SAS-1/SAS-2 Compatibility Upgrade Guide

For the Sun Blade 6000 Modular System

Part No.: 821-1800-13
December 2010, Revision A

Please
Recycle

Adobe PostScript

Contents

Using This Documentation

This document describes how to upgrade SAS-1 Network Express Modules (NEMs) and disk modules in Sun Blade 6000 Modular System from Oracle to allow SAS-1/SAS-2 device coexistence.

Related Documentation

For the most up-to-date information about your server, refer to its documentation set located on the web:

Documentation	Web Site
Server documentation	(http://docs.sun.com/app/docs/prod/blade.srvr#hic)
Solaris Operating System Installation	(http://docs.sun.com/)
All Sun hardware documentation	(http://docs.sun.com/)

Translated versions of some documents are available on the Sun documentation web site (http://docs.sun.com). The English documentation is revised more frequently and might be more up-to-date than the translated documentation.

Documentation Comments

Submit comments about this document by clicking the Feedback[+] link at:

(http://docs.sun.com)

Please include the title and part number of your document with your feedback:

SAS-1/SAS-2 Compatibility Upgrade Guide For the Sun Blade 6000 Modular System, part number 821-1800-13.

SAS-1/SAS-2 Compatibility Upgrade Instructions

This document provides information on what is required to support a server module with a SAS-2 RAID Expansion Module (REM) in a Sun Blade 6000 Modular System chassis that has SAS-1 Network Express Modules (NEMs), or SAS-1 NEMs and Sun Blade 6000 Disk Modules (which are SAS-1 devices).

You *must* perform the firmware upgrade procedure in this document before inserting your server module with a SAS-2 REM into a SAS-1 system chassis.

Note – Refer to your device's documentation to determine its SAS level. Alternatively, you can identify SAS-1 and SAS-2 devices by the maximum data transfer speeds supported by the devices. SAS-1 devices support a maximum data transfer speed of 3 Gb per second. SAS-2 devices support a maximum data transfer speed of 6 Gb per second.

The following topics are covered:

Overview

A server module with a SAS-2 REM might hang when inserted into a Sun Blade 6000 Modular System chassis under the following conditions:

- If the chassis contains SAS-1 NEMs, such as:
  - Sun Blade 6000 Multi-Fabric Network Express Module
  - Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module
- If the chassis contains Sun Blade 6000 Disk Modules (SAS-1 devices)

To ensure optimal system performance and avoid the potential for a system hang, you need to upgrade the SAS expander firmware of all SAS-1 NEMs and Sun Blade 6000 Disk Modules in the chassis to the latest available firmware update that supports SAS-1/SAS-2 coexistence.

The Sun Blade X6270 M2 is an example of a server module that ships with a SAS-2 REM. If you install a SAS-2 REM into a server module that previously did not have one, you will need to perform this upgrade before installing the server module into the chassis. Refer to your product documentation to determine whether your server module includes a SAS-2 REM (for more on available SAS-2 REMs, refer to "System Requirements for the SAS-1/SAS-2 Compatibility Upgrade" on page 3).

After performing the SAS-1/SAS-2 compatibility upgrade, the server module with the SAS-2 REM will be supported in the SAS-1 chassis with the following conditions:

- The SAS-2 server module will function properly in the chassis and be able to use its own internal SAS-2 storage and its PCIe Express Modules (EMs).
- The SAS-2 server module will be able to use the network component of SAS-1 NEMs.
- The SAS-2 server module **cannot** use disks in a Sun Blade 6000 Disk Module (a SAS-1 device). This is an unsupported configuration.
- The SAS-2 server module **must** be installed in a chassis slot that **does not** have a Sun Blade 6000 Disk Module in an adjacent slot.

System Requirements for the SAS-1/SAS-2 Compatibility Upgrade

Currently available SAS-1 NEMs and disk modules that include SAS expanders that require the SAS-1/SAS-2 compatibility upgrade are listed below.

- Sun Blade 6000 Disk Module (B18-AA)
- Sun Blade 6000 Multi-Fabric Network Express Module (X4212A)
- Sun Blade 6000 10GbE Multi-Fabric Network Express Module (X4236A)
- Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module (X4238)

In addition, if your device contains an Integrated Lights Out Manager (ILOM) service processor, it might also require an upgrade to match the new expander firmware.

