Sun Storage F5100 Flash Array

Product Notes

Part No.: E21408-04
February 2012, Revision A

Copyright © 2009, 2012, Oracle and/or its affiliates. All rights reserved.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish, or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

If this is software or related software documentation that is delivered to the U.S. Government or anyone licensing it on behalf of the U.S. Government, the following notice is applicable:

U.S. GOVERNMENT RIGHTS Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle USA, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications which may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate fail-safe, backup, redundancy, and other measures to ensure the safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

AMD, Opteron, the AMD logo, and the AMD Opteron logo are trademarks or registered trademarks of Advanced Micro Devices. Intel and Intel Xeon are trademarks or registered trademarks of Intel Corporation. All SPARC trademarks are used under license and are trademarks or registered trademarks of SPARC International, Inc. UNIX is a registered trademark licensed through X/Open Company, Ltd.

This software or hardware and documentation may provide access to or information on content, products, and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

Copyright © 2009, 2012, Oracle et/ou ses affiliés. Tous droits réservés.

Ce logiciel et la documentation qui l'accompagne sont protégés par les lois sur la propriété intellectuelle. Ils sont concédés sous licence et soumis à des restrictions d'utilisation et de divulgation. Sauf disposition de votre contrat de licence ou de la loi, vous ne pouvez pas copier, reproduire, traduire, diffuser, modifier, breveter, transmettre, distribuer, exposer, exécuter, publier ou afficher le logiciel, même partiellement, sous quelque forme et par quelque procédé que ce soit. Par ailleurs, il est interdit de procéder à toute ingénierie inverse du logiciel, de le désassembler ou de le décompiler, excepté à des fins d'interopérabilité avec des logiciels tiers ou tel que prescrit par la loi.

Les informations fournies dans ce document sont susceptibles de modification sans préavis. Par ailleurs, Oracle Corporation ne garantit pas qu'elles soient exemptes d'erreurs et vous invite, le cas échéant, à lui en faire part par écrit.

Si ce logiciel, ou la documentation qui l'accompagne, est concédé sous licence au Gouvernement des Etats-Unis, ou à toute entité qui délivre la licence de ce logiciel ou l'utilise pour le compte du Gouvernement des Etats-Unis, la notice suivante s'applique :

U.S. GOVERNMENT RIGHTS. Programs, software, databases, and related documentation and technical data delivered to U.S. Government customers are "commercial computer software" or "commercial technical data" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, the use, duplication, disclosure, modification, and adaptation shall be subject to the restrictions and license terms set forth in the applicable Government contract, and, to the extent applicable by the terms of the Government contract, the additional rights set forth in FAR 52.227-19, Commercial Computer Software License (December 2007). Oracle America, Inc., 500 Oracle Parkway, Redwood City, CA 94065.

Ce logiciel ou matériel a été développé pour un usage général dans le cadre d'applications de gestion des informations. Ce logiciel ou matériel n'est pas conçu ni n'est destiné à être utilisé dans des applications à risque, notamment dans des applications pouvant causer des dommages corporels. Si vous utilisez ce logiciel ou matériel dans le cadre d'applications dangereuses, il est de votre responsabilité de prendre toutes les mesures de secours, de sauvegarde, de redondance et autres mesures nécessaires à son utilisation dans des conditions optimales de sécurité. Oracle Corporation et ses affiliés déclinent toute responsabilité quant aux dommages causés par l'utilisation de ce logiciel ou matériel pour ce type d'applications.

Oracle et Java sont des marques déposées d'Oracle Corporation et/ou de ses affiliés.Tout autre nom mentionné peut correspondre à des marques appartenant à d'autres propriétaires qu'Oracle.

AMD, Opteron, le logo AMD et le logo AMD Opteron sont des marques ou des marques déposées d'Advanced Micro Devices. Intel et Intel Xeon sont des marques ou des marques déposées d'Intel Corporation. Toutes les marques SPARC sont utilisées sous licence et sont des marques ou des marques déposées de SPARC International, Inc. UNIX est une marque déposée concédée sous licence par X/Open Company, Ltd.

Ce logiciel ou matériel et la documentation qui l'accompagne peuvent fournir des informations ou des liens donnant accès à des contenus, des produits et des services émanant de tiers. Oracle Corporation et ses affiliés déclinent toute responsabilité ou garantie expresse quant aux contenus, produits ou services émanant de tiers. En aucun cas, Oracle Corporation et ses affiliés ne sauraient être tenus pour responsables des pertes subies, des coûts occasionnés ou des dommages causés par l'accès à des contenus, produits ou services tiers, ou à leur utilisation.

