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Oracle® Linux

Release Notes for Oracle Linux 6 Update 7 (SPARC)



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Abstract

This document contains information about the Oracle Linux 6 for SPARC release. Note that this document might be updated after the Oracle Linux 6 for SPARC product releases. To check for updates to this document, refer to the Oracle Linux 6 documentation library on the Oracle Technology Network (OTN) Web site:

https://docs.oracle.com/cd/E37670_01/index.html

This document is intended for users and administrators of Oracle Linux. It describes potential issues that you might encounter while using Oracle Linux 6 on the SPARC platform, and includes any corresponding workarounds. Oracle recommends that you read this document before installing or upgrading to Oracle Linux 6 for SPARC.

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Preface

The *Oracle Linux 6 Update 7 (SPARC) Release Notes* provides a summary of the most notable changes and differences from the Oracle Linux distribution for the x86 architecture. Also included in this document are known issues and possible workarounds for Oracle Linux 6 Update 7 on the SPARC platform.

Audience

This document is written for system administrators who want to use Oracle Linux on the SPARC platform. It is assumed that readers have a general understanding of the Linux operating system.

Related Documents

The latest version of this document and other documentation for this product are available at:

<http://www.oracle.com/technetwork/server-storage/linux/documentation/index.html>.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
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Chapter 1 Introduction

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Oracle Linux 6 Update 7 (SPARC) is the first public release of Oracle Linux on the SPARC platform. The release is built from the same source packages as the corresponding Oracle Linux distribution for the x86 architecture, plus any required patches and modifications that are required to support the SPARC platform.

This document describes the most notable changes and differences and lists known issues and possible workarounds. It is an addendum to the *Oracle Linux 6 Update 7 Release Notes* for x86:

https://docs.oracle.com/cd/E37670_01/E64030/html/index.html

This document covers the Oracle Linux 6 Update 7 (SPARC) UEK R2 ISO image and the Oracle Linux 6 Update 7 (SPARC) UEK R4 ISO image. Note that individual chapters are provided for each UEK release and ISO version.

For information about the Oracle Linux 6 Update 7 (SPARC) UEK R2 ISO, see [Chapter 2, Oracle Linux 6 Update 7 \(SPARC\) UEK R2 ISO](#).

For information about the Oracle Linux 6 Update 7 (SPARC) UEK R4 ISO, see [Chapter 3, Oracle Linux 6 Update 7 \(SPARC\) UEK R4 ISO](#).

1.1 Support Statement

Oracle makes Oracle Linux 6 Update 7 (SPARC) available as a developer release for the benefit of developers and partners. Oracle does not offer support for Oracle Linux 6 Update 7 (SPARC) except where it has been installed on Exadata SL6 hardware and is using the Unbreakable Enterprise Kernel Release 2 (UEK R2).

Oracle Linux 6 Update 7 (SPARC) is a pure 64-bit operating system and can only work on a 64-bit SPARC CPU. The software has only been built and tested on the following platforms:

- SPARC T5 server (Minimum firmware version: Sun System Firmware 9.6.5)
- SPARC T7 series server (Minimum firmware version: Sun System Firmware 9.7.5.b)
- **UEK R4 only:** SPARC S7 series server (Minimum firmware version: Sun System Firmware 9.7.5.b)

If possible, always update to the latest firmware for your hardware before installing Oracle Linux 6 Update 7 (SPARC). The latest firmware for these systems can be downloaded from <https://www.oracle.com/technetwork/systems/patches/firmware/release-history-jsp-138416.html>.

For information about known issues that are related to peripheral support, for example, network or storage adapters, see [Chapter 4, Known Issues and Limitations That Apply to Oracle Linux 6 Update 7 \(SPARC\)](#).

Chapter 2 Oracle Linux 6 Update 7 (SPARC) UEK R2 ISO

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Oracle Linux 6 Update 7 (SPARC) boots an optimized version of the UEK R2 kernel (2.6.39-500.1.76), including enhancements and modifications that are required to better support the SPARC `sun4v` architecture. UEK Release 2 for SPARC is based on the same source code as the x86 version, plus any SPARC-specific modifications.

This chapter describes notable features and changes, important patches and modifications, and known issues and limitations for the Unbreakable Enterprise Kernel Release 2.

For information pertaining to Oracle Linux 6 Update 7 (SPARC) UEK Release 4, see [Chapter 3, Oracle Linux 6 Update 7 \(SPARC\) UEK R4 ISO](#).

2.1 Notable Features and Changes for Oracle Linux 6 Update 7 (SPARC) UEK R2

The following are notable features and changes that pertain to Oracle Linux 6 Update 7 (SPARC) UEK R2.

2.1.1 Changes and Differences From Oracle Linux 6 Update 7 on x86 or x86_64

Oracle Linux 6 Update 7 (SPARC) is built from the same source files as the Oracle Linux 6 Update 7 release for the x86 platform. A number of packages were amended to compile on the SPARC platform. These portability changes were applied on top of the existing source archives. In many cases, the changes only related to the Red Hat Package Manager (RPM) specification files that define how to compile the source code and package the resulting binaries. In some cases, changes to the actual source code were necessary. All of these patches are available in the source RPM packages or have been contributed back to the upstream project.

Due to the fundamental differences of the SPARC and PC architecture, some additional changes were necessary, such as the removal of some packages. Some packages that better facilitated Oracle Linux on the SPARC platform or specifically required by Exadata were added to the distribution. The complete list of source and binary packages for Oracle Linux for SPARC is available at:

https://linux.oracle.com/OL6u7_SPARC_pkgs.html

UEK configuration has been adapted to the SPARC platform. A number of SPARC-specific patches have been incorporated to better support the features that are available on this architecture. In addition, drivers for devices that are not available on the SPARC platform have been disabled in the kernel configuration.

The following information pertains to feature support in Oracle Linux 6 Update 7 (SPARC) UEK R2:

- The Red Hat compatible kernel is not included. The system installs and boots the Unbreakable Enterprise Kernel Release 2 (2.6.39-500.1.76) by default.

- There is no separate boot ISO image for the Unbreakable Enterprise Kernel that can be used to perform a network installation.
- The GRand Unified Bootloader version 2 (GRUB2) is used as the boot loader.
- Btrfs is not supported on the `root` file system.
- Ksplice is not supported.
- DTrace is not supported.
- The endianness differs across the two platforms. SPARC platforms use big-endian byte ordering, while x86 platforms use little-endian byte ordering.
- Oracle VM Server for SPARC features are included, but are limited, which can affect stability. Development for these features is ongoing.
- `SysRq` functionality is available in the kernel. To use this feature, ensure that it is enabled in the kernel as follows:

```
# echo 1 > /proc/sys/kernel/sysrq
```

- To use this function on a guest domain that is hosting Oracle Linux, open its console by running the following command:

```
# ldmconsole ldg0
```

You will need to replace the guest domain name according to your installation.

Use the key sequence `~~#`, then press the `SysRq` key.

- To use this function on a bare metal system, connect to the host's console. Press the `Escape` key, then press `Shift+b`, and finally, press the `SysRq` key.

