

Oracle® VM

Installation and Upgrade Guide for Release 3.4

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Abstract

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Preface

The Oracle VM Installation and Upgrade Guide provides detailed instructions for installing and upgrading Oracle VM.

Audience

The Oracle VM Installation and Upgrade Guide is intended for system administrators and end users who want to install or upgrade Oracle VM.

Related Documents

For more information, see the following documents in the Oracle VM documentation set:

- [Oracle VM Release Notes](#)
- [Oracle VM Installation and Upgrade Guide](#)
- [Oracle VM Concepts Guide](#)
- [Oracle VM Manager Getting Started Guide](#)
- [Oracle VM Manager User's Guide](#)
- [Oracle VM Manager Command Line Interface User's Guide](#)
- [Oracle VM Administrator's Guide](#)
- [Oracle VM Paravirtual Drivers for Microsoft Windows Guide](#)
- [Oracle VM Web Services API Developer's Guide](#)
- [Oracle VM Security Guide](#)
- [Oracle VM Manager Third-Party Licensing Information](#)

You can also get the latest information on Oracle VM by going to the Oracle VM Web site:

<http://www.oracle.com/us/technologies/virtualization/oraclevm>

Command Syntax

Oracle Linux command syntax appears in `monospace` font. The dollar character (\$), number sign (#), or percent character (%) are Oracle Linux command prompts. Do not enter them as part of the command. The following command syntax conventions are used in this guide:

Convention	Description
backslash \	A backslash is the Oracle Linux command continuation character. It is used in command examples that are too long to fit on a single line. Enter the command as displayed (with a backslash) or enter it on a single line without a backslash: <pre>dd if=/dev/rdskc0t1d0s6 of=/dev/rst0 bs=10b \ count=10000</pre>
braces { }	Braces indicate required items: <pre>.DEFINE {macro1}</pre>

Convention	Description
brackets []	Brackets indicate optional items: <code>cvtcrt <i>termname</i> [<i>outfile</i>]</code>
ellipses ...	Ellipses indicate an arbitrary number of similar items: <code>CHKVAL fieldname value1 value2 ... valueN</code>
<i>italics</i>	Italic type indicates a variable. Substitute a value for the variable: <code><i>library_name</i></code>
vertical line	A vertical line indicates a choice within braces or brackets: <code>FILE <i>filesize</i> [K M]</code>
forward slash /	A forward slash is used to escape special characters within single or double quotes in the Oracle VM Manager Command Line Interface, for example: <code>create Tag name=MyTag description="HR/'s VMs"</code>

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.
<code>monospace</code>	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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Chapter 1 Overview

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This guide is designed to assist you with the installation procedures for both Oracle VM Manager and Oracle VM Server. It discusses the different pre-installation requirements for each component in a deployment and steps through the installation process, for both Oracle VM Manager and Oracle VM Server, to illustrate typical actions that are taken. This guide also describes how to configure an environment to automate the installation of Oracle VM Server.



Important

To get the latest information about the recent fixes, security alerts, critical patch updates, and other such changes, users with the appropriate support contract can access the support article *Oracle VM : What's New with Release 3.4.7.1 - Latest Information (Doc ID 2832974.1)* on My Oracle Support at: <https://support.oracle.com/oip/faces/secure/km/DocumentDisplay.jspx?id=2832974.1>.

The following sections summarize the basic steps for installation on the different platforms supported and provide links to more detailed coverage.

1.1 Planning Your Oracle VM Deployment

To install Oracle VM, you must install at least one [Oracle VM Server](#) and one instance of [Oracle VM Manager](#). Your Oracle VM Server can be on either x86 hardware or SPARC hardware. Oracle VM Servers in a [server pool](#) must be of the same type, either x86 or SPARC. You cannot mix x86 and SPARC servers in the same server pool; however Oracle VM Manager can manage server pools of different types.

If you are planning to install Oracle VM in a production environments, the following requirements apply:

- Oracle VM Manager and Oracle VM Server versions should be the same whenever possible. You can use Oracle VM Manager to manage Oracle VM Servers on a different, earlier patch level of a release – for example: Oracle VM Manager 3.4.5 with Oracle VM Server 3.4.2. However, it is recommended that you maintain the same patch level to ensure full compatibility with the latest functionality.

To facilitate the upgrade of your environment, you can temporarily use Oracle VM Manager Release 3.4.x in combination with Oracle VM Servers at Release 3.2.10, 3.2.11 or 3.3.x. However, in such a mixed environment you can no longer change the configuration of the servers running an older software release; server management is restricted to presenting storage repositories and performing virtual machine operations. You should proceed with the upgrade of your Oracle VM Servers as soon

as possible, so that the installed release matches Oracle VM Manager again, and full management functionality is restored.

**Note**

Beginning with Release 3.4.6, upgrades from Oracle VM Server for x86 at Release 3.2.10 or 3.2.11 and Oracle VM Agent for SPARC at Release 3.3.1 are not supported. Users on these older server releases must first upgrade to a supported version (e.g. 3.4.5) before upgrading to a later version.

**Note**

As of Release 3.4.5, Oracle VM Manager uses the TLSv1.2 protocol by default. To be able to temporarily manage Oracle VM Servers at Release 3.2.10, 3.2.11 or 3.3.x, and Oracle VM Agent for SPARC at Release 3.3.1, you can enable the TLSv1 protocol, which is less secure. For instructions, see [Section 7.6, “Enabling the TLS Version 1 Protocol”](#) in the *Oracle VM 3.4 Installation and Upgrade guide*.

- A minimum cluster of three Oracle VM Server nodes in each server pool is strongly recommended for [high availability](#) (HA). If one node in the cluster experiences a hardware failure or is shut down for maintenance, failover redundancy is preserved with the other two nodes. Having a third node in the cluster also provides reserve capacity for production load requirements.

1.2 Getting Installation ISOs and Packages

All Oracle VM software can be downloaded from the Oracle Software Delivery Cloud:

<https://edelivery.oracle.com/oraclevm>

You must be a registered user, logged in and have accepted the terms and conditions to download software from the Oracle Software Delivery Cloud.

Software downloads are available as Media Packs, each of which represents a different release of the software. It is recommended that you select the most recent Media Pack to obtain patch updates to the software that you intend to install. Each Media Pack contains a collection of ISOs and Zip archives that are available for download. You can select the components that you require for your deployment and download each of these using your web browser.

To locate the Oracle VM software on the Oracle Software Delivery Cloud, search for Oracle VM Manager and Oracle VM Server. Note that the software for Oracle VM Server for SPARC is included in the Media Pack for Oracle VM Server.

Depending on your installation strategy, ISOs and Zip archives may need to be copied to the relevant host or hosts involved in a deployment, or should be placed in shared storage accessible to the systems involved.

1.3 Installation From Bootable Physical Media

You can create a bootable physical media, such as a DVD-ROM, to install software directly onto systems. To do this, the ISO image file must be accessible to the host that you are using to create the bootable physical media.

You should refer to the appropriate documentation for creating bootable physical media. However, if you are using Oracle Linux, the following command burns the ISO image file to a physical DVD-ROM:

```
# growisofs -Z /dev/dvd=/tmp/OVMSvr.iso
```

Substitute `/dev/dvd` with the device name of your optical disc drive. Substitute `/tmp/OVMSvr.iso` with the path to the ISO file. If you are uncertain of the device name for your drive, try running:

```
cat /proc/sys/dev/ovm/info
```

Take note of the drive name and prepend it with `/dev/`.

Solaris users can use the `cdrw` tool to do something similar:

```
# cdrw -i -d /dev/rdisk/cxtxdxs2 /var/tmp/OVMSvr.iso
```

Substitute `/dev/rdisk/cxtxdxs2` with the device name of your optical disc drive. Substitute `/var/tmp/OVMSvr.iso` with the path to the ISO image file. If you are uncertain of the device name for your optical disc drive, try using the `rmformat` command to list your removable media devices and take note of the Logical Node that is reported for the device.

When you have burned your media to an optical disc, you can use it to install the software onto your target host. In the case of Oracle VM Server for x86 hardware, the ISO that you have burned is a bootable DVD-ROM that includes a full operating system installation. If you have opted to install your servers using physical media, ensure the DVD-ROM device is configured as the first boot device in the BIOS or UEFI settings for each server where you want to install the software.

For most other installations, such as for Oracle VM Manager or Oracle VM Agent for SPARC, the operating system is already present on the target host. You then need to mount the DVD-ROM device in the existing file system. Typically, this can be achieved by running the following command:

```
# mount -t iso9660 /dev/dvd /mnt/ovm
```

Substitute `/dev/dvd` with the device name of your optical disc drive. Substitute `/mnt/ovm` with a suitable path to an existing mount point. If you are uncertain of the device name for your drive, try running:

```
cat /proc/sys/dev/ovm/info
```

Take note of the drive name and prepend it with `/dev/`.



Note

If you are installing Oracle VM Manager from an ISO file that has been automatically mounted, ensure the permissions to the mounted directory are at least `0755`.

1.4 Loopback ISO Mounts

For installations that do not replace the entire operating system of the target host, such as the installation of Oracle VM Manager, the most common method of accessing the installation media is to perform a loopback mount on the ISO provided. For this method, the ISO image file must be accessible to the target host.

1.4.1 Loopback Mounts on x86

If the target host is an x86-based system running Oracle Linux, run the following command to perform a loopback mount of the ISO image file:

```
# mount -o loop /tmp/OracleVM-Manager.iso /mnt
```

Substitute `/tmp/OracleVM-Manager.iso` with the full path to the ISO image file. Substitute `/mnt` with the path to the directory on the file system to use as a mount point. From this point onward, you can access the contents of the ISO image file at the location of your mount point.

1.4.2 Loopback Mounts on SPARC

If the target host is a SPARC-based system running Oracle Solaris, run the following command to perform a loopback mount of the ISO image file:

```
# mount -o ro -F hsfs /var/tmp/OracleVM-Manager.iso /mnt
```

Substitute `/var/tmp/OracleVM-Manager.iso` with the full path to the ISO image file. Substitute `/mnt` with the path to the directory on the file system to use as a mount point. From this point onward, you can access the contents of the ISO image file at the location of your mount point.

If you have trouble mounting the ISO image file on a SPARC system, you may need to manually configure the ISO image file as a loopback device:

```
# lofiadm -a /var/tmp/OracleVM-Manager.iso
```

This command outputs the device name you should use, for example `/dev/lofi/1`. Use the new loopback device to perform the mount, for example:

```
# mount -o ro -F hsfs /dev/lofi/1 /mnt
```

When you have finished installing, remember to unmount the loopback device and remove it:

```
# umount /mnt
# lofiadm -d /dev/lofi/1
```

Refer to the `lofiadm` man page for more details.

1.5 Installing Oracle VM Server on x86

Installing Oracle VM Server on x86 deletes any previous operating system and data on the drive selected for installation. To install Oracle VM Server on an x86 server:

1. Boot the computer on which you want to install Oracle VM Server with your Oracle VM Server bootable physical media.
2. At the boot prompt, press **Enter**.
3. Follow the prompts to install Oracle VM Server.

See [Chapter 2, Installing Oracle VM Server](#) for detailed information on installing Oracle VM Server.

If you want to use more than one Oracle VM Server, repeat the installation process. Oracle VM Servers can be added to a server pool and managed by Oracle VM Manager.

To automate the install, see [Chapter 3, Performing a Network Installation of Oracle VM Server](#).

1.6 Installing Oracle VM Server on SPARC

Installing Oracle VM Server on a SPARC server requires you install and configure the following on the SPARC server:

1. Oracle Solaris OS in the [control domain](#).
2. Oracle VM Server for SPARC. This is included in Oracle Solaris 11 OS.
3. Oracle VM Agent for SPARC.



Important

Installing Oracle Solaris within the control domain will destroy the data on the disk on which it is installed, however if Oracle Solaris 11 is already installed within the control domain then Oracle VM Server for SPARC is already available and there is no need to reinstall. Setting up Oracle VM Server for SPARC in this environment will not result in any data being destroyed.

See [Section 2.2, “Installing Oracle VM Server on SPARC Hardware”](#) for detailed information on installing Oracle VM Server on SPARC servers.

If you want to use more than one Oracle VM Server, repeat the installation process.

To automate the install, see [Chapter 3, *Performing a Network Installation of Oracle VM Server*](#).

1.7 Installing Oracle VM Manager

To install Oracle VM Manager:

1. Start the operating system on the computer on which you want to install Oracle VM Manager.
2. Insert and mount the Oracle VM Manager installation media.
3. As the *root* user, start the Oracle VM Manager installation script:

```
# ./runInstaller.sh
```

4. Follow the prompts to install Oracle VM Manager.

See [Chapter 4, *Installing Oracle VM Manager*](#) for detailed information on installing Oracle VM Manager.

1.8 Upgrading Oracle VM

You can upgrade Oracle VM from Release 3.2.10 or later. You cannot upgrade Oracle VM 2.x to Oracle VM 3.x, in this case you must re-install Oracle VM. See [Chapter 5, *Upgrading Oracle VM*](#) for information on performing an upgrade.

Chapter 2 Installing Oracle VM Server

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This chapter discusses the installation requirements and procedures for the installation of [Oracle VM Server](#). Since the deployment of Oracle VM Server is significantly different on x86 hardware to deployment on SPARC hardware, this chapter is divided into two primary sections, to discuss the requirements and procedure specific to each hardware platform.

Before performing an installation of Oracle VM Server it is highly recommended that you review the preinstallation tasks and requirements for your chosen platform. Failure to meet requirements may result in install failure, or could render an installation unusable.

You may also consider referring to [Chapter 3, Performing a Network Installation of Oracle VM Server](#) for information on performing automated installs of Oracle VM Server.

2.1 Installing Oracle VM Server on x86 Hardware

This section is intended for system administrators who want to install [Oracle VM Server](#) on x86 hardware. For smaller deployments installation from a bootable DVD-ROM using the provided ISO image file is common, while for larger deployments administrators may consider deployment via network installation using PXE boot.

To install Oracle VM Server using the DVD-ROM or PXE boot method, you need to visit the Oracle Software Delivery Cloud to select the Oracle VM Server ISO image file from the Oracle VM Media Pack. The Oracle VM Server ISO image file can be burned as a bootable disk and used to install Oracle VM Server from a DVD-ROM drive.

A PXE boot installation requires several additional steps to configure a DHCP/PXE boot server. Furthermore, if automated installation is required, a kickstart configuration file must be created to guide the Anaconda installation wizard through each of the installation steps. The DHCP/PXE boot server allows a bare-metal system to automatically receive an IP address via DHCP, load a kernel via TFTP, and then boot without an installed operating system. Once the bare-metal server boots, you can install Oracle VM Server from the installation media or use a kickstart file to automate the Oracle VM Server installation.

This section describes pre-installation tasks and requirements. These apply to all deployments of Oracle VM Server, regardless of your installation strategy. We also provide detailed coverage of a manual attended installation performed from bootable physical media, such as a DVD-ROM. It is recommended

that you perform at least one fully attended installation of Oracle VM Server from bootable physical media, even if you intend to perform a network-based install using PXE boot. Once you have completed this, refer to [Section 3.1, “Installing Oracle VM Server for x86 from PXE Boot”](#) for more information on how to prepare for a network-based installation.



Note

If you plan to install Oracle VM Server on a system that uses a software RAID array as storage, you must use a kickstart configuration file. For more information, see [Section 2.1.4, “Performing a Kickstart Installation of Oracle VM Server”](#).

2.1.1 Preinstallation Tasks and Requirements

Before you start the [Oracle VM Server](#) installation, make sure your computer meets the minimum hardware and software requirements and that your network is configured appropriately.

2.1.1.1 Hardware Requirements

This release of Oracle VM Server supports x86_64 host hardware only. Oracle VM Server requires a 64-bit processor with at least an i686-class processor on the host computer. This includes all Intel Pentium Pro or newer, and all AMD Athlon/Duron processors or newer. At least a Pentium 4 or Athlon CPU is recommended.

For [hardware virtualized](#) (unmodified) [guest](#) operating systems (for example, Microsoft Windows), a CPU with hardware virtualization support is required. This includes some Intel Pentium D, Core, Core2 and Xeon models, and some AMD Athlon and Opteron models. This feature may also need to be enabled in the BIOS or UEFI. Please refer to your processor documentation for information on whether your processor supports hardware virtualization and how to enable it in the system firmware interface.

A dual core CPU or multiple CPUs are recommended to run multiple guests.

The minimum memory requirement is 1 GB RAM, although it is recommended you have a computer with at least 2 GB RAM. Guest memory requirements vary for each guest operating system. You should perform your own memory sizing for guest operating systems.

It is also worth noting that if you intend to connect to SAN-based physical disks, memory consumption increases on the server for each LUN or target by around 1 MB per LUN or target. If hundreds of LUNs are to be attached to the server, you must scale memory requirements appropriately.