Please
Recycle

Adobe PostScript

Contents

Sun Storage F5100 Flash Array Product Notes 1

Special Considerations 1

Replacing Energy Storage Modules 1

Shipping Energy Storage Modules 2

Configuration Guidelines and Limitations 2

Multipathing on the Sun Storage F5100 Flash Array 3

Connecting Multiple Arrays or JBODs 3

Oracle Solaris Device Path Changes After FMod Replacement 3

System Specifications and Requirements 3

Current and Legacy Systems 4

Supported Hosts, HBAs, and OSs 4

Supported SPARC Configurations 5

Supported Oracle x86 Configurations 5

Supported HBA Firmware 8

Supported System Firmware 9

Required Patches 9

Supported Disk Management Software 10

Aligning FMODs for Optimal Performance 12

Known Issues 13

Documentation Errata 17

Sun Storage F5100 Flash Array Product Notes

These product notes contain the following important information about the Sun Storage F5100 flash array from Oracle.

- "Special Considerations" on page 1
- "Configuration Guidelines and Limitations" on page 2
- "System Specifications and Requirements" on page 3
- "Aligning FMODs for Optimal Performance" on page 12
- "Known Issues" on page 13
- "Documentation Errata" on page 17

Special Considerations

Keep the following considerations in mind when handling or shipping the energy storage modules (ESMs) in the Sun Storage F5100 flash array:

Replacing Energy Storage Modules

Caution – When replacing an ESM, ensure that you follow the replacement procedures provided in the *Sun Storage F5100 Flash Array Service Manual*.

When replacing an ESM, follow these guidelines:

- Use only an ESM that has been provided by Oracle.
- Use the ESM only as described in the product service manual.

- Do not disassemble ESMs.
- Dispose of or recycle ESMs properly in accordance with local regulations, noting the warning label located on the ESMs.
- Do not attempt to recharge ESMs outside of the system.
- Fully charge ESMs before placing the array into service. This process can take up to 10 minutes. You will know an ESM is fully charged when the green OK LED changes from a slow blink to steady on.
- Fully discharge the ESM before removing it.

  For information on how to discharge an ESM, see the *Sun Storage F5100 Flash Array Service Manual*.

Caution – If AC power fails while an ESM is removed from the system, data on the FMods that are backed up by the removed ESM could be lost. Do not leave an ESM bay empty any longer than necessary to complete the replacement procedure.

Shipping Energy Storage Modules

If you ship an ESM, you must do so in accordance with all International Air Transport Association (IATA) regulations.

Refer to the document "Transporting Products With a Miscellaneous Class 9 Dangerous Goods Classification," which was provided with the product when it was shipped to you, for additional information. Additionally, you can refer to the Dangerous Goods Regulations document at:

http://www.iata.org

Configuration Guidelines and Limitations

The following configuration limitations exist for the Sun Storage F5100 flash array. Configuring systems that do not adhere to these guidelines might produce unexpected results.

Note – The *Sun Storage F5100 Flash Array Installation Guide* provides detailed information about the configurations that can be produced using the Sun Storage F5100 flash array.

Multipathing on the Sun Storage F5100 Flash Array

Multipathing is not supported on the Sun Storage F5100 flash array. For additional configuration restrictions, see the *Sun Storage F5100 Flash Array Installation Guide*.

Connecting Multiple Arrays or JBODs

Cascading a Sun Storage F5100 flash array to other Sun Storage F5100 flash arrays, JBODs, or other SAS-based storage array is not supported. Interconnecting the expanders on the Sun Storage F5100 flash array is also not supported.

Oracle Solaris Device Path Changes After FMod Replacement

After an FMod replacement, the Oracle Solaris device path will change. Applications and utilities that depend on the old device path will need to be reconfigured to work with the new one. For workaround instructions, see known issue 6801166 in "Known Issues" on page 13.

System Specifications and Requirements

This section describes the following system specifications:

- "Current and Legacy Systems" on page 4
- "Supported Hosts, HBAs, and OSs" on page 4
- "Supported Disk Management Software" on page 10

Current and Legacy Systems

Two versions of the Sun Storage F5100 flash array exist: the current system and the legacy system. Legacy systems support SAS1 HBAs and current systems support SAS1 and SAS2 HBAs. For specific HBA support, see "Supported Hosts, HBAs, and OSs" on page 4.

