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Hitachi NAS Platform

NAS Platform to VSP Unified Migration Guide

This guide describes how to perform a data-in-place migration of the Hitachi NAS Platform and Virtual Storage Platform (VSP) Gx00 File solution to the VSP Gx00 platform.

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Preface

Intended audience

This document is intended for customers and Hitachi Vantara partners who license and use NAS Platform with Cisco Nexus.

Accessing product downloads

Product software, drivers, and firmware downloads are available on Hitachi Vantara Support Connect: https://support.hitachivantara.com/.

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Chapter 1: Introduction

This guide describes how to perform a data-in-place migration of the Hitachi NAS Platform and Virtual Storage Platform (VSP) Gx00 File solution to the VSP Gx00 platform.

Chapter 2: Site Preparation and Prerequisites

Prerequisites

This process has the following pre-requisites:

- Using the serial number of the array, request TBKeys to provide the license keys for the Unified array before scheduled maintenance**.**

  Note: If the serial number of the array is 440091, request a single set of license keys for MAC address 04-04-00-00-09-01. (There is no need for HDS storage and a cluster license.)
- The Unified solution is only supported on the VSP G400/600/800 and no other array (VSP G200, VSP G1000, HUS VM, and so on).
- Verify two additional batteries are available. Insight services should pair the batteries with the NAS Module upgrade.
- If the current HNAS is 30x0, caution should be taken to tear down aggregates accordingly as there are no 1G ports on the Unified platform (similar to the 4060/4080/4100).

  Note: Do this as part of the scheduled down-time, prior to copying the registry.

  You may want to deselect the 1G ports and re-assign to 10G ports, or simply remove all ports from the aggregates and re-assign the ports after migration has completed.

- WFS 1 file systems are *not* supported on the Unified platform. Do not attempt to migrate if these are present on the current HNAS system.
- Note the number of FC ports used on the existing system. The number of usable ports may need to be consolidated as four Channel Blades (CHBs) per controller are removed.
- Note where the CHBs are currently installed in SUT. Location: 1A/2A, 1B/2B.
- Verify sufficient free space of at least 500GiB on RAID 1 (2+2) Parity Group of 10k SAS when using an array with HDD's or mixed Gx00 with FMD and HDD. If the array is Gx00 with all FMD or an Fx00 (AFA), use SSD in RAID 5 (3+1). Using DP Vols as NAS OS LUs on any media will be supported in future release.
  Please verify at the time of implementation.

  - Please note that a dedicated CLPR will be used for the NAS OS LUs until DP Volume support as noted above.

- Verify LDEVs of N and N-1 are available. For example, on the VSP G400/600, the maximum LDEVs of 4094(0F:FE) and 4095(0F:FF) and are available. For G800, the LDEV IDs are 16382(3F:FE) and 16383(3F:FF). If these LDEV ID's are in use, the installation software will choose the highest available values.

- To allow for installation of NAS firmware after the NAS File Modules have been inserted, follow the IIS/FTP server settings set forth in the Maintenance Manual, e08MPC0.pdf, beginning on page MPC01-390.

    - If a firewall is in use between the MPC and array, enable port 20 for FTP services on the firewall.

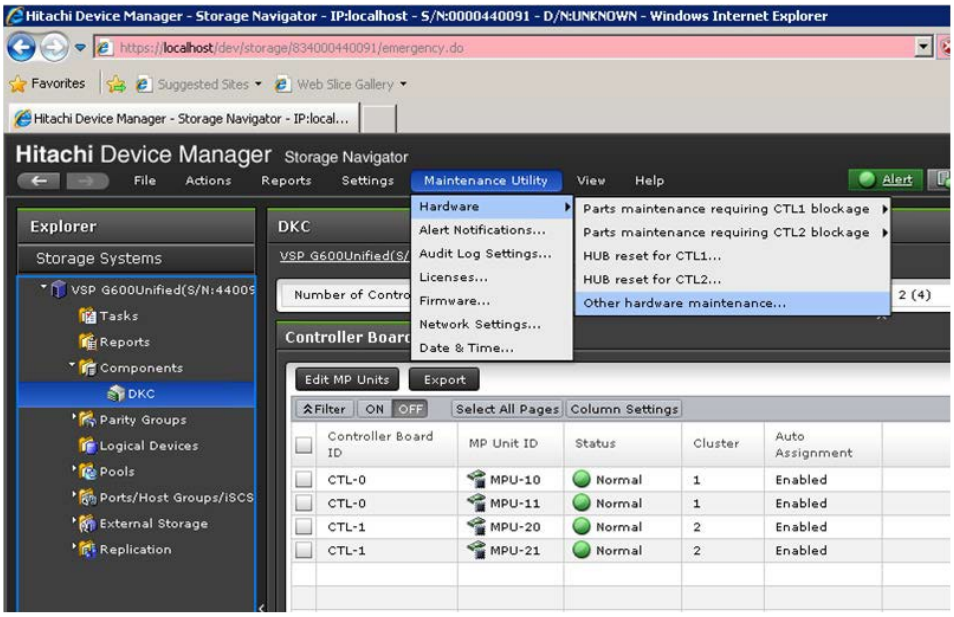
- If HCS will be used to administer the Unified solution, the minimum supported version is 8.4.1.
- If integrating the Unified platform into an existing NAS infrastructure, it may be more advantageous to continue using the external SMU, although using the embedded SMU is acceptable.

Note: When integrating into an existing HCS infrastructure, using the embedded SMU as the communication vehicle to HCS is preferred over the external SMU.

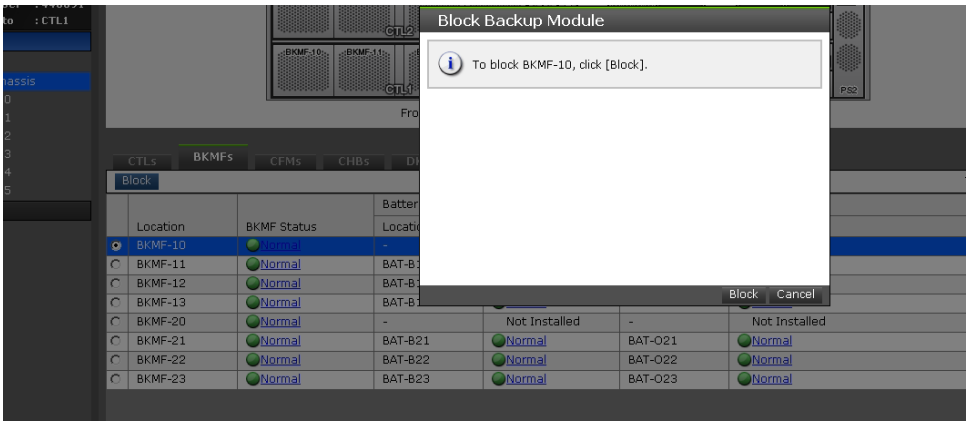
Install additional batteries

Use the Hitachi Device Manager to begin the battery replacement process.

1. Using the drop-down menus, select **Maintenance Utility > Hardware > Other hardware** maintenance.

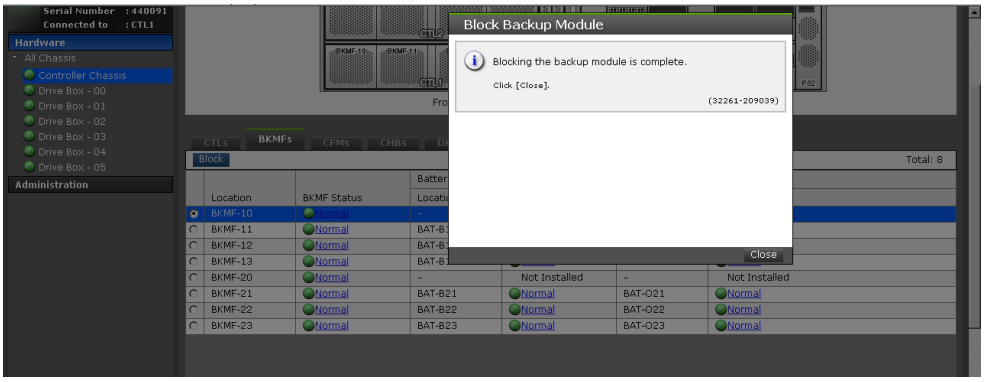


2. Block the backup module at BKMF-10 by clicking **Block**.



3. After you have physically installed the battery, click **Close**.

   Note: The fan module speed will increase while the battery is removed. This is normal.



4. Repeat this same process for the BKMF-20 battery.

   Note: The battery status will remain “Not Installed” until the installation of the NAS modules is complete.

Clearing browser caches

To ensure the NAS modules are listed in the CHB section’s Install drop-down list, start by clearing the browser cache. Typically, the Hitachi Device Manager uses Internet Explorer, therefore the steps presented here will refer to that browser. Otherwise, for other browsers, adapt these instructions as needed to clear the browser cache.

1. Open Internet Explorer.
2. Hitachi NAS Platform to Hitachi Virtual Storage Platform Unified Gx00 Models Migration Guide August 2016 **Hitachi Data Systems** Page 4

3. For IE v8, from the Tools menu choose Internet Options. For IE v9 or higher, in the upper right corner, click the small gear icon (to the right of the star icon) and choose **Internet Options**.
4. In the General tab, under Browsing history, click **Delete**.
5. Un-check the Preserve Favorites website data box.
6. Enable the Temporary Internet files, Cookies, and History selection boxes.
7. The Form data, Passwords, and inPrivate Filtering data boxes may be left un-unselected. However, you can select them to delete this data if you so wish to do so.
8. Click **Delete**.
9. When finished, click **OK** to commit the changes.
10. Close the Internet Explorer window and reopen to restart it.

Preventing future caching issues

To reduce some potential caching issues, it is best to have Internet Explorer set to request the latest version of the page rather than relying on a cached copy. To do this:

1. For IE v8, from the Tools menu choose **Internet Options**. For IE v9 or higher, in the upper right corner, click the small gear icon (to the right of the star icon) and choose Internet Options.
2. In the General tab, under Browsing history, click **Settings**.
3. Under **Check for newer versions of stored pages** ensure **Every time I visit the webpage** is selected.
4. Click **OK** to commit the changes.

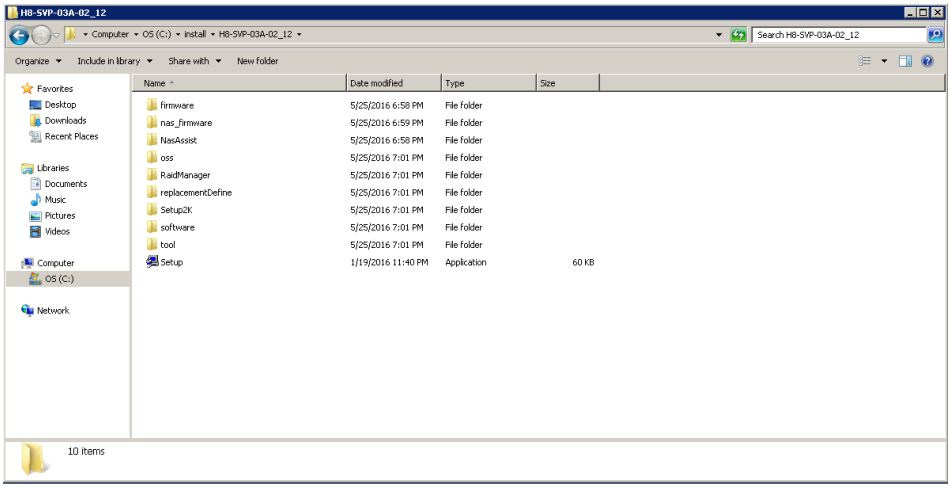
Chapter 3: Software Requirements and Creating Parity Group

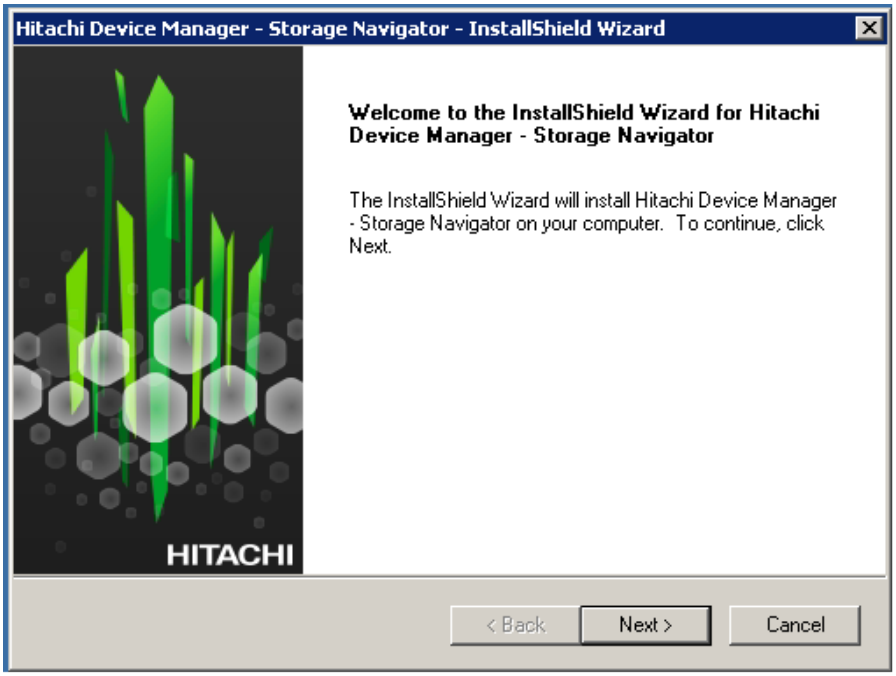
Software requirements

The migration process has the following software requirements:

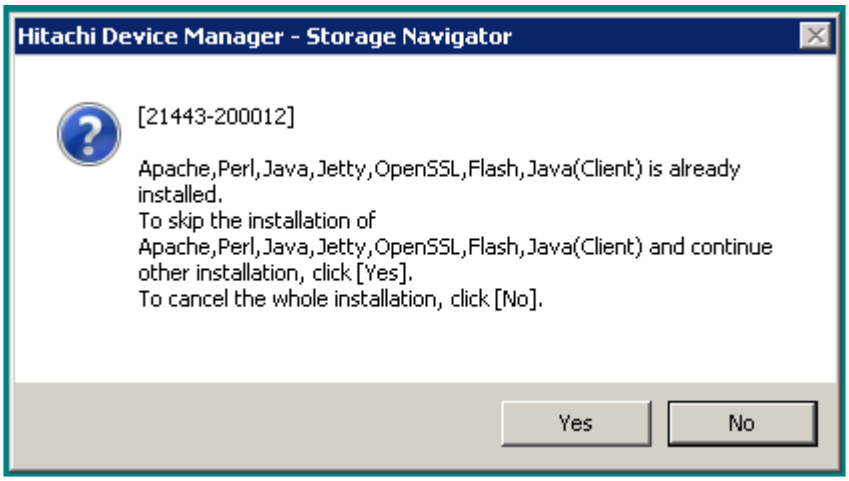
1. Update the NAS and SMU to latest available release. Submit an upgrade plan to HNAS Upgrade Review prior to performing this procedure.
2. For simplicity, verify that the VSP Gx00 is running SVOS 6.4.1 (or latest SVOS).
3. Obtain the MPC file. Generally, the MPC will be the customer engineer's laptop computer and is needed to select the NAS module-associated software components for installation.

4. Extract the compressed files and browse to `Setup.exe` to upgrade the system from MPC mode.

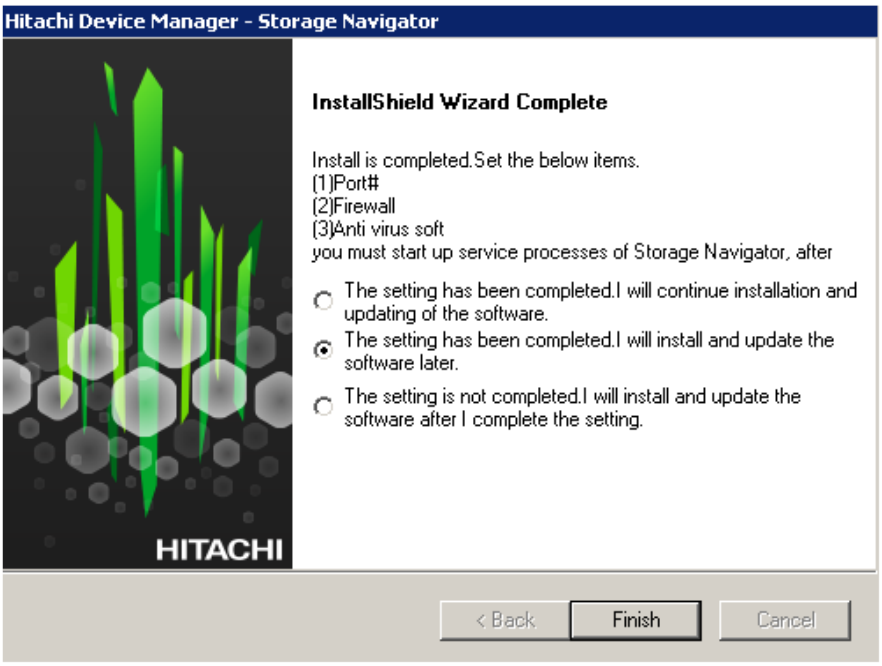




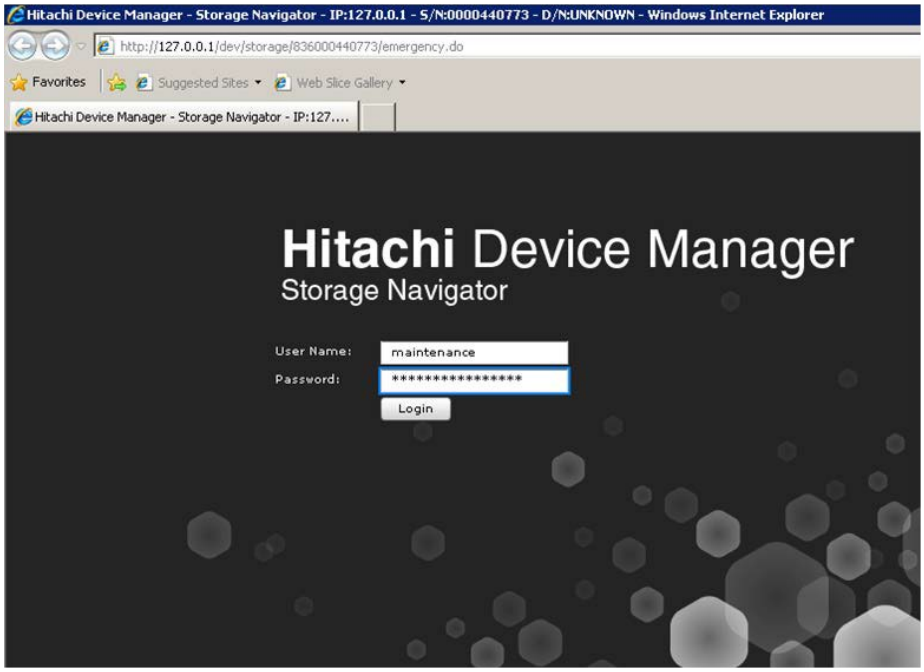
5. Accept the displayed license agreements.
6. Click **Yes** to continue.



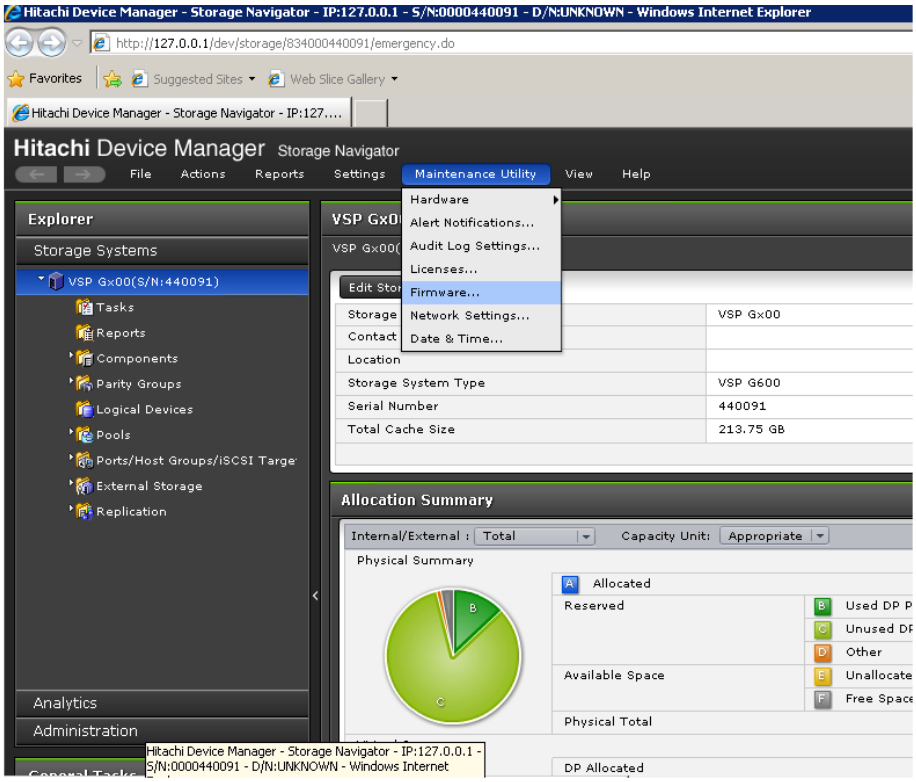
7. Select the second radio button (as shown in the following illustration) to apply files later and click **Finish**.



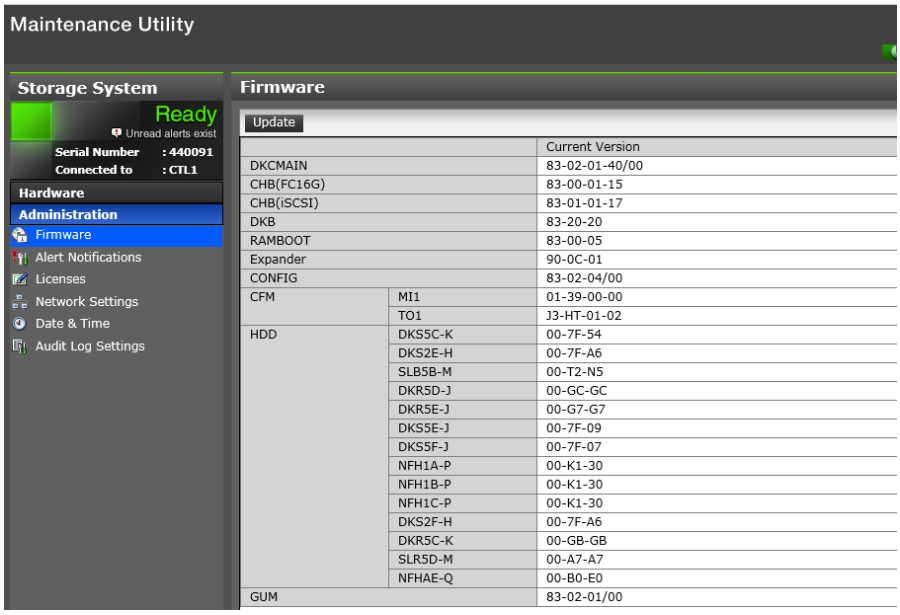
8. Log into Hitachi Device Manager.



