SPARC T7 Series Servers Product Notes

ORACLE®

SPARC T7 Series Servers Product Notes

Part No: E54981-14

Access to Oracle Support

Contents

Using This Documentation

- **Overview** – Contains late-breaking information for the server.
- **Audience** – Technicians, system administrators, and authorized service providers.
- **Required knowledge** – Experience with the Oracle Solaris operating system, troubleshooting, and replacing hardware.

Product Documentation Library

Documentation and resources for this product and related products are available at `http://www.oracle.com/goto/t7-1/docs`, `http://www.oracle.com/goto/t7-2/docs`, `http://www.oracle.com/goto/t7-4/docs`.

Feedback

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

Late-Breaking Information

These topics provide important information and late-breaking news about the server:

Preinstalled Software

Software	Location	Description
Oracle Solaris 11.3 OS	The OS is installed on drive 0, using a ZFS file system.	Host OS.
Oracle VM Server for SPARC[†]	/opt/SUNWldm	Manages logical domains.
Oracle VTS[†]	/usr/sunvts	Provides hardware validation tests.

[†]These software components are part of the Oracle Solaris 11 OS distribution.

The preinstalled OS is ready to be configured at the appropriate point when you first apply power to the server.

Mandatory package updates might not be preinstalled. Ensure that you obtain and install all mandatory updates before you put the server into production. See "Mandatory Oracle Solaris 11 OS Package Updates" on page 14.

Refer to the Oracle Solaris documentation for instructions on installing and configuring the Oracle Solaris OS.

You can reinstall the OS along with mandatory package updates or patches instead of using the preinstalled OS. See "Minimum Supported Versions of the Firmware, OS, and Software" on page 13.

IMPORTANT - Install Latest OS Updates, Patches, and Firmware

Some product features are enabled only when the latest versions of patches or firmware are installed. In order to retain optimal performance, security, and stability, installing the latest available patches or firmware is required.

Verify that the server firmware version is at a minimum 9.4.3 or higher.

1. Check the server firmware:

   From the ILOM web interface, click System Information → Summary, then view the property value for the System Firmware Version in the General Information table.

   From the command prompt, type:

   ```
   -> show /HOST
   ```

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

3. If required, download the latest available software release version from My Oracle Support at:

   https://support.oracle.com

4. If required, update the server firmware.

   Refer to the information about performing firmware updates in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance*. Ensure that you perform the preparatory steps described in that document before updating the firmware.

Minimum Supported Versions of the Firmware, OS, and Software

You are required to install the latest available and supported versions of the system firmware, OS, and patches, for optimal performance, security, and stability. See "IMPORTANT - Install Latest OS Updates, Patches, and Firmware" on page 12.

Oracle Solaris 11 is the recommended OS for the SPARC T7 series servers. Oracle Solaris 11 provides simplified installation and maintenance, enhanced virtualization capabilities, and performance improvements. A more detailed list of Oracle Solaris 11 advantages is available at http://www.oracle.com/technetwork/server-storage/solaris11/overview/index.html.

Note - If you configure the server with Oracle VM Server for SPARC, you can install various combinations of the minimum (or later) versions of the OS. For example, use Oracle Solaris 11.3 for the control domain, and Oracle Solaris 10 9/10 in a guest domain.

Software	Minimum Supported Versions
Oracle System Firmware	9.4.3.c or later.
	9.5.4.c or later to support 64 GByte DIMMs.
	9.7.1.c or later to support Oracle 3.2 TB NVMe SSDs.
	(Sun System Firmware 9.7.1.c includes Oracle ILOM 3.2.6.)
	9.8.3 or later to support Aura 7 PCIe cards, with the `Hardware_Programmables-1.0.14-SPARC_T7-1+T7-2+T7-4+S7-2+S7-2L.pkg` file also installed. **Note -** The server might require more recent firmware to support Oracle Solaris Kernel Zones. For specific firmware requirements, refer to *Creating and Using Oracle Solaris Kernel Zones*.
Oracle Solaris 11 OS	Oracle Solaris 11.3 for the control domain, guest domains, and non-virtualized configurations.
	Includes these software components:
	■ Oracle VM Server for SPARC ■ Oracle VTS
	Oracle Solaris 11.3 SRU 10.7 or later to support Oracle 3.2 TB NVMe SSDs.
	(Oracle Solaris 11.3 SRU 10.7 includes Oracle VM Server for SPARC 3.4.)
	Also see "Mandatory Oracle Solaris 11 OS Package Updates" on page 14.
Oracle Solaris 10 OS	Oracle Solaris 10 9/10 or Oracle Solaris 10 8/11, plus Oracle Solaris 10 1/13 SPARC Bundle and patches.
	For virtual guest domains only:
	Includes Oracle VTS 7 PS15.
	Also see "Mandatory Oracle Solaris 10 OS Patches" on page 15.

Software	Minimum Supported Versions
Java Development Kit	Java applications running on this product require one of these minimum JDK versions: ■ JDK 11 or higher ■ JDK 1.8.0_60 b27 or higher ■ JDK 1.7.0_85 b33 or higher For production use, Oracle recommends using the latest available JDK and JRE versions, and does not recommend using JDK versions that are no longer updated and are in sustaining support. For details, refer to https://www.oracle.com/technetwork/java/javase/overview/index.html For information about running older versions of the JDK on SPARC servers, refer to Doc ID 2564392.1 on My Oracle Support.
Oracle Database Enterprise Edition	12.1.0.2, plus required bundle patch (BP13). Required on Oracle Solaris 11.3 for in-memory features.

Note - Some PCIe cards and devices have other minimum requirements. For details, including what is required for a device to be bootable, refer to the product notes and other documentation for that device.

Mandatory Oracle Solaris 11 OS Package Updates

No package update is required at this time to use the preinstalled Oracle Solaris 11.3 OS with this server.

If you reinstall the OS, you might need to install certain package updates before you put the server and optional hardware or software components into production.

Install the most recent Oracle Solaris 11.3 Support Repository Update (SRU). Taking this action ensures that your server has the latest software for the best performance, security, and stability.

Use the `pkg info entire` command to display which SRU is currently installed on your server.

Use the `pkg` command or the package manager GUI to download any available SRUs from: `https://pkg.oracle.com/solaris/support`.

Note - To access the Oracle Solaris 11 package update repository, you must have an Oracle support agreement that enables you to install a required SSL certificate and support key.

See *Installing the OS* in your servers Installation Guide.

Mandatory Oracle Solaris 10 OS Patches

If you choose to install the Oracle Solaris 10 OS in a guest domain, you must also install additional patches and in some cases, a patch bundle.

Oracle Solaris 10 1/13 Mandatory Patches

A supported version of the OS is only supported in guest domains.

Installation Order	OS and Patches
1	Oracle Solaris 10 1/13.
2	These mandatory patches:

These mandatory patches:

- All patches up to October 2015 or later.
- KU150400-29.

To install Oracle Solaris 10 1/13, you must use an image with the miniroot patched with KU150400-29, or higher.

The correct image is provided in MOS patch 26032848. This image contains the original Oracle Solaris 10 1/13 software, and a miniroot image which includes kernel patch 150400-48. Downloading and using this image enables the installation of Oracle Solaris 10 1/13 on guest domains via jumpstart without the need to manually patch the packed miniroot.

(optional) If, for some reason, you do not want to use the image provided in the MOS patch, you can use the prior method to manually patch the packed miniroot. You must also use this method to patch versions of Oracle Solaris older than Oracle Solaris 10 1/13. Refer to MOS article 1501320.1 for instructions on how to patch a packed miniroot at My Oracle Support (https://myoraclesupport.com).

You can use the Oracle Solaris 10 JumpStart technology and finish scripts to patch the installed image.

If you are unfamiliar with the Oracle Solaris 10 JumpStart technology, contact your support representative or Oracle Support for documentation that describes how to configure an Oracle Solaris 11 zone as an Oracle Solaris 10 1/13 JumpStart server.

Oracle Solaris 10 8/11 Mandatory Patches

This version of the OS is supported only in guest domains.

Installation Order	OS and Patches
1	Oracle Solaris 10 8/11. **Note -** Until the Oracle Solaris 10 1/13 SPARC Bundle has been installed, Oracle Solaris 10 8/11 supports only 512 CPUs and 3840 Gbytes of memory. For servers exceeding those resources, reduce the resources until the Oracle Solaris 10 1/13 SPARC Bundle has been installed, or install a later version of Oracle Solaris.
2	Oracle Solaris 10 1/13 SPARC Bundle. This bundle causes the OS to operate as the Oracle Solaris 10 1/13 OS, but the version number in the `/etc/release` file remains as Oracle Solaris 10 8/11.
3	These mandatory patches: ■ All patches up to October 2015. ■ KU150400-29. To install Oracle Solaris 10, you must patch the miniroot of the installation media with KU150400-29, or higher. You can use the Oracle Solaris 10 JumpStart technology and finish scripts to patch the installed image. Refer to MOS article 1501320.1 for instructions on how to patch a packed miniroot at My Oracle Support (`https://myoraclesupport.com`). If you are unfamiliar with the Oracle Solaris 10 JumpStart technology, contact your support representative or Oracle Support for documentation that describes how to configure an Oracle Solaris 11 zone as an Oracle Solaris 10 1/13 JumpStart server.

Note - Until the Oracle Solaris 10 1/13 SPARC Bundle is installed, you might encounter these bugs—15712380, 15704520, 15665037. The first two bugs are resolved when the Oracle Solaris 10 1/13 SPARC bundle is installed. These bugs do not impact the patch installations.

Oracle Solaris 10 9/10 Mandatory Patches

This version of the OS is supported only in guest domains.

Installation Order	OS, Patches, and Packages
1	Oracle Solaris 10 9/10 **Note -** Until the Oracle Solaris 10 1/13 SPARC Bundle has been installed, Oracle Solaris 10 9/10 only supports 512 CPUs and 1023 GBytes of memory. For servers exceeding those resources, reduce the resources until the Oracle Solaris 10 1/13 SPARC Bundle has been installed, or install a later version of Oracle Solaris.
2	Oracle Solaris 10 1/13 SPARC Bundle. This bundle causes the OS to operate as the Oracle Solaris 10 1/13 OS, but the version number in the `/etc/release` file remains as Oracle Solaris 10 9/10.
3	These mandatory patches: ■ All patches up to October 2015. ■ KU150400-29. To install Oracle Solaris 10, you must patch the miniroot of the installation media with KU150400-29, or higher. You can use the Oracle Solaris 10 JumpStart technology and finish scripts to patch the installed image. Refer to MOS article 1501320.1 for instructions on how to patch a packed miniroot at My Oracle Support (`https://myoraclesupport.com`). If you are unfamiliar with the Oracle Solaris 10 JumpStart technology, contact your support representative or Oracle Support for documentation that describes how to configure an Oracle Solaris 11 zone as an Oracle Solaris 10 1/13 JumpStart server.
4	Use the `pkgadd` command to install the `SUNWust1` and `SUNWust2` packages.