You can determine the system version by the manufacturing date and serial number. Systems manufactured after 12/14/2010 are current systems and have a serial number that starts with "1049BD", or greater, which appears in this format:

1049BDXXXX or greater

Legacy systems serial numbers start with any combination less than "1049BD".

The system serial number (SysSN) is located on the front of the system, left side.

Note – At this time, upgrading a legacy Sun Storage F5100 flash array to a current Sun Storage F5100 flash array is not supported.

Supported Hosts, HBAs, and OSs

The following sections describe which combinations of hardware, software, and firmware are supported with the Sun Storage F5100 flash array.

Supported SPARC Configurations

Supported SPARC Servers	Supported HBAs	Sun Storage F5100 System	Supported Operating Systems
Sun SPARC Enterprise M3000 Sun SPARC Enterprise M4000 Sun SPARC Enterprise M5000 Sun SPARC Enterprise M8000 Sun SPARC Enterprise M9000 Sun SPARC Enterprise T5120 Sun SPARC Enterprise T5220 Sun SPARC Enterprise T5440	SG-XPCIE8SAS-E-Z SG-SAS6-EXT-Z	Current or legacy Current	• Oracle Solaris 10 5/08 SPARC (64-bit) plus patches • Oracle Solaris 10 5/09 SPARC (64-bit) plus patches
Sun SPARC Enterprise T5140 Sun SPARC Enterprise T5240	SG-XPCIE8SAS-E-Z	Current or legacy	• Oracle Solaris 10 5/08 SPARC (64-bit) plus patches • Oracle Solaris 10 5/09 SPARC (64-bit) plus patches
Sun SPARC Enterprise T3-1 Sun SPARC Enterprise T3-2	SG-SAS6-EXT-Z	Current	• Oracle Solaris 10 9/10 SPARC (64-bit) plus patches
Sun SPARC Enterprise T3-1B Sun SPARC Enterprise T3-4	SG-SAS6-EM-Z	Current	• Oracle Solaris 10 9/10 SPARC (64-bit) plus patches

Supported Oracle x86 Configurations

Third-party servers are not supported.

Supported x86 Servers	Supported HBAs	Sun Storage F5100 System	Supported Operating Systems
Sun Fire X2100 Sun Fire X2100 M2 Sun Fire X2200 Sun Fire X2200 M2 Sun Fire X2250 Sun Fire X2270 Sun Fire X4100 M2 Sun Fire X4140 Sun Fire X4150 Sun Fire X4200 M2 Sun Fire X4240 Sun Fire X4250 Sun Fire X4440 Sun Fire X4450 Sun Fire X4600 Sun Fire X4600 M2	SG-XPCIE8SAS-E-Z	Current or legacy	• Oracle Solaris 10 5/08 x86 (64-bit) plus patches • Oracle Linux 5.5 (64-bit) • Oracle Linux 5.4 (64-bit) • SUSE 11 (64-bit) • SUSE 10 SP3 (64-bit) • RHEL5.5 (64-bit) • RHEL5.4 (64-bit) • Windows 2008 SP2 (64-bit) • Windows 2008 R2 (64-bit)
Sun Fire X4640 Sun Fire X4275	SG-SAS6-EXT-Z	Current	• Oracle Solaris 10 5/08 x86 (64-bit) plus patches • Oracle Linux 5.5 (64-bit) • Oracle Linux 5.4 (64-bit) • SUSE 11 (64-bit) • SUSE 10 SP3 (64-bit) • RHEL5.5 (64-bit) • RHEL5.4 (64-bit) • Windows 2008 SP2 (64-bit) • Windows 2008 R2 (64-bit)
Sun Fire X4170 Sun Fire X4270 Sun Fire X4540	SG-SAS6-EXT-Z SG-XPCIE8SAS-E-Z	Current or legacy	• Oracle Solaris 10 5/08 x86 (64-bit) plus patches • Oracle Linux 5.5 (64-bit) • Oracle Linux 5.4 (64-bit) • SUSE 11 (64-bit) • SUSE 10 SP3 (64-bit) • RHEL5.5 (64-bit) • RHEL5.4 (64-bit) • Windows 2008 SP2 (64-bit) • Windows 2008 R2 (64-bit)

