Oracle® Server X5-4 Product Notes

ORACLE®

Oracle Server X5-4 Product Notes

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Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info or visit http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs if you are hearing impaired.

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Using This Documentation

- **Overview** – Provides late-breaking information, issue status, and product announcements for Oracle Server X5-4.
- **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/x5-4/docs-videos`.

Feedback

Provide feedback about this documentation at `https://www.oracle.com/goto/docfeedback`.

Oracle Server X5-4 Product Information

This section provides the following information about supported operating systems, firmware, and hardware configurations.

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Supported Firmware

Some product features are enabled only when the latest versions of patches or firmware are installed. Customers are required to install version 3.2.2 or newer for optimal performance, security, and stability. For details, see "IMPORTANT - Install Latest OS Updates, Patches, and Firmware" on page 20.

You can find detailed information about supported firmware releases here:

- Latest Firmware Releases for Oracle x86 Servers
- Firmware Downloads and Release History for Oracle Systems

Additional information about tools, drivers, component firmware versions, and bug fixes is available in the software release Readme file. For access to the Readme file, see "Server Update Information" on page 13.

Supported Operating Systems

The following Hardware Compatibility Lists (HCLs) identify the latest operating system versions supported on Oracle hardware. To find the latest operating system version supported for Oracle Server X5-4 go to the following sites and search using your server model number:

- Oracle Linux – https://linux.oracle.com/pls/apex/f?p=117:1:3991604960223967
- Oracle VM – https://linux.oracle.com/pls/apex/f?p=117:1:3991604960223967
- Windows – https://www.windowsservercatalog.com/
- VMware ESXi – https://www.vmware.com/resources/compatibility/search.php
- Red Hat Enterprise Linux – https://access.redhat.com/certifications
- SUSE Linux Enterprise Server – https://www.suse.com/yessearch/Search.jsp

Note - Operating system versions are added frequently.

The following table provides minimum supported operating systems.

Operating System	Minimum Supported Version
Oracle Solaris	Oracle Solaris 11.2 SRU 9
Oracle Linux	Oracle Linux 7 for x86 (64-bit) (available as a system preinstalled OS option) Oracle Linux 6.6 for x86 (64-bit) (available as a system preinstalled OS option)
Oracle VM	Oracle VM Server 3.3.2 (available as a system preinstalled OS option)
Red Hat Enterprise Linux	RHEL 6.6 and 7.0
Windows	Microsoft Windows Server 2012 Microsoft Windows Server 2012 and 2012 R2
VMware ESXi	VMware vSphere 6.0

New Features and Changes in SW3.2.2

New features, major enhancements, bug fixes, and other changes that are introduced in platform software release 3.2.2 include:

- Oracle Integrated Lights Out Manager (ILOM) 5.0.2 features
- Oracle Hardware Management Pack 2.4.8
- Security updates

The following table lists Oracle Server X5-4 software release 3.2.2 supported operating systems and virtual machine software.

Operating System	Supported Versions
Oracle Linux	Oracle Linux 6 Update 6, Oracle Linux 6 Update 7, Oracle Linux 6 Update 8, Oracle Linux 6 Update 9, Oracle Linux 6 Update 10 Oracle Linux 7 Update 1, Oracle Linux 7 Update 2, Oracle Linux 7 Update 3, Oracle Linux 7 Update 4, Oracle Linux 7 Update 5, Oracle Linux 7 Update 6, Oracle Linux 7 Update 7, Oracle Linux 7 Update 8, Oracle Linux 7 Update 9 Oracle Linux 8 Update 1, Oracle Linux 8 Update 2, Oracle Linux 8 Update 3
Oracle VM	Oracle VM Server 3.3.1, Oracle VM Server 3.3.2, Oracle VM Server 3.3.3, Oracle VM Server 3.3.4, Oracle VM Server 3.4.1, Oracle VM Server 3.4.2, Oracle VM Server 3.4.3, Oracle VM Server 3.4.4, Oracle VM Server 3.4.5
Oracle Solaris	Oracle Solaris 11 Update 2, Oracle Solaris 11 Update 3
VMware ESXi	VMware ESXi 6.0, VMware ESXi 6.0 Update 1, VMware ESXi 6.0 Update 2, VMware ESXi 6.0 Update 3, VMware ESXi 6.5 Update 1
Red Hat Enterprise Linux	Red Hat Enterprise Linux 6 Update 5, Red Hat Enterprise Linux 6 Update 6, Red Hat Enterprise Linux 6 Update 7, Red Hat Enterprise Linux 6 Update 8 Red Hat Enterprise Linux 7, Red Hat Enterprise Linux 7 Update 1, Red Hat Enterprise Linux 7 Update 2, SUSE Linux Enterprise Server 11 SP3
Windows	Microsoft Windows Server 2012, Microsoft Windows Server 2012 R2, Microsoft Windows Server 2016

Server Update Information

System software (SW) releases are available to maintain support, add enhancements, and correct issues. Updates can include new versions of firmware (BIOS and SP/Oracle ILOM), new releases of tools and drivers, and updates to other supported components.

When a SW release becomes available, its contents are listed in the release Readme file, which is available at the following sources:

- In Oracle System Assistant by clicking the Help button on the System Information page.
- On My Oracle Support at `https://support.oracle.com`.
- With any server package download from My Oracle Support.

Related Information

-

Supported Hardware

The following table contains information about supported hardware for the Oracle Server X5-4.

Note - For additional information about server hardware features, see *Oracle Server X5-4 Installation Guide*

Hardware	Supported Component
CPUs	Intel Xeon E7-8895 v3 18-core 2.6 GHz CPU in a two or four CPU configuration.
Memory[†]	16 GB DDR3-1600 DIMM 16 GB DDR3-1600 LRDIMM
Storage drives[‡]	600 GB 2.5-inch 10000 rpm SAS-3 HDD 1.2 TB 10000 rpm 2.5-inch SAS-3 HDD - Oracle 1.6 TB NVMe SSD and Oracle 3.2 TB NVMe SSD - Not available in systems with Oracle Flash Accelerator F320 PCIe Cards - Require an Oracle NVMe PCIe Switch Card
PCIe cards[*]	- SAS HBA cards: Sun Storage 12 Gb SAS PCIe HBA: 8 port - Oracle Flash Accelerator F320 PCIe Card - Oracle NVMe PCIe Switch Card (required to support Oracle 1.6 TB and 3.2 TB NVMe SSD) **Note -** A system can support either Oracle Flash Accelerator F320 PCIe Cards or Oracle 1.6 TB and 3.2 TB NVMe SSD. It cannot support both. - Fibre channel HBAs: - Sun Storage 16 Gb Fiber Channel PCIe Universal HBA, Qlogic - Sun Storage 12 Gb SAS PCIe RAID HBA - Sun Storage 16 Gb FC optics, SR, Qlogic - Sun Storage 10 Gb FCoE optics, SR, Qlogic - Sun Storage 16 Gb Fibre Channel PCIe Universal HBA, Emulex 10 Gigabit-Ethernet cards: - Sun Dual Port 10GBase-T PCIe 2.0 Low Profile Adapter - Dual-Port 10 Gigabit-Ethernet PCIe 2.0 Copper/Fiber SFP+ - Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP

Hardware	Supported Component
	■ Infiniband cards: Sun Dual Port QDR InfiniBand Host Channel Adapter for PCIExpress Gen 3

[†]For DIMM population rules, see *Oracle Server X5-4 Service Manual*

[‡]For drive population rules, see the *Oracle Server X5-4 Service Manual*

[*]For PCIe card population rules, see "PCIe Card Configuration" on page 15.