Note - Until the Oracle Solaris 10 1/13 SPARC Bundle is installed, you might encounter these bugs—15712380, 15704520, 15665037. The first two bugs are resolved when the Oracle Solaris 10 1/13 SPARC Bundle is installed. These bugs do not impact the patch installations.

▼ Obtain Oracle Solaris 10 Patches

1. **Sign in to My Oracle Support:**

    https://support.oracle.com

2. **Select the Patches & Updates tab.**

3. **Search for a patch using the Patch Search panel.**

   When searching for a patch using the Patch Name or Number field, you must specify the complete name or number of the patch. For example:

   - `Solaris 10 1/13 SPARC Bundle`
   - `13058415`
   - `147159-03`

   To search using a patch number without the revision number (last two digits), type `%` in place of the revision number. For example:

   `147159-%`

4. **After you locate the patch, access the README and download the patch from the site.**

   The patch README provides the patch installation instructions.

Updating the System Firmware from a Version Earlier than 9.5.2.g

Upgrading the SPARC T7 server from a system firmware version earlier than 9.5.2.g requires a different procedure than the usual system firmware upgrade process, because the NAND flash memory on the SP is reformatted during the update. You must perform additional steps in order to retain configuration information.

If you need to use this procedure, read it thoroughly before attempting to proceed. Failure to accurately follow these steps can result in significant additional downtime before the server is restored to a fully functional state. Allow at least 40 minutes to perform this upgrade procedure on a SPARC T7 server.

Briefly, the procedure is as follows:

1. Determine which firmware version is currently on the server.

   See "Check the Current Firmware Version" on page 19.
2. Power off the server.

   See "Power Off the Server" on page 20
3. Record your SP network settings.

   See "Record SP Network Properties" on page 21.
4. Back up the current SP configuration.

   See "Back Up the Current SP Configuration" on page 22

5. Load the initial firmware image.

See "Load the Initial System Firmware Image" on page 22.

6. Restore the SP network connection.

See "Restore the SP Network Properties" on page 26.

7. Load the system firmware a second time.

See "Load the Firmware Image a Second Time" on page 27.

8. Restore the previously backed up SP configuration.

See "Restore the SP Configuration" on page 30.

9. Load the Oracle Solaris fallback image.

See "Load the Oracle Solaris Fallback Image" on page 31.

10. Load the final system firmware image.

See "Load the Final System Firmware Image" on page 32.

The examples throughout this procedure show use of the CLI on a new Oracle SPARC T7-4 server to upgrade from system firmware 9.5.2.c to 9.5.2.g. These examples show a syntax that you can use on any Oracle SPARC T7 series server, but customer-specific values will vary. Variables are in *italics* and should not be entered directly.

Unless otherwise noted, you can perform the steps in this procedure using any of these methods:

- The server's local serial management connection
- The web browser-based network management connection
- The command-line SSH network management connection
- Oracle Enterprise Manager OpsCenter

Refer to the Oracle ILOM documentation for additional details about performing operations using the ILOM CLI or web interface.

Refer to the Oracle Enterprise Manager OpsCenter documentation for details on performing steps with that program.

▼ Check the Current Firmware Version

The upgrade to system firmware 9.5.2.g or later only requires additional steps if you are upgrading from system firmware 9.5.2.c or earlier. Check which version of the firmware is loaded on the server before continuing.

Note - You must have full user role privileges (i.e. `aucro`).

1. **Log in to the SP. Type:**

    ORACLESP-<XXXXXXXX> `login:` **root**
    ```
    Password:
    Detecting screen size; please wait...done

    Oracle(R) Integrated Lights Out Manager
    ```
    `Version` *X.X.X.X.x rXXXXXX*
    ```
    Copyright (c) 2017, Oracle and/or its affiliates. All rights reserved.
    ```
    `Hostname:` *ORACLESP-<XXXXXXXX>*

    `->`

2. **Display the current system firmware version. Type:**

    `->` **show /HOST sysfw_version**

    ```
      /HOST
        Properties:
            sysfw_version = Sun System Firmware 9.5.2.c YYYY/MM/DD HH:MM
    ```

    `->`

3. **Determine your next steps:**

    - **If your server firmware version is 9.5.2.g or later, load the latest firmware image.**
      See "Load the Final System Firmware Image" on page 32.

    - **If your firmware version is earlier than 9.5.2.g, power off the server.**
      See "Power Off the Server" on page 20.

▼ Power Off the Server

1. **Power off the server. Type:**

    ```
    -> stop /System
    Are you sure you want to stop /System (y/n)? y
    Stopping /System
    ```

```
->
```

2. **Verify that the server is powered off. Type:**

```
-> show /System power_state

  /System
    Properties:
        power_state = Off

->
```

3. **Record your SP network properties.**

   See .

▼ Record SP Network Properties

During this firmware upgrade process, the SP network configuration information will be reset to factory defaults. You must note your current SP network properties before continuing with the firmware upgrade.

You will need this information later to restore SP network connection.

1. **Display the current SP network configuration information. Type:**

```
-> show /SP/network ipaddress ipgateway ipnetmask ipdiscovery

  /SP/network
    Properties:
        ipaddress = XX.XX.XX.XX
        ipgateway = YY.YY.YY.YY
        ipnetmask = ZZ.ZZ.ZZ.ZZ
        ipdiscovery = static

->
```

2. **If your SP uses a static connection (i.e., if the `ipdiscovery` value is `static`), note the current network configuration properties.**

   Note - If your SP uses a DHCP connection, the network configuration will be restored automatically.

3. **Back up the current SP configuration.**
    See .

▼ Back Up the Current SP Configuration

> **Note -** You cannot use Oracle Enterprise Ops Center for this portion of the upgrade procedure.

1. **Set a 16-character passphrase for encryption of the SP configuration information. Type:**

    ```
    -> set /SP/config passphrase=<XXXXXXXXXXXXXXXX>
    Set 'passphrase' to 'XXXXXXXXXXXXXXXX'

    ->
    ```

    Note the passphrase for later use.

2. **Create the backup of the SP configuration information. Type:**

    ```
    -> set /SP/config dump_uri=scp://<username>@<ip_address_or_hostname>/backup_XXXXXXXX.xml

    Enter remote user password: *********
    Dump successful.

    ->
    ```

    The backup file might take several minutes to write, depending on the amount of platform-specific data in your configuration.
    Note the name and location of the SP backup file.

    > **Note -** If you are upgrading the system firmware on more than one server, Oracle recommends using a different file name for each SP backup.

3. **Load the initial firmware image.**
    See .

▼ Load the Initial System Firmware Image

> **Note -** Loading the system firmware image might take up to 15 minutes.

1. Load the initial system firmware image. Type:

```
-> load -source http://<ip_address_or_hostname>/Sun_System_Firmware-9_5_2_g-
SPARC_T7-4.pkg /SP/firmware

NOTE: An upgrade takes several minutes to complete. ILOM
      will enter a special mode to load new firmware. No
      other tasks can be performed in ILOM until the
      firmware upgrade is complete and ILOM is reset.

Are you sure you want to load the specified file (y/n)? y
Preserve existing configuration (y/n)? y
.....................................................................................................

Firmware update is complete.
ILOM will now be restarted with the new firmware.
```

After loading the initial image of the new system firmware, the SP automatically reboots from primary flash. During reboot, the SP will use factory defaults even if you answered **y** to the question, `Preserve existing configuration (y/n)?`

```
-> /sbin/reboot
Stopping coredump capture...done.
Watchdogd: Stopping patting ... Done
Network Interface Plugging Daemon...stop eth0...done.
Stopping kernel log daemon....
...
Mounting root filesystem read-only...done.
Will now restart.
Restarting system.
+****
Primary Bootstrap.
SYSRST    = 0x1
  Reading RO_Hw_Straps
  Searching for packages
      Good uboot CRC for data=[*000c0000, len=553b4] in pkg *0013f800 (crc: 0x44f46b65)
      Good uboot CRC for data=[*000c0000, len=80000] in pkg *00140000 (crc: 0xb0b8c9ac)
      Good kernel CRC for data=[*00142000, len=1e0de8] in pkg *00140000 (crc:
 0xbf324077)
      Good root CRC for data=[*00340000, len=ef1000] in pkg *00140000 (crc: 0x5d3b8e31)
      Good vbscdir CRC for data=[*01740000, len=4c000] in pkg *00140000 (crc:
 0x7a62c323)
      Good uboot CRC for data=[*018c0000, len=553b4] in pkg *0193f800 (crc: 0x2f78db1d)
      Good uboot CRC for data=[*018c0000, len=80000] in pkg *01940000 (crc: 0x97d92980)
      Good kernel CRC for data=[*01942000, len=1df2e0] in pkg *01940000 (crc:
 0xf7697623)
      Good root CRC for data=[*01b40000, len=ef1000] in pkg *01940000 (crc: 0xb19fd0e5)
```

```
        Good vbscdir CRC for data=[*02f40000, len=4c000] in pkg *01940000 (crc:
 0xda3cef04)
   Starting U-Boot at 0x000c0000\ufffd

U-Boot 2010.03

Custom Pilot3 U-Boot 0.1 (Dec  4 2015 - 11:41:49) r105871

VGA buffer reserved 0x800000 bytes at 0x80000000
sptrace allocated 0x800000 bytes at 0x9F800000
DRAM:  496 MB
Flash: 48 MB
In:    serial
Out:   serial
Err:   serial

  ARM restart caused by: reboot
  hardware interface reset by: none
  Galactic1: 0x4000c900, Galactic2: 0x0
  The host is OFF(S5) (hostWantsPwr=0, powerGood=0,
 allowPwrOn=0|0, outOfReset=0, fatalError=0).

...
```