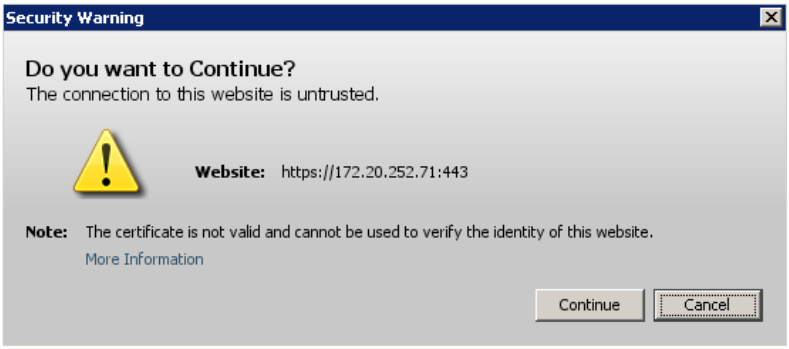
9. Upgrade the controller firmware through GUM by logging into one of the controllers.



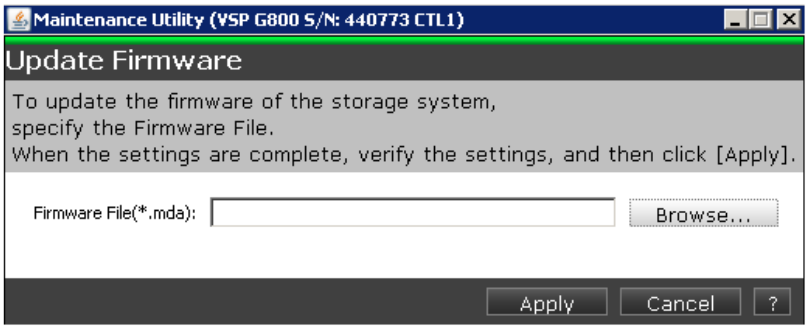
10. Browse to the `NASAllfirmware.mda` file location (approximately 2GB in size) and perform an online **Update**.

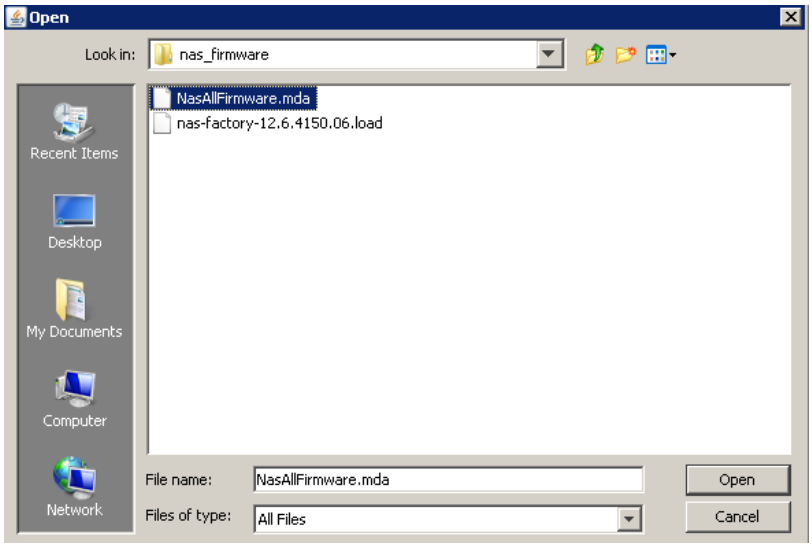


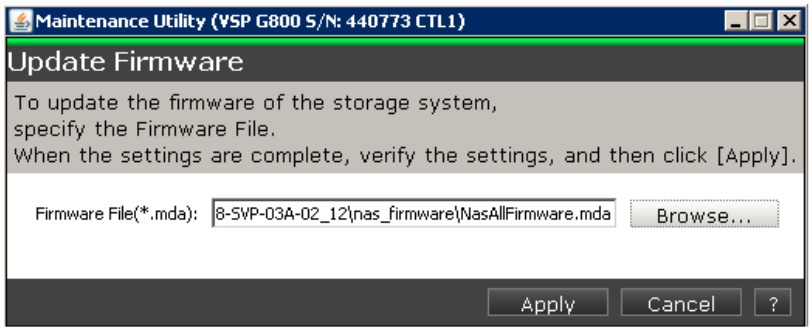
11. If prompted by a Security Warning dialog box noting the website connection is untrusted, click **Continue** to proceed.



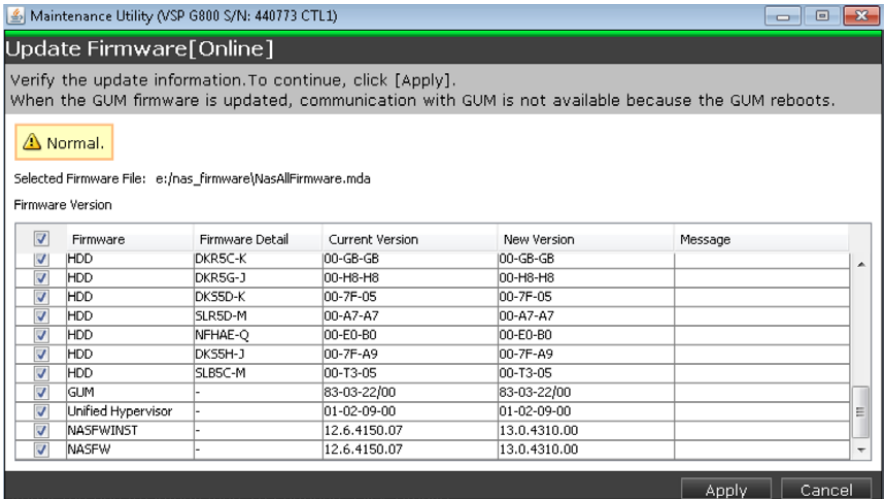
12. Locate the firmware file using the Browse function, select it, then click **Apply**.

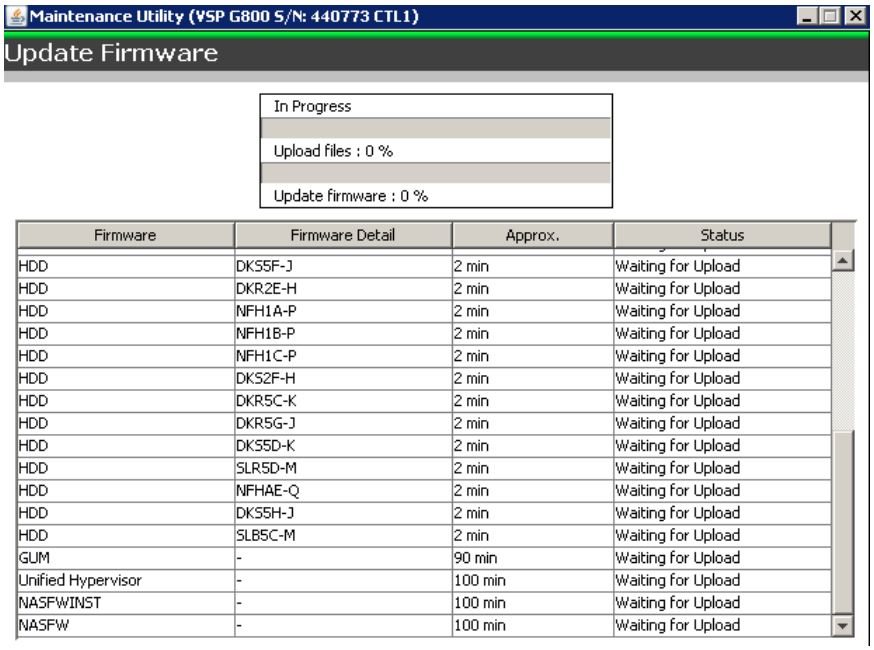






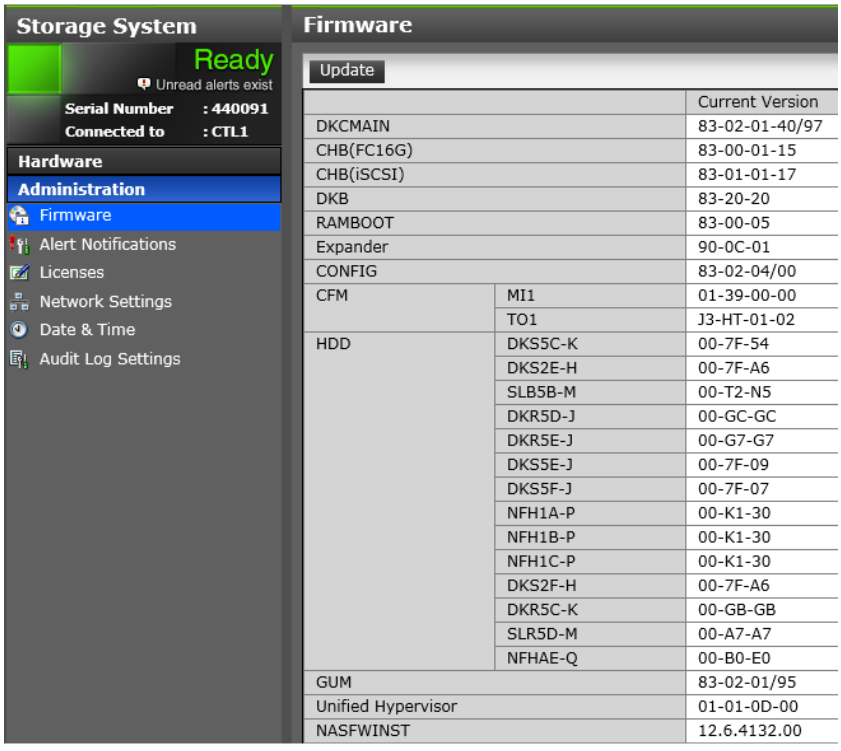
13. Note the new installation selection of `Unified Hypervisor` and `NASFWISNT` and `NASFW` at the bottom of the list of packages. These packages must be manually selected.



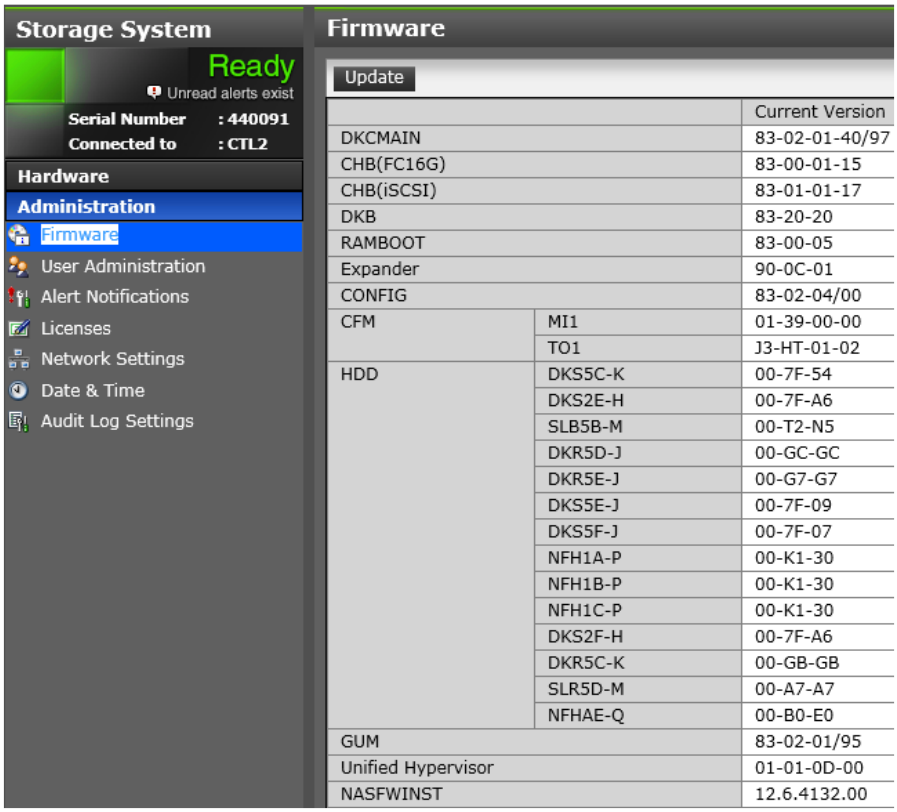


Firmware	Firmware Detail	Approx.	Status
HDD	DKS5F-J	2 min	Waiting for Upload
HDD	DKR2E-H	2 min	Waiting for Upload
HDD	NFH1A-P	2 min	Waiting for Upload
HDD	NFH1B-P	2 min	Waiting for Upload
HDD	NFH1C-P	2 min	Waiting for Upload
HDD	DKS2F-H	2 min	Waiting for Upload
HDD	DKR5C-K	2 min	Waiting for Upload
HDD	DKR5G-J	2 min	Waiting for Upload
HDD	DKS5D-K	2 min	Waiting for Upload
HDD	SLR5D-M	2 min	Waiting for Upload
HDD	NFHAE-Q	2 min	Waiting for Upload
HDD	DKS5H-J	2 min	Waiting for Upload
HDD	SLB5C-M	2 min	Waiting for Upload
GUM	-	90 min	Waiting for Upload
Unified Hypervisor	-	100 min	Waiting for Upload
NASFWINST	-	100 min	Waiting for Upload
NASFW	-	100 min	Waiting for Upload

14. Verify both controllers (CTL1 and CTL2) have updated GUM versions and are also running the Unified Hypervisor.



		Current Version
DKCMAIN		83-02-01-40/97
CHB(FC16G)		83-00-01-15
CHB(iSCSI)		83-01-01-17
DKB		83-20-20
RAMBOOT		83-00-05
Expander		90-0C-01
CONFIG		83-02-04/00
CFM	MI1	01-39-00-00
	TO1	J3-HT-01-02
HDD	DKS5C-K	00-7F-54
	DKS2E-H	00-7F-A6
	SLB5B-M	00-T2-N5
	DKR5D-J	00-GC-GC
	DKR5E-J	00-G7-G7
	DKS5E-J	00-7F-09
	DKS5F-J	00-7F-07
	NFH1A-P	00-K1-30
	NFH1B-P	00-K1-30
	NFH1C-P	00-K1-30
	DKS2F-H	00-7F-A6
	DKR5C-K	00-GB-GB
	SLR5D-M	00-A7-A7
	NFHAE-Q	00-B0-E0
GUM		83-02-01/95
Unified Hypervisor		01-01-0D-00
NASFWINST		12.6.4132.00



		Current Version
DKCMAIN		83-02-01-40/97
CHB(FC16G)		83-00-01-15
CHB(iSCSI)		83-01-01-17
DKB		83-20-20
RAMBOOT		83-00-05
Expander		90-0C-01
CONFIG		83-02-04/00
CFM	MI1	01-39-00-00
	TO1	J3-HT-01-02
HDD	DKS5C-K	00-7F-54
	DKS2E-H	00-7F-A6
	SLB5B-M	00-T2-N5
	DKR5D-J	00-GC-GC
	DKR5E-J	00-G7-G7
	DKS5E-J	00-7F-09
	DKS5F-J	00-7F-07
	NFH1A-P	00-K1-30
	NFH1B-P	00-K1-30
	NFH1C-P	00-K1-30
	DKS2F-H	00-7F-A6
	DKR5C-K	00-GB-GB
	SLR5D-M	00-A7-A7
	NFHAE-Q	00-B0-E0
GUM		83-02-01/95
Unified Hypervisor		01-01-0D-00
NASFWINST		12.6.4132.00

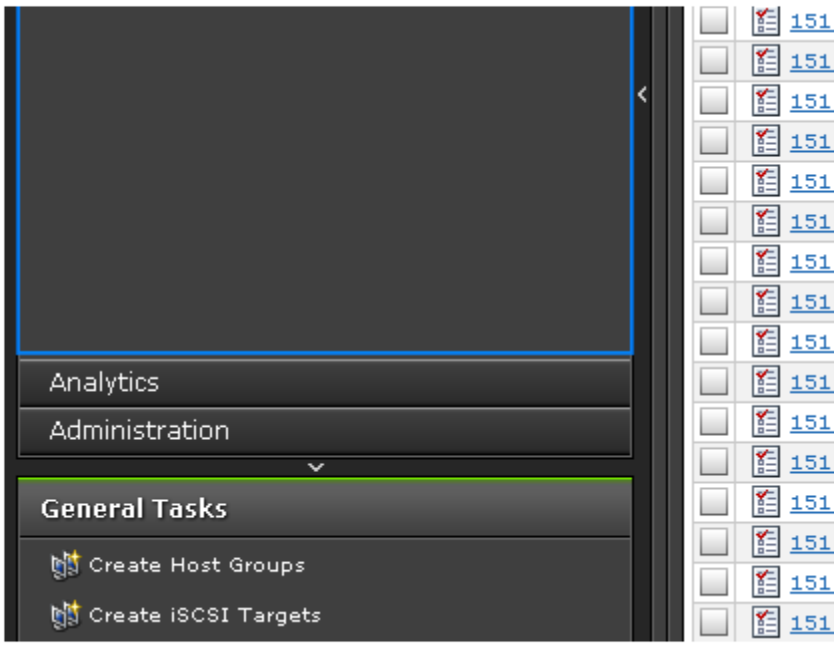
Channel board modules

It is likely that an existing G(F)x00 will have at least one FC or iSCSI CHB in slots A, B, C or D of each controller.
These CHBs will have to be either removed completely (file-only solution with no replication) or moved to any of the spare slots E, F or G (Unified or replicated environment).
In preparation for any CHB removal or slot changes, the HNAS gateway cluster must be disconnected and is described in the next section.

Creating the dedicated 4GB CLPR and associated Parity Group for the NAS OS LU

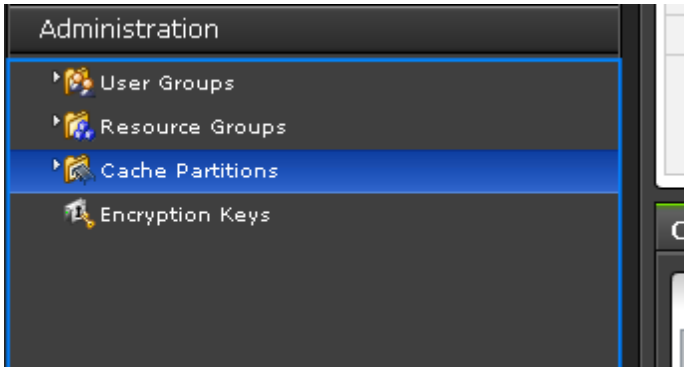
The following steps describe how to create the dedicated 4GB CLPR and associated Parity Group for the NAS OS LU.

1. Create a new cache partition. In the Storage Navigator, click the Administration tab in the left side column.

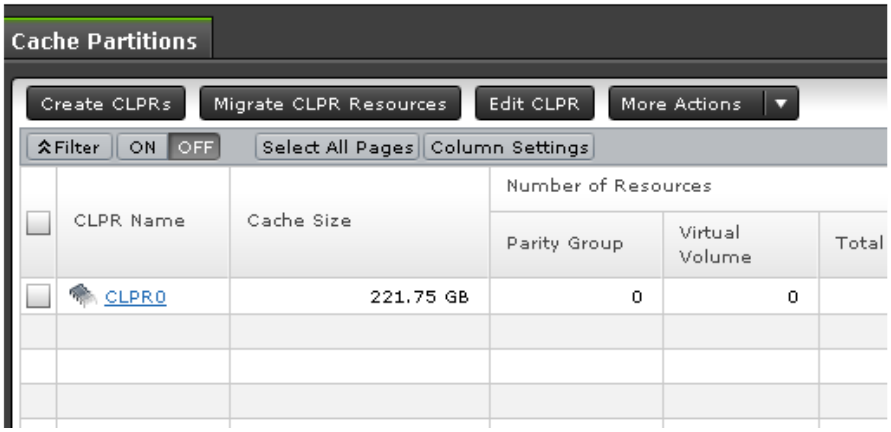


This displays the Administration task functions.

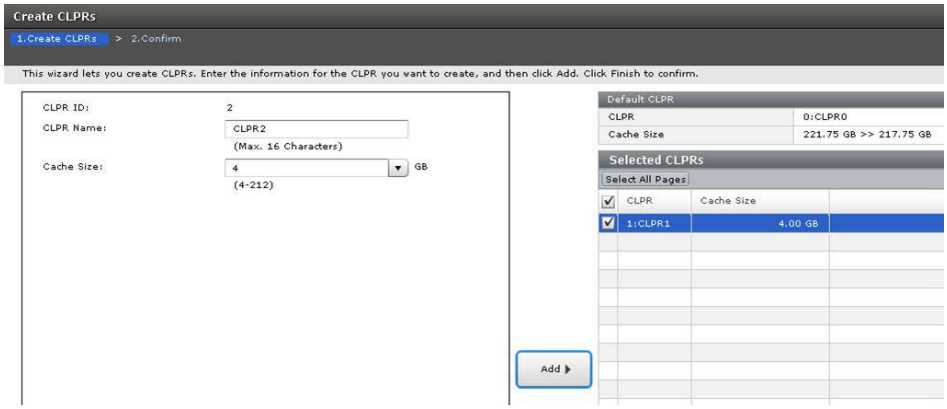
2. Select **Cache Partitions**.



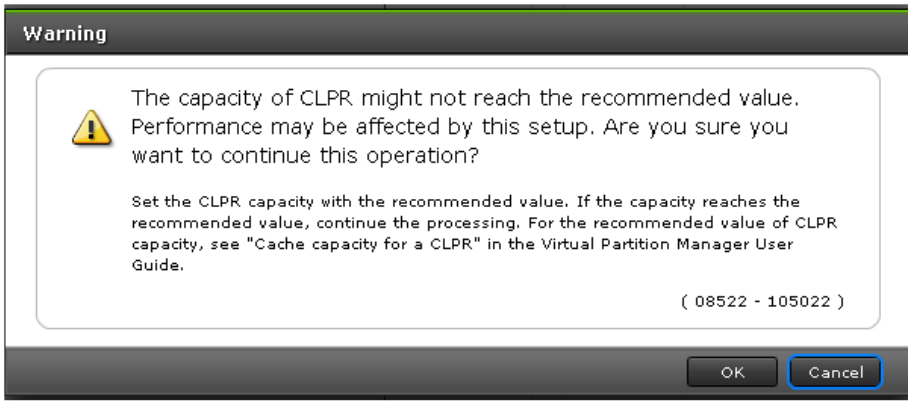
3. Select **Create CLPRs**.