By default, the installer creates a root partition into which Oracle VM Server is installed and an additional partition that you can use as a local repository or as a virtual disk attached to a virtual machine. However, in cases where the additional partition is 2GB or less in size, Oracle VM Server cannot use the additional partition. Likewise, if the disk on which you are installing Oracle VM Server is small enough that the root partition takes most of the available space, the installer does not create the additional partition.



Note

In future you will upgrade your environment between errata releases and new versions. Over time these operations consume disk space. While it is possible to remove unnecessary files and clean up disk space and resize partitions, you should plan to minimize disruption and avoid issues by allocating two or three times the minimum required disk space to Oracle VM Server, where possible.

Table 2.1 Minimum Hardware Requirements for Oracle VM Server

Items	Minimum Value
Memory	1.0 GB

Items	Minimum Value
Processor Type	64 bit i686 P4
Processor Speed	1.3 GHz*2
Available Hard Disk Space	6 GB

2.1.1.2 Software Requirements

There are no prerequisite software requirements. Oracle VM Server includes a small Linux-based management operating system. All previous operating systems and data on the disk selected for installation are lost during the installation of Oracle VM Server.

Migration from any operating system, or previous alternate virtualization environment, is not supported in this release.

2.1.1.3 Network Requirements

Oracle VM Server requires at least one stable and static IPv4 address that does not change over server reboots. If you use DHCP to manage the IP address space in your environment, the DHCP server should be configured to map the server interface MAC addresses to specific IP assignments. This ensures that your host always receives the same IP address. The behavior of the Oracle VM Server host is undefined if used in an environment where your IP address may change due to DHCP lease expiry.

If your DHCP server is configured to provide a default gateway, this could impact on the behavior of Oracle VM Server as the gateway provided over DHCP would override any statically defined gateway set on Oracle VM Server. Therefore, Oracle recommends that you ensure that your DHCP server is not configured to provide a default gateway unless you are certain that the default route is the one that you want your Oracle VM Server instances to make use of.

Many actions performed within [Oracle VM Manager](#) require that server hostnames are properly resolved. It is highly recommended that a DNS server is configured on your network and will answer with the hostname and reverse IP lookups for each Oracle VM Server in your Oracle VM environment. If this is not feasible, you may need to add host entries to `/etc/hosts` on each Oracle VM Server after you have finished your installation. Since it is easy for these entries to become outdated, resulting in difficulty when troubleshooting, this approach should be avoided.

Technically, it is possible to run Oracle VM Server with a single network interface per physical server. During the installation of each Oracle VM Server the management interface is configured, and during discovery by Oracle VM Manager the server management interfaces are included in the default management network. Since the management network is capable of providing all network functions in Oracle VM, including storage and [virtual machine](#) traffic, there is no functional need for additional networks. Even if you wish to separate different types of network traffic, a single interface is enough: the management network can be run on a [VLAN](#) and additional network connections can be made via VLAN interfaces configured on top of the single physical network interface.

The main reasons to opt for multiple physical network interfaces are:

- **Security.** You may wish to keep internal and inter-server traffic separated from networks with a route to the internet. Or you may need to guarantee that network traffic from different virtual environments, or different types of network traffic, are physically separated. The management domain, dom0, network and control ports should never be exposed to or reachable from the internet.
- **Redundancy.** You do not want your environment to stop working if one network interface fails. A good way to avoid this is to aggregate two interfaces in a bond interface. A bond port, as it is called in Oracle VM, can work in active-backup mode, but also increases performance when used as an aggregation of two active links with twice the bandwidth and load balancing.

- **Performance.** If you have multiple physical network interfaces, link aggregation is a good way to add bandwidth for a given network function. In addition, or as an alternative, you can create multiple physical networks and use them for dedicated functions; for example a separate storage network or a network for virtual machine traffic only.



Note

Oracle VM Ethernet network functionality can be applied to standard 10/100/1000Mbit Ethernet interfaces as well as 10Gbit Ethernet interfaces.

2.1.1.4 Oracle VM Server Memory Settings

Installation allocates memory to `dom0` using the following calculation:

$(768 + 0.0205 * \text{Physical memory (MB)})$ round to 8

You can use this calculation to determine memory allocation for the Oracle VM Server installation. However, you should not make the memory allocation for dom0 smaller than the calculated value.

2.1.1.5 Obtaining the Software

If you do not already have the Oracle VM Server software, download the Oracle VM Server ISO image file from:

- Oracle Software Delivery Cloud: <http://edelivery.oracle.com/oraclevm>
- Oracle Support site: <https://support.oracle.com/>



Note

- Download the latest Oracle VM Server ISO that is available on the download site.
- Be sure to always run the `yum update` command after the installation is completed to update the Oracle VM Server components to the latest version.
- Starting with the Oracle VM 3.4.6 release, new Oracle VM Server ISOs are not always created when a new Manager ISO is released. Oracle VM Server packages, however, are continuously delivered to the yum repos and ULN channels to allow for regular updates.

See [Section 1.2, “Getting Installation ISOs and Packages”](#) for more information.

Depending on your installation strategy, you may need to perform some additional steps before you begin the installation. If you intend to install from DVD-ROM, you should burn a DVD-ROM disc with the ISO image file. See [Section 1.3, “Installation From Bootable Physical Media”](#) for information on how you can do this. If you intend to perform a network installation using PXE boot, you need to ensure that you DHCP/PXE boot server is properly set up and configured for this, that the kernel on the ISO image file is available via TFTP and that the entire ISO image file is accessible via NFS or HTTP. See [Section 3.1, “Installing Oracle VM Server for x86 from PXE Boot”](#) for further information. Finally, if you wish to perform an unattended installation, you must create a kickstart configuration file. This is discussed in [Section 2.1.4, “Performing a Kickstart Installation of Oracle VM Server”](#).

2.1.2 Installing Oracle VM Server From a DVD-ROM

If you have not installed [Oracle VM Server](#) before, you should perform at least one installation directly from DVD-ROM. Even if you intend to perform the majority of your installations over the network using PXE boot, a successful fully attended installation of Oracle VM Server can be useful if you need to obtain a template kickstart configuration file to use for your unattended network-based installations.

You can install Oracle VM Server in legacy BIOS mode or UEFI mode. However, you cannot change modes after installation. For example, if you install Oracle VM Server in legacy BIOS mode, you cannot then switch to UEFI mode. If you want to change from legacy BIOS mode to UEFI mode, or from UEFI mode to legacy BIOS mode, you must re-install Oracle VM Server.

If you are installing Oracle VM Server in UEFI mode, you must switch from legacy BIOS mode to UEFI mode before you begin the installation process. Enter the BIOS setup utility for the target server and change the boot mode to UEFI, if necessary.

To install Oracle VM Server from a bootable physical media such as a DVD-ROM:

1. Insert the Oracle VM Server installation media into your optical disc drive.
2. Change the boot order to start from the optical disc drive in the BIOS or UEFI settings.
3. Boot the server with the Oracle VM Server installation media.
4. The `boot:` prompt displays. Press **Enter** to begin the installation.



Note

- The installer starts automatically after one minute.
- The installer is available in text mode only.

5. On the **Disc Found** screen, do one of the following:
 - Select **OK** and then press **Enter** to test the installation media for errors.



Warning

Testing the installation media requires a server reboot to continue the installation. If you do not have physical access to the server itself, it is not recommended that you perform this test.

- Select **Skip** and press **Enter** to continue the installation without testing the media.
6. If the installer successfully detects the installation media, a welcome screen displays. Select **OK**.
 7. On the **Language Selection** screen, select the language you want to use for the installation process as well as the default language for the operating system. Select **OK** and then press **Enter**.
 8. On the **Keyboard Selection** screen, select the keyboard layout, for example, **us** for U.S. English. The keyboard layout you select becomes the default for the operating system. Select **OK** and then press **Enter**.
 9. On the Oracle VM Server **End User License Agreement** screen, read the licensing terms for Oracle VM Server. Select **Accept** to accept the EULA and continue.

Disk Partition Layout

The **Partitioning Type** screen lets you choose a partitioning option for the drive into which you install Oracle VM Server.

Disk device naming and node numbering can change across reboots. This means that a local disk may not be at `/dev/sda` as you might have expected for each subsequent reboot, or a partition that is initially represented as `sda1` may appear as `sda2` after a reboot. However, Oracle VM Server uses partition

UUIDs to ensure that partitions are correctly mapped to their mount points at boot time, so when reviewing partition layout, you should not expect the device node numbering to always remain the same.

Option	Description
Use entire drive	Uses all the available space on the target drive. Select this option if you are installing Oracle VM Server to a multipathed disk. See Section 2.1.3, “Installing Oracle VM Server to Multipath Storage” for more information.
Replace existing Linux system	Replaces an existing Linux system on the target drive.
Use free space	Uses only the free space available on the target drive.
Create custom layout	Lets you create and edit partitions on the target drive. You cannot create a custom partition layout if you are installing in UEFI mode.

After you select a partition layout, do the following:

1. Select which drive(s) you want to use for the installation.

If you are installing in legacy mode, you can select one or more drives. If you are installing in UEFI mode, you should select only one bootable drive.



Important

If you have attached USB storage to the server, it might appear as a listed disk where you are able to install Oracle VM Server. Running Oracle VM Server from a USB disk is possible but is not supported for production environments. If you are testing an installation and decide to install to a USB disk, the disk must be at least 32 GB in size. In the case where you select to install to a USB disk, the entire disk is used for the Oracle VM Server installation. Partitioning does not make excess disk space available for use as a discoverable local disk.

2. Select **OK** and press **Enter**.
3. On the **Review Partition Layout** screen, select one of the following:

Yes

Examines and formats the target drive before proceeding with the installation. If you are installing in legacy mode, you can select this option to ensure that the installer can successfully install Oracle VM Server with the selected partitioning layout. Do not select this option if you are installing in UEFI mode.

No

Skips the partitioning layout check and proceed with the installation.

4. On the **Writing storage configuration to disk** screen, confirm that you want to write the partitioning information to disk. Proceeding past this step erases any data on the selected partition.
5. Select **Write changes to disk** and then press **Enter**.

Boot Loader Partition

On the **Boot loader configuration** screen, do the following:

1. Select the partition into which you want to install the boot loader. Make sure the boot loader is installed on the bootable disk which is configured in the BIOS, or edit the boot device order accordingly within the BIOS to ensure that the correct disk is used to access the boot loader at start up.
2. Select **Allow boot from a multipath device** to install Oracle VM Server to a multipathed disk. For information and considerations on performing a multipath installation, see [Section 2.1.3, “Installing Oracle VM Server to Multipath Storage”](#).
3. Select **Change drive order** to arrange drive order and modify where the installation program locates the Master Boot Record.
4. Select **OK** and then press **Enter**.

Kdump Setting

Kdump is a crash dumping mechanism that captures a memory dump image for dom0 in the event of a system crash. The Kdump mechanism reserves a small amount of memory to boot the system from the context of another kernel, instead of from the context of the crashed kernel. Kdump then generates a memory dump image, or `vmcore` file, which allows you to accurately determine the cause of the system crash.

By default, Kdump is disabled. However, Oracle strongly recommends that you enable Kdump during installation. If a system crash occurs for Oracle VM Server, the information that the `vmcore` file provides helps to accurately and efficiently diagnose issues and drastically improves the time it takes to return to production.

Make one of the following selections and then press **Enter**:

Yes

Enable Kdump. The amount of memory reserved for Kdump is calculated automatically and `vmcore` files are stored in the default location at `/var/crash/`.

No

Do not enable Kdump. This option is not recommended.

With Oracle VM Server Release 3.4.2, Kdump settings are automatically carried forward during the upgrade process. If the Kdump service was enabled previously, it is recommended that you check and confirm the settings are correct after the upgrade or enable the Kdump service after the upgrade if it was not enabled previously.

For more information on configuring Kdump, refer to [Manually Configuring kdump for Oracle VM Server](#) in the *Oracle VM Administrator's Guide*.

Management Network Interface

Select the network interface that you have configured for the management connection. This network interface allows Oracle VM Manager to discover the Oracle VM Server that you are installing.



Warning

As of Oracle VM Release 3.4.4, an option is available that allows you to disable the default network bond that is created during installation. This network bond is called `bond0` and it should only be disabled for specific configurations approved by Oracle. Contact your Oracle support representative for more information if required.

Make one of the following selections and then press **Enter**:

OK

Connects the interface to a regular network.

Add to VLAN

Connects the interface to a [VLAN](#)-type network.

Management VLAN

If your Oracle VM Management network is on a VLAN, the **Oracle VM Management VLAN** screen lets you enter the applicable VLAN tag.

- 0 is reserved.
- 1 corresponds with "untagged".

After you enter the VLAN tag, select **OK** and then press **Enter**.

Network Interface Configuration

On the **Network Interface Configuration** screen, do the following:

1. If your computer uses a static IP address, enter the IP address and prefix (netmask) for your computer.

If your computer uses DHCP to assign its IP address, select **Dynamic IP configuration (DHCP)**. See [Section 2.1.1.3, "Network Requirements"](#) for more information on using DHCP with Oracle VM.

Select **OK** and then press **Enter**.

2. The **Miscellaneous Network Settings** screen is displayed. Enter the Gateway, Primary DNS and optional Secondary DNS in the respective fields.

Select **OK** and then press **Enter**.

3. The **Hostname Configuration** screen is displayed. If your machine has its own hostname, select **manually** and enter the hostname or IP address. You should use a fully qualified hostname, for example, myserver.example.com.

If your machine uses DHCP to assign its hostname, select **automatically via DHCP**. See [Section 2.1.1.3, "Network Requirements"](#) for more information on using DHCP with Oracle VM.

Select **OK** and then press **Enter**.

Time and Date Settings

On the **Time Zone Selection** screen, configure the system time and date. Select **OK** and then press **Enter**.

**Note**

It is best practice to configure 3 NTP servers at a minimum. See [Section 7.3, "Configure the NTP Service on the Oracle VM Manager Host"](#) for more information.

Root and Agent Passwords

You specify the Oracle VM Agent and *root* user passwords during installation. For information about password security, review [Installing Oracle VM Server](#) in the Oracle VM Security Guide.

On the **Oracle VM Agent password** screen, do the following:

1. Enter a password to be used for the [Oracle VM Agent](#) in the **Password** field. This password is used by Oracle VM Manager to take ownership of the Oracle VM Server. This is the password you use when discovering Oracle VM Servers in Oracle VM Manager.
2. Re-enter the password in the **Password (confirm)** field.
3. Select **OK** and then press **Enter**. If the two passwords do not match, you must enter them again.

On the **Root Password** screen, do the following:

1. Enter a password for the *root* user in the **Password** field. The *root* password must be at least six characters long.
2. Re-enter the password in the **Password (confirm)** field.
3. Select **OK** and then press **Enter**. If the two passwords do not match, you must enter them again.

Existing Installation Check

The installer checks for an existing Oracle VM Server installation. If one is found, the **System to Upgrade** screen displays.

Select **Reinstall System** to replace the existing installation.

For instructions on upgrading, see [Section 5.6.2, “Upgrading Oracle VM Server Using the ISO File”](#).



Note

Upgrading an Oracle VM Server from Release 2.x is not supported; you must perform a fresh install.

Final Installation Steps

When you finish configuring the installation settings, the installer performs dependency checks and then begins configuring and installing packages. The **Package Installation** screen displays and shows the progress and details about the installation process.

When the Oracle VM Server installation is finished, the **Complete** screen displays, do the following:

1. Remove the Oracle VM installation media.
2. Select **Reboot**.

When the server reboots, the Oracle VM Agent starts automatically.

A log of the install is located in `/root/install.log`. If the install fails to complete successfully, review this log file to identify possible causes.

Be sure to always run the `yum update` command after the installation is completed to update the Oracle VM Server components to the latest version.

2.1.3 Installing Oracle VM Server to Multipath Storage

Oracle VM Server can be installed to a multipathed disk attached to a Fibre Channel adapter. Review the following considerations before you install Oracle VM Server to a multipathed disk:

- The target disk must be multipathed.
- You must have a Fibre Channel HBA enabled within the boot BIOS of the target server. Refer to the documentation provided by your adapter manufacturer to obtain instructions on loading firmware and enabling the adapter.
- The BIOS settings for the target server must be configured to select the HBA and target disk as the primary boot device after the installation is complete.
- The boot Fibre Channel adapter must be connected to an external disk large enough for the install contents and there should be enough free space available on the disk to complete the installation.
- Multipath installation does not use remaining disk space to create an additional partition for local repositories or virtual machine assignment.

To install Oracle VM Server to a multipathed disk, do the following:

1. Run the Oracle VM Server installation media.
2. Step through the installer screens until the **Partitioning Type** screen displays. See [Disk Partition Layout](#) for more information.
3. Select **Use entire drive**. Ensure that **only** one multipath disk is selected for installation and that this disk matches the one that you have prepared for the installation.



Note

Splitting an install across multiple disks for a boot-from-SAN configuration is not supported. Mixing local disks and multipath disks in an installation is not supported.

4. Continue with the installation process.



Note

If you are attempting to install Oracle VM Server into a Fiber Channel over Ethernet (FCoE) SAN that the installer does not list, see [Section 6.1.1, "FCoE SAN not Listed as Available Drive"](#).