The process continues. The section in *italics* in this example indicates output that is different from typical firmware upgrade. In this case, this output is normal during a firmware upgrade from a version earlier than 9.5.2.g to a firmware version 9.5.2.g or later.

```
Loading kernel module video.
Loading kernel module Timer.
Mounted vbsc
```
Erasing the nand ...
Erasing 512 Kibyte @ 40000000 -- 100 % complete.
no UBI volumes found, initializing media:
erasing media..
formatting media..
UBI device number 0, total 2048 LEBs (1056964608 bytes, 1008.0 MiB), available 2024 LEBs
 (1044578304 bytes, 996.2 MiB), LEB size 516096 bytes (504.0 KiB)
UBI volumes (0):
  params: (20.2 MB) created mounted
  persist: (106.3 MB) created mounted
  coredump: (70.4 MB) created mounted
  large: (64.5 MB) created mounted
  extra: (36.4 MB) created mounted
  package: (230.3 MB) created mounted
  miniroot: (468.1 MB) created mounted
Available freespace: 0 MB

Checking configuration files state ...
... not preserving config
... Restoring configuration files ...
  params: (20.2 MB) exists was_mounted
  persist: (106.3 MB) exists was_mounted
  coredump: (70.4 MB) exists was_mounted
  large: (64.5 MB) exists was_mounted
  extra: (36.4 MB) exists was_mounted
  package: (230.3 MB) exists was_mounted
  miniroot: (468.1 MB) exists was_mounted
Available freespace: 0 MB
  Saving TLI data...FAILED
  Removing old configuration files
  Removing platform specific files
  Restoring default configuration files...Done
  Restoring TLI data...FAILED
Configuration files state good

*1970-01-01 00:02:42 ** Error: Did not find any saved ilom package file*
sp_trace_write failed: -1
```
Setting the system clock.
System Clock set to: Mon Dec  7 18:51:52 UTC 2015.
Initializing SP Trace Buffers
Setting up networking....
Will now mount local filesystems:.
Will now activate swapfile swap:done.
Cleaning up temporary files...Cleaning /var/run...done.
Cleaning /var/lock...done.
...
Starting ILOM Watchdog daemon.
 Done
Running plat...Preparsing sensor.xml... ( took 12 seconds ) done
Probing frus ...done
Done running plat
psnc_file_read: cannot access file '/persist/psnc_backup1.xml'
Identifying Product Data...Backup2
Setting poweron delay...
Starting Dynamic FRUID Daemon early init: dynafrud_early_init  Done (0)
INIT: Entering runlevel: 3
Preparsing sensor.xml... ( took 1 seconds ) done
Starting Event Manager: eventmgr  . Done
...
waiting for GM ready ....GM is ready
Starting Sppostadm:  -a Done

ORACLESP-<XXXXXXXX> login:
```

2.   Restore the SP network properties.

▼ Restore the SP Network Properties

SP network connectivity is required in order to continue the firmware upgrade process. If your SP is configured with a static network connection (i.e., the ipdiscovery parameter is set to static), you must type in the network configuration properties before continuing.

Note - This part of the upgrade can only be performed using a console connection to the serial management port.

Note - If your SP network configuration is set to use DHCP, continue to .

1. Log in to the service processor:

Note - You must have full user role privileges (i.e. aucro) for this step.

```
ORACLESP-<XXXXXXXX> login: root
Password:
Detecting screen size; please wait...done

Oracle(R) Integrated Lights Out Manager

Version X.X.X.X.x rXXXXXX

Copyright (c) 2015, Oracle and/or its affiliates. All rights reserved.

Warning: The system appears to be in manufacturing test mode.
Contact Service immediately.

Warning: password is set to factory default.

Warning: HTTPS certificate is set to factory default.

Warning: Product identification data missing. System may not function properly.
Service must update product identification data. Contact Service immediately.

Unrecognized Chassis: This module is installed in an unknown or unsupported
chassis. You must upgrade the firmware to a newer version that supports
this chassis.
```

```
Hostname: ORACLESP-<XXXXXXXX>

-> cd /SP/network
/SP/network

Unrecognized Chassis: This module is installed in an unknown or unsupported
chassis. You must upgrade the firmware to a newer version that supports
this chassis.

->
```

2.   Configure the SP network properties. Type:

```
-> set /SP/network pendingipaddress=<XX.XX.XX.XX> pendingipgateway=<YY.YY.YY.YY>
 pendingipnetmask=<ZZ.ZZ.ZZ.ZZ> commitpending=true

Set 'pendingipaddress' to 'XX.XX.XX.XX'
Set 'pendingipgateway' to 'YY.YY.YY.YY'
Set 'pendingipnetmask' to 'ZZ.ZZ.ZZ.ZZ'
Set 'commitpending' to 'true'

->
```

3.   Load the second system firmware image.
See .

▼ Load the Firmware Image a Second Time

After restoring the Oracle Solaris miniroot, you must load the new system firmware image
a second time. This updates the secondary flash in the SP. The SP then reboots, makes the
secondary flash the primary flash, and loads the new firmware image from the primary flash.
This process takes about six minutes.

1.   Load the second image of system firmware 9.5.2.g or later. Type:

```
-> load -source http://<ip_address_or_hostname>/Sun_System_Firmware-9_5_2_g-
SPARC_T7-4.pkg /SP/firmware

NOTE: An upgrade takes several minutes to complete. ILOM
      will enter a special mode to load new firmware. No
      other tasks can be performed in ILOM until the
      firmware upgrade is complete and ILOM is reset.
```

```
Are you sure you want to load the specified file (y/n)? y
Preserve existing configuration (y/n)? y
.....................................................................
.....................................................................
.....................................................................
.....................................................................

Firmware update is complete.
ILOM will now be restarted with the new firmware.


-> /sbin/reboot
Stopping coredump capture...done.
Watchdogd: Stopping patting ... Done
Network Interface Plugging Daemon...stop eth0...done.
Stopping kernel log daemon....
...
Mounting root filesystem read-only...done.
Restarting system.
Will now restart+****
Primary Bootstrap.
SYSRST     = 0x1
  Reading RO_Hw_Straps
  Searching for packages
      Good uboot CRC for data=[*000c0000, len=553b4] in pkg *0013f800 (crc: 0x44f46b65)
      Good uboot CRC for data=[*000c0000, len=80000] in pkg *00140000 (crc: 0xb0b8c9ac)
      Good kernel CRC for data=[*00142000, len=1e0de8] in pkg *00140000 (crc:
 0xbf324077)
      Good root CRC for data=[*00340000, len=ef1000] in pkg *00140000 (crc: 0x5d3b8e31)
      Good vbscdir CRC for data=[*01740000, len=4c000] in pkg *00140000 (crc:
 0x7a62c323)
      Good uboot CRC for data=[*018c0000, len=553b4] in pkg *0193f800 (crc: 0x44f46b65)
      Good uboot CRC for data=[*018c0000, len=80000] in pkg *01940000 (crc: 0xb0b8c9ac)
      Good kernel CRC for data=[*01942000, len=1e0de8] in pkg *01940000 (crc:
 0xbf324077)
      Good root CRC for data=[*01b40000, len=ef1000] in pkg *01940000 (crc: 0x5d3b8e31)
      Good vbscdir CRC for data=[*02f40000, len=4c000] in pkg *01940000 (crc:
 0x7a62c323)
  Starting U-Boot at 0x000c0000\ufffd

U-Boot 2010.03

Custom Pilot3 U-Boot 0.1 (Dec  4 2015 - 11:41:49) r105871

VGA buffer reserved 0x800000 bytes at 0x80000000
sptrace allocated 0x800000 bytes at 0x9F800000
DRAM:  496 MB
Flash: 48 MB
```

```
In:    serial
Out:   serial
Err:   serial

  ARM restart caused by: reboot
  hardware interface reset by: none
  Galactic1: 0x4000c900, Galactic2: 0x0
  The host is OFF(S5) (hostWantsPwr=0, powerGood=0,
 allowPwrOn=0|0, outOfReset=0, fatalError=0).


pilot3 chip revision : 0x5
SP Debug Jumper:  Inserted
SP CLR_PASSD Jumper:  Empty


...
Loading kernel module video.
Loading kernel module Timer.
Mounted vbsc
  params:  (20.2 MB) exists mounted
  persist:  (106.3 MB) exists mounted
  coredump:  (70.4 MB) exists mounted
  large:  (64.5 MB) exists mounted
  extra:  (36.4 MB) exists mounted
  package:  (230.3 MB) exists mounted
  miniroot:  (468.1 MB) exists mounted
Available freespace: 0 MB

Checking configuration files state ...
Image date:  Fri Dec  4 12:18:44 PST 2015 Image revision: 105871
Conf date:   Fri Dec  4 12:18:44 PST 2015 Conf revision:  105871
Configuration files state good after upgrade.
Setting the system clock.
System Clock set to: Mon Dec  7 19:31:08 UTC 2015.
...
Probing frus ...done
Done running plat
Identifying Product Data...Done
Setting poweron delay...
Starting Dynamic FRUID Daemon early init: dynafrud_early_init  Done (0)
INIT: Entering runlevel: 3
Preparsing sensor.xml... ( took 1 seconds ) done
Starting Event Manager: eventmgr  . Done
Starting ipmi log manager daemon: logmgr . Done
...
waiting for GM ready ...GM is ready
Starting Sppostadm:  -a Done

ORACLESP-XXXXXXXX login:
```

2. **Restore the SP configuration.**

   See .

▼ Restore the SP Configuration

Restoring the SP configuration you previously backed up might take three minutes or longer, depending on the amount of platform-specific data.

> **Note -** You cannot use Oracle Enterprise Ops Center for this portion of the upgrade procedure.

1. **Log in to the SP. Type:**

   > **Note -** You must have full user role privileges (i.e. `aucro`) to perform this task.

   ```
   ORACLESP-<XXXXXXXX> login: root
   Password:
   Detecting screen size; please wait...done

   Oracle(R) Integrated Lights Out Manager

   Version X.X.X.X.x rXXXXXX

   Copyright (c) 2017, Oracle and/or its affiliates. All rights reserved.

   Hostname: ORACLESP-<XXXXXXXX>

   ->
   ```

2. **Set the passphrase for restoring the SP configuration information.**

   Use the passphrase you noted earlier. Type:

   ```
   -> set /SP/config passphrase=<XXXXXXXXXXXXXXXX>
   Set 'passphrase' to 'XXXXXXXXXXXXXXXX'

   ->
   ```

3. **Restore the backed up SP configuration. Type:**

   ```
   -> set /SP/config load_uri=scp://<username>@<ip_address_or_hostname>/backup_XXXXXXXX.xml
   Enter remote user password: *********
   Dump successful.
   ->
   ```

> **Note -** If you are restoring the SP configuration from a local serial port connection, the screen output includes the following:

```
set: Load partially successful, please view the event log
```

The `/SP/logs/event/list` log includes the following line:

```
Config restore: Unable to restore property '/SP/serial/external/commitpending'
(Can not change serial settings - the serial console is in use.)
```

4. **Load the Oracle Solaris fallback image.**

   See "Load the Oracle Solaris Fallback Image" on page 31.