Oracle Software in Silicon

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

Software in Silicon features are offered as a technology preview in UEK R2. They include the following:

- Silicon Secured Memory

This feature enhances application data integrity (ADI) by enabling the detection of memory corruption issues. When the feature is enabled, software can mark buffers with special version information that is checked by the hardware. If there is a version mismatch on a load or store, an exception is raised and the application is not allowed to access that region of memory. Silicon Secured Memory helps prevent buffer overflow or other external attacks. Applications that use its own custom memory allocator can take advantage of this feature.

- Data Analytics Accelerator (DAX)

Co-processors in the SPARC chip perform query-related operations directly in the hardware. These on-chip queries improve Oracle Database performance. DAX hardware acceleration can be leveraged through Oracle Database 12c in-memory database operations. DAX operations are supported in DB 12.1.0.2 and later.

Note that the APIs to these features are subject to change.

For more information about Oracle Software in Silicon functionality, go to <https://www.oracle.com/technetwork/server-storage/softwareinsilicon/index.html>.

2.2 Important Patches and Modifications for UEK R2

The following important patches and modifications have been made in this release:

- `CONFIG_NO_HZ` has been disabled.
- `CONFIG_NODES_SHIFT` has been increased from 4 to 5 to support SPARC systems with up to 32 sockets.
- `CONFIG_NR_CPUS` has been increased from 256 to 4064 to support SPARC systems with a large number of strands, cores, or sockets.
- The `megaraid_sas` driver for the MegaRAID SAS HBA has been modified to work on a big-endian architecture such as SPARC.
- The `ixgbe` driver for the Intel10 Gigabit PCI-Express network adapter has been modified to look up the MAC address in OpenPROM.
- Patches have been added to properly identify newer CPUs in `/proc/cpuinfo`.
- Patches have been added to enable many SPARC-specific performance improvements, including four-level page table handling, NMI handling, and performance counters. NMI handling and performance counters are supported only for bare-metal server installations.
- Several miscellaneous bug fixes have been applied to the logical domain Virtual Network driver (`sunvnet`) and the logical domain Virtual Disk Client driver (`sunvdc`).
- The `openprom` kernel driver has been enabled.
- The following device driver modules have been disabled for SPARC systems:
 - `dme1737`
 - `f71805f` and `f71882fg`
 - `it87`
 - `lightning`
 - `lm78`
 - `mk712`
 - `ns588`
 - `pc87360` and `pc87427`
 - `radeon` and `radeon_kms`
 - `sch5627`
 - `smsc47b397` and `smsc47m1`

The software described in this documentation is either no longer supported or is in extended support.

Oracle recommends that you upgrade to a current supported release.

Known Issues and Limitations for UEK R2

- [snd_mtpav](#)
- [tmp_atmel](#)
- [tpm_nsc](#) and [tpm_tis](#)
- [vt1211](#)
- [w83627ehf](#) and [w83627hf](#)

2.3 Known Issues and Limitations for UEK R2

The following are known issues and limitations that pertain to UEK R2.

2.3.1 System Services Fail to Start Correctly

On some SPARC T5 servers, the system can fail to start services, including [sshd](#) or networking, and does not reach the desired run level after the initial installation.

A kernel boot message such as the following is displayed:

```
f028abb0: ttyS0 at I/O 0x0 (irq = 1) is a SUN4V HCONS Serial:  
8250/16550 driver, 4 ports, IRQ sharing enabled  
Not supported on sparc yet.
```

The following error message is also logged to [/var/log/boot.log](#):

```
init: Failed to spawn rc main process: unable to open console: Input/output error
```

These errors occur because the console driver does not correctly detect or support the console device on these systems. The workaround is to log in as [root](#) and run [exec init 3](#) to bring up the system manually. When all services have started, press [Enter](#) to obtain a login prompt.

Chapter 3 Oracle Linux 6 Update 7 (SPARC) UEK R4 ISO

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Oracle Linux 6 Update 7 (SPARC) boots an optimized version of the UEK R4 (4.1.12-94.3.4) kernel, including enhancements and modifications that are required to better support the SPARC [sun4v](#) architecture. UEK R4 for SPARC is based on the same source code as the x86 version, plus any SPARC-specific modifications.

For information pertaining to Oracle Linux 6 Update 7 (SPARC) UEK Release 2, see [Chapter 2, Oracle Linux 6 Update 7 \(SPARC\) UEK R2 ISO](#).

3.1 Notable Features and Changes for Oracle Linux 6 Update 7 (SPARC) UEK R4

The following are notable features and changes that pertain to Oracle Linux 6 Update 7 (SPARC) UEK R4.

3.1.1 Changes and Differences From Oracle Linux 6 Update 7 on x86 or x86_64

Oracle Linux 6 Update 7 (SPARC) is built from the same source files as the Oracle Linux 6 Update 7 release for the x86 platform. A number of packages were amended to compile on the SPARC platform. These portability changes were applied on top of the existing source archives. In many cases, the changes only related to the RPM specification files that define how to compile the source code and package the resulting binaries. In some cases, changes to the actual source code were necessary. All of these patches are available in the source RPM packages or have been contributed back to the upstream project.

Due to the fundamental differences of the SPARC and PC architecture, some additional changes were necessary, such as the removal of some packages. Some packages that better facilitated Oracle Linux on the SPARC platform or specifically required by Exadata were added to the distribution. The complete list of source and binary packages for Oracle Linux for SPARC available at:

https://linux.oracle.com/OL6u7_SPARC_pkgs.html

UEK configuration has been adapted to the SPARC platform. A number of SPARC-specific patches have been incorporated to better support the features that are available on this architecture. In addition, drivers for devices that are not available on the SPARC platform have been disabled in the kernel configuration.

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Oracle recommends that you upgrade to a current supported release.

Changes and Differences From Oracle Linux 6 Update 7 on x86 or x86_64

The following information pertains to feature support in Oracle Linux 6 Update 7 (SPARC) UEK R4:

- The Red Hat compatible kernel is not included. The system installs and boots the UEK R4 (4.1.12-94.3.4) kernel by default.
- There is no separate boot ISO image for the Unbreakable Enterprise Kernel that can be used to perform a network installation.
- GRUB2 is used as the boot loader.
- Btrfs is not supported on the `root` file system.
- Ksplice is not supported.
- DTrace is supported in this UEK version.

DTrace is included in Oracle Linux 6 Update 7 (SPARC) UEK Release 4. To download supported DTrace utilities packages under a developer release, go to <https://www.oracle.com/technetwork/server-storage/linux/downloads/linux-dtrace-2800968.html>.

For more detailed information about DTrace, see the [Oracle Linux DTrace Guide](#).

- The endianness differs across the two platforms. SPARC platforms use big-endian byte ordering, while x86 platforms use little-endian byte ordering.
- OpenFabric Enterprise Edition (OFED) package set for UEK R4. See [Section 3.4, “Upgrading Oracle-Supported OFED Packages for UEK R4”](#) for instructions on upgrading OFED packages.
- Oracle VM Server for SPARC includes more advanced features and new packages
- `SysRq` functionality is available in the kernel. To use this feature, ensure that it is enabled in the kernel as follows:

```
# echo 1 > /proc/sys/kernel/sysrq
```

- To use this function on a guest domain that is hosting Oracle Linux, open its console by running the following command:

```
# ldmconsole 1dg0
```

You will need to replace the guest domain name according to your installation.

