Oracle® Flash Accelerator F640 PCIe Card v1 Product Notes

Part No: E87232-08
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Référence: E87232-08

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Contents

Using This Documentation

- **Overview** – Provides late-breaking information about Oracle Flash Accelerator F640 PCIe Card v1
- **Audience** – System administrators, network administrators, and service technicians
- **Required knowledge** – Advanced understanding of server systems

Product Documentation Library

Documentation and resources for this product and related products are available at: https://www.oracle.com/goto/oracleflashf640/docs

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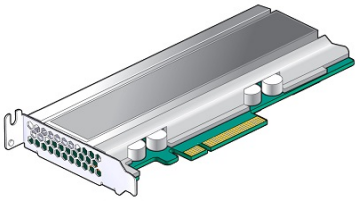
Oracle Flash Accelerator F640 PCIe Card v1 Product Notes

This section contains late-breaking information about Oracle Flash Accelerator F640 PCIe Card v1s. Read this section before reading other Oracle Flash Accelerator F640 PCIe Card v1 documentation. Always refer to the latest version of the product notes.

For specific installation instructions, late-breaking information about the installation and use of Oracle Flash Accelerator F640 PCIe Card v1s with your server, supported firmware and operating systems, important operating notes, and known issues, refer to the latest platform product notes document.



These topics are included in this section.

Description	Links
Review the software and firmware supported for Oracle Flash Accelerator F640 PCIe Card v1s.	“Supported Hardware and Software” on page 10
Review important information for configuring Oracle Flash Accelerator F640 PCIe Card v1s.	“Implementation Considerations” on page 17
Check known issues.	“Known Issues” on page 38

Supported Hardware and Software

The following sections describe the software and firmware supported for Oracle Flash Accelerator F640 PCIe Card v1s:

Supported Servers and Operating Systems

This section lists the servers that support Oracle Flash Accelerator F640 PCIe Card v1s. 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 Oracle Flash Accelerator F640 PCIe Card v1.

x86 Servers	Number of Cards	Slots Supported for Installing Cards	Minimum Supported Operating Systems
Oracle Server X7-2L	1 to 4 for HC (High Capacity) 1 to 8 for EF (Extreme Flash)	For HC (High Capacity): Slots 4,5,6,10 For EF (Extreme Flash): Slots 2,3,4,5,6,8,9,10 See "Oracle Server X7-2L Configuration" on page 18 for additional requirements.	■ Oracle Linux 7.3 With Unbreakable Enterprise Kernel Release 4 Update 4 (UEK R4u4) or the Red Hat Compatible Kernel ■ Oracle Linux 6.9 With Unbreakable Enterprise Kernel Release 4 Update 4 (UEK R4u4) or the Red Hat Compatible Kernel ■ Oracle VM 3.4.4 ■ Oracle Solaris 11.3 SRU 23 ■ Windows Server 2016 ■ Windows Server 2012 R2 ■ VMware ESXi 6.5 Update 1
Oracle Server X7-8	1 to 4 in 4-CPU System 1 to 8 in 8-CPU System	4-CPU System System A: Slots 8,6,4,2 4-CPU System System B: Slots 16,14,12,10 8-CPU System Slots 16,8,14,6,12,4,10,2	■ Oracle Linux 7.3 With Unbreakable Enterprise Kernel Release 4 Update 4 (UEK R4u4) or the Red Hat Compatible Kernel ■ Oracle Linux 6.9 With Unbreakable Enterprise Kernel Release 4 Update 4 (UEK R4u4) or the Red Hat Compatible Kernel

x86 Servers	Number of Cards	Slots Supported for Installing Cards	Minimum Supported Operating Systems
			■ Oracle VM 3.4.4 ■ Oracle Solaris 11.3 SRU 23 ■ Windows Server 2016 ■ Windows Server 2012 R2 ■ VMware ESXi 6.5 Update 1

SPARC Servers	Number of Cards	Slots Supported for Installing Cards	Minimum Supported Operating Systems
SPARC S7-2 Server	1 to 3	1 to 3	Oracle Solaris 11.3 (SRU 23)
SPARC S7-2L Server	1 to 6	1 to 6	Oracle Solaris 11.3 (SRU 23)
SPARC T7-1 Server	1 to 4	1 to 6	Oracle Solaris 11.3 (SRU 23)
SPARC T7-2 Server	1 to 4	1 to 8 (All)	Oracle Solaris 11.3 (SRU 23)
SPARC T7-4 Server	1 to 8	1, 2, 3, 4, 13, 14, 15, 16	Oracle Solaris 11.3 (SRU 23)
SPARC M7-8 Server with one PDomain	1 to 16 Up to 16 per system	1 to 16 (All)	Oracle Solaris 11.3 (SRU 23)
SPARC M7-8 Server with two PDomains	1 to 8 Up to 8 per PDomain. Up to 16 per system	1 to 16 (All)	Oracle Solaris 11.3 (SRU 23)
SPARC M7-16 Server	1 to 32 Up to 8 per PDomain Up to 32 per system	1 to 48 (All)	Oracle Solaris 11.3 (SRU 23)
SPARC T8-1 Server	1 to 4	1 to 6 (All)	Oracle Solaris 11.3 (SRU 23)
SPARC T8-2 Server	1 to 4	1 to 8	Oracle Solaris 11.3 (SRU 23)
SPARC T8-4 Server	1 to 8	3, 16, 4, 15, 7, 12, 8, 11, 1, 14, 5, 10, 2, 13, 6, 9	Oracle Solaris 11.3 (SRU 23)
SPARC M8-8 Server with one PDomain	1 to 12 Up to 12 per system	1 to 16 (All)	Oracle Solaris 11.3 (SRU 23)
SPARC M8-8 Server with two PDomains	1 to 16 Up to 8 per PDomain Up to 16 per system	1 to 16	Oracle Solaris 11.3 (SRU 23)

Other servers and processors might 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 for device support.

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 your server product notes for up-to date information on supported servers, operating systems, and required patchsets.

Minimum Supported Card Firmware Version

Oracle Flash Accelerator F640 PCIe Card v1s run with the minimum required firmware package listed in the following table.

Firmware	Minimum Required Card Firmware Version	Recommended Card Firmware Version
Oracle 6.4 TB NVMe SSD Package	Patch 28403112 - ORACLE FLASH 640 ACCELERATOR PCIE AIC - RD28 FIRMWARE QDV1RD28 Support for: ■ Oracle X7 series servers ■ SPARC S7 series servers ■ SPARC T7 series servers ■ SPARC T8 series servers ■ SPARC M7 series servers ■ SPARC M8 series servers	Patch 33518707: F640 ORACLE FLASH ACCELERATOR (AIC) FW RF35 Oracle Flash Accelerator F640 PCIe Card : ICDPC5ED2. RF35.fw QDV1RF35 Support for: ■ Oracle X7 series servers ■ SPARC S7 series servers ■ SPARC T7 series servers ■ SPARC T8 series servers ■ SPARC M7 series servers ■ SPARC M8 series servers

Note - For best practice, install the latest device firmware versions.

Summary of Changes in Firmware RF35 Release

The following improvements or changes were included in firmware QDV1RF35 release of Oracle Flash Accelerator F640 PCIe Card v1:

- Support for SPARC T8-4 servers.
- If you install Oracle Flash Accelerator F640 PCIe Card v1s as an option, you must update 8DV1RD30 firmware to QDV1RD35 (the metadata will automate this process). Recommended firmware update improves quality of product for Oracle Flash Accelerator F640 PCIe Card v1.
- The AIC Firmware RF35 package includes the firmware files and associated metadata.xml files that automate the Oracle Flash Accelerator F640 PCIe Card v1 update process.