▼ Load the Oracle Solaris Fallback Image

Now that you have loaded the initial image of system firmware 9.5.2.g or later and restored the network and other configuration parameters to the SP, you must reload the Oracle Solaris fallback image.

> **Note -** Loading the Oracle Solaris fallback image takes about three minutes.

1. **Load the Oracle Solaris miniroot package. Type:**

   -> **load -source** *http://<ip_address_or_hostname>/sol-11_2_10_5_0-fallback_boot-sparc.pkg /SP/firmware/host/miniroot*

   ```
   Are you sure you want to load the specified file (y/n)? y
   This installs a new copy of miniroot.  Do you want to continue (y/n)? y


   Firmware update is complete.

   ->
   ```

2. **Load the final system firmware image.**

   See "Load the Final System Firmware Image" on page 32.

▼ Load the Final System Firmware Image

This final firmware image load takes about six minutes.

1. Load the final system firmware image. Type:

```
-> load -source http://<ip_address_or_hostname>/Sun_System_Firmware-9_5_2_g-
SPARC_T7-4.pkg /SP/firmware

NOTE: An upgrade takes several minutes to complete. ILOM
      will enter a special mode to load new firmware. No
      other tasks can be performed in ILOM until the
      firmware upgrade is complete and ILOM is reset.

Are you sure you want to load the specified file (y/n)? y
Preserve existing configuration (y/n)? y
......................................................................................................

Firmware update is complete.
ILOM will now be restarted with the new firmware.


-> /sbin/reboot
Stopping coredump capture...done.
Watchdogd: Stopping patting ... Done
Network Interface Plugging Daemon...stop eth0...done.
Stopping kernel log daemon....
...
Mounting root filesystem read-only...done.
Restarting system.
Will now restart+****
Primary Bootstrap.
SYSRST    = 0x1
  Reading RO_Hw_Straps
  Searching for packages
      Good uboot CRC for data=[*000c0000, len=553b4] in pkg *0013f800 (crc: 0x44f46b65)
      Good uboot CRC for data=[*000c0000, len=80000] in pkg *00140000 (crc: 0xb0b8c9ac)
      Good kernel CRC for data=[*00142000, len=1e0de8] in pkg *00140000 (crc:
 0xbf324077)
      Good root CRC for data=[*00340000, len=ef1000] in pkg *00140000 (crc: 0x5d3b8e31)
      Good vbscdir CRC for data=[*01740000, len=4c000] in pkg *00140000 (crc:
 0x7a62c323)
      Good uboot CRC for data=[*018c0000, len=553b4] in pkg *0193f800 (crc: 0x44f46b65)
      Good uboot CRC for data=[*018c0000, len=80000] in pkg *01940000 (crc: 0xb0b8c9ac)
      Good kernel CRC for data=[*01942000, len=1e0de8] in pkg *01940000 (crc:
 0xbf324077)
      Good root CRC for data=[*01b40000, len=ef1000] in pkg *01940000 (crc: 0x5d3b8e31)
```

```
     Good vbscdir CRC for data=[*02f40000, len=4c000] in pkg *01940000 (crc:
 0x7a62c323)
  Starting U-Boot at 0x000c0000\ufffd


U-Boot 2010.03


Custom Pilot3 U-Boot 0.1 (Dec  4 2015 - 11:41:49) r105871


VGA buffer reserved 0x800000 bytes at 0x80000000
sptrace allocated 0x800000 bytes at 0x9F800000
DRAM:  496 MB
Flash: 48 MB
In:    serial
Out:   serial
Err:   serial

  ARM restart caused by: reboot
  hardware interface reset by: none
  Galactic1: 0x4000c900, Galactic2: 0x0
  The host is OFF(S5) (hostWantsPwr=0, powerGood=0,
 allowPwrOn=0|0, outOfReset=0, fatalError=0).

pilot3 chip revision : 0x5
SP Debug Jumper:  Inserted
SP CLR_PASSD Jumper:  Empty

...
Loading kernel module video.
Loading kernel module Timer.
Mounted vbsc
  params:  (20.2 MB) exists mounted
  persist:  (106.3 MB) exists mounted
  coredump:  (70.4 MB) exists mounted
  large:  (64.5 MB) exists mounted
  extra:  (36.4 MB) exists mounted
  package:  (230.3 MB) exists mounted
  miniroot:  (468.1 MB) exists mounted
Available freespace: 0 MB

Checking configuration files state ...
Image date:  Fri Dec  4 12:18:44 PST 2015 Image revision: 105871
Conf date:   Fri Dec  4 12:18:44 PST 2015 Conf revision:  105871
Configuration files state good after upgrade.
Setting the system clock.
System Clock set to: Mon Dec  7 19:31:08 UTC 2015.
...
Probing frus ...done
Done running plat
```

```
Identifying Product Data...Done
Setting poweron delay...
Starting Dynamic FRUID Daemon early init: dynafrud_early_init  Done (0)
INIT: Entering runlevel: 3
Preparsing sensor.xml... ( took 1 seconds ) done
Starting Event Manager: eventmgr  . Done
Starting ipmi log manager daemon: logmgr . Done
...
waiting for GM ready ...GM is ready
Starting Sppostadm:  -a Done

ORACLESP-XXXXXXXX login:
```

The firmware update process is complete.

2.   **If the server does not power on automatically, power on the server. Type:**

```
-> start /System
  Are you sure you want to start /System (y/n)? y
  Starting /System

->
```

Updating SP Firmware from the HOST

To update SP firmware from the HOST, Oracle is standardizing on the `fwupdate` utility. This utility is included in Oracle Solaris as part of the Oracle Hardware Management Pack (OHMP).

Note - Beginning with SPARC T7 servers, the `sysfwdownload` utility does not ship with SP firmware releases, and that utility is not supported.

For more information on using the `fwpudate` utility that is included in Oracle Solaris 11.3, refer to "Update an Oracle ILOM Service Processor Using `fwupdate`" in the *Oracle Server CLI Tools for Oracle Solaris 11.3 User Guide* (http://docs.oracle.com/cd/E64576_01/html/E64582/gltkm.html#scrolltoc).

When you follow the steps in that procedure, and have obtained a desired firmware package, this is the command that will update the SP from the HOST:

`fwupdate update sp-bios-firmware -n sp_bios -f` *firmware-package-file*`.pkg`

firmware-package-file.pkg is the path to the firmware package for your server's SP.

Required Firmware Updates for X-Options

If you install the Oracle Flash Accelerator F160 PCIe Card or the Oracle 1.6TB NVMe SSD as an x-option, you must update the firmware to RA13, or a subsequent release if available. Servers ordered with this option installed already have the updated firmware.

For firmware upgrade instructions, refer to the NVMe card and SSD documentation at: `http://www.oracle.com/goto/oracleflashf160/docs`.

Determine Correct Firmware for IO Devices

Some product features are enabled only when the latest versions of patches or firmware are installed. In order to retain optimal performance, security, and stability, installing the latest available patches or firmware is required. Confirm that the latest server firmware version is installed.

To easily determine the latest released version of supported firmware for available IO devices, locate the "IO Options Firmware 1.0" patch (patch number 25393974) on My Oracle Support (MOS).

This patch can be found in a "Product or Family (Advanced)" search, under the "Patches & Update" tab on MOS for any SPARC T7, S7 or M7 platform from Oracle. For example, a query for *SPARC S7-2L* will include *SPARC S7-2L IO Options Firmware 1.0*.

The patch only contains a README, with a table of available IO devices and a pointer to the latest supported firmware patch on MOS for each device.

Installing and Booting Oracle Solaris 11 From Devices Connected to a USB Port

To install Oracle Solaris without using an IPS AutoInstall server on the network, you can use Oracle Solaris media in a DVD drive. The DVD drive can be built into the server or attached to a USB port. You also can boot from an ISO image copied to a DVD disk, hard drive, or SSD.

You can install Oracle Solaris 11.3 OS on this server from an image copied to a USB flash drive. That USB image is available for download at the same location as the ISO images `http://www.oracle.com/technetwork/server-storage/solaris11/downloads/index.html`.

You also can create a persistent device alias for a device connected to a USB port. The simpler alias name remains available for future installation or boot operations.

For more information about installing Oracle Solaris and creating persistent device aliases, refer to *Installing Oracle Solaris 11.3 Systems* at:

http://docs.oracle.com/cd/E53394_01.

You can boot Oracle Solaris 11.3 from drives installed in the server (hard drive, SSD, or DVD drive) or from devices connected to a USB port.

For the path to identify a USB port in a `boot` command, refer to the list of devices output by the `show-dev` OpenBoot command.

PCIe Slot Configuration Requirements for Aura7 PCIe Cards

The following PCIe slot configuration requirements exist for these servers when Aura7 PCIe cards are installed:

- In SPARC T7-4 servers that have Aura7 PCIe cards installed, you must install cards in slots 1/2/3/4/13/14/15/16 to avoid thermal concerns in the system.
- In SPARC T7-1 servers that have Aura7 PCIe cards installed, you can populate no more than four slots, which is two fewer than systems that use Aura6 PCIe cards.

Oracle VM Server for SPARC Guidelines

If you plan to configure Oracle VM Server for SPARC on this server, follow these guidelines:

- Do not configure the Oracle Solaris 10 OS in the control domain, root domains, I/O domains, or service domains.
- You can configure Oracle Solaris 10 OS with the required patches and packages in guest domains.
- Be aware that instances of Oracle Solaris 10 with required patches and packages in a single guest domain are limited to 1024 virtual CPUs and 4 Tbytes of memory.

The majority of a physical domain's memory can be assigned to logical domains. However, a small portion of the PDomain's memory is preassigned to software components, the hypervisor, and certain I/O devices. To determine which portions of the memory are unavailable for logical domains, log in to the PDomain and type this command:

```
# ldm ls-devices -a mem
```

In the command output, look for the rows that include _sys_ in the BOUND column. These portions of memory are not available for logical domains.

For more information about Oracle VM Server for SPARC, refer to the Oracle VM Server for SPARC documentation.

Oracle Software in Silicon Features

The microprocessors for the SPARC T7 series servers offer co-engineered hardware and software capabilities that enable applications to run with the highest levels of security, reliability, and speed. This functionality is called as Oracle *Software in Silicon*.