Use the key sequence `~~#`, then press the `SysRq` key.

- To use this function on a bare metal system, connect to the host's console. Press the `Escape` key, then press `Shift+b`, and finally, press the `SysRq` key.
- `system-config-network-tui` screen packages are included.

Oracle Software in Silicon

The microprocessors for the SPARC M7, T7, and S7 series servers offer new co-engineered hardware and software capabilities that enable applications to run with the highest levels of security, reliability and speed. This functionality is called *Oracle Software in Silicon*.

Software in Silicon features are offered as a technology preview in UEK R4. They include the following:

- Silicon Secured Memory

This feature enhances application data integrity (ADI) by enabling the detection of memory corruption issues. When the feature is enabled, software can mark buffers with special version information that is checked by the hardware. If there is a version mismatch on a load or store, an exception is raised and the application is not allowed to access that region of memory. Silicon Secured Memory helps prevent buffer overflow or other external attacks. Applications that use its own custom memory allocator can take advantage of this feature.

- Data Analytics Accelerator (DAX)

Co-processors in the SPARC chip perform query-related operations directly in the hardware. These on-chip queries improve Oracle Database performance. DAX hardware acceleration can be leveraged through the Oracle Database 12c in-memory database operations. DAX operations are supported in DB 12.1.0.2 and later.

Note that the APIs to these features are subject to change.

For more information about Oracle Software in Silicon functionality, refer to: <https://www.oracle.com/technetwork/server-storage/softwareinsilicon/index.html>.

3.2 Important Patches and Modifications for UEK R4

The following important patches and modifications have been made in this release:

- `CONFIG_NO_HZ` has been disabled.
- `CONFIG_NODES_SHIFT` has been increased from 4 to 5 to support SPARC systems with up to 32 sockets.
- `CONFIG_NR_CPUS` has been increased from 256 to 4064 to support SPARC systems with a large number of strands, cores, or sockets.
- The `megaraid_sas` driver for the MegaRAID SAS HBA has been modified to work on a big-endian architecture such as SPARC.
- The `ixgbe` driver for the Intel10 Gigabit PCI-Express network adapter has been modified to look up the MAC address in OpenPROM.
- Patches have been added to properly identify newer CPUs in `/proc/cpuinfo`.
- Patches have been added to enable many SPARC-specific performance improvements, including four-level page table handling, NMI handling, and performance counters. NMI handling and performance counters are supported only for bare-metal server installations.
- Several miscellaneous bug fixes have been applied to the logical domain Virtual Network driver (`sunvnet`) and the logical domain Virtual Disk Client driver (`sunvdc`).
- The `openprom` kernel driver has been enabled.
- The following device driver modules have been disabled for SPARC systems:
 - `dme1737`
 - `f71805f` and `f71882fg`

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Oracle recommends that you upgrade to a current supported release.

Known Issues and Limitations for UEK R4

- `it87`
- `lightning`
- `lm78`
- `mk712`
- `ns588`
- `pc87360` and `pc87427`
- `radeon` and `radeon_kms`
- `sch5627`
- `smsc47b397` and `smsc47m1`
- `snd-mtpav`
- `tmp_atmel`
- `tpm_nsc` and `tpm_tis`
- `vt1211`
- `w83627ehf` and `w83627hf`

3.3 Known Issues and Limitations for UEK R4

The following are known issues and limitations that pertain to UEK R4. For known issues that pertain to the UEK4 QU4 release that might also pertain to this release, see the [Oracle Linux Unbreakable Enterprise Kernel Release 4 Update 4 Release Notes](#).

3.3.1 Video Redirection Feature Does Not Work in UEK R4 on SPARC T7-2 Server

Because the UEK R4 release does not have the Matrox driver built in, the video redirection feature does not work on a SPARC T7-2 server. As a workaround, select the `Use serial redirection` option in Oracle Integrated Lights Out Manager (ILOM).

3.3.2 Crash Utility Fails on UEK R4

Because live system analysis is not supported in the version of the `crash` utility that is provided in UEK R4, the utility fails with the following error: "crash: cannot resolve `_stext`".

3.3.3 Booting SPARC T4-4 Bare Metal Server From UEK R4 ISO Does Not Work

You cannot boot a SPARC T4-4 bare metal server from the UEK R4 installation ISO image. To work around this issue, add `mem=64g` to the kernel command line.

3.3.4 Second Stage of Installation Media Should Be Performed Over HTTP or NFS Server

When Installing Oracle Linux 6 Update 7 on a SPARC T5-8 server, the second stage installation media should be provided over an HTTP or NFS server. You can use a virtual CD-ROM that is created with ILOM to initiate the installation.

3.3.5 Downrev System Firmware Could Cause Kernel Panics Running DAX Operations

Running DAX operations on Oracle Linux 6 Update 7 (SPARC) UEK R4 with downrev system firmware could cause kernel panics.

Install SysFW 9.7.5 or later to prevent panics when using DAX. SysFW 9.7.5 is the minimum firmware version that is required to run DAX on UEK R4.

You can download SPARC firmware patches from [My Oracle Support](#).

3.3.6 DTrace Issues on UEK R4

The following are known issues that pertain to using DTrace on UEK R4.

3.3.6.1 Access to Some Arguments in SDT and USDT Probes Is Not Available

Access to `arg6`, `arg7`, `arg8`, and `arg9` in Statically Defined Tracing (SDT) and Userland Statically Defined Tracing (USDT) probes is not available on the SPARC platform. As a result, these argument types will always appear to contain `0`. This issue might also prevent translated `args[6]`, `args[7]`, `args[8]`, and `args[9]` from working.

3.3.6.2 Function Bound Tracing Return Probes Not Implemented on SPARC Platform

Function Bound Tracing (FBT) return probes are currently not implemented on the SPARC platform.

3.3.6.3 DTrace PID Provider Is Not Installed on System

The DTrace PID provider feature is not implemented in this release and therefore is not installed on the system.

3.3.7 Oracle VM for SPARC Issues on UEK R4

The following are known issues that pertain to using Oracle VM for SPARC on UEK R4.

3.3.7.1 `kdump` Only Supports Local Dump Targets

Because the network adapter fails to configure properly when booting the crash kernel, some commands you specify in the `/etc/kdump.conf` configuration file might cause the core collector to fail because they specify remote dump targets. Such commands are `net`, `nfs`, `nfs4`, and `ssh`.

Use only the `raw` or `path` command in the `/etc/kdump.conf` file to specify a local location in which to create the `vmcore`.

3.3.7.2 Service Domain OS Performance Drops When Virtual Disk Back Ends Are Stored on the `root` File System

To avoid a performance drop on the control domain, or any domain that is acting as a service domain, do not store file-based virtual disk images on the `root` file system of the service domain.

If you must store the file back end on the `root` file system, be aware that the control domain will experience this performance drop. To workaround this problem, change the scheduler to Completely Fair Queuing (CFQ).

3.3.7.3 `macvlan` Interface Does Not Obtain a DHCP Address in a Logical Domain

To configure `macvlan` networking for a Linux container (`lxc`) in a logical domain, explicitly add alternate MAC addresses to the `vsw0` or `vnet0` device. This configuration enables these devices to identify the `macvlan` MAC address.

