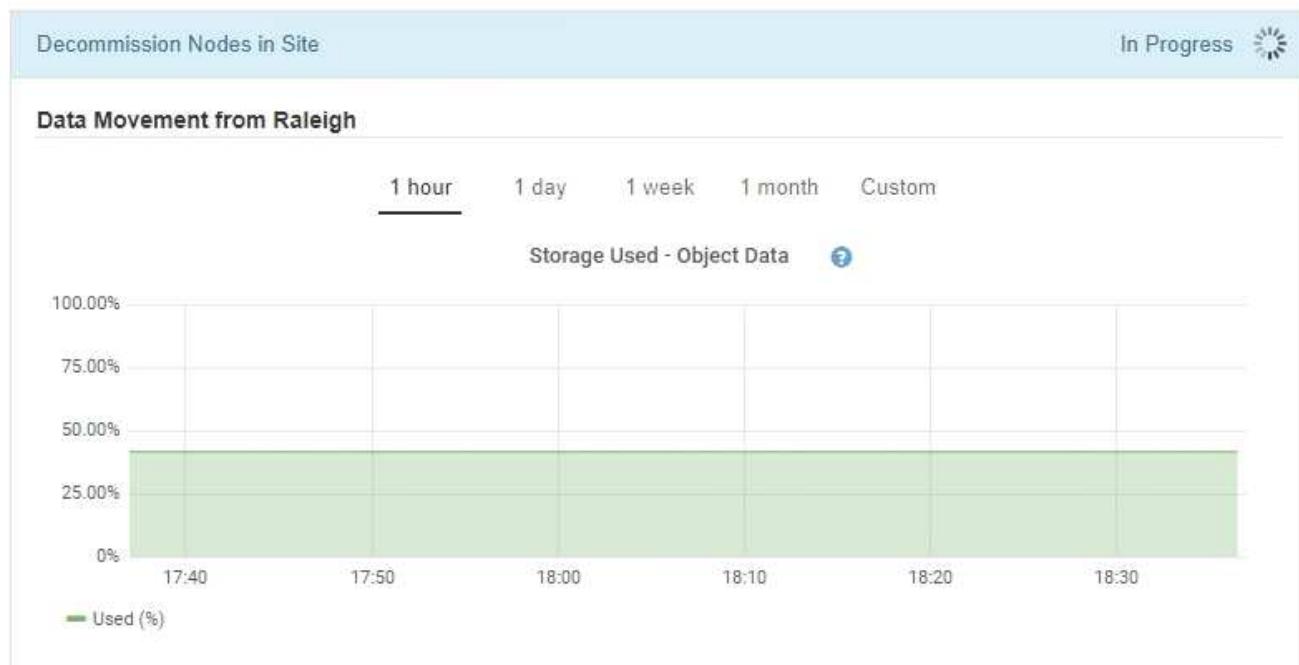


The Recovery Package file must be secured because it contains encryption keys and passwords that can be used to obtain data from the StorageGRID system.

2. Using the Data Movement chart, monitor the movement of object data from this site to other sites.

Data movement started when you activated the new ILM policy in Step 3 (Revise ILM Policy). Data movement will occur throughout the decommission procedure.

Decommission Site Progress



3. In the Node Progress section of the page, monitor the progress of the decommission procedure as nodes are removed.

When a Storage Node is removed, each node goes through a series of stages. Although most of these stages occur quickly or even imperceptibly, you might need to wait days or even weeks for other stages to complete, based on how much data needs to be moved. Additional time is required to manage erasure-coded data and re-evaluate ILM.

Node Progress

 Depending on the number of objects stored, Storage Nodes might take significantly longer to decommission. Extra time is needed to manage erasure coded data and re-evaluate ILM.

The progress for each node is displayed while the decommission procedure is running. If you need to perform another maintenance procedure, select **Pause** to suspend the decommission (only allowed during certain stages).

