All grid node types: Replacing a Linux node

StorageGRID

NetApp
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All grid node types: Replacing a Linux node

If a failure requires that you deploy one or more new physical or virtual hosts or reinstall Linux on an existing host, you must deploy and configure the replacement host before you can recover the grid node. This procedure is one step of the grid node recovery process for all types of grid nodes.

“Linux” refers to a Red Hat® Enterprise Linux®, Ubuntu®, CentOS, or Debian® deployment. Use the NetApp Interoperability Matrix Tool to get a list of supported versions.

This procedure is only performed as one step in the process of recovering software-based Storage Nodes, primary or non-primary Admin Nodes, Gateway Nodes, or Archive Nodes. The steps are identical regardless of the type of grid node you are recovering.

If more than one grid node is hosted on a physical or virtual Linux host, you can recover the grid nodes in any order. However, recovering a primary Admin Node first, if present, prevents the recovery of other grid nodes from stalling as they try to contact the primary Admin Node to register for recovery.

1. Deploying new Linux hosts
2. Restoring grid nodes to the host
3. What’s next: Performing additional recovery steps, if required

Related information

NetApp Interoperability Matrix Tool

Deploying new Linux hosts

With a few exceptions, you prepare the new hosts as you did during the initial installation process.

To deploy new or reinstalled physical or virtual Linux hosts, follow the procedure for preparing the hosts in the StorageGRID installation instructions for your Linux operating system.

This procedure includes steps to accomplish the following tasks:

1. Install Linux.
2. Configure the host network.
3. Configure host storage.
4. Install Docker.
5. Install the StorageGRID host service.

> Stop after you complete the “Install StorageGRID host service” task in the installation instructions. Do not start the “Deploying grid nodes” task.

As you perform these steps, note the following important guidelines:

- Be sure to use the same host interface names you used on the original host.

- If you use shared storage to support your StorageGRID nodes, or you have moved some or all of the disk drives or SSDs from the failed to the replacement nodes, you must reestablish the same storage mappings that were present on the original host. For example, if you used WWIDs and aliases in `/etc/multipath.conf` as recommended in the installation instructions, be sure to use the same alias/WWID pairs in `/etc/multipath.conf` on the replacement host.
- If the StorageGRID node uses storage assigned from a NetApp AFF system, confirm that the volume does not have a FabricPool tiering policy enabled. Disabling FabricPool tiering for volumes used with StorageGRID nodes simplifies troubleshooting and storage operations.

> Never use FabricPool to tier any data related to StorageGRID back to StorageGRID itself. Tiering StorageGRID data back to StorageGRID increases troubleshooting and operational complexity.

Related information

Install Red Hat Enterprise Linux or CentOS

Install Ubuntu or Debian

Restoring grid nodes to the host

To restore a failed grid node to a new Linux host, you restore the node configuration file using the appropriate commands.

When doing a fresh install, you create a node configuration file for each grid node to be installed on a host. When restoring a grid node to a replacement host, you restore or replace the node configuration file for any failed grid nodes.

If any block storage volumes were preserved from the previous host, you might have to perform additional recovery procedures. The commands in this section help you determine which additional procedures are required.

Steps

- Restoring and validating grid nodes
- Starting the StorageGRID host service
- Recovering nodes that fail to start normally

Restoring and validating grid nodes

You must restore the grid configuration files for any failed grid nodes, and then validate the grid configuration files and resolve any errors.

About this task

You can import any grid node that should be present on the host, as long as its `/var/local` volume was not lost as a result of the failure of the previous host. For example, the `/var/local` volume might still exist if you used shared storage for StorageGRID system data volumes, as described in the StorageGRID installation instructions for your Linux operating system. Importing the node restores its node configuration file to the host.

If it is not possible to import missing nodes, you must recreate their grid configuration files.

You must then validate the grid configuration file, and resolve any networking or storage issues that might

occur before going on to restart StorageGRID. When you re-create the configuration file for a node, you must use the same name for the replacement node that was used for the node you are recovering.

See the installation instructions for more information on the location of the `/var/local` volume for a node.

