



SANnet II Manual Firmware Upgrade and Controller Recovery Step Guide - From 3.2x to 4.1x Guide

Please read this document in its entirety before proceeding with the firmware upgrade or Controller Recovery Steps.

Prerequisites for Upgrading Firmware

The prerequisites for installing the new firmware are:

- SANscape Command-Line Interface (CLI) version 2.1.1 or higher is required. If you do not have this package installed, or if you have an older version, download and install the latest version from the Dot Hill Customer Resource Center at <http://crc.dothill.com>.

- Upgrade script saves time. If the script is not an option go to “**Manually Upgrading Firmware**”.

Using the script to perform the controller firmware upgrade saves time and reduces the probability of error. If possible, use the script to perform the controller firmware upgrade.

The controller firmware script restores the following configuration settings:

- controller-name
- controller-id
- logical drive controller assignment (Primary/Secondary)
- host-wwn-name
- cache-parameters: write-back, write-through, random, sequential
- disk-array: normal-verify, rebuild-verify, init-verify, rebuild-priority
- drive-parameters: spin-up, disk-access-delay, scsi-io-timeout, queue-depth, polling-interval, enclosure-polling-interval, auto-detect-swap-interval, smart, auto-global-spare
- host-parameters: queue-depth, max-luns-per-id, fibre-connection-mode
- channels - This option restores the channel type, (disk or host), and target IDs.
- maps - This option restores the LUN mappings. All other settings will be set to the 4.11 default setting.

- Ethernet connections required for out-of-band firmware upgrades. For RAID controller firmware upgrades, an Ethernet connection (or two Ethernet connections for dual-controller configurations) is required for out-of-band firmware upgrades, if the array to be upgraded is not connected to the host on which the upgrades are to be performed.

In order to use the Ethernet connection(s), the controller must have an IP address assigned.

- A Fibre Channel connection to the array is required when no network connection to the array is available.

- Stop all I/O to the array before beginning the controller firmware upgrade. Unmount all SANnet II 200 FC and SATA logical drives/LUNs from any hosts connected to the array, for the duration of the install procedure. For example, filesystems mounted from the SANnet II 200 FC device should be unmounted, and databases accessing raw devices on the array must be shut down.

- **Do not exceed 32 partitions per logical drive.**

If your configuration has more than 32 partitions per logical drive (firmware 3.2x), you must back up the data on the affected logical drives, reconfigure the partitions per logical drive to less than 32, redistribute the data across the logical drives, and then upgrade the firmware.

- You must reconfigure controller and network parameters after upgrading the controller firmware.

For example, the controller password is not restored if you perform a manual upgrade or an inband upgrade using the script. The password is set to null when the upgrade completes. The controller password is restored if you perform an out-ofband upgrade using the script.

- You must have a serial connection to restore the IP address, netmask, and default gateway settings for your array when the upgrade completes. The serial connection must be set to 38400. Note the IP address, netmask, and default gateway settings for your array before you begin the upgrade.

- Using the RS-232 interface, note the filter map and sector/head/cylinder parameters, and record these settings.

The RS-232 serial interface allows additional filter map and sector/head/cylinder parameters beyond what CLI allows. After the firmware is upgraded, there is no way to recover this information. For details, see “Preparing to Update Controller Firmware” on page 34.

- If you will be using the script to perform the upgrade:

- You must currently have controller firmware version 3.27R or later.

- If performing an in-band upgrade using the script, the controller password is not restored. The password is set to null when the upgrade completes. Be sure to specify a more secure controller password.

- Be aware that if the array controller is power-cycled at the wrong time during programming of the PLD firmware, the array controller may be rendered inoperable and require replacement.

- Due to important data integrity improvements in this release, the performance for RAID1 has been impacted. Random write operations are impacted the most -- performance is reduced by 10-20%.

- Stop any SANscape agent that may be running on a host connected to the array controller. The SANscape agent may interfere with the download of SES code and the script upgrade process. To stop the agent, issue the shell command:

`/etc/init.d/ssagent stop` as root on any system where SANscape is installed. If the agent is running on a Microsoft Windows system connected to the array, use the **Services** application (**Start->Run->services.msc**) to stop the SANscape Agent service.

- Stop any optional software that monitors the array, such as the StorADE agent software, following the procedures described in the documentation for that application.

StorADE, or any other application which monitors the status of the enclosure, may also interfere with controller or SES firmware downloads and the controller firmware script upgrade.

- Unpack the update into any convenient directory (for example, `/var/tmp`).

To Determine the Current Controller Firmware Version

To determine the current controller firmware version, use one of the following methods:

- Using the RAID controller serial or `telnet` interface, choose the **view system Information** firmware menu option. The current firmware version is displayed as **Firmware Version**.

- In the SANscape program, highlight any component of the desired array, choose **View → View Controller**, and then check the **FW Rev** checkbox.

- Using SANscape CLI, enter the `show inquiry` command.

To Determine the Current SES and PLD Firmware Versions

To determine your current SES and PLD firmware versions, using SANscape CLI enter the **show ses** command. The SES version of each controller is displayed in the **Rev** column. The PLD version is displayed in the **PLD** column. See Table 20 in the section “Downloading and Installing Firmware” on page 26 for the latest SES and PLD version information.

To Determine the Current SATA Router and MUX Firmware Versions

To determine your current SATA multiplexer (MUX) board firmware version, using SANscape CLI enter the **show sata-mux** command. The MUX version of each board is displayed in the **PC150/Rev** column.

To determine your current SATA router firmware version, using SANscape CLI enter the **show sata-router** command. The router version is displayed in the **Rev** column.