Summary of Changes in Firmware RF30 Release

The following improvements or changes were included in firmware 8DV1RF30 release of Oracle Flash Accelerator F640 PCIe Card v1 and Oracle 6.4 TB NVMe SSD:

- Merged firmware for Oracle Flash Accelerator F640 PCIe Card v1 and Oracle 6.4 TB NVMe SSD. Recommended firmware update improves quality of product and merges into one binary for both Oracle Flash Accelerator F640 PCIe Card v1 and Oracle 6.4 TB NVMe SSD.
- The AIC Firmware RF30 package includes the firmware files and associated metadata.xml files that automate the Oracle Flash Accelerator F640 PCIe Card v1 and 6.4TB NVMe PCIe SSD update process.
- If you install Oracle Flash Accelerator F640 PCIe Card v1s as an option, you must update 8DV1RD22 or 8DV1RD24 firmware to 8DV1RD27, and then to 8DV1RD28 or to 8DV1RF30 (the metadata will automate this process).
- Key Fixes include:
  - Bug ID 28244670 – Oracle ILOM incorrectly faults the device with message "Fault fault.io.scsi.cmd.disk.dev.rqs.baddrv on FRU /SYS" (Oracle 6.4 TB NVMe SSD)

    Oracle ILOM Software Release 4.0.4.21.a is required on x86 platforms using firmware release 8DV1RF30 to reduce device read failures. The SMbus can take up to 30 seconds to respond after a firmware update (Bug ID: 28708331 – Device Monitor: Extend jitter check to cover device read failures).
  - Bug ID 27759886 – Oracle 6.4 TB NVMe SSD SFF Asserting on RE14 – when device sits unpowered for several weeks, device may report UE errors or assert

    To immediately ensure the fix is implemented, perform the *Secure Erase Cards Before Use* erase sequence, otherwise after two weeks of device power-on the issue will be fully resolved. See “Secure Erase Cards Before Use” on page 34.
  - Assert codes HI149 and DE003 (DRAM Memory Access Error), and NDA (no device attached) due to NAND channel timeout and sidetrace corruption

Summary of Changes in Firmware RD28 Release

The following improvements or changes were included in firmware 8DV1RD28 release of Oracle F640 Flash Card:

- If you install Oracle Flash Accelerator F640 PCIe Card v1s as an option, you must update 8DV1RD22 firmware to 8DV1RD24, and then to 8DV1RD28, or a subsequent firmware release if available.

Summary of Changes in Firmware RD24 Release

The following improvements or changes were included in firmware 8DV1RD24 release of Oracle F640 Flash Card:

- Support for Oracle X7 series servers.
- If you install Oracle Flash Accelerator F640 PCIe Card v1s as an option, you must update the firmware to 8DV1RD24, or a subsequent release if available.

Summary of Changes in Firmware RD22 Release

The following improvements or changes were included in firmware 8DV1RD22 release of Oracle F640 Flash Card:

- Support for SPARC S7 series servers.
- Support for SPARC T7 series servers.
- Support for SPARC T8 series servers.
- Support for SPARC M7 series servers.
- Support for SPARC M8 series servers.
- If you install Oracle Flash Accelerator F640 PCIe Card v1s as an option in SPARC T7, T8, M7, M8 series servers, you must update the firmware to 8DV1RD22, or a subsequent release if available.

Required Host Firmware

Oracle Flash Accelerator F640 PCIe Card v1s run with the minimum required host firmware listed in the following table.

x86 Driver	Minimum Required System Firmware Version (Patch No.)	Recommended System Firmware Version (Patch No.)
Oracle Server X7-2	Patch 27468399 Oracle Server X7-2 SW 1.1.1	Patch 33193097: Oracle Server X7-2 SW 3.2.2 - FIRMWARE PACK or later
Oracle Server X7-2L	Patch 27468368 Oracle Server X7-2L SW 1.1.1	Patch 33194331: Oracle Server X7-2L SW 3.2.2 - FIRMWARE PACK or later
Oracle Server X7-8	Patch 27471346 Oracle Server X7-8 SW 1.1.2	Patch 33187298: Oracle Server X7-8 SW 3.2.2 - FIRMWARE PACK or later

SPARC Driver	Minimum Required System Firmware Version (Patch No.)	Recommended System Firmware Version (Patch No.)
SPARC S7-2 Server	S7-2 Sun System Firmware 9.8.3 - Patch number 27043768 With Hardware_Programmables-1.0.14-SPARC_T7-1+T7-2+T7-4+S7-2+S7-2L.pkg file also installed.	Patch 33270228: FIRMWARE: SPARC S7-2 SUN SYSTEM FIRMWARE 9.10.3 or later
SPARC S7-2L Server	S7-2 Sun System Firmware 9.8.3 - Patch number 27043769 With Hardware_Programmables-1.0.14-SPARC_T7-1+T7-2+T7-4+S7-2+S7-2L.pkg file also installed.	Patch 33270230: FIRMWARE: SPARC S7-2L SUN SYSTEM FIRMWARE 9.10.3 or later
SPARC T7-1 Server	SPARC T7-1 Sun System Firmware 9.8.3 - Patch number 27043765 With Hardware_Programmables-1.0.14-SPARC_T7-1+T7-2+T7-4+S7-2+S7-2L.pkg file also installed.	Patch 33270223: FIRMWARE: SPARC T7-1 SUN SYSTEM FIRMWARE 9.10.3 or later
SPARC T7-2 Server	SPARC T7-2 Sun System Firmware 9.8.3 - Patch number 27043766 With Hardware_Programmables-1.0.15-SPARC_T7-1+T7-2+T7-4+S7-2+S7-2L.pkg file also installed.	Patch 33270225: FIRMWARE: SPARC T7-2 SUN SYSTEM FIRMWARE 9.10.3 or later
SPARC T7-4 Server	SPARC T7-4 Sun System Firmware 9.8.3 - Patch number 27043767 With Hardware_Programmables-1.0.14-SPARC_T7-1+T7-2+T7-4+S7-2+S7-2L.pkg file also installed.	Patch 33270226: FIRMWARE: SPARC T7-4 SUN SYSTEM FIRMWARE 9.10.3 or later
SPARC T8-1 Server	T8-1 Sun System Firmware 9.8.1a - Patch number 26585181	Patch 33270219: FIRMWARE: SPARC T8-1 SUN SYSTEM FIRMWARE 9.10.3 or later
SPARC T8-2 Server	T8-2 Sun System Firmware 9.8.1 - Patch number 26585182	Patch 33270220: FIRMWARE: SPARC T8-2 SUN SYSTEM FIRMWARE 9.10.3 or later
SPARC T8-4 Server	T8-4 Sun System Firmware 9.8.1 - Patch number 26585183	Patch 33270221: FIRMWARE: SPARC T8-4 SUN SYSTEM FIRMWARE 9.10.3 or later

SPARC Driver	Minimum Required System Firmware Version (Patch No.)	Recommended System Firmware Version (Patch No.)
SPARC M7-8 Server with one PDomain	SPARC M7-Systems Sun System Firmware 9.5.2.g - Patch number 22078907	Patch 33270227: FIRMWARE: SPARC M8-8+M7-16+M7-8 SYSTEMS SUN SYSTEM FIRMWARE 9.10.3 or later
SPARC M7-8 Server with two PDomains	SPARC M7-Systems Sun System Firmware 9.5.2.g or later - Patch number 22078907	Patch 33270227: FIRMWARE: SPARC M8-8+M7-16+M7-8 SYSTEMS SUN SYSTEM FIRMWARE 9.10.3 or later
SPARC M7-16 Server	SPARC M7-Systems Sun System Firmware 9.5.2.g - Patch number 22078907	Patch 33270227: FIRMWARE: SPARC M8-8+M7-16+M7-8 SYSTEMS SUN SYSTEM FIRMWARE 9.10.3 or later
SPARC M8-8 Server with one PDomain	SPARC M8-Systems Sun System Firmware 9.8.0d - Patch number 27185996	Patch 33270227: FIRMWARE: SPARC M8-8+M7-16+M7-8 SYSTEMS SUN SYSTEM FIRMWARE 9.10.3 or later
SPARC M8-8 Server with two PDomains	SPARC M8-Systems Sun System Firmware 9.8.0d - Patch number 27185996	Patch 33270227: FIRMWARE: SPARC M8-8+M7-16+M7-8 SYSTEMS SUN SYSTEM FIRMWARE 9.10.3 or later

Note - Refer to Firmware Downloads and Release History for Oracle Systems (`https://www.oracle.com/servers/technologies/firmware/release-history-jsp.html`).

