NetApp

Grid node decommission

StorageGRID

NetApp
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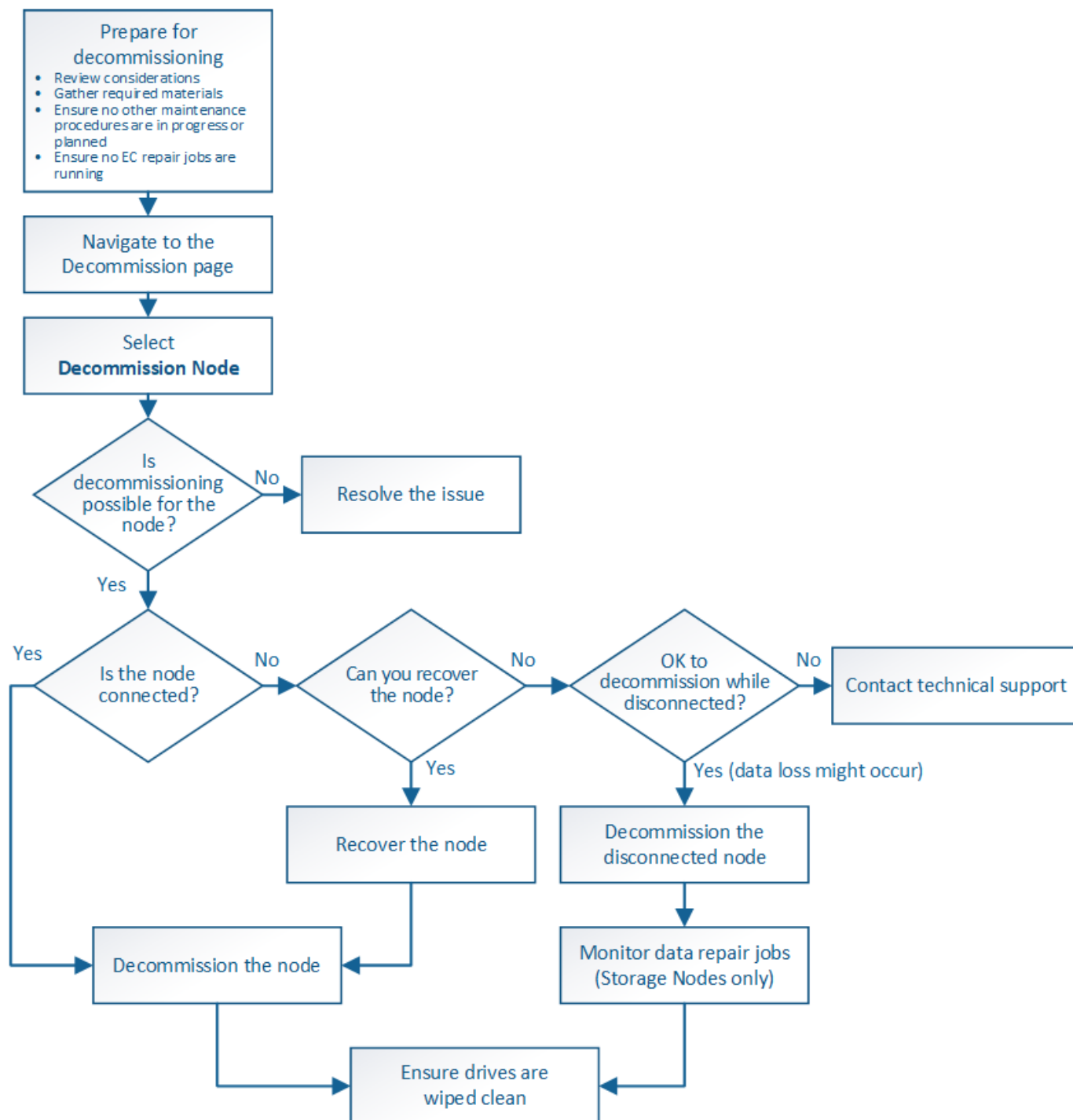
Grid node decommission

You can use the node decommission procedure to remove one or more Storage Nodes, Gateway Nodes, or non-primary Admin Nodes at one or more sites. You cannot decommission the primary Admin Node or an Archive Node.

In general, you should decommission grid nodes only while they are connected to the StorageGRID system and all nodes are in normal health (have green icons on the **NODES** pages and on the **Decommission Nodes** page). However, if required, you can decommission a grid node that is disconnected. Before removing a disconnected node, make sure you understand the implications and restrictions of that process.

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

- You have added a larger Storage Node to the system and you want to remove one or more smaller Storage Nodes, while at the same time preserving objects.
- 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 cannot recover or bring back online.