5. When you have completed the installation, reboot the server and remove the installation media or update your PXE configuration to allow the server to boot from the Fibre Channel HBA and target disk defined as the primary boot device in the server BIOS or UEFI.
6. When the server has rebooted, confirm that it is using the multipathed disk for the root mount point. For example, run the `df` command and check that the output is similar to the following:

```
/dev/mapper/360a98000433468704234747633373175p2 51475068 1222456 47631172 3% /
```



Note

Remember, to reinstall or boot from a local disk, you must change the boot device order in the BIOS or UEFI setup for the server.

2.1.4 Performing a Kickstart Installation of Oracle VM Server

You can automate the installation of Oracle VM Server with a kickstart configuration file. A kickstart configuration file provides information about the target system to the installation program and sets installation options so that you do not need to enter them manually.

In certain cases, Oracle VM supports installation of Oracle VM Server with a kickstart configuration file only. If you plan to install Oracle VM Server on a system that uses a software RAID array as storage, you must use a kickstart configuration file.

2.1.4.1 Creating Kickstart Configuration Files



Important

You should always review the kickstart configuration before you begin the installation process. Performing installations with kickstart configuration files does not provide a method for notifying you of errors. For this reason, you should always verify that Oracle VM Server is successfully installed on the target system and that the file system partitioning is correct.

There are two recommended methods for creating kickstart configuration files for Oracle VM Server:

- Manually install Oracle VM Server and copy the kickstart file that the installation program creates.

The installation program generates a kickstart configuration file that contains the options that you specify during the installation process. After you complete the installation, the file is available on the Oracle VM Server file system at: `/root/anaconda-ks.cfg`.

- Use the Kickstart Configurator tool.

To use the Kickstart Configurator tool, you should install Oracle Linux Release 6 with a graphical user environment. You can then install and run `system-config-kickstart`. For more information, see:

http://docs.oracle.com/cd/E37670_01/E41137/html/ol_kickstart.html

2.1.4.2 Kickstart Configurations

Before you attempt to install Oracle VM Server with a kickstart configuration, you should review the following examples:

- [Single Disk Partitions](#)
- [Software RAID Partitions](#)

You should also review the information in [Considerations for Kickstart Configurations](#).

Single Disk Partitions

The following shows a kickstart configuration for an installation of Oracle VM Server onto a single disk:

```
# Kickstart configuration

install
nfs --server=n.n.n.n --dir=/srv/install/ovs
eula Accepted
lang en_US.UTF-8
keyboard us
network --onboot yes --device eth0 --mtu=1500 --bootproto dhcp --noipv6
ovsagent --iscrypted $6$pkg8GsEJFbLPdRf6$JvBX.yJo6F9oyz1qIldIPy0bHvPpOHElZKvg3FR9DIWW07nMy/k2T5r3r
ovsmgmtif eth0
rootpw --iscrypted $6$T00IU.UJCLq2JZio$iJj1RPwV5wX7pD3puIUrZh1j7R2aF.cGFs6FEs2K9Py2yO3eEntR2vRko4

firewall --service=ssh
authconfig --enablesshadow --passalgo=sha512
selinux --disabled
timezone --utc America/Los_Angeles
```

```

bootloader --location=mbr --driveorder=sda,sdb --append="rhgb quiet crashkernel=auto"

clearpart --all --drives=sda

part / --fstype=ext4 --grow --maxsize=51200 --size=1024
part /boot --fstype=ext4 --size=500
part swap --grow --maxsize=16128 --size=16128

part None --fstype=ext4 --grow --size=100

reboot

%packages
@base
@core
@ovs-virtualization

%end

```

The preceding kickstart configuration includes the following options:

- Use an NFS server at the path to the Oracle VM Server ISO image file:

```
nfs --server=n.n.n.n --dir=/srv/install/ovs
```

- Accept the EULA (End User License Agreement) in a kickstart configuration:

```
eula Accepted
```



Important

You should read the EULA before you accept the terms in the kickstart configuration. The EULA is available on the Oracle VM Server ISO.

- Install the boot loader on the Master Boot Record, specify that the `sda` drive is before the `sdb` drive in the BIOS drive order, and append the `rhgb` and `quiet` kernel parameters:

```
bootloader --location=mbr --driveorder=sda,sdb --append="rhgb quiet crashkernel=auto"
```



Note

The `crashkernel=auto` directive enables Kdump during installation. The installer automatically calculates appropriate memory and offset values to reserve for the crash kernel and appends the correct information to the GRUB 2 configuration. For more information, see [Diagnostic Tools for Oracle VM Server](#) in the *Oracle VM Administrator's Guide*.

- Clear all partitions on the disk where you are installing Oracle VM Server:

```
clearpart --all --drives=sda
```

- Create a root partition with the `ext4` file system type that is 1024 MB in size and can grow in size to a maximum of 51200 MB:

```
part / --fstype=ext4 --grow --maxsize=51200 --size=1024
```

- Create a boot partition with the `ext4` file system type that is 500 MB in size:

```
part /boot --fstype=ext4 --size=500
```

- Create a swap partition that is 16128 MB in size and can grow in size to a maximum of 16128 MB:

```
part swap --grow --maxsize=16128 --size=16128
```

- Create an additional partition with the remaining space on the local disk:

```
part None --fstype=ext4 --grow --size=100
```

- Ignore all disks other than the target installation disk:

```
ignoredisk --only-use=/dev/disk/by-path/pci-0000:00:1f.2-scsi-0:0:0:0
```

- Automatically reboot Oracle VM Server after installation:

```
reboot
```

Software RAID Partitions

You can configure a software RAID in a kickstart configuration to install Oracle VM Server on an array of disks.



Important

- Oracle VM Server supports installation on software RAID devices on BIOS-based systems only.
- You should not attempt to install Oracle VM Server on a software RAID if a disk that is 2 TB or larger is a member of the array. Due to a limitation with the Master Boot Record (MBR), Oracle VM Server cannot boot from disks that are 2 TB or larger in a software RAID configuration.

The following is an example kickstart configuration for installing Oracle VM Server on a software RAID device:

```
# Kickstart configuration for software RAID

install
url --url http://hostname/path/to/ISO
eula Accepted
lang en_US.UTF-8
keyboard us
network --device MAC_address --bootproto static --ip ip_address \
--netmask mask --nameserver ip_address --hostname hostname
ovsagent --iscrypted $6$upZ1tfKbh46roUFg$uMZ19u.aVfHb4KTe0VoiVPtz63fM4OtY9aY7GgvOJ0ChPwOBKu4rx/

ovsmgmtif MAC_address
rootpw --iscrypted $1$5VD6GV8E$ums7BMsNiFRcYz0D8HrD6/
firewall --disabled
authconfig --enableshadow --enablemd5
selinux --disabled
timezone --utc America/Los_Angeles

bootloader --location=mbr --driveorder=disk/by-id/scsi-disk1-ID --append="crashkernel=auto"
iscsiname iSCSI_initiator_name

zerombr yes

clearpart --initlabel --all --drives=disk/by-id/scsi-disk1-ID,disk/by-id/scsi-disk2-ID

part raid.boota --size 500 --ondisk disk/by-id/scsi-disk1-ID --asprimary
part raid.bootb --size 500 --ondisk disk/by-id/scsi-disk2-ID --asprimary
raid /boot --fstype=ext4 --level=1 --device=md0 raid.boota raid.bootb

part raid.roota --size 32768 --ondisk disk/by-id/scsi-disk1-ID --asprimary
part raid.rootb --size 32768 --ondisk disk/by-id/scsi-disk2-ID --asprimary
raid / --fstype=ext4 --level=1 --device=md1 raid.roota raid.rootb
```

```
part raid.swapa --size 8192 --ondisk disk/by-id/scsi-disk1-ID --asprimary
part raid.swapb --size 8192 --ondisk disk/by-id/scsi-disk2-ID --asprimary
raid swap --fstype=swap --level=1 --device=md2 raid.swapa raid.swapb

reboot

%packages
#@everything
@base
@core
@ovs-virtualization
```

The preceding kickstart configuration includes the following options:

- Access the contents of the Oracle VM Server ISO image file at a URL:

```
url --url http://hostname/path/to/ISO
```

- Accept the EULA (End User License Agreement) in a kickstart configuration:

```
eula Accepted
```



Important

You should read the EULA before you accept the terms in the kickstart configuration. The EULA is available on the Oracle VM Server ISO.

- Install the boot loader on the Master Boot Record, specify the BIOS drive order, and append the `crashkernel=auto` kernel parameter:

```
bootloader --location=mbr --driveorder=disk/by-id/scsi-disk1-ID --append="crashkernel=auto"
```



Note

The `crashkernel=auto` directive enables Kdump during installation. The installer automatically calculates appropriate memory and offset values to reserve for the crash kernel and appends the correct information to the GRUB 2 configuration. For more information, see [Diagnostic Tools for Oracle VM Server](#) in the *Oracle VM Administrator's Guide*.

- Assign a name to the iSCSI node that is attached during installation:

```
iscsiname iSCSI_initiator_name
```

- Initialize any invalid partition tables on disks:

```
zerombr yes
```



Note

This option destroys all contents of disks that have invalid partition tables.

- Clear all partitions on the disks in the array:

```
clearpart --initlabel --all --drives=disk/by-id/scsi-disk1-ID,disk/by-id/scsi-disk2-ID
```

- Create a boot partition with RAID level 1 and filesystem type `ext4` that is 500 MB in size on each disk in the array. Also assign `md0` as the device name:

```
part raid.boota --size 500 --ondisk disk/by-id/scsi-disk1-ID --asprimary
part raid.bootb --size 500 --ondisk disk/by-id/scsi-disk2-ID --asprimary
```

```
raid /boot --fstype=ext4 --level=1 --device=md0 raid.boota raid.bootb
```

- Create a root partition with RAID level 1 and filesystem type `ext4` that is 32768 MB in size on each disk in the array. Also assign `md1` as the device name:

```
part raid.roota --size 32768 --ondisk disk/by-id/scsi-disk1-ID --asprimary
part raid.rootb --size 32768 --ondisk disk/by-id/scsi-disk2-ID --asprimary
raid / --fstype=ext4 --level=1 --device=md1 raid.roota raid.rootb
```

- Create a swap partition with RAID level 1 and filesystem type `swap` that is 8192 MB in size on each disk in the array. Also assign `md1` as the device name:

```
part raid.swapa --size 8192 --ondisk disk/by-id/scsi-disk1-ID --asprimary
part raid.swapb --size 8192 --ondisk disk/by-id/scsi-disk2-ID --asprimary
raid swap --fstype=swap --level=1 --device=md2 raid.swapa raid.swapb
```

- Automatically reboot Oracle VM Server after installation:

```
reboot
```

Considerations for Kickstart Configurations

You should also consider the following points when you create your kickstart configuration:

- Oracle VM Release 3.4 supports installations of Oracle VM Server onto a single disk or LUN only. As a result, kickstart installations using multiple disks in a non-software RAID configuration is not supported.
- As a security best practice, you should ensure the `console=hvc0` option is not appended to the boot loader configuration. This option can echo your password in the server console at login.
- Several other options may be appended to the bootloader line depending on your environment requirements. See [Section 5.7, “Finalizing Upgrades on Oracle VM Server for x86”](#) for more information on the other options that you may want to append here.
- If your server has multiple network interfaces, you should at least specify the network interface to be used for the management interface first. If you have more than one network interface specified in a kickstart file, the first interface is used as the management interface. It is preferable to not include lines for any of the other network interfaces available on your server within the kickstart configuration file, as this can confuse the installer. You can configure additional network interfaces on a server within Oracle VM Manager after installation and discovery.
- It is possible to create a `%post` division in your kickstart configuration file for the purpose of automating some actions after the install has completed, but before the server has rebooted. This can prove useful if you need to perform additional tasks, such as copying SSH keys from a location accessible to the server, or for triggering a change to a PXELinux configuration parameter to prevent an install loop as discussed in [Section 3.1, “Installing Oracle VM Server for x86 from PXE Boot”](#).
- Disk device names and node numbering can change after Oracle VM Server reboots. As a result, non-persistent device names, such as `/dev/sda`, change between reboots. For this reason you should use persistent names such as the device UUID or WWID when identifying disks in a kickstart configuration. You can use the following command to identify disks:

```
# ls -lR /dev/disk
```

2.2 Installing Oracle VM Server on SPARC Hardware

In addition to x86-based hardware, this release of [Oracle VM Manager](#) can manage SPARC-based host hardware. This chapter discusses installing and configuring the software required to support management of [server pools](#), [Oracle VM Servers](#), and [guest virtual machines](#) on SPARC systems in Oracle VM

Manager. This chapter is intended for system administrators who want to install the software required to manage Oracle VM Server for SPARC systems in Oracle VM Manager.



Note

Access the Oracle VM Server for SPARC documentation at <http://www.oracle.com/technetwork/documentation/vm-sparc-194287.html>. To determine the version of the Oracle VM Server for SPARC documentation to reference, run the `pkg list ldomsmanager` command.

2.2.1 Preinstallation Tasks and Requirements

Your SPARC server must meet the minimum hardware and software requirements listed in this section.

2.2.1.1 Hardware Requirements



To install Oracle VM Server for SPARC, you need a SPARC T-series, SPARC M-series, or SPARC S-series server. See *Supported Platforms* in the *Oracle VM Server for SPARC Installation Guide*.

2.2.1.2 Software and System Firmware Requirements

The software required to configure your SPARC server so that it is discoverable by [Oracle VM Manager](#) is as follows:

Table 2.2 Required Software and System Firmware for SPARC Servers

Software and System Firmware	Description
Oracle Solaris OS	<p>Install the latest Oracle Solaris 11.3 SRU OS on the control domain.</p> <p>See the following sections in the <i>Oracle VM Server for SPARC Installation Guide</i>:</p> <ul style="list-style-type: none"> • Oracle Solaris 11.3 OS requirements, see <i>Oracle Solaris OS Versions</i>. • Oracle Solaris OS installation and upgrade procedures, see <i>Installing and Upgrading the Software</i>.
	<div style="display: flex; align-items: center;"> <div> <p>Note</p> <p>Oracle VM Agent for SPARC Release 3.4.6 supports Oracle Solaris 11.4. For information about upgrading to this Release 3.4.6, see Section 5.8.2.2, “Updating to Oracle Solaris 11.3 Manually”.</p> </div> </div>
SPARC System Firmware	<p>The firmware for your SPARC servers must match the required version to support Oracle VM Server for SPARC.</p> <p>See the following sections in the <i>Oracle VM Server for SPARC Installation Guide</i>:</p> <ul style="list-style-type: none"> • SPARC system firmware requirements for Oracle Solaris 11.3 or Solaris 11.4 OS, see <i>System Firmware Versions and Oracle Solaris OS Versions</i>. • Upgrade procedures for SPARC system firmware, see <i>Upgrading the System Firmware</i>.

Software and System Firmware	Description
Oracle VM Server for SPARC	<p>Install at least Oracle VM Server for SPARC 3.3 on your SPARC server. Note that this software is included by default with the Oracle Solaris 11.3 OS. The Oracle VM Server for SPARC 3.4 software is included by default with the Oracle Solaris 11.3 SRU 8 OS.</p>
	
	<p>Note</p>
	<p>Run the <code>pkg list ldomsmanager</code> command to obtain the version of the Oracle VM Server for SPARC software.</p>
Oracle VM Agent for SPARC	<p>Oracle VM Agent for SPARC must be installed in the control domain. Oracle VM Agent for SPARC enables systems running Oracle VM Server for SPARC to be discovered and managed by Oracle VM Manager.</p>
	
	<p>Note</p>
	<p>As of Oracle VM Release 3.4.3, the Oracle VM Agent for SPARC runs with Python 2.7.</p>
	<p>See Section 2.2.1.6, “Obtaining the Oracle VM Agent for SPARC Software” for information on downloading and installing Oracle VM Agent for SPARC.</p>
Oracle Solaris Image Package System (IPS) Repositories	<p>An IPS repository must be configured to host the Oracle VM Agent for SPARC software when using an automated installer for Oracle VM Server for SPARC. For more information, see Section 3.2.2, “Setting up an IPS repository”.</p>
	<p>When upgrading Oracle VM Servers running on SPARC hardware, two Oracle Solaris IPS repositories are required to ensure you have access to the Oracle Solaris updates and the Oracle VM Agent for SPARC software. For more information, see Section 5.8.3.1, “Setting Up IPS Repositories” in the <i>Upgrading from Oracle VM Agent for SPARC Release 3.3.x or Between 3.4.x Errata Releases</i> section.</p>

2.2.1.3 Network Requirements

Oracle VM Server for SPARC has the same basic network requirements as specified for x86 hardware in [Section 2.1.1.3, “Network Requirements”](#).

