



# Sun StorEdge™ 3000 Family RAID Controller Firmware Migration Guide

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Sun Microsystems, Inc.  
www.sun.com

Part No. 819-6573-11  
March 2007, Revision A

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# Preface

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The *Sun StorEdge 3000 Family RAID Controller Firmware Migration Guide* provides steps for using and troubleshooting the `s3kd1res` (Sun StorEdge 3000 Download and Restore) script, which automates the migration from RAID controller version 3.xx to version 4.15 or later *only* on Solaris, Linux, and Microsoft Windows operating systems. A manual firmware migration procedure for HP-UX and IBM AIX operating systems is also provided.

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## Read These First

Before you begin following the procedures described in this guide, familiarize yourself with the following documents as they contain information needed to perform the firmware migration.

- The Release Notes for your array.
- The README included in the patch you downloaded for your array.

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## How This Book Is Organized

This book covers the following topics:

[Chapter 1](#) lists the system prerequisites and requirements that must be met *before* you begin the firmware migration process using the `s3kd1res` script. It also describes script behavior and limitations.

[Chapter 2](#) provides steps you need to follow before you run the `s3kd1res` script and the steps to run the script.

[Chapter 3](#) lists and describes possible error messages, likely causes, and resolutions.

[Appendix A](#) provides the manual procedure for performing a controller firmware migration on HP-UX and IBM AIX operating systems.

[Appendix B](#) describes how to reference the `s3kd1res` man page and describes the `s3kd1res` syntax and options.

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## Using UNIX Commands

This document does not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. Refer to the following for this information:

- Software documentation that you received with your system
- Solaris™ operating system documentation, which is at <http://docs.sun.com>

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## Shell Prompts

Shell	Prompt
C shell	<i>machine-name%</i>
C shell superuser	<i>machine-name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

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# Typographic Conventions

Typeface <sup>1</sup>	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
<b>AaBbCc123</b>	What you type, when contrasted with on-screen computer output	% <b>su</b> Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. You <i>must</i> be superuser to do this. To delete a file, type <code>rm filename</code> .

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<sup>1</sup> The settings on your browser might differ from these settings.

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All Sun StorEdge 3000 family documentation is available online in both PDF and HTML format at the following location:

[http://www.sun.com/products-n-solutions/hardware/docs/Network\\_Storage\\_Solutions/Workgroup/](http://www.sun.com/products-n-solutions/hardware/docs/Network_Storage_Solutions/Workgroup/)

You can view, print, or purchase a broad selection of Sun documentation at:

<http://www.sun.com/documentation>

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# Contacting Sun Technical Support

For late-breaking news and troubleshooting tips, review the Release Notes for your array located in the appropriate directory:

[http://www.sun.com/products-n-solutions/hardware/docs/Network\\_Storage\\_Solutions/Workgroup/](http://www.sun.com/products-n-solutions/hardware/docs/Network_Storage_Solutions/Workgroup/)

If you have technical questions about this product that are not answered in the documentation, go to:

<http://www.sun.com/service/contacting>

To initiate or check on a USA-only service request, contact Sun support at:

800-USA-4SUN

To obtain international technical support, contact the sales office of each country at:

<http://www.sun.com/service/contacting/sales.html>

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## 508 Accessibility Features

The Sun StorEdge documentation is available in Section 508-compliant HTML files that can be used with assistive technology programs for visually impaired personnel. These files are provided on the Documentation CD for your product as well as on the web sites identified in the section “Accessing Sun Documentation” on page ix. Additionally, the software and firmware applications provide keyboard navigation and shortcuts, which are documented in the user’s guides.

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*Sun StorEdge 3000 Family RAID Controller Firmware Migration Guide*, part number 819-6573-11.



## Before You Begin the Firmware Migration

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This chapter introduces and describes the `s3kd1res` script and lists the system prerequisites and requirements that must be met before you begin the firmware migration process. It also describes script behavior and limitations. Topics include:

- [“Migrating Firmware on Solaris, Linux, and Microsoft Windows Operating Systems” on page 1](#)
- [“Migrating Firmware on HP-UX and IBM AIX Operating Systems” on page 2](#)
- [“System Prerequisites and Requirements” on page 2](#)
- [“Script Behavior and Limitations” on page 5](#)

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## Migrating Firmware on Solaris, Linux, and Microsoft Windows Operating Systems

When migrating from firmware version 3.xx to 4.15 or later on Solaris, Linux, and Microsoft Windows operating systems, you *must* use the `s3kd1res` script, which is contained in the Sun StorEdge Configuration Service/Sun StorEdge CLI software package, `SUNWSSCS`. Version 2.3 or later is required. If you do not have this package installed, or if you have an earlier version, download version 2.3 from the Sun Download Center, or install it from the optional Sun StorEdge Professional Manager CD. For software installation or upgrading instructions, refer to the *Sun StorEdge 3000 Family Software Installation Guide*.

The `s3kd1res` 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 the Sun StorEdge CLI (`scccli`) to perform all operations on the controller. Settings that are not restored by the script must be restored manually. See [“Configuration Settings That Are Restored” on page 7](#) and [“Configuration Settings That Are Not Restored” on page 8](#) for more information.



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**Caution** – Do not use the `s3kd1res` migration script if you are upgrading from firmware version 4.xx to firmware version 4.15 or later. If you are currently running controller firmware 4.xx, refer to the latest Release Notes for your array for instructions about how and where to download the most recent controller firmware patch. The README included in that patch provides the instructions necessary to upgrade from firmware version 4.xx to firmware version 4.15 or later, as well as upgrade instructions for other firmware components included in the patch.

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## Migrating Firmware on HP-UX and IBM AIX Operating Systems

The `s3kd1res` script cannot be used for firmware migrations on HP-UX and IBM AIX operating systems. Instead, follow the instructions provided in [“Migrating Controller Firmware on HP-UX and IBM AIX Operating Systems” on page 29](#). Before beginning the migration, contact Sun service personnel for assistance. Time and materials charges might apply if not currently covered under warranty/support contract.

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## System Prerequisites and Requirements

Before installing controller firmware version 4.15 or later, make sure your environment supports the prerequisites and requirements for running the script as listed in [TABLE 1-1](#).



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**Caution** – Failure to adhere to the system prerequisites and requirements can result in data loss.