Keep Drivers and Firmware Up to Date

Refer to the server documentation to check for updates to the device firmware. For information on updating drivers and firmware for Oracle Flash Accelerator F640 PCIe Card v1s, see "Accessing Software Updates and Firmware Downloads" on page 22 and refer to "Update Your System to the Latest Software Release" in *Oracle Flash Accelerator F640 PCIe Card User Guide*.

Server Management Tools

The following single system management tools are available for the server:

- **Oracle Integrated Lights Out Management (ILOM)**. For information, refer to the product information page at: `https://www.oracle.com/servers/technologies/integrated-lights-out-manager.html`. For documentation, refer to the Oracle Integrated Lights Out Manager (ILOM) 5.0 Documentation Library at: `https://www.oracle.com/goto/ilom/docs`

You can find descriptions of new Oracle ILOM 5.0 features in the *Oracle ILOM Feature Updates and Release Notes*.

- **Oracle Hardware Management Pack**, available with the Oracle Solaris OS or as a standalone product with other OS. For information, refer to the product information page at: https://www.oracle.com/servers/technologies/hardware-management-pack.html. For documentation and OS support matrix, refer to the Oracle Hardware Management Pack 2.4 Documentation Library at: https://www.oracle.com/goto/ohmp/docs

  Oracle Hardware Management Pack for Oracle Solaris 11.4 Documentation Library at https://docs.oracle.com/cd/E79568_01/index.html

In addition, the following software is available to manage multiple systems in a data center:

Oracle Enterprise Manager Ops Center, available software to manage multiple systems in a data center. For information, refer to the product information page at: https://www.oracle.com/enterprise-manager/technologies/. For documentation, refer to the Oracle Enterprise Manager Cloud Control Documentation Library at: https://docs.oracle.com/en/enterprise-manager/related-products.html

Implementation Considerations

These topics provide important information for configuring Oracle Flash Accelerator F640 PCIe Card v1s in supported servers:

Oracle Server X7-2L Configuration

Oracle Flash Accelerator F640 PCIe Card v1 population rules for Oracle Server X7-2L:

- If Oracle F640 Flash Card quantity is less than three, then Oracle F640 Flash Card installation order is: NVMe0, NVMe1, NVMe2, NVMe3 NVMe4, NVMe5, NVMe6, NVMe7, NVMe8, NVMe9, NVMe10, NVMe11
- If Oracle F640 Flash Card quantity is four, then Oracle F640 Flash Card installation order is: NVMe4, NVMe5, NVMe6, NVMe10
- If Oracle F640 Flash Card quantity is more than four, then Oracle F640 Flash Card installation order is: NVMe0, NVMe1, NVMe2, NVMe3 NVMe4, NVMe5, NVMe6, NVMe7, NVMe8, NVMe9, NVMe10, NVMe11

  Note the following restrictions for installing more than four Oracle F640 Flash Cards:

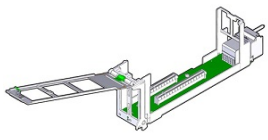
  - Do not install Oracle Storage 12 Gb SAS PCIe RAID HBA, Internal: 16 port card.
  - Do not install HBA-connected storage drives in the server front bays.

Refer to the server documentation for more information at https://www.oracle.com/goto/x7-2l/docs.

Oracle Server X7-8 Configuration

Oracle Server X7-8 requires a doublewide PCIe hot-plug carrier extension for each installed Oracle Flash Accelerator F640 PCIe Card v1 to facilitate airflow. Dual PCIe Card Carriers (DPCCs) do not allow the use of one adjacent PCIe slot. PCIe hot-plug carrier extensions (PN 710710) are installed in odd numbered PCIe slots.

The following figure shows an example of a hot-swappable Dual PCIe Card Carrier that populates two PCIe slots for each Oracle Flash Accelerator F640 PCIe Card v1.



For more information about server configuration, refer to the server documentation at https://www.oracle.com/goto/x7-8/docs.

SPARC S7-2 Server Configuration

SPARC S7-2 series servers support the Oracle Flash Accelerator F640 PCIe Card v1 as a boot device.

For more information about the servers, refer to the server documentation at https://www.oracle.com/goto/s7-2/docs.

SPARC S7-2L Server Configuration

SPARC S7-2 series servers support the Oracle Flash Accelerator F640 PCIe Card v1 as a boot device.

For more information about the servers, refer to the server documentation at https://www.oracle.com/goto/s7-2l/docs.

SPARC T7-1 Server Configuration

SPARC T7 series servers support the Oracle Flash Accelerator F640 PCIe Card v1 as a boot device.

In SPARC T7-1 servers that have Oracle Flash Accelerator F640 PCIe Card v1s installed, you can populate no more than four slots, which are two fewer than systems that use Oracle Flash Accelerator F320 PCIe Cards.

For more information about the servers, refer to the server documentation at https://www.oracle.com/goto/t7-1/docs.

SPARC T7-2 Server Configuration

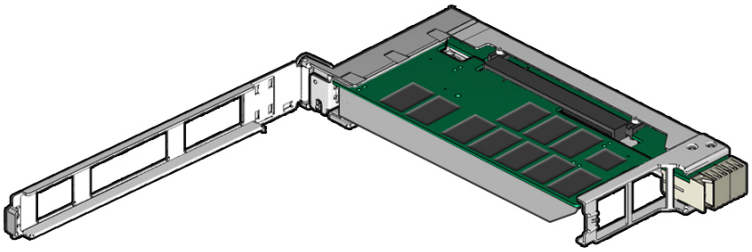
SPARC T7 series servers support the Oracle Flash Accelerator F640 PCIe Card v1 as a boot device.

For more information about the server, refer to the server documentation at https://www.oracle.com/goto/t7-2/docs.

SPARC T7-4 Server Configuration

SPARC T7-4 Servers require a singlewide PCIe hot-plug carrier extension for each installed Oracle Flash Accelerator F640 PCIe Card v1 to facilitate airflow.

In SPARC T7-4 servers that have Oracle Flash Accelerator F640 PCIe Card v1s installed, you must install cards in slots 1/2/3/4/13/14/15/16 to avoid thermal concerns in the system.



SPARC T7 series servers support the Oracle Flash Accelerator F640 PCIe Card v1 as a boot device.

For more information about the servers, refer to the server documentation at https://www.oracle.com/goto/t7-4/docs.

SPARC M7 Series Servers Configuration

SPARC M7 series servers support the use of only PCIe x16 hot-plug card carriers, which are physically labeled with "x16 CAR" on the faceplate. PCIe x8 card carriers from earlier generations of Oracle servers, which are labeled with "CAR" on the faceplate, are not supported for use in M7 series servers. PCIe x8 and PCIe x16 cards are supported for use in these servers.

SPARC M7 series servers support the Oracle Flash Accelerator F640 PCIe Card v1 as a boot device. Use slot 3 for the NIC and boot device. Treat SPARC M7 series server slots 1 and 3 in CMIOUs 0-2 and 4-6 the same. Oracle F640 Flash Cards should be in the lowest number slots available. If the Oracle F640 Flash Card contains the operating system for the physical domain, then bring the physical domain down to the Oracle ILOM prompt (power down the PDomain).

