

Troubleshooting the Sun StorEdge 3000 Download and Restore Upgrade Script (s3kd1res)

This document describes and provides troubleshooting information for the `s3kd1res` (Sun StorEdge 3000 Download and Restore) upgrade script, which automates the upgrade process from RAID controller firmware version 3.xx to version 4.15 only. The following topics are covered:

- “Description” on page 1
- “Before Running `s3kd1res`” on page 2
- “Script Troubleshooting” on page 5

Description

The `s3kd1res` upgrade script saves the controller configuration in XML format, upgrades the firmware, resets nvram, and restores the configuration based on the XML file. The script uses `sccli` to perform all operations on the controller. Not all settings are restored by the script, and therefore they must be restored manually. See “Configuration Settings Not Restored” on page 3 for more information.



Caution – Do not use the `s3kd1res` upgrade script if you are performing an upgrade from firmware version 4.xx to firmware version 4.15.

Before Running s3kd1res

Before running the s3kd1res script, it is important to understand the behavior and limitations of the script.



Caution – Failure to understand the behavior and limitations of the script and not taking the specified precautions can result in data loss.

- Filter maps for Fibre Channel and SATA might not be remapped correctly. The RS-232 serial interface allows additional parameters beyond what `sccli` allows, including read-write/read-only, exclude/include, name, and filter masks. `sccli` does not provide a way to check for these parameters. These parameters must be checked before running the script. After nvram is set, there is no way to recover this information.
- *Only* those parameters listed in “Configuration Settings That Are Restored” on page 4 are restored. Other parameters must be restored using the RS-232 serial interface. See “Configuration Settings Not Restored” on page 3 for a list of parameters that are not restored.
- Because nvram will be reset, communication with the RAID controller will be lost. You must restore the host LUN and channel setting (for in-band only) and network settings (out-of-band).
- Make sure the serial port setting is configured to 38400; otherwise, you will not be able to access it to restore critical settings.
- If you have logical drives or logical volumes with more than 32 partitions per logical drive or logical volume, make sure you delete all of these partitions. Create a configuration that contains less than 32 partitions per logical drive or logical volume, and then restore the data.
- Make sure the RS-232 interface is connected and configured at 38400, and monitored during the entire operation. After the nvram and controller are reset, the script specifies that certain manual tasks be performed with the RS-232 serial interface, including setting the IP address and mapping a host LUN if in-band communication is used. The RS-232 connection ensures that the script can communicate with the RAID controller after the nvram reset. Refer to the *Sun StorEdge 3000 Family Installation, Operation, and Service Manual* for information about connecting the RS-232 interface.
- It might not be possible to recover from some `sccli` errors. In such cases, the script will exit with a back trace, which is a list of functions and their parameters called at the time of the error. Some errors are considered exceptions and are accompanied by a back trace. See “Script Troubleshooting” on page 5 for a list of these errors.
- Make sure you back up your data.

Configuration Settings Not Restored

The configuration settings listed below are not restored by the `s3kd1res` script. Because these settings must be manually restored, record these parameters for *each* LUN that you want to restore the name for, or for *each* LUN that does not use the following default parameters: `type=include`, `access mode=read/write`, `filter mask=0xFFFFFFFFFFFFFFFF`.

- Network settings
 - IP address
 - netmask
 - gateway
- Host LUN filter settings
 - type
 - access mode
 - name
 - filter masks
 - world wide name
 - logical drive/partition number

- Sector/head/cylinder settings
- Channel data rate

If the channel data rate is set to 1 GHz or 2 GHz, after the script is run, the channel speed is set to Auto (auto-negotiation). However, some older HBAs do not support the latest auto-negotiation protocols. If your channel data rate was previously set at 1 GHz rather than Auto to avoid this problem, reset it to 1 GHz after the script finishes running. Refer to the Release Notes for your array for information about HBA support and limitations.

- Non-default RCCOM settings

RCCOM channel settings are restored for Channels 2 and 3 only. RCCOM settings for other channels are not restored.
- Certain customized settings, such as Peripheral Device Type Parameters.