Oracle VM Server for SPARC has the following additional network requirements:

Network Configuration Profile. In Oracle Solaris 11.3, the Oracle VM Agent for SPARC requires the control domain to be configured with the DefaultFixed network configuration profile. If this network configuration profile is not enabled on the control domain then, during the installation of the Oracle VM Agent for SPARC software, the Oracle VM Agent for SPARC setup tool offers the opportunity to enable this network configuration profile and to reconfigure the network.

Alternatively, you can manually configure the DefaultFixed network configuration profile and the network on the control domain before installing the Oracle VM Agent for SPARC. For more information about network configuration profiles, see *Configuring and Administering Network Components in Oracle Solaris 11.3* available at:

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

**Note**

This section applies only to Oracle Solaris 11.3. In Oracle Solaris 11.4, the Default Fixed network configuration profile has been removed.

Server Hostname. The server hostname should be different from "localhost" and it should resolve to an IP address different from 127.0.0.1.

You can check the hostname of the server with the `hostname` command:

```
# hostname
foo.example.com
```

If the command returns "localhost" then use the `hostname` command to change the hostname.

You can check that the hostname resolves to an IP address with the `getent` command:

```
# getent hosts `hostname`
192.168.1.1
```

If the command does not return an IP address or returns 127.0.0.1 then update the `/etc/hosts` file or your name service so that the hostname resolves to a valid IP address. For more information about naming services, see the *Working With Oracle Solaris 11.3 Naming and Directory Services: DNS and NIS* documentation at:

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

2.2.1.4 Storage Requirements

Although not a strict requirement, Solaris I/O Multipathing should be enabled for all storage used on the server (SAS, FC, iSCSI). Solaris I/O Multipathing provides higher availability for storage devices through the use of multipathed connections. On a default Solaris installation, Solaris I/O Multipathing is enabled only for SAS controllers using the `mpt_sas` driver, but it is not enabled for Fibre Channel and iSCSI controller ports. For more information about Solaris I/O Multipathing, refer to *Managing SAN Devices and Multipathing in Oracle Solaris 11.3* at:

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

Enabling Solaris I/O Multipathing. To enable Solaris I/O multipathing on all supported multipath capable controller ports, use the `stmsboot` command:

```
# stmsboot -e
```

**Note**

Note that device names change once under Solaris I/O multipathing control, and a reboot is required for changes to take effect.

For more information about enabling Solaris I/O Multipathing, refer to section [Enabling and Disabling Multipathing](#) in *Managing SAN Devices and Multipathing in Oracle Solaris 11.3* available at:

http://docs.oracle.com/cd/E53394_01/html/E54792/gpii.html#scrolltoc

Third-Party Storage Devices. Using Solaris I/O Multipathing with a third-party storage device may require additional configuration. If you have enabled Solaris I/O multipathing using the `stmsboot` and you are using a third-party storage device and Solaris I/O Multipathing is not effectively enabled for that storage device, then refer to [Configuring Third-Party Storage Devices](#) in *Managing SAN Devices and Multipathing in Oracle Solaris 11.3* available at:

http://docs.oracle.com/cd/E53394_01/html/E54792/gjftx.html#scrolltoc

2.2.1.5 Oracle VM Agent for SPARC Configuration Requirements

Before you install the Oracle VM Agent for SPARC, ensure that the server is in the factory-default configuration. During installation, the Oracle VM Agent for SPARC setup tool creates and stores a configuration that is suitable for use with Oracle VM Manager.

Use the following procedure to configure the platform with the factory-default configuration:

1. If there are domains other than the primary [domain](#), then stop and unbind all domains except the primary domain.

```
# ldm stop-domain -a
# ldm unbind-domain <domain>
```

2. Specify the factory-default configuration and shut down the primary domain.

```
# ldm set-sconfig factory-default
# shutdown -i5 -g0 -y
```

3. From the service processor, perform a power cycle of the system to load the factory-default configuration.

```
-> stop /SYS
-> start /SYS
```

2.2.1.6 Obtaining the Oracle VM Agent for SPARC Software

If you do not already have the Oracle VM Agent for SPARC software, download Oracle VM Agent for SPARC from the Oracle Software Delivery Cloud:

<https://edelivery.oracle.com/oraclevm>

See [Section 1.2, “Getting Installation ISOs and Packages”](#), in the appendix, for more information.

Use of Oracle VM Agent for SPARC is licensed under the GNU General Public License, version 2 license at:

<http://www.gnu.org/licenses/gpl-2.0.html>

Since SPARC systems already include a hypervisor within the firmware by default, installation of Oracle VM Server for SPARC does not replace the existing operating system. Therefore, it is possible to perform the installation from within the existing control domain. Save the Oracle VM Agent for SPARC archive file in the control domain.

2.2.2 Installing the Distributed Lock Manager (DLM) Package

If you have not already installed the DLM package, you should download and install it before you install Oracle VM Agent. The DLM package is required to support server pool clustering.

Download the DLM package, `ovs-dlm-3.4.1-bxxx.p5p`, from <https://edelivery.oracle.com/oraclevm>. For more information about downloading software, see [Section 1.2, “Getting Installation ISOs and Packages”](#).

To install the DLM package, do the following:

1. Stop the `ovs-config` service:

```
# svcadm disable -s ovs-config
```

2. Install the DLM package:

```
# pkg install -g ovs-dlm-3.4.x-bxxx.p5p dlm
```

3. Restart the ovs-config service:

```
# svcadm enable ovs-config
```

2.2.3 Installing Oracle VM Agent for SPARC

Before you install Oracle VM Agent for SPARC, configure the `solaris` publisher on the system, for example:

```
# pkg set-publisher -P -g https://pkg.oracle.com/solaris/support/ solaris
```

For detailed instructions, refer to the repository documentation at https://pkg-register.oracle.com/register/product_info/1/. In addition, for more information about configuring publishers, see http://docs.oracle.com/cd/E53394_01/html/E54739/publisher-config.html#scrolltoc.

To install Oracle VM Agent for SPARC, do the following:

1. On the [control domain](#), unpack the Oracle VM Agent for SPARC archive file:

```
# tar xzf ovs-ldoms-xx.tar.gz
```

2. Run the Oracle VM Agent for SPARC installer:

```
# cd ovs-ldoms-xx
# ./install
Oracle VM Agent Release 3.x.x Installer
```

The installer includes a check to determine whether or not you are running a supported version of Solaris. If the Solaris version is below 11, the installer exits with an error message.

3. The installer installs all required packages

```
- Installing Packages

      Packages to install:  6
      Create boot environment: No
      Create backup boot environment: No
      Services to change:  1

DOWNLOAD                                PKGS      FILES    XFER (MB)   SPEED
Completed                                6/6       226/226    1.6/1.6     0B/s

PHASE                                     ITEMS
Installing new actions                    353/353
Updating package state database           Done
Updating image state                     Done
Creating fast lookup database             Done
Reading search index                     Done
Updating search index                     6/6
```

4. The installer runs the [Oracle VM Agent](#) setup tool, `ovs-agent-setup`. For more information about the Oracle VM Agent setup tool, see [Section 2.2.4, “Configuring Oracle VM Agent for SPARC”](#).

```
- Configuring the OVS Agent
```

5. The installer enables all required SMF services. See [Section 2.2.6, “Using the Oracle VM Agent for SPARC Service”](#) for information on using the Oracle VM Agent for SPARC service.

```
- Enabling Required Services
```

```
Installation Completed.
```

The Oracle VM Agent for SPARC is installed in the control domain. Oracle VM Server for SPARC is now configured and ready to be discovered and managed by [Oracle VM Manager](#).

2.2.4 Configuring Oracle VM Agent for SPARC

The Oracle VM Agent for SPARC can be configured using the Oracle VM Agent for SPARC setup command, `ovs-agent-setup`. This command checks that the system is properly configured to run the [Oracle VM Agent](#). If the system is not properly configured then the command attempts to fix the configuration. The `ovs-agent-setup` command is automatically run when installing the Oracle VM Agent.

It is possible to run this command manually to control the configuration of the Oracle VM Agent for SPARC, run the `ovs-agent-setup` command on the [control domain](#):

```
# ovs-agent-setup configure
```

2.2.4.1 Configuring the Network

1. If the server is not configured with the DefaultFixed network configuration profile, then the network profile configuration menu is displayed.

```
Network Configuration
*** ERROR: The DefaultFixed network profile is not enabled.

-----

Network Profile Configuration

The system must be configured with the DefaultFixed network
profile. You can manually configured the DefaultFixed network
or you can use this tool to do the configuration. This tool
will configure a single network interface, all other network
interfaces will be unconfigured.

Do you want to use this tool to configure the network?

  1) Yes, use this tool to configure the network
  2) No, I will configure the network manually

Choice (1-2) [1]:
```

To use the tool to enable the DefaultFixed network configuration profile and configure the network, select 1.

To skip the configuration of the network, select 2. In which case, you must manually enable the DefaultFixed network configuration profile and configure the network.

2. When configuring the network, if you are not connected to the system console then a warning is displayed.

```
!!! WARNING !!!

You are not connected to the system console. Reconfiguring
the network can disrupt your remote connection to the server
and you can lose the remote access to the server.

!!! WARNING !!!

Are you sure that you want to continue?

  1) Yes, continue and configure the network
```

```
2) No, cancel the configuration of the network
```

```
Choice (1-2):
```

To continue the network configuration, select 1.



Warning

Configuring the network can disrupt current network connections to the server and you can potentially lose your connection to the server. So it is safer to configure the network from the system console.

To cancel the configuration of the network, select 2. Then connect to the system console, and restart the configuration by running the `ovs-agent-setup configure` again.

3. The Oracle VM Management Interface menu is displayed.

```
Collecting information about network interfaces...
-----

Oracle VM Management Interface

Choose the network interface to use for the management of this
machine.

  1) net0: 00:14:4f:e3:0f:12 (nxge0)
  2) net1: 00:14:4f:e3:0f:13 (nxge1)
  3) net2: 00:14:4f:e3:0f:14 (nxge2)
  4) net3: 00:14:4f:e3:0f:15 (nxge3)

Interface (1-4) [1]:
```

Select the network interface to use for the management of the server.

4. The Network Interface Configuration menu is displayed.

```
IPv4 Configuration for net0

  1) Dynamic IP configuration (DHCP)
  2) Manual address configuration

IPv4 Configuration (1-2) [1]:
```

To configure the network interface with DHCP, select 1. To configure the network interface with a static IP address, select 2.

Configuring the Network with DHCP

- a. If the network interface is to be configured with DHCP, then the Hostname Configuration menu is displayed.

```
Hostname Configuration

If your system is part of a larger network where hostnames
are assigned by DHCP, select automatically via DHCP.
Otherwise, select manually and enter a hostname for your
system.

  1) automatically via DHCP
  2) manually

Hostname Configuration (1-2) [1]:
```

If the server uses DHCP to assign its hostname, select 1. If the server has its own hostname, select 2. Then, at 'Hostname' prompt, enter the hostname to be used.

- b. The Oracle VM management interface configuration is displayed:

```
Oracle VM Management Interface

Interface: net0
IP Address: DHCP
Hostname: DHCP

Are these parameters correct?

1) Yes, configure the network with these parameters
2) No, enter new parameters for the network configuration

Choice (1-2):
```

Select 1 to confirm that parameters are correct. The tool then configures the network. Select 2 if you want to enter new parameters, the process to configure the network then restarts from the beginning.

Configuring the Network With a Static IP

- a. If the network interface is to be configured with a static IP configuration, then the tool requests to enter IP configuration information.

```
IP Address [192.168.1.10]:
Prefix (Netmask) [255.255.255.0]:
Gateway [192.168.1.1]:
Primary DNS [192.168.168.168]:
Secondary DNS [192.168.169.169]:
Hostname [foo.example.com]:
```

- b. The Oracle VM management interface configuration is displayed:

```
Oracle VM Management Interface

Interface: net0
IP Address: 192.168.1.10
Prefix (Netmask): 255.255.255.0
Gateway: 192.168.1.1
Primary DNS: 192.168.168.168
Secondary DNS: 192.168.169.169
Hostname: foo.example.com

Are these parameters correct?

1) Yes, configure the network with these parameters
2) No, enter new parameters for the network configuration
```

Choice (1-2):

Select 1 to confirm that parameters are correct. The tool then configures the network. Select 2 if you want to enter new parameters, the process to configure the network then restarts from the beginning.

Configuring the Hostname

The setup tool checks if the server is configured with a valid hostname, that is a hostname different from "localhost" and that resolves to an IP address different from 127.0.0.1.

- a. If the hostname of the server is set to localhost, then an error is displayed.

```
*** ERROR: The server has an invalid hostname (localhost).
-----

Server Hostname

The server has no hostname or an invalid hostname. Use
the "hostname" command to check and configure the hostname
of the server. You might also want to check the network
configuration of the server.

Press <return> to continue...
*** ERROR: The server has an invalid hostname (localhost).
```

After the setup tool exists, you must use the `hostname` command to configure the hostname of the server.

- b. If the hostname resolves to the 127.0.0.1 then an error is displayed and the `/etc/hosts` file is updated to not resolve the hostname to 127.0.0.1.

```
*** ERROR: The server hostname (foo) should not resolve to 127.0.0.1.
Configuring /etc/hosts to not resolve foo to 127.0.0.1
Updating /etc/inet/hosts, the previous file is backed up as /etc/inet/hosts.20121128190648
```

When the setup tool updates the `/etc/hosts` file, the original `/etc/hosts` file is backup as `/etc/inet/hosts.<date-and-time>`.

- c. If the hostname does not resolve to an IP address then an error is displayed.

```
*** ERROR: The server hostname (foo) does not resolve to an IP address.
-----

Server IP Address

The server hostname does not resolve to an IP address.

hostname: foo

Update the /etc/hosts file or the name service so that the
hostname of the server is resolved to a valid IP address.
You might also want to check the network configuration of
the server.

Press <return> to continue...
```

```
*** ERROR: The server hostname (fooxxx) does not resolve to an IP address.
```

After the setup tool exits, you must update the `/etc/hosts` file or your name service so that the hostname resolves to a valid IP address. For more information about naming services, see the *Working With Oracle Solaris 11.3 Naming and Directory Services: DNS and NIS* documentation at:

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

2.2.4.2 Configure the Storage

The setup tool checks if all disks are configured with Solaris I/O Multipathing. If some disks are not configured with Solaris I/O Multipathing, then the tool prints warning messages, and displays instructions for enabling Solaris I/O Multipathing.

```
Storage Configuration
*** WARNING: disk c6t216000C0FF8089D5d4s2 is not configured with I/O multipathing
*** WARNING: disk c5t216000C0FF8089D5d4s2 is not configured with I/O multipathing
*** WARNING: disk c3t4d0s2 is not configured with I/O multipathing
*** WARNING: disk c3t0d0s2 is not configured with I/O multipathing
*** WARNING: disk c3t1d0s2 is not configured with I/O multipathing

*** WARNING: Some disks are not configured with I/O multipathing, the usage of Solaris
I/O multipathing is recommended.

-----

Solaris I/O Multipathing
The usage of Solaris I/O multipathing is recommended. To enable Solaris
I/O multipathing on all supported multipath capable controller ports, run
the following command:
    stmsboot -e
Note that a device will have a different name from its original name when
it is under Solaris I/O multipathing control, and a reboot is required for
changes to take effect.
Refer to the stmsboot(1M) man page for more information.
Press <return> to continue...
```



Note

The setup tool does not automatically enable Solaris I/O Multipathing. For more information about enabling Solaris I/O Multipathing, refer to [Section 2.2.1.4, "Storage Requirements"](#).

2.2.4.3 Configure Clustering

The setup tool checks the clustering software is correctly configured.

If the clustering software is not correctly configured then its configuration is automatically updated.

```
Cluster Configuration
Cluster Configuration OK
```

2.2.4.4 Oracle VM Agent Configuration

If the Oracle VM Agent password is not defined then the Oracle VM Agent password menu is displayed.

```
*** ERROR: The Oracle VM Agent password is not defined.

-----

Oracle VM Agent password
Enter a password for the Oracle VM Agent (ovs-agent)
```

```
This password is used in Oracle VM manager to manage
and monitor this server and its guest VMs. You must
type it twice to ensure you know what it is and
didn't make a mistake in typing.
```

```
Password:
Password (confirm):
```

Enter a password to be used for the Oracle VM Agent. This password is used by [Oracle VM Manager](#) to manage and monitor the Oracle VM Server for SPARC, and the guests created and running within it. This is the password you use when discovering [Oracle VM Servers](#) in Oracle VM Manager.

Then re-enter the password.

The password characters are not echoed to the screen. If the two passwords do not match, the tool prompts you to enter them again.

2.2.4.5 Configuring the Logical Domains Manager

The setup tool checks if the Logical Domains Manager is correctly configured.