For more information about the servers, refer to the server documentation at https://www.oracle.com/goto/m7/docs.

SPARC T8-1 Server Configuration

SPARC T8 series servers support the Oracle Flash Accelerator F640 PCIe Card v1 as a boot device.

For more information about the servers, refer to the server documentation at https://www.oracle.com/goto/t8-1/docs.

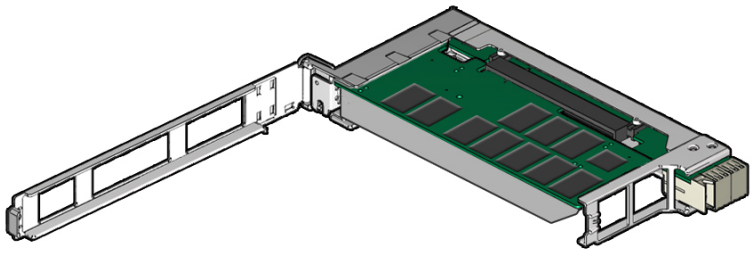
SPARC T8-2 Server Configuration

SPARC T8 series servers support the Oracle Flash Accelerator F640 PCIe Card v1 as a boot device.

For more information about the server, refer to the server documentation at https://www.oracle.com/goto/t8-2/docs.

SPARC T8-4 Server Configuration

SPARC T8-4 Servers require a singlewide PCIe hot-plug carrier extension for each installed Oracle Flash Accelerator F640 PCIe Card v1 to facilitate airflow.



SPARC T8 series servers support the Oracle Flash Accelerator F640 PCIe Card v1 as a boot device.

For more information about the servers, refer to the server documentation at https://www.oracle.com/goto/t8-4/docs.

SPARC M8 Series Servers Configuration

SPARC M8 series servers support the use of only PCIe x16 hot-plug card carriers, which are physically labeled with "x16 CAR" on the faceplate. PCIe x8 card carriers from earlier generations of Oracle servers, which are labeled with "CAR" on the faceplate, are not supported for use in M8 series servers. PCIe x8 and PCIe x16 cards are supported for use in these servers.

SPARC M8 series servers support the Oracle Flash Accelerator F640 PCIe Card v2 as a boot device. SPARC M8 series servers support up to two Oracle F640 Flash Card v2s per CMIOU. Use slot 3 for the NIC and boot device. Treat SPARC M8 series server slots 1 and 3 in CMIOUs 0-2 and 4-6 the same. Oracle F640 Flash Card v2s should be in the lowest number CMIOU slots available.

Hot-plugging cannot be used if the Oracle F640 Flash Card v2 contains the operating system boot image for the physical domain (PDomain). In that case power down the physical domain to the Oracle ILOM prompt. Refer to: *Removing Power From the Server or Domain* at `https://docs.oracle.com/cd/E55211_01/html/E55215/gojoq.html#scrolltoc`

For more information about the servers, refer to the server documentation at `https://www.oracle.com/goto/m8/docs`.

SSD Volume Management

A volume manager can present multiple SSD devices as one larger volume. Use the Automatic Storage Management (ASM) volume manager or other volume manager to concatenate multiple flash memory domains. For example, a volume manager can be used to concatenate four 6.4 TB domains into a single 25.6 TB volume.

Refer to the Automatic Storage Management documentation at `https://docs.oracle.com/en/database/oracle/oracle-database/19/ostmg/index.html`.

Accessing 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.

See:

- “Download the Device Software Package” on page 23
- “Update the NVMe Storage Drive Firmware” on page 24

- “Verify Oracle Oracle Flash Accelerator F640 PCIe Card v1 Operation” on page 29

▼ Download the Device Software Package

To find the device software package, access My Oracle Support and download the latest software package for Oracle Flash Accelerator F640 PCIe Card v1s.

1. **Go to the My Oracle Support web site: `https://support.oracle.com`.**
2. **Sign in to My Oracle Support.**
3. **At the top of the page, click the `Patches & Updates` tab.**
   The Patch Search pane appears at the right of the screen.
4. **Within the Search tab area, click `Number/Name` or `Bug Number (Simple)`.**
   The Search tab area appears with search fields.
5. **In the Product field, enter the patch number for Oracle Flash Accelerator F640 PCIe Card v1s.**
   See “Minimum Supported Card Firmware Version” on page 12.
6. **In the Release field, select a software release from the drop-down list.**
   Expand the list to see all available software releases.
7. **Click Search.**
   The Patch Advanced Search Results screen appears, listing the patches for the software release.
8. **To select a patch for a software release, click the patch number next to the software release version.**
   You can use the Shift key to select more than one patch.
   A pop-up action panel appears. The panel contains several action options, including the ReadMe, Download, and Add to Plan options. For information about the Add to Plan option, click the associated button and select “Why use a plan?”.
9. **To review the ReadMe file for this patch, click `ReadMe`.**
10. **To download the patch for the software release, click `Download`.**
11. **In the File Download dialog box, click the patch zip file name.**
    The patch for the software release downloads. The download is an archive zip file, which you must extract to find the directory containing the image.pkg file.

▼ Update the NVMe Storage Drive Firmware

This procedure provides instructions to update Oracle F640 Flash Card NAND flash controller firmware on the host for supported operating systems. Oracle F640 Flash Card firmware is updated as a single package using Oracle Hardware Management Pack utility command-line interface (CLI) tools.

Note - For detailed instructions on system software updates, refer to the server documentation.

Before You Begin

- Update your system to the latest software release.
- Verify that the latest supported software release of Oracle Hardware Management Pack is installed on the host.

  For CLI command instructions, refer to Oracle Hardware Management Pack documentation at `https://www.oracle.com/goto/ohmp/docs`.

1. **Check Oracle Flash Accelerator F640 PCIe Card v1 Product Notes for the latest firmware requirements.**

   See "Minimum Supported Card Firmware Version" on page 12.

2. **Log in to the target system.**

   For detailed instructions, refer to the server installation guide. For example, to log in to the target system through SSH or through Oracle ILOM Remote System Console Plus, do one of the following:

   - **If you are using an SSH client connection.**

     a. **From a shell command line in a terminal window, establish an SSH connection to the server host.**

        Type: **`ssh root@`***hostname*, where *hostname* can be the DNS name or the IP address for the server host.

     b. **Log in to the system using an account with root access.**

     c. **Proceed to Step 3.**

   - **If you are using a remote system console, first refer to the server Administration Guide and then perform these steps.**

     To launch an Oracle ILOM Remote System Console Plus session, refer to Launching Remote KVMS Redirection Sessions in the server Administration Guide.

a. **Establish a remote connection to the host console.**

   Start an Oracle ILOM serial console session, type:

   ```
   -> start /HOST/console

   Are you sure you want to start /HOST/console (y/n)? y
   ```

b. **Ensure that the server is powered on and booted.**

c. **Access the operating system command-line interface.**

   You issue Oracle Hardware Management Pack commands from the operating system command-line interface.

3. **Download and store any firmware image file updates on the server that are required to support Oracle Flash Accelerator F640 PCIe Card v1s and 6.4 TB NVMe SSDs.**

   a. **Download firmware image files from this location:**

      https://support.oracle.com

      See “Download the Device Software Package” on page 23.

   b. **Copy the downloaded firmware image files obtained to the target system root directory.**

4. **Identify all Oracle Flash Accelerator F640 PCIe Card v1 and 6.4 TB NVMe SSD controller firmware versions in the server.**

   a. **Type `# fwupdate list controller`.**

      In the following examples, Oracle Flash Accelerator F640 PCIe Card v1 controllers `c0` and `c1` are enumerated in the output returned by the above command.

```
# fwupdate list controller
================================================
CONTROLLER
================================================
ID    Type   Manufacturer   Model     Product Name              FW Version
------------------------------------------------------------------------------
c0    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T  QDV1RF35
c1    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T  QDV1RF35
c10   SAS    LSI Logic      0x00ce    Avago MegaRAID SAS 9361-1 4.710.00-
c12   NET    Intel          0x1533    Intel(R) I210 Gigabit Net -
```

b. Verify that the firmware package files that are installed in Oracle Flash Accelerator F640 PCIe Card v1s require updating.