4. Create the CLPR with a size of 4GB and click **Add**.

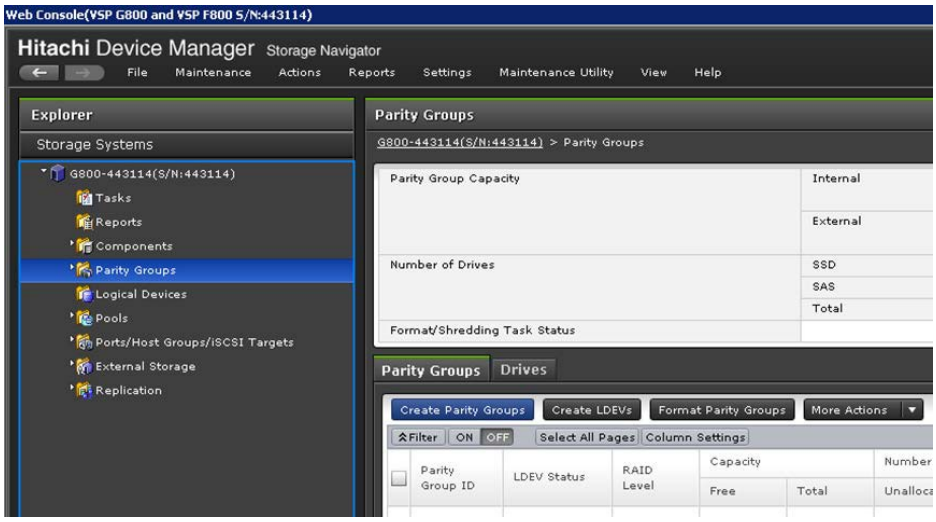


5. It is possible a capacity warning message may display. If this happens, click **OK** to continue the operation as it is safe to ignore the warning.

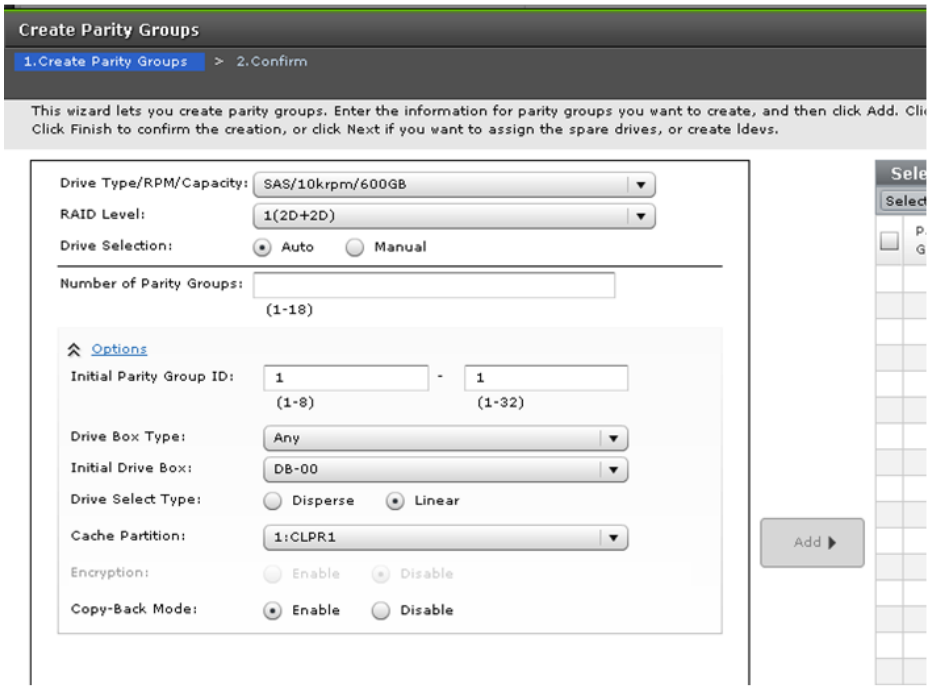


6. Wait until the Create CLPR task completes.

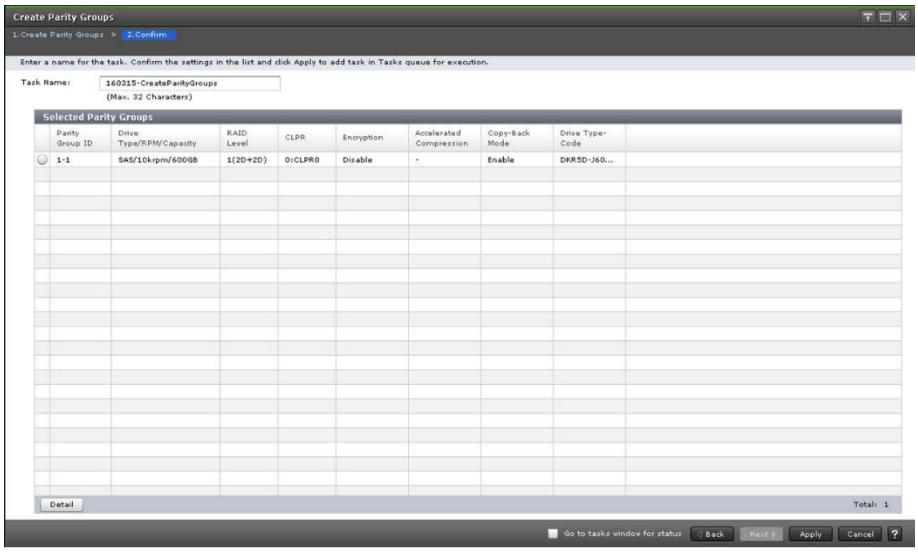
7. In the Storage Navigator (or HCS), go to **Storage Systems > Parity Groups**. Click **Create Parity Groups**.



8. In the Create Parity Groups dialog, select **Drive Type/RPM/Capacity** and **RAID Level1(2D+2D)**. For consistency, this Parity Group should be comprised of HDD available as a Hot Spare in case of a drive failure.
9. For the Number of Parity Groups, enter the value 1. Select CLPR1 as the Cache Partition (this is the 4GB CLPR created previously). Leave all other options unchanged. Click **Add** and then **Finish**, but when prompted do not click Next yet.



10. Instead, click **Apply** and wait for the task to complete.



11. Exit the Storage navigator application.

Chapter 4: Migration Process

Disabling access to the storage from gateway cluster

1. Connect using secure shell (SSH) from the SMU to the server and select the appropriate cluster from the SMU (if there are more than two entities).
2. Document the v-node bindings of the file systems to restore them properly once the system is unified.
3. Run the `df` command to log the current bindings:

```
curacao-1:$ df
ID Label EVS Size Used Snapshots Reduction Avail Thin FS Type
---- ---------- --- -------- ------------- --------- -------------- ---------
----- ---- ----------------------------------
1030 deb02 1 2.618 TB 1.558 TB (60%) NA 4.092 TB (72%) 1.06 TB (40%) No 32
KB,WFS-2,128 DSBs,dedupe enabled
1036 tfs01 1 323.3 GB 242.1 GB (75%) NA 0 B (0%) 81.21 GB (25%) No 4 KB,WFS-
2,128 DSBs,dedupe enabled
Tier 0 18 GB 808.5 MB (4%) 0 B (0%) 17.21 GB (96%)
Tier 1 305.3 GB 241.3 GB (79%) 0 B (0%) 64 GB (21%)
1037 tfs02 1 1.14 TB 507.1 GB (43%) NA 501.4 GB (50%) 660.3 GB (57%) No 4
KB,WFS-2,128 DSBs,dedupe enabled
Tier 0 18 GB 4.178 GB (23%) 0 B (0%) 13.82 GB (77%)
Tier 1 1.122 TB 502.9 GB (44%) 501.4 GB (50%) 646.5 GB (56%)
1024 tfs03 2 3.596 TB 2.82 TB (78%) NA 1.635 TB (37%) 793.8 GB (22%) No 4
KB,WFS-2,128 DSBs,dedupe enabled
Tier 0 34.2 GB 13.14 GB (38%) 0 B (0%) 21.06 GB (62%)
Tier 1 3.562 TB 2.808 TB (79%) 1.635 TB (37%) 772.8 GB (21%)
1025 tfs04 2 12.93 TB 11.07 TB (86%) NA 4.023 TB (27%) 1.861 TB (14%) No 4
KB,WFS-2,128 DSBs,dedupe enabled
Tier 0 54 GB 35.21 GB (65%) 0 B (0%) 18.79 GB (35%)
```

```
Tier 1 12.87 TB 11.03 TB (86%) 4.023 TB (27%) 1.843 TB (14%)
1035 deb01 2 863.6 GB 709.9 GB (82%) NA 0 B (0%) 153.7 GB (18%) No 4 KB,WFS-
2,128 DSBs,dedupe enabled
1034 randomdata 3 4.245 TB 3.641 TB (86%) NA 0 B (0%) 618 GB (14%) No 32
KB,WFS-2,128 DSBs,dedupe enabled
Tier 0 90 GB 70.77 GB (79%) 0 B (0%) 19.23 GB (21%)
Tier 1 4.157 TB 3.572 TB (86%) 0 B (0%) 598.7 GB (14%)
```

4. Using the command-line interface (CLI), SMU or HCS, unmount all the file systems on the target Gxx platform or disable the necessary file serving EVSs.

    - Disable all file serving EVSs. For example, with one EVS from the CLI:

      ```
      curacao-1:$ vn 1 evs disable -e 1
      Do you want to proceed? (Y/N)[N]:
      y
      [evs took 14 s.]
      [vn took 14 s.]
      ```

    - Repeat for all file serving EVSs, as required.

5. Verify all file systems are cleanly unmounted using the HNAS event log. By disabling the EVSs, there will no longer be file systems listed in the output of the `df` command.

6. Locate the current cluster UUID (`cluster-show`). An example UUID is highlighted in the output shown here.

   ```
   curacao-1:$ cluster-show
   Overall Status = Online
   Cluster Health = Robust
   Cluster Mode = Clustered
   Cluster Name = curacao
   Cluster UUID = 813ec18a-f00e-11d0-9000-133b0782b468
   Cluster Size = 2
   Node Name = curacao-1
   Node ID = 1
   Cluster GenId = 17
   Cluster Master = No
   ```

7. From the CLI, list the spans on the cluster using the command `span-list`.
8. For each listed span on the server being converted, remove the current cluster UUID from the spans (`span-remove-cluster-uuid <`*`span_name`*`> <`*`cluster name`*`>`).

   Note: This may not necessarily be all spans if the existing server will continue being utilized, but for this process, it is assumed that the server will no longer be in use. For example, when removing the `nlsas` (or `flash`) span from the cluster named `curacao`:

   ```
   curacao-1:$ span-remove-cluster-uuid nlsas curacao
   Success
   ```

```
If any other cluster has loaded this span, it will not
register the change until you reboot it or, on that
remote cluster, unmount any mounted file systems on the
span and run:

sd-rescan-cod nlsas
```

9. On the CLI, deny access to the spans on the server being upgraded (`span-deny-access <span-name>`).

```
curacao-1:$ span-deny-access nlsas;span-deny-access flash
Success
Success
```

Note: This step is optional if the original cluster will be used to continue servicing different storage.

10. When tiered filesystems are in use, export the tiering composition for all SDs. Running this command will place the file on the current managing SMU in the /home/manager directory:

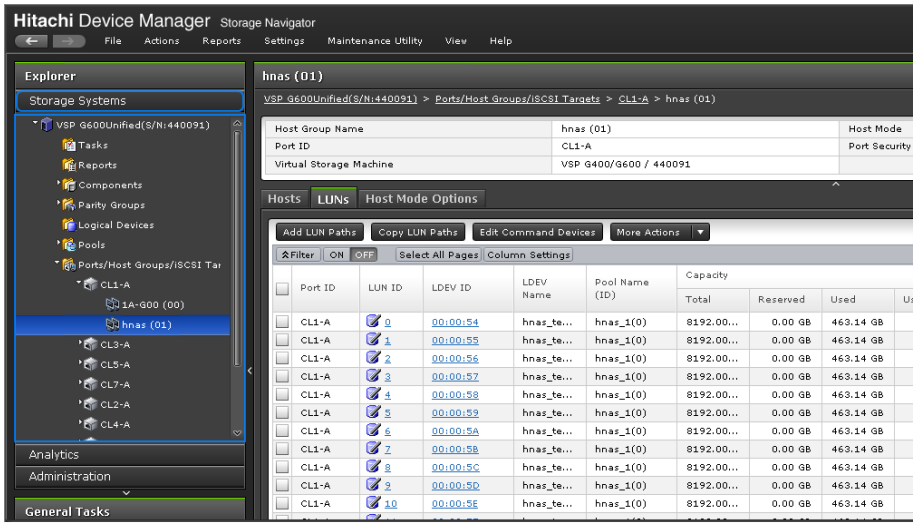
```
curacao-1:$ sd-tier-export all-tiered-sds.txt 0-27
On the SMU, the contents can be checked:

[manager@curacao-smu ~]$ more all-tiered-sds.txt
Schema 0
0 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:57
1 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:58
2 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:59
3 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:5A
4 0 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:63
5 0 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:64
6 0 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:65
7 0 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:66
8 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:67
9 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:68
10 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:69
11 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:6A
12 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:6B
13 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:6C
14 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:6D
15 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:6E
16 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:6F
17 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:70
18 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:71
19 250 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:72
20 1 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:73
21 1 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:74
22 1 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:75
23 1 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:76
24 1 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:77
25 1 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:78
26 1 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:79
27 1 [03:01:00]60:06:0E:80:12:9C:9B:00:50:40:9C:9B:00:00:00:7A
```

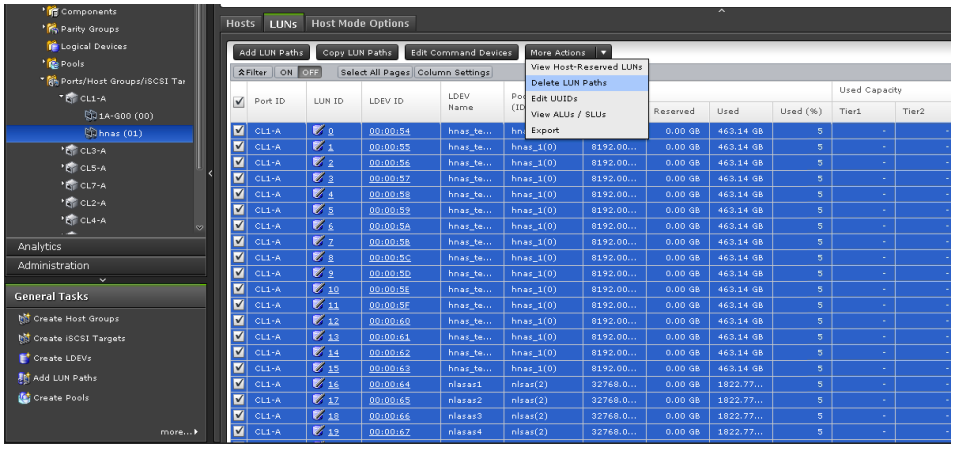
Unmapping all SDs associated with HNAS from target ports

WARNING: Use extra care when following the steps presented here. There is a point just after Step 3 where continuing with the automated Wizard process would result in shredding the LDEVs, which should not be done. *If the LDEVs are shredded, the resulting data loss is irreparable.* Where it says in Step 4 to click **Finish**, be sure to do that.

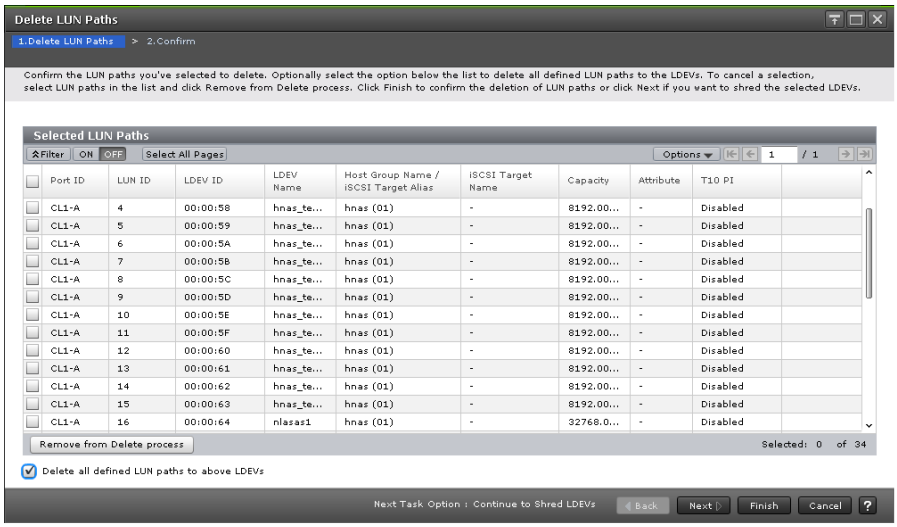
1. Launch the Hitachi Device Manager Storage Navigator. For example: https://localhost/dev/storage/834000440091/emergency.do.



2. From **More Actions** drop-down menu, select the **Delete LUN paths**.



3. Select **Delete all defined LUN paths to above LDEVS**.



WARNING: In the next step, be sure to click **Finish**. Do not click **Next**, because continuing further in the Wizard would result in shredding the LDEVs, which you do not want to do. Doing so could lead to irreparable data loss.

4. Click **Finish**.
5. After all the SDs are removed, you can use `sd-forget` to remove them from the registry. This will make the target SD configuration cleaner.

Backing up the HNAS cluster registry

Prior to performing a registry backup of the HNAS, log into the CLI of one node and type `cn all smu-service-enable`. This is to ensure that when the registry from the HNAS is transferred to the Unified, the embedded SMU will be accessible.

Back up both the SMU (as a general best practice, but not needed as part of this process) and server registries from the current SMU and store on local machine.

Alternatively, you can back up the server registry using the CLI command `backupregistry`.

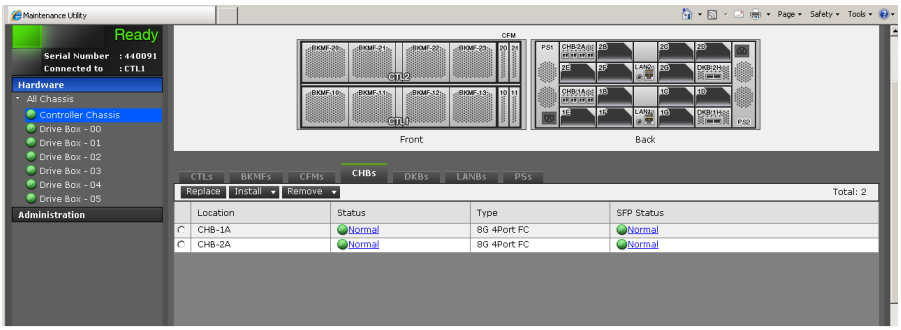
Shutting down the existing HNAS

Using the CLI, run the command `shutdown -a`.

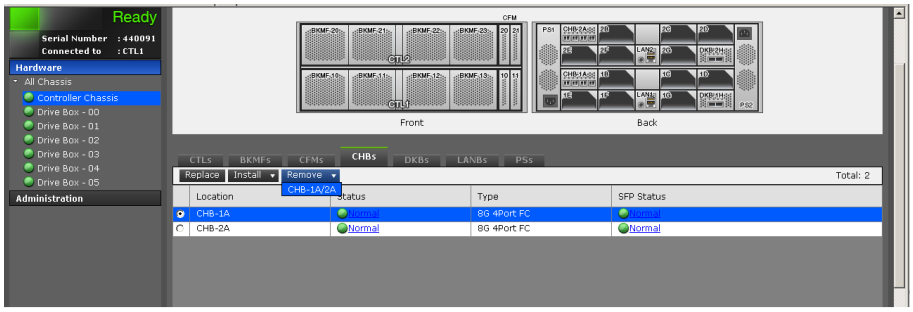
Removing or moving CHBs

To remove or move CHBs, follow these steps:

1. Verify LDEVS have been unmapped from host ports.
2. From the Hitachi Device Manager, access the Maintenance Utility and select the Chassis view.
3. Click **CHBs** tab to select it.

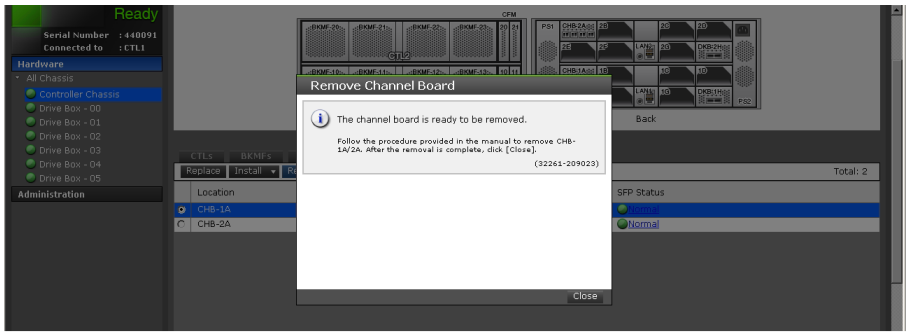


4. Select **CHB** and click **Remove**. Follow the steps in the board removal wizard.

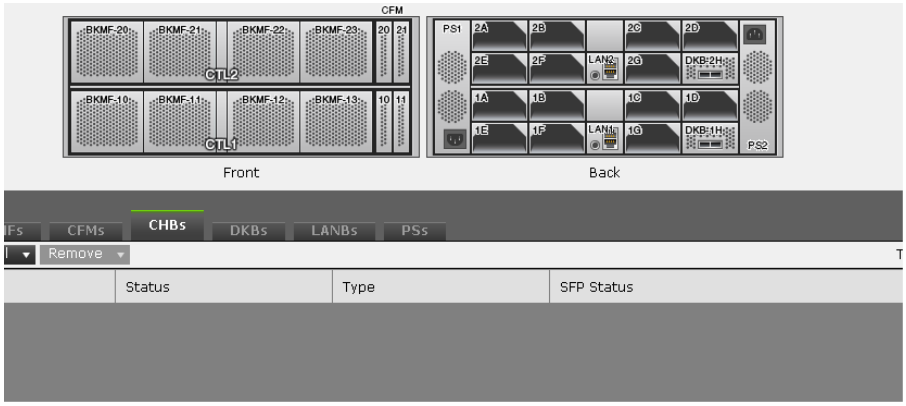


5. On the Remove Channel Board dialog box, click **Remove**.

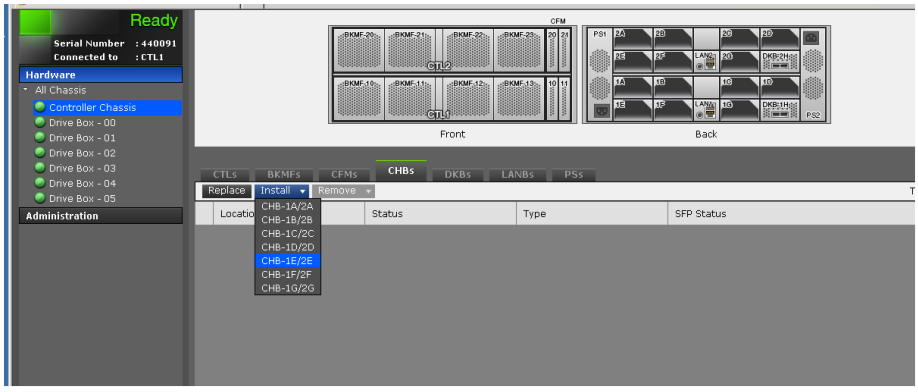
6. When the board removal process is completed, click **Close**.