Software in Silicon features include:

- **Silicon Secured Memory** – detects common memory access errors including:
  - Buffer overflows
  - Unallocated or freed memory access errors
  - "Double free" memory access errors
  - Stale pointer memory access errors

  With Silicon Secured Memory enabled, an error is likely to be raised if an application tries to access memory to which it should not have access. This feature enhances application data integrity (ADI). (The Silicon Secured Memory feature is not supported for use with Kernel Zones at this time.)
- **Data Analytics Accelerator (DAX)** – Coprocessors perform query-related operations directly through the hardware, which improves Oracle Database performance. You can use DAX hardware acceleration for Oracle Database 12c in-memory database operations. (The DAX feature is not supported for use with Kernel Zones at this time.)

For more details on Silicon Secured Memory, refer to the Oracle Solaris 11.3 documentation.

To use DAX, you must configure the Oracle Database 12c in-memory feature. For instructions, refer to "Using the In-Memory Column Store" at:

http://docs.oracle.com/database/121/ADMIN/memory.htm#ADMIN14257

Oracle Solaris Fallback Miniroot Image Must Be Installed on a New SPM

When you replace the SPM in your server, you must install a fallback miniroot image that corresponds to the version of Oracle Solaris that are using. The miniroot image is not part of

the OS or firmware image that you install. Also, you must update the miniroot image when you install a new version of Oracle Solaris on the server, so the fallback image matches that version and SRU of Oracle Solaris.

You must download the fallback miniroot image for your hardware and your Oracle Solaris version from My Oracle Support at `https://support.oracle.com`. Then follow the procedure "Uploading a New Solaris Miniroot Package From SP to Host" in the *Oracle ILOM Administrator's Guide for Configuration and Maintenance*.

You will see the `defect.ilom.fs.miniroot-missing` error if you fail to install a fallback miniroot image. For example:

```
-> show faulty

Target                    | Property                |Value
------------------------+-------------------------
+--------------------------------------
   /SP/faultmgmt/0          | fru                     | /SYS
   /SP/faultmgmt/0/faults/0 | class                   | defect.ilom.fs.miniroot-
missing
```

Connecting a Terminal Device to the SER MGT Port

Crossover adapters are no longer provided in the shipping kit. To connect the server's SER MGT port to a terminal device, use an RJ-45 cable that is set up for a null modem configuration, in which the transmit and receive signals cross over.

Known Issues

These are the known issues for the SPARC T7 servers:

- "Some SPARC T7-2 Memory Risers Include Flat-Head Screws" on page 39
- "When You Create Logical Domains, Some Memory Is Reserved By the Server" on page 40
- "`javac` Fails During Builds on T7 Platforms (19503356)" on page 40
- "Processes Hang in `nanosleep()` in an Oracle Solaris 10 Guest Domain (19690481)" on page 40
- "Oracle VTS System Exerciser Disk Test Fails On eUSB Device Due to Delayed `taskq` (18154963)" on page 41

- "Servers With Missing Miniroot Indicate Cooling in the List of Affected Subsystems (20922954)" on page 42

- "Oracle Solaris Should Process `os-root-device` Only Upon Boot (21077998)" on page 43

- "Logical Domains Virtual Disk Access Failed - Oracle Solaris Cluster Not Coming Up Following Single-Node Reboot (21421237)" on page 45

- "Fault Repair From the SPM Does Not Work In a Multi-Hop Between a Control Domain and the Root Domain (21459393)" on page 46

- "`sun4v_pcbe_enable` Warning Appears When Starting a Guest Domain Running Oracle Solaris 10 (21466955)" on page 46

- "`ixgbevf` Driver Does Not Properly Report a Link State Change to the MAC Layer (21629053)" on page 47

- "Flash Logging Is Broken in Hypervisor (21646012)" on page 48

- "Solaris OS Fails to Drop to OpenBoot Upon Retirement of SCC Cores and L2DS (21644300, 21772653)" on page 48

- "Sun Dual 10GbE SFP+ PCIe Low Profile Adapter Card Faulted With `Virtual_TTE_invalid` Error (21694361, 21848425)" on page 51

- "The Solaris OS Sometimes Fails to Recover Following a QRAP Event (22022572)" on page 53

- "Virtual_TTE_invalid Error On Assigned IOV Device (22138210)" on page 55

- "Saved LDOMs Configuration Fails To Boot After Upgrading the Server With an Additional Processor Module (22012359, 22161099)" on page 56

- "T7-x Observes Dropped Characters Running SysFW 9.7.4 (25506535)" on page 57

- "Do Not Use Certain Hynix 32GB DIMMs on T7 Servers (23284277, 23284255, 23222472)" on page 58

- "Net Install of 11.3SRU21b4 and b5 Panics With NVME Devices Installed (26241738)" on page 58

Some SPARC T7-2 Memory Risers Include Flat-Head Screws

Your SPARC T7-2 server could include a memory riser that is secured with a flat-head screw instead of the standard hex-head screw. If that is the case, use a No. 1 flat-blade screwdriver to service that memory riser.

When You Create Logical Domains, Some Memory Is Reserved By the Server

When you use Oracle VM Server for SPARC, you can assign most of the memory in a SPARC T7 server to logical domains. However, a small portion of the server's memory is preassigned to software components, the hypervisor, and certain I/O devices. Also, if DIMM sparing is active, a portion of memory is reserved to enable the server to operate normally after a DIMM has failed.

To determine which portions of memory are unavailable for logical domains, type:

```
# ldm ls-devices -a mem
```

In the output, look for rows that include `_sys_` in the `Bound` column. Each of those portions of memory is not available for logical domains.

For more information about DIMM sparing, refer to "DIMM Sparing Overview" in *SPARC T7 Series Servers Administration Guide*.

`javac` Fails During Builds on T7 Platforms (19503356)

If you are developing Java applications on SPARC T7 servers, use JDK version 7u72 or later.

Processes Hang in `nanosleep()` in an Oracle Solaris 10 Guest Domain (19690481)

To install Oracle Solaris 10, you must patch the miniroot of the installation media with KU150400-25, at minimum. You can use the Oracle Solaris 10 JumpStart technology and finish scripts to patch the installed image. Refer to MOS article 1501320.1 for instructions on how to patch a packed miniroot at https://support.oracle.com.

If you are unfamiliar with the Oracle Solaris 10 JumpStart technology, contact your support representative or Oracle Support for documentation that describes how to configure an Oracle Solaris 11 zone as an Oracle Solaris 10 1/13 JumpStart server.

Oracle VTS System Exerciser Disk Test Fails On eUSB Device Due to Delayed `taskq` (18154963)

Under heavy load, one or more of the embedded USB devices used on SPARC T7 and SPARC M7 servers to accommodate boot archives (not intended for direct customer use) might experience disconnect and reconnect events, with messages similar to this one appearing on the console or in `syslog`:

```
scsi: WARNING: /pci@309/pci@2/usb@0/storage@1/disk@0,0
(sd22):      Command failed to complete...Device is gone
WARNING: /pci@309/pci@2/usb@0/storage@1 (scsa2usb13):
Reinserted device is accessible again.
```

If you are using Oracle VTS to validate the server during these disconnect/reconnect events, the events might cause the VTS Disk test to fail, with an error logged in `/var/sunvts/logs/sunvts.err` file such as the following:

```
SunVTS7.0ps19.2: VTSID 8009
Disk.diskmediatestmfg.FATAL rdsk/c7t0d0: Failed to open the device node,
Error Message : (No such device or address).
Suggestions :
(1) Verify if the device node exists in /dev/rdsk directory
(2) Run format(1M), rmformat(1)>
(3) Run '# devfsadm -C ' to clean-up dangling /dev links" SunVTS7.0ps19.2: VTSID 6427
 vtsk.
ERROR : Disk.diskmediatest.0[c7t0d0] (pid=5575) exited with exit code: 1 during task
 431404.
```

Recovery: The server recovers the failed device automatically.

Excessive Messages Generated for a Power Supply Fan Fault (19951780)

When the fan on a power supply fails, fault messages are repeatedly generated and cleared until you replace the power supply.

On the Oracle Solaris console, the repeated messages are similar to this:

```
Nov  4 09:58:41 system-name SC Alert: [ID 821027 daemon.alert] Fault
critical: Fault detected at time = Tue Nov  4 14:01:16 2014. The
suspect component: /SYS/PS0 has fault.chassis.device.psu.fail with
probability=100.
```

In the Oracle ILOM event log, the multiple entries are similar to this:

```
53        Tue Nov  4 14:01:16 2014  Fault    Fault    critical
     Fault detected at time = Tue Nov  4 14:01:16 2014. The suspect
     component: /SYS/PS0 has fault.chassis.device.psu.fail with
     probability=100.
352        Tue Nov  4 14:01:06 2014  Sensor    Log       minor
     Power Supply : /SYS/PS0/STATE : Predictive failure : Asserted
351        Tue Nov  4 14:01:06 2014  Sensor    Log       minor
     Power Supply : /SYS/PS0/STATE : Failure detected : Deasserted
350        Tue Nov  4 14:01:00 2014  Fault     UUID_Repaired  minor
     Fault with UUID 9e6ba288-ec5a-48bf-d129-e24a90055231 repaired
349        Tue Nov  4 14:01:00 2014  Fault     Repair    minor
     Component /SYS/PS0 repaired
348        Tue Nov  4 14:01:00 2014  Fault     Repair    minor
     Fault fault.chassis.device.psu.fail on component /SYS/PS0 cleared
347        Tue Nov  4 14:01:00 2014  Sensor    Log       minor
     Power Supply : /SYS/PS0/STATE : Predictive failure : Deasserted
346        Tue Nov  4 14:01:00 2014  Sensor    Log       minor
     Power Supply : /SYS/PS0/STATE : Failure detected : Asserted>
```

Workaround: The messages will stop repeating when you replace the failing power supply.

Servers With Missing Miniroot Indicate Cooling in the List of Affected Subsystems (20922954)

This issue was fixed in system firmware 9.5.2.g.

If the miniroot volume is missing in a system, the property /System/Open_Problems shows Cooling in the list of affected subsystems:

```
-> show /System/Open_Problems

Open Problems (1)
Date/Time               Subsystems          Component
----------------------  ------------------  ------------
Sat Aug 29 22:29:17 2015  System, Cooling    /System (Host System)
        The ILOM Mini-Root system is missing. (Probability:100,
        UUID:ce6e7e97-523c-e55b-a6fc-96dd2dd09187, Resource:/SYS/SP, Part
        Number:9999999294, Serial Number:465769T+1520BUR294, Reference
        Document:http://support.oracle.com/msg/ILOM-8000-9W)
```

Cooling should not appear in the Subsystems column because the miniroot volume has nothing to do with the cooling subsytem.