PCIe Card Configuration

The following PCIe card installation and mixing rules apply to the Oracle Server X5-4:

■ No mixing of Emulex and Qlogic versions of the Sun Storage 16 Gb Fibre Channel PCIe Universal HBA in the system. Only one vendor's option card can be used per system.

■ No mixing of FC SFP+ and FCoE SFP+ on the same Sun Storage 16 Gb Fibre Channel Universal HBA.

■ However, you can have a mix of a single vendor's Sun Storage 16 Gb Fibre Channel Universal HBA in the system (either Qlogic or Emulex); one installed with FC SFP+ and one installed with FCoE SFP+.

  ■ For Qlogic adapters: 7101676, 7101680, 7101678 FCoE

  ■ For Emulex adapters: 7101686, 7101688 FCoE

■ No mixing of the Sun Storage 16 Gb Fibre Channel PCIe Universal HBA with the Sun Storage 16 Gb FC PCIe HBA in the system.

■ Oracle Server X5-4 supports *either* Oracle Flash Accelerator F320 PCIe Cards *or* Oracle 1.6 TB and 3.2 TB NVMe SSDs. Installing both in the same system is not supported.

■ Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter cards are not supported on servers with Oracle VM preinstall.

The following PCIe card and slot population rules are recommendations based on factory tested configurations.

PCIe Card Installation Order	PCIe Card	Maximum in 2-CPU System	Slot Installation Order	Maximum in 4-CPU System	Slot Installation Order
1	NVMe PCIe Switch Card (required to support Oracle 6.4 TB, 1.6 TB and 3.2 TB NVMe SSD)	1	Slot 1	1	Slot 1
2	Oracle Flash Accelerator F640 PCIe Card (7115454)	2	Slots 6 and 4	4	Slots 10, 7, 6, 4
3	Oracle Flash Accelerator F320 PCIe Card: 3.2 TB,	2	Slots 6 and 4	4	Slots 10, 7, 6, 4

PCIe Card Installation Order	PCIe Card	Maximum in 2-CPU System	Slot Installation Order	Maximum in 4-CPU System	Slot Installation Order
	NVMe PCIe 3.0 (7113825, 7113826) **Note -** Do not install these in the same server with Oracle 1.6 TB NVMe SSD or 3.2 TB NVMe 3.0 SSD.				
4	Oracle Flash Accelerator F160 PCIe Card (7110864, 7110865)	2	Slots 6 and 4	4	Slots 10, 7, 6, 4
5	Sun Storage 12 Gb SAS PCIe RAID HBA: 8 port (7110116, 7110117)	1	Slot 2	1	Slot 2
6	Sun Storage 16 Gb Fibre Channel PCIe Universal HBA, Qlogic (7101674). Card option installation order: 1. FC short wave optics, Qlogic 2. FC long wave optics, Qlogic 3. FcoE short reach optics, Qlogic	2	Slots 6, 4, 5, 3, 1	4	Slots 11, 8, 6, 4, 10, 7, 5, 3, 9, 1
7	Sun Storage 16 Gb Fibre Channel PCIe Universal HBA, Emulex (7101684). Card option installation order: 1. FC short wave optics, Emulex 2. FCoE short reach optics, Emulex	2	Slots 6, 4, 5, 3, 1	4	Slots 11, 8, 6, 4, 10, 7, 5, 3, 9, 1
8	Sun Storage 12 Gb SAS PCIe HBA: 8 port	2	Slots 6, 4, 5, 3, 1	2	Slots 11, 8, 6, 4, 10, 7, 5, 3, 9, 1
8	Sun Dual Port QDR InfiniBand Host Channel Adapter for PCIExpress Gen 3 (7104073, 7104074)	2	Slots 6, 4, 5, 3, 1	2	Slots 11, 8, 6, 4, 10, 7, 5, 3, 9, 1
10	Oracle Quad 10 Gb or Dual 40 Gb Ethernet Adapter	4 in 4x10 mode or 1 in 2x40 mode	Slots 6, 4, 5, 3, 1	4	Slots 11, 8, 6, 4, 10, 7, 5, 3, 9, 1
11	Dual-Port 10 Gigabit-Ethernet PCIe 2.0 Copper/ Fiber SFP+ (1109A-Z, X1109A-Z)	4	Slots 6, 4, 5, 3, 1	8	Slots 11, 8, 6, 4, 10, 7, 5, 3, 9, 1

PCIe Card Installation Order	PCIe Card	Maximum in 2-CPU System	Slot Installation Order	Maximum in 4-CPU System	Slot Installation Order
12	Sun Dual Port 10GBase-T PCIe 2.0 Low Profile Adapter LP; (7100563, 7100488)	2	Slots 6, 4, 5, 3, 1	4	Slots 11, 8, 6, 4, 10, 7, 5, 3, 9, 1
13	Sun Quad Port GbE PCIe 2.0 Low Profile Adapter, UTP (7100479, 7100477)	4	Slots 6, 4, 5, 3, 1	8	Slots 11, 8, 6, 4, 10, 7, 5, 3, 9, 1

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`

- Oracle System Assistant – For information, refer to instructions for setting up the server using Oracle System Assistant in the *Oracle X5 Series Servers Administration Guide* at `https://www.oracle.com/goto/x86admindiag/docs`.

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`

Oracle Integrated Lights Out Manager (ILOM)

Each server module compute node includes a service processor (SP). The SP contains Oracle Integrated Lights Out Manager (ILOM), which provides IPMI 2.0 compliant remote server management capabilities.

The following interfaces provide network access to Oracle ILOM:

- Integrated Lights Out Manager (ILOM) through the server module node service processor (SP) or Chassis Monitoring Module (CMM)
- Local ILOM command-line access using serial connection
- 10/100 management Ethernet port to midplane
- Remote keyboard, video, mouse, and storage (KVMS) over IP

Related Information

-
- ILOM documentation library: https://www.oracle.com/goto/ilom/docs

Important Operating Notes

This section provides information about critical issues that affect your server. These include:

Topic	Links
Server Security, Software Releases, and Critical Patch Updates	"Server Security, Software Releases, and Critical Patch Updates" on page 19
IMPORTANT - Install Latest OS Updates, Patches, and Firmware	"IMPORTANT - Install Latest OS Updates, Patches, and Firmware" on page 20
Note changes to the Oracle ILOM TLSv1.1 configuration property	"Changes to TLSv1.1 Configuration Property as of ILOM 4.0.3.x" on page 21
Diagnosing SAS Data Path Failures on Servers Using MegaRAID Disk Controllers	"Diagnosing SAS Data Path Failures on Servers Using MegaRAID Disk Controllers" on page 22
Oracle ILOM Deprecation Notice for IPMI 2.0 Management Service	"Deprecation Notice for Oracle ILOM IPMI 2.0 Management Service" on page 23
Information about self-signed SSL certificates	"Resolving Warning Messages for Custom CA and Self-Signed SSL Certificates" on page 24

For known issues affecting system components, see:

- "Hardware, Firmware, and BIOS Issues and Announcements" on page 29
- "Oracle Integrated Lights Out Manager (ILOM) Issues and Announcements" on page 37
- "Oracle System Assistant Issues" on page 43
- "Oracle Solaris Issues and Announcements" on page 45
- "Oracle VM Issues and Announcements" on page 51

Server Security, Software Releases, and Critical Patch Updates

To ensure continued security of your system, Oracle strongly recommends that you apply the latest Software Releases. Server Software Releases include Oracle ILOM, BIOS, and other

firmware updates, often referred to as "patches." Oracle publishes these patches regularly on the My Oracle Support site. Applying these patches helps ensure optimal system performance, security, and stability. You can identify the latest Software Release for your system at: `http://www.oracle.com/technetwork/systems/patches/firmware/release-history-jsp-138416.html`

To download a software release, go to My Oracle Support at: `https://support.oracle.com`

Oracle notifies customers about security vulnerability fixes for all its products four times a year through the Critical Patch Update (CPU) program. Customers should review the CPU advisories to ensure that the latest software release updates are applied to their Oracle products. Note that updates for Engineered Systems will be specifically published for a specific Engineered Systems product (that is, you need not look at specific updates for individual software components included in your Engineered System). For more information about the Oracle CPU program, go to `https://www.oracle.com/security-alerts/`.