See “Verifying Custom Settings” on page 4 for information about creating a file that enables you to verify that custom settings have been restored after the script has been run.

Configuration Settings That Are Restored

The configuration settings listed below are restored by the `s3kd1res` script.

- controller-name
- controller-ID
- logical drive controller assignment (primary or secondary)
- host-wwn-name
- **cache parameters:**
 - write-back
 - write-through
 - random
 - sequential
- **disk-array parameters:**
 - 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

Verifying Custom Settings

You can create a configuration file that enables you to verify that any custom settings have been restored after the script has been run. You might need to refer to it later in case it is necessary to restore or troubleshoot the configuration settings.

Type the following command to save the configuration settings in `.txt` format:

```
sccli> show configuration <filename.txt>
```

The command might take several minutes to complete and will save the file in the current working directory.

Script Troubleshooting

The `s3kd1res` script is designed to be safely rerun at any point. However, the script might not complete successfully if the process is interrupted or a timeout occurs. Manual intervention might be required to return the storage to a known state. Generally, that means performing a successful controller reset and confirming that the Sun Storage CLI can communicate with the device (restore IP address or in-band mapping). The previously saved XML file will be used for the rerun.

The script can bypass the firmware download and nvram reset by using the `--restore=all` option. In addition, different types of settings can be restored as outlined previously with other `--restore=<xxx>` options. For example, if the script fails after the nvram reset, you can continue (possibly with manual intervention), with `--restore=all`.

If it's necessary to rerun the script from the beginning, the firmware is reloaded, the nvram is reset again, and all settings are restored from the saved XML file from the previous attempt. The major concern is the integrity of the XML file. On a clean first run, the script saves the XML file as specified on the command line. If the file exists, the script prompts whether it should be used to restore the configuration. The script will not overwrite the configuration file. For instance, if the script crashes immediately after the nvram reset, and the user restarts the script, the script will not generate a new XML file, and therefore will not overwrite the previously saved good configuration.

Note – Step-by-step interactions that take place when the upgrade script runs are logged to a file called `s3kd1res.log`, which can be found in the same directory where the script was run. If an upgrade fails, resulting in an indeterminate or incomplete status, contact authorized service personnel and make your log files (`s3kd1res.log`, `<filename>.xml`, and `<filename>.txt`) available to them. (See “Verifying Custom Settings” on page 4 for information about creating `<filename>.txt`.)

Error Messages

Possible error messages are described below.

Note – If special characters such as ampersands are used in a controller name, errors will result without an error message. If it is necessary to use special characters in a controller name, you must use standard UNIX syntax escape procedures to enclose the special character in single or double quotation marks.

Message	<pre>WARNING cli command failed continuing... Command: <cmd> The CLI response was: <result> Please check settings manually.</pre>
Occurs	Restoration of settings
Meaning	The <code>sccli</code> command failed to restore the setting. The script will continue. If necessary, the setting might be able to be restored after the script completes with <code>sccli</code> or the RS-232 interface. A summary of failed commands will be printed at the end of the script. Note that some settings might not be able to be recovered due to restrictions in the controller firmware.
Likely Cause	The setting is not supported with the current version of the firmware or the CLI.
Resolution	Verify that the new firmware supports the settings, and then restore settings with <code>sccli</code> or the RS-232 interface after the script completes.

Message	<pre>Restoration completed with warnings. Please check settings. The following cli commands failed: <sccli cmds></pre>
Occurs	At script end
Meaning	The script failed to restore some settings. A summary of failed commands is printed.
Likely Cause	The setting is not supported with the current version of the firmware or Sun StorEdge CLI.
Resolution	Restore settings with <code>sccli</code> or the RS-232 interface. Note that some settings might not be able to be recovered due to restrictions in the controller firmware.

