

Sun Flash Accelerator F80 PCIe Card Product Notes

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Using This Documentation

- **Overview** – These product notes include information about supported software and firmware, and important operating guidelines for Sun Flash Accelerator F80 PCIe Cards.
- **Audience** – Technicians, system administrators, authorized service providers, and users.
- **Required knowledge** – Experience with servers and advanced understanding of server storage systems.

Product Documentation Library

Documentation and resources for this product and related products are available at <http://www.oracle.com/goto/SunFlashF80/docs>.

Feedback

Provide feedback about this documentation at <http://www.oracle.com/goto/docfeedback>.

Sun Flash Accelerator F80 PCIe Card Product Notes

This document contains late-breaking information about the Sun Flash Accelerator F80 PCIe Card from Oracle. Read this document before reading other Sun Flash Accelerator F80 PCIe Card documentation.

This document is written for technicians, system administrators, authorized service providers (ASPs), and users who have advanced experience installing, troubleshooting, and replacing hardware.

For specific installation instructions, see your system installation guide. For late-breaking information about the installation and use of the Sun Flash Accelerator F80 PCIe Card on your server, see the most recent version of the server product notes.

The following sections are included in this document:

- [“Supported Hardware and Software” on page 9](#)
- [“Implementation Considerations” on page 14](#)
- [“Known Issues” on page 18](#)

Supported Hardware and Software

The following sections describe the software and firmware supported for the Sun Flash Accelerator F80 PCIe Card.

- [“Supported Servers and Operating Systems” on page 10](#)
- [“Minimum Supported Card Firmware Version” on page 12](#)
- [“Required Host Software” on page 13](#)
- [“Keeping Drivers and Firmware Up To Date” on page 14](#)

Supported Servers and Operating Systems

This section describes servers that support the Sun Flash Accelerator F80 PCIe Card. For detailed information about using this card with your server, see the product notes for your server, available at:

<https://docs.oracle.com>

The following servers are supported for the Sun Flash Accelerator F80 PCIe Card:

SPARC Servers	Number of Cards	Slots Supported and Preferred Order for Installing F80 Card	Supported Operating Systems
SPARC T4-1	1 to 2	5, 3	<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 ■ Oracle Solaris 10 8/11 OS with required patchsets ■ Oracle Solaris 10 9/10 OS with the Solaris 10 8/11 SPARC Bundle and required patchsets
SPARC T4-2	1 to 4	9, 8, 7, 0 (Slot 6 if Slot 0 is unavailable)	<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 ■ Oracle Solaris 10 8/11 OS with required patchsets ■ Oracle Solaris 10 9/10 OS with the Solaris 10 8/11 SPARC Bundle and required patchsets
SPARC T5-2	1 to 6	1, 8, 2, 7, 3, 6, 4, 5	<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 ■ Oracle Solaris 10 8/11 OS with required patchsets
SPARC T5-4	1 to 8	1, 3, 5, 7, 9, 11, 13, 15	<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 ■ Oracle Solaris 10 8/11 OS with required patchsets
See “ SPARC Server T5-4 and T5-8 Configuration ” on page 15		Requires a doublewide carrier to facilitate air flow.	
SPARC T5-8	1 to 8	1, 3, 5, 7, 9, 11, 13, 15	<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 ■ Oracle Solaris 10 8/11 OS with required patchsets
See “ SPARC Server T5-4 and T5-8 Configuration ” on page 15		Requires a doublewide carrier to facilitate air flow.	
SPARC M5-32	1 to 60	Slot 8 in each I/O unit (IOU) is not supported.	<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 ■ Oracle Solaris 10 8/11 OS with required patchsets
See “ SPARC Server M5-32 and M6-32 Configuration ” on page 16			
SPARC M6-32	1 to 60	Slot 8 in each I/O unit (IOU) is not supported.	<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 ■ Oracle Solaris 10 8/11 OS with required patchsets

SPARC Servers	Number of Cards	Slots Supported and Preferred Order for Installing F80 Card	Supported Operating Systems
See “SPARC Server M5-32 and M6-32 Configuration” on page 16			
Fujitsu M10-1	1 to 3	2, 0, 1	<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 SRU 1.4 ■ Oracle Solaris 10 1/13 OS with required patchsets
Fujitsu M10-4	1 to 11	10, 6, 2, 8, 4, 9, 5, 1, 7, 3, 0	<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 SRU 1.4 ■ Oracle Solaris 10 1/13 OS with required patchsets
Fujitsu M10-4S	1 to 8	6, 2, 4, 5, 1, 7, 3, 0	<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 SRU 1.4 ■ Oracle Solaris 10 1/13 OS with required patchsets