TABLE 1 lists the currently available server module SAS-2 REMs affected by this issue, and the minimum required SAS-1/SAS-2 compatibility firmware for SAS-1 devices to fix the issue.

TABLE 1 Supported SAS-2 REMs and Required SAS-1 Device Firmware

If Your Server Module Has One of These SAS-2 REMs:	Minimum Required SAS-1 Expander Firmware for Sun Blade 6000 Disk Modules:	Minimum Required SAS-1 Expander Firmware for Sun Blade 6000 Multi-Fabric NEMs:	Minimum Required SAS-1 Expander and ILOM Firmware for Sun Blade 6000 Virtualized Multi-Fabric 10GbE NEMs:
• Sun Storage 6 Gb SAS REM RAID HBA (SGX-SAS6-R-REM-Z) • Sun Storage 6 Gb SAS REM HBA (SGX-SAS6-REM-Z)	Expander version 5.04.03, available in Sun Blade 6000 Disk Module software release 2.1	Expander version 5.04.03, available in Sun Blade 6000 Disk Module software release 2.1	Expander version 5.04.03 and ILOM version 2.0.3.12, available in Sun Blade 6000 Virtualized Multi-Fabric 10GbE NEM software release 2.2.

Proceed to "Upgrading Disk Module and SAS-NEM Expander Firmware" on page 4 for instructions on performing the upgrade.

Upgrading Disk Module and SAS-NEM Expander Firmware

Perform the SAS-1/SAS-2 compatibility upgrade on all SAS-1 NEMs and Sun Blade 6000 Disk Modules before attempting to install your SAS-2 server module into the chassis. The upgrade can only be performed from server modules in the chassis and only from server modules with a supported SAS-1 REM or on-board LSI controller chip.

A list of server modules with SAS-1 Host Bus Adapters (HBAs) capable of performing the upgrade can be found in "Server Modules Supported to Perform the Upgrade" on page 6.

Obtaining the Latest Disk Module and SAS-NEM Expander Firmware for SAS-1/SAS-2 Coexistence

To support SAS-1/SAS-2 coexistence, SAS expanders for both the Sun Blade 6000 Disk Modules and SAS-1 NEMs must be at firmware version 5.04.03, at a minimum. You need to download the latest available firmware update for your platform.

- For Sun Blade 6000 Disk Modules, download **Sun Blade 6000 Disk Module Software 2.1**. This version also includes expander firmware for the Sun Blade 6000 Multi-Fabric Network Express Module.
- For the Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module, download **Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module Software 2.2**. This version includes both expander firmware and ILOM firmware.
- For the Sun Blade 6000 Multi-Fabric Network Express Module, check the software download site for a supported release that contains expander firmware version 5.04.03 or later firmware update.

TABLE 2 lists the download image names for each SAS-1 NEM and disk module that requires a firmware upgrade.

TABLE 2 SAS-1 NEM and Disk Module Download Image Names

SAS-1 NEM or Disk Module	Download Image Names
Sun Blade 6000 Disk Module Software 2.1 (B18-AA)	• `mfgImageCust03V.5.04.03.bin` • `sasxfwnv.5.04.03.fw`
Sun Blade 6000 Multi-Fabric Network Express Module (X4212A)	• `mfgImageCust03N.5.04.03.bin` • `sasxfwnv.5.04.03.fw`
Sun Blade 6000 10GbE Multi-Fabric Network Express Module (X4236A)	• `mfgImageCust03G.5.04.03.bin` • `sasxfwgv.5.04.03.fw`
Sun Blade 6000 Virtualized Multi-Fabric 10GbE Network Express Module Software 2.2 (X4238)	• `mfgImageCust03N.5.04.03.bin` • `sasxfwhv.5.04.03.fw`

To download the appropriate software release, go to `(http://www.oracle.com/goto/blades)` and do the following:

1. Click "All Downloads" in the Downloads box that is located on the right side of the web page.
2. Scroll down to "Servers and Storage Systems" and click "Sun Downloads: A-Z Listing."
3. Scroll down and select one of the products listed in TABLE 2.

Note – You might need to set up an online account before downloading the software release.