To identify NVMe controllers that need updated firmware image files, view the `FW Version` column in the output from the **`fwdupdate list controller`** command.
In the following example, Oracle Flash Accelerator F640 PCIe Card v1 controller `c0` shows firmware version `8DV1RD30`, while the other NVMe controllers show firmware version `8DV1RF35`.

```
# fwupdate list controller
================================================
CONTROLLER
================================================
ID    Type   Manufacturer   Model     Product Name              FW Version
------------------------------------------------------------------------------
c0    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T  QDV1RD30
c1    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T  QDV1RF35
c10   SAS    LSI Logic      0x00ce    Avago MegaRAID SAS 9361-1 4.710.00-
c12   NET    Intel          0x1533    Intel(R) I210 Gigabit Net -
```

c. View the Firmware Revision in the output from the `nvmeadm list -v` command.

To identify NVMe controllers and current firmware versions type **`# nvmeadm list -v`**.
In the following example, controllers `SUNW-NVME-1` and `SUNW-NVME-2` show firmware version `8DV1RF35` in the output returned by the above command.

```
# nvmeadm list -v
SUNW-NVME-1
        PCI Vendor ID:                  0x8086
        Serial Number:                  PHLE713401RZ6P4BGN-1
        Model Number:                   7335943:ICDPC5ED2ORA6.4T
        Firmware Revision:              QDV1RF35
        Number of Namespaces:           1
SUNW-NVME-2
        PCI Vendor ID:                  0x8086
        Serial Number:                  PHLE713401RZ6P4BGN-2
        Model Number:                   7335943:ICDPC5ED2ORA6.4T
        Firmware Revision:              QDV1RF35
        Number of Namespaces:           1
root:~#
```

5. Quiesce Oracle Flash Accelerator F640 PCIe Card v1s and 6.4 TB NVMe SSD devices.

Before removing the card, manually quiesce I/O and device usage.

Caution - System hang or data loss. Before updating device firmware, ensure that the device is quiesced and the following events are not occurring:

- The operating system is not accessing the disk (for example, the system boot disk).
- An application is not accessing the disk (for example, a database application).

6. **Update the selected Oracle Flash Accelerator F640 PCIe Card v1s with the specified firmware package.**

The `fwupdate` command can update firmware for all similar devices in the system utilizing an XML metadata file. This method is called Automatic Mode and is the recommended method for upgrades.

Note - Alternately, if you determine that each device must be updated with a separate `fwupdate` command, perform the `fwupdate` Automatic Single Drive method, or the `fwupdate` Manual method (if an XML metadata file is not available). For CLI command instructions, refer to Oracle Hardware Management Pack documentation at: https://www.oracle.com/goto/ohmp/docs.

a. **Verify that an XML metadata file is available for the server.**

An XML metadata file must be included with the firmware update package to use Automatic Mode. Refer to the update package release notes for more information.

b. **To update device firmware on Oracle Flash Accelerator F640 PCIe Card v1s, type `#fwupdate update controller -x metadata.xml`**

In the following example, controllers `c1` and `c2` will be upgraded to firmware version `QDV1RF35`.

```
# fwupdate update controller -x metadata.xml
 The following components will be upgraded as shown:
============================================================
ID        Priority Action     Status      Old Firmware Ver.   Proposed Ver.
------------------------------------------------------------------------------
c1        1        Check FW   Success     8DV1RD30            QDV1RF35
c2        1        Check FW   Success     8DV1RD30            QDV1RF35
Do you wish to process all of the above component upgrades? [y/n]?
```

If the current firmware package version on the selected controller is higher than the specified firmware package version, the command returns an error. For error codes, refer to Oracle Hardware Management Pack documentation at https://www.oracle.com/goto/ohmp/docs.

c. To upgrade the firmware packages and process all of the above component upgrades, type `y`.

```
Updating c1:  Success
Updating c2:  Success

Verifying all priority 1 updates

Execution Summary
=========================================================
ID  Priority Action     Status    Old Firmware Ver. Proposed Ver.  New Firmware Ver.
 System Reboot
-------------------------------------------------------------------------------
c1  1      Post Power Pending    8DV1RD30          QDV1RF35    N/A     System Reset
c2  1      Post Power Pending    8DV1RD30          QDV1RF35    N/A     System Reset
System Reboot required for some applied firmware
Do you wish to automatically reboot now? [y/n]?
```

d. Type `y` to reboot the host server to initialize the firmware update.

7. Re-access the console. See step 2.

For more instructions, refer to the server Installation Guide.

8. Verify that updated firmware packages are installed in Oracle Flash Accelerator F640 PCIe Card v1s.

a. Type the following from a terminal:

```
# fwupdate list controller
```

In the following example, Oracle Flash Accelerator F640 PCIe Card v1s are displayed.

```
# fwupdate list controller
================================================
CONTROLLER
================================================
ID    Type   Manufacturer   Model     Product Name              FW Version
-------------------------------------------------------------------------
c0    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T  QDV1RF35
c1    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T  QDV1RF35
c10   SAS    LSI Logic      0x00ce    Avago MegaRAID SAS 9361-1 4.710.00-
c12   NET    Intel          0x1533    Intel(R) I210 Gigabit Net -
```

b. Verify host recognition of all Oracle Flash Accelerator F640 PCIe Card v1 and 6.4 TB NVMe SSDs by checking PCIe ID enumeration.

In the above example, Oracle Flash Accelerator F640 PCIe Card v1 controllers `c0` and `c1` are enumerated in the output returned by the above command.

c. **Ensure that Oracle Flash Accelerator F640 PCIe Card v1 and 6.4 TB NVMe SSD firmware was updated in the output returned by the above command.**

   In the above example, Oracle Flash Accelerator F640 PCIe Card v1 controllers `c0` and `c1` show firmware version `QDV1RF35`.

9. **Verify Oracle Flash Accelerator F640 PCIe Card v1 operation.**

   See "Verify Oracle Oracle Flash Accelerator F640 PCIe Card v1 Operation" on page 29.

10. **Repeat the firmware upgrade process until Oracle Flash Accelerator F640 PCIe Card v1s have the most up to date firmware release.**

    See "Minimum Supported Card Firmware Version" on page 12.

    For example, upgrade firmware revision to 8DV1RD30, and then to QDV1RF35.

Related Information

- "Minimum Supported Card Firmware Version" on page 12
- For CLI command instructions, refer to Oracle Hardware Management Pack documentation at `https://www.oracle.com/goto/ohmp/docs`.

  Oracle Server CLI Tools User's Guide

▼ Verify Oracle Oracle Flash Accelerator F640 PCIe Card v1 Operation

This procedure provides instructions to verify Oracle Flash Accelerator F640 PCIe Card v1 operation on the host for supported Oracle Solaris and Oracle Linux operating systems. Verify Oracle Flash Accelerator F640 PCIe Card v1 and 6.4 TB NVMe SSD operation using Oracle Hardware Management Pack utility CLI tools.

Before You Begin

- Verify that Oracle Hardware Management Pack is installed on the host.

  For CLI command instructions, refer to Oracle Hardware Management Pack documentation at `https://www.oracle.com/goto/ohmp/docs`.
- Ensure that you have access to the server (either directly or over the network).