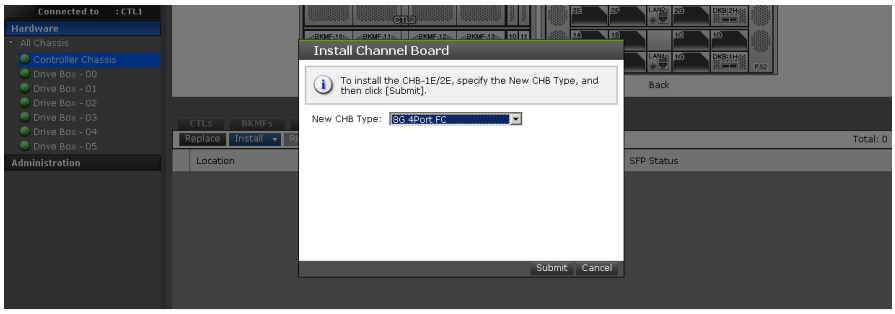


7. At this point, the CHBs are no longer reported.



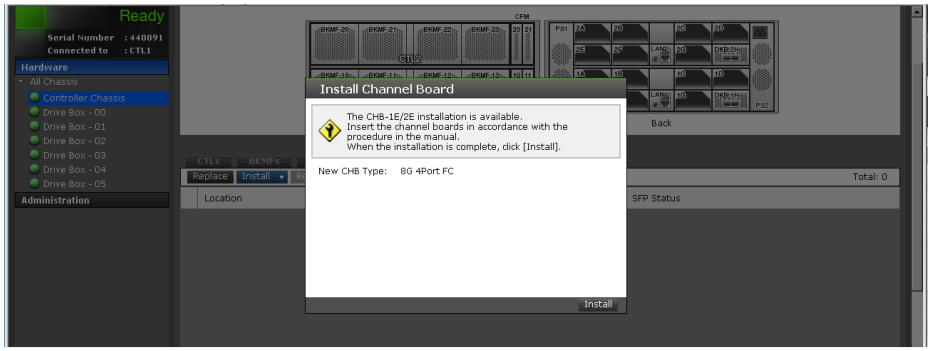
8. Place the CHBs into slots 1E and 2E, but do not fully engage them into the slots.
9. Select the applicable CHB type. In this case, the same CHB is being used, so the 8GB x 4 port is selected.



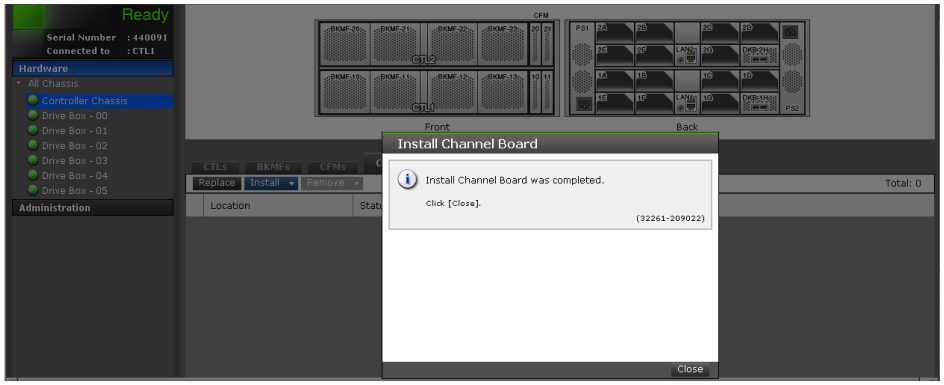


10. Physically install the CHBs into the new slots, connect applicable fiber cables, then click **Install**.

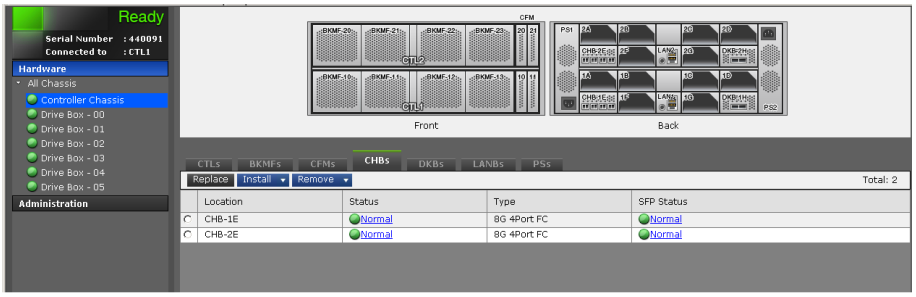
    Note: Connecting fibers may impede the NAS File Module installation process.



11. After the installation process completes, click **Close**.



12. The newly inserted CHBs are now displayed.

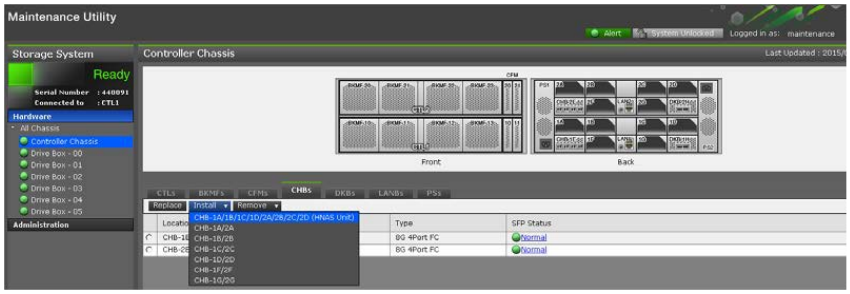


Installing the NAS File Modules

1. Remove the screws that hold the internal bracket support and pull out the assembly.
2. Place the NAS File Modules into the vacated portion of each controller, but do not insert them fully into the chassis.

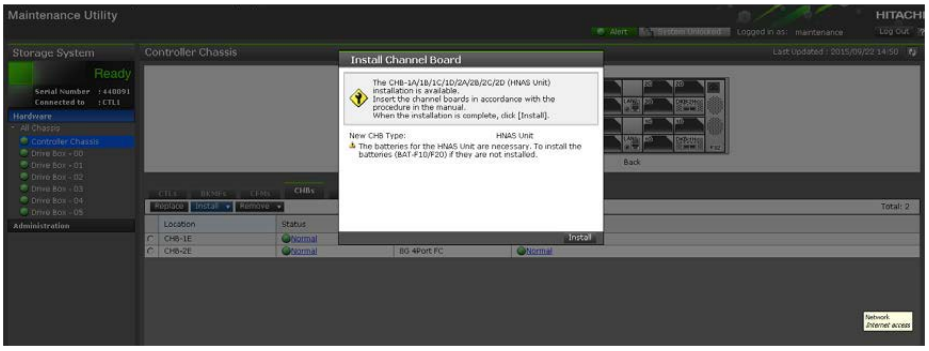
   Important: Do not insert the NAS File Modules fully into the chassis. To keep nominal airflow, keep them approximately 2.5cm (one inch) out so the connectors do not engage.

3. From the Hitachi Device Manager, access the Maintenance Utility and select Chassis view.
4. Select the appropriate CHB tab and click **Install**. Select the **1A/1B/1C/1D/2A/2B/2C/2D(NAS Module)**.

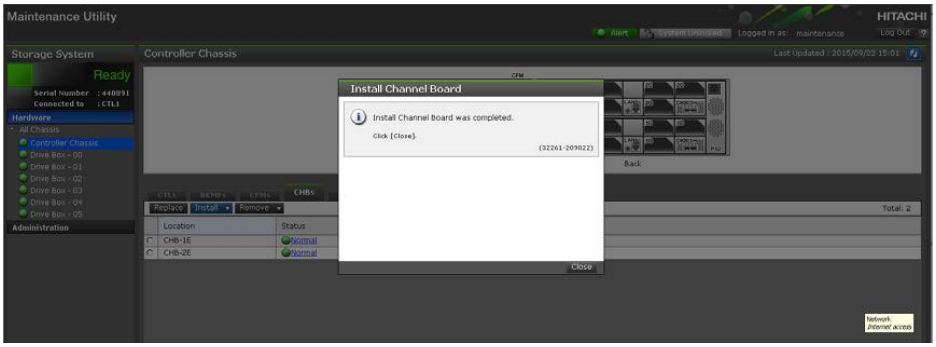


5. Select **NAS Module** from the **New CHB Type** drop-down list and click **Submit**.

6. At this point, now insert the NAS File Module fully into the slot and click **Install**.

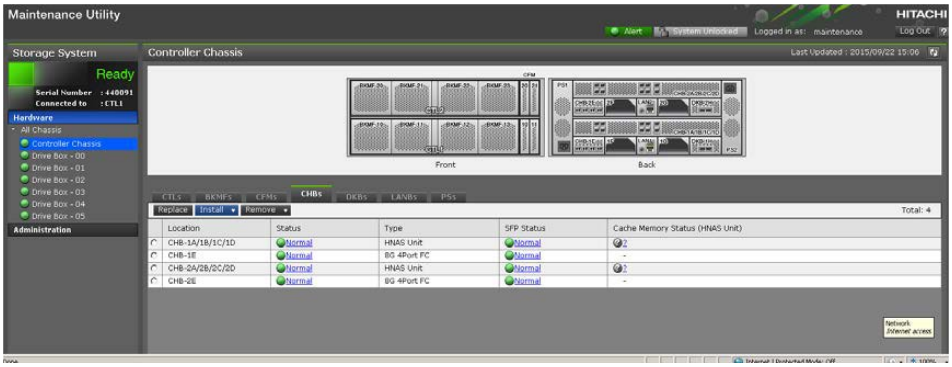


7. When the installation process completes, click **Close**.

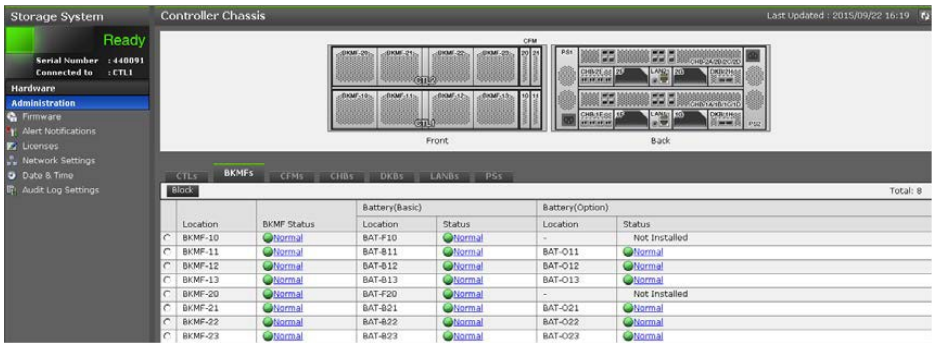


8. The new NAS File Modules show as installed.

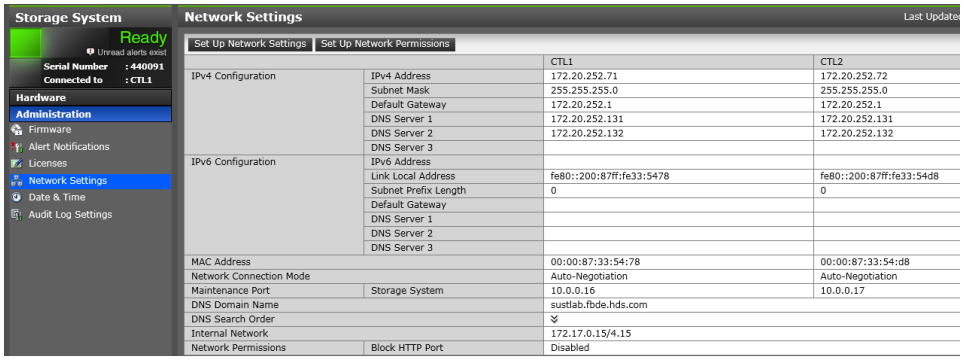
   Note: Do not connect the NAS Module Ethernet ports to the customer network at this time.



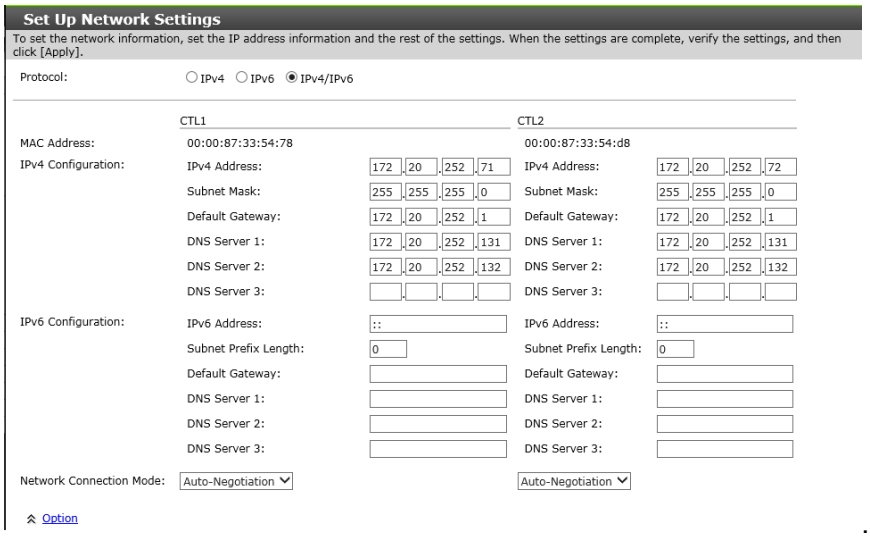
9. Additionally, the newly installed batteries appear. Notice the batteries are appended with the letter F, indicating they are associated with the file module.



10. Change the internal Management Network value from the default. From the drop-down menu, select **Administration > Network Settings** and click **Set Up Network Settings**.

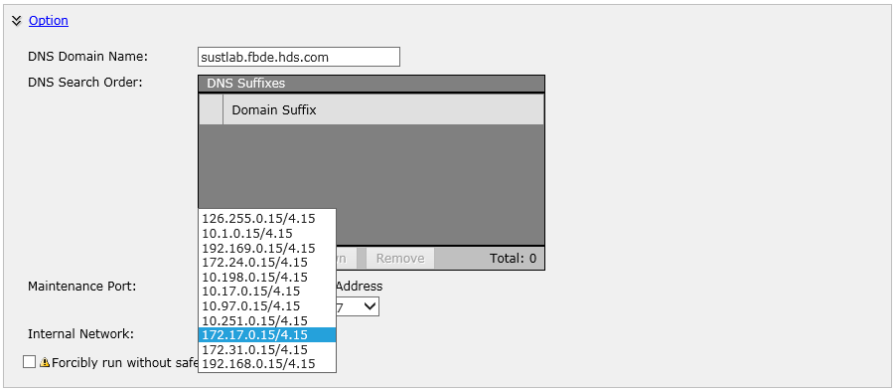


11. The Set Up Network Settings dialog box appears:

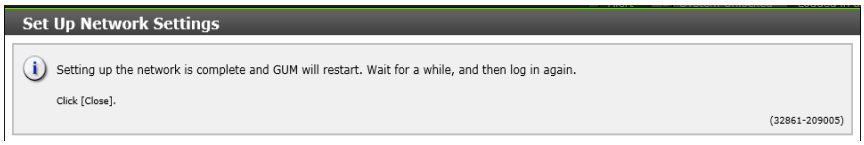


12. Click the **Option** link to expand the area below it.

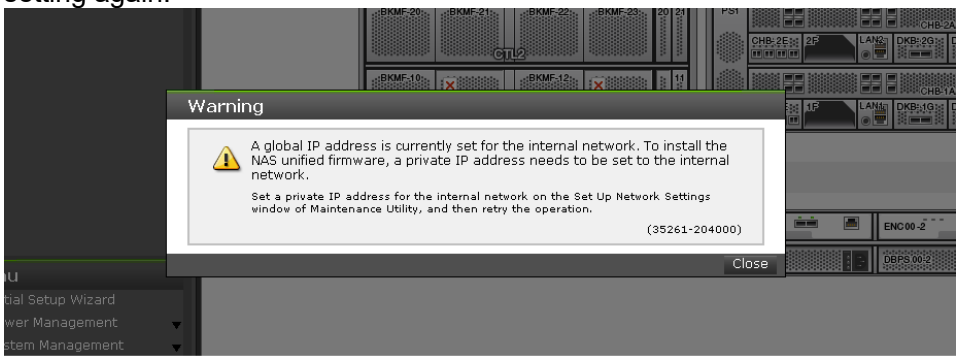
13. Using the Internal Network selection box, chose a different value, one that is not used in the local network and click **Apply**. This may take several minutes for the task to complete.



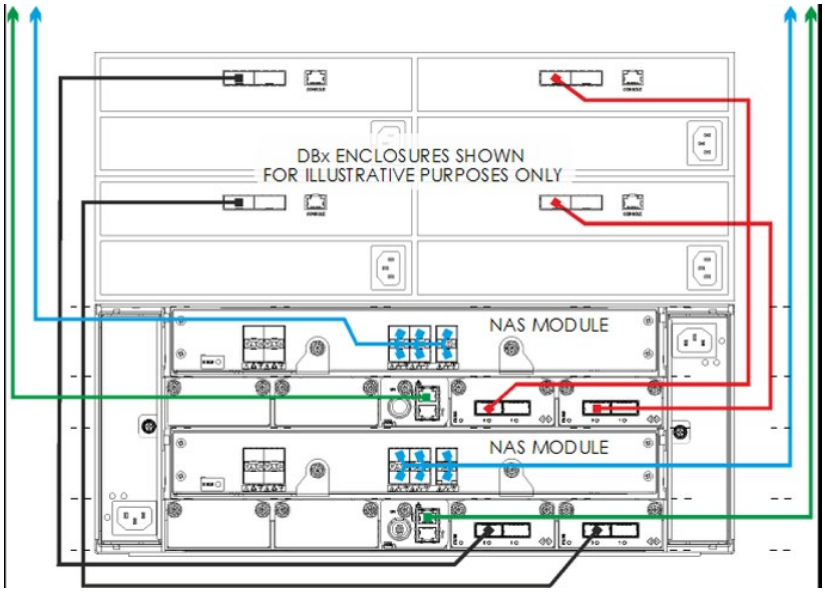
14. When done, a notification window displays.



Note: If the setting is incorrect, the NAS Platform firmware installation will not start and you will see the following pop-up window, requiring you to change the setting again.



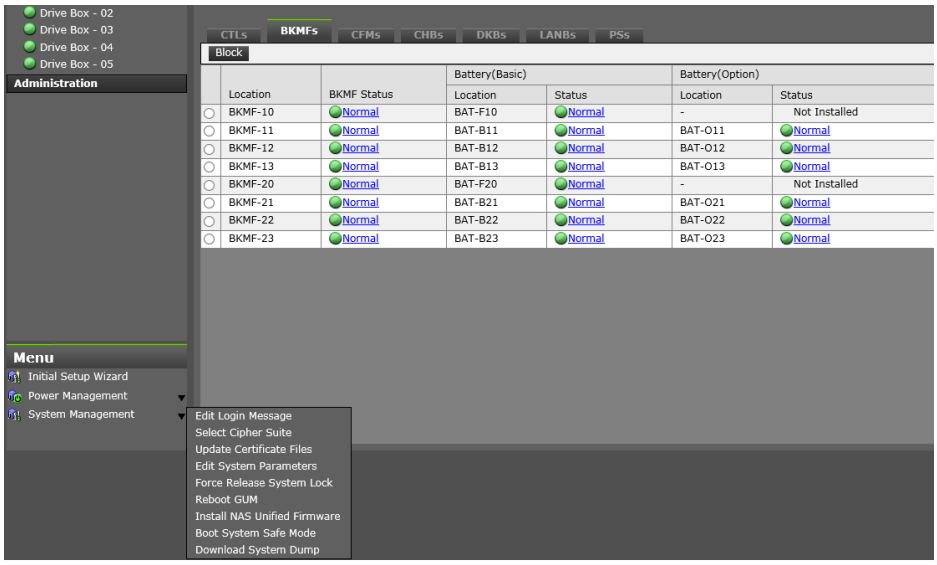
15. Route the cabling (drive channel SAS cabling and NAS module Ethernet) in accordance with the following guidelines.