Obtaining the Firmware Update Utility to Deploy the Required Expander Firmware

To upgrade the disk module and SAS-NEM expander firmware to the required level for SAS-1/SAS-2 coexistence, you can use the Firmware Update command-line tool (`fwupdate`) included in **Oracle Hardware Management Pack 2.0.1** (upgrade instructions in this document describe using this tool).

The `fwupdate` tool included with Hardware Management Pack 2.0.1 can be run from supported Sun x86 or SPARC servers from Oracle. The tool is also supported on Oracle Solaris, Linux, and Windows operating systems. Refer to the Hardware Management Pack 2.0 documentation for details.

To obtain Hardware Management Pack 2.0.1, go to:

(http://www.sun.com/systemmanagement/managementtools.jsp)

- For installation of Hardware Management Pack 2.0.1, including how to install subcomponents (such as the `fwupdate` tool), refer to the *Sun Server Hardware Management Pack 2.0 User's Guide* (821-1609).
- For additional details on using the `fwupdate` CLI tool not described in this document, refer to *Sun Server CLI Tools and IPMItool User's Guide* (821-1600).

  These documents can be found at:
  (http://docs.sun.com/app/docs/prod/svrmgmt.pack2#hic)

Note – You might need to first setup an online account before downloading the software release.

Note – For instructions on installing and using the `fwupdate` tool with SPARC servers, refer to the *CLI Tools User's Guide for SPARC Servers* (821-2058). You can download Oracle Management Pack 2.0.1 for SPARC servers, which includes the fwupdate tool (`fwupdate_sparc.tar.gz`) at the following web site: (http://www.sun.com/systemmanagement/managementtools.jsp).

Server Modules Supported to Perform the Upgrade

TABLE 3 lists server modules equipped with either an LSI SAS-1 on-board chip or a supported SAS-1 REM HBA that you can use to perform the SAS-1/SAS-2 compatibility upgrade. Since the upgrade to the affected SAS-1 devices (NEMs and disk modules) must be done through the SAS-1 bus, the server module(s) at which the upgrade will be performed must have one of the supported HBAs.

Note – The REM HBAs must have a minimum firmware level of v1.25.00 (also referred to as Phase 13); otherwise, the firmware upgrade will not work. For instructions on how to check HBA versions, see "Checking Host Bus Adapter Firmware Versions on x86 Server Blades" in the *Sun Blade 6000 Disk Module Administration Guide* (820-4922).

TABLE 3 Supported Server Blades With LSI SAS-1 On-board Chips and SAS-1 REM Host Bus Adapters

Server	Supported On-board SAS-1 Controller Chip	Supported SAS-1 RAID Expansion Module (REM)
T6300	LSI 1068E	REMs are not supported in this server
T6320	None	• T6320 RAID 0/1 Expansion Module (LSI) • Sun Blade RAID 0/1 G2 Expansion Module (LSI)
T6340	None	Sun Blade RAID 0/1 G2 Expansion Module (LSI)
X6220	LSI 1068E	REMs are not supported in this server.
X6240	None	• Sun Blade RAID 0/1 G2 Expansion Module (LSI) • Sun Blade RAID 5 Expansion Module (Intel/Adaptec)
X6250	None	Sun Blade RAID 5 Expansion Module (Intel/Adaptec)
X6270	None	• Sun Blade RAID 0/1 G2 Expansion Module (LSI) • Sun Blade RAID 5 Expansion Module (Intel/Adaptec)
X6440	None	• Sun Blade RAID 0/1 G2 Expansion Module (LSI) • Sun Blade RAID 5 Expansion Module (Intel/Adaptec)
X6450	None	• Sun Blade RAID 0/1 G2 Expansion Module (LSI) • Sun Blade RAID 5 Expansion Module (Intel/Adaptec)

▼ Upgrade Disk Module and SAS-NEM Firmware Using the `fwupdate` Utility

The Hardware Management Pack 2.0.1 includes a firmware update command-line tool that works across platforms (x86/64 and SPARC) and operating systems (Oracle Solaris, Windows, Linux). You must use this tool to perform the SAS-1/SAS-2 coexistence firmware upgrade. It is recommended that you stop all SAS I/O traffic before performing the SAS-NEM firmware upgrade.

Note – Upgrading SAS-NEM and disk module firmware can disrupt SAS I/O traffic throughout the chassis. Plan on performing the SAS-NEM firmware upgrade at a time when you can temporarily stop host to disk module I/O.