The flowchart shows the high-level steps for decommissioning grid nodes.

Prepare for decommissioning
- Review considerations
- Gather required materials
- Ensure no other maintenance procedures are in progress or planned
- Ensure no EC repair jobs are running

Navigate to the Decommission page

Select **Decommission Node**

Is decommissioning possible for the node? — No → Resolve the issue

Yes

Is the node connected?

Yes → Decommission the node

No → Can you recover the node?

Yes → Recover the node → Decommission the node

No → OK to decommission while disconnected?

No → Contact technical support

Yes (data loss might occur) → Decommission the disconnected node → Monitor data repair jobs (Storage Nodes only) → Ensure drives are wiped clean

Decommission the node → Ensure drives are wiped clean

Prepare to decommission grid nodes

You must review the considerations for removing grid nodes and confirm no repair jobs are active for erasure-coded data.

Considerations for grid node decommission

Before you start this procedure to decommission one or more nodes, you must understand the implications of removing each type of node. Upon the successful decommissioning of a node, its services will be disabled and the node will be

automatically shut down.

You cannot decommission a node if doing so will leave StorageGRID in an invalid state. The following rules are enforced:

- You cannot decommission the primary Admin Node.

- You cannot decommission Archive Nodes.

- You cannot decommission an Admin Node or a Gateway Node if one of its network interfaces is part of a high availability (HA) group.

- You cannot decommission a Storage Node if its removal would affect the ADC quorum.

- You cannot decommission a Storage Node if it is required for the active ILM policy.

- You should not decommission more than 10 Storage Nodes in a single Decommission Node procedure.

- You cannot decommission a connected node if your grid includes any disconnected nodes (nodes whose health is Unknown or Administratively Down). You must decommission or recover the disconnected nodes first.

- 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.

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

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

> ⓘ Do not remove a grid node's virtual machine or other resources until instructed to do so in decommission procedures.

Considerations for Admin Node or Gateway Node decommission

Review the following considerations before decommissioning an Admin Node or a Gateway Node.

- The decommission procedure requires exclusive access to some system resources, so you must confirm that no other maintenance procedures are running.

- You cannot decommission the primary Admin Node.

- You cannot decommission an Admin Node or 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 administering StorageGRID.

- As required, you can safely change the ILM policy while decommissioning a Gateway Node or 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).

Related information

Administer StorageGRID

Considerations for Storage Node decommission

If you plan to decommission a Storage Node, you must understand how StorageGRID manages the object data and metadata on that node.

The following considerations and restrictions apply when decommissioning Storage Nodes:

- 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.

- If the Storage Node is disconnected when you decommission it, the system must reconstruct the data using data from the connected Storage Nodes, which can result in data loss.

- When you remove a Storage Node, large volumes of object data must be transferred over the network. Although these transfers should not affect normal system operations, they can have an impact on 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.

- Decommission procedures that involve Storage Nodes can be paused during certain stages to allow other maintenance procedures to run if needed, and resumed once they are complete.

- You cannot run data repair operations on any grid nodes when a decommission task is running.

- You should not make any changes to the ILM policy while a Storage Node is being decommissioned.

- When you remove a Storage Node, data on the node is migrated to other grid nodes; however, this data is not completely removed from the decommissioned grid node. To permanently and securely remove data, you must wipe the decommissioned grid node's drives after the decommission procedure is complete.

- When you decommission a Storage Node, the following alerts and alarms might be raised 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.

Related information

Restore object data to storage volume, if required

Understand the ADC quorum

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

decommissioning. This 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 cannot 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 data center site must have the ADC service. If a data center site has more than three Storage Nodes with the ADC service, a simple majority of those nodes must remain available after the decommissioning (($0.5 *$ `Storage Nodes with ADC`) $+ 1$).

For example, suppose a data center 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, you must add a new Storage Node in an expansion and specify that it should have an ADC service. Then, you can decommission the existing Storage Node.

Related information

Expand your grid

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 the 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 policy?

> ⓘ An ILM policy that cannot be satisfied will lead to backlogs and alarms, and can 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 factors listed in the table.

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

Related information

Manage objects with ILM

Expand your grid

Decommission disconnected Storage Nodes

You must understand what can happen if you decommission a Storage Node while it is disconnected (health is Unknown or Administratively Down).

When you decommission a Storage Node that is disconnected from the grid, StorageGRID uses data from other Storage Nodes to reconstruct the object data and metadata that was on the disconnected node. It does this by automatically starting data repair jobs at the end of the decommissioning process.