---

**TABLE 1-1** System Prerequisites and Requirements for Migrating RAID Controller Firmware on Solaris, Linux, and Microsoft Windows Operating Systems

Prerequisite//Requirement	Description
Obtain the most recent controller firmware patch.	Refer to the latest Release Notes for your array for instructions about how and where to download the most recent controller firmware patch.
Required SAF-TE or SES version.	The array must be currently running the required version of SAF-TE or SES firmware:
Sun StorEdge 3310 SCSI array	You must be running controller firmware version 3.25S or later and SAF-TE version 1168 or later.
Sun StorEdge 3510 FC array	You must be running controller firmware version 3.27R or later and SES version 1046 or later.
Sun StorEdge 3511 SATA array	You must be running controller firmware version 3.27R or later and SES version 0413 or later.
Using the <code>s3kd1res</code> script.	<p data-bbox="705 1112 1286 1272">The <code>s3kd1res</code> script is required for migrating controller firmware on Solaris, Linux, and Windows operating systems only. If you are migrating firmware on HP-UX and IBM AIX operating systems, see <a href="#">“Migrating Controller Firmware on HP-UX and IBM AIX Operating Systems”</a> on page 29.</p> <p data-bbox="705 1295 1268 1373">The <code>s3kd1res</code> script is contained in the Sun StorEdge Configuration Service/Sun StorEdge CLI software package, <code>SUNWSSCS</code>. Version 2.3 or later is required.</p> <p data-bbox="705 1395 1286 1558">If you do not have this package installed, or if you have an earlier version, download version 2.3 from the Sun Download Center, or install it from the optional Sun StorEdge Professional Manager CD. For software installation or upgrading instructions, refer to the <i>Sun StorEdge 3000 Family Software Installation Guide</i>.</p>

**TABLE 1-1** System Prerequisites and Requirements for Migrating RAID Controller Firmware on Solaris, Linux, and Microsoft Windows Operating Systems (Continued)

Prerequisite/Requirement	Description
You must have a serial connection.	<p>You must have a serial connection to restore settings during the migration process. Use a null modem serial cable to connect the COM port of the array to the serial port on a host workstation. Make sure the serial port setting is configured to 38400 baud, 8 bit, 1 stop bit, no parity; otherwise, you will not be able to access it to restore critical settings. Refer to the <i>Sun StorEdge 3000 Family Installation, Operation, and Service Manual</i> for information about connecting the RS-232 interface.</p> <p>Make sure the RS-232 serial interface is connected and configured at 38400 baud and <i>monitored</i> during the entire migration process. 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 controller after the nvram reset.</p>
The migration can be performed in-band or out-of band; out-of-band is preferred.	<p>Ethernet connections are required for out-of-band firmware migrations if the array to be upgraded is not connected to the host from which the migrations are to be performed.</p> <p><b>Note:</b> Migrating the firmware using an out-of-band connection is preferred over an in-band connection.</p> <p>Depending on your array, a SCSI or Fibre Channel connection to the array is required for in-band firmware migrations when no network connection to the array is available.</p>
Create configurations of less than 32 partitions per logical drive or logical volume.	<p>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. <i>Before</i> beginning the firmware migration, contact authorized Sun service personnel for assistance. Time and materials charges might apply if not currently covered under warranty/support contract.</p>

**TABLE 1-1** System Prerequisites and Requirements for Migrating RAID Controller Firmware on Solaris, Linux, and Microsoft Windows Operating Systems (*Continued*)

Prerequisite/Requirement	Description
Back up data and restore after recreating partitions.	Make sure you back up your data <i>before</i> running the script. Backing up data and restoring after recreating the partitions is required; otherwise, there is loss of data.
Create a .txt file to record settings so that you can manually restore settings that the script does not restore after the firmware migration.	See <a href="#">“Creating a Configuration File” on page 9</a> for more information.
The array must be migrated offline.	Stop all I/O activity and unmount any file systems or volumes mounted on the array <i>before</i> running the script.

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## Script Behavior and Limitations

It is not possible to restore all configuration information with `sccli` and the XML configuration file. Make sure you understand the following script behavior and limitations as described in [TABLE 1-2](#).



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

---

**TABLE 1-2** s3kd1res Migration Script Behavior and Limitations

Behavior/Limitation	Description
Filter maps for Sun StorEdge 351x arrays might not be remapped correctly.	The RS-232 serial interface allows additional parameters beyond what <code>sccli</code> allows, including read-write/read-only, exclude/include, name, and filter masks. <code>sccli</code> does not provide a way to check for these parameters. These parameters must be checked before running the script. After <code>nvr</code> is set, there is no way to recover this information. These parameters must be restored manually.
Not all settings are restored.	<i>Only</i> those settings listed in <a href="#">“Configuration Settings That Are Restored” on page 7</a> are restored. Other parameters must be recorded and then restored using the RS-232 serial interface. See <a href="#">“Configuration Settings That Are Not Restored” on page 8</a> for a list of parameters that are not restored.
You need to verify customized settings.	If you have custom settings that you want restored, see <a href="#">“Creating a Configuration File” on page 9</a> for information on creating a file that enables you to verify that custom settings have been restored after the script has been run.
You must restore the host LUN and channel setting (in-band) and network settings (out-of-band).	Because <code>nvr</code> is reset, communication with the RAID controller is lost. You must restore the host LUN and channel setting (for in-band only) and network settings (out-of-band) when prompted by the script. <b>Note:</b> Migrating the firmware using an out-of-band connection is preferred over an in-band connection.
You need a serial connection after the firmware has been migrated.	You must reconfigure controller and network parameters using a serial connection after the firmware has been migrated. The controller password is not restored if you perform an in-band migration. The password is set to null when the migration completes.
It might not be possible to recover from some <code>sccli</code> errors.	In such cases, the script exits 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 <a href="#">“Error Messages” on page 20</a> for a list of these errors.

# Configuration Settings That Are Restored

The following configuration settings are restored by the `s3kd1res` script. All other settings are reset to the default settings of the firmware version to which you are migrating.

- controller-name
- controller-ID
- logical drive controller assignment (primary or secondary)
- host-wwn-name (Sun StorEdge 351x arrays only)
- **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
- **host parameters**
  - queue-depth
  - max-luns-per-id
  - fibre-connection mode (Sun StorEdge 351x arrays only)
- **channels**
  - channel type (disk or host)
  - target IDs
- **maps**
  - LUN mappings

# Configuration Settings That Are Not Restored

The configuration settings listed in this section are not restored by the `s3kd1res` script. After the script resets nvram, the only way to restore these settings is to re-enter them after the migration is complete.

Because these settings must be manually restored, record these parameters for *each* LUN for which you want to restore the name, and for *each* LUN that does not use the following default parameters: `type=include`, `access mode=read/write`, `filter mask=0xFFFFFFFFFFFFFFFF`.

See [“Using the RAID Firmware Application to View Settings That Are Not Restored” on page 9](#) for information on viewing these settings.

- **Network settings**
  - IP address
  - netmask
  - gateway
- **Sector/head/cylinder settings**
- **Host LUN filter settings** (Sun StorEdge 351x arrays only)
  - type
  - access mode
  - name
  - filter masks
  - world wide name
  - logical drive/partition number

- **Channel data rate** (Sun StorEdge 351x arrays only)

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** (Sun StorEdge 351x arrays only)

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 [“Creating a Configuration File” on page 9](#) for information on creating a file that enables you to verify that custom settings have been restored after the script has been run.