Before You Begin:

- If your chassis has Sun Blade 6000 Disk Modules installed, download the appropriate Sun Blade 6000 Disk Module software package from the Oracle download site to *each* server module equipped with a SAS-1 REM that is slot-paired with a Sun Blade 6000 Disk Module. See "Obtaining the Latest Disk Module and SAS-NEM Expander Firmware for SAS-1/SAS-2 Coexistence" on page 4.
- Download the appropriate SAS-1 NEM software package to a server module. If you have Sun Blade 6000 Disk Modules installed, download it to *one* server module equipped with a SAS-1 REM that is slot-paired with a Sun Blade 6000 Disk Module. See "Obtaining the Latest Disk Module and SAS-NEM Expander Firmware for SAS-1/SAS-2 Coexistence" on page 4.
- Download the Oracle Hardware Management Pack 2.0.1 version required (several OS versions are available) to a server module. If you have Sun Blade 6000 Disk Modules installed, download it to *each* server module equipped with a SAS-1 REM that is slot-paired with a Sun Blade 6000 Disk Module. Extract the archive file and run the component installer to install the `fwupdate` tool. See "Obtaining the Firmware Update Utility to Deploy the Required Expander Firmware" on page 5.

Note – The `fwupdate` tool and firmware image files must be copied to and run from servers in the chassis. They cannot be run from a network share.

If available, start at a server module slot-paired with a Sun Blade 6000 Disk Module, then do the following:

1. Open a terminal or command prompt at the host.

Note – You must be logged in with root permission level to run `fwupdate` commands on Unix-based platforms, or Administrator permission level for Windows platforms. These instructions can be used on servers running Oracle Solaris, Linux, or Windows.

---

2. Change directories to where the `fwupdate` tool is located.

Note – If is not necessary to change directories if `fwupdate` is in your search path.

---

3. **Identify the SAS expanders by entering the command:**

   `fwupdate list all`

   All controllers, expanders, and connected devices are listed. Expanders for both the SAS-NEMs and the slot-paired disk module will be identified. Make a note of all the expander IDs.

   Example output might look like this:

```
CONTROLLER c0
=============
Manufacturer   Model     Product Name     F/W Version         BIOS Version
------------------------------------------------------------------------
LSI Logic      0x0058    LSIREM           01.26.92.00         06.24.01.00

EXPANDERS
===============
ID      Chassis Manufacturer   Model          Expander Name   FW Version
-------------------------------------------------------------------------
c0x0    0       SUN            NEMHydra_C10   Master          5.2.14.0
c0x1    1       SUN            NEMHydra_C10   Master          5.2.14.0
c0x2    2       SUN            Blade Storage  Master          5.2.14.0
c0x3    3       SUN            Blade Storage  Slave           5.2.14.0

DISKS
===============
ID    Brand    Model            Chassis Slot  Type   Media  Size(GB)Firmware Rev.
-------------------------------------------------------------------------------
c0d0   SEAGATE   ST914602SSUN146G   -       -     sas    HDD    146      0603
c0d1   SEAGATE   ST914602SSUN146G   -       -     sas    HDD    146      0400
c0d2   HITACHI   H101414SCSUN146G   -       -     sas    HDD    146      SA02
c0d3   SEAGATE   ST973402SSUN72G    -       -     sas    HDD    73       0603
c0d4   SEAGATE   ST914602SSUN146G   -       -     sas    HDD    146      0603
c0d5   SEAGATE   ST914602SSUN146G   -       -     sas    HDD    146      0400
c0d6   HITACHI   H101414SCSUN146G   -       -     sas    HDD    146      SA02
c0d7   SEAGATE   ST973402SSUN72G    -       -     sas    HDD    73       0603
```

   The following expander components must be upgraded:

   - Network Express Module (NEM) expanders:
     - The expander manufacturing image
     - The expander firmware
   - Disk module expanders (*both* Master and Slave):
     - The expander manufacturing image
     - The expander firmware

Note – It can take up to 2 minutes to upgrade expander firmware on each disk module.

Note – Though not recommended, if you later attempt to downgrade your expander firmware, it must be done in the reverse order listed above (disk module expanders first, then NEM expanders).