Oracle also recommends that you update to the latest operating system release when it becomes available. Although a minimum operating system release is supported, updating to the latest OS release ensures that you have the most up-to-date software and security patches. To confirm that you have the latest OS release, refer to the Oracle Hardware Compatibility Lists. See "Supported Operating Systems" on page 12.

For details about the current system software update, see: "IMPORTANT - Install Latest OS Updates, Patches, and Firmware" on page 20.

▼ IMPORTANT - Install Latest OS Updates, Patches, and Firmware

Some product features are enabled only when the latest versions of operating systems, patches, and firmware are installed. To retain optimal performance, security, and stability, you must install the latest available operating systems, patches, and firmware.

To verify the server firmware version:

1. **Use Oracle ILOM to check your system firmware version.**

   - **From the web interface, click System Information > Summary, then view the System Firmware Version in the General Information table.**

   - **From the CLI, type:** `show /System/Firmware` **or** `version.`

For more details, refer to information about viewing system information and inventory in your server administration guide, which is available at `https://www.oracle.com/goto/ilom/docs`.

2. **Ensure that the server firmware version is at the minimum required version, shown above, or a subsequent release, if available.**

3. **If the required firmware (or newer) is not installed:**

    a. **Download the firmware from My Oracle Support at:** `https://support.oracle.com`

        For more information, see: "Supported Firmware" on page 11

    b. **Install the downloaded firmware.**

        Refer to the information about performing firmware updates in the *Oracle ILOM Administrators Guide for Configuration and Maintenance,* which is available at `https://www.oracle.com/goto/ilom/docs`. Ensure that you perform the preparatory steps described in that document before updating the firmware.

Note - Occasionally after installing the firmware, the Oracle ILOM web interface cannot display the power state correctly on the power control page. To correct this problem, clear your browser cache before logging in to the Oracle ILOM web interface.

Changes to TLSv1.1 Configuration Property as of ILOM 4.0.3.x

Present Behavior: The Oracle ILOM TLSv1.1 configuration property is Enabled by default.

Future Behavior: The following changes will occur to the TLSv1.1 configuration property sometime after the Oracle ILOM 4.0.3 firmware release:

- First Change: The TLSv1.1 configuration property will default to Disabled in the next minor release of Oracle ILOM.
- Second Change: The TLSv1.1 configuration property will no longer be supported and will be removed from all Oracle ILOM user interfaces in the next major release of Oracle ILOM.

For future updates regarding TLSv1.1 support in Oracle ILOM, refer to latest release information in the `Oracle ILOM Feature Updates and Release Notes for Firmware 4.0.x` at `https://docs.oracle.com/cd/E81115_01/index.html`.

Diagnosing SAS Data Path Failures on Servers Using MegaRAID Disk Controllers

Important Operating Note

On Oracle x86 servers using MegaRAID disk controllers, Serial Attached SCSI (SAS) data path errors can occur. To triage and isolate a data path problem on the SAS disk controller, disk backplane (DBP), SAS cable, SAS expander, or hard disk drive (HDD), gather and review the events in the disk controller event log. Classify and analyze all failure events reported by the disk controller based on the server SAS topology.

To classify a MegaRAID disk controller event:

- Gather and parse the MegaRAID disk controller event logs either by running the automated sundiag utility or manually using the or `StorCLI` command.

    - For Oracle Exadata Database Machine database or storage cell servers, run the sundiag utility.
    - For Oracle Server X5-4, use the `StorCLI` command.

For example, manually gather and parse the controller event log by using the `StorCLI` command. At the root prompt, type:

```
root# ./storcli64/c0 show events file=event.log
Controller=0
Status=Success
```

Note - Use the existing name of the event log as the name for the disk controller event log. This produces a MegaRAID controller event log with the given file name `event.log`.

To show drive and slot errors separately, at the root prompt, type:

```
root# /opt/MegaRAID/storcli/storcli64 /c0 /eall /sall show errorcounters
Controller=0
Status=Success
Description=Show Drive/Cable Error Counters Succeeded.
```

Error Counters:

Drive	Error Counter for Drive Error	Error Counter for Slot
/c0/e8/s0	0	0
/c0/e8/s1	0	0
/c0/e8/s2	0	0

Drive	Error Counter for Drive Error	Error Counter for Slot
/c0/e8/s3	0	0
/c0/e8/s4	0	0
/c0/e8/s5	0	0
/c0/e8/s12	0	0
/c0/e8/s13	0	0

These error counters reflect drive or slot errors separately.

The following SCSI sense key errors found in the event log in SAS data path failures indicate a SAS data path fault:

```
B/4B/05 :SERIOUS: DATA OFFSET ERROR
B/4B/03 :SERIOUS: ACK/NAK TIMEOUT
B/47/01 :SERIOUS: DATA PHASE CRC ERROR DETECTED
B/4B/00 :SERIOUS: DATA PHASE ERROR
```

A communication fault between the disk and the host bus adapter causes these errors. The presence of these errors, even on a single disk, means there is a data path issue. The RAID controller, SAS cables, SAS expander, or disk backplane might be causing the interruption to the communication in the path between the RAID controller and the disks.

Oracle Service personnel can find more information about the diagnosis and triage of hard disk and SAS data path failures on x86 servers at the My Oracle Support web site: `https://support.oracle.com`. Refer to the Knowledge Article Doc ID 2161195.1. If there are multiple, simultaneous disk problems on an Exadata server, Oracle Service personnel can refer to Knowledge Article Doc ID 1370640.1.

Deprecation Notice for Oracle ILOM IPMI 2.0 Management Service

Present Behavior: IPMI 2.0 Management Sessions - Enabled (default setting).

Future Behavior: The following IPMI Management Service changes will occur in a future Oracle ILOM firmware release after firmware version 4.0.2.

First IPMI Service Support Change: The default configuration property for IPMI 2.0 Sessions will change from Enabled to Disabled. Clients relying on Oracle ILOM IPMI 2.0 session support by default will no longer be able to communicate with Oracle ILOM.

To enable IPMI communication with Oracle ILOM, perform one of the following:

- Use the Oracle IPMI TLS service and interface. For more information, refer to *IPMI TLS Service and Interface* in the *Oracle ILOM Protocol Management Reference SNMP and IPMI Firmware Release 4.0.x*.

- or -

- Manually enable the configuration property for IPMI 2.0 Session. For details, refer to *IPMI Service Configuration Properties* in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x*.

Second IPMI Service Support Change: Removal of IPMI 2.0 client support.

IPMI 2.0 clients *will no longer be able* to communicate with Oracle ILOM. Clients relying on IPMI communication will need to use the IPMI TLS service and interface. For more information, refer to *IPMI TLS Service and Interface* in the *Oracle ILOM Protocol Management Reference SNMP and IPMI Firmware Release 4.0.x*.

For future updates about IPMI Management Service support in Oracle ILOM, refer to the latest firmware release information published in the *Oracle ILOM Feature Updates and Release Notes Firmware Release 4.0.x*.

Resolving Warning Messages for Custom CA and Self-Signed SSL Certificates

The following information applies to the users of the Oracle ILOM Remote System Console and the Oracle ILOM Remote System Console Plus.