Supported x86 Servers	Supported HBAs	Sun Storage F5100 System	Supported Operating Systems
Sun Fire X4170 M2 Sun Fire X4270 M2	SG-SAS6-EXT-Z	Current	• Oracle Solaris 10 9/08 x86 (64-bit) plus patches • Oracle Linux 5.5 (64-bit) • Oracle Linux 5.4 (64-bit) • SUSE 11 (64-bit) • SUSE 10 SP3 (64-bit) • RHEL5.5 (64-bit) • RHEL5.4 (64-bit) • Windows 2008 SP2 (64-bit) • Windows 2008 R2 (64-bit)
Sun Fire X6220 Sun Fire X6240 Sun Fire X6250 Sun Fire X6270 Sun Fire X6275 Sun Fire X6440 Sun Fire X6450	PCIE8SAS-EB-Z	Current or legacy	• Oracle Solaris 10 5/08 x86 (64-bit) plus patches • Oracle Linux 5.5 (64-bit) • Oracle Linux 5.4 (64-bit) • SUSE 11 (64-bit) • SUSE 10 SP3 (64-bit) • RHEL5.5 (64-bit) • RHEL5.4 (64-bit) • Windows 2008 SP2 (64-bit) • Windows 2008 R2 (64-bit)
Sun Fire X6270 M2 Sun Fire X4800	SG-SAS6-EM-Z	Current or legacy	• Oracle Solaris 10 5/08 x86 (64-bit) plus patches • Oracle Linux 5.5 (64-bit) • Oracle Linux 5.4 (64-bit) • SUSE 11 (64-bit) • SUSE 10 SP3 (64-bit) • RHEL5.5 (64-bit) • RHEL5.4 (64-bit) • Windows 2008 SP2 (64-bit) • Windows 2008 R2 (64-bit)
Sun Fire X4470	SG-SAS6-EXT-Z	Current	• Oracle Solaris 10 9/08 x86 (64-bit) plus patches • Oracle Linux 5.5 (64-bit) • Oracle Linux 5.4 (64-bit) • SUSE 11 (64-bit) • SUSE 10 SP3 (64-bit) • RHEL5.5 (64-bit) • RHEL5.4 (64-bit) • Windows 2008 SP2 (64-bit) • Windows 2008 R2 (64-bit)

Supported HBA Firmware

The following table describes the supported firmware version for each HBA, and which HBA works in which Sun Storage F5100 system (current or legacy).

Download HBA firmware at http://www.lsi.com/support/sun

Note – Before you connect your flash array to a SGX-SAS6-EXT-Z or SGX-SAS6-EM-Z HBA, you must install CAM 6.7 and apply the latest CAM patches for your host OS. The patches are required to ensure proper support for this configuration and may be found at https://support.oracle.com/CSP/ui/flash.html.

Sun Storage F5100 System	Supported HBAs	Description	Required Firmware Version
Current	SGX-SAS6-EXT-Z	Oracle's Sun Storage 6 Gb SAS PCIe HBA provides 6 Gbyte/sec SAS performance and supports up to 40 Fmods on the array.	MPTFW-05.00.17.00, or greater
	SGX-SAS6-EM-Z	Oracle's Sun Storage 6 Gb SAS PCIe Express Module HBA provides 6 Gbyte/sec SAS performance and supports up to 40 Fmods on the array.	MPTFW-05.00.17.00, or greater
	SG-XPCIE8SAS-E-Z	Sun StorageTek PCIe SAS host bus adapter that provides 2x4 lanes of 3 Gbyte/second SAS performance and supports up to 20 FMods on the array.	MPTFW-01.29.06.00-IT, or greater
	SG-XPCIE8SAS-EB-Z	Sun StorageTek SAS ExpressModule HBA for Sun Blade Servers. Provides 2x4 lanes of PCIe 3Gb/s per ports. Supports up to 20 FMods on the array.	MPTFW-01.29.06.00-IT, or greater
Legacy	SG-XPCIE8SAS-E-Z	Sun StorageTek PCIe SAS host bus adapter that provides 2x4 lanes of 3 Gbyte/second SAS performance and supports up to 20 FMods on the array.	MPTFW-01.29.06.00-IT, or greater
	SG-XPCIE8SAS-EB-Z	Sun StorageTek SAS ExpressModule HBA for Sun Blade Servers. Provides 2x4 lanes of PCIe 3Gb/s per ports. Supports up to 20 FMods on the array.	MPTFW-01.29.06.00-IT, or greater

Supported System Firmware

Firmware	Legacy Systems	Current Systems
SAS expander firmware	LSI FW 05.03.73.00	LSI FW 05.04.05
Flash Module firmware	MP1F	D129
FPGA firmware	2.2	2.4

Note – CAM 6.7 provides the latest SAS expander firmware and the latest Flash Module firmware.