4. Upgrade the expander firmware of the SAS-1 NEM as follows:

a. Rename the manufacturing image from */path/*`mfgImageCust03`*x*`.5.04.03.bin` **to** `mfgImageCust03`*x*`.bin`**.**

Where *x* is a variable that is determined by the name of the image file for the specific NEM expander being upgraded. For manufacturing image file names for SAS-1 NEMs, see TABLE 2.

Note – The version of manufacturing image may not be machine readable. And after the expander firmware is updated, the new version of the manufacturing image is not readable until after the system has been power cycled.

b. Upgrade the manufacturing image by entering:

`fwupdate update expander-manufacturing-image -n c0x0 -f /`*`path`***`/mfgImageCust03`***`x`***`.bin`**

Where c0x0 is the ID for the target NEM expander, and *path* is the directory path to where the image file is located, and *x* is determined by the name of the manufacturing image file for the specific SAS-1 NEM expander being upgraded (see TABLE 2).

Example output might look like:

```
The following components will be upgraded:
c0x0 [y/n]? y
Upgrade of c0x0 from 5.2.14.0 to 5.4.3.0 succeeded.
```

Note – Wait until the firmware of the target expander has been successfully upgraded before attempting any additional commands. If you see an "Upgrade succeeded, but is not yet active" message, it can be safely ignored.

If the upgrade is not successful, review the `fwupdate` error log file to isolate the problem and retry the upgrade. The `fwupdate.log` file is located in `/var/log/fwupdate/fwupdate.log` in Solaris and Linux, and `/temp/log/fwupdate/fwupdate.log` in Windows.

c. **Upgrade the expander firmware by entering:**

`fwupdate update expander-firmware -n c0x0 -f /`*`path`***`/sasxfw`***`x`**
`v.5.04.03.fw`

Where c0x0 is the ID for the target NEM expander, *path* is the directory path to where the image file is located, and *x* is determined by the name of the expander firmware file. For the name of the expander firmware file for the specific SAS-1 NEM being upgraded, see TABLE 2.

Example output might look like this:

```
The following components will be upgraded:
c0x0 [y/n]? y
Upgrade of c0x0 from 5.2.14.0 to 5.4.3.0 succeeded.
```

Note – Wait until the firmware of the target expander has been successfully upgraded before attempting any additional commands. If you see an "Upgrade succeeded, but is not yet active" message, it can be safely ignored.

---

d. **If the chassis has two SAS-1 NEMs, repeat the upgrade process described in** Step b **and** Step c **for the second NEM.**

The example used here would include upgrading expander `c0x1`.

5. **Upgrade the expander firmware of the host-paired Sun Blade 6000 Disk Module as follows:**

a. **Rename the manufacturing image from** */path/*`mfgImageCust03`*x*`.5.04.03.bin` **to** `mfgImageCust03`*x*`.bin`**.**

Where *x* is a variable that is determined by the name of the manufacturing image file for the specific disk module expander being upgraded (see TABLE 2).

Note – The version of manufacturing image may not be machine readable. And after the expander firmware is updated, the new version of the manufacturing image is not readable until after the system has been power cycled.

---

b. Upgrade the manufacturing image by entering:

`fwupdate update expander-manufacturing-image -n c0x0 -f /`*`path`***`/mfgImageCust03`***`x`***`.bin`**

Where c0x0 is the ID for the target NEM expander, and *path* is the directory path to where the image file is located, and *x* is determined by the name of the manufacturing image file for the specific disk module expander being upgraded (see TABLE 2).

Example output might look like:

```
The following components will be upgraded:
c0x0 [y/n]? y
Upgrade of c0x0 from 5.2.14.0 to 5.4.3.0 succeeded.
```

Note – Wait until the firmware of the target expander has been successfully upgraded before attempting any additional commands. If you see an "Upgrade succeeded, but is not yet active" message, it can be safely ignored.

If the upgrade is not successful, review the `fwupdate` error log file to isolate the problem and retry the upgrade. The `fwupdate.log` file is located in `/var/log/fwupdate/fwupdate.log` in Solaris and Linux, and `/temp/log/fwupdate/fwupdate.log` in Windows.

c. Upgrade the expander firmware by entering:

`fwupdate update expander-firmware -n c0x2 -f /`*`path`***`/sasxfw`***`x`***`v.5.04.03.fw`**

Where c0x2 is the ID for the target disk module expander, *path* is the directory path to where the image file is located, and *x* is determined by the name of the disk module expander firmware file. For the name of the disk module expander firmware file, see TABLE 2.