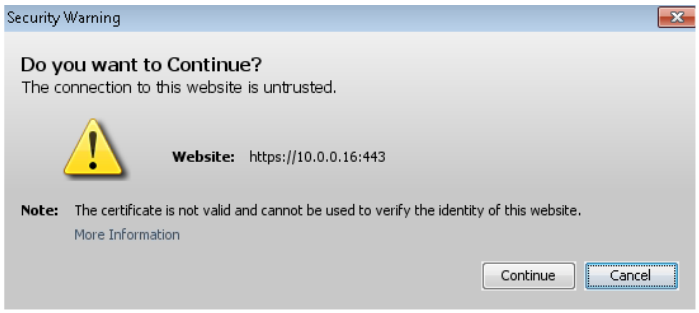
Chapter 5: Firmware Update and NAS Software Installation

Initial firmware upgrade

1. From the Hitachi Device Manager main menu, select **System Management > Install NAS Unified Firmware**.

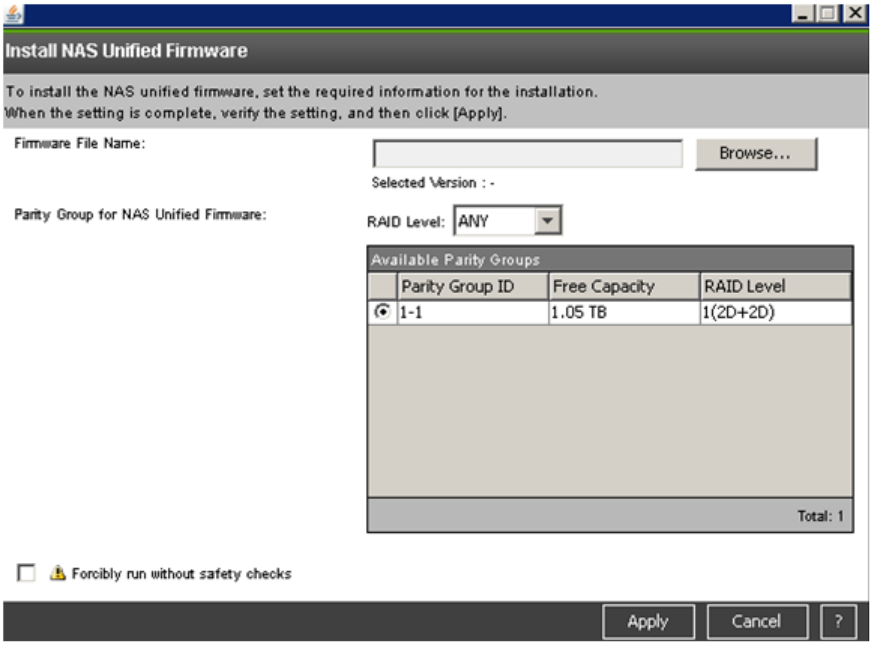


2. If a certificate warning notification is displayed, it is safe to ignore it and click **Continue**.

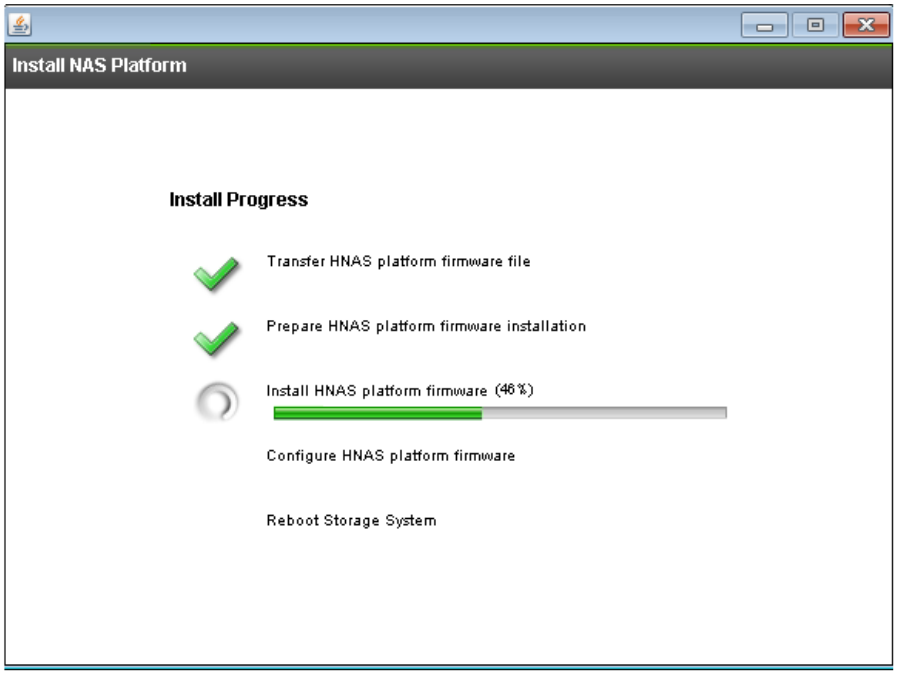


3. The java applet will find the spare disk space left on available Parity Groups. In this example, the application found space on the 2+2 RAID 10 PG, which at the time of this publication is the only supported combination for an array with HDD. The minimum drive capacity is 300GB. For an array with all flash (FMD)—either a Gx00 or Fx00—you must use 3+1 RAID 5 SSD, with a minimum drive capacity of 200GB.

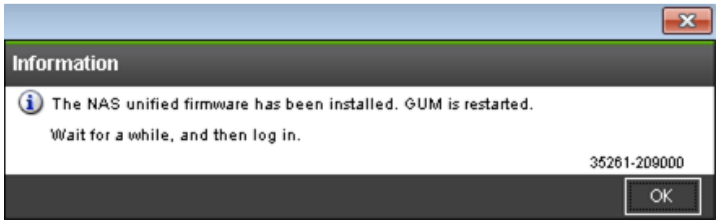
4. Browse to the `nas-factory-12.6.41xx.00.load` file.



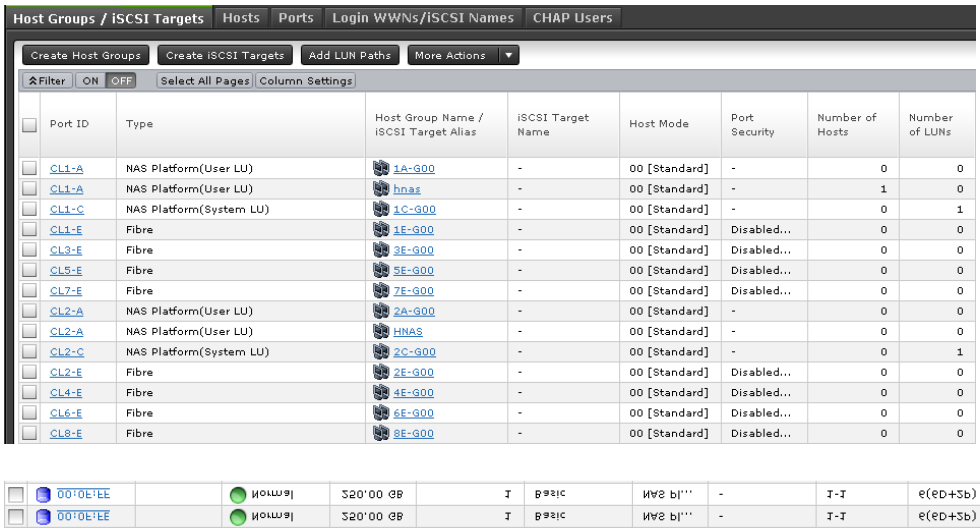
5. Click **Apply** to continue. A status window displays installation progress.



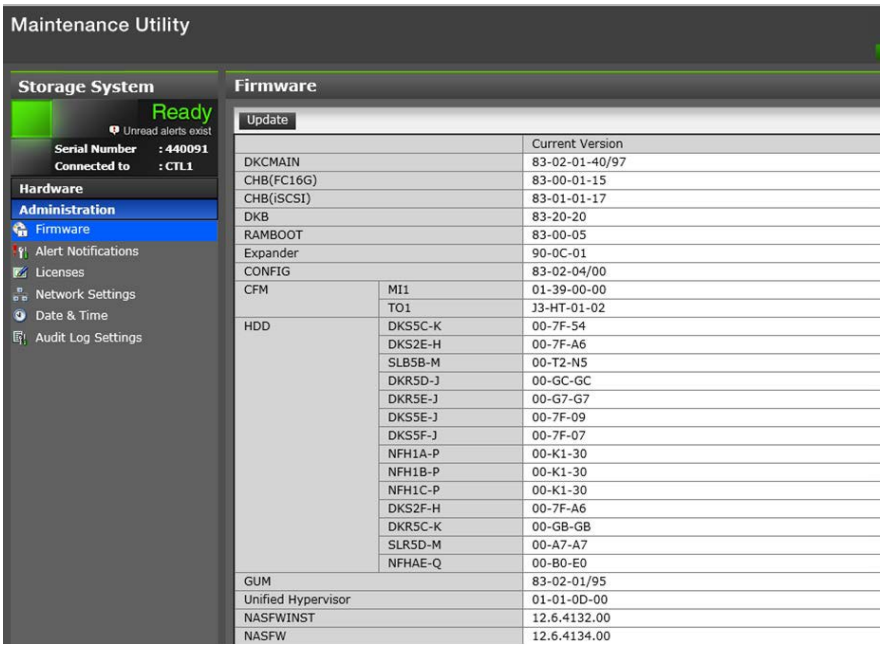
6. When the process completes, a dialog box displays the status, including that the GUM has been restarted.



7. At this point, the System LDEVS were created and Quick Formatting performed on ports 1C/2C under the newly created NAS Platform (System LU). The system LUs might be under Quick Format, depending on the media type.



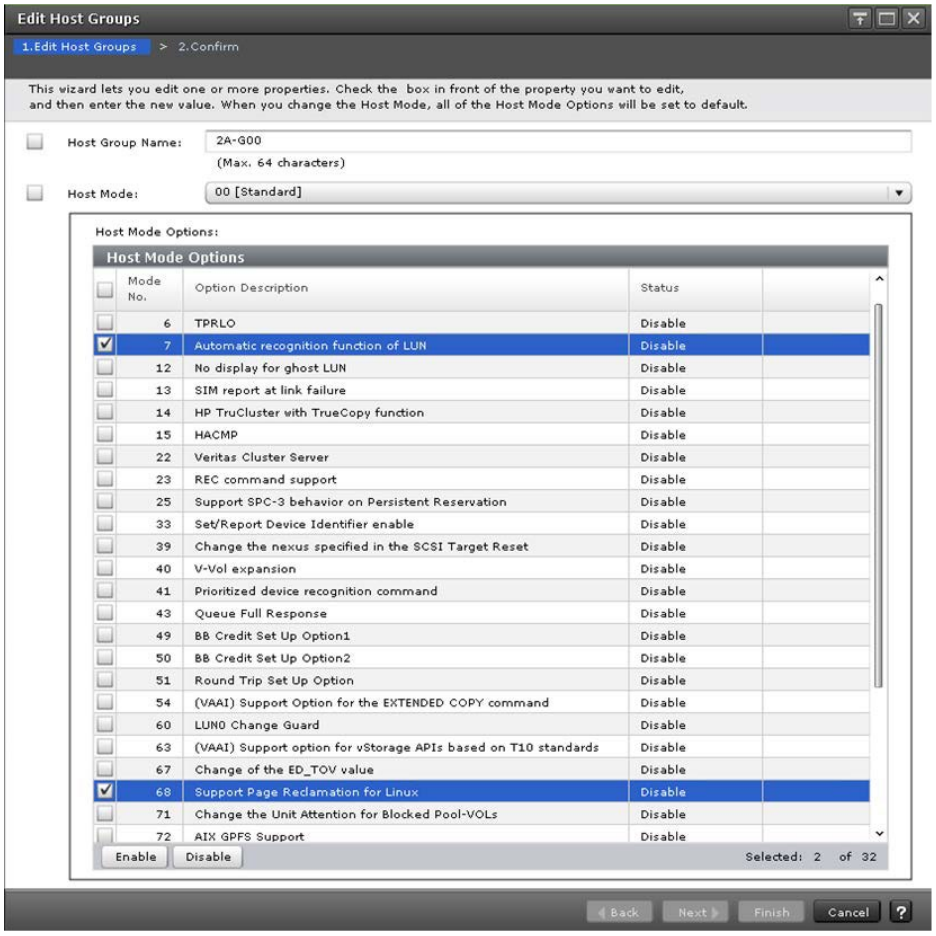
8. The system is now ready for NAS use. The illustration here shows the NAS updates have completed.



		Current Version
DKCMAIN		83-02-01-40/97
CHB(FC16G)		83-00-01-15
CHB(iSCSI)		83-01-01-17
DKB		83-20-20
RAMBOOT		83-00-05
Expander		90-0C-01
CONFIG		83-02-04/00
CFM	MI1	01-39-00-00
	TO1	J3-HT-01-02
HDD	DKS5C-K	00-7F-54
	DKS2E-H	00-7F-A6
	SLB5B-M	00-T2-N5
	DKR5D-J	00-GC-GC
	DKR5E-J	00-G7-G7
	DKS5E-J	00-7F-09
	DKS5F-J	00-7F-07
	NFH1A-P	00-K1-30
	NFH1B-P	00-K1-30
	NFH1C-P	00-K1-30
	DKS2F-H	00-7F-A6
	DKR5C-K	00-GB-GB
	SLR5D-M	00-A7-A7
	NFHAE-Q	00-B0-E0
GUM		83-02-01/95
Unified Hypervisor		01-01-0D-00
NASFWINST		12.6.4132.00
NASFW		12.6.4134.00

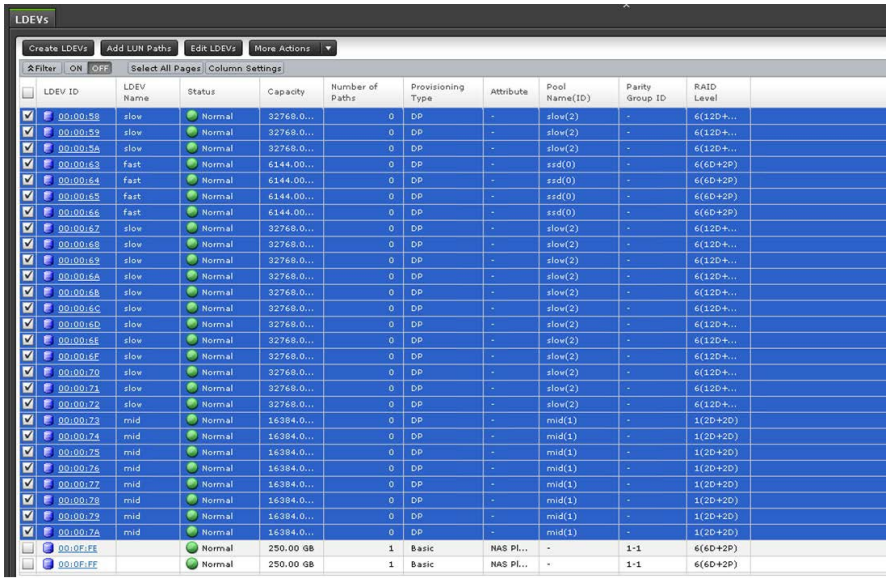
9. Reboot the Hitachi Device Manager.
10. Once rebooted, launch the Hitachi Device Manager and select **File > Refresh All**. This operation may take several minutes to process.

11. After upgrade, enable HostMode Options 7 and 68 on ports 1A and 2A.

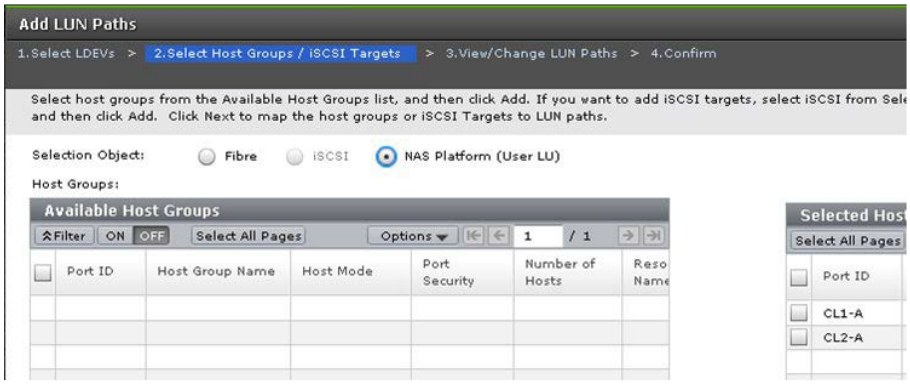


12. Add LUN paths to LDEVS on default host group on ports 1A and 2A.

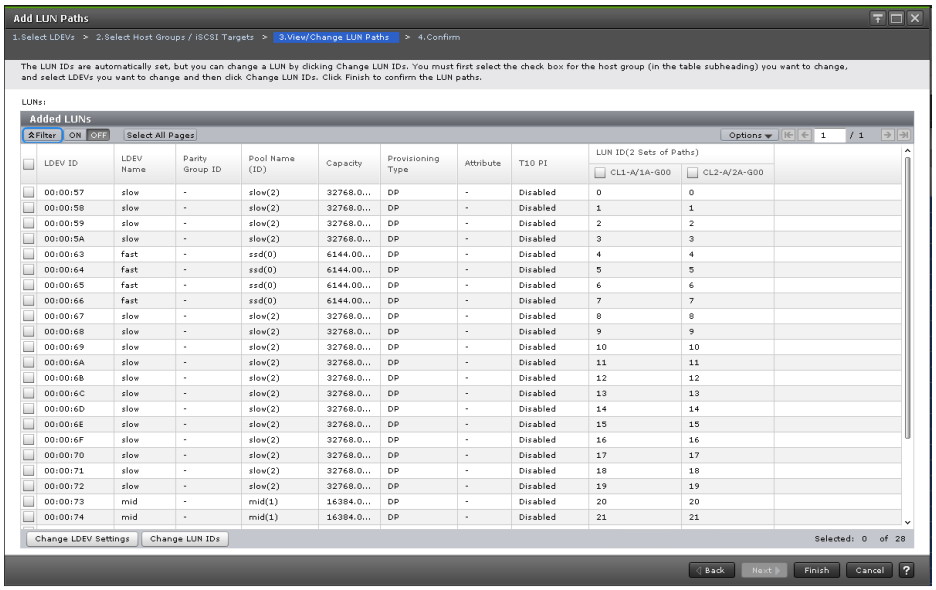
    Note: Do not map the system LDEVS (00:0F:FE and 00:0F:FF).



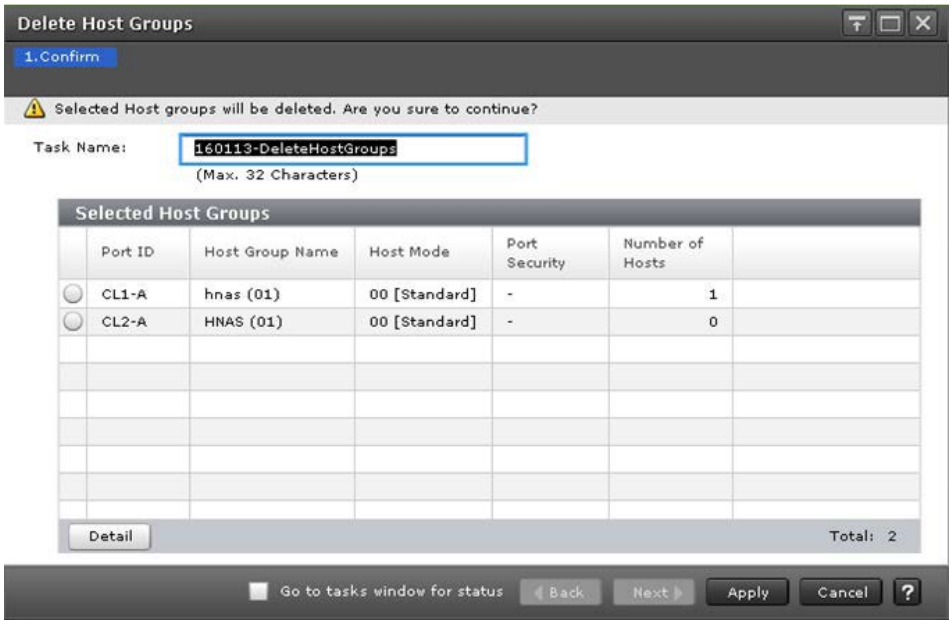
13. Add LUN paths to LDEVS on default host group on ports 1A and 2A.



14. Click **Next** to continue to the next screen.



15. Delete the pre-existing Host Groups that were allocated to ports 1A and 2A (used when the system was Gateway-attached). These host groups can no longer be used.



Chapter 6: Configuring NAS Modules Post-Upgrade

Note: There is no need to run `nas-preconfig` as was previously done on the 4000 series.

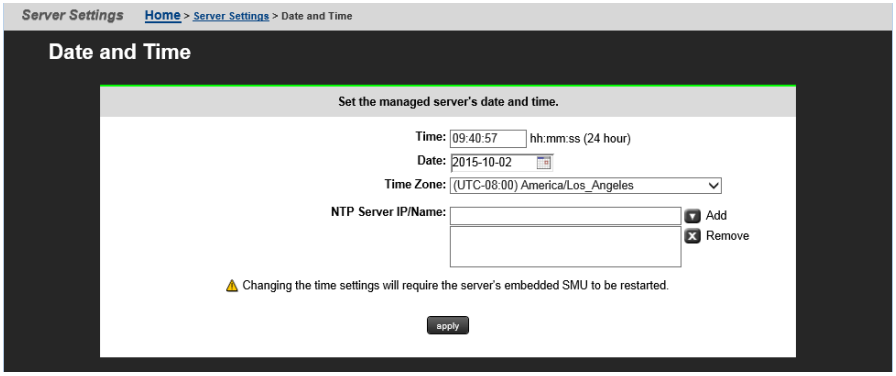
Setting the date and time

1. Connect to the GUM controller 1 SMU using the IP address assigned to it.

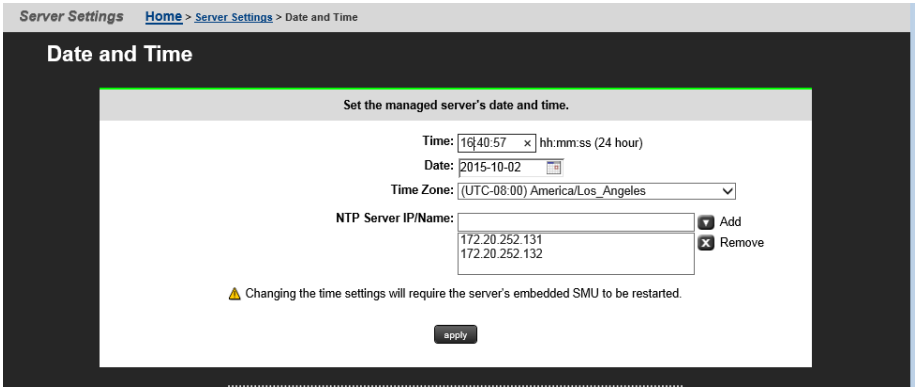
   Note: When logging in, use either the username/password '`manager/nasadmin`' or '`maintenance/raid-maintenance`.' The '`admin/nasadmin`' ID will not work.

2. Select the **NAS Manager**.

3. Select **Home > Server Settings > Date and Time**.



4. At this point, you can either manually change the time, date, and time zone, or attempt to use one of the configured NTP servers to retrieve the current date and time.



