Best Practice for Adding or Replacing Storage Modules in a Production Cluster

When adding or replacing storage modules in a production cluster, following the procedures in this document expedites a successful deployment, and decreases the instance of future problems.

Although you may run some of these steps in parallel, it is important to execute the majority of these steps completely before moving on to the next set of procedures. You should monitor the system health closely. Adding or replacing storage modules can heavily impact the drives, so you should also monitor drive health and resolve any hardware issues as soon as possible before continuing with this procedure.

Procedure

NOTE: Steps 1-6 should be taken as soon as possible to determine if any hardware issues need to be addressed prior to proceeding.

Also, Steps 1 - 10 do not impact the production SAN and can be taken care of well ahead of time.

Location of Required Files

This procedure refers to documents and files located on the LeftHand Networks Resource Center, located at https://www.lefthandnetworks.com/member_area/proceed.php
- If not already registered, click the *"Need To Join?"* button to register, after which you will be emailed a temporary password
- If you have Resource Center access but cannot access the necessary files, you may need your user level changed. Contact LeftHand Technical Support for assistance.

Initial Preparation

1. Make sure all critical, production data is backed up to tape.

2. Install the new storage module(s) into the rack, or to a temporary location. Connect them to the network switch and apply power.

NOTE: Refer to the Configuration Interface section of your SAN Platform Manual for details on step 3 below.

3. Using a null-modem cable and terminal program:

- Configure each new storage module with a unique name and IP address. Before choosing an IP address, ping that address to confirm it is not currently being used.

NOTE: When underlined replacing a storage module, if the original storage module is down and can not, or will not, be brought up during the replacement process, you can configure the new replacement unit with the same name and IP address as the original unit. If the original storage module is still up, you must use a unique name and IP address on the new replacement. In that case, you can reconfigure the new storage modules to the original names and IP addresses after the replacement process is complete, if desired.

- Configure each new storage module with the same subnet and gateway as the existing storage modules.

- Configure each storage module password to match the other storage modules in the cluster.

4. Use the Find feature in the Centralized Management Console (Console) to find the new storage modules. They should appear as Available Storage Modules.

5. Install the LeftHand Networks Health Check Utility.

Since the latest version of Health Check creates a monitoring user account on the new storage modules, it is critical to download and install the latest version of Health Check even if you have Health Check already installed.

- On the LeftHand Networks Resource Center, go to the *Software Download Center / Support Tools / Health Check Utility* folder. Download the latest Health Check utility and installation instructions, then install the utility, carefully following the instructions.

- During the Health Check install, be sure to include the IP addresses of both the new and old storage modules.

6. Run the Health Check scheduled task. Contact LeftHand Networks for analysis of the logs. This step is critical to confirm there are no hardware issues that need to be addressed before proceeding.

Configuring the new storage modules

1. Make sure all new storage modules are at the same primary version of SAN/iQ

(6.6, 6.5, 6.3, etc.).

- If the new storage modules have an earlier version of SAN/iQ than the existing storage modules, upgrade them now.

- If the new storage modules have a more recent version of SAN/iQ than the existing storage modules, it is recommended that you upgrade the existing storage modules before proceeding. Alternately, upgrading a minimum of one existing storage module running manager in the cluster to the new version will allow you to add the new units to the cluster. In that case, it is recommended to upgrade the remaining storage modules as soon as possible.

- For details on upgrading SAN/iQ, please refer to the "SAN/iQ Upgrade Guidelines", found on the Resource Center at: https://www.lefthandnetworks.com/member_area/dl_file.php?fid=923&action=display

The SAN/iQ Upgrade Guidelines document will include important information on:

- The required files and how to access them
- Preparing your servers and upgrading the Windows Solution Pack (if applicable)
- Upgrading the storage modules
- Important precautions

- o If upgrading only the new units, since they are in an "available" state, you can select all the new storage modules and run the upgrades in parallel. Each storage module reboots as part of the upgrade. You may need to use the Find feature in the Console to rediscover them.

- o If upgrading production storage modules, it is very important to follow the precautions in the "SAN/iQ Upgrade Guidelines".

- o On any storage module that is upgraded, reinstall smGenWatch, using the "Install Software" feature in the Console

  NOTE: If the upgrade is to SAN/iQ version 6.6 or higher, it is important to reinstall the 6.6 version of Health Check, instead of reinstalling smGenWatch individually, to make sure the monitoring user account gets recreated on the storage module. Installing Health Check will automatically install smGenWatch.

2. On the new storage modules, configure the following parameters to match the other storage modules in the cluster:

- RAID level (RAID-0, RAID-5, RAID-10, etc).