Required Patches

The following patch identifiers represent the minimum level of the patches that must be installed. Use the following table to locate the appropriate patches for your system.

Legacy Systems Required Patches	Current Systems Required Patches
• Oracle Solaris Performance Patch • HBA Firmware Patch • Windows 2003 Patch • Persistent Log Message Patch	• HBA Firmware Patch • Persistent Log Message Patch

Oracle Solaris Performance Patch

Download and install the following *mandatory* performance patch on your Oracle Solaris host:

- For Oracle Solaris 10 SPARC U4-U7, 138881-01 or later with MPT patch 141736-05
- For Oracle Solaris 10 x86 U4-U7, 138881-01 or later with MPT patch 141737-05

Available for download from the following web site:

`https://support.oracle.com/CSP/ui/flash.html`

Note – To enable maximum throughput from the MPT driver, add `mpt_doneq_thread_n_prop=8;` to `/kernel/drv/mpt.conf` and reboot the system.

Note – Refer to the CAM software release notes to identify the Oracle Solaris patches required by the CAM software.

HBA Firmware Patch

You must update your HBA firmware to support Oracle's Sun Storage F5100 flash array. For the supported HBAs firmware versions, see "Supported HBA Firmware" on page 8.

HBA firmware is available for download from the following web site:

`http://www.lsi.com/support/sun`

Windows 2003 Patch

On Windows 2003 platforms, you must install the Windows 2003 SP2 HotFix (KB943545) patch. You will be unable to register the storage device using the CAM software until you install this patch.

The patch is available for download from the following web site:

`http://support.microsoft.com/kb/943545/en-us`

If you are unable to access this web site, contact your Oracle Account Representative for assistance.

Persistent Log Message Patch

If you are experiencing persistent log messages such as `command slot is full`, and other problems associated with known issue 6807120 ("Known Issues" on page 13), download the appropriate patch, listed in the following section, "Oracle Solaris Performance Patch" on page 9.

Supported Disk Management Software

The following software is supported for use with the Sun Storage F5100 flash array.

TABLE 1 Supported Disk Management Software for Current Systems

Software	Description
Oracle's Sun Storage Common Array Manager 6.7 with patch: • 145965-03 CAM 6.7.0 Firmware Release 5.4.5 for F5100 (for Oracle Solaris) • 145966-03 CAM 6.7.0 Firmware Release 5.4.5 for F5100 (for Windows) • 144861-01 Windows platform fix • 145967-03 CAM 6.7.0 Firmware Release 5.4.5 for F5100 (for Linux RHEL SuSE)	Enclosure management software

TABLE 2 Supported Disk Management Software for Legacy Systems

Software	Description
Oracle's StorageTek Common Array Manager 6.5.0 with patch: • 141581-01 (for Windows) No patches are needed for Oracle Solaris or Linux	Enclosure management software
Oracle's StorageTek Common Array Manager 6.4.1 with patch: • 141484-01, or higher (for Oracle Solaris) • 141485-01 (for Windows) • 141486-01 (for Linux)	Enclosure management software

To download the software, and find more information about the CAM software, refer to the following web site:

http://www.oracle.com/us/products/servers-storage/storage/disk-storage/031603.htmlhttp://www.oracle.com/us/products/servers-storage/storage/disk-storage/031603.htm

Aligning FMODs for Optimal Performance

To obtain optimal performance, all partitions must be aligned to start on 4K-aligned boundaries. Actions required to ensure proper alignment vary based on your environment.

In SPARC environments with an SMI label, no verification is required. In SPARC environments with an EFI label, it is sufficient to verify that partition boundaries start on 4K-aligned boundaries by using the `format` command. In x86 environments there are multiple tools to create partitions, it is important to understand the tool used to ensure the partition starts at a 4K-aligned value.

The example below uses the `format` command to inspect and alter partition tables.