1. **Observe Oracle Flash Accelerator F640 PCIe Card v1 status indicator LEDs.**

Verify that the Fault-Service Action Required Oracle Flash Accelerator F640 PCIe Card v1 status indicator is not lit and that the green Power status indicator is lit on Oracle Flash Accelerator F640 PCIe Card v1s and 6.4 TB NVMe SSDs that you updated.
Refer to "Status Indicators" in *Oracle Flash Accelerator F640 PCIe Card User Guide*.

2. **Log in to the target system.**
For detailed instructions, refer to the server installation guide. For example, to log in to the target system through SSH or through Oracle ILOM Remote System Console Plus, do one of the following:

   - **If you are using an SSH client connection.**

     a. **From a shell command line in a terminal window, establish an SSH connection to the server host.**
     Type: **`ssh root@`***hostname*, where *hostname* can be the DNS name or the IP address for the server host.

     b. **Log in to the system using an account with root access.**

     c. **Proceed to Step 3.**

   - **If you are using a remote system console, refer to the server administration guide and perform these steps.**

     a. **Establish a remote connection to the host console.**
     Start an Oracle ILOM serial console session, type:

     ```
     -> start /HOST/console
     Are you sure you want to start /HOST/console (y/n)? y
     ```

     To launch an Oracle ILOM Remote System Console Plus session, refer to Launching Remote KVMS Redirection Sessions in the server administration guide.

     b. **Ensure that the server is powered on and booted.**

     c. **Access the operating system command-line interface.**
     You issue Oracle Hardware Management Pack commands from the operating system command-line interface.

3. **Identify all Oracle F640 Flash Cards and verify that the latest firmware packages are installed.**

a. Type the following command: `# fwupdate list controller`.

```
# fwupdate list controller
================================================
CONTROLLER
================================================
ID    Type   Manufacturer   Model     Product Name              FW Version
------------------------------------------------------------------------------
c0    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T  QDV1RF35
c1    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T  QDV1RF35
c10   SAS    LSI Logic      0x00ce    Avago MegaRAID SAS 9361-1 4.710.00-
c12   NET    Intel          0x1533    Intel(R) I210 Gigabit Net -
```

b. Verify host recognition of all Oracle F640 Flash Cards by checking controller ID enumeration.

In the above example, Oracle F640 Flash Card controllers `c0` and `c1` are enumerated in the output returned by the above command.

c. Ensure that all Oracle F640 Flash Card firmware revisions are current in the FW Version output returned by the above command.

See "Minimum Supported Card Firmware Version" on page 12.

4. Check NVMe device status.

To identify NVMe controllers and current firmware versions, type **`#nvmeadm list -v`**.

To identify NVMe controllers that have updated firmware, view the `Firmware Revision` row in the output from the **`nvmeadm list -v`** command.

In the following example, controllers `SUNW-NVME-1` and `SUNW-NVME-1` show firmware version `QDV1RF35` in the output returned by the above command.

```
# nvmeadm list -v
SUNW-NVME-1
        PCI Vendor ID:                  0x8086
        Serial Number:                  PHLE713401RZ6P4BGN-1
        Model Number:                   7335943:ICDPC5ED2ORA6.4T
        Firmware Revision:              QDV1RF35
        Number of Namespaces:           1
SUNW-NVME-2
        PCI Vendor ID:                  0x8086
        Serial Number:                  PHLE713401RZ6P4BGN-2
        Model Number:                   7335943:ICDPC5ED2ORA6.4T
        Firmware Revision:              QDV1RF35
        Number of Namespaces:           1
```

5. **Check Oracle Flash Accelerator F640 PCIe Card v1 health and SMART information.**

   To check the selected 6.4 TB NVMe SSD health and SMART (Self-Monitoring, Analysis, and Reporting Technology) information, type:

   ```
   # nvmeadm getlog -h
   ```

   Ensure that Oracle F640 Flash Cards have remaining drive life (`Percentage Used`) in the output returned by the above command.

   ```
   # nvmeadm getlog -h
   F640-NVME-1
   SMART/Health Information:
           Critical Warning: 0
           Temperature: 312 Kelvin
           Available Spare: 100 percent
           Available Spare Threshold: 10 percent
           Percentage Used: 0 percent
           Data Unit Read: 0x1 of 512k bytes.
           Data Unit Written: 0x0 of 512k bytes.
           Number of Host Read Commands: 0x30313b3
           Number of Host Write Commands: 0x302f25d
           Controller Busy Time in Minutes: 0x0
           Number of Power Cycle: 0xf
           Number of Power On Hours: 0x1c
           Number of Unsafe Shutdown: 0xf
           Number of Media Errors: 0x0
           Number of Error Info Log Entries: 0x0
   F640-NVME-2
   SMART/Health Information:....
   ```

Related Information

- “Minimum Supported Card Firmware Version” on page 12
- Oracle Hardware Management Pack documentation at: `https://www.oracle.com/goto/ohmp/docs`

Issues Fixed in This Firmware Release

This section lists the cumulative issues fixed in Firmware Release QDV1RF35 or previously. Consult the Readme.

Fixed Issues

The following Oracle Flash Accelerator F640 PCIe Card v1 issues are fixed in Firmware Release QDV1RF30.

Bug ID	Issue
27759886	Oracle 6.4 TB NVMe SSD Asserting on RE14 To immediately ensure the fix is implemented, perform the *Secure Erase Cards Before Use* erase sequence, otherwise after two weeks of device power-on the issue will be fully resolved. See "Secure Erase Cards Before Use" on page 34.
28708331	Device Monitor: Extend jitter check to cover device read failures Oracle Server X7-2, Oracle Server X7-2L, and Oracle Server X7-8 require using Software Release 1.3.2 or later with Oracle ILOM Software Release 4.0.4.21.a in conjunction with device firmware release 8DV1RF30 to reduce device read failures. The SMbus can take up to 30 seconds to respond after a firmware update.

The following issues are fixed in Firmware Release QDV1RD28.

Bug ID	Issue
27740631	One controller processor in Oracle Flash Accelerator F640 PCIe Card v1 running FW QDV1RD24 does not enumerate after reboot, but is present after power cycle
27446403	Oracle Flash Accelerator F640 PCIe Card v1 running FW QDV1RD22 fails
27439114	Oracle Flash Accelerator F640 PCIe Card v1 running FW QDV1RD24 fails
27023041	Out of band temperature monitoring of Oracle Flash Accelerator F640 PCIe Card v1 stops updating temperature
26842551	Oracle Flash Accelerator F640 PCIe Card v1 device shutdown during OS reboot does not complete, stops

The following issues are fixed in Firmware Release QDV1RD22.

Bug ID	Issue
26768459	Oracle Flash Accelerator F640 PCIe Card v1 Activity LEDs 1 and 2 are OFF during idle when they should be ON
26776176	Fixed assert codes SR004
26638669	Oracle Server X7-8 PCIe Fatal Error - extending completion timeout range for the NVMe device
26566040	Determine the correct NVMe Shutdown timeout period for RTD3 (RunTime D3) power state Oracle Flash Accelerator F640 PCIe Card v1s support NVMe specifications for RTD3 Resume Latency and RTD3 Entry Latency. RTD3R Resume latency allows 7.5 seconds of margin for

Bug ID	Issue
	devices to safely start before main power is applied to the device controller. RTD3E Entry latency allows 6 seconds of margin for active devices to safely shutdown before main power is removed from the device controller. **Note -** Shutdown not complete messages may appear for OSes that do not support RTD3 Resume Latency and RTD3 Entry Latency.