A warning message occurs when the Java client is not properly configured to validate the Secure Sockets Layer (SSL) certificate that is currently being using by Oracle ILOM. This validation behavior applies to Oracle ILOM firmware version 3.2.8 or later for systems using the default self-signed SSL certificate and to Oracle ILOM firmware version 3.2.10 and later for systems using a Custom Certification Authority (CA) SSL certificate.

To resolve the SSL warning message, refer to the applicable sections noted below in the Oracle ILOM Administrator's Guide for Configuration and Maintenance Firmware Release 4.0.x, which is available at: https://www.oracle.com/goto/ilom/docs

- *Warning Messages for Self-Signed SSL Certificate*
- *Resolving Warning Messages for Custom Certification Authority (CA) SSL Certificate*

Oracle x86 Products Accessibility

This section describes the accessibility features that are part of Oracle x86 hardware, firmware, and related documentation.

Oracle strives to make its products, services, and supporting documentation usable and accessible to the disabled community. To that end, products, services, and documentation include features that make the product accessible to users of assistive technology.

For more information about Oracle's commitment to accessibility, go to:

- https://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc

Hardware Accessibility

Oracle x86 hardware has color-coded labels, component touch points, and status indicators (LEDs) that provide information about the system. These labels, touch points, and indicators can be inaccessible features for sight-impaired users. The product HTML documentation provides context and descriptive text available to assistive technologies to aid in interpreting status and understanding the system. System-level descriptions and status indicator interpretation can be found in the product Service Manual. The documentation also provides diagrams and screenshots that do not rely on color. Within the diagrams, callouts indicate the referenced component information. The callout descriptions are mapped within a table. All images and tables in the documentation include descriptive alternative text.

Another method to obtain information about the system is to use the built-in Oracle Integrated Lights Out Manager (ILOM). Oracle ILOM provides a browser-based interface and a command-line interface that support assistive technologies for real-time viewing of system status, indicator interpretation, and system configuration. For details, see "Oracle ILOM Accessibility."

You can access the accessible HTML documentation for Oracle x86 hardware products at:

- https://docs.oracle.com/en/servers/

Oracle ILOM Accessibility

You can use the Oracle Integrated Lights Out Manager (ILOM) browser user interface (BUI) to monitor and manage the server hardware. The Oracle ILOM BUI does not require a special accessibility mode; rather, its accessibility features are always available. The BUI was developed using standard HTML and JavaScript and its features conform to accessibility guidelines.

To navigate a BUI page and select items or enter commands, you can use standard keyboard inputs, such as using the Tab key to go to a selection, or the up and down arrow keys to scroll through the page. You can also make menu selections by using standard keyboard combinations.

For example, using the Oracle ILOM Open Problems BUI page, you can identify faulted memory modules (DIMMs) or processors (CPUs) that would otherwise be identified by a lit LED indicator on the motherboard. Likewise, you can use the Oracle ILOM BUI to monitor the hardware power states that are also indicated by flashing LED indicators on the hardware.

The Oracle ILOM command-line interface (CLI) is an alternative and equivalent way to access the Oracle ILOM BUI features and functionality. Because the operating systems that run on the Oracle server hardware support assistive technologies to read the content of the screen, you can use the CLI as an equivalent means to access the color-based, mouse-based, and other visual-based utilities that are part of the BUI. For example, you can use a keyboard to enter CLI commands to identify faulted hardware components, check system status, and monitor system health.

You can use the Oracle ILOM Remote Console Plus to access both a text-based serial console and a graphics-based video console that enable you to remotely redirect host server system keyboard, video, mouse, and storage devices. Note, however, that the Oracle ILOM Java Remote Console does not support scaling of the video frame within the Java application. You need to use assistive technology to enlarge or reduce the content in the Java Remote Console Plus display.

As an alternative method to using the BIOS Setup Utility to configure BIOS settings, Oracle ILOM provides a set of configurable properties that can help you manage the BIOS configuration parameters on an Oracle x86 server. Using Oracle ILOM, you can:

- Back up a copy of the BIOS configuration parameters to an XML file using the Oracle ILOM BUI.
- Edit the XML file using a standard XML editor. The BIOS XML tags correlate directly to the BIOS screen labels.
- Restore the XML file of the backed up or edited configuration parameters to BIOS.

The BUI and CLI methods for using Oracle ILOM are described in the accessible HTML documentation for Oracel ILOM at:

- https://www.oracle.com/goto/ilom/docs

Oracle Hardware Management Pack Accessibility

Oracle Hardware Management Pack software is a set of command-line interface (CLI) tools. Oracle Hardware Management Pack software does not include product-specific accessibility features. Using a keyboard, you can run the CLI tools as text commands from the operating system of a supported Oracle server. All output is text-based.

Additionally, most Oracle Hardware Management Pack tools support command output to a text log file or XML file, which can be used for text-to-speech conversion. Accessible manual pages (man pages) are available that describe the Hardware Management Pack tools on the system on which those tools are installed.

Installation and uninstallation of Oracle Hardware Management Pack can be performed manually, using text commands entered from the CLI. Assistive technology products such as screen readers, digital speech synthesizers, or magnifiers can be used to read the content of the screen.

Refer to the assistive technology product documentation for information about operating system and command-line interface support.

The CLI tools for using the software are described in the accessible HTML documentation for Hardware Management Pack at:

- https://www.oracle.com/goto/ohmp/docs

BIOS Accessibility

When viewing BIOS output from a terminal using the serial console redirection feature, some terminals do not support function key input. However, BIOS supports the mapping of function keys to Control key sequences when serial redirection is enabled. Descriptions of the function key to Control key sequence mappings are provided in the product documentation, typically within the server Service Manual. You can navigate the BIOS Setup Utility by using either a mouse or keyboard commands.

As an alternative method of configuring BIOS settings using the BIOS Setup Utility screens, Oracle ILOM provides a set of configurable properties that can help you manage the BIOS configuration parameters on an Oracle x86 server. For more information, see "Oracle ILOM Accessibility."

BIOS information and its functions are typically documented in the product Service Manual or Installation Guide.

Documentation Accessibility

Documentation for Oracle hardware is provided in HTML and PDF formats. The HTML documents are accessible using standard operating system controls and assistive technology. PDF documents are also provided; however, PDF is not an accessible format. PDF documents are considered support documents because the PDF content is available in accessible HTML format.

Product documentation provides figures, other types of images, and screenshots that do not rely on color for interpretation. Within the figures, callouts indicate the referenced component 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.

The documentation might contain links to web sites of other companies and organizations that Oracle does not own or control. Oracle neither evaluates nor makes any representations regarding the accessibility of these web sites.

You can access the accessible HTML documentation for Oracle x86 products at:

- https://docs.oracle.com/en/servers/

Diversity and Inclusion

Oracle is fully committed to diversity and inclusion. Oracle recognizes the influence of ethnic and cultural values and is working to remove language from our products and documentation that might be considered insensitive. While doing so, we are also mindful of the necessity to maintain compatibility with our customers' existing technologies and the need to ensure continuity of service as Oracle's offerings and industry standards evolve. Because of these technical constraints, our effort to remove insensitive terms is an ongoing, long-term process.