Note - Direct I/O support (DIO) is available for SPARC T4-1 and T4-2 servers.

x86 Servers	Number of F80 Cards	Slots Supported for Installing F80 Card	Supported Operating Systems
Sun Server X4-8			<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 (SRU 12) ■ Oracle Linux 6.5, based on UEK3 (Unbreakable Linux Kernel Release 3)
4 processors:	1-4	7, 5, 3, 1	
8 processors:	1-8	11, 9, 7, 5, 3, 1, 15, 13	<ul style="list-style-type: none"> ■ Oracle Linux 5.10, based on UEK3 (Unbreakable Linux Kernel Release 3) ■ Oracle Virtual Machine 3.2.7
Sun Server X4-4			<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 (SRU 12) ■ Oracle Linux 6.5, based on UEK3 (Unbreakable Linux Kernel Release 3)
2 processors:	1-4	6, 4, 5, 3	
4 processors:	1-6	10, 7, 6, 3, 8, 5	<ul style="list-style-type: none"> ■ Oracle Linux 5.10, based on UEK3 (Unbreakable Linux Kernel Release 3) ■ Oracle Virtual Machine 3.2.7
Sun Server X4-2L	1 to 4	1, 2, 4, 5	<ul style="list-style-type: none"> ■ Oracle Solaris 11.1 ■ Oracle Solaris 10 1/13 ■ Oracle Linux 5.9, based on UEK2 (Unbreakable Linux Kernel Release 2) ■ Oracle Linux 6.4, based on UEK2 (Unbreakable Linux Kernel Release 2) ■ Oracle Virtual Machine 3.2.7
See “Sun Server X4-2L Configuration” on page 16			

x86 Servers	Number of F80 Cards	Slots Supported for Installing F80 Card	Supported Operating Systems
			Note - Sun Server X4-2L with pre-installed Oracle VM 3.2 is not supported for Sun Flash Accelerator F80 PCIe Card operation.

Other servers and processors may be added to this list in the future, if they qualify. Check your server product notes for confirmation that your server has subsequently been qualified.



Caution - Any unsupported configuration causes the host to power off as soon as it is powered on. A fault is generated on the service processor when an unsupported configuration is detected. The fault clears after the unsupported configuration is fixed and the host is powered on.

Note - Refer to the server's product notes for up-to date information on supported servers, operating systems and required patchsets.

Minimum Supported Card Firmware Version

The Sun Flash Accelerator F80 PCIe Card runs with the firmware packages listed below:

Firmware	Version	Patch
F80 Firmware Package (recommended)	13.05.11.01	SW2.0 25292120
F80 Firmware Package	09.05.41.00	SW1.1 1993331
F80 Firmware Package (minimum)	09.05.33.00	SW1.0 17860600

Summary of Changes in Firmware 13.05.11.01 Release

The following improvements and changes are included in SW2.0 Phase 13.05.11.01 release of the Sun Flash Accelerator F80 PCIe Card:

- Permanently disabled SMART caching, removed the checksum error reported by smartctl.
- Bug 22727539 - FATAL resetting due to F80 and F40 fault_state(0x0d04)
- Bugs 22843161 and 22848220 - Cards failed with "poor performance" at the same time, due to background recycler. Fix for reset due to fault_state (0x0d04), and performance improvement due to background recycler.

If you install the Sun Flash Accelerator F80 PCIe Card as an x-option on a server, you must update the firmware from 09.05.33.00 to 13.05.11.01, or a subsequent release if available.

Summary of Changes in Firmware 09.05.41.00 Release

The following improvements and changes are included in SW1.1 Phase 09.05.41.00 release of the Sun Flash Accelerator F80 PCIe Card:

- Improved power cycle management.
- DDCLI 110.00.12.00 for F80 and F40 Management. Command line utility (OS specific) for management and monitoring of the F80 PCIe card.

If you install the Sun Flash Accelerator F80 PCIe Card as an x-option on a server, you must update the firmware from 09.05.41.00 to 13.05.11.01, or a subsequent release if available.