## Creating a Configuration File

Create a configuration file that enables you to verify that any custom settings have been restored after the script has been run. You will need to refer to it after the script has been run 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.

---

**Note** – Configuration setting output files are not transferable. That is, you cannot save a configuration file for a specific Sun StorEdge array and use it to perform the script upgrade on another Sun StorEdge array.

---

## Using the RAID Firmware Application to View Settings That Are Not Restored

Use the RAID firmware application menus described in this section to view and record the following settings that are not restored. You will need to provide this information when running the script. For information on accessing the RAID firmware application, refer to the *Sun StorEdge 3000 Family RAID Firmware User's Guide*.

- To view the IP address, netmask, and gateway settings, from the Main Menu, choose "view and edit Configuration parameters > communication Parameters > Internet Protocol (TCP/IP)."
- To view sector/head/cylinder settings, from the Main Menu, choose "view and edit Configuration parameters > Host-side parameters > Host Cylinder/Head/Sector mapping Configuration."
- (Sun StorEdge 351x arrays only) To view host LUN filter settings, from the Main Menu, choose "view and edit Host luns." Also, for reference during the migration, record the Host LUN settings.
- (Sun StorEdge 351x arrays only) To view RCCOM settings, from the Main Menu, choose "view and edit channels." Also, for reference during the migration, record the channel ID settings.



# Using the Firmware Migration Script (`s3kd1res`)

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This chapter provides steps you need to follow *before* you run the `s3kd1res` script and the steps to run the script. Topics covered include:

- [“Before Running the `s3kd1res` Script” on page 11](#)
- [“Running the `s3kd1res` Script” on page 14](#)

---

## Before Running the `s3kd1res` Script

This section provides the steps you need to follow *before* you run the `s3kd1res` script.

1. **Make sure you understand and have followed the steps provided in [“System Prerequisites and Requirements” on page 2](#) and [“Script Behavior and Limitations” on page 5](#).**
2. **Make sure you have created a configuration file that enables you to verify that any custom settings have been restored after the script has been run.**  
See [“Creating a Configuration File” on page 9](#) for more information.
3. **Read the latest Release Notes for your array for instructions about how and where to download the most recent controller firmware patch.**
  - a. **Download the patch.**
  - b. **Unpack the patch to any convenient directory that is easy to remember (for example, `/var/tmp`).**
4. **Change your working directory to the directory in which the patch was unpacked, and confirm that the Sun binary file is present.**

## 5. Invoke the CLI.

The firmware migration procedures require you to invoke `sccli` using the appropriate syntax for the type of connection used to manage the array.

If the array to be upgraded is a RAID subsystem attached to a Fibre Channel HBA installed on the local host, type the `sccli` command with no arguments:

```
sccli
```

If more than one array is connected to local Fibre Channel, `sccli` displays a list from which the appropriate device can be selected.

If the array has an IP address configured, it can be managed remotely using a network (or out-of-band) connection. To specify this mode, type:

```
sccli [-w <password>] <hostname | ip>
```

where *password* is the password assigned to the controller and *hostname | ip* is the host name or IP address of the array. If no controller password is set, omit the `-w` option and password option

---

**Note** – Use single quote characters to quote the password if it contains any characters that are interpreted specially by the shell.

---

## 6. Verify that you are running version 2.3 or greater of `sccli` by typing:

```
sccli> version
```

## 7. Verify the product and version of the array by typing:

```
sccli> show inquiry
```

## 8. Examine the output.

- **For the Sun StorEdge 3310 SCSI array**, if the "Product" is "StorEdge 3310F D" and "Device Type: Enclosure" is displayed, the device is a JBOD chassis. Discontinue this migration procedure, and refer to "SAF-TE Firmware Update" found in the README included in the patch you downloaded for your array.

- **For the Sun StorEdge 3510 FC array**, if the “Product” is “StorEdge 3510F D” and “Device Type: Enclosure” is displayed, the device is a JBOD chassis. Discontinue this migration procedure, and refer to the `JBOD_upgrade.txt` included in the patch you downloaded for your array.
- **For the Sun StorEdge 3511 SATA array**, if the “Product” is “StorEdge 3511F D,” and “Device Type: Enclosure” is displayed, the device is a JBOD chassis. Discontinue this migration procedure, and refer to “SES Firmware Update” found in the `README` included in the patch you downloaded for your array.

---

**Note** – For an out-of-band `sccli` connection, “Device Type” is not displayed for a JBOD chassis.

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- If the “Product” is not “StorEdge 3310,” “StorEdge 3510,” or “StorEdge 3511,” this patch does not apply. Select a different array or discontinue this procedure.
- If the firmware version reported is the version to which you are migrating, the controller firmware does not need to be migrated. Discontinue this migration procedure.

**For the Sun StorEdge 3310 SCSI array**, refer to “SAF-TE Firmware Update” found in the `README` included in the patch you downloaded for your array.

**For the Sun StorEdge 3510 FC or 3511 SATA array**, refer to “SES Firmware Update” found in the `README` included in the patch you downloaded for your array.

## 9. Verify single or dual controller by typing:

```
sccli> show redundancy
```

The dual controller array is healthy if the redundancy mode is "Active-Active" and the status is "Enabled."

The single controller array is healthy if the redundancy mode is "Active-Active" and the status is "Scanning."

If the array does not show a healthy status, correct the problem before proceeding.

---

# Running the s3kd1res Script

Perform the following steps to run the s3kd1res script.

---

**Note** – If you are upgrading more than one array, note the time it takes to upgrade the first array so that you can schedule the amount of time needed to upgrade the other arrays.

---

---

**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 [“Creating a Configuration File” on page 9](#) for information about creating <filename>.txt.) Also see [“Script Troubleshooting” on page 19](#) for a list of possible error messages and resolutions.

---

1. **Make sure you have read and performed the steps provided in [“System Prerequisites and Requirements” on page 2](#), [“Script Behavior and Limitations” on page 5](#), and [“Before Running the s3kd1res Script” on page 11](#).**
2. **Make sure you have created a configuration file that enables you to verify that any custom settings have been restored after the script has been run.**  
See [“Creating a Configuration File” on page 9](#) for more information.
3. **Stop all I/O activity and unmount any file systems or volumes mounted by a volume manager from the array.**
4. **Stop any Sun StorEdge Configuration Service agent that might be running on a host connected to the array controller.**

To stop the agent, issue the shell command as "root" user:

```
/etc/init.d/ssagent stop
```

If the agent is running on a Microsoft Windows system connected to the array, use the Services application to stop the agent service by choosing Start > Run > Services.msc.

5. Because other applications might interfere with controller firmware downloads, stop any other software that monitors the array.

Refer to the documentation for the specific application for information on stopping the agent software.