If the miniroot volume is missing from the system, this Cooling message can be safely ignored. In addition, there is no interruption in service.

Oracle Solaris Should Process `os-root-device` Only Upon Boot (21077998)

After Oracle Solaris is installed on the server with its root file system stored on an iSCSI device that is accessed using IP over Infiniband (IPoIB), if Oracle Solaris is subsequently reinstalled onto other storage devices, booting the newly installed Oracle Solaris instance attempts to mount the root file system from the previously installed iSCSI devices using IPoIB. This situation is due to the continued presence of the `os-root-device` NVRAM variable. For example:

Note - This example shows output from an M7 server.

```
(1) os-root-device refers to a working IB HCA and iSCSI target configuration
SPARC M7-8, No Keyboard
Copyright (c) 1998, 2015, Oracle and/or its affiliates. All rights reserved.
OpenBoot 4.37.3, 1.4257 TB memory available, Serial #105354904.
Ethernet address 0:10:e0:47:96:a4, Host ID: 8765678.


Boot device: /pci@315/pci@1/nvme@0/disk@1  File and args:
SunOS Release 5.11 Version 11.3 64-bit
Copyright (c) 1983, 2015, Oracle and/or its affiliates. All rights reserved.
@ NOTICE: Configuring iSCSI to access the root filesystem...
Hostname: xxxxx
cannot mount 'rpool/export' on '/export': directory is not empty
cannot mount 'rpool/export' on '/export': directory is not empty
cannot mount 'rpool/export/home' on '/export/home': failure mounting parent
dataset
cannot mount 'rpool1/VARSHARE/zones' on '/system/zones': mountpoint or
dataset is busy
svc:/system/filesystem/local:default: WARNING: /usr/sbin/zfs mount -a failed:
one or more file systems failed to mount
Sep 29 02:03:56 svc.startd[13]: svc:/system/filesystem/local:default: Method
"/lib/svc/method/fs-local" failed with exit status 95.
Sep 29 02:03:56 svc.startd[13]: system/filesystem/local:default failed
fatally: transitioned to maintenance (see 'svcs -xv' for details)


xxxxx console login:

(2) os-root-device is invalid (bad device path to an IB device):


...


SPARC M7-8, No Keyboard
Copyright (c) 1998, 2015, Oracle and/or its affiliates. All rights reserved.
OpenBoot 4.37.3, 1.4257 TB memory available, Serial #105354904.
```

```
Ethernet address 0:10:e0:47:96:a4, Host ID: 8765678.

Boot device: /pci@315/pci@1/nvme@0/disk@1  File and args:
SunOS Release 5.11 Version 11.3 64-bit
Copyright (c) 1983, 2015, Oracle and/or its affiliates. All rights reserved.
resolve_ib_path_one: unable to hold /pci@30d/pci@1/pciex15b3,1003@1
WARNING: Cannot plumb network device 6

panic[cpu0]/thread=20012000: vfs_mountroot: cannot mount root

Warning - stack not written to the dumpbuf
000000002000fa00 genunix:main+1dc (208a1000, 20122e40, 202f6640, 0, 0, 1)
  %l0-3: 0000000000000000 00000000203bdc00 0000000000000000 0000000010070800
  %l4-7: 0000000020122c00 0000000010070800 0000000000000000 0000000000000000

Deferred dump not available.
skipping system dump - no dump device configured and deferred dump is
disabled
rebooting...
Resetting...

...

(3) os-root-device refers to an invalid or inaccessible iSCSI target:
SPARC M7-8, No Keyboard
Copyright (c) 1998, 2015, Oracle and/or its affiliates. All rights reserved.
OpenBoot 4.37.3, 1.4257 TB memory available, Serial #105354904.
Ethernet address 0:10:e0:47:96:a4, Host ID: 8765678.

Boot device: /pci@315/pci@1/nvme@0/disk@1  File and args:
SunOS Release 5.11 Version 11.3 64-bit
Copyright (c) 1983, 2015, Oracle and/or its affiliates. All rights reserved.
@ NOTICE: Configuring iSCSI to access the root filesystem...
@ WARNING: iscsi connection(5) login failed - Requested ITN does not exist at
this address. (0x02/0x03) Target:
oqn.1986-03.com.sun:02:sca-m78-168-pd0-s11u3-30-sparc, TPGT: -1
@ WARNING: iscsi connection(5) login failed - Requested ITN does not exist at
this address. (0x02/0x03) Target:
oqn.1986-03.com.sun:02:sca-m78-168-pd0-s11u3-30-sparc, TPGT: -1
@ WARNING: iscsi connection(5) login failed - Requested ITN does not exist at
this address. (0x02/0x03) Target:
oqn.1986-03.com.sun:02:sca-m78-168-pd0-s11u3-30-sparc, TPGT: -1
@ WARNING: iscsi connection(5) login failed - Requested ITN does not exist at
this address. (0x02/0x03) Target:
oqn.1986-03.com.sun:02:sca-m78-168-pd0-s11u3-30-sparc, TPGT: -1
@ WARNING: iscsi connection(5) login failed - Requested ITN does not exist at
this address. (0x02/0x03) Target:
oqn.1986-03.com.sun:02:sca-m78-168-pd0-s11u3-30-sparc, TPGT: -1
```

```
@ WARNING: Failed to configure iSCSI boot session
@ WARNING: Failed to get iscsi boot path

panic[cpu0]/thread=20012000: vfs_mountroot: cannot mount root

Warning - stack not written to the dumpbuf
000000002000fa00 genunix:main+1dc (208a1000, 20122e40, 202f6640, 0, 0, 1)
  %l0-3: 0000000000000000 00000000203bdc00 0000000000000000 0000000010070800
  %l4-7: 0000000020122c00 0000000010070800 0000000000000000 0000000000000000

Deferred dump not available.
skipping system dump - no dump device configured and deferred dump is
disabled
rebooting...
Resetting...
```

Workaround:

1. Clear os-root-device at the ok prompt.

   ok **set-default os-root-device**

2. Boot Oracle Solaris.

   ok **boot**

Logical Domains Virtual Disk Access Failed - Oracle Solaris Cluster Not Coming Up Following Single-Node Reboot (21421237)

This issue appears on the configuration of a two-node Oracle Solaris 3.3 3/13 cluster plus the Oracle Solaris 10 1/13 recommended patch set and quorum devices using the SCSI-2 protocol, configured as Oracle VM Server for SPARC guest domains serviced by Oracle Solaris 11.3 I/O domains.

If one node leaves the cluster, either due to a node halt, panic, reboot event, or loss of cluster interconnect (that is, split brain), delayed SCSI-2 access to a quorum device might lead to a panic on the other cluster node, producing an error similar to this one:

```
 panic[cpu13]/thread=30011df80e0: CMM: Unable to acquire the quorum device.
```

Workaround: On guest domains running Oracle Solaris 10 1/13 plus recommended patches, configure the quorum device to use the SCSI-3 protocol.

Recovery: If the workaround is unsuccessful, reboot the server. Collect any panic core dumps and contact your service representative.

> **Note -** For more information about administering SCSI protocol settings for storage devices, refer to the *Oracle Solaris Cluster System Administration Guide*.

Fault Repair From the SPM Does Not Work In a Multi-Hop Between a Control Domain and the Root Domain (21459393)

This issue was fixed in Oracle Solaris 11.3.2.4.

If an I/O domain diagnoses a fault against a device to which it has direct access, the fault information is visible in the primary (that is, control) domain and in Oracle ILOM, as well as in the I/O domain that diagnosed the fault. However, if you attempt to repair the fault from Oracle ILOM, the repair action fails. No error message is displayed, but the fault is still present if you execute subsequent `fmadm` commands from the I/O domain.

> **Note -** This issue applies to all the repair-related variants of the fmadm command `fmadm acquit`, `fmadm repair`, `fmadm repaired`, and `fmadm replaced`.

Recovery: If you encounter this bug, execute the `fmadm repair` command in the affected I/O domain and the repair operation works as intended.

`sun4v_pcbe_enable` Warning Appears When Starting a Guest Domain Running Oracle Solaris 10 (21466955)

When running Oracle Solaris 10 in a guest domain, this message appears on the guest domain console upon start up:

```
Boot device: disk  File and args: -k
Loading kmdb...
SunOS Release 5.10 Version Generic_150400-20 64-bit
Copyright (c) 1983, 2014, Oracle and/or its affiliates. All rights reserved.
WARNING: sun4v_pcbe_enable: no HV API found
Hostname: ...
```

This message appears because the Oracle Solaris 10 version of `cpustat`(1M) cannot monitor the performance counters in the SPARC T7 and M7 processors. This message may be safely ignored.

Starting with Oracle Solaris 11.3, the cpustat(1M) command can monitor the performance counters in SPARC T7 and M7 processors.

ixgbevf Driver Does Not Properly Report a Link State Change to the MAC Layer (21629053)

This issue was fixed in Oracle Solaris 11.3.2.4.

If you reboot the root domain with I/O Resiliency (IOR) enabled (that is, logical domains failure policy set to ignore) the I/O domain might fail to initiate an ixbgevf network interface.

For example, before rebooting non primary root domain (NPRD), type:

Note - This example shows output from a SPARC T7-2 server.

```
# ipmpstat -i
INTERFACE   ACTIVE  GROUP     FLAGS     LINK      PROBE     STATE
net1        yes     ipmp0     --mbM--   up        disabled  ok
net7        yes     ipmp0     -------   up        disabled  ok

# dladm show-phys
LINK            MEDIA           STATE   SPEED  DUPLEX    DEVICE

net0            Ethernet        up      0      unknown   vnet0
net7            Ethernet        up      10000  full      ixgbevf7
net1            Ethernet        up      10000  full      ixgbevf4
```

After rebooting the NPRD, type:

```
# ipmpstat -i
INTERFACE   ACTIVE  GROUP     FLAGS     LINK      PROBE     STATE
net1        no      ipmp0     -------   down      disabled  failed
net7        yes     ipmp0     --mbM--   up        disabled  ok
# dladm show-phys
LINK            MEDIA           STATE   SPEED  DUPLEX    DEVICE

net0            Ethernet        up      0      unknown   vnet0
net7            Ethernet        up      10000  full      ixgbevf7
net1            Ethernet        down    10000  full      ixgbevf4
```

Recovery: Perform these steps.