Steps

1. At the command line of the recovered host, list all currently configured StorageGRID grid nodes:`sudo storagegrid node list`

   If no grid nodes are configured, there will be no output. If some grid nodes are configured, expect output in the following format:

   ```
   Name               Metadata-Volume
   ============================================================
   dc1-adm1           /dev/mapper/sgws-adm1-var-local
   dc1-gw1            /dev/mapper/sgws-gw1-var-local
   dc1-sn1            /dev/mapper/sgws-sn1-var-local
   dc1-arc1           /dev/mapper/sgws-arc1-var-local
   ```

   If some or all of the grid nodes that should be configured on the host are not listed, you need to restore the missing grid nodes.

2. To import grid nodes that have a `/var/local` volume:

   a. Run the following command for each node you want to import:`sudo storagegrid node import node-var-local-volume-path`

      The `storagegrid node import` command succeeds only if the target node was shut down cleanly on the host on which it last ran. If that is not the case, you will observe an error similar to the following:

      ```
      This node (node-name) appears to be owned by another host (UUID host-uuid).

      Use the --force flag if you are sure import is safe.
      ```

   b. If you see the error about the node being owned by another host, run the command again with the `--force` flag to complete the import:`sudo storagegrid --force node import node-var-local-volume-path`

      > ⓘ Any nodes imported with the `--force` flag will require additional recovery steps before they can rejoin the grid, as described in “Performing additional recovery steps, if required.”

3. For grid nodes that do not have a `/var/local` volume, recreate the node’s configuration file to restore it to the host.

   Follow the guidelines in “Creating node configuration files” in the installation instructions.

When you re-create the configuration file for a node, you must use the same name for the replacement node that was used for the node you are recovering. For Linux deployments, ensure that the configuration file name contains the node name. You should use the same network interfaces, block device mappings, and IP addresses when possible. This practice minimizes the amount of data that needs to be copied to the node during recovery, which could make the recovery significantly faster (in some cases, minutes rather than weeks).

If you use any new block devices (devices that the StorageGRID node did not use previously) as values for any of the configuration variables that start with `BLOCK_DEVICE_` when you are recreating the configuration file for a node, be sure to follow all of the guidelines in “Fixing missing block device errors.”

4. Run the following command on the recovered host to list all StorageGRID nodes.

   ```
   sudo storagegrid node list
   ```

5. Validate the node configuration file for each grid node whose name was shown in the storagegrid node list output:

   ```
   sudo storagegrid node validate node-name
   ```

   You must address any errors or warnings before starting the StorageGRID host service. The following sections give more detail on errors that might have special significance during recovery.

Related information

Install Red Hat Enterprise Linux or CentOS

Install Ubuntu or Debian

Fixing missing network interface errors

Fixing missing block device errors

What’s next: Performing additional recovery steps, if required

Fixing missing network interface errors

If the host network is not configured correctly or a name is misspelled, an error occurs when StorageGRID checks the mapping specified in the `/etc/storagegrid/nodes/node-name.conf` file.

You might see an error or warning matching this pattern:

`Checking configuration file `/etc/storagegrid/nodes/node-name.conf` for node node-name...` `ERROR: node-name: GRID_NETWORK_TARGET = host-interface-name` node-name: Interface 'host-interface-name' does not exist`

The error could be reported for the Grid Network, the Admin Network, or the Client Network. This error means that the `/etc/storagegrid/nodes/node-name.conf` file maps the indicated StorageGRID network to the host interface named `host-interface-name`, but there is no interface with that name on the current host.

If you receive this error, verify that you completed the steps in “Deploying new Linux hosts.” Use the same

names for all host interfaces as were used on the original host.

If you are unable to name the host interfaces to match the node configuration file, you can edit the node configuration file and change the value of the GRID_NETWORK_TARGET, the ADMIN_NETWORK_TARGET, or the CLIENT_NETWORK_TARGET to match an existing host interface.

Make sure the host interface provides access to the appropriate physical network port or VLAN, and that the interface does not directly reference a bond or bridge device. You must either configure a VLAN (or other virtual interface) on top of the bond device on the host, or use a bridge and virtual Ethernet (veth) pair.

Related information

Deploying new Linux hosts

Fixing missing block device errors

The system checks that each recovered node maps to a valid block device special file or a valid softlink to a block device special file. If StorageGRID finds invalid mapping in the `/etc/storagegrid/nodes/node-name.conf` file, a missing block device error displays.