If the Logical Domains Manager is not correctly configured then its configuration is automatically updated.

```
LDoms Manager Configuration
*** WARNING: The LDoms Manager is not configured for outgoing migration.
Configuring the domain manager
LDoms Manager Configuration OK
```

2.2.4.6 Activating a Logical Domain Configuration

The setup tool checks if the logical domain configuration is correct. If the logical domain configuration is not correct then it is automatically updated and saved on the Service Processor:

```
LDoms Configuration
*** ERROR: The vcc service is not configured on the primary domain.
*** ERROR: The vds service is not configured on the primary domain.
*** WARNING: The primary domain is configured with too many cpus for creating guest virtual
machines.
*** WARNING: The primary domain is configured with too much memory for creating guest
virtual machines.
*** WARNING: The primary domain is not configured with the recommended number of cpus (8).
*** WARNING: The primary domain is not configured with the recommended amount of memory (8GB).
*** WARNING: The system is not using the ovm-initial configuration.
Configuring the vcc service
Configuring the vds service
Configuring the primary domain
Saving the ovm-initial configuration on the service processor
LDoms Configuration OK
```

If the logical domain configuration has been updated then the logical domain configuration menu is displayed.

```
LDoms Configuration

The LDoms configuration has been created and stored on the
service processor. To activate this configuration, you need
to reboot the system.

Do you want to reboot the system now?

1) Yes, reboot the system now
2) No, I will reboot the system later
```



```
Choice (1-2):
```

Select 2 to exit the installer so that you can manually reboot the system to activate the logical domain configuration.

2.2.4.7 Configuring Virtual I/O Services

The setup tool checks that virtual I/O services are correctly configured.

If a virtual I/O service is not correctly configured then its configuration is automatically updated.

```
Virtual I/O Services Configuration
*** ERROR: The virtual disk service (vds) is not configured to be disabled at boot time.
*** ERROR: The virtual switch service (vsw) is not configured to be disabled at boot time.
Configuring the virtual disk service
Configuring the virtual switch service
Virtual I/O Services Configuration OK
```

2.2.5 Control Domain CPU and Memory Settings

The [Oracle VM Agent](#) setup tool configures the control domain with 1 CPU core. If the server has 16 GB of memory or more, the control domain is allocated 8 GB of memory. If the server has less than 16 GB of memory, the control domain is allocated 2 GB of memory and a warning message is displayed.¹ If you encounter performance issues because the control domain does not have enough CPUs or memory, you can increase the number of CPU cores and the amount of memory assigned to the control domain. Note, with the Oracle VM Agent, you cannot assign less than 1 CPU core and 2 GB of memory to the control domain, while 8 GB of memory for the control domain is the recommended minimum.

Use the following procedure to change the number of CPU cores or the amount of memory assigned to the control domain:

To change the number of CPU cores or memory assigned to the control domain

1. Connect as root to the control domain.
2. Specify the number of CPU cores to assign to the control domain. For example, to assign 2 cpu cores to the control domain:

```
# svccfg -s ovs-config setprop config/core_count=2
```

3. Specify the amount of memory (in GB) to assign to the control domain. For example, to assign 16 GB of memory to the control domain:

```
# svccfg -s ovs-config setprop config/memory_size=16
```

4. Refresh and restart the `ovs-config` service:

```
# svcadm refresh ovs-config
# svcadm restart ovs-config
```

5. The restart of the `ovs-config` service automatically reconfigures the control domain with the specified number of CPU cores and amount of memory and restarts the other Oracle VM Agentservices (`ovs-agent` and `ovmwatch`). Check that all services come back online:

```
# svcs ovm/*
STATE          STIME          FMRI
```

¹ This is only likely to occur on older SPARC systems such as the T2, T2+ and the T3, since these systems can have a minimum of 4 GB or 8 GB of memory. Newer servers like the T4 (with a minimum of 16 GB) and the T5 (with a minimum of 128 GB), are unaffected and are automatically configured so that the control domain is allocated a full 8 GB of memory.

```

online      15:40:59  svc:/ovm/ovs-config:default
online      15:40:59  svc:/ovm/ovmwatch:default
online      15:41:18  svc:/ovm/ovs-agent:default

```

If a service fails to restart and goes into the maintenance state, check for errors in the log file of the service. The restart of the `ovs-config` service fails if the control domain cannot be configured with the specified number of CPU cores and amount of memory.

Note that the reconfiguration of the control domain is achieved dynamically without rebooting the control domain, but the new configuration persists if the control domain is rebooted. The reconfiguration can be achieved while virtual machines are running, and the change impacts any running virtual machines. The server can continue to be managed with Oracle VM Manager while the `ovs-agent` is not fully restarted.

To restore the default configuration, use the same steps to set the `core_count` and `memory_size` to 0.

2.2.6 Using the Oracle VM Agent for SPARC Service

To check the status of the Oracle VM Agent for SPARC service:

```
# svcs ovs-agent
```

To start the Oracle VM Agent for SPARC service:

```
# svcadm enable -r ovs-agent
```

To stop the Oracle VM Agent for SPARC service:

```
# svcadm disable ovs-agent
```

If the [Oracle VM Agent](#) service fails to come online, look for errors in the `/var/svc/log/ovm-ovs-agent:default.log` file.

You can also check if the configuration has any error by running the following command:

```
# ovs-agent-setup check
```

If the command reports any error, then the Oracle VM Agent service is be unable to start.

For more detailed information about managing Oracle Solaris 11 services, see *Managing System Services in Oracle Solaris 11.3*.

http://docs.oracle.com/cd/E53394_01/html/E54799/eqbrs.html#scrolltoc

2.2.7 Oracle VM Agent for SPARC Log File

The Oracle VM Agent for SPARC log file is located at:

```
/var/log/ovs-agent.log
```

The Oracle VM Agent for SPARC service log file is located at:

```
/var/svc/log/ovm-ovs-agent:default.log
```

The Oracle VM Agent for SPARC configuration service log file is located at:

```
/var/svc/log/ovm-ovs-config:default.log
```

2.2.8 Uninstalling Oracle VM Agent for SPARC

To uninstall Oracle VM Agent for SPARC:

1. On the [control domain](#), change directory to the location in which you uncompressed the [Oracle VM Agent](#) (see [Section 2.2.3, "Installing Oracle VM Agent for SPARC"](#)), and run the following as the *root* user:

```
# cd ovs-ldoms-xx  
# ./uninstall
```

The script uninstalls Oracle VM Agent for SPARC and removes the default Oracle VM Storage Connect plug-ins.

Chapter 3 Performing a Network Installation of Oracle VM Server

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This chapter covers different automated installation techniques for installing Oracle VM Server.

It is important to understand that in the case of Oracle VM Server on x86 hardware, an installation is equivalent to a full operating system installation and that the ISO image file provided is a bootable image. On SPARC hardware, the hypervisor is built into the firmware and Oracle Solaris 11.3 includes its own logical domain manager. Installation of Oracle VM Server on SPARC hardware involves installing the Oracle VM Agent for SPARC that allows Oracle VM Manager to interface with the Logical Domains Manager. In this case, an installation of Oracle VM Server for SPARC involves installing additional packages and configuring the environment for Oracle VM.

For deployments of a large number of x86 Oracle VM Servers, network installation using PXE boot may be preferred to using a bootable physical media such as DVD-ROM. For deployments of a large number of SPARC Oracle VM Servers, network installation using Solaris Auto-Install (AI) may be preferred.

Installations of Oracle VM Server for x86 hardware can be largely automated by taking advantage of a kickstart configuration file that guides the Anaconda-based install wizard through each of the installation options available. Installations of Oracle VM Server for SPARC hardware can be largely automated by taking advantage of the AI manifest to automatically configure the system.

This chapter provides you with the information required for each of these installation techniques. Commands are provided for both x86 and SPARC environments where relevant.

3.1 Installing Oracle VM Server for x86 from PXE Boot

In deployments where multiple systems must be installed, it is common to perform a network-based installation by configuring target systems to load a PXE boot image from a TFTP server configured on the same network. This deployment strategy typically suits environments where many Oracle VM Server instances are to be installed on x86 hardware at once.

This section describes some of the basic configuration steps required on a single Oracle Linux server that is set up to provide all of the services needed to handle a PXE boot environment. There are many

different approaches to the architecture and choices of software required to service PXE boot requests. The information provided here is intended only as a guideline for setting up such an environment.

**Note**

As of Release 3.4.5, the updated Xen hypervisor for Oracle VM Server is delivered as a single binary, named `xen.mb.efi` instead of `xen.gz`, which can be loaded by the EFI loader, Multiboot, and Multiboot2 protocols.

3.1.1 PXE Boot Overview

PXE boot is a method of installing Oracle VM Server on multiple client machines across the network. In general, to successfully perform a PXE boot, you need to do the following:

1. Install and configure an Oracle Linux server to provide services and host files across the network.
2. Configure a DHCP service to direct client machines to the location of a boot loader.
3. Configure a TFTP service to host the boot loader, kernel, initial RAM disk (initrd) image, Xen hypervisor, and configuration files.
4. Host the contents of the Oracle VM Server ISO image file on an NFS or HTTP server.
5. Create a kickstart configuration file for the Oracle VM Server installation.

A kickstart configuration file allows you to automate the Oracle VM Server installation steps that require user input. While not necessary to perform a PXE boot, using a kickstart configuration file is recommended. For more information, see [Section 2.1.4, “Performing a Kickstart Installation of Oracle VM Server”](#).

6. Set up the PXE client boot loaders.
 - a. For BIOS-based PXE clients you use the `pxelinux.0` boot loader that is available from the `syslinux` package. For UEFI-based PXE clients in a non-Secure Boot configuration, you use the `grubx64.efi` boot loader.

**Note**

Oracle VM Release 3.4.1 and Release 3.4.2 require you to build the boot loader for UEFI-based PXE clients. For more information, see [Section A.1, “Setting Up PXE Boot for Oracle VM Server Release 3.4.1 and Release 3.4.2”](#).

- b. Create the required boot loader configuration files.
- c. Host the boot loader and configuration files on the TFTP server.

3.1.2 Configuring the DHCP Service

The DHCP service handles requests from PXE clients to specify the location of the TFTP service and boot loader files.

**Note**

- If your network already has a DHCP service configured, you should edit that configuration to include an entry for PXE clients. If you configure two different

DHCP services on a network, requests from clients can conflict and result in network issues and PXE boot failure.

- The following examples and references are specific to ISC DHCP.

Configure the DHCP service as follows:

1. Install the `dhcp` package.

```
# yum install dhcp
```

2. Edit `/etc/dhcp/dhcpd.conf` and configure an entry for the PXE clients as appropriate. See [Example DHCP Entry for PXE Clients](#).

3. Start the DHCP service and configure it to start after a reboot.

```
# service dhcpd start
# chkconfig dhcpd on
```



Note

If the server has more than one network interface, the DHCP service uses the `/etc/dhcp/dhcpd.conf` file to determine which interface to listen on. If you make any changes to `/etc/dhcp/dhcpd.conf`, restart the `dhcpd` service.

4. Configure the firewall to accept DHCP requests, if required.

Example DHCP Entry for PXE Clients

The following is an example entry in `dhcpd.conf` for PXE clients:

```
set vendorclass = option vendor-class-identifier;
option pxe-system-type code 93 = unsigned integer 16;
set pxetype = option pxe-system-type;

option domain-name "example.com";

subnet 192.0.2.0 netmask 255.255.255.0 {
  option domain-name-servers 192.0.2.1;
  option broadcast-address 192.0.2.2;
  option routers 192.0.2.1;
  default-lease-time 14400;
  max-lease-time 28800;
  if substring(vendorclass, 0, 9)="PXEClient" {
    if pxetype=00:07 or pxetype=00:09 {
      filename "tftpboot/grub2/grubx64.efi";
    } else {
      filename "tftpboot/pxelinux/pxelinux.0";
    }
  }
  pool {
    range 192.0.2.14 192.0.2.24;
  }
  next-server 10.0.0.6;
}

host svr1 {
  hardware ethernet 08:00:27:c6:a1:16;
  fixed-address 192.0.2.5;
  option host-name "svr1";
}

host svr2 {
  hardware ethernet 08:00:27:24:0a:56;
```

```
fixed-address 192.0.2.6;
option host-name "svr2";
}
```

- The preceding example configures a pool of generally available IP addresses in the range `192.0.2.14` through `192.0.2.24` on the `192.0.2/24` subnet. Any PXE-booted system on the subnet uses the boot loader that the `filename` parameter specifies for its PXE type.
- The boot loader `grubx64.efi` for UEFI-based clients is also located in the `grub2` subdirectory of the TFTP server directory. In a non-Secure Boot configuration, you can specify `grubx64.efi` as the boot loader.
- The boot loader `pxelinux.0` for BIOS-based clients is located in the `pxelinux` subdirectory of the TFTP server directory.
- The `next-server` statement specifies the IP address of the TFTP server from which a client can download the boot loader file.



Note

You should have a `next-server` statement even if you use the same server to host both DHCP and TFTP services. Otherwise, some boot loaders cannot get their configuration files, which the client to reboot, hang, or display a prompt.

- The static IP addresses `192.0.2.5` and `192.0.2.6` are reserved for `svr1` and `svr2`, which are identified by their MAC addresses.

3.1.3 Configuring the TFTP Service

The TFTP service hosts boot loader files, configuration files, and binaries on the network so PXE clients can retrieve them.

Configure the TFTP service as follows:

1. Install the `tftp-server` package.

```
# yum install tftp-server
```

2. Open `/etc/xinetd.d/tftp` for editing and then:
 - a. Set `no` as the value of the `disable` parameter.

```
disable = no
```

- b. Set `/tftpboot` as the TFTP root.

```
server_args = -s /tftpboot
```

3. Save and close `/etc/xinetd.d/tftp`.
4. Create the `/tftpboot` directory if it does not already exist.

```
# mkdir /tftpboot
```

5. Restart the `inetd` server.

```
# service xinetd restart
```

6. Configure the firewall to allow TFTP traffic, if required.

3.1.4 Copying the Xen Hypervisor, Installer Kernel, and RAM Disk Image

The TFTP service hosts the following files so that PXE clients can retrieve them over the network:

- `xen.mb.efi` - Xen hypervisor for Oracle VM Server
- `vmlinux` - installer kernel
- `initrd.img` - initial RAM disk image

Copy the files to your TFTP service as follows:

1. Create an `isolinux` subdirectory in the TFTP server root.

```
# mkdir /tftpboot/isolinux
```

2. Mount the Oracle VM Server ISO image file as a loopback device. For instructions, see [Section 1.4, “Loopback ISO Mounts”](#).
3. Copy the contents of `images/pxeboot` from the ISO image file into the `ovs` subdirectory you have created.

```
# cp /mnt/images/pxeboot/* /tftpboot/isolinux/
```

Substitute `mnt` with the path to the mount point where you mounted the ISO image file.

3.1.5 Hosting the Contents of the Oracle VM Server ISO File

You must host the contents of the Oracle VM Server ISO image file over the network so that the PXE clients can access them. You can use an NFS or HTTP server as appropriate.



Note

You cannot host only the ISO image file itself over the network. You must make the entire contents of the ISO image file available in a single directory.

The following steps provide an example using an NFS server:

1. Install an NFS server if necessary.

```
# yum install nfs-utils
```

2. Create a directory for the contents of the Oracle VM Server ISO image file.

```
# mkdir -p /srv/install/ovs
```

3. Mount the Oracle VM Server ISO image file as a loopback device. For instructions, see [Section 1.4, “Loopback ISO Mounts”](#).
4. Copy the contents of the Oracle VM Server ISO image file into the directory you created.

```
# cp -r /mnt/* /srv/install/ovs
```

Substitute `mnt` with the path to the mount point where you mounted the ISO image file.

5. Edit `/etc/exports` to configure your NFS exports.

```
/srv/install *(ro,async,no_root_squash,no_subtree_check,insecure)
```

Depending on your security requirements, you can configure this export only to cater to particular hosts.

6. Start the NFS service.

```
# service nfs start
```

If the NFS service is already running and you make any changes to the `/etc/exports` file, run the following command to update the exports table within the NFS kernel server:

```
# exportfs -va
```

7. Configure the NFS service to always start at boot.

```
# chkconfig nfs on
# chkconfig nfslock on
```

8. Configure the firewall to allow clients to access the NFS server, if required.

3.1.6 Copying the Kickstart Configuration File

To perform a PXE boot, you should create a kickstart configuration file to automate the installation process. The kickstart configuration file provides the input that the Anaconda installation wizard requires. If you have not already created a kickstart configuration file, `ks.config`, see [Section 2.1.4, “Performing a Kickstart Installation of Oracle VM Server”](#).

You must make the kickstart configuration file available to PXE clients over the network. To do this, you can copy the file to the NFS or HTTP server where you host the contents of the Oracle VM Server ISO image file, as follows:

```
# cp /tmp/OVS_ks.conf /srv/install/kickstart/ks.cfg
```

Substitute `/tmp/OVS_ks.conf` with the path to your kickstart configuration file for the Oracle VM Server installation.

3.1.7 Setting Up the Boot Loader

PXE clients require a boot loader to load the Xen hypervisor and the Linux installation kernel.

For BIOS-based PXE clients you use the `pxelinux.0` boot loader that is available from the `syslinux` package.