Manually Upgrading Firmware

As always backup the data on the array. Dot Hill Systems will not be responsible for lost data if the data was not backed up prior to doing any upgrade. With doing a manual upgrade please have patience with the process and don't do anything until you get a message on the screen. You must use SCCLI 2.1.1 or higher to perform this upgrade.

If upgrading from 3.2x to 4.1x there are some steps that **MUST** be taken in order for the firmware upgrade to be complete.

After completing your backup the upgrade process can start.

Upgrading from 3.2x to 4.1x

Preparation for the upgrade

1. You must currently have controller firmware version 3.27R or later.
2. Ethernet connections required for out-of-band firmware upgrades. For RAID controller firmware upgrades, an Ethernet connection (or two Ethernet connections for dual-controller configurations) is required for out-of-band firmware upgrades, if the array to be upgraded is not connected to the host on which the upgrades are to be performed. In order to use the Ethernet connection(s), the controller must have an IP address assigned.
3. The tool that will be used for doing the upgrade is SANscape SCCLI 2.1.1.
4. Using the SCCLI capture the “**show config**” output to a file and print it out.
5. To get to the array oob the IP address of the array must be known prior to the following command: **sccli <ip address>** and press return. This will connect you to the array.
6. Using the SCCLI command, capture the “**show config**” output to a file and print it out. Example: **sccli> show config filename.txt**. The file will be output in the directory in which you ran the sccli executable. So it may be wise to but the path where the file can be found easily.
7. Stop all I/O to the array before beginning the controller firmware upgrade. Unmount all SANnet II 200 FC and SATA logical drives/LUNs from any hosts connected to the array, for the duration of the install procedure. For example, filesystems mounted from the SANnet II 200 FC device should be unmounted, and databases accessing raw devices on the array must be shut down.
8. Copy the firmware that is going to be used for the upgrade to a directory where it is easy to find and remember. Copying to a directory where the sccli command is run is a good place because the path does not need to be added to the command when doing the upgrades.

Performing the Upgrade

1. Start up sccli on a machine that is directly attached to the array or via the Ethernet network. For Ethernet Command: **sccli <ip address>** and press return and if directly connected the command is **sccli**.
2. To upgrade both controllers type the following command:
download controller-firmware -r filename.ext
This process will take up to 10 minutes. Please be patient.
3. The sccli command line will change and at one point it will state “**resetting controller**”. Once the command line comes back to the **sccli>** prompt do the following.
4. Type the command “**reset nvram**”. Once this process is completed and the **sccli>** prompt is back do the following.
5. Power off the array for 10 seconds and power it back on. If there are JBOD’s attached please power down all and bring back up in the proper order. Powering Down – RAID unit first then JBOD’s. Powering UP – JBOD’s first wait 30 seconds and then power on the RAID unit. If power cycling is not possible please issue this command: “**reset controller**” at the **sccli>** prompt. Once the prompt is back do the following,
6. Once these steps have been completed check the system using the sccli command: **show inq** and make sure that the output states the new firmware revision.

Performing the Upgrade if upgrade did not complete properly

Prerequisite for doing the following upgrade steps: Prior to doing the following steps you must complete the steps that are now going to be outlined.

1. Remove one controller and power cycle. If the system comes up fine with one controller then power down and pull the one controller out and insert the other controller. If the system comes up fine then follow the next step. If at this point the system does not come up properly, with either controller, then contact Dot Hill support before going any further.
2. Power down the system and insert both controllers. Power the system back on. If the system does not come up or one controller keeps failing during boot up then the following steps can be tried.
3. Prior to following the “**controller recovery steps**” please contact Dot Hill support to verify the issue.

Controller Recovery Steps

To do the controller recovery steps each controller will be upgraded one at a time. This means that only one controller will be inserted at a time. Complete the following steps on each controller. Once completed power down the array and insert both controllers and power the array back on.

1. Start up `sccli` on a machine that is directly attached to the array or via the Ethernet network. For Ethernet Command: `sccli <ip address>` and press return and if directly connected the command is `sccli`.
2. To upgrade one controller at a time type the following command:
download controller-firmware filename.ext
This process will take up to less than 10 minutes. Please be patient.
3. Once the command line comes back to the `sccli>` prompt do the following. Type the command “***reset nvram***”. Once this process is completed and the `sccli>` prompt is back do the following.
4. Power off the array for 10 seconds and power it back on. If there are JBOD’s attached please power down all and bring back up in the proper order. Powering Down – RAID unit first then JBOD’s. Powering UP – JBOD’s first wait 30 seconds and then power on the RAID unit. If power cycling is not possible please issue this command: “***reset controller***” at the `sccli>` prompt. Once the prompt is back do the following.
5. Use a serial terminal application if you did this upgrade out-of-band and add the IP address back in so you can run `sccli oob`.
6. Once these steps have been completed check the system using the `sccli` command: “***show inq***” and make sure that the output states the new firmware revision.
7. If all comes back fine. Power down the array pull the upgraded controller out and insert the other controller. Now please follow steps 1 through 6 again under “**controller recovery steps**” for the second controller.

8. Once both controllers have been upgraded and steps 1 through 6 have been completed on each controller power down the array and insert both controllers.
9. Power on the array.
10. Verify the array comes up properly. If so, then complete the upgrade by adding all the pertinent information regarding your configuration, WWN, LUN mappings, and any other configuration parameters that need to be changed. Once that is completed start bringing your hosts back online one at a time. ***Do not use the “Restore NVRAM” in the serial terminal application. This will cause problems and the previous steps will have to be done over again.***