For example, if `vnet0` exists, the following command adds multiple MAC addresses to the `vnet0` device:

```
primary# ldm set-vnet alt-mac-addrs=auto,auto,auto,auto vnet0 domain-name
```

Update the `/container/container-name/config` configuration file to specify a value for the `lxc.network.hwaddr` property. The value is one of the MAC addresses that is generated by the `ldm set-vnet` command.

3.3.7.4 `cdrom[:device]` Is Not Supported for an Installation Boot

If you specify the `cdrom[:device]` value to the `repo` property, the installer fails and issues an error message.

The workaround is to use other `repo` property values when installing packages that are not on the ISO image. See "Installation Boot Options" in *Oracle Linux Installation Guide for Release 6*.

3.3.7.5 SSH Access to Primary Is Lost After Executing Service Network Restart When Virtual Switch Device Is Present

When configuring virtual networking, it is recommended that you configure `udev` rules before you reboot the control domain. If the virtual switch already exists, and you run the following commands to enable the virtual switch after a reboot, access to the control domain is lost:

```
primary# sed -i '/SUBSYSTEM/ s/^#/' /etc/udev/rules.d/99-vsw.rules
primary# udevadm control --reload-rules
primary# udevadm trigger
primary# service network restart
```

To recover, reboot the control domain.

3.3.7.6 `net_ratelimit` Messages Appear in Kernel Message Log When a Logical Domain Is Not Running

You might see `net_ratelimit` messages in the kernel log when a logical domain is bound, started, and waiting at the OpenBoot PROM prompt to boot its operating system.

These messages appear when Oracle VM Server for SPARC networking is configured, but before the logical domain is running and handling network traffic.

You can safely ignore these messages. Note that these messages are no longer issued after the domain boots and is handling network traffic.

3.3.7.7 NetworkManager Not Included in Oracle Linux 6 Update 7 (SPARC) UEK R4

The `NetworkManager` package is available in the Oracle Linux 6 Update 7 (SPARC) UEK R2 ISO, but it has been removed from the Oracle Linux 6 Update 7 (SPARC) UEK R4 ISO because it is not suitable for a server environment. If the `NetworkManager`RPM is installed, it causes adverse effects on a server that runs the Oracle VM Server for SPARC software.

If you are upgrading from the Oracle Linux 6 Update 7 (SPARC) UEK R2 release to the Oracle Linux 6 Update 7 (SPARC) UEK R4 release, you will need to erase the `NetworkManager` RPM if it is installed. Otherwise, an installation or update of `ldomsmanager` is blocked with a message similar to the following:

```
--> Processing Conflict: ldomsmanager-3.5.0.0-26.2373.1.el6.sparc64 conflicts NetworkManager  
--> Finished Dependency Resolution  
Error: ldomsmanager conflicts with 1:NetworkManager-0.8.1-99.0.2.el6.sparc64
```

3.3.7.8 Physical Disks Used by a Guest Domain Should Be Excluded From the Oracle Linux lvm.conf File

Exclude any physical disks that are used by a guest domain from the `/etc/lvm/lvm.conf` configuration file on the service domain that owns the physical disks.

The following example `global_filter` values are based on a server with four disks: `/dev/sda`, `/dev/sdb`, `/dev/sdc`, and `/dev/sdd`. The service domain uses the `/dev/sda` and `/dev/sdb` disks.

Specify one of the following `global_filter` values:

- **Explicit include.** Create a filter to include disks that are used by the service domain and to exclude all other disks.

```
global_filter = [ "a|^/dev/sda[0-9]*$|", "a|^/dev/sdb[0-9]*$|", "r/.*/" ]
```

- **Explicit exclude.** Create a filter to exclude disks that are not used by the service domain and to include all other disks.

```
global_filter = [ "r|^/dev/sdc[0-9]*$|", "r|^/dev/sdd[0-9]*$|", "a/.*/" ]
```

Then, perform the following steps after you update the `/etc/lvm/lvm.conf` file:

1. Update the `initramfs` image for booting.

```
svcdom# dracut -f
```

2. Reboot the service domain on which you have updated the `/etc/lvm/lvm.conf` file.

```
svcdom# reboot
```

3.4 Upgrading Oracle-Supported OFED Packages for UEK R4

The following procedure provides instructions for upgrading OFED packages from UEK R2 to UEK R4.

1. Install the packages that are provided by Oracle from the Oracle Linux Yum Server at <https://yum.oracle.com> as follows:

The software described in this documentation is either no longer supported or is in extended support.

Oracle recommends that you upgrade to a current supported release.

Upgrading Oracle-Supported OFED Packages for UEK R4

- a. Back up the existing `yum` repository file.

```
# mv /etc/yum.repos.d/public-yum-olN.repo /etc/yum.repos.d/public-yum-olN.repo.bck
```

- b. Download the latest yum repository file for Oracle Linux 6 Update 7 (SPARC).

```
# wget -O /etc/yum.repos.d/public-yum-ol6.repo https://yum.oracle.com/sparc64/public-yum-ol6.repo
```

2. Remove any existing OFED packages.

```
# remove 'package-name*'
```

For example, you might need to remove some of the following packages:

```
# yum remove 'ibacm*'  
# yum remove 'ib-bonding*'  
# yum remove 'ibutils*'  
# yum remove 'infiniband-diags*'  
# yum remove 'libibcm*'  
# yum remove 'libibcommon*'  
# yum remove 'libibmad*'  
# yum remove 'libibumad*'  
# yum remove 'libibverbs*'  
# yum remove 'libmlx4*'  
. . .
```

3. Clean all `yum` cached files from all enabled repositories.

```
# yum clean all
```

4. Install the OFED packages.

```
# yum install oracle-ofed-release
```

5. Enable the RDMA service.

```
# chkconfig rdma on
```



Note

Each UEK release requires a different set of OFED packages. If you change the kernel on your system to a UEK release other than UEK R4, remove the existing UEK R4-based OFED packages before installing the correct packages for the new kernel.

Chapter 4 Known Issues and Limitations That Apply to Oracle Linux 6 Update 7 (SPARC)

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This chapter describes known issues and limitations that generally apply to Oracle Linux 6 Update 7 (SPARC).

4.1 [ext4](#) File System Must Be Selected During Installation

The installer offers a choice of file systems that can be used for root (/) and any other partitions. Currently, only the [ext4](#) file system can be used. Selecting an alternate file system might result in an unbootable system.

4.2 Untested File Systems

Although the package for using and managing the [btrfs](#) file system is included in this release, testing is limited, and therefore this file system might not work correctly or as expected.

4.3 NMI Messages When Booting in an Oracle VM Server for SPARC Guest Domain

Messages such as the following might be reported when booting Oracle Linux 6 Update 7 (SPARC) in an Oracle VM Server for SPARC guest domain:

```
Performance events:  
Testing NMI watchdog ...  
WARNING: CPU#0: NMI appears to be stuck (0->0)!  
Please report this to bugzilla.kernel.org,  
and attach the output of the 'dmesg' command.  
  
WARNING: CPU#1: NMI appears to be stuck (0->0)!  
Please report this to bugzilla.kernel.org,  
and attach the output of the 'dmesg' command.  
...
```

This workaround requires system firmware support, but any version that meets the requirements that are listed in [Section 6.1, “Hardware and Software Requirements”](#) has the correct support.