Hardware, Firmware, and BIOS Issues and Announcements

Links to Issues	Workaround?
"Lockstep Memory (Channel) Mode Is Not Supported" on page 29	N/A
"Configuring Jumbo Frames on the Onboard Network Interface Controller" on page 30	N/A
"New Policy Allows You to Prevent System from Disabling DIMMs with Correctable Errors" on page 30	N/A
"New BIOS Setup Selections Can Disable Keyboard and Mouse, and Virtual CD/DVD Drive (21653077)" on page 31	N/A
"To Update Oracle 1.6TB NVMe SSD Firmware, Install RA11 Before Updating to RA12 or RA13" on page 31	Yes
"Reset Takes a Long Time and Causes the Server to Power Cycle" on page 32	N/A
"Updating Firmware for the Sun Storage 16 Gb Fibre Channel PCIe Universal HBA, QLogic (20884466)" on page 32	Yes
"Antistatic Wrist Straps Are Not Included With All CRUs and FRUs" on page 33	N/A
"Changing a Bootable Drive Changes the Order of Devices in the Boot List (22917522)" on page 33	Yes
	Fixed in SW 1.1.1
"System Cannot Boot From An iSCSI Target In UEFI Boot Mode (19721378)" on page 34	No
	Fixed in SW 1.1.0
"SMI Half-Width Failover Error During Server Boot (20494095)" on page 34	Yes
	Fixed in SW 1.0.4
"ZSF Storage ZS5-4 Might Incorrectly Report a Faulted Processor (31686669)" on page 36	No

Lockstep Memory (Channel) Mode Is Not Supported

Your Oracle Server X5-4 does not support lockstep memory mode, which is also known as double device data correction, or Extended ECC.

Configuring Jumbo Frames on the Onboard Network Interface Controller

Your Oracle Server X5-4 includes an internal Intel X540 Ethernet controller, similar to the Sun Dual Port 10GBase-T Adapter. It can be configured to support jumbo frame sizes up to 15.5 KB. The default frame size is 1.5 KB.

For more information, refer to:

- http://docs.oracle.com/cd/E25543_01/index.html
- http://www.intel.com/content/www/us/en/embedded/products/networking/ethernet-x540-datasheet.html

New Policy Allows You to Prevent System from Disabling DIMMs with Correctable Errors

Normally when a DIMM exceeds the threshold of correctable errors (CEs), the system maps it out, which disables it until it can be replaced.

Setting the DIMM CE Map Out policy allows you to prevent the system from mapping out DIMMs that exceed the CE threshold. This feature is available with Oracle ILOM 3.2.6 or later.

- When DIMM CE Mapout is enabled, DIMMs that exceed the CE threshold are mapped out (disabled). This is the default.
- When DIMM CE Mapout is disabled, DIMMs that exceed the CE threshold are not mapped out.

To enable or disable the DIMM CE Mapout policy:

- From the Oracle ILOM web interface, navigate to System Management > Policy and use the drop-down list to enable or disable DIMM CE fault DIMM map out.
- From the Oracle ILOM command-line interface (CLI), enter:

  set /SP/policy DIMM_CE_MAP_OUT=[*enabled/disabled*]

New BIOS Setup Selections Can Disable Keyboard and Mouse, and Virtual CD/DVD Drive (21653077)

Two new selections have been added to the Advanced > USB Ports screen in BIOS Setup. These selections include:

- BMC CD/DVD Drive: Enable or disable the virtual CD/DVD drive in Oracle ILOM.
- BMC Keyboard and Mouse: Enable or disable keyboard and mouse access to the host.

Note - If you disable the BMC Keyboard and Mouse, you cannot use a keyboard to access the host, and you cannot enter BIOS Setup again to re-enable it. Instead, you must use Oracle ILOM to re-enable it. For details, refer to the Oracle Integrated Lights Out Manager (ILOM) 3.2 Documentation Library at: https://www.oracle.com/goto/ilom/docs.

To disable or enable Oracle ILOM to host USB ports:

1. Access BIOS.
2. Select Advanced -> USB.
3. Scroll down the list and select Enabled or Disabled as desired.

To Update Oracle 1.6TB NVMe SSD Firmware, Install RA11 Before Updating to RA12 or RA13

If your Oracle 1.6TB NVMe SSD has firmware RA10 or lower, you must update to RA11 before you update to RA12 or RA13.

The software release includes two firmware files, RA11 and RA13, and associated metadata. xml files that automate the update process. RA11 is bridge firmware to get to RA12 or RA13.

RA13 includes a critical fix where the device might assert at initial power-on. All supported platforms should upgrade to RA13 at earliest convenience.

- If your Oracle 1.6TB NVMe SSD has RA11 or RA12, you can upgrade directly to RA13.
- If your Oracle 1.6TB NVMe SSD has RA10 or lower, you must upgrade to RA11 before upgrading to RA12 or RA13.

Note - Oracle 1.6TB NVMe SSDs do not support firmware versions lower than RA10.

For the latest information about Oracle 1.6TB NVMe SSDs, see `https://www.oracle.com/goto/oracleflashf160/docs`

Reset Takes a Long Time and Causes the Server to Power Cycle

If you have a pending BIOS upgrade, a routine reset takes longer than expected and causes your server to power cycle and reboot several times. This is expected behavior, as it is necessary to power cycle the server to upgrade the BIOS firmware. If the upgrade includes an FPGA update, it can take more than 30 minutes to complete.

A pending BIOS upgrade exists when both conditions are true:

- You update the BIOS and service processor firmware using Oracle ILOM.
- You select the option to Delay BIOS Upgrade.
- The host is powered on.

If you then reboot the server expecting a routine server reset and instead initiate a (delayed) BIOS upgrade, wait until the upgrade is finished. Do not interrupt the process, as this can result in corrupted firmware and server down time.

> **Caution -** Data corruption and system downtime. Interrupting the firmware upgrade process can corrupt the firmware and render the server inoperable.Do not interrupt the upgrade. Allow the process to finish.

> **Note -** Oracle ILOM and BIOS updates are designed to work together. When you have a pending BIOS upgrade, it is recommended that you install the upgrade by resetting or power cycling your server as soon as possible.

For details, refer to "Update the BIOS and Service Processor Firmware (Oracle ILOM)" in *Oracle X5 Series Servers Administration Guide*.

Updating Firmware for the Sun Storage 16 Gb Fibre Channel PCIe Universal HBA, QLogic (20884466)

To update firmware on the Sun Storage 16 Gb Fibre Channel PCIe Universal HBA, QLogic (model 7101674), you must use the image update kit available from the QLogic support site. This kit contains special scripts for updating firmware on the HBA.

> **Note -** Though other tools are available to perform component firmware updates, such as Oracle System Assistant and Oracle Hardware Management Pack, they do not include the additional scripts required to complete the update for this device.

To obtain the QLogic image update kit:

1. Go to the QLogic support site:

   http://driverdownloads.qlogic.com/QLogicDriverDownloads_UI/Oracle_Search.aspx

2. Enter the model number of the (7101674) into the search field.
3. Select the appropriate image upgrade kit for your operating system.
4. Download the kit and refer to the Readme for installation instructions.

Antistatic Wrist Straps Are Not Included With All CRUs and FRUs

The service and installation documentation might state that antistatic wrist straps are included with Customer Replaceable Units (CRUs) and Field Replaceable Units (FRUs). This is not always true. Some CRUs and FRUs are shipped without antistatic wrist straps.

Changing a Bootable Drive Changes the Order of Devices in the Boot List (22917522)

This problem is fixed in system software release 1.1.1.

If you replace a bootable drive, it might change the order of devices in the boot list.

Workaround

Change the boot order manually. For details, see the *Oracle X5 Series Servers Administration Guide* at https://www.oracle.com/goto/x86admindiag/docs.

System Cannot Boot From An iSCSI Target In UEFI Boot Mode (19721378)

This was fixed in system software release 1.1.0.

When in UEFI Boot Mode, the system fails to boot from an iSCSI target and instead boots the next available device.

No workaround is available for this issue. Monitor bug status for fix availability.