1. Unplumb and plumb the failed interface.

```
# ipadm delete-ip net1
# ipadm create-ip net1
```

2. Add the device into the `ipmp` group again.

```
# ipadm add-ipmp -i net1 ipmp0
```

Flash Logging Is Broken in Hypervisor (21646012)

The flash file used to log the console before the SPM is available (saved to `/HOST/console/bootlog`) does not work properly.

In some rare cases, the boot flash output stops when the hypervisor initiates during start up. The console log is still available once the SPM is started, in `/HOST/console/history`.

If the server encounters an error when the SPM is down or before the SMP boot sequence finishes, the error might not be logged in the system flash log for later recovery and diagnosis. In addition, the error does not appear in the fault management shell or in `show faulty` output.

If the system flash log write action collides with a saved LDoms configuration, the LDoms configuration might be overwritten. On the next power-on event, the server boots into factory default mode, and the saved XML configuration file is available on the boot disk.

Recovery: To recover the configuration, enable recovery mode and reboot the server.

1. Enable recover mode.

```
primary# svccfg -s ldmd setprop ldmd/recovery_mode = astring: auto
primary# svcadm refresh ldmd
```

2. Reboot the server.

```
primary# reboot
```

Solaris OS Fails to Drop to OpenBoot Upon Retirement of SCC Cores and L2DS (21644300, 21772653)

This issue was fixed in Sun System Firmware 9.5.2.

If the primary domain is configured without enough resources (two SCCs or fewer) and correctable errors trigger an FMA retirement action affecting both these SCCs, then the domain

hangs upon reboot. Other domains are not affected, and continue to run normally as long as their own network cards and drives are still available. If an error triggers a domain retirement, you can view the fault using the fmadm faulty command.

Note - This example shows output from a SPARC T7-2 server.

```
SUNW-MSG-ID: SPSUN4V-8001-YA, TYPE: Problem, VER: 1, SEVERITY: Major
EVENT-TIME: Tue Oct  6 18:50:50 EDT 2015
PLATFORM: SPARC T7-2, CSN: 12345678, HOSTNAME: bur-t72-303-sp
SOURCE: fdd, REV: 1.0
EVENT-ID: f78853a2-87cf-e147-efb3-ecc370ef147e
DESC: An event was received indicating a fault was diagnosed by another fault manager.
AUTO-RESPONSE: Refer to the document at http://support.oracle.com/msg/SPSUN4V-8001-YA.
IMPACT: Refer to the document at http://support.oracle.com/msg/SPSUN4V-8001-YA.
REC-ACTION: Use 'fmadm faulty' to provide a more detailed view of this event. Please
 refer to the associated reference document at http://support.oracle.com/msg/SPSUN4V-
8001-YA for the latest service procedures and policies regarding this diagnosis.


-> fmadm faulty

Time                 UUID msgid                                       Severity
------------------ ------------------------------------ -------------- --------
2015-10-06/22:51:00 abea80bd-6d18-46a4-e9cc-fda7df765748 SPSUN4V-8001-YA Major

Problem Status    : open [injected]
Diag Engine       : fdd 1.0
System
  Manufacturer   : Oracle Corporation
  Name           : SPARC T7-2
  Part_Number    : 87654321
  Serial_Number  : 12345678

----------------------------------------
Suspect 1 of 1
  Fault class  : fault.cpu.generic-sparc.l2d-uc
  Certainty    : 100%
  Affects      : /SYS/MB/CM0/CMP/SCC3/L2D1
  Status       : faulted

  FRU
    Status          : faulty
    Location        : /SYS/MB
    Manufacturer    : Oracle Corporation
    Name            : ASY,MB,T7-2
    Part_Number     : 7093274
    Revision        : 02
    Serial_Number   : 465769T+1434NH00JJ
```

```
        Chassis
           Manufacturer   : Oracle Corporation
           Name           : SPARC T7-2
           Part_Number    : 87654321
           Serial_Number  : 12345678


Description : A cpu has experienced an uncorrectable level 2 data cache
              error (UE).


Response    : Cpu cores associated with the cache will be deconfigured.


Impact      : Some services may be lost and performance may be impacted.


Action      : Use 'fmadm faulty' to provide a more detailed view of this
              event. Please refer to the associated reference document at
              http://support.oracle.com/msg/SPSUN4V-8001-YA for the latest
              service procedures and policies regarding this diagnosis.


------------------ ------------------------------------ -------------- --------
Time               UUID msgid          Severity
------------------ ------------------------------------ -------------- --------
2015-10-06/22:50:50 f78853a2-87cf-e147-efb3-ecc370ef147e SPSUN4V-8001-YA Major


Problem Status    : open [injected]
Diag Engine       : fdd 1.0
System
   Manufacturer   : Oracle Corporation
   Name           : SPARC T7-2
   Part_Number    : 87654321
   Serial_Number  : 12345678


----------------------------------------
Suspect 1 of 1
   Fault class  : fault.cpu.generic-sparc.l2d-uc
   Certainty    : 100%
   Affects      : /SYS/MB/CM0/CMP/SCC3/L2D0
   Status       : faulted

   FRU
      Status          : faulty
      Location        : /SYS/MB
      Manufacturer    : Oracle Corporation
      Name            : ASY,MB,T7-2
      Part_Number     : 7093274
      Revision        : 02
      Serial_Number   : 465769T+1434NH00JJ
      Chassis
         Manufacturer  : Oracle Corporation
```

```
         Name           : SPARC T7-2
         Part_Number    : 87654321
         Serial_Number  : 12345678

Description : A cpu has experienced an uncorrectable level 2 data cache
              error (UE).

Response    : Cpu cores associated with the cache will be deconfigured.

Impact      : Some services may be lost and performance may be impacted.

Action      : Use 'fmadm faulty' to provide a more detailed view of this
              event. Please refer to the associated reference document at
              http://support.oracle.com/msg/SPSUN4V-8001-YA for the latest
              service procedures and policies regarding this diagnosis.
```

This issue is the root cause of a domain retirement if the fault is reported on the same cores running the primary domain, and the primary domain hangs upon reboot.

Workaround: Ensure that the primary guest domain is assigned two SCCs or more (that is, a minimum of two SCCs and a few additional cores) on the same node.

Recovery: Force reset the domain (reset -f /HOST) to regain access. Upon reboot the server is unable to access the most recently saved SPM configuration, and reverts to the factory default configuration instead.

Sun Dual 10GbE SFP+ PCIe Low Profile Adapter Card Faulted With `Virtual_TTE_invalid` Error (21694361, 21848425)

CR 21694361 was fixed in Sun System Firmware 9.5.2.

This issue occurs when guest domains configured using PCIe virtual functions are rebooted. In that case, if the guest domain owning the virtual function reboots, the system might generate TTE_Invalid errors during the reboot process. These errors are harmless and can be ignored, but they will trigger system faults.

For example, type:

Note - This example shows output from an M7 server.

```
# fmdump -eV
2015-08-18/04:57:48  ereport.io.pciex.rc.epkt@/SYS/CMIOU0/IOH/IOS0
   ...
```

```
          event_name     = Virtual_TTE_invalid

     # fmadm faulty


     --------------- ------------------------------------ -------------- --------
     Time                 UUID                                 msgid          Severity
     ------------------ ------------------------------------ ----------------------
     2015-09-22/14:23:19 eeb0aefa-2af6-4cd4-9a7a-e873266f82a2 PCIEX-8000-0A  Unknown


     Problem Status   : open
     Diag Engine      : eft 1.16
     System
        Manufacturer   : Oracle Corporation
        Name           : SPARC M7-8
        Part_Number    : 32973358+5+1
        Serial_Number  : AK00246629


     System Component
        Manufacturer   : Oracle Corporation
        Name           : SPARC M7-8
        Part_Number    : 7092780
        Serial_Number  : AK00254527


     ----------------------------------------
     Suspect 1 of 1
        Fault class  : fault.io.pciex.device-interr
        Certainty    : 100%
        Affects      : /SYS/CMIOU2/PCIE3/CAR/CARD
        Status       : faulted

        FRU
           Status          : faulty
           Location        : /SYS/CMIOU2/PCIE3/CAR
           Manufacturer    : Oracle Corporation
           Name            : TLA,CAR,X16
           Part_Number     : 7089613
           Revision        : 03
           Serial_Number   : 465769T+14329C07F5
           Chassis
              Manufacturer  : Oracle Corporation
              Name          : SPARC M7-8
              Part_Number   : 7092780
              Serial_Number : AK00254527

     Description : A fault was diagnosed by the Host Operating System.

     Action      : Please refer to the associated reference document at
        http://support.oracle.com/msg/PCIEX-8000-0A for a complete,
```

```
    detailed description and the latest service procedures and
    policies regarding this diagnosis.
```

Recovery: Clear the fault. For example:

 # fmadm acquit eeb0aefa-2af6-4cd4-9a7a-e873266f82a2

The Solaris OS Sometimes Fails to Recover Following a QRAP Event (22022572)

On rare occasions, the Solaris OS might fail to reboot successfully following a panic caused by a SPARC processor queue array parity error (QRAP).

This issue is present if mreg-uc ereports with the error-condition field is set to QRAP.