Secure Erase Cards Before Use

Bug ID: 27759886 *Fixed in Firmware Release RF30*

Oracle Flash Accelerator F640 PCIe Card v1 may report uncorrectable errors or assert after not being powered for three or more months. For best practice, secure erase Oracle Flash Accelerator F640 PCIe Card v1s before use (especially if use is reading from the card as a test) and especially if the card has been unpowered for more than three months. If the NAND media is not refreshed for approximately three months, the drive may experience media errors.

Over time, the drive firmware policy refreshes the media in the background while it remains powered-on. If the drive has been powered on long enough for the background refresh policy to be applied to all bits, the drive is not at risk for this issue. The time required to refresh all the bits is approximately 14 days and varies by product.

If the number of bits experiencing this issue exceeds the error-correction code (ECC) capability, it may result in an uncorrectable read error. If the uncorrectable read errors occur during normal drive operation, the drive will report an increased number of SMART media errors to the host. If the uncorrectable read errors occur during drive power-on, the drive will report either an ASSERT or BAD_CONTEXT error code to the host.

The following screen shows an ASSERT or BAD_CONTEXT event at power-on after the media has not been refreshed for a time.

```
Firmware QDV1RD28: ASSERT_100452A0, BAD_CONTEXT_1042, or BAD_CONTEXT_1043
```

Workaround:

Select one of the following methods before use of the drive for operation or test. An off-line server can be used.

- Download and use RF30 mitigation firmware to secure erase the drive, using the `nvmeadmin` utility. See *Secure Erase Oracle Flash Accelerator F640 PCIe Card v1*.
- Wait two weeks for a media refresh while the drive is powered-on before using the drive.

Caution - All data will be destroyed after an erase.

Secure Erase Oracle Flash Accelerator F640 PCIe Card v1

If immediate refresh of all bits is desired, secure erase the drive, using the Oracle Hardware Management Pack NVMe admin utility.

For more information on CLI commands, refer to *Oracle Hardware Management Pack 2.4 Server CLI Tools User's Guide*: `https://www.oracle.com/goto/ohmp/docs`. See "Server Management Tools" on page 16.

1. Stop all IO to the NVMe device before attempting this action. Manually quiesce I/O and device usage.
2. List all server devices. Type: **`# fwupdate list controller`**. For example:

```
# fwupdate list controller

================================================
CONTROLLER
================================================
ID    Type   Manufacturer   Model     Product Name               FW Version
------------------------------------------------------------------------------
c0    SAS    LSI Logic      0x0097    ORACLE-T7                  05.00.00.00
c1    SAS    LSI Logic      0x0097    SAS9300-8e                 13.00.00.00
c2    SAS    LSI Logic      0x0097    ORACLE-T7                  05.00.00.00
c3    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T   8DV1RF35
c4    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T   8DV1RF35
c5    NVMe   Intel          0x0a54    7335940:ICDPC2DD2ORA6.4T   8DV1RF35
c6    NVMe   Intel          0x0a54    7335940:ICDPC2DD2ORA6.4T   8DV1RF35
c7    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T   8DV1RF35
c8    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T   8DV1RF35
c9    NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T   8DV1RF35
c10   NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T   8DV1RF35
c11   NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T   8DV1RF35
c12   NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T   8DV1RF35
c13   NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T   8DV1RF35
c14   NVMe   Intel          0x0a54    7335943:ICDPC5ED2ORA6.4T   8DV1RF35
```

3. Back up drive user data, if necessary.
4. Download the RF30 mitigation firmware image, if necessary.

   See "Download the Device Software Package" on page 23 at "Accessing Software Updates and Firmware Downloads" on page 22.
5. Update the affected drive with the RF30 mitigation firmware, if necessary. See "Update the NVMe Storage Drive Firmware" on page 24.

   Type: **`# fwupdate update nvme-controller-firmware -f`** *<FW file>* **`-n`** *<controller ID>* For example:

```
# fwupdate update nvme-controller-firmware -f ICDPC2DD2.RF30.fw -n c3

The following components will be upgraded as shown:
=========================================================
ID        Priority Action     Status      Old Firmware Ver.   Proposed Ver.       New
 Firmware Ver.   System Reboot
-----------------------------------------------------------------------------------------------------------
c3        1        Check FW   Success     QDV1RF30            Not Provided        N/A
                  N/A
Do you wish to process all of the above component upgrades? [y/n]? y
Updating c3:  Success

Verifying all priority 1 updates
   No metadata provided, so version verification can not be completed

Execution Summary
=========================================================
ID        Priority Action     Status      Old Firmware Ver.   Proposed Ver.       New
 Firmware Ver.   System Reboot
-----------------------------------------------------------------------------------------------------------
c3        1        Validate   Pending     QDV1RF30            Not Provided
 QDV1RF30            N/A
```

6. If applying updates from below Firmware Release RD28, perform a drive full power cycle, as required.

   Because the Oracle Flash Accelerator F640 PCIe Card v1 Vaux (3.3V) cannot be controlled by Oracle ILOM control, perform a system AC power cycle. Refer to the server documentation.

7. Reset the affected drive. Type: **# fwupdate reset controller -n** *<controller ID>*.
8. Check NVMe device status to identify NVMe controllers and current firmware versions. Type **#nvmeadm list -v**. For example:

```
# nvmeadm list -v
SUNW-NVME-1
        PCI Vendor ID:                  0x8086
        Serial Number:                  PHLE713400T56P4BGN-1
        Model Number:                   7335943:ICDPC5ED2ORA6.4T
        Firmware Revision:              8DV1RF35
        Number of Namespaces:           1
SUNW-NVME-2
        PCI Vendor ID:                  0x8086
        Serial Number:                  PHLE713400T56P4BGN-2
        Model Number:                   7335943:ICDPC5ED2ORA6.4T
```

```
        Firmware Revision:              8DV1RF35
        Number of Namespaces:           1
SUNW-NVME-3
        PCI Vendor ID:                  0x8086
        Serial Number:                  PHLE7464009N6P4OGN
        Model Number:                   7335940:ICDPC2DD2ORA6.4T
        Firmware Revision:              8DV1RF35
        Number of Namespaces:           1
SUNW-NVME-4
        PCI Vendor ID:                  0x8086
        Serial Number:                  PHLE7464009L6P4OGN
        Model Number:                   7335940:ICDPC2DD2ORA6.4T
        Firmware Revision:              QDV1RF30
        Number of Namespaces:           1
```

9. Take the drive offline. Type: **# nvmeadm offline -n <namespace> <controller name>** *namespacecontroller_name*. The namespace is 1 in the following example:

```
# nvmeadm offline -n 1 SUNW-NVME-3
```

10. Securely erase the affected drive three times.

    To securely erase all namespaces (SES=1), type: **# nvmeadm erase -a** *controller_name*. For example:

```
# nvmeadm erase -a SUNW-NVME-3
SUNW-NVME-3
Erase data on all namespaces (Y/N)?y
Erase device SUNW-NVME-3 successfully.
```

    Repeat this command two more times to securely erase all namespaces. For example:

```
# nvmeadm erase -a SUNW-NVME-3
SUNW-NVME-3
Erase data on all namespaces (Y/N)?y
Erase device SUNW-NVME-3 successfully.
# nvmeadm erase -a SUNW-NVME-3
SUNW-NVME-3
Erase data on all namespaces (Y/N)?y
Erase device SUNW-NVME-3 successfully.
```

11. Place the drive online. Type: **# nvmeadm online -n <namespace> <controller name>** *namespacecontroller_name*. The namespace is 1 in the following example:

```
# nvmeadm online -n 1 SUNW-NVME-3
```

12. Identify the affected drive block device name of SUNW-NVME-3 using the **`nvmeadm namespace`** command. The Block Device Name is `/dev/rdsk/c28t1d0s2` in the following example:

```
# nvmeadm namespace -v SUNW-NVME-3
SUNW-NVME-3
        Namespace: 1
                Block Size:                     512
                Capacity:                       6401252745216
                Metadata Size:                  0
                Block Device Name:              /dev/rdsk/c28t1d0s2
                Status:                         online
```

    Verify that the device status is `online`.