If you observe an error matching this pattern:

`Checking configuration file /etc/storagegrid/nodes/node-name.conf for node node-name… ERROR: node-name: BLOCK_DEVICE_PURPOSE = path-name` ` *node-name*: *path-name* does not exist`

It means that `/etc/storagegrid/nodes/node-name.conf` maps the block device used by *node-name* for PURPOSE to the given path-name in the Linux file system, but there is not a valid block device special file, or softlink to a block device special file, at that location.

Verify that you completed the steps in “Deploying new Linux hosts.” Use the same persistent device names for all block devices as were used on the original host.

If you are unable to restore or recreate the missing block device special file, you can allocate a new block device of the appropriate size and storage category and edit the node configuration file to change the value of BLOCK_DEVICE_PURPOSE to point to the new block device special file.

Determine the appropriate size and storage category from the tables in the “Storage requirements” section of the installation instructions for your Linux operating system. Review the recommendations in “Configuring host storage” before proceeding with the block device replacement.

If you must provide a new block storage device for any of the configuration file variables starting with `BLOCK_DEVICE_` because the original block device was lost with the failed host, ensure the new block device is unformatted before attempting further recovery procedures. The new block device will be unformatted if you are using shared storage and have created a new volume. If you are unsure, run the following command against any new block storage device special files.

Run the following command only for new block storage devices. Do not run this command if you believe the block storage still contains valid data for the node being recovered, as any data on the device will be lost.

```
sudo dd if=/dev/zero of=/dev/mapper/my-block-device-name bs=1G count=1
```

Related information

Deploying new Linux hosts

Install Red Hat Enterprise Linux or CentOS

Install Ubuntu or Debian

Starting the StorageGRID host service

To start your StorageGRID nodes, and ensure they restart after a host reboot, you must enable and start the StorageGRID host service.

1. Run the following commands on each host:

   ```
   sudo systemctl enable storagegrid
   sudo systemctl start storagegrid
   ```

2. Run the following command to ensure the deployment is proceeding:

   `sudo storagegrid node status node-name`

   For any node that returns a status of Not-Running or Stopped, run the following command:

   `sudo storagegrid node start node-name`

3. If you have previously enabled and started the StorageGRID host service (or if you are unsure if the service has been enabled and started), also run the following command:

   ```
   sudo systemctl reload-or-restart storagegrid
   ```

Recovering nodes that fail to start normally

If a StorageGRID node does not rejoin the grid normally and does not show up as recoverable, it may be corrupted. You can force the node into recovery mode.

To force the node into recovery mode:

`sudo storagegrid node force-recovery node-name`

Before issuing this command, confirm that the node's network configuration is correct; it may have failed to rejoin the grid due to incorrect network interface mappings or an incorrect Grid Network IP address or gateway.

After issuing the `storagegrid node force-recovery node-name` command, you must perform additional recovery steps for *node-name*.

Related information

What's next: Performing additional recovery steps, if required

What's next: Performing additional recovery steps, if required

Depending on the specific actions you took to get the StorageGRID nodes running on the replacement host, you might need to perform additional recovery steps for each node.

Node recovery is complete if you did not need to take any corrective actions while you replaced the Linux host or restored the failed grid node to the new host.

Corrective actions and next steps

During node replacement, you may have needed to take one of these corrective actions:

- You had to use the `--force` flag to import the node.
- For any `<PURPOSE>`, the value of the `BLOCK_DEVICE_<PURPOSE>` configuration file variable refers to a block device that does not contain the same data it did before the host failure.
- You issued `storagegrid node force-recovery node-name` for the node.
- You added a new block device.

If you took **any** of these corrective actions, you must perform additional recovery steps.

Type of recovery	Next step
Primary Admin Node	Configuring the replacement primary Admin Node
Non-primary Admin Node	Selecting Start Recovery to configure a non-primary Admin Node
Gateway Node	Selecting Start Recovery to configure a Gateway Node
Archive Node	Selecting Start Recovery to configure an Archive Node
Storage Node (software-based): • If you had to use the `--force` flag to import the node, or you issued `storagegrid node force-recovery node-name` • If you had to do a full node reinstall, or you needed to restore /var/local	Selecting Start Recovery to configure a Storage Node

Type of recovery	Next step
Storage Node (software-based): • If you added a new block device. • If, for any `<PURPOSE>`, the value of the `BLOCK_DEVICE_<PURPOSE>` configuration file variable refers to a block device that does not contain the same data it did before the host failure.	Recovering from storage volume failure where the system drive is intact

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