4.4 Disk That Is Used for Installation Must Not Contain a Sun VTOC Partition

The disk on which you are installing Oracle Linux 6 Update 7 (SPARC) must not contain a Sun VTOC partition. Otherwise, Anaconda fails during the installation with the error: [PartitionException: Unable to satisfy all constraints on the partition.](#)

The software described in this documentation is either no longer supported or is in extended support.

Oracle recommends that you upgrade to a current supported release.

Cannot Boot a System with Encrypted Partitions

You can use the following workaround:

1. After the system displays the message `Welcome to Oracle Linux Server for sparc64`, press `[Ctrl]+Z` to access the shell.
2. Use the `dd` command to erase the first 10 MB of the disk device:

```
# dd if=/dev/zero of=/dev/device bs=1024k count=10 oflag=direct
```

3. Type the `exit` command to exit the shell and return to the installer.

4.5 Cannot Boot a System with Encrypted Partitions

Oracle Linux 6 Update 7 (SPARC) cannot boot if you select to encrypt the system's partitions during installation.

4.6 Installing on SAN Storage Can Fail With Errors

If you install a system on SAN storage, the installation can fail with `seeking device` errors.

The workaround is to additionally specify the `nodmraid` option by editing the GRUB boot menu entry. For instance, select the GRUB option **Install linux using text mode (use DHCP)** and press the `e` key to edit the boot entry. Navigate to the string starting with `linux` and add the `nodmraid` option to the string.

Chapter 5 Availability and Installation

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Oracle Linux 6 Update 7 (SPARC) is available as ISO installation media from the Oracle Technology Network (<https://www.oracle.com/linux/products.html>) and as individual RPM packages from the Unbreakable Linux Network (<https://linux.oracle.com>) and the Oracle Linux Yum Server (<http://yum.oracle.com>).

You can install the distribution either as an Oracle VM Server for SPARC guest domain, also known as a *logical domain*, or on a bare metal server.

For questions regarding configuring or using the `yum` command to install updates, refer to the *Oracle Linux Administrator's Solutions Guide* at https://docs.oracle.com/cd/E37670_01/index.html.

The kernel's source code is available from a public git source code repository at <http://oss.oracle.com/git/>.

5.1 Installing on Bare Metal Servers

Most SPARC servers use the OpenBoot firmware to bootstrap the environment. To be able to install Oracle Linux 6 Update 7 (SPARC) from the ISO image, you must make some changes on the console. For detailed instructions on how to use OpenBoot, refer to the [Oracle Solaris documentation](#).



Note

The disk on which you install the operating system cannot be partitioned or contain a Sun VTOC partition. Otherwise, Anaconda fails during installation with the error: `PartitionException: Unable to satisfy all constraints on the partition.`

For more information about the limitations of Sun disk label partitioning, see [Section 5.1.1, "About Boot Disk Partitioning"](#).

To install Oracle Linux 6 Update 7 (SPARC) on a bare metal server:

1. Write the ISO image of the Oracle Linux 6 Update 7 (SPARC) distribution to a DVD.
2. Perform one of the following steps to access the OpenBoot prompt:
 - During system startup, press `STOP-A (L1-A)`.
 - If you are accessing the system by using the ILOM service processor, enter the following command:

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

Serial console started. To stop, type #.
<return>
{0} ok
```

The software described in this documentation is either no longer supported or is in extended support.

Oracle recommends that you upgrade to a current supported release.

Installing on Bare Metal Servers

In this example, the `ok` prompt indicates that the OpenBoot firmware is in control of the system.

If you have difficulty accessing the OpenBoot prompt, refer to the guidelines at:

<https://docs.oracle.com/cd/E19836-01/E20746/z40002fe1298584.html>

3. Use the `setenv` command to set the value of `auto-boot?` to `false`:

```
{0} ok setenv auto-boot? false
auto-boot? false
```

If `auto-boot?` is set to `false`, the system does not attempt to bootstrap the system from the defined boot devices (usually `disk` and `net`). You can change the value back to `true` after installation when you are satisfied that the system is performing as expected.

4. Use the `show-disks` command to examine the drives that are attached to the system, and select the disk on which you want to install Oracle Linux:

```
{0} ok show-disks
a) /pci@0/pci@0/pci@a/scsi@0/disk
q) NO SELECTION
Enter Selection, q to quit: a
/pci@0/pci@0/pci@a/scsi@0/disk has been selected.
```

For convenience, you can use the `nvalias` command to create a device alias for the selected device:

```
{0} ok nvalias oldisk Ctrl+Y
```

OpenBoot expands `Ctrl+Y` inline to the currently selected disk, `/pci@0/pci@0/pci@a/scsi@0/disk`.

You can use the `devalias` command to determine which aliases are defined, as shown in the following example:

```
{0} ok devalias
screen          /pci@0/pci@0/pci@2/pci@0,2/display@1
nvram           /virtual-devices/nvram@3
cdrom           /pci@0/pci@0/pci@a/scsi@0/disk@2,0:f
disk3           /pci@0/pci@0/pci@a/scsi@0/disk@3
disk2           /pci@0/pci@0/pci@a/scsi@0/disk@2
disk1           /pci@0/pci@0/pci@a/scsi@0/disk@1
disk0           /pci@0/pci@0/pci@a/scsi@0/disk@0
disk             /pci@0/pci@0/pci@a/scsi@0/disk@0
oldisk           /pci@0/pci@0/pci@a/scsi@0/disk
scsi             /pci@0/pci@0/pci@a/scsi@0
display          /pci@0/pci@0/pci@2/pci@0,2/display@1
net0             /pci@0/pci@0/pci@8/network@0
net               /pci@0/pci@0/pci@8/network@0
virtual-console  /virtual-devices/console@1
name              aliases
```

The `@N` syntax refers to the port number on a physical connector. `disk@0` is the disk controller. `disk@1`, `disk@2`, and so on are the physical disks. In this example, the installation is performed on `disk1`.

5. Insert the DVD containing the ISO image into the system's DVD-ROM drive. At the OpenBoot prompt, use the following command to boot from the DVD device and to load GRUB:

```
{0} ok boot cdrom
```

6. Choose between performing a text-based installation or graphical installation. You can perform a text-based installation with or without networking configured. A graphical installation requires you configure networking and a VNC server on the system being installed so that you can use a remote VNC client to access the system. You can configure networking to use DHCP to obtain a network address or you can manually assign an IP address.

The following are some examples of the combinations that are possible:

- To perform a text-based installation without network access, select the GRUB option **Install linux using text mode (use DHCP)** and press the Enter key.



Note

Some advanced configuration options, such as advance disk partitioning schemes, are not available in text mode. You can install a small, default system and use **yum update** to expand it after installation. Alternatively, you can use a Kickstart file to define an advanced system layout.

- To perform a text-based installation with network access using DHCP to obtain an IP address for the **eth0** network interface, and you are using an HTTP-served Kickstart file to perform the installation, select the GRUB option **Install linux using text mode (use DHCP)** and press **e** to edit the boot entry. Navigate to the string starting with **linux** and add options:

```
noipv6 ksdevice=eth0 ks=http://192.0.2.1/sparc.ks
```

to the end of this line, substitute <http://192.0.2.1/sparc.ks> with the URL where the Kickstart file is located. Then press the **Control+x** key combination to boot.

- To perform a text-based installation with network access, specifying an IP address manually, select the GRUB option **Install linux using text mode (use DHCP)** and press the **e** key to edit the boot entry. Navigate to the string starting with **linux** and change the **ip=dhcp** option to **ip=ask**.
- To be able to perform a graphical installation from a VNC client with network access to the system being installed, select the GRUB option **Install linux using VNC (graphical) mode (use DHCP)** and press the Enter key.

The installation process obtains an IP address from the DHCP server before starting the VNC service:

```
Running anaconda 13.21.149, the Oracle Linux Server system installer - please wait.  
18:47:05 Starting VNC...  
18:47:07 The VNC server is now running.  
18:47:07  
  
WARNING!!! VNC server running with NO PASSWORD!  
You can use the vncpassword=<password> boot option  
if you would like to secure the server.  
  
18:47:07 Please manually connect your vnc client to sparc:1 (192.0.2.83) to begin the install.  
Press <enter> for a shell  
18:47:08 Starting graphical installation.
```

In this example, from the remote host you would need to connect the VNC client to 192.0.2.83:1 as follows:

```
$ vncviewer 192.0.2.83:1
```

The software described in this documentation is either no longer supported or is in extended support.

Oracle recommends that you upgrade to a current supported release.

About Boot Disk Partitioning

7. Perform the Oracle Linux installation, which is almost identical to the procedure for installing Oracle Linux on x86 hardware. For more information, see the [Oracle Linux 6 Installation Guide](#).
8. After the installation has finished, reboot the system. Select to boot from disk at the OpenBoot prompt:

```
{0} ok boot disk1
```

In the GRUB menu select the kernel to boot, or wait for the default kernel to be booted.

9. When you are satisfied that the system boots correctly, return it to the OpenBoot prompt, and use the `setenv` command to set the value of `auto-boot?` to `true`:

```
{0} ok setenv auto-boot? true  
auto-boot? true
```

10. (Optional) After installing Oracle Linux, you can view and modify OpenBoot PROM (OBP) settings by using the SPARC-specific `prtconf` and `eeprom` commands.

For example, you can use the `eeprom` command as follows to display and modify OBP settings:

```
# eeprom use-nvramrc?=true  
# eeprom nvramrc='devalias ol6 /pci@0/pci@1/pci@0/scsi@0/disk@0'  
# eeprom auto-boot?=true
```

5.1.1 About Boot Disk Partitioning

The SPARC platforms use the Sun disk label partitioning format (also known as SMI VTOC). This format has the following limitations:

- The partition table is restricted to 8 partitions (0-7), where partition 2 represents the entire disk and cannot be used.
- The partition format uses cylinder-head-sector addressing (CHS) rather than Logical Block Addressing (LBA). As a result, the maximum size of the system disk is 2 TB. However, additional disks can use a GUID Partition Table, which Oracle Linux can address and so are not limited by the capabilities of the OpenBoot firmware drivers.
- The Sun Label partitioning scheme aligns data by cylinder boundary and not by sector. As a result, the installer adjusts any values that you enter to be cylinder-aligned. For example, if you specify a a partition size of 1000 MB, the actual size would perhaps be 1004 MB.
- The default layout for the system disk assigns 1 GB of the system disk to the boot partition in `ext3` file system format. The remainder of the system disk becomes a single logical volume that is outside the control of the OpenBoot firmware, and is divided into a swap space volume and a volume for the remainder of the system installation.

5.1.2 Network Installation Media

It is possible to perform a full network boot installation similar to the solution described for an x86 environment in [Configuring a Network Installation Server](#) in the [Oracle Linux 6 Installation Guide](#). This can be done by using the GRUB2 installer networking capabilities in conjunction with the OpenBoot `dhcp` boot option.

This setup requires configurable and reachable DHCP and TFTP servers on the network where Oracle Linux 6 Update 7 (SPARC) is being installed, and at least one system where Oracle Linux 6 Update 7 (SPARC) is manually installed to obtain the appropriate boot content from the GRUB2 environment.

The following instructions provide steps to configure an environment to perform network installations and describes how to start a network installation once the environment is configured.

1. Install Oracle Linux 6 Update 7 (SPARC) on at least one system, manually using the instructions in [Section 5.1, “Installing on Bare Metal Servers”](#) or in [Chapter 6, *Installing and Configuring the Control Domain on Oracle Linux 6 Update 7 \(SPARC\)*](#).
2. On the system where Oracle Linux 6 Update 7 (SPARC) is already installed, prepare a GRUB2 network boot directory by using the `grub2-mknetdir` command, as shown in this example:

```
# grub2-mknetdir --net-directory=/var/lib/tftpboot/
```

3. Move the content of the output from the `grub2-mknetdir` to the host running the TFTP server. If the current system is to act as the TFTP host, you may leave the content of the `/var/lib/tftpboot/` where it is, but ensure that a TFTP daemon is installed, configured and running on the host. Instructions from this point onward assume that the TFTP server is configured to serve content from `/var/lib/tftpboot`.
4. Configure the DHCP server to point to the `boot/grub2/sparc64-ieee1275/core.img` file available on the TFTP server. For example, the DHCP server might have an entry similar to the following:

```
subnet 192.0.2.0 netmask 255.255.255.0 {  
    range 192.0.2.10 192.0.2.20;  
    next-server 192.0.2.1;  
    filename "boot/grub2/sparc64-ieee1275/core.img";  
}
```

5. Copy the `boot/vmlinuz` and `boot/initrd.img` files from the Oracle Linux 6 Update 7 (SPARC) installation ISO to the `/var/lib/tftpboot/boot/` directory on the TFTP server.
6. On the TFTP server, create a `/var/lib/tftpboot/boot/grub2/grub.cfg` file with the following content:

```
menuentry 'Install' {  
    insmod tftp  
    set root=tftp,192.0.2.1  
    linux /boot/vmlinuz  
    initrd /boot/initrd.img  
}
```

Substitute `192.0.2.1` with the IP address assigned to the TFTP server.

7. On any system where you intend to install Oracle Linux 6 Update 7 (SPARC), simply type the following at the OpenBoot prompt:

```
{0} ok boot eth0:dhcp
```

Substitute `eth0` for the network interface that is connected to the network serviced by the DHCP server. After GRUB is loaded, the usual installation menu is displayed and installation can proceed as usual.

Specifying System-Specific Boot Loader Configuration

The previous instructions assume that a common boot loader configuration is used for all systems. However, it is also possible to provide an unique configuration for each system by specifying GRUB2 environment variables.

The software described in this documentation is either no longer supported or is in extended support.

Oracle recommends that you upgrade to a current supported release.

Additional Packages and Yum Configuration

For example, you could change the content of the `/var/lib/tftpboot/boot/grub2/grub.cfg` file as follows:

```
configfile "${prefix}/${net_default_mac}.cfg"
```

You could then create a configuration file for each system in `/var/lib/tftpboot/boot/grub2` by using the system's MAC address as the file name, for example, `00:14:4f:fa:0d:e1.cfg`, where `00:14:4f:fa:0d:e1` is the MAC address of the network interface to be used for network booting.

For more information, type the `info grub2` command to access the GRUB2 manual.

5.2 Additional Packages and Yum Configuration

By default, all new installations of Oracle Linux 6 Update 7 (SPARC) are automatically configured to use the Oracle Linux Yum Server. All of the base packages that required to run Oracle Linux 6 Update 7 (SPARC) are included on the ISO image.

Some security patches and updates to these packages, as required for the Exadata platform, are made available from the Oracle Linux Yum Server on the `ol6_latest` channel. Packages that are required for development in this environment are additionally made available within the `ol6_software_collections` channel on the Oracle Linux Yum Server. You do not need an Oracle Linux support subscription to use this service. Note that the `latest` channel is enabled by default. For more information about how to obtain updates from the Oracle Linux Yum Server and how to update your `yum` configuration files for the latest Oracle Linux 6 (SPARC) release, see <http://yum.oracle.com>.

The `ol6_software_collections` channel for Oracle Linux 6 Update 7 (SPARC) provides a limited subset of the Software Collection Library that is available for Oracle Linux 6 (x86), for the purpose of providing current development tools for this platform.

Some security patches and updates for the Unbreakable Enterprise Kernel Release 4 and related OFED packages are made available from the Oracle Linux Yum Server in the following channels:

- `ol6_Uekr4` channel – Includes the latest packages for the Unbreakable Enterprise Kernel Release 4 for Oracle Linux 6 (SPARC64).
- `ol6_Uekr4_OFED` channel – Provides OFED supporting tool packages for the Unbreakable Enterprise Kernel Release 4 on Oracle Linux 6 (SPARC64).

To enable additional channels, download <https://yum.oracle.com/sparc64/public-yum-ol6.repo> and save it to `/etc/yum.repos.d/public-yum-ol6.repo`. Open the file in a text editor and ensure that you set `enabled=1` for the specified channels.

Using Packages That Are Included in a Software Collection

To use any of the packages in a software collection, install the collection by using the `yum` command as follows:

```
# yum install devtoolset-3
```

To use the packages included in a software collection, you must first enable the collection using the `scl` command included in the `scl-utils` package. To enable a software collection for use by any other application, use the `scl` utility with the `enable` action. For example, you would enable `devtoolset-3` for use in the `bash` shell as follows:

```
# scl enable devtoolset-3 bash
```

The software described in this documentation is either no longer supported or is in extended support.

Oracle recommends that you upgrade to a current supported release.

Using Packages That Are Included in a Software Collection

For more information about the Software Collection Library, see the *Oracle Linux 6 Software Collection Library Release Notes* at https://docs.oracle.com/cd/E37670_01/E59096/html/index.html.

Chapter 6 Installing and Configuring the Control Domain on Oracle Linux 6 Update 7 (SPARC)

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This chapter describes the configuration of a control domain and guest domains that are supported by UEK R4. You can create UEK R2 guest domains, but not a UEK R2 control domain.

You must perform the installation of Oracle Linux 6 Update 7 (SPARC) from an Oracle VM Server for SPARC control domain by using the `1dm` command.



Note

All of the `1dm` commands that are needed to create a control domain and guest domains are supported with UEK R4. Only the `1dm set-core` command is supported with UEK R2.

6.1 Hardware and Software Requirements

The Oracle VM Server for SPARC control domain support in Oracle Linux 6 Update 7 (SPARC) UEK R4 is a subset of the features that are in Oracle Solaris 11.3. The following information describes how to create and administer guests by using virtual I/O, which is currently the recommended configuration.



Note

Oracle VM Server for SPARC features are offered as a technology preview in UEK R4.

- **Hardware.** Use at least a SPARC T4 series server. It is best to use a SPARC T5 series server, a SPARC T7 series server, or a SPARC S7 series server.
- **System firmware.** Use at least the system firmware versions for the following hardware:
 - SPARC T4 - 8.8.4
 - SPARC T5 - 9.5.4.a
 - SPARC T7 - 9.7.5.b
 - SPARC S7 - 9.7.5.b
- **Oracle Linux OS.** Install at least Oracle Linux 6 Update 7 (SPARC) UEK R4 in the control domain.

6.2 Installing the Logical Domains Manager in the Control Domain

6.2.1 How to Install the Logical Domains Manager in the Control Domain

1. Install the RPM package.

When you install the `ldomsmanager` package, the `ldoms` package is installed as well.

```
primary# yum install ldomsmanager
```

2. Verify that the correct package is installed.

The `yum info` output looks similar to the following:

```
primary# yum info ldoms ldomsmanager
Loaded plugins: downloadonly, ulninfo
Available Packages
Name : ldoms
Arch : sparc64
Version : 1.0.0
Release : 1569.el6
Size : 59 k
Repo : devtoolset-6
Summary : Logical Domains Configuration and Administration
License : UPL
Description : Provides logical domains (LDoms) platform support for guest domains running
            : under Oracle VM Server for SPARC. A logical domain is a hypervisor-based
            : virtual machine consisting of a discrete logical grouping of resources that
            : has its own operating system and identity within a single computer system.
            : Each logical domain is only permitted to observe and interact with those
            : server resources that are made available to it by the hypervisor.

Name : ldomsmanager
Arch : sparc64
Version : 3.5.0.0
Release : 23.2331.1.el6
Size : 709 k
Repo : devtoolset-6
Summary : Logical Domains Manager
License : UPL
Description : Oracle VM Server for SPARC - Virtualization for SPARC M-Series and T-Series
```

3. Determine whether the Logical Domains Manager and Logical Domains Agent services are running.

```
primary# service ldmad status
ldmad is stopped
primary# service ldmd status
ldmd is stopped
```

4. Start the Logical Domains Manager and Logical Domains Agent services.

```
primary# service ldmad start
primary# service ldmd start
```

5. Verify that the Logical Domains Manager and Logical Domains Agent services are running.

```
primary# service ldmad status
ldmad (pid PID) is running
primary# service ldmd status
ldmd (pid PID) is running
```

6.3 Configuring Services in the Control Domain

Configuring the Oracle VM Server for SPARC services in an Oracle Linux 6 Update 7 (SPARC) control domain is similar to configuring the services in an Oracle Solaris control domain. See "[Setting Up Services and the Control Domain](#)" in *Oracle VM Server for SPARC 3.4 Administration Guide*.

The following configuration steps differ from the steps on the Oracle Solaris OS.

- Oracle Linux 6 Update 7 (SPARC) does not support memory or virtual I/O dynamic reconfiguration (DR).

Initiate a delayed reconfiguration in the control domain.

```
primary# ldm start-reconf primary
```

- (Optional) To configure the `ldmd` service to support auto-recovery, set the `LDMD_ARGS` environment variable in the `/etc/sysconfig/ldmd` file.