6. If you haven't already done so, set up a serial connection to the controller.

See ["System Prerequisites and Requirements"](#) on page 2 for more information.

7. Run the script to migrate the controller firmware.

For Solaris and Linux operating systems, change the directory to:

```
/opt/SUNWsscs/sbin
```

Type:

```
./s3kdlres <xml filename> --device=<device or IP> --password=<controller password>
```

where *xml filename* is a name specified for the file in which the array configuration output is saved.

where *device* or *IP* is either the device name for in-band or the IP address of the array for out-of-band.

where *controller password* is an optional password that only needs to be specified if a password for this controller has been previously set.

Example for in-band migration with no password:

```
./s3kdlres /var/tmp/xml_conf.out --device=/dev/rdisk/c4t40d0s2
```

Example for out-of-band migration with no password:

```
./s3kdlres /var/tmp/xml_conf.out --device=206.111.111.111
```

For Microsoft Windows, choose Start > Run.

To launch a command prompt, type:

```
cmd
```

Change the directory to:

```
C:\Program Files\Sun\sccli
```

Type:

```
s3kdres <xml filename> --device=<device or IP> --password=<controller  
password>
```

where *xml filename* is a name specified for the file where the array configuration output is saved.

where *device* or *IP* is either the device name for in-band or the IP address of the array for out-of-band.

where *controller password* is an optional password that only needs to be specified if a password for this controller has been previously set.

Example for in-band migration with no password:

```
./s3kdres /var/tmp/xml_conf.out --device=\\.PhysicalDrive1
```

Example for out-of-band migration with no password:

```
./s3kdres /var/tmp/xml_conf.out --device=206.111.111.111
```

**8. When the script prompts you for the firmware file, specify the full path name where the firmware patch was extracted from and the firmware file name.**

Solaris operating system example:

```
/var/tmp/SUN415F-3510.bin
```

Microsoft Windows example:

```
C:\Program Files\Sun\sccli\113723-XX\SUN415F-3510.bin
```

The script performs several steps that are output to the screen, which takes several minutes, after which the following prompt is displayed:

```
Please perform the following manual operations
using the serial port interface:

1. Restore serial port and network settings
2. In-band only: Restore channel settings (ID) and LUN mapping

Reset the controller, and wait for the controller to become ready,
then type "yes" to continue below

Continue? <yes>:
```

9. Using the RAID firmware application through the serial connection, restore the IP address, netmask, and gateway settings as recorded in the instructions in [“Using the RAID Firmware Application to View Settings That Are Not Restored” on page 9](#).

From the Main Menu, choose "view and edit Configuration parameters > communication Parameters > Internet Protocol (TCP/IP)."

10. If you are using in-band communication, using the RAID firmware application through the serial connection, also restore channel settings (ID) and LUN mappings to ensure that the upgrade script is able to continue to access the array. To restore channel settings, from the Main Menu, choose "view and edit channels." To restore LUN mappings, from the Main Menu, choose "view and edit Host luns."
11. Reset the controller and wait for the controller to come back online.
12. Only after the controller comes back online, type `yes` to the prompt shown in [Step 8](#).
13. Verify that the firmware upgrade succeeded by examining the firmware revision again by typing:

```
sccli> show inquiry
```

Verify that the firmware version reported is the one to which you have migrated.

14. Manually restore all other configuration settings not already specified in [Step 9](#) and [Step 10](#) that are listed in [“Configuration Settings That Are Not Restored” on page 8](#).

Refer to the *Sun StorEdge 3000 Family RAID Firmware User's Guide* for more information about restoring these settings.

15. Save the current array configuration settings in `.txt` format with the name `after.txt`.

```
sccli> show configuration after.txt
```

This command might take several minutes to complete.

16. Compare `after.txt` to the `filename.txt` file referenced in [Step 2](#) and to other recorded settings to verify that settings have been restored.
17. When the migration process is finished, continue with the “SAF-TE Firmware Upgrade” or “SES Firmware Upgrade” procedure as described in the `README` included in the patch you downloaded for your array.

If you are connecting a Sun StorEdge 3511 expansion unit to a Sun StorEdge 3510 FC controller, continue with the section "Mixed 3510 and 3511 Upgrades" found in the `README` included in the patch you downloaded for your array.

## Script Troubleshooting

---

This chapter lists and describes possible error messages, likely causes, and resolutions.

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 `sccli` 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 is 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 [“Creating a Configuration File” on page 9](#) for information about creating `<filename>.txt`.)

---

---

# Error Messages

This section describes possible error messages.

---

**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.

---

---

<b>Message</b>	WARNING cli command failed continuing... Command: <cmd> The CLI response was: <result> Please check settings manually.
<b>Occurs</b>	Restoration of settings
<b>Meaning</b>	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.
<b>Likely Cause</b>	The setting is not supported with the current version of the firmware or Sun StorEdge CLI.
<b>Resolution</b>	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.

---

<b>Message</b>	Restoration completed with warnings. Please check settings. The following cli commands failed: <sccli cmds>
<b>Occurs</b>	At script end
<b>Meaning</b>	The script failed to restore some settings. A summary of failed commands is printed.
<b>Likely Cause</b>	The setting is not supported with the current version of the firmware or Sun StorEdge CLI.
<b>Resolution</b>	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.

---

<b>Message</b>	A filename is required
<b>Occurs</b>	Startup check
<b>Meaning</b>	You must supply a file name as part of the <code>s3kd1res</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.

---

<b>Likely Cause</b>	Usage error
<b>Resolution</b>	Specify a file name on the command line. Restart the script.
<b>Message</b>	<sccli-cmd> not found or not executable Enter full pathname for sccli to continue
<b>Occurs</b>	Startup check
<b>Meaning</b>	The script relies on the Sun StorEdge CLI being installed properly. This is normally installed as /opt/SUNWssc/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.
<b>Likely Cause</b>	Usage error
<b>Resolution</b>	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>
<b>Message</b>	Failed to contact RAID controller device: <device> Please correct the problem, or enter a new device, and try again
<b>Occurs</b>	Startup check
<b>Meaning</b>	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
<b>Likely Cause</b>	Usage error or device cannot be reached
<b>Resolution</b>	Confirm <device> is correct. Manually check communication with: # sccli <device> about Restart the script.
<b>Message</b>	Failed to contact RAID controller. Please correct the problem and try again.
<b>Occurs</b>	After firmware download and nvram reset
<b>Meaning</b>	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
<b>Likely Cause</b>	Failure to set network parameters for out-of-band or map LUN for in-band after nvram reset.
<b>Resolution</b>	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 “--restore=settings channels maps all” on page 44 for more information.