Required Host Software

The Sun Flash Accelerator F80 PCIe Card runs with the minimum required host software listed below:

SPARC Driver	Minimum Required Host Firmware Version With Patches	Recommended System Software Version (Patch No.)
SPARC T4-1	8.3.0.c	150413-02
SPARC T4-2	8.3.0.c	150414-02
SPARC T5-2	9.0.0.h	16588974
SPARC T5-4	9.0.2.g	17019069
SPARC T5-8	9.0.2.g	17019069
SPARC M5-32	9.0.1.b	1540816.1
SPARC M6-32	9.0.1.b	1540816.1
Fujitsu M10-1	XCP version 2041	Patch 16687261: FUJITSU M10-1 XCP2041 FIRMWARE
Fujitsu M10-4	XCP version 2041	Patch 16687263: FUJITSU M10-4 XCP2041 FIRMWARE
Fujitsu M10-4S	XCP version 2041	Patch 16687267: FUJITSU M10-4S XCP2041 FIRMWARE

x86 Driver	Minimum Required Host Firmware Version With Patches	Recommended System Software Version (Patch No.)
Sun Server X4-8	Software 1.0.0	■ X4-8 SW 1.0.0 Firmware Pack - Patch number 18755157
Sun Server X4-4	Software 1.0.0	■ X4-4 SW 1.0.0 Firmware Pack - Patch number 18529116

x86 Driver	Minimum Required Host Firmware Version With Patches	Recommended System Software Version (Patch No.)
Sun Server X4-2L	Software 1.0.0	■ X4-2L SW 1.0.0 Firmware Pack - Patch number 17438833

Keeping Drivers and Firmware Up To Date

Use the DDCLI utility to check and update card firmware. For information on updating drivers and firmware for Sun Flash Accelerator F80 PCIe Card, refer to the *Sun Flash Accelerator F80 PCIe Card User's Guide* and [“Accessing DDCLI Software Updates and Firmware Downloads” on page 17](#).

Implementation Considerations

The following sections contain important information for configuring Sun Flash Accelerator F80 PCIe Card:

- [“Configuring Sun Flash Accelerator F80 PCIe Card For Optimum Performance” on page 14](#)
- [“SPARC Server T5-4 and T5-8 Configuration” on page 15](#)
- [“SPARC Server M5-32 and M6-32 Configuration” on page 16](#)
- [“Sun Server X4-2L Configuration” on page 16](#)
- [“Card Volume Management” on page 17](#)
- [“Accessing DDCLI Software Updates and Firmware Downloads” on page 17](#)

Note - The Sun Flash Accelerator F80 PCIe Card cannot be used as a boot device.

Configuring Sun Flash Accelerator F80 PCIe Card For Optimum Performance

Sun Flash Accelerator F80 PCIe Cards must be configured for optimum flash card performance. You should take the following into account when configuring your server system for installed Sun Flash Accelerator F80 PCIe Cards:

- Follow performance guidelines for implementing Sun Flash Accelerator F80 PCIe Card 8k block tuning. The Sun Flash Accelerator F80 PCIe Card is designed to provide best

performance for data transfers that are multiples of 8k size, and use addresses that are 8k aligned. Partitions should be aligned to start on 8k boundaries.

Oracle Solaris OS automatically ensures 8k alignment when the default SMI label type is selected. If a label of type EFI is desired, care must be taken to specify and ensure 8k alignment: the default start sector of 34 for EFI labels is not an 8k aligned value. Use the partition subcommand of the Solaris format command to change the start sector to 48, or any other 8k aligned value. Note that there are 512B per sector.

The ZFS file system automatically aligns partitions to start on 8k boundaries when a full disk is allocated to ZFS (recommended). If you allocate individual EFI partitions to a ZFS pool, ensure the partition is 8k-aligned as discussed above. Refer to:

- ZFS Tuning Guide: http://docs.oracle.com/cd/E26502_01/html/E29022/chapterzfs-flash.html
- Card Optimization Guidelines in *Sun Flash Accelerator F80 PCIe Card User's Guide*.
- Follow cache flush recommendations for servers with ZFS and installed Sun Flash Accelerator F80 PCIe Cards. Refer to the ZFS tuning guide for cache flush recommendations. See http://docs.oracle.com/cd/E26502_01/html/E29022/chapterzfs-flash.html.
- Do **not** disable power management in BIOS menus, to avoid a reduction in card performance if the server is reset.
- When configuring Power Safe mode, disable CPU deep cstates in `/etc/system` files.
- Install the latest software and firmware for servers with installed Sun Flash Accelerator F80 PCIe Cards. See “[Keeping Drivers and Firmware Up To Date](#)” on page 14.

SPARC Server T5-4 and T5-8 Configuration

SPARC Server T5-4 and SPARC Server T5-8 require a doublewide PCIe hot plug carrier extension for each installed Sun Flash Accelerator F80 PCIe Card to facilitate air flow. Doublewide carriers do not allow the use of one adjacent PCIe slot. PCIe hot plug carrier extensions (Mkt PN 710710) are installed in odd numbered PCIe slots.