Message	<pre>A filename is required</pre>
Occurs	Startup check
Meaning	You must supply a file name as part of the <code>s3kdlres</code> command to save the XML data to that file (that is, in order to hold the XML configuration). Although the script does not require extensions on the file name, you can use one.
Likely Cause	Usage error
Resolution	Specify a file name on the command line. Restart the script.

Message	<sccli-cmd> not found or not executable Enter full pathname for sccli to continue
Occurs	Startup check
Meaning	The script relies on sccli being installed properly. This is normally installed as /opt/SUNWsscs/sbin/sccli for Solaris or UNIX operating systems. For Microsoft Windows, the default path name is the directory where the Sun StorEdge CLI package has been installed. If that fails, the script uses C:\Program Files\Sun\sccli. <sccli-cmd> is the full path name searched for by the script.
Likely Cause	Usage error
Resolution	Confirm that the package is installed correctly and that the location of sccli is correct. Restart script with: s3kdlres saved-XML-filename --cli=path-to-sccli --device=<device>

Message	Failed to contact RAID controller device: <device> Please correct the problem, or enter a new device, and try again
Occurs	Startup check
Meaning	The script attempts a simple sccli command to confirm communication with the RAID controller. <device> is the in-band or out-of-band device specified on the command line or the default device: 192.168.1.1
Likely Cause	Usage error or device cannot be reached
Resolution	Confirm <device> is correct. Manually check communication with: # sccli <device> about Restart the script.

Message	Failed to contact RAID controller. Please correct the problem and try again.
Occurs	After firmware download and nvram reset
Meaning	The script attempts a simple sccli command to confirm communication with the RAID controller. <device> is the in-band or out-of-band device specified on the command line or the default device: 192.168.1.1
Likely Cause	Failure to set network parameters for out-of-band or map LUN for in-band after nvram reset.
Resolution	Set the network parameters (IP address, netmask, and gateway) for out-of-band communication or map a LUN for in-band communication. Confirm communication with the controller: # sccli <device> about Restart the script with the --restore=all option using the existing XML configuration file saved: # s3kdlres <XMLfile> --device=<device> --restore=all See the s3kdlres man page for details on the --restore option.

Message	Unknown Access Mode: <access-mode> Wanted "inband" or "out-of-band"
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Occurs	Startup check
Meaning	The access mode is used for certain conditionals. <code>sccli</code> cannot determine what access mode is being used or an unknown access mode was encountered.
Likely Cause	Bad XML data, a <code>sccli</code> bug, or a script bug
Resolution	Reset the controller using the serial port. Confirm access mode with: <code># sccli <device> show access</code> Restart the script. Contact Technical Support if the problem persists.

Message	<pre>Password is required. Password is not correct.</pre>
Occurs	Startup check
Meaning	For out-of-band only. The controller password is set. Either the password was not supplied on the command line, or the password was incorrect.
Likely Cause	Usage error
Resolution	Restart the script with: <code># s3kdres saved-XML-filename IP-address --password=<controllerpassword></code>

Message	<pre>Unsupported firmware found. Upgrades supported to firmware 4xxx only.</pre>
Occurs	Firmware download
Meaning	Only upgrades from 3.2x to 4.xx are supported.
Likely Cause	An incorrect firmware download was attempted.
Resolution	The firmware can be downloaded manually with <code>sccli</code> : <code># sccli <device> download controller-firmware <fn></code>

Message	<pre>Upgrades to firmware <rev> not supported. Upgrades supported to firmware 4xxx only.</pre>
Occurs	Firmware download
Meaning	Only upgrades from 3.2x to 4.xx are supported.
Likely Cause	An incorrect firmware download was attempted.
Resolution	The firmware can be downloaded manually with <code>sccli</code> : <code># sccli <device> download controller-firmware <fn></code>

Message	<pre>Upgrades from firmware <rev> not supported. Upgrades supported from filename 32xx only.</pre>
Occurs	Firmware download
Meaning	Only upgrades from 3.2x to 4.xx are supported.