---

<b>Message</b>	Unknown Access Mode: <access-mode> Wanted "inband" or "out-of-band"
<b>Occurs</b>	Startup check
<b>Meaning</b>	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.
<b>Likely Cause</b>	Bad XML data, a <code>sccli</code> bug, or a script bug
<b>Resolution</b>	Reset the controller using the serial port. Confirm access mode with: # <code>sccli &lt;device&gt; show access</code> Restart the script. If the problem persists, contact authorized Sun service personnel.

---

<b>Message</b>	Password is required. Password is not correct.
<b>Occurs</b>	Startup check
<b>Meaning</b>	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.
<b>Likely Cause</b>	Usage error
<b>Resolution</b>	Restart the script with: # <code>s3kdlres saved-XML-filename IP-address --password=&lt;controllerpassword&gt;</code>

---

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

---

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

---

<b>Message</b>	Upgrades from firmware <rev> not supported. Upgrades supported from filename 32xx only.
----------------	--

---

---

<b>Occurs</b>	Firmware download
<b>Meaning</b>	Only upgrades from 3.2x to 4.xx are supported.
<b>Likely Cause</b>	There is incorrect firmware loaded on the controller.
<b>Resolution</b>	The firmware can be downloaded manually with <code>sccli</code> : <pre># sccli &lt;device&gt; download controller-firmware &lt;fn&gt;</pre>

---

<b>Message</b>	Logical Volumes not supported in this release. The following Logical Volumes were found: Logical Volume id: <lv-id> <b>Note:</b> This error message only applies to firmware version 4.11.
<b>Occurs</b>	Firmware download
<b>Meaning</b>	Logical volumes are not supported for this upgrade (firmware version 4.11).
<b>Likely Cause</b>	Logical volumes are present.
<b>Resolution</b>	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.

---

<b>Message</b>	<code>sccli version &lt;version&gt; not supported. Please update sccli</code>
<b>Occurs</b>	Startup check
<b>Meaning</b>	<code>sccli</code> version 2.x or later is required.
<b>Likely Cause</b>	There has been an installation error or the incorrect <code>sccli</code> has been specified on the command line.
<b>Resolution</b>	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=&lt;device&gt;</pre>

---

<b>Message</b>	<safte ses> <rev> not supported *** Out of rev. SES or SAF-TE code detected. Please update SES or SAF-TE code with the following <code>sccli</code> command Update out of rev. <safte ses> code <rev> <pre>sccli &lt;device&gt; download &lt;safte ses&gt;-firmware &lt;fn&gt;</pre> Where <fn> is name of the firmware file
<b>Occurs</b>	Startup check
<b>Meaning</b>	Minimum SAF-TE code 1168 and SES code 1046 (FC) or 0413 (SATA) is required.
<b>Likely Cause</b>	Out-of-date SAF-TE or SES code

---

---

**Resolution** Confirm SAF-TE or SES code with:  
# sccli <device> show safte  
# sccli <device> show ses  
The script lists a sample sccli 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 *Sun StorEdge 3000 Family RAID Firmware User's Guide* 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

---

---

<b>Occurs</b>	Restoring maps
<b>Meaning</b>	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 <code>sccli</code> failed to do so.
<b>Likely Cause</b>	<code>sccli</code> failed to change the logical drive or logical volume assignment.
<b>Resolution</b>	<p>Change the logical drive or logical volume assignment using the serial interface:</p> <ol style="list-style-type: none"> <li>1. From the Main Menu, choose "view and edit Logical drives."</li> <li>2. Select the logical drive that you want to reassign.</li> <li>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.</li> <li>4. Restart the script with the <code>--restore=maps</code> option using the existing XML configuration file saved:</li> </ol> <pre># s3kdlres &lt;XMLfile&gt; --device=&lt;device&gt; --restore=maps</pre> <p>See "<a href="#">"--restore=settings channels maps all"</a> on page 44 for more information.</p>

---

<b>Message</b>	<p>Redundancy status after controller reset does not match original Redundancy status.</p> <pre>Original Redundancy Status: &lt;status&gt; New Redundancy Status: &lt;status&gt;</pre> <p>Correct problem and rerun script from the beginning.</p>
<b>Occurs</b>	After firmware download, before nvram reset
<b>Meaning</b>	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.
<b>Likely Cause</b>	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).
<b>Resolution</b>	<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=&lt;device&gt;</pre> <p>A firmware download will be re-attempted even if the upgrade was successful.</p> <p>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:</p> <pre># sccli &lt;device&gt; show redundancy</pre> <p>[2] If the redundancy status continues to show "Detecting," the controllers are not binding as a pair. Contact authorized Sun service personnel.</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.</p> <p>Confirm the correct firmware revision with:</p> <pre># sccli &lt;device&gt; show inquiry</pre>

---

---

If the firmware is correct, reset the nvram with:

```
# sccli <device> reset nvram
# sccli <device> reset controller
```

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 “[--restore=settings|channels|maps|all](#)” on page 44 for more information.

If the firmware is incorrect, contact authorized Sun service personnel.

If the problem persists, contact authorized Sun service personnel.

---

**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 authorized Sun service personnel. Report all exceptions to authorized Sun service personnel.**

---

<b>Message</b>	Failed to run command: <cmd>: <error> result: <result>
<b>Occurs</b>	Varies
<b>Meaning</b>	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> .
<b>Likely Cause</b>	Failure to contact device [see 1 below], unexpected XML tag [see 2 below], or command exceeded 20-minute timeout [see 3 below].
<b>Resolution</b>	<p>[1] If the &lt;result&gt; 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 &lt;device&gt; about</pre> <p>Restart the script with the <code>--restore=all</code> option, using the existing XML configuration file saved:</p> <pre># s3kdlres &lt;XMLfile&gt; --device=&lt;device&gt; --restore=all</pre> <p>See “<a href="#">--restore=settings channels maps all</a>” on page 44 for more information.</p> <p>If it happens after “Restoring Channel Ids,” it might be possible to recover with other <code>--restore</code> options:</p> <pre># s3kdlres &lt;XMLfile&gt; --device=&lt;device&gt; --restore=settings # s3kdlres &lt;XMLfile&gt; --device=&lt;device&gt; --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 “[--restore=settings|channels|maps|all](#)” on page 44 for more information.

[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 “[--restore=settings|channels|maps|all](#)” on page 44 for more information.



**Caution:** Only edit the XML file under the direction of authorized Sun service personnel. 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 authorized Sun service personnel.

---

<b>Message</b>	Cannot find Channel Assignment for ch: <ch>, tgt: <tgt>, found: <assignment>
<b>Occurs</b>	Restoring channels
<b>Meaning</b>	The script cannot determine the assignment (Primary or Secondary) for the channel and target listed from the XML data.
<b>Likely Cause</b>	Bad XML data
<b>Resolution</b>	Restore the channel settings manually with the <code>sccli</code> command: <pre># sccli &lt;device&gt; 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 &lt;device&gt; reset controller</pre> <pre># s3kdlres &lt;XMLfile&gt; --device=&lt;device&gt; --restore=maps</pre> See “ <a href="#">--restore=settings channels maps all</a> ” on page 44 for more information. <b>Note:</b> 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.