SMI Half-Width Failover Error During Server Boot (20494095)

This was fixed in system software release 1.0.4.

On rare occasions during server power on or reset, the system might light the server front-panel CPU Service Action Required indicator and generate an error for the processor and memory subsystems. Single and isolated incidents of this error can be safely ignored. More information is available by logging in to the Oracle ILOM web interface or CLI. Clear the errors using the CLI fault management shell.

Oracle ILOM Web Interface

To investigate the error, log in to the Oracle ILOM web interface. A Service Required state for the Processor and Memory subsystems appears in the Status section of the Oracle ILOM Summary screen. More information is available by clicking the Open Problems link, wherein the problems are defined as:

```
A Scalable Memory Interconnect (SMI) half-width failover has been detected.
```

Note - Additional information is provided within the problem definition, including identification of the specific processor (P) and memory riser (MR) card.

To repair the fault, see the workaround procedure below.

Oracle ILOM CLI Interface

To investigate and repair the errors using the Oracle ILOM CLI interface, see the workaround procedure below.

Workaround

The processor and MR card errors can be repaired using the CLI fault management shell, as described below. If the error persists or memory performance degrades, contact Oracle Service.

1. In a terminal window, type the following command to start an `ssh` session with the server's service processor (SP):

   `ssh root@`*sp-ip-address*

   where *sp-ip-address* is the IP address of the SP.

2. When the CLI prompt appears (–>), navigate to the fault management directory by typing the following command:

   `cd /SP/faultmgmt`

3. To view components that are in a fault state, type the following command:

   `show`

   The components are listed under Targets, as shown in the following example:

   ```
   /SP/faultmgmt
   Targets:
   shell
   0 (/SYS/MB/P0)
   1 (/SYS/MB/P0/MR1)
   ```

4. Make note of the processor and MR card numbering:

   For example, the following shows the faulted processor as P0 and the faulted MR card as MR1:

   ```
   0 (/SYS/MB/P0)
   1 (/SYS/MB/P0/MR1)
   ```

5. To start the `faultmgmt` shell, type the following command:

   `start shell`

   The system responds:

   ```
   Are you sure you want to start /SP/faultmgmt/shell (y/n)?
   ```

   To confirm, type: **`y`**

   The `faultmgmt` prompt appears:

```
(faultmgmtsp>)
```

6. To repair the processor, type the following command:

   fmadm repair /SYS/MB/*P#*

   where *P#* is the number of the processor

7. To repair the MR card, type the following command:

   fmadm repair /SYS/MB/*P#/MR#*

   where *P#/MR#* is the number of the processor and MR card.

8. To exit the faultmgmt shell, type:

   exit

9. Reboot the server and monitor for repeat occurrences of this issue.

ZSF Storage ZS5-4 Might Incorrectly Report a Faulted Processor (31686669)

The Solaris Operating System used in the Oracle ZSF Storage ZS5-4 platform (based on the Oracle Server X5-4) includes the fmd (fault management daemon). This daemon might report low frequencies of memory controller correctable errors that lead to a processor being falsely reported as faulted (fault.cpu.intel.mc_ce). You should safely be able to ignore these spurious faults, which do not affect system operation, and use the fmadm command from the Oracle ILOM Fault Management Shell to manually clear these fault messages.

If the cpu.intel.mc_ce faults occur with high frequency, replace any faulted DIMMs on the associated memory riser card as described in the Service Manual. If that does not fix the problem, then replace the processor.

Oracle Integrated Lights Out Manager (ILOM) Issues and Announcements

Links to Issues	Workaround?
"Use Oracle ILOM 4.0 Documentation After Updating to Firmware Version 2.0.0 or Newer" on page 37	N/A
"File Transfer Using URI Fails if Target Password Contains Certain Special Characters (25917655)" on page 38	Fixed in SW 1.5.0
"Oracle ILOM SNMP v3 Traps Are Not Delivered After SNMP Engine ID Change (23634048)" on page 38	Yes
"Oracle ILOM Setting Causes Longer Reset And Multiple Reboots" on page 39	NA
"Out-Of-Memory Condition Message Following System AC Power Cycle or SP Reset (17622795)" on page 39	Yes
	Fixed in SW 1.1.1
"Third-Party Web Scan and Test Tools Cause Sluggish Oracle ILOM Performance (23564626)" on page 40	Yes
	Fixed in SW 1.1.1
"Diagnostic Setting Can Interrupt Firmware Update (17563508)" on page 40	Yes
	Fixed in SW 1.0.2

Note - Additional information about Oracle ILOM appears in "Important Operating Notes" on page 19.

Use Oracle ILOM 4.0 Documentation After Updating to Firmware Version 2.0.0 or Newer

When you update firmware, it updates Oracle ILOM as well, and earlier Oracle ILOM documentation collections no longer apply.

- Refer to the Oracle ILOM 4.0 documentation collection for SW 2.0.0 or newer, refer to the Oracle ILOM 4.0 documentation collection.
- Refer to the Oracle ILOM 3.2 documentation collection for older SW versions.

The Oracle ILOM documentation collections are posted at `https://www.oracle.com/goto/ilom/docs`.

File Transfer Using URI Fails if Target Password Contains Certain Special Characters (25917655)

This problem is fixed in SW 1.5.0.

When using Oracle ILOM to transfer files using a Uniform Resource Identifier (URI), the transfer fails if the target host's password contains any of the following special characters:

```
# ; ?
```

Examples of these transfers include using host storage redirection, and backing up and restoring BIOS and SP configurations.

Workaround

Use a target host password that does not include any of the indicated special characters.

Oracle ILOM SNMP v3 Traps Are Not Delivered After SNMP Engine ID Change (23634048)

If you change the engine ID, create an SNMP v3 user, and configure an alert using that user without waiting approximately 10 seconds between each action, the internal user configuration might be incorrect and traps are missed.

Workaround

Do not create multiple configuration changes without verifying the effect of each configuration change. To prevent misconfigured users and missed traps, insert sleep statements in the script. For example:

```
# change engineID
set /SP/services/snmp engineid=NEWENGINEID
# sleep 10 seconds to give snmp enough time to make the change
sleep 10
# verify engineID
show /SP/services/snmp engineid
```

```
# verify SNMPv3 users have been deleted
show /SP/services/snmp/users

# create snmpv3 user
create /SP/services/snmp/users newuser authenticationpassword=...
# sleep 10 seconds to give snmp enough time to make the change
sleep 10
# verify user
show /SP/services/snmp/users newuser
# do a snmpget with that user to verify it

# configure alert
set /SP/alertmgmt/rules/1 type=snmptrap ...
# sleep 10 seconds to give snmp enough time to make the change
sleep 10
# verify alert
show /SP/alertmgmt/rules/1
set /SP/alertmgmt/rules/1 testrule=true
```

Oracle ILOM Setting Causes Longer Reset And Multiple Reboots

When set, the Oracle ILOM Delay BIOS Upgrade setting delays a planned BIOS firmware upgrade until the next server reboot. Firmware upgrades typically involve multiple system-initiated (automatic) reboots, which significantly increases the time of a routine server reset. If you reboot the server expecting a routine server reset and instead initiate a (delayed) BIOS upgrade, wait until the upgrade is finished. Do not interrupt the upgrade process. Interrupting the upgrade process can result in corrupted firmware and server down time.

Note - If the firmware upgrade includes an FPGA update, the upgrade process can take as long as 26 minutes to finish.

For details, refer to *Update the BIOS and Service Processor Firmware (Oracle ILOM)* in *Oracle X5 Series Servers Administration Guide*.