Likely Cause	There is incorrect firmware loaded on the controller.
Resolution	The firmware can be downloaded manually with <code>sccli</code> : <pre># sccli <device> download controller-firmware <fn></pre>

Message	Logical Volumes not supported in this release. The following Logical Volumes were found: Logical Volume id: <lv-id> Note: This error message only applies to firmware version 4.11.
Occurs	Firmware download
Meaning	Logical volumes are not supported for this upgrade (firmware version 4.11).
Likely Cause	Logical volumes are present.
Resolution	Back up logical volume data to tape or other media. Delete the logical volumes, and restart the script to complete the upgrade. After the upgrade is completed, recreate the logical volumes manually and recover the data from backup.

Message	<code>sccli version <version> not supported. Please update sccli</code>
Occurs	Startup check
Meaning	<code>sccli version 2.x or later is required.</code>
Likely Cause	There has been an installation error or the incorrect <code>sccli</code> has been specified on the command line.
Resolution	Verify that earlier versions are removed, and if using the <code>--cli=path-to-cli</code> option, verify that the path is correct. Make sure <code>sccli 2.x</code> or later is installed. Restart the script with: <pre>s3kdlres saved-XML-filename --device=<device></pre>

Message	<code><saft ses> <rev> not supported</code> <code>*** Out of rev. SES or SAF-TE code detected.</code> Please update SES or SAF-TE code with the following <code>sccli</code> command Update out of rev. <code><saft ses> code <rev></code> <pre>sccli <device> download <saft ses>-firmware <fn></pre> Where <code><fn></code> is name of the firmware file
Occurs	Startup check
Meaning	Minimum SAF-TE code 1168 and SES code 1046 (FC) or 0413 (SATA) is required.
Likely Cause	Out-of-date SAF-TE or SES code
Resolution	Confirm SAF-TE or SES code with: <pre># sccli <device> show safte</pre> <pre># sccli <device> show ses</pre> The script lists a sample <code>sccli</code> command that you can use to download the SAF-TE or SES firmware. Upgrade SAF-TE or SES code using the command listed, and then restart the script.

Message	Can't open XML file: <XMLfile>: <error> Failed to save XML file: <XMLfile>: <error>
Occurs	Startup check
Meaning	An error was encountered creating or saving the XML configuration. The <error> tag might provide additional information such as "permission denied."
Likely Cause	Insufficient privileges. File system full.
Resolution	Once you have verified permissions and available space, rerun the script. Note: The XML file created is typically less than 100 Kbyte.

Message	The following devices have too many partitions for this upgrade. Please delete partitions 32 and above: ----- <logical-drive volume>: Id: <id>, Partitions: <nPartitions>
Occurs	Startup check
Meaning	Firmware 4.xx supports up to 32 partitions per logical drive or logical volume. More than 32 partitions per logical drive or logical volume were found.
Likely Cause	More than 32 partitions detected.
Resolution	Back up or move all data on all partitions of the listed logical drives or volumes. Delete all partitions for logical drives or logical volumes with more than 32 partitions per logical drive or logical volume. Create a configuration that contains less than 32 partitions per logical drive or logical volume, and then restore the data. Delete all partitions on the specified logical drives or volumes with: # sccli <device> configure partition <partition> delete Refer to the sccli man page for details on the configure partition command.
	Caution: Deleting the partition destroys the data. Data cannot be recovered. Refer to the sccli man page for details on deleting partitions. Restart the script.
	Note: Deleting partitions can also be completed using controller firmware commands. Refer to the <i>Sun StorEdge 3000 Family RAID Firmware User's Guide</i> for detailed instructions.

Message	Please change the Controller Assignment for the following: <logical-<drive volume>: Id: <id>, Change Assignment to <Primary Secondary> Then rerun the script with the option: --restore=maps
Occurs	Restoring maps
Meaning	After an nvram reset, all logical drives and logical volumes are changed to Primary. Any logical drives that were originally assigned to the Secondary controller must be reassigned to the Secondary controller but sccli failed to do so.
Likely Cause	sccli failed to change the logical drive or logical volume assignment.