For UEFI-based PXE clients in a non-Secure Boot configuration, you use the `grubx64.efi` boot loader that is available from the Oracle VM Server ISO image file.



Note

Oracle VM Release 3.4.1 and Release 3.4.2 require you to build the boot loader for UEFI-based PXE clients. Before you proceed with any of the following steps, you must first complete the following procedure: [Section A.1.1.1, “Building the GRUB2 Boot Loader”](#).

3.1.7.1 Setting Up the PXELinux Boot Loader for BIOS-based PXE Clients

If you are performing a PXE boot for BIOS-based PXE clients, you use the `pxelinux.0` boot loader from the `syslinux` package.

Getting the PXELinux Boot Loader

To get the PXELinux boot loader, you must install `syslinux`.



Important

The PXELinux boot loader files must match the kernel requirements of the DHCP server. You should install the `syslinux` package that is specific to the Oracle Linux installation on which your DHCP service runs.

Complete the following steps:

1. Install the `syslinux` package.

```
# yum install syslinux
```

2. If you have SELinux enabled, install the `syslinux-tftpboot` package to ensure files have the correct SELinux context.

```
# yum install syslinux-tftpboot
```

Hosting the PXELinux Boot Loader

After you get the PXELinux boot loader, you copy the following files to the TFTP server so the BIOS-based PXE clients can access them over the network:

- `pxelinux.0` - PXELinux binary
- `vesamenu.c32` - graphical menu system module
- `mboot.c32` - text only menu system module. You can use `mboot.c32` without `vesamenu.c32` if you do not require a graphical boot menu.

To host the boot loader, do the following:

1. Create a `pxelinux` directory in the TFTP root.
2. Copy the boot loader and menu modules to the `pxelinux` directory.

```
# cp /usr/share/syslinux/pxelinux.0 /tftpboot/pxelinux/  
# cp /usr/share/syslinux/vesamenu.c32 /tftpboot/pxelinux/  
# cp /usr/share/syslinux/mboot.c32 /tftpboot/pxelinux/
```

Configuring the PXELinux Boot Loader

For BIOS-based PXE clients, you must create two boot loader configuration files on the TFTP server, as follows:

1. Create the `pxelinux.cfg` directory.

```
# mkdir /tftpboot/pxelinux/pxelinux.cfg
```

2. Create a PXE menu configuration file.

```
# touch /tftpboot/pxelinux/pxelinux.cfg/pxe.conf
```

3. Create a PXE configuration file.

```
# touch /tftpboot/pxelinux/pxelinux.cfg/default
```

4. Configure `pxe.conf` and `default` as appropriate. See [Example Boot Loader Configurations](#).

Example Boot Loader Configurations

The following is an example of `pxelinux.cfg/pxe.conf`:

```
MENU TITLE PXE Server
NOESCAPE 1
ALLOWOPTIONS 1
PROMPT 0
menu width 80
menu rows 14
MENU TABMSGROW 24
MENU MARGIN 10
menu color border          30:44          #ffffff #00000000 std
```

The following is an example of `pxelinux.cfg/default`:

```
DEFAULT vesamenu.c32
TIMEOUT 800
ONTIMEOUT BootLocal
PROMPT 0
MENU INCLUDE pxelinux.cfg/pxe.conf
NOESCAPE 1
LABEL BootLocal
    localboot 0
    TEXT HELP
    Boot to local hard disk
    ENDTEXT
LABEL OVS
    MENU LABEL OVS
    KERNEL mboot.c32
    # Note that the APPEND statement must be a single line, the \ delimiter indicates
    # line breaks that you should remove
    APPEND /tftpboot/isolinux/xen.mb.efi --- /tftpboot/isolinux/vmlinuz ip=dhcp \
        dom0_mem=max:128G dom0_max_vcpus=20 \
        ksdevice=eth0 ks=nfs:192.0.2.0:/srv/install/kickstart/ks.cfg \
        method=nfs:192.0.2.0:/srv/install/ovs --- /tftpboot/isolinux/initrd.img
    TEXT HELP
    Install OVM Server
    ENDTEXT
```

The default behavior on timeout is to boot to the local hard disk. To change the default behavior to force an install, you can change the `ONTIMEOUT` parameter to point to the `OVS` menu item. The important thing to remember here is that when an install is completed, the server reboots and if this option is not changed back to `BootLocal`, the server enters into an installation loop. There are numerous approaches to handling this, and each depend on your own environment, requirements and policies. The most common approach is to boot the servers using one configuration, wait for a period until they are all in the install process and then change this configuration file to ensure that they return to local boot at the time that they reboot.

The `KERNEL` location points to the `mboot.c32` module. This allows us to perform a multiboot operation so that the installer loads within a Xen environment. This is necessary for two reasons. First, it is useful to establish that the Xen hypervisor is at least able to run on the hardware prior to installation. Second, and more importantly, device naming may vary after installation if you do not run the installer from within the Xen hypervisor, leading to problems with device configuration post installation.

In the `APPEND` line of the preceding example:

- Some parameters in `APPEND` are broken into separate lines with the `\` delimiter for readability purposes. A valid configuration places the entire `APPEND` statement on a single line.
- The Xen hypervisor is loaded first from `isolinux/xen.mb.efi` in the TFTP server root.
- The installer kernel is located within the path `isolinux/vmlinuz` in the TFTP server root.

- The IP address for the installer kernel is acquired using DHCP.
- Limits are applied to dom0 for the installer to ensure that the installer is stable while it runs. This is achieved using the default parameters: `dom0_mem=max:128G` and `dom0_max_vcpus=20`.
- The `ksdevice` parameter specifies the network interface to use. You should specify a value that reflects your network configuration, such as `eth0`, a specific MAC address, or an appropriate keyword. Refer to the appropriate kickstart documentation for more information.
- The initial ramdisk image is located within the path `isolinux/initrd.img` in the TFTP server root.

3.1.7.2 Setting Up the GRUB2 Boot Loader for UEFI-based PXE Clients

If you are performing a PXE boot for UEFI-based PXE clients, you can use the GRUB2 boot loader that is available on the Oracle VM Server ISO image file.

Hosting the GRUB2 Boot Loader

Host the GRUB2 boot loader on the TFTP server so PXE clients can access it over the network, as follows:

1. Create a `grub2` directory in the TFTP root.
2. Mount the Oracle VM Server ISO image file as a loopback device. For instructions, see [Section 1.4, “Loopback ISO Mounts”](#).
3. In a non-Secure Boot configuration, you just need to copy the `grubx64.efi` boot loader from the `/EFI/BOOT/` directory to the `grub2` directory.

```
# cp -r path/EFI/BOOT/grubx64.efi /tftpboot/grub2/
```

Substitute `path` with the directory where you mounted the Oracle VM Server ISO image file.

4. Copy the GRUB2 modules and files to the appropriate directory.

```
# cp -r path/grub2/lib/grub/x86_64-efi/*.{lst,mod} /tftpboot/grub2/x86_64-efi
```

Substitute `path` with the path to the contents of the Oracle VM Server ISO image file on your file system.

Setting Up the GRUB2 Configuration

Complete the following steps to set up the GRUB2 configuration:

1. Create an `EFI/redhat` subdirectory in the TFTP server root.
2. Copy `grub.cfg` from the Oracle VM Server ISO image file to the directory.

```
# cp -r path/EFI/BOOT/grub.cfg /tftpboot/grub2/EFI/redhat/grub.cfg-01-cd-ef-gh-ij-kl-mn
```

Where `-cd-ef-gh-ij-kl-mn` is the MAC address for the Network Interface Card (NIC) for the PXE boot client.

Substitute `path` with the directory where you mounted the Oracle VM Server ISO image file.

3. Modify `grub.cfg` on the TFTP server as appropriate. See [Example grub.cfg](#).

Oracle VM Server provides a GRUB2 boot loader for UEFI and BIOS-based PXE clients. However, the `grub.cfg` must be compatible with GRUB, not GRUB2. The Anaconda installation program for Oracle

VM Server is compatible with GRUB only. You can find more information at: http://docs.oracle.com/cd/E37670_01/E41138/html/ch04s02s01.html

Example grub.cfg

The following is an example of `grub.cfg`:

```
menuentry 'Install Oracle VM Server' --class fedora --class gnu-linux --class gnu --class os {
    echo 'Loading Xen...'
    multiboot2 /tftpboot/isolinux/xen.mb.efi dom0_mem=max:128G dom0_max_vcpus=20
    echo 'Loading Linux Kernel...'
    module2 /tftpboot/isolinux/vmlinuz ip=dhcp \
    repo=nfs:192.0.2.0:/srv/install/ovs \
    ks=nfs:192.0.2.0:/srv/install/kickstart/ks.cfg \
    ksdevice=00:10:E0:29:B6:C0
    echo 'Loading initrd...'
    module2 /tftpboot/isolinux/initrd.img
}
```

In the preceding example,

- Some parameters in `module2` statement are broken into separate lines with the `\` delimiter for readability purposes. A valid configuration contains all parameters and values in a single line.
- The Xen hypervisor is loaded first from `isolinux/xen.mb.efi` in the TFTP server root.
- The following parameters apply limits to dom0. These limits ensure that the installation program is stable while it runs: `dom0_mem=max:128G` and `dom0_max_vcpus=20`.
- The installer kernel is located within the path `isolinux/vmlinuz` in the TFTP server root.
- The IP address for the installer kernel is acquired using DHCP.
- The `repo` parameter specifies the IP address of the NFS server that hosts the contents of the Oracle VM Server ISO image file and the path to those contents.
- The `ks` parameter specifies the IP address of the NFS server that hosts the kickstart configuration file and the path to the file.
- The `ksdevice` parameter specifies the network interface to use. You should specify a value that reflects your network configuration, such as `eth0`, a specific MAC address, or an appropriate keyword.
- The initial ramdisk image is located within the path `isolinux/initrd.img` in the TFTP server root.

3.1.8 Starting the Installation Process

To start the Oracle VM Server installation for PXE clients, do the following:

1. For BIOS-based PXE clients using the PXELinux boot loader, update the `/tftpboot/pxelinux.cfg/default` configuration file to use the `OVS` option as the default in the case of a timeout.
2. Configure the network boot or PXE boot option in the BIOS or UEFI settings for each client, as appropriate.
3. Reboot each target client.

Each client makes a DHCP request during the network boot process. The DHCP service allocates an IP address to the client and provides the path to the boot loader on the TFTP server. Each target client then makes a TFTP request for the boot loader and loads the default menu. After they reach the menu option

timeout, each client loads the kernel and initrd image from the TFTP service and begins the boot process. The client then connects to the NFS or HTTP server and installation begins.

3.2 Using the Automated Installer (AI) for Oracle VM Server for SPARC

Oracle Solaris and the Oracle VM Agent for SPARC can be automatically installed on SPARC servers over the network using Solaris Automated Installer (AI). This allows for the rapid deployment of Oracle VM Server for SPARC across multiple SPARC systems, reducing administrative overhead and the likelihood of configuration or installation errors. Solaris AI is described in detail in the document titled *Installing Oracle Solaris 11.3 Systems* at:

http://docs.oracle.com/cd/E53394_01/html/E54756/useaipart.html

In this section we assume that you already have a sufficient understanding of Solaris AI and are able to set up an Install Server to deploy Solaris to your SPARC systems. This section highlights the additional steps that you need to perform to ensure that the Oracle VM Agent for SPARC and any other required packages are also installed and configured on your SPARC systems.

To set up and configure SPARC AI for rapid deployment of Oracle VM Server for SPARC across multiple SPARC systems, the following steps must be taken:

- Set up an IPS repository with the Oracle VM Agent for SPARC software.
- Create an Oracle Solaris Installation Service.
- Create an installation manifest for Oracle VM Agent for SPARC.
- Create a configuration profile for the installation of Oracle VM Server for SPARC.
- Install Oracle VM Server for SPARC on your SPARC hardware.

3.2.1 Installing the Distributed Lock Manager (DLM) Package

If you have not already installed the DLM package, you should download and install it before you install Oracle VM Agent. The DLM package is required to support server pool clustering.

Download the DLM package, `ovs-dlm-3.4.x-bxxx.p5p`, from <https://edelivery.oracle.com/oraclevm>. For more information about downloading software, see [Section 1.2, “Getting Installation ISOs and Packages”](#).



Note

You can add the DLM package to an IPS repository and install from there. See [Section 3.2.2, “Setting up an IPS repository”](#).

To install the DLM package, do the following:

1. Stop the `ovs-config` service:

```
# svcadm disable -s ovs-config
```

2. Install the DLM package:

```
# pkg install -g ovs-dlm-3.4.x-bxxx.p5p dlm
```

3. Restart the `ovs-config` service:

```
# svcadm enable ovs-config
```

3.2.2 Setting up an IPS repository

In addition to installing Solaris, your IPS repository must be configured to install the Oracle VM Agent for SPARC software. To do this, you must set up an IPS repository that contains the Oracle VM Agent for SPARC software packages to be used during the installation.

To set up an IPS repository for Oracle VM Agent for SPARC

1. If you have not already created a package repository that is accessible over HTTP, you must create one by performing the following actions on the system where you intend to host your repositories:

```
# pkgrepo create /path/to/my-repository
# svccfg -s application/pkg/server setprop pkg/inst_root=/path/to/my-repository
# svccfg -s application/pkg/server setprop pkg/port=8888
# svcadm refresh application/pkg/server
# svcadm enable application/pkg/server
```

2. Check that the package repository server is online:

```
# svcs pkg/server
STATE          STIME         FMRI
online         timestamp    svc:/application/pkg/server:default
```

3. Download the latest Oracle VM Agent for SPARC software from <https://edelivery.oracle.com/oraclevm>, as described in [Section 1.2, “Getting Installation ISOs and Packages”](#).

4. Extract the software, for example:

```
# tar xzf ovs-ldoms-3.4.x-bxxx.tar.gz
```

5. Copy the software to the package repository, for example:

```
# pkgrecv -s ovs-ldoms-3.4.x-bxxx/ovs-ldoms.p5p -d /path/to/my-repository 'ovm/*'
# pkgrecv -s ovs-dlm-3.4.x-bxxx.p5p -d /path/to/my-repository 'ovm/*'
```

6. Restart the package repository server and ensure that it is online:

```
# svcadm restart application/pkg/server
# svcs pkg/server
```

7. If the package repository server is in maintenance status, clear the service:

```
# svcadm clear pkg/server
```

8. Check that the contents of the repository are available, for example:

```
# pkgrepo list -s /path/to/my-repository
# pkgrepo list -s http://my-repo-server:8888/
```

3.2.3 Creating an Oracle Solaris Installation Service

To install Oracle Solaris 11.3 over the network, you must create an Oracle Solaris installation service using the `installadm create-service` command.



Note

The Automatic Installation (AI) tools package provides the `installadm` command. You can install the AI tools package with the `pkg install install/installadm` command.

For instructions to create an Oracle Solaris installation service, see *Installing Oracle Solaris 11.3 Systems* at:

http://docs.oracle.com/cd/E53394_01/html/E54756/useaipart.html

After the procedure is completed, you can check that your installation service is correctly set up by using the `installadm list` command. The output from this command should look similar to the following:

```
# installadm list

Service Name          Alias Of Status Arch  Image Path
-----
solaris11_3_12_5_0-sparc -      on    sparc  /export/auto_install/solaris11_3_12_5_0-sparc
```

In the example output, the installation service is `solaris11_3_12_5_0-sparc`.

To download the software, refer to Oracle Solaris 11.3 Support Repository Updates (SRU) Index [ID 2045311.1](#) from My Oracle Support, available at:

<https://support.oracle.com/epmos/faces/DocumentDisplay?id=2045311.1>



Note

Oracle VM Server for SPARC 3.3 has been integrated into Oracle Solaris 11.3.