Out-Of-Memory Condition Message Following System AC Power Cycle or SP Reset (17622795)

This issue is fixed in SW 1.1.1

During a system-intiated (automatic) AC power cycle or service processor (SP) reset (for example, during a firmware or software update), the SP might display an out-of-memory message, as shown in the following example:

```
Running BIOS version check...
Stop updating /conf/progparts.version
Running Platform Diagnostics: platform_diags.sh.

************************************************
System restarted due to Out-Of-Memory condition.
************************************************


ORACLESP-HW-x5-4_20645 login:
```

This is a rare occurrence. If the restart was an intentional system power cycle or SP reset, the "Out-of-Memory condition" message can be ignored.

Third-Party Web Scan and Test Tools Cause Sluggish Oracle ILOM Performance (23564626)

This issue is fixed in SW 1.1.1

Under certain conditions, third-party web scanning and test tools can cause Oracle ILOM to run extremely slowly.

Workaround

Install SW 1.1.1.

Diagnostic Setting Can Interrupt Firmware Update (17563508)

This issue is fixed in SW 1.0.2

After running UEFI diagnostics on the server from the Oracle ILOM web interface (Host Management > Diagnostics), disable the "Run diagnostics on boot" setting before initiating a firmware update, software update, or other action that requires an system-initiated (automatic) power-off or reset.

These actions require one or more automatic server reboots. Failing to disable the diagnostic setting can interrupt the update process and cause firmware corruption and server down time.

Oracle System Assistant Issues

The following table lists the Oracle System Assistant issues for the Oracle Server X5-4.

Links to Issues	Workaround
"Ignore Warnings in Oracle System Assistant Readme" on page 43	N/A
	Fixed in SW 1.0.3

Ignore Warnings in Oracle System Assistant Readme

The Oracle System Assistant readme file contains benign warning messages:

WARNING! This firmware is not formally supported on this platform. DO NOT SHIP.

You can ignore these messages.

This problem is fixed in system software release 1.0.3.

Oracle Solaris Issues and Announcements

Unable to Connect to iSCSI Target Message (18747496)

When installing the Oracle Solaris OS or booting the server from an iSCSI target, the following message might appear on the screen:

```
"NOTICE: iscsi connection(5) unable to connect to target  @ xxx target address  @ xxx"
```

This message can be safely ignored. No workaround is required.

▼ FMA Warning Messages About MSI-X Interrupt Vectors (20724005)

During network OS installation, some x86 systems with large configurations that include a lot of network cards might generate FMA warnings about running out of MSI-X interrupt vectors. These messages are harmless and are not seen after the installation finishes and the system reboots to the operating system.

The FMA warnings and description appear as:

```
fault.io.nic.config
The network device failed to configure a feature. A(n) unsupported error has been
 detected during
driver's attach context causing a(n) config service impact while involving the device's
 rx_ring subsystem.
```

Workaround

To fix this issue, edit the GRUB entry to pass the boot parameter: ddi-msix-alloc-limit=2.

1. **During boot, when the Oracle Solaris version information appears on the screen (for example: Oracle Solaris 11.2.9.0.5), type `e` to edit this entry.**

2. **Find the following multiboot line:**

   ```
   $multiboot /ROOT/solaris/@/$kern $kern -B console=ttya -B $zfs_bootfs -B
   ```

3. **Revise the line by appending the following parameter to the end:**

   `ddi-msix-alloc-limit=2`

   For example:

   ```
   $multiboot /ROOT/solaris/@/$kern $kern -B console=ttya -B $zfs_bootfs -B ddi-msix-alloc-
   limit=2
   ```

4. **To continue booting with the above revision, press `Ctrl + X` or `F10`.**

▼ Oracle Solaris 11.*x* OS With Desktop Package Cannot Be Powered Off Using Certain Options in Oracle ILOM (16816951, 17952405)

For a server running Oracle Solaris 11.*x* with the desktop package, the following Oracle ILOM power off options do not power off the server:

- When performing a graceful shutdown of the server from the Oracle ILOM web interface.
- When performing a forced shutdown of the server using the `stop -f /SYS` command from the Oracle ILOM command-line interface (CLI).

Other power off options work normally.

Workaround

Change the Power Manager setting in the `gnome-power-manager.service` file.

● **Depending on whether you want to use the Oracle ILOM web interface or CLI to change the Power Manager setting, do one of the following:**

> **Note -** If gnome-power-manager demon is currently running, enter `pkill gnome-power-manager`
> from the command line to stop it.

- **To change the setting using the Oracle ILOM CLI, edit the `gnome-power-manager.service` file as follows:**

  In `/usr/share/dbus-1/services/gnome-power-manager.service` file, append `--verbose`
  to the following line: `Exec=/usr/bin/gnome-power-manager`

  For example:

  ```
  Exec=/usr/bin/gnome-power-manager --verbose
  ```

- **To power-off the server using the Oracle ILOM web interface, do the following:**

  a. **Select System > Preferences > Startup Applications from gnome-panel's menu list.**

  b. **Select Power Manager > Edit.**

  c. **Append `--verbose` to the following line: `gnome-power-manager`.**

  For example:

  ```
  gnome-power-manager --verbose
  ```

Linux Issues and Announcements

Links to Issues	Workaround
	Yes

C-State Performance Issue with Intel_Idle Driver (16873953)

The system CPUs cannot get deeper than the C1 state when the system is idle (sleep state). This can manifest itself in C-state thread wakeup performance latencies.

Workaround

1. Edit the `/etc/grub.conf` file to add the following kernel parameter:

   `intel_idle.max_cstate=0`

2. Reboot your server.

   This disables the default intel_idle driver and forces the kernel to use acpi_idle.

   This issue does not exist for Oracle Linux 6.6 UEK3.

Oracle VM Issues and Announcements

Link to Issue	Workaround?
"Ethtool Shows Unknown Speed and Duplex (16563881)" on page 51	Yes
"Error After Installing Oracle VM 3.3.2 Server on a System With a Large Amount of Memory (16557272)" on page 52	Yes

▼ Ethtool Shows Unknown Speed and Duplex (16563881)

When `ethtool` command is used on Oracle VM 3.3.2 server, the status "Unknown!" is displayed for the Speed and Duplex settings. For example:

```
# ethtool eth0
Settings for eth0:
        Supported ports: [ TP ]
        Supported link modes:   10baseT/Half 10baseT/Full
                                100baseT/Half 100baseT/Full
                                1000baseT/Full
        Supports auto-negotiation: Yes
        Advertised link modes:  10baseT/Half 10baseT/Full
                                100baseT/Half 100baseT/Full
                                1000baseT/Full
        Advertised pause frame use: Symmetric
        Advertised auto-negotiation: Yes
        Speed: Unknown!
        Duplex: Unknown! (255)
        Port: Twisted Pair
        PHYAD: 1
        Transceiver: internal
        Auto-negotiation: on
        MDI-X: Unknown
        Supports Wake-on: pumbg
        Wake-on: d
        Current message level: 0x00000007 (7)
        Link detected: no
```

The problem is due to insufficient interrupt resources available to report the appropriate status.

Workaround

- **Edit the `grub.conf` file to add the following kernel boot parameters:**

    ```
    extra_guest_irqs=64,2048 nr_irqs=2048
    ```

▼ Error After Installing Oracle VM 3.3.2 Server on a System With a Large Amount of Memory (16557272)

In some instances, a system with a large amount of memory requires special configuration in order for Oracle VM to install and launch correctly. If not, you could receive the following error on launch after installation:

```
kernel panic -not syncing: Out of memory and no killable processes
```

If you install Oracle VM 3.3.2 from an ISO image or by using Oracle System Assistant, the `dom0_mem` parameter should be set correctly. If you install the Oracle VM software from PXE boot or some other customized environment and you have a large-memory system, you might need to recalculate the `dom0_mem` setting.