Before decommissioning a disconnected Storage Node, be aware of the following:

- You should never decommission a disconnected node unless you are sure it cannot be brought online or recovered.

> ⓘ Do not 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.

- If a disconnected Storage Node contains the only copy of an object, that object will be lost when you decommission the node. 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.

- 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 are not monitored by the decommission procedure. You must manually monitor these jobs and restart them as needed. See Check data repair jobs.

- If you decommission more than one disconnected Storage Node at a time, data loss might occur. The system might not be able to reconstruct data if too few copies of object data, metadata, or erasure-coded fragments remain available.

> (i) If you have more than one disconnected Storage Node that you cannot recover, contact technical support to determine the best course of action.

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 to add 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.

> (i) If you are consolidating older and smaller appliances with new models or larger capacity appliances, you many use the node clone feature or the node clone procedure and the decommission procedure if you are not 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.

Related information

Expand your grid

Decommission multiple Storage Nodes

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

- 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.

If you need to decommission a disconnected Storage Node, you will also complete these steps after the decommission procedure completes in order 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.

1. Log in to the primary Admin Node:

   a. Enter the following command: `ssh admin@`*`grid_node_IP`*

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

   b. Enter the password listed in the `Passwords.txt` file.

   c. Enter the following command to switch to root: `su -`

   d. Enter the password listed in the `Passwords.txt` file.

2. 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 do not 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. Go to the next step.

```
root@DC1-ADM1:~ # repair-data show-ec-repair-status

Repair ID Scope Start Time End Time State Est/Affected Bytes Repaired
Retry Repair
=======================================================================
==========
949283 DC1-S-99-10(Volumes: 1,2) 2016-11-30T15:27:06.9 Success 17359
17359 No
949292 DC1-S-99-10(Volumes: 1,2) 2016-11-30T15:37:06.9 Failure 17359 0
Yes
949294 DC1-S-99-10(Volumes: 1,2) 2016-11-30T15:47:06.9 Failure 17359 0
Yes
949299 DC1-S-99-10(Volumes: 1,2) 2016-11-30T15:57:06.9 Failure 17359 0
Yes
```

3. If the State for all repairs is `Success`, you do not need to restart any repair jobs.

4. If the State for any repair is `Failure`, 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 `Success`.

Gather required materials

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

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

Related information

[Web browser requirements](#)

Access Decommission Nodes page

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

What you'll need

- You must be signed in to the Grid Manager using a [supported web browser](#).
- You must have the Maintenance or Root Access permission.

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. For example, this page shows grid nodes in two data centers. The Decommission Possible column indicates that you can decommission the Gateway Node, one of the five Storage Nodes, and the non-primary Admin Node.

Decommission Nodes

Before decommissioning a grid node, review the health of all nodes. If possible, resolve any issues or alarms before proceeding.

Select the checkbox for each grid node you want to decommission. If decommission is not possible for a node, see the Recovery and Maintenance Guide to learn how to proceed.

Grid Nodes

	Name	Site	Type	Has ADC	Health	Decommission Possible
	DC1-ADM1	Data Center 1	Admin Node	-	✓	No, primary Admin Node decommissioning is not supported.
	DC1-ARC1	Data Center 1	Archive Node	-	✓	No, Archive Nodes decommissioning is not supported.
☐	DC1-G1	Data Center 1	API Gateway Node	-	✓	✓
	DC1-S1	Data Center 1	Storage Node	Yes	✓	No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
	DC1-S2	Data Center 1	Storage Node	Yes	✓	No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
	DC1-S3	Data Center 1	Storage Node	Yes	✓	No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
☐	DC1-S4	Data Center 1	Storage Node	No	✓	✓
☐	DC2-ADM1	Data Center 2	Admin Node	-	✓	✓
	DC2-S1	Data Center 2	Storage Node	Yes	✓	No, site Data Center 2 requires a minimum of 3 Storage Nodes with ADC services.

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-most column includes a check box. If a node cannot be decommissioned, this column describes the issue. If there is more than one reason a node cannot be decommissioned, the most critical reason is shown.

Decommission Possible reason	Description	Steps to resolve
No, node type decommissioning is not supported.	You cannot decommission the primary Admin Node or an Archive Node.	None.

Decommission Possible reason	Description	Steps to resolve
No, at least one grid node is disconnected. **Note:** This message is shown for connected grid nodes only.	You cannot decommission a connected grid node if any grid node is disconnected. The **Health** column includes one of these icons for grid nodes that are disconnected: • 🌙 (gray): Administratively Down • 🌀 (blue): Unknown	Go to the step that lists the decommission procedure choices.

No, one or more required nodes is currently disconnected and must be recovered.
 	