3.2.4 Creating an Installation Manifest

You need to create a custom XML AI manifest file to install and configure the Oracle VM Agent automatically. For more information about custom XML AI manifest file, see [Customizing an XML AI Manifest File](#) at:

http://docs.oracle.com/cd/E53394_01/html/E54756/gmfbv.html#scrolltoc

Create an Installation Manifest

1. Start by copying the default manifest of your install service:

```
# installadm list -n solaris11_3_12_5_0-sparc -m
Service/Manifest Name          Status          Criteria
-----
solaris11_3_12_5_0-sparc
  orig_default                  Default        None

# installadm export -n solaris11_3_12_5_0-sparc -m orig_default -o manifest_ai_ovm.xml
```

2. Open the exported `manifest_ai_ovm.xml` in a text editor and customize it in the following way:

- In the **<source>** section, make sure that a Solaris publisher is defined and that it points to a Solaris IPS repository for the Solaris 11.3 version that also contains the Oracle VM Server for SPARC Release 3.3 or higher packages. For example:

```
<publisher name="solaris">
  <origin name="http://solaris-11-repository"/>
</publisher>
```

- In the **<source>** section, add the Oracle VM (ovm) publisher with a reference to the IPS repository that you have set up with Oracle VM Agent for SPARC software. For example:

```
<publisher name="ovm">
```

```
<origin name="http://my-repo-server:8888"/>
</publisher>
```

- In the **<software_data>** install section, add the following lines to have the Oracle VM Agent for SPARC software and the DLM software installed:

```
<name>pkg:/ovm/ovs-agent</name>
<name>pkg:/ovm/dlm</name>
```

3. Add the manifest to the installation service. In addition, you can specify criteria associated with this manifest. This manifest is only applicable to SPARC **sun4v** system, so you should at least use the **sun4v** criteria:

```
# installadm create-manifest -n solaris11_3_12_5_0-sparc -f manifest_ai_ovm.xml -m ovm -c \
arch="sun4v"

# installadm list -m -n solaris11_3_12_5_0-sparc
Service/Manifest Name      Status      Criteria
-----
solaris11_3_12_5_0-sparc
  ovm                      arch = sun4v
  orig_default             Default     None
```

3.2.5 Creating a Configuration Profile

To have the server automatically configured after the installation, you need to provide a configuration profile. For more information about creating a configuration profile, see [Creating System Configuration Profiles](#) at:

http://docs.oracle.com/cd/E53394_01/html/E54756/syscfg-2.html

To create a configuration profile, run the interactive configuration tool and save the output to a file. The following command creates a valid profile in `profile_ovm.xml` from responses you enter interactively:

```
# sysconfig create-profile -o profile_ovm.xml
```



Important

In the interactive configuration tool, you *must* select the option to configure the network manually or it will not be possible to automatically configure Oracle VM Agent for SPARC using the installation service.

To have the Oracle VM Agent for SPARC configured automatically during the installation, add the following section inside the **<service_bundle>** section of the generated `profile_ovm.xml` file:

```
<service version="1" type="service" name="ovm/ovs-config">
  <instance enabled="true" name="default">
    <property_group type="application" name="config">
      <propval type="astring" name="password" value="encrypted-password"/>
      <propval type="boolean" name="autoconfig" value="true"/>
    </property_group>
  </instance>
</service>
```

Replace the `encrypted-password` value with the encrypted version of the password that you want to use for the Oracle VM Agent.

You can generate the encrypted version of the password on any system using the following command:

```
# python -c "import crypt, sys; print crypt.crypt(sys.argv[-1], \
'\$6\$s\$' % sys.argv[-2])" $(pwgen -s 16 1) password
```

Substitute *password* with the password that you want to use for the Oracle VM Agent, for example:

```
# python -c "import crypt, sys; print crypt.crypt(sys.argv[-1], \
    '\$6\$%s\$' % sys.argv[-2])" $(pwgen -s 16 1) s3cr3tp4ssw0rd
$6$c$pgcCqd6Urrrepi9EzdK93x5XSpyiNzup7SACDNjV0tsqm6HFNeg385wMu1GjE.J.S.FL8J7gt15VZnq7tOAd/N0
```

The output from this command is the *encrypted-password* value that you should substitute in the section that you added to the configuration profile.

Finally, add the configuration profile to the installation service. In addition, you can specify criteria associated with this profile. This profile is only applicable to SPARC **sun4v** system, so you should at least use the **sun4v** criteria:

```
# installadm create-profile -n solaris11_3_12_5_0-sparc --file profile_ovm.xml -c arch=sun4v

# installadm list -p
Service/Profile Name      Criteria
-----
solaris11_3_12_5_0-sparc
  profile_ovm.xml         arch = sun4v
```

3.2.6 Performing an Installation

For more information about installing a server with the Solaris Auto-Install, see [Installing Client Systems](#) at:

http://docs.oracle.com/cd/E53394_01/html/E54756/client.html

On the installation server, you must associate the MAC address of each server, that you wish to install, with the installation service that you have set up. This is achieved by running the following command:

```
# installadm create-client -n solaris11_3_12_5_0-sparc -e mac-address
```

Substitute *mac-address* with the actual MAC address for the network interface on the server that is used to connect to the installation service.

On your target servers, if you have configured your DHCP to provide the information for the installation service, you can issue the following command at boot:

```
ok boot net:dhcp - install
```

If you have not configured DHCP, on your target server issue the following commands at boot:

```
ok setenv network-boot-arguments host-ip=client-ip,router-ip=router-ip,\
  subnet-mask=subnet-mask,hostname=hostname,\
  file=http://install-server-ip-address:5555/cgi-bin/wanboot-cgi
ok boot net - install
```

Substitute *client-ip* with the IP address that you intend to allocate to the server, *router-ip* with the IP address of your router or default gateway, *subnet-mask* with the subnet mask of your network, and *hostname* with the hostname that you wish to use for your server. Finally, ensure that the URL that you provide for the *file* parameter matches the URL to access your Solaris AI server.

Chapter 4 Installing Oracle VM Manager

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Complete the procedures in this chapter to successfully install [Oracle VM Manager](#).

This chapter also provides procedures to uninstall Oracle VM Manager.

4.1 Oracle VM Manager Components

The applications necessary to run [Oracle VM Manager](#) are packaged in the ISO image. Some or all of the following applications may be installed on the [host computer](#) when you install Oracle VM Manager:

Oracle VM Manager

The Oracle VM Manager application provided as a Oracle [WebLogic](#) Server domain and container.

Oracle WebLogic Server 12c

Oracle WebLogic Server 12c Standard Edition, including Application Development Framework (ADF) Release 12c, is included with the Oracle VM Manager. Use of Oracle WebLogic Server 12c Standard Edition is restricted to use with Oracle VM Manager. For more information about Oracle WebLogic Server, see the Oracle WebLogic Server 12c documentation:

<http://docs.oracle.com/middleware/1212/>

MySQL Enterprise Edition

MySQL Enterprise Edition is included for use as the Oracle VM Manager Management Repository. Use of MySQL Enterprise Edition, including without limitation MySQL Enterprise Backup, is restricted to use with Oracle VM Manager.

This MySQL database is installed locally using the packages that are bundled with the Oracle VM Manager installer. Oracle VM Manager makes use of its own version of MySQL 5.6 Enterprise Edition which is licensed for exclusive use by Oracle VM. MySQL is installed into the standard location with databases and configuration information located at `/u01/app/oracle/mysql/data`. The MySQL server that is installed uses a non-standard TCP Port (49500) for exclusive use by Oracle VM Manager. Do not use the bundled database for other applications.

To prevent potential conflicts with existing MySQL installations, The Oracle VM Manager installer requires that you remove any existing MySQL installation prior to installation. If you are running MySQL on the system where you are installing Oracle VM Manager, the installer exits to allow you to

backup any existing databases and remove the existing MySQL instance before proceeding with the installation.



Note

Oracle VM Manager Release 3.4 does not support the use of any database other than MySQL Enterprise Edition.

4.2 Minimum Hardware and Software Requirements

The following minimum system requirements must be met on the computer on which you want to install [Oracle VM Manager](#).

4.2.1 Hardware Requirements

Before you install Oracle VM Manager, make sure that your computer meets the minimum hardware requirements listed in [Table 4.1](#):

Table 4.1 Hardware Requirements for Oracle VM Manager

Items	Minimum Value
Memory	8.0 GB
Processor Type	64 bit
Processor Speed	1.83 GHz*2
Swap Space	2.1 GB
Hard Disk Space	5.5 GB in /u01 3 GB in /tmp 400 MB in /var 300 MB in /usr

4.2.2 Software Requirements

Before you install Oracle VM Manager, make sure that your computer meets the following minimum software and configuration requirements.

4.2.2.1 Operating Systems

Oracle VM Manager is supported on the following operating systems:

- Oracle Linux 6 64-bit or later.
- Oracle Linux 7 64-bit or later.
- Red Hat Enterprise Linux 6 64-bit or later.
- Red Hat Enterprise Linux 7 64-bit or later.

You can download Oracle Linux from:

- Oracle Software Delivery Cloud: <https://edelivery.oracle.com/linux>
- Oracle Support site: <https://support.oracle.com/>

For more information about Oracle Linux, see:

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

4.2.2.2 Web Browsers

The Oracle VM Manager Web Interface is supported on the web browsers described in the [Oracle VM Manager User's Guide](#)

4.2.2.3 Prerequisite Packages

If you have a minimal installation of Oracle Linux, you may not have all of the required packages installed. These packages are required for the Oracle VM Manager installer to run and complete. For all installations, the `zip` and `unzip` and `perl` packages are required. To install these packages, enter:

```
# yum install zip unzip perl
```

The Oracle VM Manager installer runs some additional checks for other software packages that are required to complete the installation. If a required package is missing, the installer may exit with a warning message notifying you of the missing package and the steps that you may need to take to install it. Typically systems that have been installed as a 'minimal' installation may be missing specific packages. For instance, on Oracle Linux 6 and 7 you may be required to install the `libaio` package, while on Oracle Linux 7 you must additionally install the `net-tools` and `perl-Data-Dumper` packages.

The Oracle VM Manager installer is responsible for installing a number of different software packages, some of which may have other dependencies. If you have not installed at least a minimal installation of Oracle Linux, the installer may exit at any point and notify you of missing dependencies. In this situation, you must ensure that dependency packages are installed before attempting to resume an installation.

Oracle VM Manager 3.4.7 and above, and MySQL 8.0, requires some packages that might not be installed. These packages are:

- Oracle VM Manager 3.4.7 requires `polycoreutils-python` for Oracle Linux7.
- MySQL 8.0, included with Oracle VM Manager 3.4.7, requires the use of `openssl` 1.0.1 or above.

4.2.2.4 Removal of Pre-Existing MySQL Installations

If you have an existing MySQL installation on the system where you intend to install Oracle VM Manager you must backup your databases and uninstall it. Oracle VM Manager requires exclusive use of MySQL due to the specific tuning parameters that it applies to the configuration. Oracle VM Manager uses MySQL Enterprise Edition on a non-standard port. The licensing of the MySQL Enterprise Edition provided with Oracle VM Manager grants exclusive use to Oracle VM. You must not use the MySQL server provided for any other purpose. If an existing MySQL installation is present on the system, the installer exits with an error message informing you that you must remove this before continuing with the installation.

MariaDB installations and any associated libraries must equally be removed to avoid conflicts with the Oracle VM Manager MySQL database. If an existing MariaDB installation is present on the system, the installer exits with an error message informing you that you must remove this before continuing with the installation. You can remove conflicting MariaDB packages by entering:

```
# yum remove mariadb-libs
```

4.2.2.5 Network

The host computer on which you install Oracle VM Manager must have the host name correctly configured (*pingable*). Make sure the computer's host name matches the host name in the `/etc/hosts` file. Use the following command to check the host name:

```
# hostname
```

Use a text editor to check the host name in the `/etc/hosts` file. For example, to use VI enter

```
# vi /etc/hosts
```

For example, if the computer's host name is `hostname1.example.com`, and the IP address is `10.1.1.1`, the corresponding item in the `/etc/hosts` file should be:

```
10.1.1.1 hostname1.example.com hostname1
```

Oracle VM Manager requires that the system time reported by all Oracle VM Servers is synchronized with the time reported by the Oracle VM Manager host. Therefore, Oracle VM Manager runs an NTP daemon that is used to update the system time on each Oracle VM Server. The NTP daemon on Oracle VM Manager must be able to synchronize with other NTP servers, or it will fail to promote itself to a stratum that the Oracle VM Servers can use to synchronize with. If you do not run NTP within your own environment, the Oracle VM Manager host must be able to communicate with other NTP servers on the Internet using UDP 123. Any firewalls preventing this can cause unexpected behavior within Oracle VM Manager, including the inability to properly perform server discovery.

When a VLAN is used for the management network, IPv6 should be disabled before installing Oracle VM Manager. IPv6 is not supported by Oracle VM and disabling it before installing Oracle VM Manager may help to avoid some problems with network configuration in general.

4.2.2.6 Firewall Configuration

A default Oracle Linux install has the firewall enabled. You can either open all the ports used by Oracle VM Manager, or open all ports by disabling the firewall, or open only the ports needed for Oracle VM Manager operation.

We recommend configuring the firewall to only open the required ports automatically, using the environment configuration script provided with the Oracle VM Manager installer. As part of the installation procedure, a script is included named `createOracle.sh`. You can run this script to perform a number of installation tasks in an automated way, including the standard firewall configuration. See [Section 4.3.1, “Configuring the Environment Before Installation”](#) for information on using this script.

The diagram and table below illustrate the firewall rules and requirements for Oracle VM.

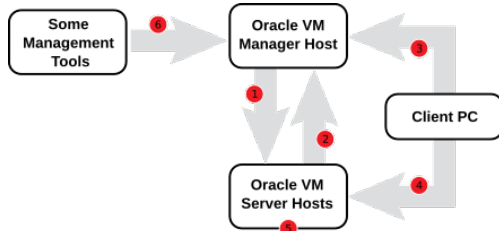


Table 4.2 Firewall Rules

No.	Component Relationship	Ports and Description	Optional
1	Oracle VM Manager to Oracle VM Server	<ul style="list-style-type: none"> TCP/8899 - HTTPS connection to the Oracle VM Agent. TCP/6900-xxxx - Secure VNC connections to connect to the VNC Console for virtual machines running on each Oracle VM Server. 	No

No.	Component Relationship	Ports and Description	Optional
		<ul style="list-style-type: none"> TCP/10000-xxxx - Secure serial connections to connect to the Serial Console for virtual machines running on each Oracle VM Server. 	
2	Oracle VM Server to Oracle VM Manager	<ul style="list-style-type: none"> TCP/7002 - HTTPS connection from Oracle VM Agent to the Oracle VM Core WSAPI. UDP/123 - NTP requests to an NTP server running on the Oracle VM Manager host. 	No
3	Client PC to Oracle VM Manager	<ul style="list-style-type: none"> TCP/7002 - HTTPS connection from web browser to Oracle VM Manager web user interface, or WSAPI. TCP/10000 - SSH connection from SSH client to Oracle VM Manager CLI. TCP/22 - SSH connection to Oracle VM Manager host for administrative work. 	No, although access to services should be limited to requirements
4	Client PC to Oracle VM Server	<ul style="list-style-type: none"> TCP/22 - SSH connection to Dom0 on each Oracle VM Server for administrative work. 	Yes
5	Oracle VM Server to Oracle VM Server	<ul style="list-style-type: none"> TCP/7777 - OCFS2/DLM heartbeat communication for clustered server pools. TCP/8002 (x86 only)- non-encrypted port to perform live virtual machine migrations. TCP/8003 (x86 only)- Securely encrypted port to perform live virtual machine migrations. TCP/8101 (SPARC only)- Securely encrypted port to perform live virtual machine migrations. TCP/6482 (SPARC only) - Logical Domains Manager XMPP port used to initiate live virtual machine migrations. 	No
6	Some Management Tools to Oracle VM Manager	<ul style="list-style-type: none"> TCP/7002 - Some external management tools may connect to Oracle VM Manager via HTTPS to access the Web Services API. 	Yes

The following instructions explain how to resolve any firewall requirements manually, and assume that you have decided not to use the environment configuration script provided with the Oracle VM Manager installer.

For Oracle Linux (or Red Hat Enterprise Linux) 6, if the `iptables` package is installed, then the `iptables` rules are added during the installation. However, for Oracle Linux (or Red Hat Enterprise Linux) 7 and beyond, if the `firewalld` package is installed, then the `firewalld` rules are added.

Note that if `iptables` or `firewalld` has been disabled on the target host prior to the installation of Oracle VM Manager, the `createOracle.sh` script does not automatically re-enable the `iptables` or `firewalld` service. No rules are added if the firewall managements tools are *not* installed. Any rules added take effect when the service is enabled.

If firewall management tools are enabled, even if there are no rules defined, each packet is checked by the firewall management tools, which can have an impact on performance.

If you prefer or need to configure the firewall manually, follow these instructions.

For `iptables`, open the required ports in `iptables` as follows:

1. Log on to the Oracle VM management server as the `root` user.
2. At the command prompt, enter the appropriate command for each port to be opened; for example:

```
# iptables -A INPUT -m state --state NEW -m tcp -p tcp --dport 7002 -j ACCEPT
# iptables -A INPUT -m state --state NEW -m udp -p udp --dport 123 -j ACCEPT
# iptables -A INPUT -m state --state NEW -m udp -p udp --dport 10000 -j ACCEPT
```

3. Save the `iptables` configuration.

```
# service iptables save
```

This does not require `iptables` to be restarted as the commands open the ports while `iptables` is running. The save ensures they are opened on reboot/restart in future.

For `firewalld`, open the required ports in `firewalld` as follows:

1. Log on to the Oracle VM management server as the `root` user.
2. At the command prompt, enter the appropriate command (which persists over reboot) for each port to be opened; for example:

```
# firewall-cmd --permanent --zone=public --add-port=7200/tcp
# firewall-cmd --permanent --zone=public --add-port=123/udp
# firewall-cmd --permanent --zone=public --add-port=10000/tcp
# firewall-cmd --reload
```

4.3 Installing Oracle VM Manager

It takes approximately 8-15 minutes to complete the installation of [Oracle VM Manager](#), depending on the performance of the Oracle VM Manager host, and the installation type you choose.