- Refer to the SPARC Server T5-4 documentation for more information on card installation at: <http://www.oracle.com/goto/T5-4/docs>
- Refer to the SPARC Server T5-8 documentation for more information on card installation at: <http://www.oracle.com/goto/T5-8/docs>

The following figure shows an example of doublewide PCIe hot plug carrier extensions that populate two PCIe slots for each Sun Flash Accelerator F80 PCIe Card.



SPARC Server M5-32 and M6-32 Configuration

Fifteen Sun Flash Accelerator F80 PCIe Cards are supported per SPARC M5-32 and M6-32 server physical domain. A SPARC M5-32 or M6-32 server can include one to four physical domains. For example, a server with two physical domains supports 30 Sun Flash Accelerator F80 PCIe cards, fifteen in each physical domain. A server with four physical domains supports 60 cards.

The Sun Flash Accelerator F80 PCIe card requires increased cooling to remove the heat generated by the card. By the internal design of the I/O Unit (IOU), PCIe slot 8 receives less airflow than the other slots. Do not install a Sun Flash Accelerator F80 PCIe card into PCIe slot 8. Hot-plug installation of the Sun Flash Accelerator F80 PCIe card is not supported.

For more information on IOU slot priority, additional configuration options, and PCIe card installation instructions, refer to the SPARC M5-32 Server Service Manual at <http://www.oracle.com/goto/M5-32/docs>, and refer to SPARC M6-32 server documentation at <http://www.oracle.com/goto/M6-32/docs>.

Sun Server X4-2L Configuration

The Sun Flash Accelerator F80 PCIe Card supports Sun Server X4-2L with Oracle Virtual Machine 3.2.7 only with a full OS installation. Sun Server X4-2L with pre-installed Oracle VM 3.2 is not supported for Sun Flash Accelerator F80 PCIe Card operation.

Sun Flash Accelerator F80 PCIe Card support in Sun Server X4-2L is restricted to Legacy BIOS boot mode. UEFI BIOS boot mode is not supported for servers with installed Sun Flash Accelerator F80 PCIe Cards.

Refer to the server documentation for more information on BIOS boot mode at <http://www.oracle.com/goto/X4-2L/docs>.

Card Volume Management

Use the Automatic Storage Management (ASM) volume manager or other volume manager to concatenate multiple flash memory module domains. For example, a volume manager can be used to concatenate four 200 GB domains into a single 800 GB volume. A volume manager can also present multiple SSD cards as one larger volume.

Refer to the documentation for more information at: http://docs.oracle.com/cd/B28359_01/server.111/b31107/asmcon.htm

Accessing DDCLI Software Updates and Firmware Downloads

Product patches, updates and firmware are available on My Oracle Support at <https://support.oracle.com> from the Patches and Updates tab. Information on accessing and using My Oracle Support can be found at the *My Oracle Support Welcome Center for Oracle Sun Customers and Partners*.

See “[Downloading the Card Software Package](#)” on page 17.

▼ Downloading the Card Software Package

To find the card software package that includes the DDCLI utility, access *My Oracle Support* and download the latest software package for the Sun Flash Accelerator F80 PCIe Card.

1. **Sign in to My Oracle Support** at <https://support.oracle.com>.
2. **Click the "Patches & Updates" tab.**
3. **In the "Patch Search" box on the right side, select "Product or Family (Advanced Search)"**
4. **Enter a partial product name for "Product is".**
A list of matches displays.
5. **Select the product of interest.**
Select one or more "releases" in the "Release is" drop down list.
Close the pop-up window.
6. **Click Search.**

A list of product downloads (listed as patches) displays.

7. Select the download of interest.

The Download Information Page displays.

If, on the Download Information Page, you get the message "You do not have permissions to download this Patch...", see *How Patches and Updates Entitlement Works* at <https://support.oracle.com> to help you determine the reason.