---

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

---

---

<b>Likely Cause</b>	Bad XML data
<b>Resolution</b>	<p>Restore the LUN mappings manually with the <code>sccli</code> command:</p> <pre># sccli &lt;device&gt; 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><b>Note:</b> 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>

---

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

---

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

---

# Migrating Controller Firmware on HP-UX and IBM AIX Operating Systems

---

When migrating from firmware version 3.xx to 4.15 or later on Solaris, Linux, and Microsoft Windows operating systems, you *must* use the `s3kd1res` script. The `s3kd1res` script cannot be used for firmware migrations on HP-UX and IBM AIX operating systems. Instead, follow the manual migration procedures provided in this appendix. Topics covered include:

- “System Prerequisites and Requirements” on page 30
- “Creating a Configuration File” on page 32
- “Before Performing the Firmware Migration” on page 34
- “Performing the Firmware Migration” on page 37

---

**Note** – Before beginning the firmware migration procedures, contact Sun service personnel for assistance. Time and materials charges might apply if not currently covered under warranty/support contract.

---

---

# System Prerequisites and Requirements

Before installing controller firmware version 4.15 or later, make sure your environment supports the following prerequisites and requirements.



---

**Caution** – Failure to adhere to the system prerequisites and requirements can result in data loss. Refer to the latest Release Notes for your array for instructions about how and where to download the most recent controller firmware patch.

---

**TABLE A-1** System Prerequisites and Requirements for Migrating RAID Controller Firmware on HP-UX and IBM AIX Operating Systems

Prerequisite/Requirements	Description
Obtain the most recent controller firmware patch.	Refer to the latest Release Notes for your array for instructions about how and where to download the most recent controller firmware patch.
Required SAF-TE or SES version.	The array must be currently running the required version of SAF-TE or SES firmware:
Sun StorEdge 3310 SCSI array	You must be running controller firmware version 3.25S or later and SAF-TE version 1168 or later.  If you do not have these firmware versions installed, download patch 113722-09 from SunSolve online, and follow the instructions provided in the README for upgrading only the firmware versions mentioned above.
Sun StorEdge 3510 FC array	You must be running controller firmware version 3.27R or later and SES version 1046 or later.  If you do not have these firmware versions installed, download patch 113723-09 from SunSolve online and follow the instructions provided in the README for upgrading only the firmware versions mentioned above.
Sun StorEdge 3511 SATA array	You must be running controller firmware version 3.27R or later and SES version 0413 or later.  If you do not have these firmware versions installed, download patch 113724-03 from SunSolve online and follow the instructions provided in the README for upgrading only the firmware versions mentioned above.

**TABLE A-1** System Prerequisites and Requirements for Migrating RAID Controller Firmware on HP-UX and IBM AIX Operating Systems (Continued)

Prerequisite/Requirements	Description
<p>You must have version 2.3 or later of the Sun StorEdge Configuration Service/Sun StorEdge CLI software package, SUNWSSCS installed.</p>	<p>If you do not have this package installed, or if you have an earlier version, download version 2.3 from the Sun Download Center, or install it from the optional Sun StorEdge Professional Manager CD. For software installation or upgrading instructions, refer to the <i>Sun StorEdge 3000 Family Software Installation Guide</i>.</p>
<p>You must have a serial connection.</p>	<p>You must have a serial connection during the migration process. Use a null modem serial cable to connect the COM port of the array to the serial port on a host workstation. Make sure the serial port setting is configured to 38400 baud, 8 bit, 1 stop bit, no parity. Refer to the <i>Sun StorEdge 3000 Family Installation, Operation, and Service Manual</i> for information about connecting the RS-232 interface.</p>
<p>The migration can be performed in-band or out-of band; out-of-band is preferred.</p>	<p>Ethernet connections are required for out-of-band firmware migrations if the array to be upgraded is not connected to the host from which the migrations are to be performed.</p> <p><b>Note:</b> Migrating the firmware using an out-of-band connection is preferred over an in-band connection.</p> <p>Depending on your array, a SCSI or Fibre Channel connection to the array is required for in-band firmware migrations when no network connection to the array is available.</p>
<p>Create configurations of less than 32 partitions per logical drive or logical volume.</p>	<p>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. <i>Before</i> beginning the firmware migration, contact authorized Sun service personnel for assistance. Time and materials charges might apply if not currently covered under warranty/support contract.</p>

**TABLE A-1** System Prerequisites and Requirements for Migrating RAID Controller Firmware on HP-UX and IBM AIX Operating Systems (Continued)

Prerequisite/Requirements	Description
Back up data and restore after recreating partitions.	Make sure you back up your data <i>before</i> running the script. Backing up data and restoring after recreating the partitions is required; otherwise, there is loss of data.
Create a .txt file to record settings so that you can manually restore them after the firmware migration.	The migration procedure resets all configuration settings to the default settings of the firmware version to which you are migrating. See <a href="#">“Creating a Configuration File” on page 32</a> for more information.
The array must be migrated offline.	Stop all I/O activity and unmount any file systems or volumes mounted on the array <i>before</i> migrating the firmware.

## Creating a Configuration File

The migration procedure resets all configuration settings, including the following to the default settings of the firmware version to which you are migrating. You need to create a .txt file to record these settings so that you can refer to it to manually restore them after the firmware migration.

- controller-name
- controller-ID
- logical drive controller assignment (primary or secondary)
- host-wwn-name (Sun StorEdge 351x arrays only)
- **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
- **host parameters**
  - queue-depth
  - max-luns-per-id
  - fibre-connection mode (Sun StorEdge 351x arrays only)
- **channels**
  - channel type (disk or host)
  - target IDs
- **maps**
  - LUN mappings
- **Network settings**
  - IP address
  - netmask
  - gateway
- **Sector/head/cylinder settings**
- **Host LUN filter settings** (Sun StorEdge 351x arrays only)
  - type
  - access mode
  - name
  - filter masks
  - world wide name
  - logical drive/partition number
- **Channel data rate** (Sun StorEdge 351x arrays only)
- **Non-default RCCOM settings** (Sun StorEdge 351x arrays only)

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.

---

**Note** – Configuration setting output files are not transferable. That is, you cannot save a configuration file for a specific Sun StorEdge array and use it to perform the script upgrade on another Sun StorEdge array.

---

# Using the RAID Firmware Application to View Settings That Are Not Restored

Use the RAID firmware application menus described in this section to view and record the following settings that are not restored. You need to provide this information when performing the migration. After nvram is reset, the only way to recover these settings is to re-enter them after the migration is complete. For information on accessing the RAID firmware application, refer to the *Sun StorEdge 3000 Family RAID Firmware User's Guide*.