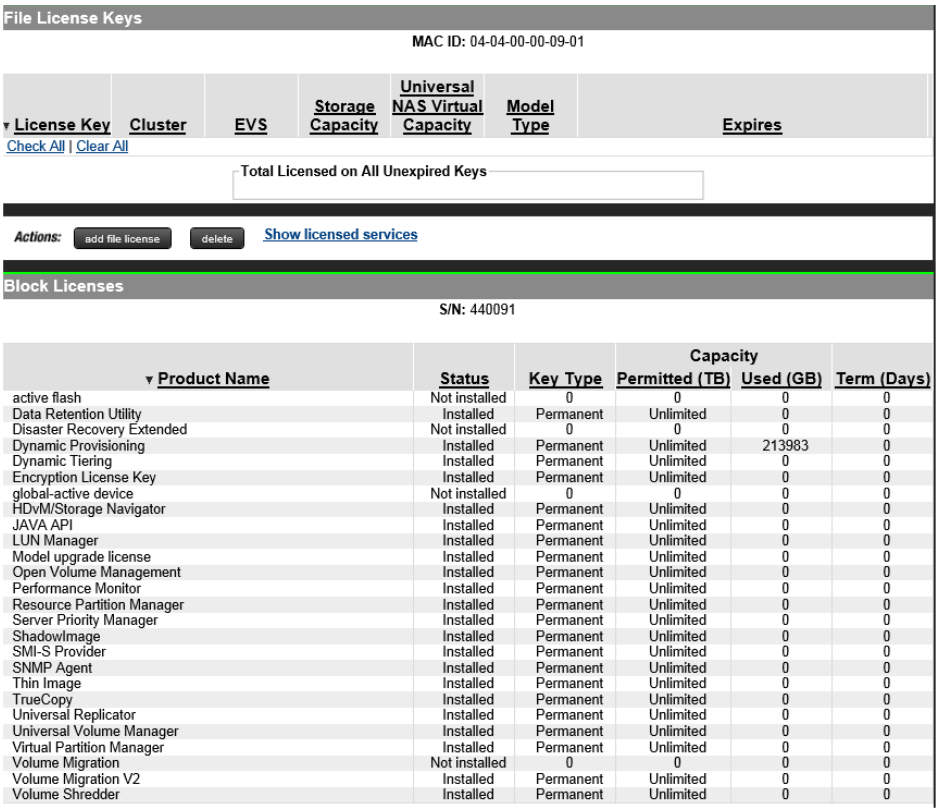
5. Click **Apply** when finished. A notification window prompts for confirmation because this action will reboot the SMU. Click **Yes** to confirm the reboot.

Adding NAS licenses

Licenses should match the prior configuration and should be coordinated through the sales Insight process.

Note: There is no need for a Hitachi Vantara storage license or a cluster license. All other licenses should match.

1. Select **Home > Server Settings > License Keys**. A window appears as follows:



File License Keys

MAC ID: 04-04-00-00-09-01

License Key	Cluster	EVS	Storage Capacity	Universal NAS Virtual Capacity	Model Type	Expires

Check All | Clear All

Total Licensed on All Unexpired Keys

Actions: add file license | delete | Show licensed services

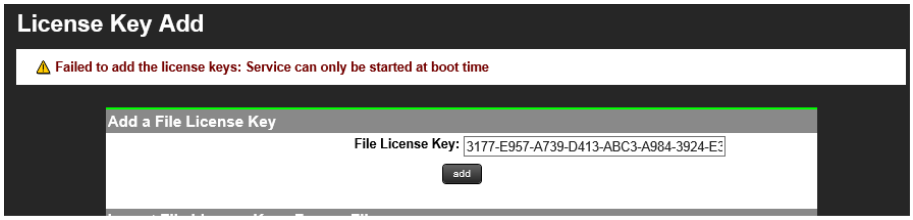
Block Licenses

S/N: 440091

Product Name	Status	Key Type	Capacity Permitted (TB)	Capacity Used (GB)	Term (Days)
active flash	Not installed	0	0	0	0
Data Retention Utility	Installed	Permanent	Unlimited	0	0
Disaster Recovery Extended	Not installed	0	0	0	0
Dynamic Provisioning	Installed	Permanent	Unlimited	213983	0
Dynamic Tiering	Installed	Permanent	Unlimited	0	0
Encryption License Key	Installed	Permanent	Unlimited	0	0
global-active device	Not installed	0	0	0	0
HDvM/Storage Navigator	Installed	Permanent	Unlimited	0	0
JAVA API	Installed	Permanent	Unlimited	0	0
LUN Manager	Installed	Permanent	Unlimited	0	0
Model upgrade license	Installed	Permanent	Unlimited	0	0
Open Volume Management	Installed	Permanent	Unlimited	0	0
Performance Monitor	Installed	Permanent	Unlimited	0	0
Resource Partition Manager	Installed	Permanent	Unlimited	0	0
Server Priority Manager	Installed	Permanent	Unlimited	0	0
ShadowImage	Installed	Permanent	Unlimited	0	0
SMI-S Provider	Installed	Permanent	Unlimited	0	0
SNMP Agent	Installed	Permanent	Unlimited	0	0
Thin Image	Installed	Permanent	Unlimited	0	0
TrueCopy	Installed	Permanent	Unlimited	0	0
Universal Replicator	Installed	Permanent	Unlimited	0	0
Universal Volume Manager	Installed	Permanent	Unlimited	0	0
Virtual Partition Manager	Installed	Permanent	Unlimited	0	0
Volume Migration	Not installed	0	0	0	0
Volume Migration V2	Installed	Permanent	Unlimited	0	0
Volume Shredder	Installed	Permanent	Unlimited	0	0

2. Click **Add the License** and copy/paste the following key into the File License Key text entry box:

   177-E957-A739-D413-ABC3-A984-3924-E352-FA1E-D133-B0C3-AD80-3720-E759-FE1A-D837-B4D0-A984-2124-E34B-FA1E-CC33-B0E3-AD80-1320-E765-FE1A-C334-B53C-A087-B825-D152-7B1F-898D



License Key Add

⚠ Failed to add the license keys: Service can only be started at boot time

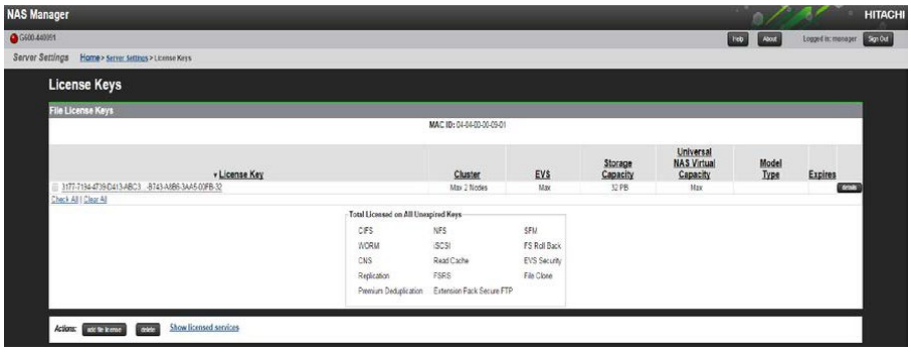
Add a File License Key

File License Key: 3177-E957-A739-D413-ABC3-A984-3924-E3

add

Note: You can ignore any 'Failed to add the license keys' notifications.

3. When finished, click **Add**. The license key summary window displays.

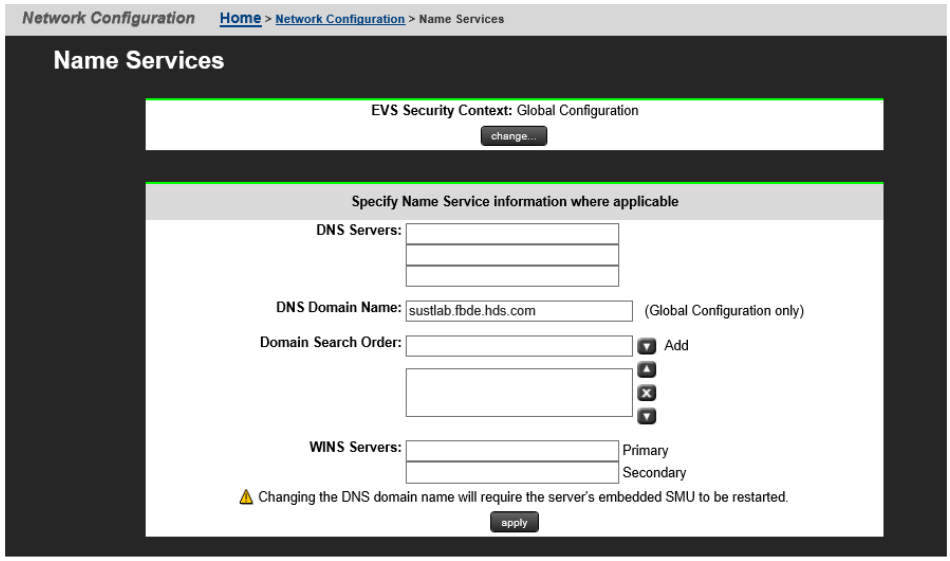


Note: Do not reboot the server at this time. It will automatically reboot as part of the registry restore.

Adding DNS domain names and servers

To add DNS domain names and servers:

1. Select **Home > Network Configuration > Name Services**. In this example, we have used `sustlab.fbde.hds.com` as an example DNS domain name.



2. When finished, click **Apply** to commit the changes. Note that changing a DNS domain name will trigger an SMU restart.

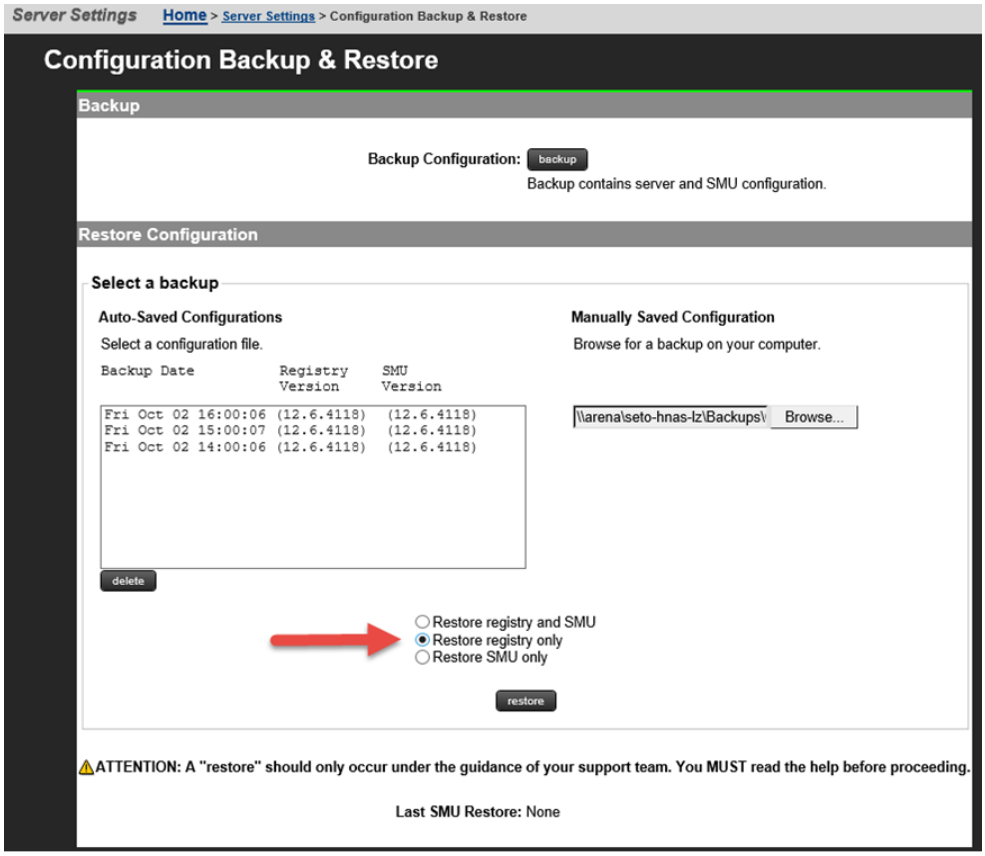
Transferring the registry

To transfer the registry:

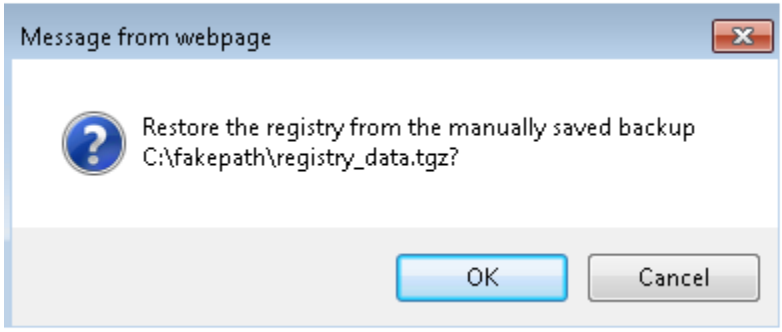
1. Select **Home > Server Settings> Configuration Backup & Restore**.
2. Choose **Manually Saved Configuration** and browse to select the backup file.

3. Select **Restore registry only**.

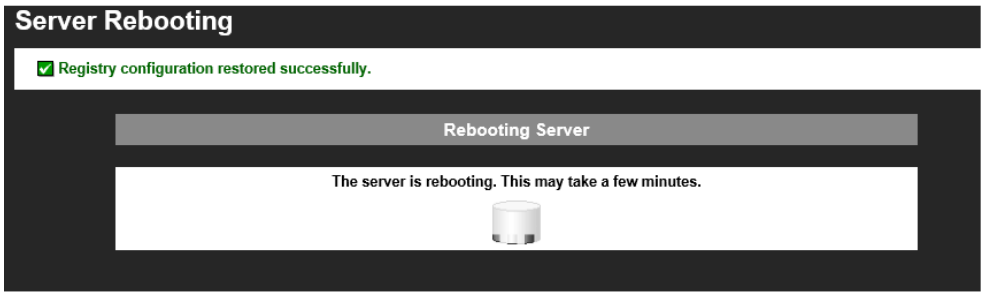
   Note: The default is **Restore registry and SMU**, so it is necessary to switch it to **Restore registry only**.



4. When finished, click **Restore**. A dialog box asks for confirmation. Click **OK** to continue.



5. After the registry is restored, the server reboots.



6. SSH into the CLI of the NAS and verify or set the embedded SMU to **enable**. This is necessary because it is possible the SMU may have been manually disabled.
7. Enable the SMU (using `smu-service-enable`) after restoration.

Restoring the SMU

Note: Restoration of the registry from external SMU to an embedded/Unified SMU is not supported at this time but may be in a future release.

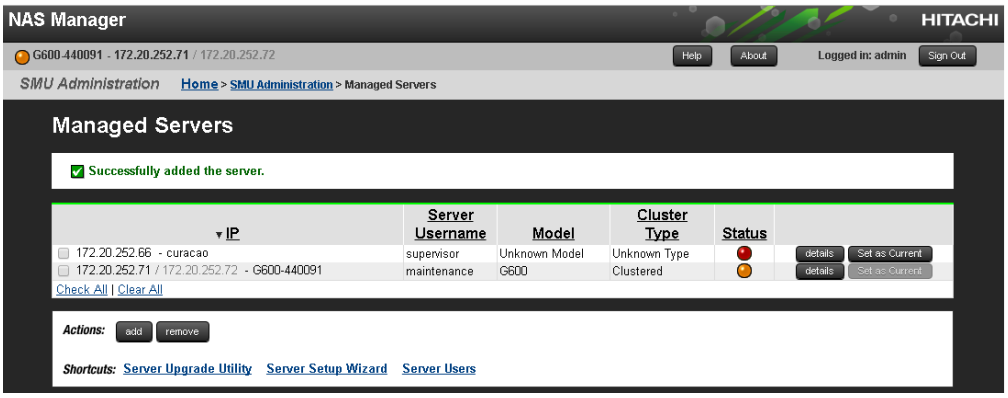
The embedded SMU lacks certain functionality that is available only with an external SMU. To continue managing as before on the original (external) SMU, you should add the GUM 1 IP address. In this example and illustration, it is 172.20.252.71.

Note: Do not attempt to uninstall or remove the embedded SMU. Other Hitachi applications may launch the embedded SMU and thus assume it is present. Furthermore, it is recommended that File Replication and Classic Data Migration only be configured on either the external or embedded SMU (not both). Contact Customer Support if you feel the need to make any changes to this recommendation.

Adding the managed server

To add a managed server, select **Home > SMU Administration > Managed Servers > Add Managed Server**. Assuming the defaults have not been changed, enter the following details:

- IP address for the managed server
- Username: `maintenance`
- Password: `raid-maintenance`



Note: In this example, the original cluster remained in place because it could still be used for other storage.

Removal of the original 4060 cluster from the external SMU is not recommended until validation of the configuration on the target has completed. At a minimum, if maintaining the original SMU for file replication tasks, do not remove the original cluster until all replication tasks have run at least one time. Replication tasks are moved from the old cluster to the new Unified by the SMU software.

Configuring Storage

System drives

Because this is not new storage and there are no SDs in the registry, the System Drives will show as Denied. To address this:

1. Use a secure-shell (SSH) from the SMU to access the server and select the appropriate cluster from the SMU (if there are more than two entities).
2. Import tiering Information (this must be done before allowing access), since Tiered file systems were in use. The server will retrieve the file that was stored on the SMU in the /home/manager directory.
3. From the CLI, enter `sd-tier-import all-tiered-sds.txt`

Allow access as required using the CLI (`sd-allow-access`) or through the SMU.

Storage pools

The storage pool or pools belong to another cluster and therefore need to be reassigned.

1. Run the CLI command `span-list` to find the necessary information:

```
G600-440091-1:$ span-list
Span instance name OK? Free Cap/GiB System drives
-------------------- --- ---- ------- ------------------
--
nlsas              Yes  99% 524288
0,1,2,3,8,9,10,11,12,13,14..
Con
------
90%
** The above span does not belong to this cluster. Its
filesystems cannot
be mounted, checked or fixed. Run
span-list-cluster-uuids slow
and then use 'span-assign-to-cluster', 'span-add-cluster-
uuid' or 'span-deny-access'.
fmd Yes 85% 155648 20,21,22,23,24,25,26,27;4,5.. 90%
** The above span does not belong to this cluster. Its
filesystems cannot be mounted, checked or fixed. Run
span-list-cluster-uuids tiered
and then use 'span-assign-to-cluster', 'span-add-cluster-
uuid' or 'span-deny-access'.
```

2. Run the CLI command `span-assign-to-cluster` to allow the Unified system to have access to the span(s). There are two variations on this command, depending on whether the `slow` or `tiered` argument is used. For example:

```
G600-440091-1:$ span-assign-to-cluster nlsas
Assigning the span to this cluster
Success
```

Or

```
G600-440091-1:$ span-assign-to-cluster fmd
Assigning the span to this cluster
Success
```

If any other cluster has loaded this span, it will not register the change until you reboot it or, on that remote cluster, unmount any mounted file systems on the span and run either `sd-rescan-cod nlsas` or `sd-rescan-cod fmd`.

File systems

Assign each filesystem to an EVS.

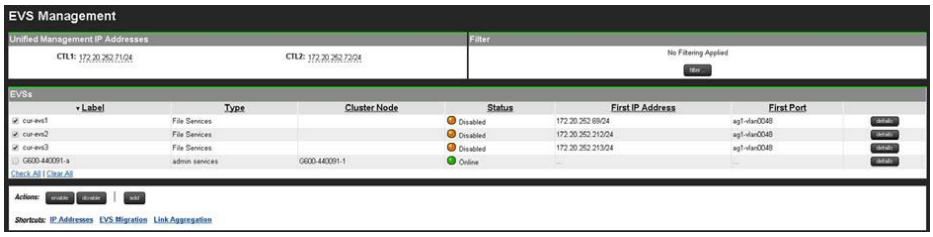
1. Run the CLI command `filesystem-list` to find the necessary information.

```
G600-440091-1:$ filesystem-list
Instance name       Dev   On span            State  EVS  Cap/GiB  Confined Flag
------------------  ----  -----------------  -----  ---  -------  -------- ----
deb01               1025  nlsas              NoEVS  -        864     8192
deb02               1024  nlsas              NoEVS  -       2682    32768
randomdata          1030  fmd                NoEVS  -       4349        -
tfs01               1028  fmd                NoEVS  -        323        -
tfs02               1029  fmd                NoEVS  -       1168        -
tfs03               1026  fmd                NoEVS  -       3684        -
tfs04               1027  fmd                NoEVS  -      13243        -
```

2. Run the CLI command `evsfs add <fs>` to bind the associated filesystem to the EVS as was previously recorded earlier in the process.

```
G600-440091-1:$ evsfs add deb02 1
OK
G600-440091-1:$ evsfs add tfs01 1
OK
G600-440091-1:$ evsfs add tfs02 1
OK
G600-440091-1:$ evsfs add tfs03 2
OK
G600-440091-1:$ evsfs add tfs04 2
OK
G600-440091-1:$ evsfs add deb01 2
OK
G600-440091-1:$ evsfs add randomdata 3
OK
```

3. Run the CLI command `evs enable -e 1` to enable the EVS(1) or enable applicable EVS through the UI.
4. Repeat the process for all EVSs.



```
G600-440091-1:$ evs enable -e 1
G600-440091-1:$ df -v

  ID       Label      Size            Used      Snapshots         Deduped           Avail  Thin
FS Type
----  -----------  --------  --------------  -------------  ---------------  ---------------  ----
-----------------------------------
1024         deb  932.3 GB        Mounting             NA  434.1 GB (58%)  612.8 GB (66%)   Yes
32 KB,WFS-2,128 DSBs,dedupe enabled
1025        deb1  17.88 GB        Mounting             NA        0 B (0%)  15.29 GB (86%)   Yes
32 KB,WFS-2,128 DSBs,dedupe enabled
1026        deb2  17.88 GB        Mounting             NA        0 B (0%)  15.29 GB (86%)   Yes
32 KB,WFS-2,128 DSBs,dedupe enabled
1027        deb3  788.8 GB        Mounting             NA  434.2 GB (68%)  585.2 GB (74%)   Yes
32 KB,WFS-2,128 DSBs,dedupe enabled
1028        deb4  1.068 TB        Mounting             NA  572.8 GB (64%)  770.4 GB (70%)   Yes
32 KB,WFS-2,128 DSBs,dedupe enabled
1029  randomdata  4.429 TB        Mounting  42.06 GB (1%)              NA  791.1 GB (17%)   Yes
32 KB,WFS-2,128 DSBs
1030         new  4.445 TB        Mounting             NA        0 B (0%)  821.4 GB (18%)    No
32 KB,WFS-2,128 DSBs,dedupe enabled
          Tier 0     90 GB  71.16 GB (79%)                       0 B (0%)  18.84 GB (21%)
          Tier 1  4.357 TB  3.573 TB (82%)                       0 B (0%)  802.6 GB (18%)
1031        new1   4.34 TB        Mounting             NA        0 B (0%)  714.4 GB (16%)    No
32 KB,WFS-2,128 DSBs,dedupe enabled
          Tier 0     90 GB  70.99 GB (79%)                       0 B (0%)  19.01 GB (21%)
          Tier 1  4.252 TB  3.573 TB (84%)                       0 B (0%)  695.4 GB (16%)
1032        new2  4.287 TB        Mounting             NA        0 B (0%)    661 GB (15%)    No
32 KB,WFS-2,128 DSBs,dedupe enabled
          Tier 0     90 GB   70.8 GB (79%)                       0 B (0%)   19.2 GB (21%)
          Tier 1  4.199 TB  3.572 TB (85%)                       0 B (0%)  641.8 GB (15%)
1033        new3   4.34 TB  3.642 TB (84%)             NA        0 B (0%)  714.4 GB (16%)    No
32 KB,WFS-2,128 DSBs,dedupe enabled
          Tier 0     90 GB  70.99 GB (79%)                       0 B (0%)  19.01 GB (21%)

          Tier 1  4.252 TB  3.573 TB (84%)                       0 B (0%)  695.4 GB (16%)
1034        new4  4.375 TB        Mounting             NA        0 B (0%)  750.1 GB (17%)    No
32 KB,WFS-2,128 DSBs,dedupe enabled
          Tier 0     90 GB  71.06 GB (79%)                       0 B (0%)  18.94 GB (21%)
          Tier 1  4.287 TB  3.573 TB (83%)                       0 B (0%)  731.1 GB (17%)
```

5. For tiered file systems, run `filesystem-remake-tiers` and manually mount the file systems.
6. Repeat as needed for all file systems.

```
G600-440091-2[cur-evs1]:$ filesystem-remake-tiers tfs02
filesystem-remake-tiers: Convert from tiered to untiered
filesystem-remake-tiers: Updating DSB with calculated blocks counts...
filesystem-remake-tiers: Command succeeded.
G600-440091-2[cur-evs1]:$ mount tfs02
Request to mount file system "tfs02" submitted successfully.
File system "tfs02" successfully mounted.
```

Configuring networking

To configure networking:

1. Connect the network service (aggregate) ports. In this example, it is just tg1 in each node.
2. Use certified SFP+ (DW-F800P-1PS10J) for the Unified platform.