Note: This message is shown for disconnected grid nodes only.
	You cannot decommission a disconnected grid node if one or more required nodes is also disconnected (for example, a Storage Node that is required for the ADC quorum).	a. Review the Decommission Possible messages for all disconnected nodes.
		
		b. Determine which nodes cannot be decommissioned because they are required.
		  ◦ If the Health of a required node is Administratively Down, bring the node back online.
		  ◦ If the health of a required node is Unknown, perform a node recovery procedure to recover the required node.

No, member of HA group(s): *x*. Before you can decommission this node, you must remove it from all HA groups.	You cannot decommission an Admin Node or a Gateway Node if a node interface belongs to a high availability (HA) group.	Edit the HA group to remove the node's interface or remove the entire HA group. See the instructions for administering StorageGRID.
No, site *x* requires a minimum of *n* Storage Nodes with ADC services.	**Storage Nodes only.** You cannot decommission a Storage Node if insufficient nodes would remain at the site to support ADC quorum requirements.	Perform an expansion. Add a new Storage Node to the site, and specify that it should have an ADC service. See information about the ADC quorum.

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

4. If decommissioning is possible for the node, determine which procedure you need to perform:

If your grid includes…	Go to…
Any disconnected grid nodes	Decommission disconnected grid nodes
Only connected grid nodes	Decommission connected grid nodes

Related information

Check data repair jobs

Understand the ADC quorum

Manage objects with ILM

Expand your grid

Administer StorageGRID

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).

What you'll need

- You understand the requirements and considerations for decommissioning grid 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 must 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 Storage Node named DC1-S4 is disconnected; all of the other nodes are connected.

Decommission Nodes

Before decommissioning a grid node, review the health of all nodes. If possible, resolve any issues or alarms before proceeding.

> ⚠ A grid node is disconnected (has a blue or gray health icon). Try to bring it back online or recover it. Data loss might occur if you decommission a node that is disconnected.
>
> See the Recovery and Maintenance Guide for details. Contact Support if you cannot recover a node and do not want to decommission it.

Select the checkbox for each grid node you want to decommission. If decommission is not possible for a node, see the Recovery and Maintenance Guide to learn how to proceed.

Grid Nodes

	Name ⌄	Site ⇅	Type ⇅	Has ADC⇅	Health	Decommission Possible
	DC1-ADM1	Data Center 1	Admin Node	-		No, primary Admin Node decommissioning is not supported.
	DC1-ADM2	Data Center 1	Admin Node	-		No, at least one grid node is disconnected.
	DC1-G1	Data Center 1	API Gateway Node	-		No, at least one grid node is disconnected.
	DC1-S1	Data Center 1	Storage Node	Yes		No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
	DC1-S2	Data Center 1	Storage Node	Yes		No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
	DC1-S3	Data Center 1	Storage Node	Yes		No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
☐	DC1-S4	Data Center 1	Storage Node	No	🔵	✔

Passphrase

Provisioning Passphrase

[   ]

[Start Decommission]

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.

  > ⓘ Be very careful when decommissioning more than one disconnected grid node at a time, especially if you are selecting multiple disconnected Storage Nodes.

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

Before decommissioning a disconnected **Storage Node**, note the following

- You should never decommission a disconnected Storage Node unless you are sure it cannot be brought online or recovered.

  > ⓘ If you believe that object data can still be recovered from the node, do not perform this procedure. Instead, contact technical support to determine if node recovery is possible.

- If you decommission more than one disconnected Storage Node, data loss might occur. The system might not be able to reconstruct data if not enough object copies, erasure-coded fragments, or object metadata remain available.

  > ⓘ If you have more than one disconnected Storage Node that you cannot 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 are not 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.

Before decommissioning a disconnected **Admin Node** or **Gateway Node**, note the following:

- 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.

- You can safely decommission a Gateway Node while it is disconnected.

Steps

1. Attempt to bring any disconnected grid nodes back online or to recover them.

   See the 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 check box 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 very 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 cannot 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.

> **⚠ Warning**
>
> The selected nodes are disconnected (health is Unknown or Administratively Down). If you continue and the node has the only copy of an object, the object will be lost when the node is removed.
>
> The following grid nodes have been selected for decommissioning and will be permanently removed from the StorageGRID Webscale system.
>
> DC1-S4
>
> Do you want to continue?
>
> [Cancel] [OK]

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.

Decommission Nodes

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

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

Name	Type	Progress	Stage
DC1-S4	Storage Node		Prepare Task

[Pause] [Resume]

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.

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

   > ℹ 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.

Decommission Nodes

The previous decommission procedure completed successfully.