Along with verifying partition boundaries, in x86 environments, you must also ensure that the disk partition[1] starts at a 4K-aligned value. If the entire disk is specified for use by the Oracle Solaris OS, the disk partition starts at cylinder 1 by default. This can be determined by using the `fdisk` command as follows:

EXAMPLE 1 Determine Whether a Partition Starts at a 4K-Aligned Value

```
# fdisk /dev/rdsk/c0t13d0p0
     Total disk size is 2987 cylinders
     Cylinder size is 16065 (512 byte) blocks
               Cylinders
Partition   Status    Type      Start   End   Length    %
======      ======   ======     =====   ===   ======   ===
   1                 Solaris2    1     2986   2986    100
```

A cylinder is 16065 blocks:
(16065 blocks/cylinder * 512 bytes/block)/4096 = 2008.125 bytes
This is *not* a 4K-aligned value.

The next 4k aligned value in this case would be cylinder 8: (8 cylinder * (16065 blocks/cylinder * 512 bytes/block) / 4096 = 16065

This value *is* a 4k aligned value (evenly divisible by 8).

1. References to disk partitions in this context refer to the partitions on the Sun Storage F5100 flash array FMods.

Note – When a disk is added to zpool, ZFS creates partitions that start on cylinder 0 by default, which results in 4k alignment. No tuning is needed if you use ZFS.

You need to ensure that individual partitions are created on 4K-aligned boundaries. To do this, use the format command to inspect and alter partition boundaries. 4K-aligned boundaries must be setup in both format and in fdisk.

When you are finished, the partition should look similar to the following example.

EXAMPLE 2 Verify That a Partition Starts at a 4K-Aligned Value

```
# fdisk /dev/rdsk/c0t13d0p0
     Total disk size is 2987 cylinders
     Cylinder size is 16065 (512 byte) blocks
                Cylinders
Partition   Status    Type      Start   End   Length    %
======      ======   ======     =====   ===   ======   ===
   1         Active  Solaris2    8      2986   2979    100
```

Once the fdisk partition is aligned, no further adjustments are needed.

Known Issues

This section describes issues that are known to affect the product and provides possible workarounds for them.

TABLE 3 Known Issues and Workarounds

Bug ID	Description	Workaround
6855446	While registering 16 data hosts connected to Sun Storage F5100 through Sun Storage Common Array Manager registration wizard in a single operation, some times one or two hosts may not get successfully registered. Navigation tree will not display SAS domains for those hosts, which will ultimately prevent SAS domain management, pertaining to those data hosts.	Manage SAS zoning from Common Array Manager > Storage Systems > Device Name > SAS Domains > SAS Domain Name.
6793967	The `zpool status -x` command incorrectly displays healthy when actual status is degraded.	Use Common Array Manager alarm report for Failed FMod or missing device paths.
6807120	Under sustained heavy I/O in Oracle Solaris configurations, CAM may consistently lose communication with the Sun Storage F5100 and report alarms. Alarms may persist if I/O load remains high. Log messages on the host will indicate that `command slot is full`.	Download the appropriate patch, listed in the following section, "Oracle Solaris Performance Patch" on page 9.

TABLE 3 Known Issues and Workarounds *(Continued)*

Bug ID	Description	Workaround
6801166	After a Sun Storage F5100 FMod replacement, the Oracle Solaris device path will change. Applications and utilities that depend on the old device path will need to be reconfigured to work with the new one.	To replace an FMod, use the following procedure for each Oracle Solaris host that has access to the replaced FMod: 1. Open and login to the CAM utility which manages the Oracle Solaris host. 2. Expand the "Hosts" tree in the left sidebar. 3. Click the hostname of the Oracle Solaris host in the tree. 4. In the main page, scroll to the "Disks" section. 5. If necessary, click the "Show Data in a Single Page" icon to display all disks connected to the host. 6. Save the main frame into a temporary file. (The method for accomplishing this is web browser-dependent.) 7. Properly power down the array and replace the FMod. 8. Properly power up the array. 9. When the Sun Storage F5100 is fully operational, click the "REFRESH" button in the top frame of StorageTek CAM. 10. Compare the web page snapshot saved in step 6 to the current list of devices displayed in the "Disk" table in CAM. Find the previous and newly created device paths for the replaced FMod by comparing the values in the Path columns. 11. Reconfigure affected applications and utilities using the newly created device path in place of the previous device path.
6809771	Under heavy I/O load in Oracle Solaris, a large number of messages may be seen indicating I/O retries (such as incomplete read- retrying). These messages occur due to a hardware bug in the LSI SAS controller that may incorrectly detect underrun conditions and report them to the driver. Overall data integrity is not compromised, but a performance impact may be observed due to the messages logged and retries required.	Ignore the retry messages or use an external means to throttle I/O throughput down to a level where these messages are not being produced in great numbers. The method required to throttle I/O will be very configuration and workload specific.
6839094	The `iostat -En` command does not report proper fault information on the Sun Storage F5100 Array and should not be used for this purpose.	Do not use the `iostat -En` command on the Sun Storage F5100 flash array from Oracle.