From the fault management shell, type:

```
fmdump -eV
2015-10-14/09:11:42
ereport.cpu.generic-sparc.mreg-uc@/SYS/CMIOU15/CM/CMP/SCC7/CORE3
                        __tod-0         = 0x561e7ead
                        __tod-1         = 0x1cee5cc0
                        tstate          = 0x4400000402
                        htstate         = 0x4
                        ehdl            = 0x1fdc100000000007
                        tpc             = 0x60000f022fac
                        tl              = 0x1
                        tt              = 0x29
                        diagnose        = 0x1
                        error-condition = QRAP
                        reported-by     = Hypervisor
                        ps-pesr         = 0x600
                        ps-res-err-qhead  = 0x0
                        ps-res-err-qtail  = 0x0
                        ps-nres-err-qhead  = 0x0
                        ps-nres-err-qtail  = 0x0
                        ps-cpu-mondo-qhead = 0x0
                        ps-cpu-mondo-qtail = 0x800000000011b340
                        ps-dev-mondo-qhead = 0x0
                        ps-dev-mondo-qtail = 0x0
```

In addition, output from the fmadm faulty command indicates that a core has been disabled by the fault management software:

```
-> fmadm faulty
------------------ ----------------------------------- ---------------------
Time              UUID                                 msgid         Severity
```

```
------------------ ------------------------------------ ---------------------
2015-11-13/05:59:06 ad7bc3bf-c0d7-657b-89e2-cc68f888c312 SPSUN4V-8000-AC Critical

Problem Status   : open
Diag Engine      : fdd 1.0
System
   Manufacturer   : Oracle Corporation
   Name           : SPARC M7-16
   Part_Number    : 32863269+3+1
   Serial_Number  : AK00247538

----------------------------------------
Suspect 1 of 1
   Fault class  : fault.cpu.generic-sparc.core-uc
   Certainty    : 100%
   Affects      : /SYS/CMIOU15/CM/CMP/SCC7/CORE3
   Status       : faulted

   FRU
       Status           : faulty
       Location         : /SYS/CMIOU15
       Manufacturer     : Oracle Corporation
       Name             : CMIOU Module
       Part_Number      : 7090830
       Revision         : 04
       Serial_Number    : 465769T+14426C01MU
       Chassis
         Manufacturer   : Oracle Corporation
         Name           : SPARC M7-16
         Part_Number    : 32863269+3+1
         Serial_Number  : AK00247538

Description : This core has encountered an uncorrectable error.

Response    : The fault manager will attempt to remove all strands
               associated with this resource from service.

Impact      : System performance may be affected.

Action      : Use 'fmadm faulty' to provide a more detailed view of this
               event. Please refer to the associated reference document at
               http://support.oracle.com/msg/SPSUN4V-8000-AC for the latest
               service procedures and policies regarding this diagnosis.
```

Recovery

From ILOM, stop and then start the affected host. For example:

```
-> stop /HOST2
```

```
-> start /HOST2
```

Virtual_TTE_invalid Error On Assigned IOV Device (22138210)

When the primary or root domain is rebooted, the I/O domain is notified to suspend the assigned virtual functions from domain being rebooted, and resume them when the reboot is complete. However, in some cases the resume notification might be issued prematurely, causing the I/O domain to fail to resume one or more of its assigned virtual functions. This issue occurs only on M7/T7 platforms when the LDOMS failure policy on the I/O domain is not set, or is set to ignore.

Two symptoms indicate this failure:

- A warning on the console in the I/O domain (also logged in /var/adm/messages)
- An FMA fault in the primary or root domain to which the physical function is assigned

The warning from the I/O domain console is as follows:

```
WARNING: pxsoft_msi_resume: retry limit exceeded.
```

The FMA fault in the primary or root domain is fault.io.pciex.device-invreq (PCIEX-8000-8R). It includes an ereport.io.pciex.rc.epkt error report with the following string:

```
event_name = Virtual_TTE_invalid
```

To list any logged FMA error reports, type:

 # fmdump -e

For a verbose listing which might include the event_name = Virtual_TTE_invalid string, type:

 # fmdump -eV

The warning from the I/O domain console is as follows:

```
WARNING: pxsoft_msi_resume: retry limit exceeded.
```

If this issue occurs, one or more assigned virtual functions will no longer work properly in the I/O domain following a primary or root domain reboot. The device drivers for the affected virtual functions cannot process any interrupt signals from the underlying hardware devices.

Recovery

To recover from this issue and regain the affected virtual functions, reboot the affected I/O domain.

To make the I/O domain more resilient against this issue, configure the following setting in its /etc/system file:

```
set pxsoft:pxsoft_resume_max_retries=1024
```

This setting only impacts the resume operations of virtual functions in the I/O domain. You must reboot I/O domain for this new setting to take effect.

Mitigation

This issue occurs if an I/O domain is assigned multiple virtual functions coming from multiple physical functions in the same PCIe bus. You can avoid this issue if you assign virtual functions in the I/O domain only from a single physical function of that PCIe bus.

Saved LDOMs Configuration Fails To Boot After Upgrading the Server With an Additional Processor Module (22012359, 22161099)

Note - Oracle does not recommend using named device bindings in LDOMs configurations.

This issue occurs on a SPARC T7-4 server when you attempt to reboot into an existing LDOMs configuration that uses named resource bindings after you have upgraded the server with an additional processor module. Factory default mode is incorrectly selected during reboot. The server boots into recovery mode, and named resource bindings specified in the previous LDOMs configuration are ignored.

Recovery

If you made a record of your LDOMs configuration before adding the processor module, regenerate the LDOMs configuration as described in the Workaround.

If you need immediate access to the old configuration, follow these steps:

1. Remove the processor module from PM1 and boot the server.

    Refer to the *SPARC T7-4 Server Service Manual* for removal instructions.

    The server reverts to its previous configuration, including the named resource bindings.

2. Make a record specific CPU and memory bindings of the LDOMs configuration.

3. Install the processor module into PM1 and boot the server.

Refer to the *SPARC T7-4 Server Service Manual* for installation instructions.

4. Regenerate the LDOMs configuration.
5. Save the LDOMs configuration and make it the default boot configuration.

Subsequent reboots will use the saved LDOMs configuration.

Workaround

Regenerate the LDOMs configuration:

1. In ILOM, set the server boot configuration to factory-default.
2. Install the processor module into PM1.

   Refer to the *SPARC T7-4 Server Service Manual* for installation instructions.
3. Reboot the server into the factory default configuration.
4. Create your desired LDOMs configuration.
5. Save the LDOMs configuration and make it the default boot configuration.

Subsequent reboots will use the saved LDOMs configuration.

T7-x Observes Dropped Characters Running SysFW 9.7.4 (25506535)

If you copy a large amount of text on OBP or Solaris while running SysFW 9.7.4, some the characters might be dropped. In the example below show at OBP, when the text *select /pci@301/pci@1/scsi@0* is copied from line 2 to line 5, the *scsi@0* text is unexpectedly dropped.

```
 {0} ok
{0} ok select /pci@301/pci@1/scsi@0
{0} ok show-sas-wwid
SAS World Wide ID is 50800200 0218f9d0
{0} ok
{0} ok unselect-dev
{0} ok select /pci@303/pci@1/ <-- missing the "scsi@0"
{0} ok show-sas-wwid
show-sas-wwid ?
```

Another possible scenario to encounter the issue is to use script to enter a long OBP or Solaris command.

Workaround: If you encounter this issue, manually type the commands instead of copying a large amount of text.

Workaround: Another option is to disable console logging from Oracle ILOM, however choosing this option means you will not get a log of console output when the SP is degraded for later retrieval. To use this workaround, type this command at the Oracle ILOM prompt:

```
-> set /HOST/console logging=disabled
```

For more information about how to work with Oracle ILOM features, refer to the Oracle ILOM documentation at:

http://www.oracle.com/goto/ilom/docs

Do Not Use Certain Hynix 32GB DIMMs on T7 Servers (23284277, 23284255, 23222472)

Do not use Hynix 32GB DIMMs with date codes WW1532 to WW1617 in SPARC T7 series servers.

Net Install of 11.3SRU21b4 and b5 Panics With NVME Devices Installed (26241738)

SPARC T7 and SPARC S7 servers with NVMe disk drives may experience Oracle Solaris OS panic during Oracle Solaris 11.3 SRU21 OS net install or boot.

For example:

```
Service discovery finished successfully
Process of obtaining install manifest initiated

panic[cpu111]/thread=2a122fd1b80: Deadlock: cycle in blocking chain

000002a122fd12f0 genunix:turnstile_will_prio+218 (2a122fd1b80, 2a12062fb80,
0, 3c, 1, 2087f000)
  %l0-3: 000002a122fd1b80 0000000000000001 0000000000000000 000000002087f108
  %l4-7: 00000000100b5fc0 0000000020121c08 000000001013b400 0000000000000000
000002a122fd13a0 genunix:turnstile_block+170 (c040b04238c38, 0,
c04090aa684c0, 20121c08, 0, 0)
  %l0-3: 000c0408ea1a79a8 0000000000002000 00000000202ffd40 0000000000000001
  %l4-7: 0000000000000000 000002a122fd1b80 0000000000000000 00000000208c0800
000002a122fd1450 unix:mutex_vector_enter+43c (2a12062fb80, 2a12062fb80,
20121c50, c04090aa684c0, 208ae708, 0)
  %l0-3: 0000000000000000 0000115bb3b38222 0000000020121c38 000002a12062fb80
```

```
  %l4-7: 0000000000000001 0000000000000000 0000000000000000 0000000000000004
000002a122fd1500 nvme:nvmex_resume+148 (40073a1d0b8, ffffffffffffffff,
c04090aa68000, 1, c04090aa684c0, 704dfc00)
  %l0-3: 0000000000000002 0000000000000050 0000000000000001 000c040b04f86250
  %l4-7: 0000000000000008 000c04090e636520 000c040b0f648690 0000000000000001
000002a122fd15b0 nvme:nvmex_intr_adjust+36c (c04090aa68000, 704df768, 100,
110de748, c04090aa684f0, c04090aa684c0)
  %l0-3: 00000000704df768 0000000000000021 0000000000000021 000c0409cfdf1b80
  %l4-7: 0000000000000021 0000000000000000 00000000110de400 00000000704df400
000002a122fd1680 nvme:nvmex_cbfunc+9c (40073a1d0b8, 0, 4, 0, 704dfe28,
704dfc00)
  %l0-3: 00000000f7499a40 00000000f9861600 0000000000000001 0000000000000001
  %l4-7: 0000000000000000 0000000000000000 0000000006cf7d40 0000000000000001
000002a122fd1730 genunix:i_ddi_irm_notify+d0 (c0409cd01d1d0, 0,
c04090aa9d458, 110e129c, 2, 0)
  %l0-3: 0000040073a1d0b8 000c04090a4182a8 0000000000000021 0000000020846db8
  %l4-7: 0000000000000021 0000000000000002 0000000000000000 0000000000000001
000002a122fd17f0 genunix:i_ddi_irm_balance+1fc (c0409cd01d1d0, 2, 20000, 0,
fffffffffffffffe, c0409cd01d238)
  %l0-3: 000c04090aa9d458 0000000000000000 000c0409cd01d1f8 0000000000000004
  %l4-7: 0000000000000000 0000000000000000 000c0409cd01d218 0000000000010000
000002a122fd18a0 genunix:irm_balance_thread+24 (c0409cd01d1d0, 0, 202ffd40,
89, c0409cd01d1f0, c0409cd01d202)
  %l0-3: 0000040002f3a0d0 0000000000000000 0000000020847800 000002a113b73b80
  %l4-7: 0000000000000000 000c0409c98e0408 0000000000000200 000000002051a4f0

syncing file systems... 41 40 done
Deferred dump not available.
skipping system dump - no dump device configured and deferred dump not
available
rebooting...
```

Workaround: Do not use Oracle Solaris S11.3 SRU 21 or SRU 22 if your server requires NVMe support. Use a different, supported SRU for NMVe support.