Pause

Resume

Search 

Name	Type	Progress	Stage
RAL-S1-101-196	Storage Node	<div style="width: 10%;"></div>	Decommissioning Replicated and Erasure Coded Data
RAL-S2-101-197	Storage Node	<div style="width: 10%;"></div>	Decommissioning Replicated and Erasure Coded Data
RAL-S3-101-198	Storage Node	<div style="width: 10%;"></div>	Decommissioning Replicated and Erasure Coded Data

If you are monitoring the progress of a connected site decommission, refer to this table to understand the decommission stages for a Storage Node:

Stage	Estimated duration
Pending	Minute or less
Wait for Locks	Minutes
Prepare Task	Minute or less
Marking LDR Decommissioned	Minutes
Decommissioning Replicated and Erasure-Coded Data	Hours, days, or weeks based on the amount of data Note: If you need to perform other maintenance activities, you can pause the site decommission during this stage.
LDR Set State	Minutes
Flush Audit Queues	Minutes to hours, based on the number of messages and network latency.
Complete	Minutes

If you are monitoring the progress of a disconnected site decommission, refer to this table to understand the decommission stages for a Storage Node:

Stage	Estimated duration
Pending	Minute or less
Wait for Locks	Minutes
Prepare Task	Minute or less
Disable External Services	Minutes
Certificate Revocation	Minutes
Node Unregister	Minutes
Storage Grade Unregister	Minutes
Storage Group Removal	Minutes
Entity Removal	Minutes

Stage	Estimated duration
Complete	Minutes

4. After all nodes have reached the Complete stage, wait for the remaining site decommission operations to complete.

- During the **Repair Cassandra** step, StorageGRID makes any necessary repairs to the Cassandra clusters that remain in your grid. These repairs might take several days or more, depending on how many Storage Nodes remain in your grid.

Decommission Site Progress

Decommission Nodes in Site	Completed
Repair Cassandra	In Progress 
StorageGRID is repairing the remaining Cassandra clusters after removing the site. This might take several days or more, depending on how many Storage Nodes remain in your grid.	
Overall Progress	0%
Deactivate EC Profiles & Delete Storage Pools	Pending
Remove Configurations	Pending

- During the **Deactivate EC Profiles & Delete Storage Pools** step, the following ILM changes are made:

- Any erasure-coding profiles that referred to the site are deactivated.
- Any Storage Pools that referred to the site are deleted.



The All Storage Nodes storage pool (StorageGRID 11.6 and earlier) is also removed because it uses the All Sites site.

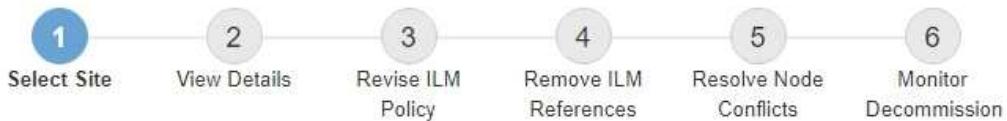
- Finally, during the **Remove Configuration** step, any remaining references to the site and its nodes are removed from the rest of the grid.

Decommission Site Progress

Decommission Nodes in Site	Completed
Repair Cassandra	Completed
Deactivate EC Profiles & Delete Storage Pools	Completed
Remove Configurations	In Progress 
StorageGRID is removing the site and node configurations from the rest of the grid.	

- When the decommission procedure has completed, the Decommission Site page shows a success message, and the removed site is no longer shown.

Decommission Site



The previous decommission procedure completed successfully at 2021-01-12 14:28:32 MST.

When you decommission a site, all nodes at the site and the site itself are permanently removed from the StorageGRID system.

Review the table for the site you want to remove. If Decommission Possible is Yes, select the site. Then, select **Next** to ensure that the site is not referred to by ILM and that all StorageGRID nodes are in the correct state.

You might not be able to remove certain sites. For example, you cannot decommission the site that contains the primary Admin Node or a site that contains an Archive Node.

Sites

	Site Name	Used Storage Capacity 	Decommission Possible
<input type="radio"/>	Sunnyvale	4.79 MB	
<input type="radio"/>	Vancouver	4.90 MB	No. This site contains the primary Admin Node.

Next

After you finish

Complete these tasks after you complete the site decommission procedure:

- Ensure that the drives of all Storage Nodes in the decommissioned site are wiped clean. Use a commercially available data wiping tool or service to permanently and securely remove data from the drives.
- If the site included one or more Admin Nodes and single sign-on (SSO) is enabled for your StorageGRID system, remove all relying party trusts for the site from Active Directory Federation Services (AD FS).
- After the nodes have been gracefully powered off automatically as part of the connected site decommission procedure, remove the associated virtual machines.

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