Resolution	<p>Change the logical drive or logical volume assignment using the serial interface:</p> <ol style="list-style-type: none"> 1. From the Main Menu, choose "view and edit Logical drives." 2. Select the logical drive that you want to reassign. 3. Choose "logical drive Assignments," and then choose Yes to confirm the reassignment. The reassignment is evident from the view and edit Logical drives screen. An LG number, such as P0 means that the logical drive is assigned to the primary controller. An LG number such as S0 means that the logical drive is assigned to the secondary controller. 4. Restart the script with the <code>--restore=maps</code> option using the existing XML configuration file saved: <pre># s3kdlres <XMLfile> --device=<device> --restore=maps</pre> <p>See the <code>s3kdlres</code> man page for details on the <code>--restore</code> option.</p>
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Message	<pre>Redundancy status after controller reset does not match original Redundancy status. Original Redundancy Status: <status> New Redundancy Status: <status> Correct problem and rerun script from the beginning.</pre>
Occurs	After firmware download, before nvram reset
Meaning	The controller redundancy status is read and saved before the firmware download happens. After the firmware download, the redundancy status is read again and compared to the original. There is a one-minute timeout for redundant controllers to bind as a pair after the firmware download and controller reset.
Likely Cause	Controllers did not bind as a pair after the firmware upgrade or the firmware upgrade was attempted on a unit in degraded mode (that is, the controller failed).
Resolution	<p>Using the serial port, reset the controller, and restart the script using a new, unique file name to save the XML configuration data:</p> <pre># s3kdlres new-saved-XML-file --device=<device></pre> <p>A firmware download will be re-attempted even if the upgrade was successful. If the problem persists, see [1], [2], or [3] below.</p> <p>[1] If the New Redundancy Status shows "Detecting," check the redundancy status with: # <code>sccli <device> show redundancy</code></p> <p>[2] If the redundancy status continues to show "Detecting," the controllers are not binding as a pair. Contact Technical Support.</p> <p>[3] If the redundancy status shows "Enabled," the controllers have now bound as a pair. Possibly the script timed out before the controllers bound. Confirm the correct firmware revision with: # <code>sccli <device> show inquiry</code></p> <p>If the firmware is correct, reset the nvram with: # <code>sccli <device> reset nvram</code> # <code>sccli <device> reset controller</code></p>

After the reset completes, set the IP address for out-of-band communication or map a LUN for in-band communication.

Confirm communication with the controller:

```
# sccli <device> about
```

Restart the script with the `--restore=all` option, using the existing XML configuration file saved:

```
# s3kdlres <XMLfile> --device=<device> --restore=all
```

See the `s3kdlres` man page for details on the `--restore` option.

If the firmware is incorrect, contact Technical Support.

If the problem persists, use the manual upgrade procedure, or contact Technical Support.

The following errors are considered exceptions and are accompanied by a back trace, providing details on the failure. Back-trace details might be useful to Technical Support. Report all exceptions to Technical Support.

Message	Failed to run command: <cmd>: <error> result: <result>
Occurs	Varies
Meaning	The script uses <code>sccli</code> to perform all operations on the controller. The command passed to <code>sccli</code> resulted in a non-zero exit status (failure), or the command timed out. The <error> tag may provide additional information. The <result> tag is the output result of <code>sccli</code>
Likely Cause	Failure to contact device [see 1 below], unexpected XML tag [see 2 below], or command exceeded 20-minute timeout [see 3 below].
Resolution	<p>[1] If the <result> tag indicates a failure to contact the device as reported by <code>sccli</code>, it might be the result of an in-band device going offline in the process. If possible, use an out-of-band connection. During the process, the in-band device will be “unmapped” from the RAID controller. This happens during the nvram reset and after “Restoring Channels Ids.” If it happens after the nvram reset, it might be possible to recover by restarting the controller, mapping the LUN, and continuing with <code>--restore=all</code>.</p> <p>Before running the <code>--restore=all</code> command, run the <code>sccli</code> command <code>about</code> to verify communication with the device.</p> <pre># sccli <device> about</pre> <p>Restart the script with the <code>--restore=all</code> option, using the existing XML configuration file saved:</p> <pre># s3kdlres <XMLfile> --device=<device> --restore=all</pre> <p>See the <code>s3kdlres</code> man page for details on the <code>--restore</code> option.</p> <p>If it happens after “Restoring Channel Ids,” it might be possible to recover with other <code>--restore</code> options:</p> <pre># s3kdlres <XMLfile> --device=<device> --restore=settings # s3kdlres <XMLfile> --device=<device> --restore=channels</pre>