- All Network settings.

  - o NIC bond type (confirm that both NICs are connected at the switch if implementing NIC bonding)

  - o Subnet mask and gateway

  - o Frame size and speed/duplex settings

3. On the new storage modules, configure time settings, monitoring settings, and SNMP (if applicable) to match the other storage modules in the cluster:

- In the Tasks menu, select 'storage module' (or 'NSM', depending on your SAN/iQ version), then Copy Configuration.

- Select a storage module currently in the cluster and click OK.

- On the next window, select all applicable check boxes. Then select all new storage modules in the list below and click OK.

  This makes the time/date and all monitoring configurations consistent across all storage modules.

4. If the existing storage modules have any unique administrative or user accounts, add those accounts to the new storage modules.

Adding the new storage modules to the management group and cluster

1. Right-click each of the new storage modules and select to add them to the existing management group. Note that this step does not move them into the cluster, and thus will not start the restripe or affect the production cluster in any way.

2. Configure the proper number of managers. See the LeftHand SAN Users Manual for details on the proper number of managers for your configuration.

   NOTE: If replacing storage modules, and the storage module being replaced is not currently running manager, no action is necessary here. If the storage module being replaced is currently running manager, wait until the replacement, and subsequent restripe is complete before starting a manager on the new storage module. See step 21 below.

3. Confirm that all volumes show as normal in the Console.

4. Add or replace the new storage modules in the existing cluster.

   - Right-click the cluster and select Edit Cluster. In the Edit Cluster window, you see the existing storage modules in the "storage modules (NSMs) in Cluster" window. IMPORTANT: Note the exact order of the storage modules in this window.

   - If adding storage modules:

     o Use the Add button to add the new storage modules.

     o Use the up/down arrows to arrange the list in the preferred order. To avoid a full restripe across the cluster, it is best not to change the order of the existing storage modules. However, if a different order is desired, make those changes now.

   - If replacing storage modules:

     o First use the Remove button to remove the targeted storage modules, taking careful note of their position in the list.

     o Use the Add button to add the new storage modules to the list.

     o Use the up/down arrows to move the new storage modules to the exact location in the list where the original storage modules were located. Keeping the list in its original order avoids a full restripe across the cluster.

   - Select OK.

5. The cluster now restripes the data from the existing units to the newly added/replaced units. This process could take a day or longer, depending on the amount of data, and the local bandwidth setting. See the next step.

6. If the restripe is adversely affecting user performance, you can reduce the local bandwidth setting. Conversely, to make the restripe complete sooner, you can increase the local bandwidth setting. It is common to use different bandwidth settings at different times of the day, depending on user schedules.

   To edit the local bandwidth, right-click the management group and select Edit Management Group.

- If your Console is version 6.6 or higher, adjust the Local Bandwidth Priority slider as desired and click OK. Note that the default setting is 4 MB/sec.

- If your Console is version 6.5 or earlier, change the value in the Local Bandwidth field as desired and click OK. Note that the default is 32768 Kb/Sec, minimum is 2048, and maximum is 327680.

To expedite the restripe, we recommend setting this as high as the user experience will allow, and maximize it whenever users are offline, or whenever feasible.

When the restripe completes

1. Verify that the restripe is complete.

    - All volumes show a status of normal.

    - The Max Used column in Cluster > Disk Usage shows the same capacity for each storage module.

2. If you edited the Local Bandwidth previously, set it back to its original setting.

3. Verify that all user data is intact and consider taking a fresh set of backups.

4. Run the Health Check scheduled task. Contact LeftHand Networks for analysis of the logs. This step is critical to confirm there are no hardware issues that need to be addressed before proceeding.

5. If storage modules were replaced, stop any managers on the storage modules now outside the cluster.

    - If the original storage modules were running managers, right-click those replacement storage modules and select Start Manager. Refer to the LeftHand SAN Users Manual to confirm the proper number of managers for your configuration.

    - Right-click each storage module now outside the cluster and select Remove from Management Group. Once they are returned to the Available pool, you can power down and disposition them as desired.

6. If storage modules were replaced, you can now use the Console to change the names and IP addresses of the new storage modules to the names and IPs of the original units if desired. Note that changing the IP address causes the unit to disappear from the network for a few minutes. You may need to use the "Find" function in the Console to view the unit again.

7. Edit the command line field in the Health Check scheduled task so that only the production storage module IP addresses remain.

8. Confirm license keys on the new storage modules

    - Right-click each new storage module and select Edit Management Group.

    - Select the Feature Registration tab and confirm that all features are licensed. If any features are not licensed, contact LeftHand Networks Technical Support to obtain updated license keys.