❶ Repair jobs for replicated and erasure-coded data have been started. These jobs restore object data that might have been on any disconnected Storage Nodes. To monitor the progress of these jobs and restart them as needed, see the Decommissioning section of the Recovery and Maintenance Guide.

Before decommissioning a grid node, review the health of all nodes. If possible, resolve any issues or alarms before proceeding.

Select the checkbox for each grid node you want to decommission. If decommission is not possible for a node, see the Recovery and Maintenance Guide to learn how to proceed.

Grid Nodes

Search 🔍

	Name	Site	Type	Has ADC	Health	Decommission Possible
	DC1-ADM1	Data Center 1	Admin Node	-	✅	No, primary Admin Node decommissioning is not supported.
	DC1-ARC1	Data Center 1	Archive Node	-	✅	No, Archive Nodes decommissioning is not supported.
☐	DC1-G1	Data Center 1	API Gateway Node	-	✅	✔
	DC1-S1	Data Center 1	Storage Node	Yes	✅	No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
	DC1-S2	Data Center 1	Storage Node	Yes	✅	No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
	DC1-S3	Data Center 1	Storage Node	Yes	✅	No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
☐	DC1-S4	Data Center 1	Storage Node	No	✅	✔
☐	DC2-ADM1	Data Center 2	Admin Node	-	✅	✔
	DC2-S1	Data Center 2	Storage Node	Yes	✅	No, site Data Center 2 requires a minimum of 3 Storage Nodes with ADC services.

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.

ⓘ Do not 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 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 are not 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 do not 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.

- Optionally, 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
    ```

    > ⓘ The `show-replicated-repair-status` option is available for technical preview in StorageGRID 11.6. This feature is under development, and the value returned might be incorrect or delayed. To determine if a repair is complete, use **Awaiting – All**, **Repairs Attempted (XRPA)**, and **Scan Period — Estimated (XSCM)** as described in Monitor repairs.

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.
  - SG100 and SG1000 services appliances
  - SG5600 storage appliances
  - SG5700 storage appliances
  - SG6000 storage appliances

Related information

Grid node recovery procedures

Decommission connected grid nodes

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

- You must understand the requirements and considerations for decommissioning grid nodes.
- You must have gathered all required materials.
- You must have ensured that no data repair jobs are active.
- You must 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 must 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 must have the provisioning passphrase.

- Grid nodes are connected.

- The **Decommission Possible** column for the node or nodes you want to decommission must include a green checkmark.

- All grid nodes must 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.

> Do not remove a grid node's virtual machine or other resources until instructed to do so in this procedure.

1. From the Decommission Nodes page, select the check box for each grid node you want to decommission.

2. Enter the provisioning passphrase.

   The **Start Decommission** button is enabled.

3. Click **Start Decommission**.

   A confirmation dialog box appears.

Info

The following grid nodes have been selected for decommissioning and will be permanently removed from the StorageGRID Webscale system.

DC1-S5

Do you want to continue?

Cancel   OK

4. Review the list of selected nodes, and click **OK**.

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

Decommission Nodes

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

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

Name	Type	Progress	Stage
DC1-S5	Storage Node		Prepare Task

Pause   Resume

ℹ Do not 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, 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.

ℹ 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.

Decommission Nodes

> The previous decommission procedure completed successfully.

Before decommissioning a grid node, review the health of all nodes. If possible, resolve any issues or alarms before proceeding.

Select the checkbox for each grid node you want to decommission. If decommission is not possible for a node, see the Recovery and Maintenance Guide to learn how to proceed.

Grid Nodes

Search 🔍

Name ⌄	Site ↓↑	Type ↓↑	Has ADC ↓↑	Health	Decommission Possible
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DC1-S1	Data Center 1	Storage Node	Yes	✅	No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
DC1-S2	Data Center 1	Storage Node	Yes	✅	No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
DC1-S3	Data Center 1	Storage Node	Yes	✅	No, site Data Center 1 requires a minimum of 3 Storage Nodes with ADC services.
☐ DC1-S4	Data Center 1	Storage Node	No	✅	✔
☐ DC2-ADM1	Data Center 2	Admin Node	-	✅	✔
DC2-S1	Data Center 2	Storage Node	Yes	✅	No, site Data Center 2 requires a minimum of 3 Storage Nodes with ADC services.

7. 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.

   ○ **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.

Complete these steps after you complete the node 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 use the appliance in another grid.

SG100 and SG1000 services appliances

SG5600 storage appliances

SG5700 storage appliances

Related information

Install Red Hat Enterprise Linux or CentOS

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.

What you'll need

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

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

> ℹ️ 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.

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.

What you'll need

You must be 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.