At this point, a controller reset is required to cause the channel settings to apply. An in-band device might be offline again. Remap the LUN using the RS-232 serial interface, and restore the remaining LUN maps:

```
# s3kdlres <XMLfile> --device=<device> --restore=maps
```

See the `s3kdlres` man page for details on the `--restore` option.

[2] The script uses data supplied from the XML file to construct `sccli` commands. If the XML data is not valid or unexpected, an invalid `sccli` command may be constructed.

It may be possible to edit the XML file, and restart the script with the `--restore=all` option using an existing XML configuration file edited and saved:

```
# s3kdlres saved-XML-filename --device=<device> --restore=all
```

See the `s3kdlres` man page for details on the `--restore` option.



Caution: Only edit the XML file under the direction of Technical Support. If this file becomes corrupted, you will not be able to use it to restore your configuration and all data could be lost.

[3] Twenty-minute and other timeouts are generally the result of hardware issues. In-band devices are discussed above.

For out-of-band-devices, there might be underlying network issues such as a stale arp cache.

Check network connectivity with:

```
# ping <out-of-band device>
```

```
# sccli <device> about
```

Report other conditions to Technical Support.

Message	Cannot find Channel Assignment for ch: <ch>, tgt: <tgt>, found: <assignment>
Occurs	Restoring channels
Meaning	The script cannot determine the assignment (Primary or Secondary) for the channel and target listed from the XML data.
Likely Cause	Bad XML data
Resolution	Restore the channel settings manually with the <code>sccli</code> command: <pre># sccli <device> configure channel channel { host drive } options</pre> (Refer to the <code>sccli</code> man page for details on the <code>configure channel</code> command.) Reset the controller, and continue to restore LUN maps with the existing saved XML file: <pre># sccli <device> reset controller</pre> <pre># s3kdlres <XMLfile> --device=<device> --restore=maps</pre> See the <code>s3kdlres</code> man page for details on the <code>--restore</code> option. Note: Resetting the controller and restoring the channel settings can also be completed using controller firmware commands. Refer to the <i>Sun StorEdge 3000 Family RAID Firmware User's Guide</i> for detailed instructions.

Message	Cannot find Channel Assignment for ld/lv: <id>, found: <assignment>
Occurs	Restoring maps
Meaning	The script cannot determine the assignment (Primary or Secondary) for the logical drive or logical volume listed.

Likely Cause	Bad XML data
Resolution	<p>Restore the LUN mappings manually with the <code>sccli</code> command:</p> <pre># sccli <device> map partition ch.tgt.lun [wwpn]</pre> <p>(Refer to the <code>sccli</code> man page for details on the <code>map partition</code> command.)</p> <p>Note: Restoring the LUN mappings can also be completed using controller firmware commands. Refer to the <i>Sun StorEdge 3000 Family RAID Firmware User's Guide</i> for detailed instructions.</p>

Message	No id found
Occurs	Startup check
Meaning	A logical drive or logical volume was found in the XML file, but some attribute information is corrupt or missing.
Likely Cause	Bad XML data
Resolution	Reset controller. Restart the script. If the problem persists, contact Technical Support.

Message	Can't find product: <product> in product table
Occurs	Startup check
Meaning	The script confirms the product to be upgraded is supported.
Likely Cause	Unsupported product
Resolution	Reset the controller. Restart the script. If the problem persists, contact Technical Support.