Example output might look like this:

```
The following components will be upgraded:
c0x2 [y/n]? y
Upgrade of c0x2 from 5.2.14.0 to 5.4.3.0 succeeded.
```

Note – Wait until the firmware of the target expander has been successfully upgraded before attempting any additional commands. If you see an "Upgrade succeeded, but is not yet active" message, it can be safely ignored.

If the upgrade is not successful, review the `fwupdate` error log file to isolate the problem and retry the upgrade. The `fwupdate.log` file is located in `/var/log/fwupdate/fwupdate.log` in Solaris and Linux, and `/log/fwupdate/fwupdate.log` in Windows.

d. Repeat Step b **and** Step c **for the second expander in the disk module.**

The example used here would include upgrading expander `c0x3`.

Note – Both Master and Slave expanders in the disk module must be upgraded.

6. Shut down the host OS and power cycle the chassis.

7. When done, check that all host viewable SAS expanders are at the supported version for SAS-1/SAS-2 coexistence (5.04.03) by entering the command:

`fwupdate list all`

Example output might look like this:

```
CONTROLLER c0
=============
Manufacturer   Model     Product Name     F/W Version         BIOS Version
------------------------------------------------------------------------
LSI Logic      0x0058    LSIREM           01.26.92.00         06.24.01.00

EXPANDERS
===============
ID      Chassis Manufacturer   Model          Expander Name   FW Version
-----------------------------------------------------------------------
c0x0    0       SUN            NEMHydra_C10   Master          5.4.3.0
c0x1    1       SUN            NEMHydra_C10   Master          5.4.3.0
c0x2    2       SUN            Blade Storage  Master          5.4.3.0
c0x3    3       SUN            Blade Storage  Slave           5.4.3.0

DISKS
===============
ID    Brand    Model           Chassis Slot  Type  Media  Size(GB)Firmware Rev.
-------------------------------------------------------------------------------
c0d0   SEAGATE   ST914602SSUN146G   -       -     sas    HDD    146     0603
c0d1   SEAGATE   ST914602SSUN146G   -       -     sas    HDD    146     0400
c0d2   HITACHI   H101414SCSUN146G   -       -     sas    HDD    146     SA02
c0d3   SEAGATE   ST973402SSUN72G    -       -     sas    HDD    73      0603
c0d4   SEAGATE   ST914602SSUN146G   -       -     sas    HDD    146     0603
```

```
c0d5    SEAGATE   ST914602SSUN146G   -       -      sas    HDD   146    0400
c0d6    HITACHI   H101414SCSUN146G   -       -      sas    HDD   146    SA02
c0d7    SEAGATE   ST973402SSUN72G    -       -      sas    HDD   73     0603
```

8. **Proceed to the next SAS-1 server module slot-paired with a Sun Blade 6000 Disk Module and repeat** Step 3 **to obtain the expander IDs.**

9. **Repeat** Step 5 **through** Step 8 **until all SAS-1 disk modules in the chassis have had their expanders upgraded.**

10. **If your SAS-1 NEMs have an ILOM service processor, you might also need to upgrade its ILOM firmware to achieve a supported firmware level that is matched to the new expander firmware.**

    For instructions on upgrading the ILOM service processor firmware for a SAS-1 NEM, refer to the NEM user's guide. For more information on SAS-1 NEMs, see "System Requirements for the SAS-1/SAS-2 Compatibility Upgrade" on page 3.

11. **After you have upgraded all of your SAS-1 NEMs and disk modules, you can safely insert your SAS-2 server module into the chassis.**

    The SAS-2 server module will be supported in the SAS-1 chassis with the following conditions:

    - The SAS-2 server module will function properly in the chassis and be able to use its own internal SAS-2 storage and its PCIe Express Modules (EMs).
    - The SAS-2 server module will be able to use the network component of SAS-1 NEMs.
    - The SAS-2 server module **cannot** use disks in a Sun Blade 6000 Disk Module (a SAS-1 device). This is an unsupported configuration.
    - The SAS-2 server module **must** be installed in a chassis slot that **does not** have a Sun Blade 6000 Disk Module in an adjacent slot.

    Refer to the documentation that comes with your SAS-2 server module for additional installation and configuration instructions.