TABLE 3 Known Issues and Workarounds *(Continued)*

Bug ID	Description	Workaround
6835314	When rezoning FMods in an Sun Storage F5100 connected to a Linux host (as is done with StorageTek CAM access configuration, for example), access to drives may become blocked. The Linux host may frequently log messages such as `removing sata device`, `tur checker reports path is down` and `LogInfo`. The first message is commonly seen during zoning operations and is expected, but when accompanied by the other messages, access to the drives may become blocked. Only a host reboot will recover access.	To avoid this scenario, perform the following actions when rezoning a Sun Storage F5100 flash array: 1. Rezone the array using the StorageTek CAM management tool. 2. If the StorageTek CAM management host is a Linux host and the access permissions for this host have been modified, reboot this host. 3. Reboot all other Linux hosts attached to the array for which the access control permissions have been modified.
6853620 and 6853219	An unexpected reduction in performance may be caused by malfunctioning hardware.	To check for this condition, examine all of the SAS port LEDs on the back of the system. During normal operation, system is booted to an OS, any port that is cabled to an HBA should have a green activity LED. Disconnected ports should have amber LEDs. If any cabled ports has a Yellow LED, indicating that both green and amber are on, first check/replace the SAS cable. If that does not correct the problem, contact Sun Service for assistance. (NOTE: This condition is valid only after booting the OS. During boot the LEDs change state as devices get discovered by the system.).
6862435	Run Agent command within CAM fails with an exception when run on Windows2008 SP2 platform with NetBIOS over TCP/IP disabled. By default NetBIOS over TCP/IP is enabled.	Verify that NetBIOS over TCP/IP is enabled.
6853757	Problems were seen with the following patches: SPARC 141736-02, 141736-03, 141736-04 and x86 141737-02, 141737-03, 141737-04.	Remove the bad patch replace with the -01 version of the patch (141845-01) or contact Sun Service.
6943376	`vxdisk` list does not list Sun Storage F5100 devices connected to a SGX-SAS6-E*n* HBA.	No workaround.
6865769	No temperature alarm generated when ambient temperature raised above 40.0 C.	When CAM registers a chassis alarm, check for an over temperature situation and resolve as needed. If no over temperature situation is apparent, contact Sun Service for additional troubleshooting assistance.

TABLE 3 Known Issues and Workarounds *(Continued)*

Bug ID	Description	Workaround
6838767	The `sscs service -o locate` command, when executed on a non-existent FMod, will generate a return code of 1. This return code is different from the previous version of CAM, which would generate a return code of 25 in the same conditions. Note the command output is correct. The problem is with the return code.	If this command is integrated into customer scripts that rely on the previous return code value of 25, those scripts need to be modified to check for this different return code of 1.
6777089	When running a Linux host with the following HBA (SG-XPCIE8SAS-E-Z with MPT 3.16.00.00), unplugging and reinserting a SAS cable causes the host to hang.	Reboot the host.
701836 (6978674)	If power is removed from a Sun Storage F5100 Flash Array when connected to a host running an Oracle Solaris 11 Express snv_151a x86 with the following HBA (SG-SAS6-EXT-Z), the host hangs and must be rebooted. After a reboot, the HBA disappears and none of the FMods are visible from the OS. System `/var/log/messages` indicates there is a PCIEX error on the host.	To recover the HBA from this state, run `fmadm repair`. For example: `# fmadm repair 201627ba-6411-6325-9d46-d40abf0fbc7f` To fix this problem, download and install patch ID 1329516 from My Oracle Support https://support.oracle.com.

Documentation Errata

The following late-breaking information does not appear in the product documentation.

TABLE 4 Documentation Updates

Title	Page Number	Update
System service labels	n/a	System labels and illustrations that reference them may have incorrect port labeling. All SAS expander ports could be incorrectly labeled with diamond and circle icons. The correct labeling scheme should have ports 0–2 labeled with diamonds, and port 3 labeled with circles.