```
primary# echo 'export LDMD_ARGS="-autorecovery 3"' >> /etc/sysconfig/ldmd
```

Auto-recovery automatically applies an auto-saved service processor (SP) configuration that is newer than the one stored in the SP.



Note

Oracle Linux 6 Update 7 (SPARC) uses the service tool to manage services such as `ldmd` or `ldmad`.

- (Optional) To enable debugging on `ldmad`, set the `LDMAD_ARGS` environment variable in the `/etc/sysconfig/ldmad` file as follows:

```
primary# echo 'export LDMAD_ARGS="-d"' >> /etc/sysconfig/ldmad
```

- The Oracle Linux 6 Update 7 (SPARC) networking architecture is different from the Oracle Solaris OS networking architecture.

An Oracle VM Server for SPARC virtual switch is configured as an Oracle Linux 6 Update 7 (SPARC) bridge in the service domain that hosts the virtual switch. Virtual switch ports appear as `vif` interfaces that are added to the bridge. If a virtual switch is configured with a physical network interface (`net-dev`), that physical network interface is added to the bridge that corresponds to the virtual switch. If the physical network interface of a virtual switch has an IP configuration, that IP configuration is moved automatically from the physical network to the bridge. The IP configuration reverts to the physical network interface when the bridge is removed.

Enable the virtual switch by uncommenting the `udev` rule within the `/etc/udev/rules.d/99-vsw.rules` file. This rule is disabled by default.

```
primary# sed -i '/SUBSYSTEM/ s/^#/' /etc/udev/rules.d/99-vsw.rules
```

See the `udev(8)` man page.

A reboot is required after the `udev` rule has been enabled and the control domain configuration has been completed.

- The virtual switch (`vsw`) device is not present until the domain is bound.

When the domain is bound, verify that bridging is operational.

```
primary# brctl show
bridge name      bridge id
vsw0           8000.0010e09a37b6
                           STP enabled    interfaces
                           no          eth0
                                         vif0.0
                                         vif0.1
```

For disk backends, you can obtain better performance by using files or physical disks, if available. Note that Oracle Linux 6 Update 7 (SPARC) does not have ZFS volumes, but it does have LVM.

6.4 Administering Guest Domains

Much of the administration of domains that use virtualized I/O is the same with Oracle Linux 6 Update 7 (SPARC) as it is with the Oracle Solaris OS. See "[Setting Up Guest Domains](#)" in *Oracle VM Server for SPARC 3.4 Administration Guide*.



Note

Only a subset of the Logical Domains Manager features have been implemented for Oracle Linux 6 Update 7 (SPARC) domains.

- After the `ldmd` service starts, use the `ldm` command to list domain information, stop and start domains.
- **List domains.**

```
primary# ldm list
NAME      STATE   FLAGS   CONS   VCPU   MEMORY   UTIL   NORM   UPTIME
primary  active  -n-cv-  UART   16     31G      1.2%  1.1%  1h 10m
ldg1     bound   -----  5000   240    16G
```

- **Stop a domain.**

```
primary# ldm stop-domain ldg1
primary# ldm list
NAME      STATE   FLAGS   CONS   VCPU   MEMORY   UTIL   NORM   UPTIME
primary  active  -n-cv-  UART   16     31G      1.2%  1.1%  1h 10m
ldg1     bound   -----  5000   240    16G
```

- **Start a domain.**

```
primary# ldm start-domain ldg1
primary# ldm list
NAME      STATE   FLAGS   CONS   VCPU   MEMORY   UTIL   NORM   UPTIME
primary  active  -n-cv-  UART   16     31G      0.8%  0.8%  1h 11m
ldg1     active  -n----  5000   240    16G      0.0%  0.0%  1m
```

- On Oracle Linux 6 Update 7 (SPARC), use the `ldmconsole` command to connect to the console of a guest domain:

```
primary# ldm start ldg1
primary# ldmconsole ldg1

{0} ok banner

SPARC S7-2, No Keyboard Copyright (c) 1998, 2016, Oracle and/or its affiliates. All
rights reserved. OpenBoot 4.40.2, 16 GB memory installed, Serial #XXXXXXXXXX.
Ethernet address 0:10:e0:XX:XX:XX, Host ID: XXXXXXXX.
```

To disconnect from the console, type `ctrl-q`.

6.5 Oracle VM Server for SPARC Troubleshooting

6.5.1 Troubleshooting Oracle VM Server for SPARC Networking Issues

- Ensure that `SUBSYSTEM` is not commented out in the `/etc/udev/rules.d/99-vsw.rules` file to avoid having the rules file being overwritten on upgrade.
- If networking does not come up automatically when `/etc/sysconfig/network-scripts/ifcfg-ethX` is configured, add the following line to the `cfg-ethX` file:

```
LINKDELAY=10
```

- Check that the `NetworkManager` package is not installed, and if necessary remove it.

6.5.2 Troubleshooting ILOM Interconnect Issues

When the OpenIPMI and `ipmitool` packages are installed, `ldmd` leverages them when the service starts up to configure communication with the service processor (SP), otherwise `ldmd` attempts to configure the `usb0` device itself.

```
primary# service ldmd start
Starting ldmd:Configuring SP interconnect on interface usb0 169.254.182.77/255.255.255.0
```

Type the following command to verify that communication with the SP is operating properly:

```
primary# ldm list-spconfig
factory-default
initial [current]
```

If communications over the ILOM interconnect are not operating properly, you might encounter errors such as the following:

```
primary# ldm add-spconfig initial
The requested operation could not be performed because the communication
channel between the LDOMs Manager and the system controller is down.
The ILOM interconnect may be disabled or down.
```

If communication to the SP cannot be established, verify the following configuration setting:

- **ILOM.**

```
-> show /SP/network/interconnect/ hostmanaged

/SP/network/interconnect
Properties:
    hostmanaged = false

-> show /SP/network/interconnect/ state

/SP/network/interconnect
Properties:
    state = enabled
```

- **Control domain.**

- Verify that the `NetworkManager` package is not installed, and if necessary, remove it.
- Verify that the `usb0` interface, over which `ldmd` communicates with the SP, is functional.

The software described in this documentation is either no longer supported or is in extended support.

Oracle recommends that you upgrade to a current supported release.

Troubleshooting ILOM Interconnect Issues

```
primary# ip addr show usb0
6: usb0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UNKNOWN qlen 1000
    link/ether 02:21:28:57:47:17 brd ff:ff:ff:ff:ff:ff
        inet 169.254.182.77/24 brd 169.254.182.255 scope global usb0
            valid_lft forever preferred_lft forever
        inet6 fe80::221:28ff:fe57:4717/64 scope link
            valid_lft forever preferred_lft forever

primary# ping 169.254.182.76
PING 169.254.182.76 (169.254.182.76) 56(84) bytes of data.
64 bytes from 169.254.182.76: icmp_seq=1 ttl=64 time=0.934 ms
64 bytes from 169.254.182.76: icmp_seq=2 ttl=64 time=0.736 ms
^C
```

If the configuration is correct, check the `/var/opt/SUNWldm/ldmd.log` log file for errors.

```
Apr 28 05:18:43 warning: cannot connect to the system controller over the ILOM interconnect
for service keystore-backup: No route to host
Apr 28 05:18:46 warning: cannot connect to the system controller over the ILOM interconnect
for service dr-pdom: No route to host
```

Attempt to reset the SP.

This reset might take several minutes though the control continues to run.

```
-> reset /SP
```

Retry the `ldm list-spconfig` command.