   Note: This may differ from the 4000 series platform so do not assume the parts are interchangeable.
3. Verify connectivity:
   - Ping EVS 1: `172.20.252.69`
   - Access the CIFS share in `\\curacao\`

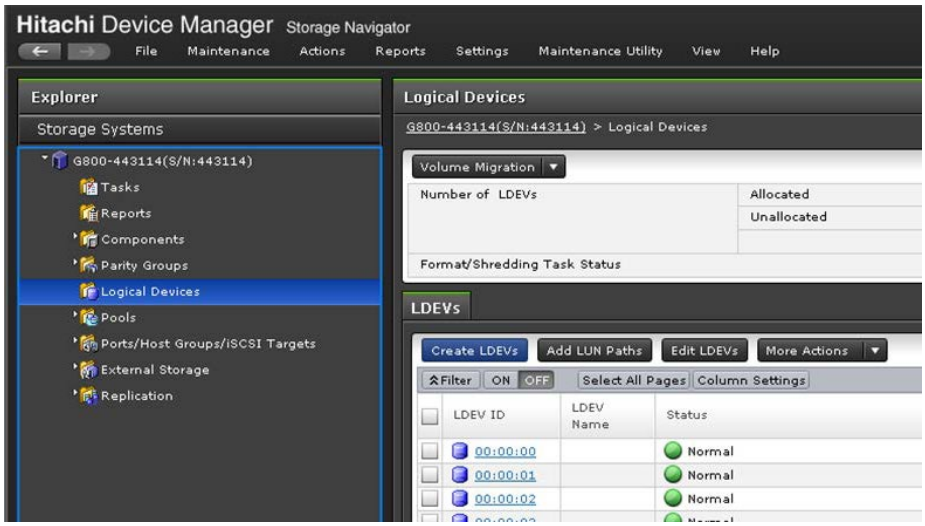
```
G600-440091-1:$ evs list

Node  EVS ID      Type          Label Enabled  Status                IP Address          Port
----  ------  -------  ------------- -------  ------  -------------------------  ------------
   1           Cluster   G600-440091-1     Yes  Online                 10.0.0.20          eth0
                                                                     126.255.48.1          eth1
   1       0     Admin   G600-440091-a     Yes  Online                126.255.48.2          eth1
                                                                2002:7eff:3002::7eff:3002          eth1
   1       1   Service        cur-evs1     Yes  Online             172.20.252.69   ag1-vlan0048
   1       3   Service        cur-evs3     Yes  Online             172.20.252.213  ag1-vlan0048
   2           Cluster   G600-440091-2     Yes  Online                 10.0.0.21          eth0
                                                                     126.255.52.1          eth1
   2       2   Service        cur-evs2     Yes  Online             172.20.252.212  ag1-vlan0048
```

4. Verify SMU relay configuration for alert emails and diagnostics are routed as needed in the customer environment, using either the external or embedded SMU. If the old cluster has been removed from the external SMU, the SMU email alert profile will require an update.

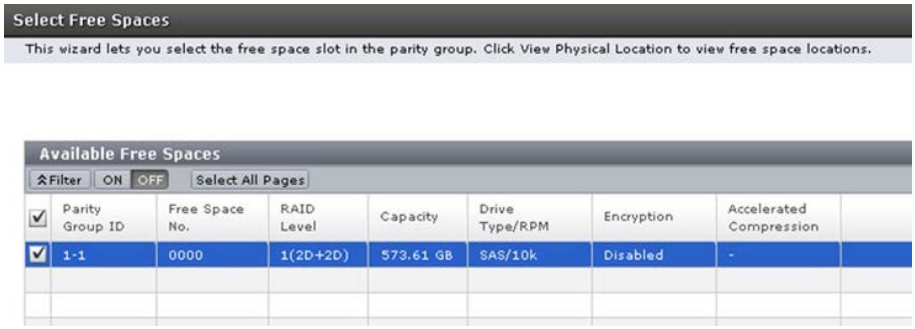
Array clean-up tasks

1. Create extra LDEV(s) on System Parity Group and add it to NAS Platform System Resource Group so that these LDEVs occupy all remaining space on Parity Group 1-1(assuming this is the PG where the system LU's reside). This is a precaution to prevent that space being mistakenly used for User LUs.
2. Using the Storage Navigator, go to **Storage Systems > Logical Devices**. Click **Create LDEVs**.

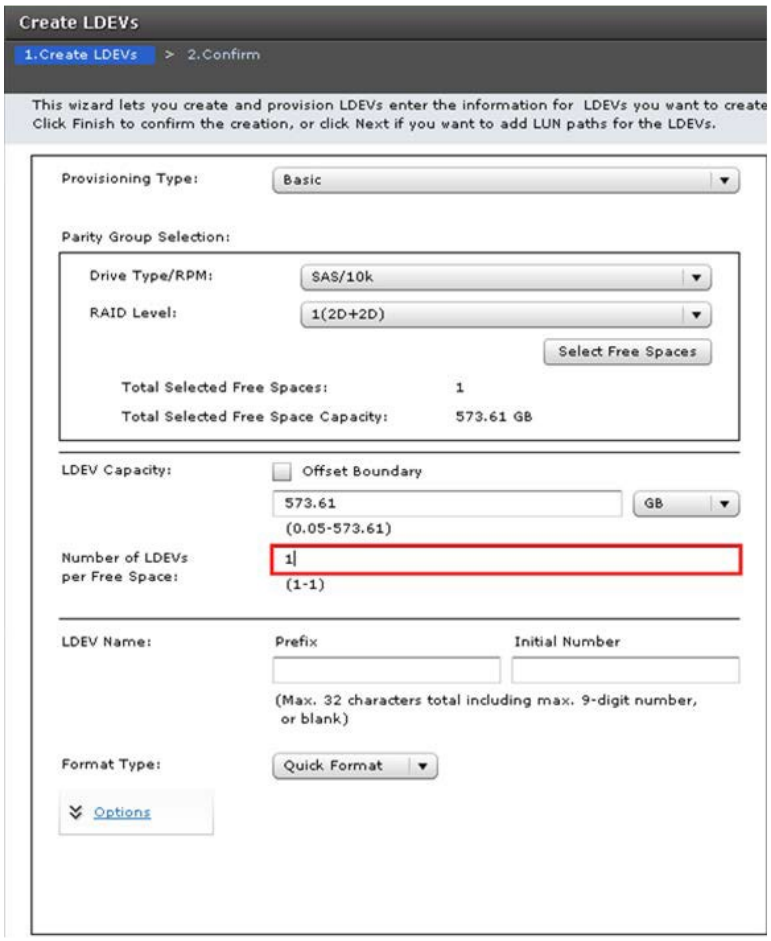


3. If not already selected, pick **RAID Level as 1(2D+2D)** from the drop-down list in Create LDEVs. Click **Select Free Spaces**.

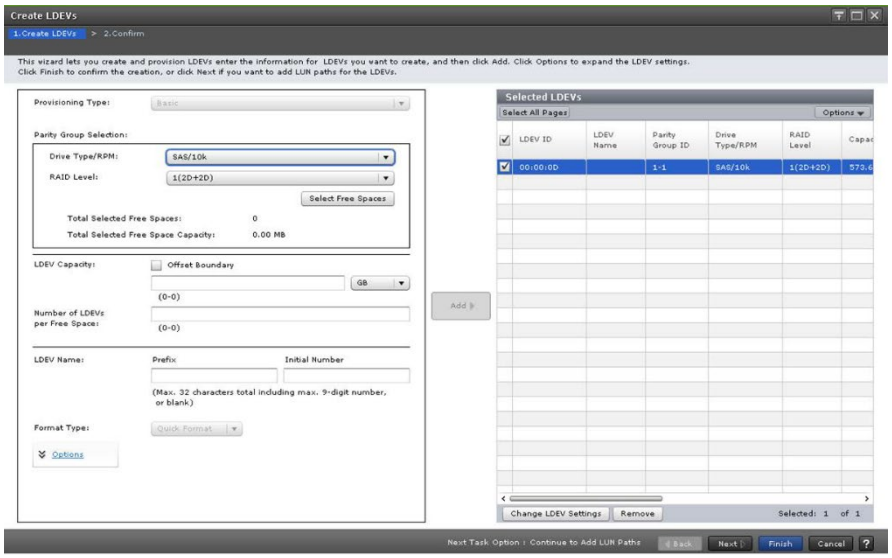
4. In the Select Free Spaces box, select Parity Group ID 1-1 and click **OK**.



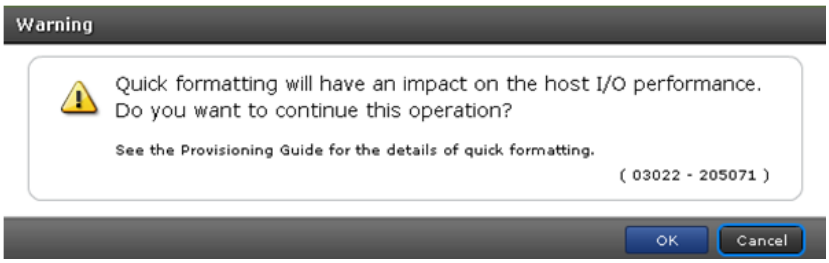
5. Under LDEV Capacity, you should see a range such as 0.05-573.61 (for example, if using 600GB x 10k SAS drives). Enter the largest number in that range in the LDEV Capacity.
6. Enter the value 1 in **Number of LDEVs per Free Space**. If the space is greater than 2.99TB, you will need to create multiple LDEVs to use all remaining capacity.



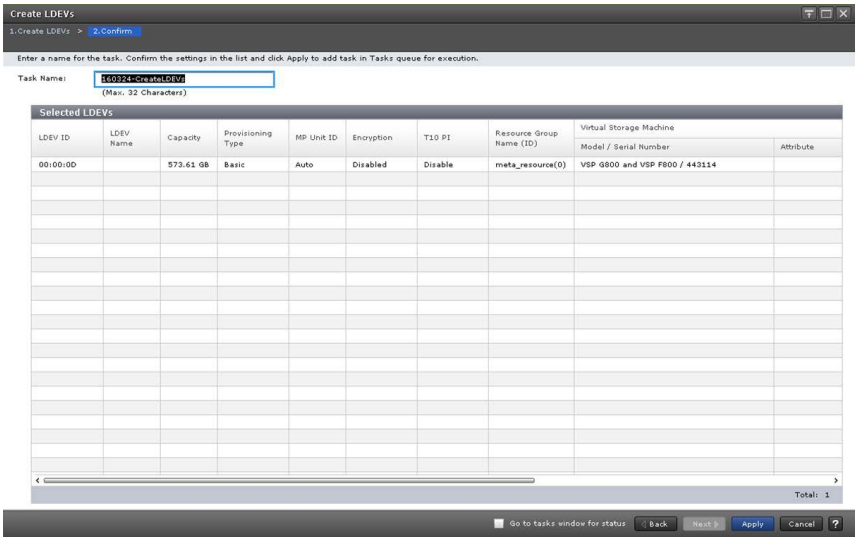
7. Click **Add**, then click **Finish**. **Note**: Do not click Next.



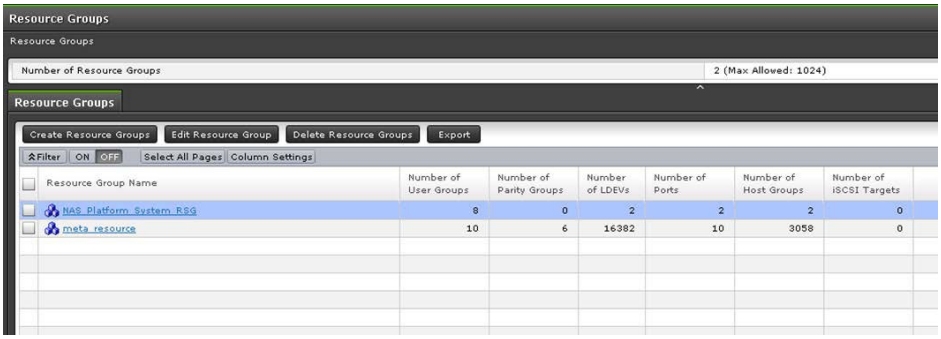
8. A dialog box warns of potential host I/O performance impact upon performing the quick reformatting. Dismiss the warning by clicking **OK**.



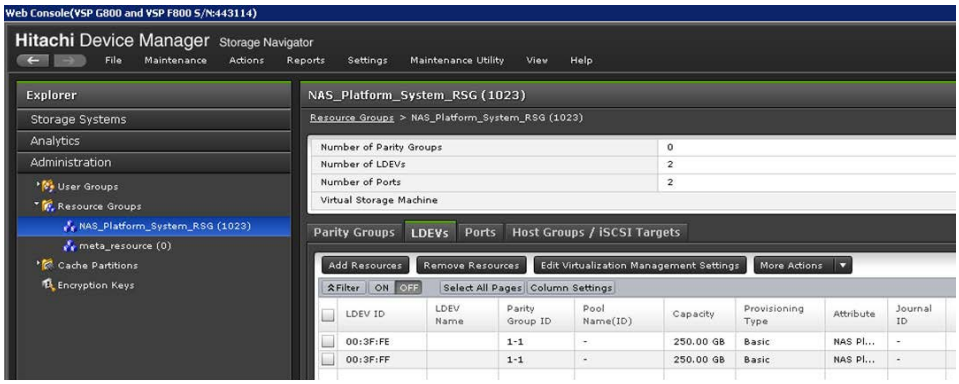
9. Click **Apply** and wait for the task to complete.



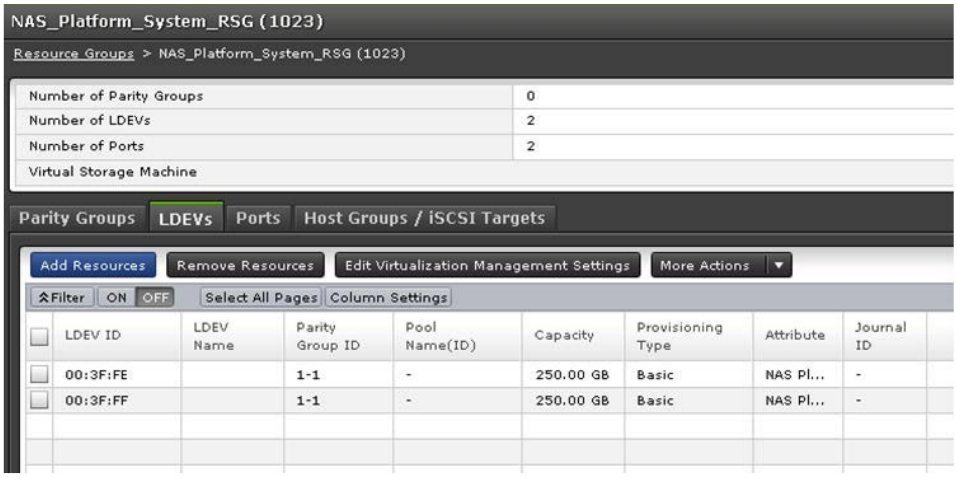
10. Add the newly created LDEV(s) to NAS Platform System Resource Group. To do this, using the Storage Navigator, go to **Administration > Resource Groups**. Click **NAS Platform System RSG**.



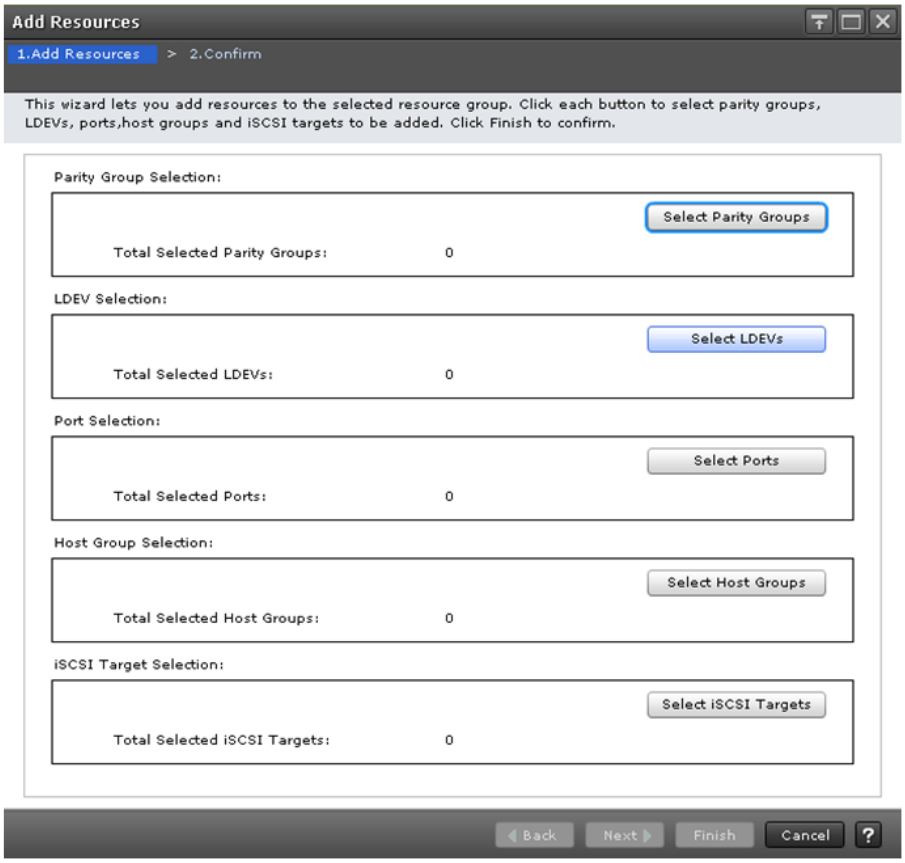
11. Click the **LDEVs** tab.



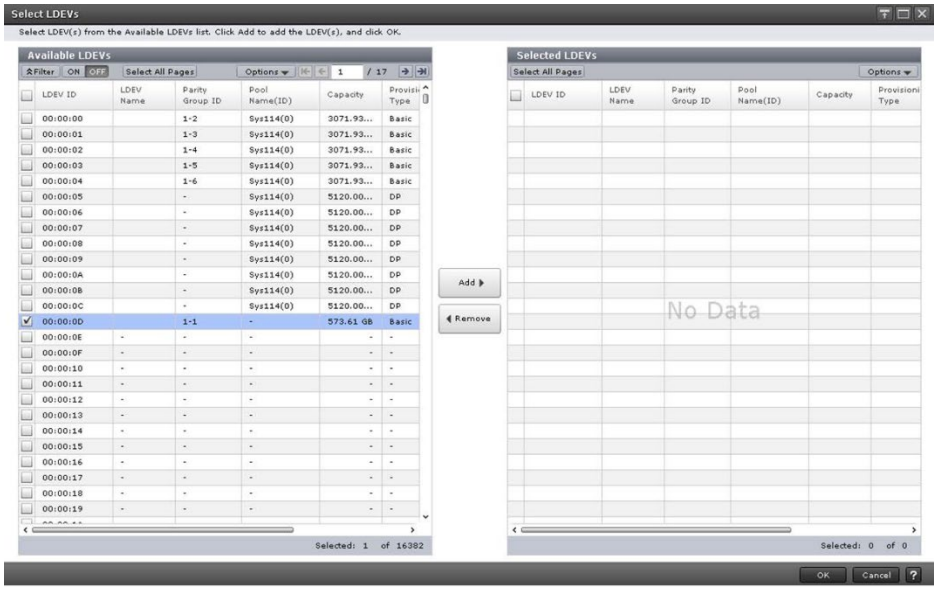
12. Click **Add Resources**.



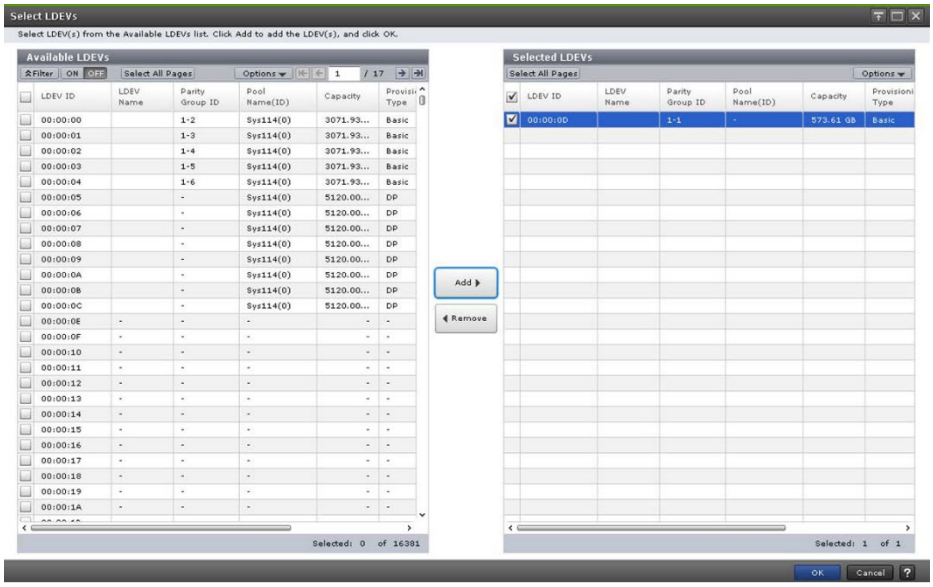
13. In the Add Resources display, click **Select LDEVs**.