Known Issues

The following table lists known issues for the Sun Flash Accelerator F80 PCIe Card:

Links to Issues	Workaround?
"FATAL resetting due to F80 and F40 fault_state(0x0d04) (22727539)" on page 18	Yes
"Cards failed with "poor performance" at the same time, due to background recycler (22843161 and 22848220)" on page 19	Yes
"Card may fail at initial power on after no power on for long period (19140306)" on page 19	Yes
"Card may not show up on power cycle (18160181)" on page 19	Yes
"Card may not initialize at power cycle (17773639)" on page 19	Yes
"SUNBT7181173 variable (up to 25% IOPS) reads throughput (11%) performance (15801572)" on page 20	Yes
"SUNBT7185967 DFF is reported missing during power cycle (15805379)" on page 20	Yes
"SUNBT7178453 Panic Logs found on Sun Flash Accelerator F80 PCIe Card (15799303)" on page 20	Yes
"Sun Flash Accelerator F80 PCIe Card DDCLI reports overall health as GOOD even if SSD temperature is over 74C (15780582)" on page 21	Yes
"Sun Flash Accelerator F80 PCIe Card Not Visible to OS (17377266)" on page 21	Yes

▼ FATAL resetting due to F80 and F40 fault_state (0x0d04) (22727539)

The Sun Flash Accelerator F40 PCIe Card may fail with FATAL resetting due to critical error fault_state(0x0d04).

Workaround

- Update the firmware to SW 2.0 or later.

▼ Cards failed with "poor performance" at the same time, due to background recycler (22843161 and 22848220)

Multiple Sun Flash Accelerator F80 PCIe Cards may fail with "poor performance" at the same time. Fix for reset due to `fault_state (0x0d04)`, and performance improvement due to background recycler.

Workaround

- Update the firmware to SW 2.0 or later.

▼ Card may fail at initial power on after no power on for long period (19140306)

The Sun Flash Accelerator F80 PCIe Card may fail at initial power on after no power on for long period.

Workaround

- Update the firmware to SW 2.0 or later.

▼ Card may not show up on power cycle (18160181)

The Sun Flash Accelerator F80 PCIe Card may not appear to be present after a power cycle.

Workaround

- Update the firmware to SW 2.0 or later.

▼ Card may not initialize at power cycle (17773639)

The Sun Flash Accelerator F80 PCIe Card may not initialize at power cycle.

Workaround

- **Update the firmware to SW 2.0 or later.**

▼ **SUNBT7181173 variable (up to 25% IOPS) reads throughput (11%) performance (15801572)**

The Sun Flash Accelerator F80 PCIe Card SUNBT7181173 variable (up to 25% IOPS) reads throughput (11%) performance.

Workaround

- **Update the firmware to SW 2.0 or later.**

▼ **SUNBT7185967 DFF is reported missing during power cycle (15805379)**

The Sun Flash Accelerator F80 PCIe Card SUNBT7185967 DFF is reported missing during power cycle.

Workaround

- **Update the firmware to SW 2.0 or later.**

▼ **SUNBT7178453 Panic Logs found on Sun Flash Accelerator F80 PCIe Card (15799303)**

Sun Flash Accelerator F80 PCIe Card Panic Logs are generated.

Workaround

- **Update the firmware to SW 2.0 or later.**

▼ Sun Flash Accelerator F80 PCIe Card DDCLI reports overall health as GOOD even if SSD temperature is over 74C (15780582)

The Sun Flash Accelerator F80 PCIe Card DDCLI utility reports overall health as GOOD even if the SSD temperature exceeds 74 degrees C.

Workaround

- Update the firmware to SW 2.0 or later.

▼ Sun Flash Accelerator F80 PCIe Card Not Visible to OS (17377266)

On a rare occasion, after a system reset, a Sun Flash Accelerator F80 PCIe card is not seen by the operating system. If the OS does not detect a Sun Flash Accelerator F80 PCIe Card, run the DDCLI command line utility. Type `ddcli` to confirm the number of Sun Flash Accelerator F80 PCIe Cards that can be seen by the system. The output should display all installed Sun Flash Accelerator F80 PCIe Cards. For more information on the DDCLI command line utility, refer to the [Sun Flash Accelerator F80 PCIe Card User's Guide](#).

The following example shows four Sun Flash Accelerator F80 PCIe cards in the DDCLI command line utility:

```
## /ddcli

*****
LSI Corporation WarpDrive Management Utility
Version 110.00.07.00 (2013.08.12)
Copyright (c) 2013 LSI Corporation. All Rights Reserved.
*****

ID      WarpDrive      Package Version  PCI Address
--      -
1      ELP-4x200-4d-n  09.05.24.00     00:02:00:00
2      ELP-4x200-4d-n  09.05.24.00     00:03:00:00
3      ELP-4x200-4d-n  09.05.24.00     00:04:00:00
4      ELP-4x200-4d-n  09.05.24.00     00:05:00:00
```

Workaround

- **If no cards display, reset the system. If the problem still exists, please contact your service representative.**