- To view the IP address, netmask, and gateway settings, from the Main Menu, choose "view and edit Configuration parameters > communication Parameters > Internet Protocol (TCP/IP)."
- To view sector/head/cylinder settings, from the Main Menu, choose "view and edit Configuration parameters > Host-side parameters > Host Cylinder/Head/Sector mapping Configuration."
- (Sun StorEdge 351x arrays only) To view host LUN filter settings, from the Main Menu, choose "view and edit Host luns." Also, for reference during the migration, record the Host LUN settings.
- (Sun StorEdge 351x arrays only) To view RCCOM settings, from the Main Menu, choose "view and edit channels." Also, for reference during the migration, record the channel ID settings.

---

## Before Performing the Firmware Migration

This section provides the steps you need to take before you perform the firmware migration.

1. **Make sure you understand and have followed steps provided in ["System Prerequisites and Requirements"](#) on page 30 and ["Creating a Configuration File"](#) on page 32.**
2. **Read the latest Release Notes for your array for instructions about how and where to download the most recent controller firmware patch.**
  - a. **Download the patch.**
  - b. **Unpack the patch to any convenient directory that is easy to remember (for example, `/var/tmp`).**

3. Change your working directory to the directory in which the patch was unpacked and confirm that the Sun binary file is present.
4. Invoke the CLI.

The firmware migration procedures require you to invoke `sccli` using the appropriate syntax for the type of connection used to manage the array.

If the array to be upgraded is a RAID subsystem attached to a Fibre Channel HBA installed on the local host, type the `sccli` command with no arguments:

```
sccli
```

If more than one array is connected to local Fibre Channel, `sccli` displays a list from which the appropriate device can be selected.

If the array has an IP address configured, it can be managed remotely using a network (or out-of-band) connection. To specify this mode, type:

```
sccli [-w <password>] <hostname | ip>
```

where *password* is the password assigned to the controller and *hostname | ip* is the host name or IP address of the array. If no controller password is set, omit the `-w` option and password option

---

**Note** – Use single quote characters to quote the password if it contains any characters that are interpreted specially by the shell.

---

5. Verify that you are running version 2.3 or greater of `sccli` by typing:

```
sccli> version
```

6. Verify the product and version of the array by typing:

```
sccli> show inquiry
```

## 7. Examine the output.

- **For the Sun StorEdge 3310 SCSI array**, if the "Product" is "StorEdge 3310F D" and "Device Type: Enclosure" is displayed, the device is a JBOD chassis. Discontinue this migration procedure, and refer to "SAF-TE Firmware Update" found in the README included in the patch you downloaded for your array.
- **For the Sun StorEdge 3510 FC array**, if the "Product" is "StorEdge 3510F D" and "Device Type: Enclosure" is displayed, the device is a JBOD chassis. Discontinue this migration procedure, and refer to the JBOD\_upgrade.txt included in the patch you downloaded for your array.
- **For the Sun StorEdge 3511 SATA array**, if the "Product" is "StorEdge 3511F D," and "Device Type: Enclosure" is displayed, the device is a JBOD chassis. Discontinue this migration procedure, and refer to "SES Firmware Update" found in the README included in the patch you downloaded for your array.

---

**Note** – For an out-of-band `sccli` connection, "Device Type" is not displayed for a JBOD chassis.

---

- If the "Product" is not "StorEdge 3310," "StorEdge 3510," or "StorEdge 3511," this patch does not apply. Select a different array or discontinue this procedure.
- If the firmware version reported is the version to which you are migrating, the controller firmware does not need to be migrated. Discontinue this migration procedure.

**For the Sun StorEdge 3310 SCSI array**, refer to "SAF-TE Firmware Update" found in the README included in the patch you downloaded for your array.

**For the Sun StorEdge 3510 FC or 3511 SATA array**, refer to "SES Firmware Update" found in the README included in the patch you downloaded for your array.

## 8. Verify single or dual controller by typing:

```
sccli> show redundancy
```

The dual controller array is healthy if the redundancy mode is "Active-Active" and the status is "Enabled."

The single controller array is healthy if the redundancy mode is "Active-Active" and the status is "Scanning."

If the array does not show a healthy status, correct the problem before proceeding.

---

# Performing the Firmware Migration

Perform the following steps to migrate the controller firmware.

---

**Note** – If you are upgrading more than one array, note the time it takes to upgrade the first array so that you can schedule the amount of time needed to upgrade the other arrays.

---

1. **Make sure you have read and performed the steps provided in “System Prerequisites and Requirements” on page 30.**
2. **Make sure you have created a configuration file that enables you to restore configuration settings after the migration is complete.**  
See “Creating a Configuration File” on page 32 for more information.
3. **Stop all I/O activity and unmount any file systems or volumes mounted by a volume manager from the array.**
4. **Stop any Sun StorEdge Configuration Service agent that might be running on a host connected to the array controller.**

To stop the agent, issue the shell command as "root" user:

```
/etc/init.d/ssagent stop
```

If the agent is running on a Microsoft Windows system connected to the array, use the Services application to stop the agent service by choosing Start > Run > Services.msc.

5. **Because other applications might interfere with controller firmware downloads, stop any other software that monitors the array.**  
Refer to the documentation for the specific application for information on stopping the agent software.
6. **If you haven't already done so, set up a serial connection to the controller.**  
See “System Prerequisites and Requirements” on page 30 for more information.



---

**Caution** – Do not restore saved 3.xx nvram from disk or any image file of 3.xx configuration on a 4.1.x controller. This can cause data loss or data corruption.

---



---

**Caution** – The `download controller-firmware` command does not support a live upgrade (hot download operation). The `-r` option in the following step must be used to prevent firmware download failure.

---

7. Perform the firmware migration by typing:

```
sccli> download controller-firmware --reset nvram -r <firmware
filename>
```

8. The following messages are displayed:

```
sccli: Downloading controller firmware...programming flash
memory...done
sccli: Resetting controller...done

The reset nvram command restores the original default settings,
including all controller parameters, host, and drive parameters,
etc. This command does not restore the controller IP address,
instead it configures the network for DHCP. You may also lose LUN
mappings on host channels.

You may need to have a serial connection to the controller
available in order to be able to restore the previous
configuration.

sccli reset nvram to factory defaults: succeeded
sccli: resetting controller...
sccli: controller has been reset
```

9. Wait until the `sccli>` prompt is displayed again, which can take 10 minutes or more, before proceeding.
10. To re-establish communication with the array, use the RAID firmware application through the serial connection to restore the IP address, netmask, and gateway recorded in [“Using the RAID Firmware Application to View Settings That Are Not Restored”](#) on page 34.
- From the RAID firmware application Main Menu to restore the IP address, netmask, and gateway by choosing “view and edit Configuration parameters > communication Parameters > Internet Protocol (TCP/IP).”
  - To restore channel settings, from the Main menu, choose “view and edit channels.”
  - To restore Host LUN mappings, from the Main menu, choose “view and edit Host luns.”