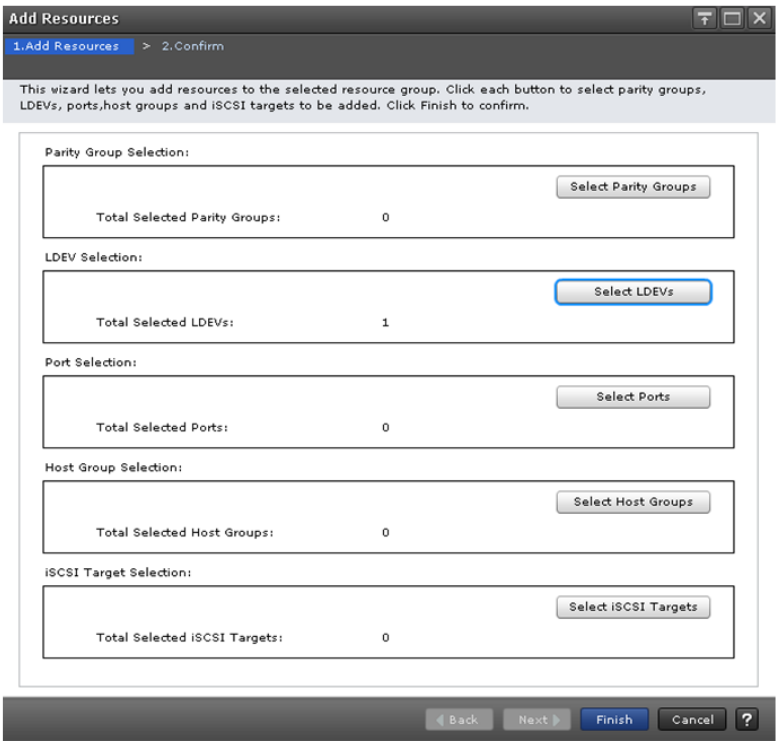
14. In the Select LDEVs display, select the LDEV created in Parity Group 1-1 in the previous procedure. This should be the only LDEV from Parity Group 1-1 listed here.



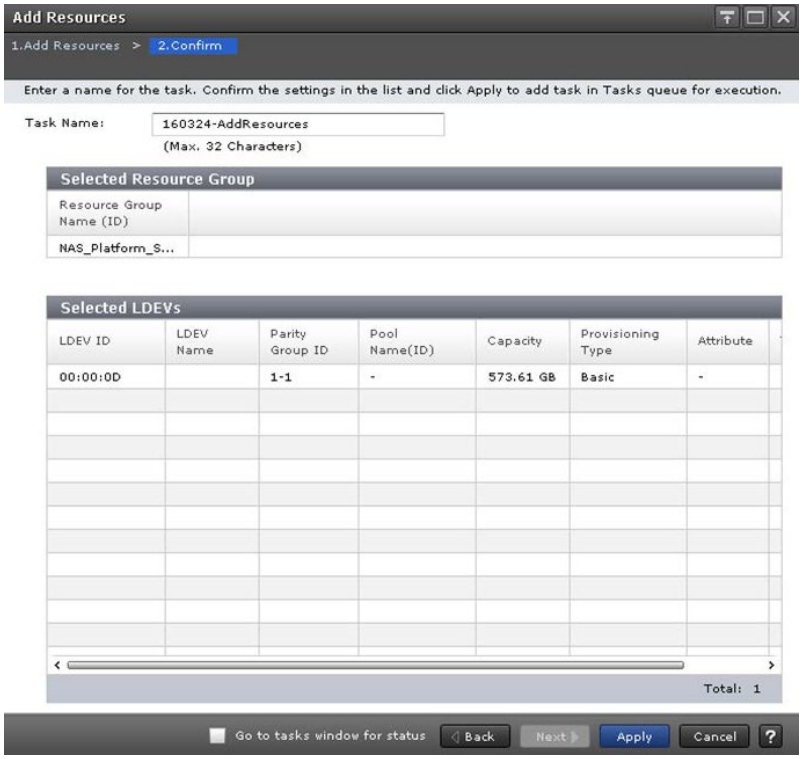
15. Click **Add**, then **OK**.



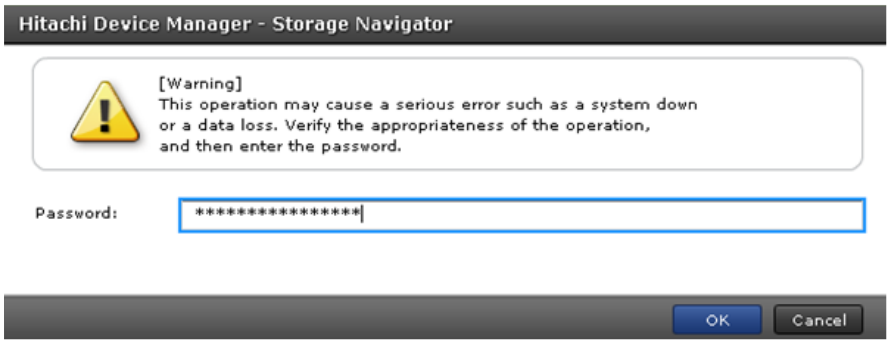
16. In the Add Resources display, click **Finish**.



17. In the confirmation display, click **Apply**.



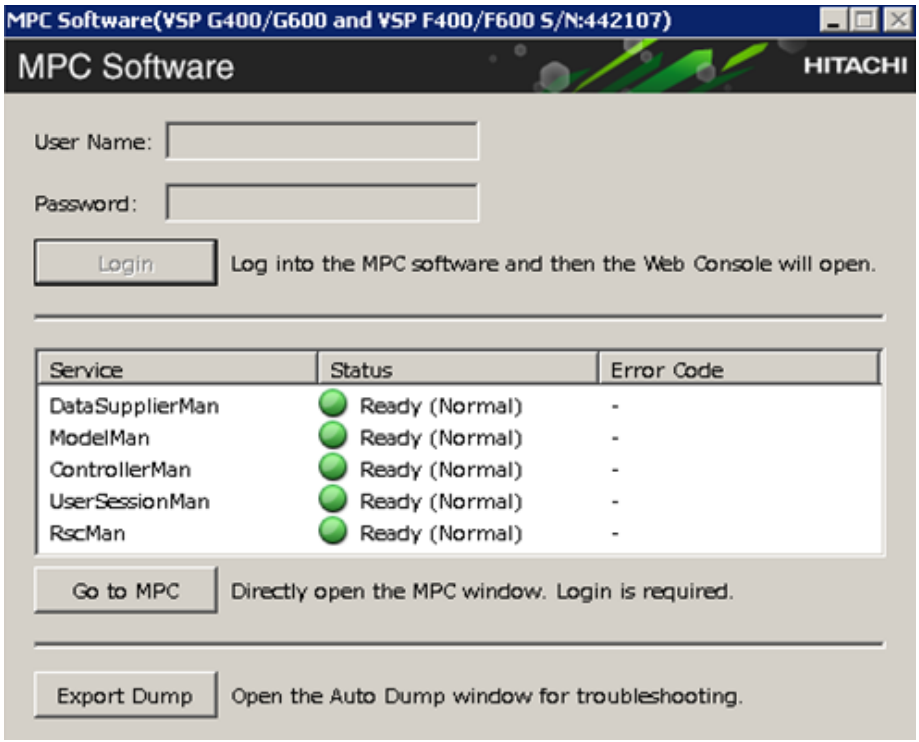
18. When prompted, enter the password (the default is `raid-maintenance`) and click **OK**.



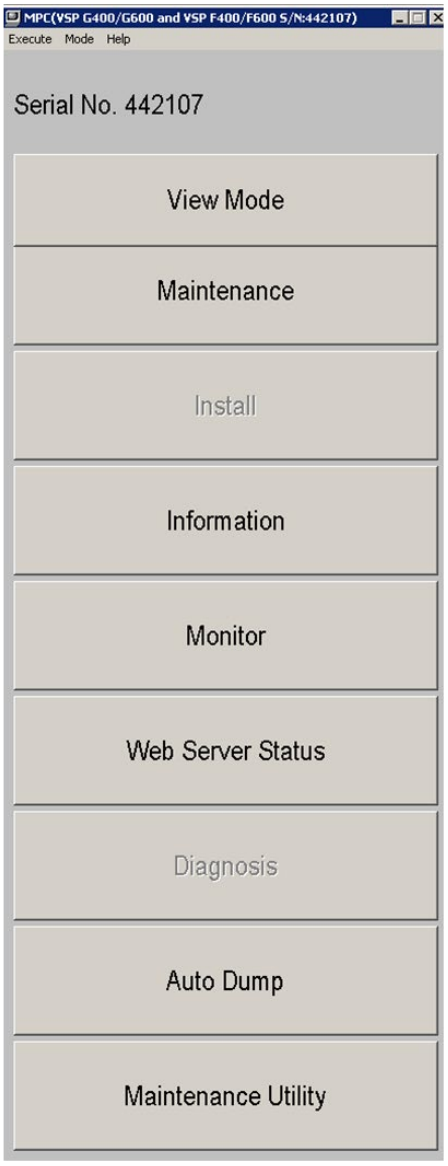
19. Wait for the task to complete. It may take some minutes.

Enable SOM 318 to generate SIM for cache overload

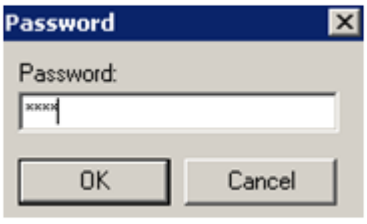
1. For SVOS versions up to and including 6.4.1a, you must enable SOM 318.
2. Close the Maintenance Utility and Storage Navigator and go back to the login window for MPC. Enter the username and password if required (defaults are `maintenance` and `raid-maintenance`). Click **Go to MPC**.



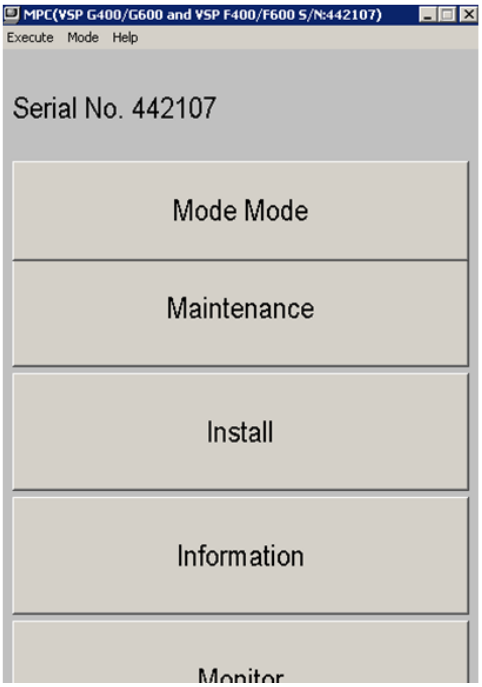
3. The MPC display opens. Note that the Install button is greyed out as not currently available. Press SHIFT+CTRL+M.



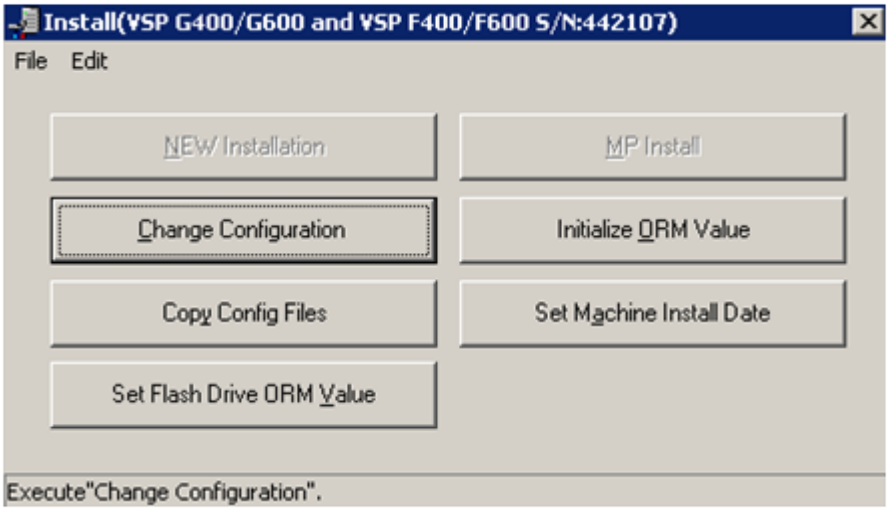
4. A password dialog box displays. Enter the password `mode` and click **OK**.



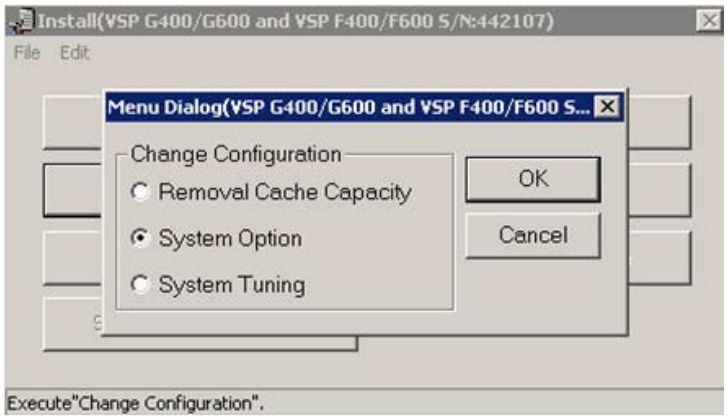
5. The Install option is now available, and the button is no longer greyed out. Click **Install**.



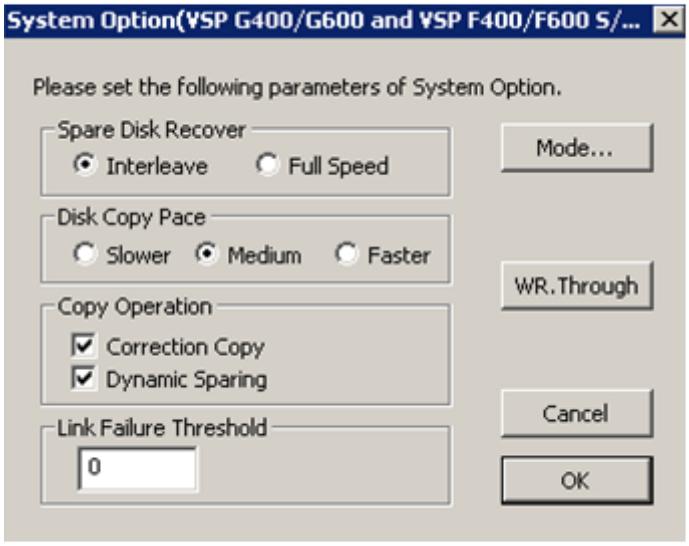
6. In the Install display, click **Change Configuration**.



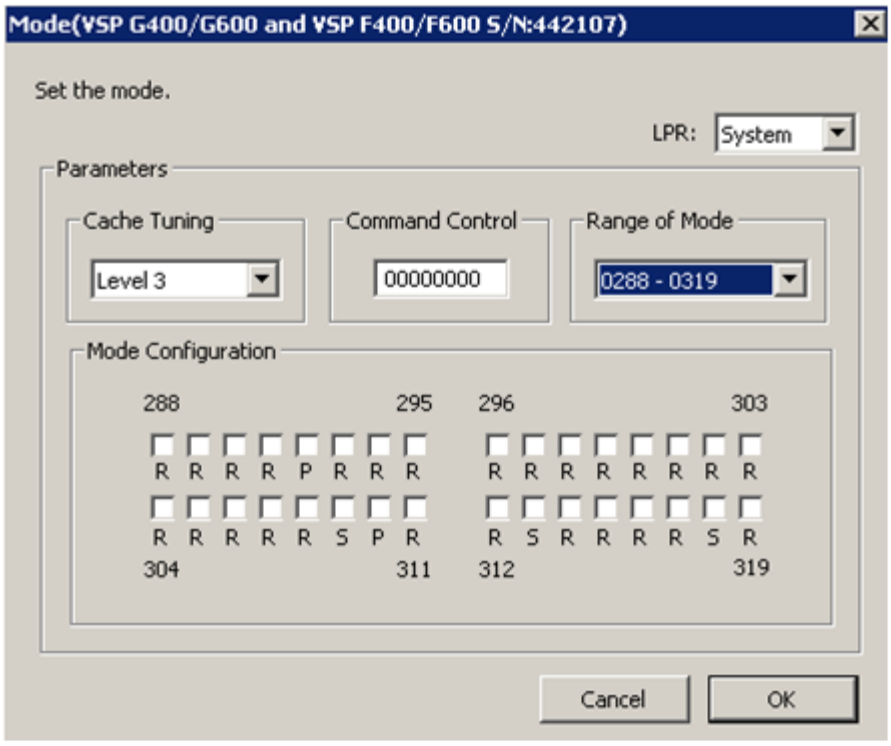
7. In the Menu Dialog display, select **System Option** and click **OK**.



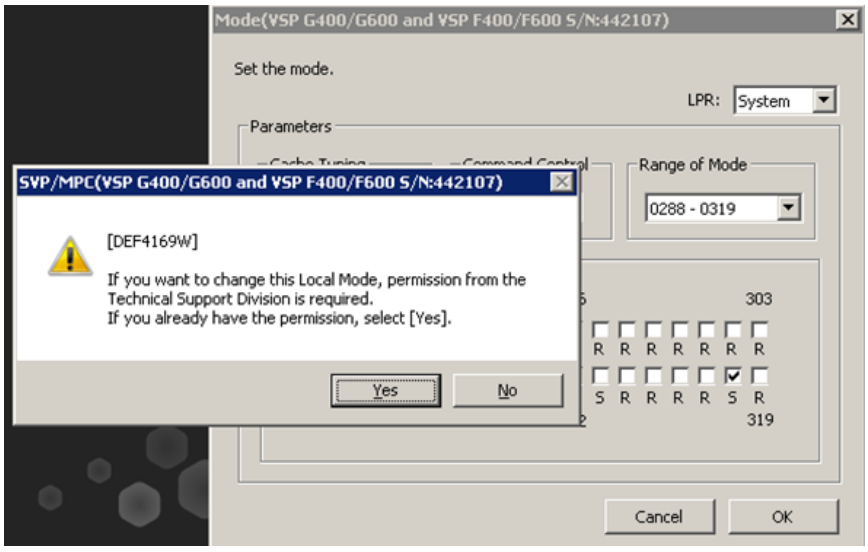
8. In the System Options display, click **Mode…**



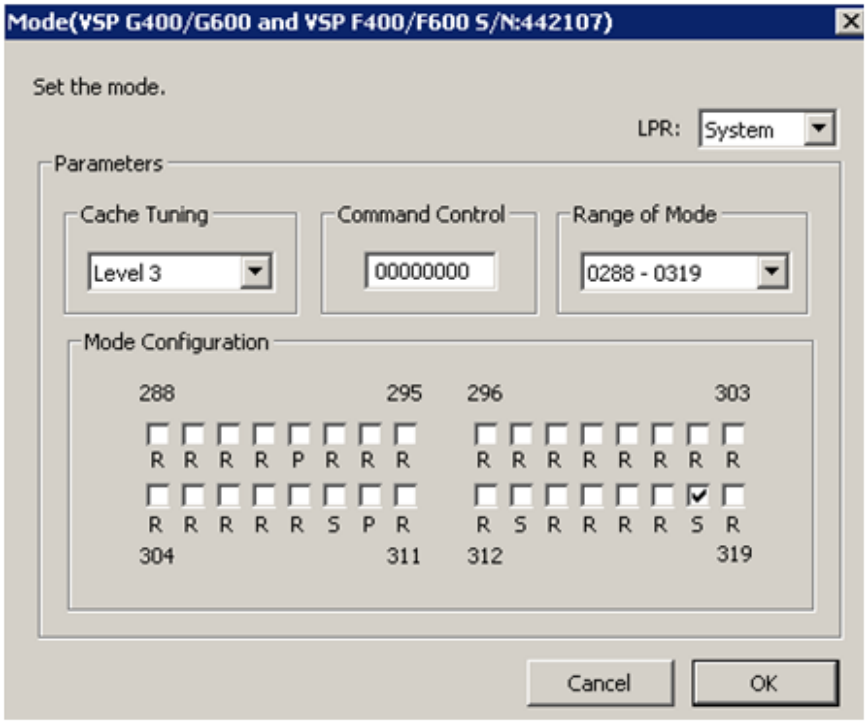
9. In the Mode display, using the Range of Mode drop-down list, select **0288-0319**.



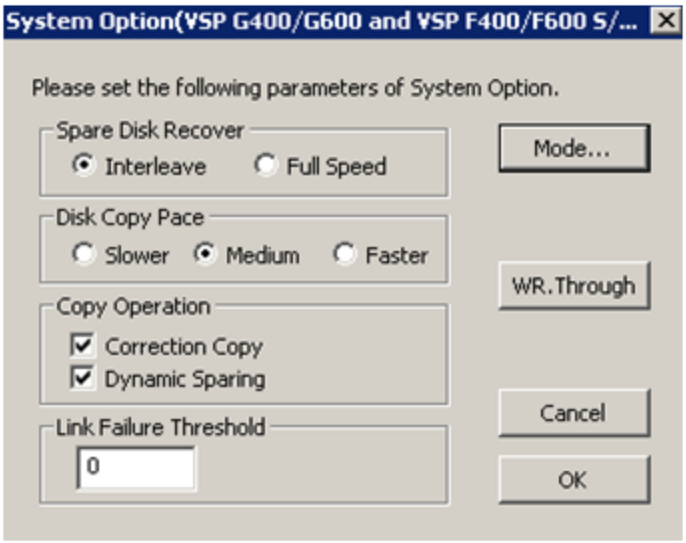
10. In the Mode Configuration section of the display, click the **S** box for the mode number **318** (the box immediately to the left of the 319 R box). As soon as you enable box 318, you should see an SVC/MPC permission notification dialog. Click **Yes** to acknowledge the notification and continue.



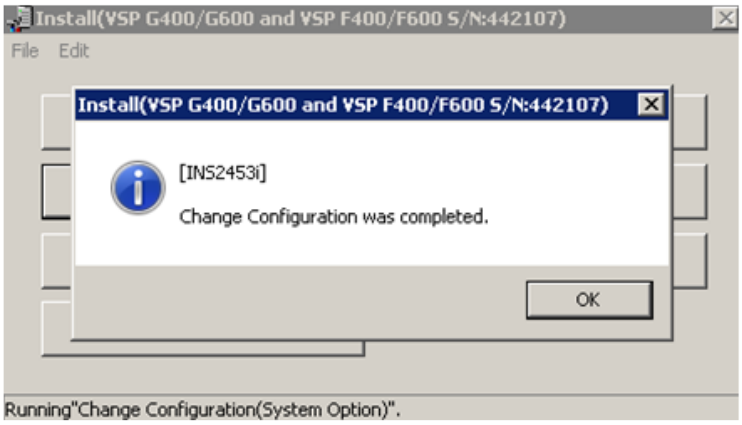
11. Back in the Mode display, click **OK**. This returns you to the System Option display.



12. In the System Option display, click **OK**.



13. In the confirmation display, click **OK** and close the Install display.



14. Back in the MPC display, click **Mode Mode** to go back to the original MPC display.