Workaround

- **To recalculate the `dom0_mem` setting, using this formula:**

dom0_mem = 502 + int(physical_mem * 0.0205)

For example, if your system has 128 GB of memory, you need to increase `dom0_mem` to 3188 MB:

```
dom0_mem=3188M
```

You can update the `dom0_mem` setting in the grub.conf file, or during installation by interrupting the boot process at grub menu and editing it there.

For more information on the `dom0_mem` setting, refer to the Installing Oracle VM Server documentation:

http://docs.oracle.com/cd/E35328_01/E35330/html/vmiug-server-dom0-memory.html

This problem is fixed in Oracle VM 3.3.3.

Getting Server Firmware and Software Updates

Description	Links
Learn about server firmware and software updates.	"Firmware and Software Updates" on page 53
Learn about the options for accessing firmware and software.	"Firmware and Software Access Options" on page 53
View the available firmware and software packages.	"Available Software Release Packages" on page 54
Access the firmware and software packages through Oracle System Assistant or My Oracle Support.	"Accessing Firmware and Software" on page 55
Install firmware and software updates.	"Installing Updates" on page 56

Firmware and Software Updates

Firmware and software, such as hardware drivers and tools for the server, are updated periodically. These are made available as a software release. The software release is a set of downloads (patches) that includes all available firmware, hardware drivers, and utilities for the server. All these have been tested together. The Readme document that is included with the download explains what has changed and what has not changed from the prior software release.

You should update your server firmware and software as soon as possible after the software release becomes available. Software releases often include bug fixes, and updating ensures that your server software is compatible with the latest server firmware and other component firmware and software.

The Readme file in the download package contains information about the updated files in the download package, as well as bugs that are fixed with the current release. The product notes also provide information about which server software versions are supported.

Firmware and Software Access Options

Use one of the following options to obtain the latest set of firmware and software for your server:

- **Oracle System Assistant**

  Oracle System Assistant is a new factory-installed option for Oracle servers that allows you to easily download and install server firmware and software.

  For more information about using Oracle System Assistant, see the Oracle X5 Series Servers Administration Guide (`https://www.oracle.com/goto/x86admindiag/docs`).

- **My Oracle Support**

  All system firmware and software are available from the My Oracle Support web site.

  For more information about what is available on the My Oracle Support web site, see `https://support.oracle.com`.

  For instructions on how to download software releases from My Oracle Support, see .

Available Software Release Packages

Downloads on My Oracle Support are grouped by product family, then product, then version. The version contains one or more downloads (patches).

For servers and blades, the pattern is similar. The product is the server. Each server contains a set of releases. These releases are not true software product releases, but rather are releases of updates for the server. These updates are called software releases and comprise several downloads, all tested together. Each download contains firmware, drivers, or utilities.

My Oracle Support has the same set of download types for this server family as shown in the following table. The same firmware and software can also be downloaded using Oracle System Assistant.

Package Name	Description	When to Download This Package
Oracle Server X5-4 SW *version*: Firmware Pack	All the system firmware, including Oracle ILOM, BIOS, and option card firmware.	You need the latest firmware.
Oracle Server X5-4 SW *version*: OS Pack	An OS Pack is available for each supported operating system version. Each OS Pack includes a package of all tools, drivers, and utilities for that version of the OS.

Software includes Oracle Hardware Management Pack and LSI MegaRAID software. | You need to update OS-specific drivers, tools, or utilities. |

Package Name	Description	When to Download This Package
	For the Windows OS, this OS Pack also includes Intel Network Teaming and Install Pack.	
Oracle Server X5-4 SW *version*: All Packs	Includes the Firmware Pack, all OS Packs, and all documents. This pack does not include Oracle VTS or the Oracle System Assistant image.	You need to update a combination of system firmware and OS-specific software.
Oracle Server X5-4 SW *version*: Diagnostics	Oracle VTS diagnostics image.	You need the Oracle VTS diagnostics image.
Oracle Server X5-4 SW *version*: Oracle System Assistant	Oracle System Assistant recovery and ISO update image.	You need to manually recover or update Oracle System Assistant.

Each of the downloads is a zip file that contains a Readme file and a set of subdirectories containing firmware or software files. The Readme file contains details on the components that have changed since the prior software release and the bugs that have been fixed.

Accessing Firmware and Software

This section provides instructions for downloading or requesting software release files.

You can use Oracle System Assistant to easily download and use the latest software release. For further information, see the Oracle X5 Series Servers Administration Guide (`https://www.oracle.com/goto/x86admindiag/docs`).

You can also obtain updated firmware and software by using My Oracle Support. See: "Download Firmware and Software Using My Oracle Support" on page 55

▼ Download Firmware and Software Using My Oracle Support

1. **Go to the following web site: `https://support.oracle.com`**

2. **Sign in to My Oracle Support.**

3. **At the top of the page, click the Patches and Updates tab.**

   The Patches and Updates screen appears.

4. **In the Search screen, click Product or Family (Advanced).**

   The screen appears with search fields.

5. **In the Product field, select the product from the drop-down list.**

   Alternatively, type a full or partial product name (for example, Oracle Server X5-4) until a match appears.

6. **In the Release field, select a software release from the drop-down list.**

7. **Click Search.**

   The patches available for downloading are listed.

   See "Available Software Release Packages" on page 54 for a description of the available downloads.

8. **To select a patch for downloading, click on it (you can use the shift key to select more than one patch).**

   A pop-up action panel appears. The pop-up panel contains several action options, including the Add to Plan and Download options. For information about the Add to Plan option, click on the associated drop-down button and select "Why use a plan?"

9. **To download the patch(es), click Download in the pop-up action panel.**

   The File Download dialog box appears.

10. **In the File Download dialog box, click on the patch zip file.**

    The patch file downloads.

Installing Updates

The following sections provide information about installing firmware and software updates:

- "Installing Updates" on page 56
- "Installing Hardware Drivers and OS Tools" on page 57

Installing Firmware

Updated firmware can be installed using one of the following:

- **Oracle Enterprise Manager Ops Center**

Ops Center Enterprise Controller can automatically download the latest firmware from Oracle, or firmware can be loaded manually into the Enterprise Controller. In either case, Ops Center can install the firmware onto one or more servers, blades, or blade chassis.

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`

- **Oracle System Assistant**

  Oracle System Assistant can download and install the latest firmware from Oracle.

  For more information, see the Oracle X5 Series Servers Administration Guide (`https://www.oracle.com/goto/x86admindiag/docs`).

- **Oracle Hardware Management Pack**

  The `fwupdate` CLI Tool within the Oracle Hardware Management Pack can be used to update firmware within the system.

  For more information, refer to the Oracle Hardware Management Pack Documentation Library at: `https://www.oracle.com/goto/ohmp/docs`.

- **Oracle ILOM**

  Oracle ILOM and BIOS firmware are the only firmware that can be updated using either the Oracle ILOM web interface or the command-line interface.

  For more information, refer to the documentation for your supported version of Oracle Lights Out Manager (ILOM) Documentation Library at: `https://www.oracle.com/goto/ilom/docs`.

Installing Hardware Drivers and OS Tools

Updated hardware drivers and operating system (OS)-related tools, such as Oracle Hardware Management Pack, can be installed using one of the following:

- **Oracle Enterprise Manager Ops 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`

- **Oracle System Assistant**

  For more information, see the Oracle X5 Series Servers Administration Guide (`http://www.oracle.com/goto/x86admindiag/docs`).

- **Other deployment mechanisms,** such as JumpStart, KickStart, or third-party tools.

For more information, refer to your operating system documentation.