13. Execute more than 490 GB of sequential write to the affected drive. For example:

```
# dd if=/dev/zero of=/dev/rdsk/c28t1d0p0 bs=131072 count=3814698
3814698+0 records in
3814698+0 records out
```

    The drive Block Device Name is `/dev/rdsk/c28t1d0s2`. Use the Block Device Name that represents the entire drive to utilize the raw device as shown in the above example.

Note - 3814698 (count) x 131072 (bs) = 500,000,096,256 bytes

---

14. Verify drive health. See "Verify Oracle Oracle Flash Accelerator F640 PCIe Card v1 Operation" on page 29.
15. Restore user data, if necessary.

Known Issues

This section describes important operating issues and known hardware and software issues for Oracle Flash Accelerator F640 PCIe Card v1s.

Supplementary and workaround information for Oracle Flash Accelerator F640 PCIe Card v1s. Specific Bug ID identification numbers are provided for service personnel.

Oracle ILOM Reports a Fault for NVMe Devices When Performing a Reboot, Firmware Update, or Hot-Plug Operation

Bug ID: 28654297

Issue: Oracle ILOM might report a `fault.chassis.device.fail`

Affected Hardware and Software: NVMe storage devices on all supported operating systems

Workaround: Disable the device_monitor feature in Oracle ILOM using the following command:

```
set /SP/services/device_monitor servicestate=disabled
```

`hwdiag io nvme_test` Shows `Unable to read FRU` After Oracle Flash Accelerator F640 PCIe Card v1 Firmware Update to RD28 (28002621, 28002756)

The `hwdiag io nvme_test` displays `Unable to read FRU` after Oracle Flash Accelerator F640 PCIe Card v1 firmware is updated to RD28. Oracle 6.4 TB NVMe SSD displays `fault.io.scsi.cmd.disk.dev.rqs.baddrv` on RD28 Oracle Flash Accelerator F640 PCIe Card v1s firmware when upgrading firmware to RD28 on all platforms.

Oracle ILOM monitors this condition and reports card fault due to MIC (I2C bus) corruption that occurs during an Oracle firmware upgrade. The MIC (management Interface controller) corruption event is not visible if the system does not use the I2C bus with Oracle ILOM.

An example for Oracle Flash Accelerator F640 PCIe Card v1s follows:

```
#hwdiag io nvme_test
    Checking NVME drive FRU contents...
        checking fru on drive PCIe 1.0 NVME         OK
        checking fru on drive PCIe 1.1 NVME         OK
        checking fru on drive PCIe 15.0 NVME        FAILED, Unable to read FRU for
 P7_NVME_PCIE1 drive
        checking fru on drive PCIe 15.1 NVME        FAILED, Unable to read FRU for
 P7_NVME_PCIE1 drive
    NVME drives FRU check:                          FAILED
```

```
    Checking NVME drive pcie links...
        checking pcie link on drive PCIe 1.0 NVME   OK
        checking pcie link on drive PCIe 1.1 NVME   OK
        checking pcie link on drive PCIe 15.0 NVME  OK
        checking pcie link on drive PCIe 15.1 NVME  OK
    NVME drives pcie link check:                    PASSED

    Checking NVME drive DSN...
        checking DSN on drive PCIe 1.0 NVME         OK
        checking DSN on drive PCIe 1.1 NVME         OK
        checking DSN on drive PCIe 15.0 NVME        FAILED, Unable to read FRU for
 P7_NVME_PCIE1 drive
        ERROR: Failed reading FRU DSN on drive PCIe 15.0 NVME
        checking DSN on drive PCIe 15.1 NVME        FAILED, Unable to read FRU for
 P7_NVME_PCIE1 drive
        ERROR: Failed reading FRU DSN on drive PCIe 15.1 NVME

 FAILED

NVME test FAILED
```

Workaround:

During the upgrade, the AIC may fail to respond on the SMbus to ILOM, which will report unable to read FRU. If this happens, the system will need to be AC cycled.

To recover the Oracle Flash Accelerator F640 PCIe Card v1 management controller on all platforms after upgrading drive firmware to RD28, AC power cycle the server, which includes reenergizing the 3Vaux supply. Completely power off the server chassis to power state 0 and disconnect all AC power cords from the server. Refer to the server documentation for instructions.

Oracle Flash Accelerator F640 PCIe Card v1 Activity LEDs 1 and 2 Are OFF During Idle When They Should Be ON (26768459)

Oracle Flash Accelerator F640 PCIe Card v1 Activity LED status indicators LED 1 and 2 should be ON during idle. 1 and 2 are OFF during idle when they should be on.

- LED 1 - Blinks Green when IO is Active - At idle not on.
- LED 2 - Blinks Green when IO is Active - At idle not on.
- LED 3 - Solid Green Link good.
- LED 4 - LED is off -- Only on when it has fault. Issue in RD22.

Workaround:

Visually inspect LED 3. If LED 3 is on, the card is powered and idle (if there is no blinking/no activity on LED 1 and 2). If all LED's are off, then the server slot is powered off.

See "Status Indicators" in *Oracle Flash Accelerator F640 PCIe Card User Guide*.

Utility nvmeadm 2.4.3.0 Can Not Reformat Oracle Flash Accelerator F640 PCIe Card v1 to 4096 Bytes LBA Size (27370903, 27367486)

The Oracle Hardware Management Pack utility nvmeadm 2.4.3.0 can not reformat an NVMe drive to 4096 bytes LBA size. When using `nvmeadm format` command, Oracle Flash Accelerator F640 PCIe Card v1s are unable to format with a "4k" logical block address block size as shown in the following examples.

```
# nvmeadm -V
nvmeadm version 2.4.3.0 r20704

# nvmeadm format -a -b 4096 -f SUNW-NVME-2
SUNW-NVME-2
Invalid blocksize and/or metadata size.
ERROR: Command failed on one or more device(s)

# nvme id-ns /dev/nvme1n1
NVME Identify Namespace 1:
nsze    : 0x2e93432b0
ncap    : 0x2e93432b0
nuse    : 0x2e93432b0
nsfeat  : 0
nlbaf   : 1
flbas   : 0
mc      : 0
dpc     : 0
dps     : 0
nmic    : 0
rescap  : 0
fpi     : 0
nawun   : 0
nawupf  : 0
nacwu   : 0
nabsn   : 0
nabo    : 0
nabspf  : 0
```

```
nvmcap  : 6401252745216
nguid   : 01000000010000005cd2e445073d4e51
eui64   : 5cd2e445073d0100
lbaf  0 : ms:0   ds:9  rp:0x2 (in use)
lbaf  1 : ms:0   ds:12 rp:0

# nvmeadm format -l SUNW-NVME-1

SUNW-NVME-1
       LBA Format: 1
               Block Size:                     512  <------.
               Metadata Size:                  0  <---------
       LBA Format: 2
               Block Size:                     512 <----------
               Metadata Size:                  8 <-----------
```

Workaround:

None. Use a supported block size other than a "4k" block size when formating. Use a different supported format utility.

Oracle Flash Accelerator F640 PCIe Card v1 Product Accessibility

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information. The callouts are mapped within a table to provide text descriptions of the referenced parts of the figures. In addition, alternative text is provided for all tables and images that provides the context of the information and images.

Note that screen readers might not always correctly read the code examples in the documentation. The conventions for writing code require that closing braces should appear on an otherwise empty line. However, some screen readers might not always read a line of text that consists solely of a bracket or brace.

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You can access the accessible HTML documentation for Oracle Flash Accelerator F640 PCIe Card v1 products at `https://www.oracle.com/goto/oracleflashf640/docs`.

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