11. Using the serial connection, manually restore the configuration settings that were recorded in the configuration file you created in [Step 2](#).
12. Verify that the firmware migration succeeded by examining the firmware revision again by typing:

```
sccli> show inquiry
```

Verify that the firmware version reported is the one to which you have migrated.

13. Save the current array configuration settings in `.txt` format with the name `after.txt`.

```
sccli> show configuration after.txt
```

This command might take several minutes to complete.

14. Compare `after.txt` to the `filename.txt` file referenced in [Step 2](#) and to other recorded settings to verify that settings have been restored.

The firmware migration procedure requires extensive configuration because all factory defaults have been restored to the migrated version of the firmware.

15. When the migration process is finished, continue with the “SAF-TE Firmware Upgrade” or “SES Firmware Upgrade” procedure as described in the `README` included in the patch you downloaded for your array.

If you are connecting a Sun StorEdge 3511 expansion unit to a Sun StorEdge 3510 FC controller, continue with the section “Mixed 3510 and 3511 Upgrades” found in the `README` included in the patch you downloaded for your array.



# Command Syntax and Options

---

This chapter describes how to reference the `s3kd1res` man page and describes the `s3kd1res` syntax and options. Topics covered include:

- [“Referencing the Man Page” on page 41](#)
- [“Command Syntax” on page 42](#)
- [“Command Options” on page 43](#)

---

## Referencing the Man Page

This section explains how to reference the man or help page depending on your operating system.

For the Solaris operating system, type:

```
man -M /opt/SUNWsscs/man s3kd1res
```

For the Linux operating system, type:

```
man 1m -M /opt/SUNWsscs/man s3kd1res
```

For the Windows operating system, view the file located in `/program files/Sun/sccli/s3kd1res.txt`.

---

# Command Syntax

This section describes the `s3kd1res` command syntax.

```
s3kd1res <XMLfile> [options]
```

---

**Note** – The `XML save`, `download fw`, and `nvrAm reset` commands can be skipped by specifying the `--restore` option. In this form, the XML file specified on the command line is read and used to restore the configuration. (See “[--restore=settings|channels|maps|all](#)” on page 44 for more information.)

---

---

**Note** – Not all configuration settings can be restored with `scli` commands. See “[Configuration Settings That Are Restored](#)” on page 7 for the list of parameters that are restored by the `--restore` option. See “[Configuration Settings That Are Not Restored](#)” on page 8 for a list of settings that are not restored by running the `s3kd1res` script.

---

# Command Options

s3kdlres options are listed and described in [TABLE B-1](#).

**TABLE B-1** s3kdlres Script Options

Option	Description
<code>--device=IP address</code>	<p>Run out-of-band by specifying an IP address.</p> <p>You can run in-band by specifying an in-band device recognized by <code>sccli</code>, but running in-band “unmaps” the host LUN after the nvram reset. It might not be possible for <code>sccli</code> to reset the controller after the nvram reset. Further manual assistance might be required using the RS-232 interface.</p> <p>When prompted, the channel setting (target ID), and the host LUN need to be restored for the operating system device used. Refer to the <i>Sun StorEdge 3000 Family CLI User's Guide</i> for details on specifying in-band devices.</p> <p>Only one device can be specified for each script execution. The default IP address is 192.168.1.1</p> <p><b>Note:</b> Migrating the firmware using an out-of-band connection is preferred over an in-band connection.</p>
<code>--password=password</code>	<p>Password for out-of-band interface only.</p> <p>This option is needed if running out-of-band and the RAID controller password is set.</p>
<code>--cli=path-to-cli</code>	<p>By default, for Solaris and Linux operating systems, the script looks for <code>sccli</code> as <code>/opt/SUNWsscs/sbin/sccli</code>. For Microsoft Windows, the default path name is the directory where the <code>sccli</code> package is installed. If that fails, the script uses <code>C:\Program Files\Sun\sccli\sccli</code>. An alternate <code>sccli</code> can be specified using this option.</p>
<code>--quiet</code>	<p>Do not echo <code>sccli</code> commands. Normally, <code>sccli</code> commands are echoed.</p>
<code>--timeout=n</code>	<p>Timeout for <code>sccli</code> commands in seconds. The default timeout for <code>sccli</code> commands is 1200 seconds (20 minutes). This timeout does not specify when <code>sccli</code> returns, but instead triggers the script to wake up and kill the <code>sccli</code> process.</p>

**TABLE B-1** s3kd1res Script Options (Continued)

Option	Description
	<p>This option might be required for very congested or long-haul network VPNs. If the script times out, depending on when the timeout occurred, you might need to recover with a <code>--restore</code>. If it happened before the firmware download, the script can be restarted. If it happened during or after the firmware download, the script cannot be restarted from the beginning due to the firmware check <code>--restore all</code> can be used to finish the configuration restore.</p>
<code>--restore=settings channels maps all</code>	<p>This option skips the interactive end-to-end process of the script. It assumes that the controller is upgraded and that <code>nvrnm</code> has been reset. In addition, it assumes that <code>scccli</code> can communicate with the controller. The options are further described below.</p>
<code>--restore=settings</code>	<p>This option restores the parameters listed in <a href="#">“Configuration Settings That Are Restored”</a> on page 7.</p> <p><b>Notes:</b></p> <p>The factory default setting for Self-Monitoring Analysis and Reporting Technology (SMART) is <code>detect-clone-replace</code> in firmware 4.xx. SMART determines whether disk drives perform predictive failure analysis. The default setting was disabled in firmware 3.2x. The script does not restore a value of disabled. All other values (<code>detect-only</code>, <code>detect-perpetual-clone</code>, and <code>detect-clone-replace</code>) are restored.</p> <p>The factory setting for polling interval is 30s in firmware 4.13 and later. The default setting was Disabled in firmware 3.2x. The script will not restore a value of 15s. All other values are restored.</p> <p>(Sun StorEdge 3310 SCSI array only) The factory default setting for <code>queue-depth</code> is 1024 in firmware 4.xx. The default setting was 256 in firmware 3.2x. The script does not restore a value of 256. All other values are restored.</p>

**TABLE B-1** s3kdlres Script Options (Continued)

Option	Description
<code>--restore=channels</code>	Restores the channel type (disk or host) and target IDs.
<code>--restore=maps</code>	Restores the LUN mappings.
<code>--restore=all</code>	Restores all of the above options. In addition, a controller reset is performed after the channels are restored. The restoration is done in the following order: <ol data-bbox="629 418 811 543" style="list-style-type: none"><li>1. settings</li><li>2. channels</li><li>3. controller reset</li><li>4. maps</li></ol> Internally, the script performs the equivalent of <code>--restore=all</code> after the firmware download/nvram reset during the interactive process.