Before you begin the installation, download the Oracle VM Manager software from:

<http://edelivery.oracle.com/oraclevm>

More information on obtaining the software is covered in [Section 1.2, “Getting Installation ISOs and Packages”](#).

Once you have downloaded the Oracle VM Manager installation ISO you must either burn it to DVD-ROM and mount the DVD on the target host (see [Section 1.3, “Installation From Bootable Physical Media”](#)); or copy the ISO to the target host and perform a loopback mount of the ISO (see [Section 1.4, “Loopback ISO Mounts”](#)).

4.3.1 Configuring the Environment Before Installation

Oracle VM Manager requires a system user named `oracle`, a group called `dba`, and a `/u01` directory with specific permissions on installation folders. The Oracle VM Manager installation media includes a shell script, `createOracle.sh`, that automatically configures the environment. This script does the following:



Note

You must use the bash login shell with the `oracle` user to install Oracle VM Manager.

The `createOracle.sh` script does the following:

- Creates the required operating system user, `oracle`, and groups, `dba`.



Note

The script does not set a password for the `oracle` user as a security measure. Because the user does not have a password, it is not possible to log in as the `oracle` user. If you want to allow login access, you must set the password manually.

- Creates the `/u01` directory, if it does not already exist, and sets permissions on required installation folders.



Note

The `/u01` directory must exist before you can install Oracle VM Manager. This directory must also have 2.4 GB of space available.

- Sets the required parameters in the `/etc/security/limits.conf` file on a Linux system.
- Opens the required ports in the firewall on a Linux system.



Note

You should run the `createOracle.sh` script if you are installing Oracle VM Manager on the system for the first time. You do not need to run this script if you are reinstalling Oracle VM Manager on the same system.

To run `createOracle.sh` and configure the environment, do the following:

1. Mount the Oracle VM Manager installation media. See [Section 1.3, “Installation From Bootable Physical Media”](#) or [Section 1.4, “Loopback ISO Mounts”](#).
2. Change directory to the mount point, for example:

```
# cd /mnt/cdrom
```

3. As the `root` user, run `createOracle.sh`

```
# ./createOracle.sh
```



Important

The `createOracle.sh` script does not automatically enable the `iptables` or `firewalld` service. You should manually confirm that the firewall service is enabled.

Manually Setting Up the Oracle User

To install Oracle VM Manager, you must have an `oracle` user that is a member of a group named `dba` and which has the correct security limits set.

The environment configuration script automatically creates and configures the `oracle` user. As an alternative to using the script, you can set up the `oracle` user with the following commands:

- If the `oracle` user does not exist on the Oracle VM Manager host, enter the following commands as the `root` user to create the user, create the group, add the user to the group, and set the user's password:

```
# groupadd dba
# useradd -g dba oracle
```

- If the `oracle` user already exists, add it to the `dba` group using the following command:

```
# usermod -g dba oracle
```

- The `oracle` user must also have a `hard nofiles` and `soft nofiles` minimum of at least 8192, as well as some other security limits set. To set these, edit the `/etc/security/limits.conf` file to include the following:

```
oracle    hard    nofile   8192
oracle    soft    nofile   8192
oracle    soft    nproc    4096
oracle    hard    nproc    4096
oracle    soft    core     unlimited
oracle    hard    core     unlimited
```

4.3.2 Running the Oracle VM Manager Installer

To install Oracle VM Manager, change directory to the mount point where you have either mounted the DVD-ROM or where you have mounted the ISO file and start the installation by running the `runInstaller` script as the `root` user:



Important

Please ensure that you have met the requirements outlined in [Section 4.2, “Minimum Hardware and Software Requirements”](#) before running the `runInstaller.sh` script. The `runInstaller.sh` script attempts to check that these requirements are met before running and may exit if a requirement is not met. It is possible to disable prerequisite steps by running the script with the `-n` or `--noprereq` option, as described in [Section 4.6, “Oracle VM Manager Installation Script \(runInstaller.sh\)”](#).

```
# cd /mnt/ovm
# ./runInstaller.sh
```

Substitute `/mnt/ovm` with the path to the mount point where the DVD-ROM or ISO image file is mounted on your own system.

A set of installer options are displayed:

```
Please select an installation type:
 1: Install
 2: Upgrade
 3: Uninstall
 4: Help
```

At the command prompt, enter **1** to perform the installation. If you already have Oracle VM Manager installed and want to upgrade it, select **2** to **Upgrade**. If you already have Oracle VM Manager installed and want to remove it, select **3** to **Uninstall**.

See [Section 4.3.2.1, “Installation”](#) for information on installing Oracle VM Manager.

See [Section 4.5, “Uninstalling Oracle VM Manager”](#) for information on uninstalling Oracle VM Manager, and its components such as MySQL, Oracle [WebLogic](#) Server, ADF and Java.

Upgrading Oracle VM Manager is discussed in [Chapter 5, Upgrading Oracle VM](#).

4.3.2.1 Installation

The Installation option installs MySQL Enterprise Edition, MySQL Enterprise Edition Backup, Oracle WebLogic Server, Oracle Application Development Framework (ADF), Java, and Oracle VM Manager on the local system. The following example shows the installation process.

**Note**

If you have an existing MySQL installation on the system where you intend to install Oracle VM Manager you must backup your databases and uninstall it. Oracle VM Manager requires exclusive use of MySQL due to the specific tuning parameters that it applies to the configuration. Oracle VM Manager uses MySQL Enterprise Edition on a non-standard port. The licensing of the MySQL Enterprise Edition provided with Oracle VM Manager grants exclusive use to Oracle VM. You must not use the MySQL server provided for any other purpose. If MySQL is installed as a result of a previous installation of Oracle VM Manager the installation prompts you to provide the hostname, root password and port number that was used in the previous installation.

Example 4.1 Installation

```
# ./runInstaller.sh

Oracle VM Manager Release 3.x.x Installer

Oracle VM Manager Installer log file:
  /var/log/ovmm/filename.log

Please select an installation type:
  1: Install
  2: Upgrade
  3: Uninstall
  4: Help

Select Number (1-4): 1
```

The installation process starts, and the following is displayed:

```
Verifying installation prerequisites ...

Starting production with local database installation ...

One password is used for all users created and used during the installation.
Enter a password for all logins used during the installation:
Enter a password for all logins used during the installation (confirm):
```

A system-wide password is required during installation. This password is used for all components used by Oracle VM Manager including MySQL, Oracle [WebLogic](#) and the Oracle VM Manager application itself. Note that the password should at least adhere to the requirements for an Oracle WebLogic password as set out below:

- Be between 8 and 16 characters in length.
- Contain at least 1 lower case and 1 upper case letter.
- Contain at least 1 numeric value or special character.

Enter the system-wide password and then enter it again when you are prompted to confirm your password.

```
Please enter your fully qualified domain name, e.g. ovs123.us.oracle.com, (or IP address)
of your management server for SSL certification generation, more than one IP address are
detected: 10.172.76.71 192.168.122.1 [10.172.76.71]:
```

Enter the fully qualified domain name or IP address of the host where you are installing Oracle VM Manager. This is used to generate the self-signed SSL certificate that is used by Oracle VM Manager to

encrypt HTTPS communications. The domain name must either match the domain name returned when running the `hostname -f` command on your system, or must match a valid IP address for the host. The installer validates the IP address or hostname entered here by attempting to ping the entry before proceeding with the installation. If the ping fails, the installer prompts to re-enter a valid domain name or IP address. It is not possible to enter 'localhost' or '127.0.0.1' as a valid hostname.

```
Verifying configuration ...
```

Warnings may occur if not all recommendations are met.

The installer provides a final option to continue or to abort the installation process. Enter **1** to continue. Progress of the installation is output on your screen step by step, as shown below:

```
Start installing Oracle VM Manager:
  1: Continue
  2: Abort

Select Number (1-2): 1

Step 1 of 7 : Database Software...
Installing Database Software...
Retrieving MySQL Database 5.6 ...
Unzipping MySQL RPM File ...
Installing MySQL 5.6 RPM package ...
Configuring MySQL Database 5.6 ...
Installing MySQL backup RPM package ...

Step 2 of 7 : Java ...
Installing Java ...

Step 3 of 7 : WebLogic and ADF...
Retrieving Oracle WebLogic Server 12c and ADF ...
Installing Oracle WebLogic Server 12c and ADF ...
Applying patches to Weblogic ...
Applying patch to ADF ...

Step 4 of 7 : Oracle VM ...
Installing Oracle VM Manager Core ...
Retrieving Oracle VM Manager Application ...
Extracting Oracle VM Manager Application ...

Retrieving Oracle VM Manager Upgrade tool ...
Extracting Oracle VM Manager Upgrade tool ...
Installing Oracle VM Manager Upgrade tool ...

Retrieving Oracle VM Manager CLI tool ...
Extracting Oracle VM Manager CLI tool...
Installing Oracle VM Manager CLI tool ...
Installing Oracle VM Manager WLST Scripts ...

Step 5 of 7 : Domain creation ...
Creating domain ...

Step 6 of 7 : Oracle VM Tools ...

Retrieving Oracle VM Manager Shell & API ...
Extracting Oracle VM Manager Shell & API ...
Installing Oracle VM Manager Shell & API ...

Retrieving Oracle VM Manager Wsh tool ...
Extracting Oracle VM Manager Wsh tool ...
Installing Oracle VM Manager Wsh tool ...

Retrieving Oracle VM Manager Tools ...
Extracting Oracle VM Manager Tools ...
```

```
Installing Oracle VM Manager Tools ...

Retrieving ovmcore-console ...
Installing ovmcore-console RPM package ...
Copying Oracle VM Manager shell to '/usr/bin/ovm_shell.sh' ...
Installing ovm_admin.sh in '/u01/app/oracle/ovm-manager-3/bin' ...
Installing ovm_upgrade.sh in '/u01/app/oracle/ovm-manager-3/bin' ...

Step 7 of 7 : Start OVM Manager ...
Enabling Oracle VM Manager service ...
Shutting down Oracle VM Manager instance ...
Starting Oracle VM Manager instance ...

Please wait while WebLogic configures the applications...
Oracle VM Manager installed.
```

When the installation is complete a summary similar to the following is displayed:

```
Installation Summary
-----
Database configuration:
  Database type           : MySQL
  Database host name      : localhost
  Database name           : ovs
  Database listener port  : 49500
  Database user           : ovs

Weblogic Server configuration:
  Administration username : weblogic

Oracle VM Manager configuration:
  Username                 : admin
  Core management port     : 54321
  UUID                     : 0004fb00000100007c08b684bd203388

Passwords:
There are no default passwords for any users. The passwords to use for Oracle VM Manager,
Database, and Oracle WebLogic Server have been set by you during this installation. In the
case of a default install, all passwords are the same.

Oracle VM Manager UI:
  https://hostname:7002/ovm/console
Log in with the user 'admin', and the password you set during the installation.

As of Oracle VM Release 3.4.5, the TLSv1.2 protocol is used for all connections and
management of 3.2.10/11 servers is not possible by default. TLSv1 protocol must be enabled,
which is less secure. For instructions, see the Oracle VM 3.4 Installation and Upgrade guide.

For more information about Oracle Virtualization, please visit:
  http://www.oracle.com/virtualization/

Oracle VM Manager installation complete.

Please remove configuration file /tmp/ovm_configid.
```



Important

Make sure you delete the temporary configuration file created during the installation:

`/tmp/ovm_configid`

This file is useful for debugging installation issues, but does contain some sensitive information that may present a security issue if left in place. This file is automatically deleted if you abort an installation.

When you have completed your installation, there are a number of additional steps that you should perform before you start using Oracle VM Manager to manage your deployment. Please see [Chapter 7, *What Next?*](#) to continue configuring your environment.

4.3.3 Installation Logs

If any errors occur during installation, check the Oracle VM Manager installation log file. Usually, this should be found in:

```
/var/log/ovmm/ovm-manager-3-install-date.log
```

However, if the installer is unable to create this directory and file for some reason, such as inadequate permissions, the install file is located in:

```
/tmp/ovm-manager-3-install-date.log
```

During installation, the installer self-extracts into the `/tmp` directory, if the installer does not exit properly, you may also find an installation log in this location:

```
/tmp/ovmm-installer.selfextract_id/ovm-manager-3-install-date.log
```

4.3.4 Installation Directories

The locations of the Oracle VM Manager components are listed in [Table 4.3](#).

Table 4.3 Oracle VM Manager component installation locations

Component	Location
MySQL	<code>/u01/app/oracle/mysql/data</code>
MySQL Enterprise Backup	<code>/opt/mysql/meb-3.12/</code> Backups are stored in: <code>/u01/app/oracle/mysql/dbbackup</code>
Java	<code>/u01/app/oracle/java</code>
Oracle WebLogic Server	<code>/u01/app/oracle/Middleware/</code>
Oracle ADF	<code>/u01/app/oracle/Middleware/</code>
Oracle VM Manager application	<code>/u01/app/oracle/ovm-manager-3/</code>
Oracle WebLogic Server domain	<code>/u01/app/oracle/ovm-manager-3/domains/ovm_domain</code>

4.4 Running Oracle VM Manager as a Virtual Machine

Oracle VM Manager does not necessarily have to run on a separate physical server in your environment. Although this is the preferred deployment process, you can also run Oracle VM Manager as a virtual machine in a carefully designed environment.



Note

You can run Oracle VM Manager under another virtualization product, such as Oracle VM VirtualBox running on a bare metal Linux or Windows system. To do this, you should ensure that the memory and CPU specifications of the virtual machine meet or exceed the requirements for Oracle VM Manager. You should also install the operating system and Oracle VM Manager components in the same manner as on bare metal. For more information, see [Section 4.2, “Minimum](#)

Hardware and Software Requirements". Plan for the possibility of problems arising with this configuration. If the virtual machine experiences issues, it may need to use repair procedures specific to the virtualization product that you are using, which are not provided in this topic.

You can configure Oracle VM Manager as a virtual machine within an Oracle VM Server for x86 server pool. This allows Oracle VM Manager to benefit from all the typical advantages of virtualization: hardware consolidation, [high availability](#), [live migration](#) and so on. As Oracle VM Manager is not associated with any one physical server, it leaves more physical resources for other applications, and at the same time it can be hot-cloned, backed up and [migrated](#) without downtime to other hardware when server maintenance is required.



Important

Although running Oracle VM Manager on a virtual machine within an Oracle VM Server for x86 server pool is possible, support is limited and the following caveats apply:

1. Oracle VM Manager should not be run on a virtual machine that it is managing. This configuration may result in a single point of failure that it cannot recover from without significant manual intervention.
2. If multiple Oracle VM environments are in use, you should install each instance of Oracle VM Manager in a configuration that ensures it manages an environment other than the one it is directly managing. Typical deployments have an instance of Oracle VM Manager running on a virtual machine in each environment, which is used to manage a different Oracle VM Server environment. This configuration may require manual intervention if all instances of Oracle VM Manager are in a failure state at the same time, for example, if all environments use the same storage, and the storage fails.
3. It is strongly recommended that an Oracle VM virtual machine, which contains an instance of Oracle VM Manager has High Availability enabled. This ensures that the virtual machine restarts automatically on a different server in the event of a physical Oracle VM Server failure.
4. The virtual machine where you want to run Oracle VM Manager must comply with the prerequisite software and hardware requirements for installing Oracle VM Manager. See [Section 4.2, "Minimum Hardware and Software Requirements"](#).
5. As stated previously, the procedure to install Oracle VM Manager as a virtual machine can be achieved using a virtualization product such as Oracle VM VirtualBox.

4.5 Uninstalling Oracle VM Manager

Before uninstalling [Oracle VM Manager](#), you may want to back up Oracle VM Manager and the Oracle VM Manager database schema. For information on how to back up Oracle VM Manager, see [Backing up the Oracle VM Manager Configuration File](#).

You perform the uninstall using the Oracle VM Manager installation script. You must start the installer from the installation media; you cannot perform an uninstall without the installation media as there is no installer located on the Oracle VM Manager [host computer](#). See [Section 4.3.2, "Running the Oracle VM Manager Installer"](#) for information on starting the installer. Follow the prompts to uninstall Oracle VM Manager. See

Section 4.6, “Oracle VM Manager Installation Script (runInstaller.sh)” for the full syntax to the installation script.

The following example shows an uninstall of a default Oracle VM Manager installation. Before you uninstall Oracle VM Manager, make sure both the Oracle VM Manager Command Line Interface and Oracle VM Manager are shut down:

```
# service ovmcli stop
# service ovmm stop
```

Example 4.2 Uninstall Oracle VM Manager

```
# ./runInstaller.sh -i Uninstall -y

Oracle VM Manager Release 3.x.x Installer

Oracle VM Manager Installer log file:
  /tmp/filename.log

Uninstall Oracle VM Manager

DB component : MySQL RPM package
MySQL RPM package installed by OVMM was found...
Removing MySQL RPM package installation ...

Product component : ovmcore-console RPM package
ovmcore-console RPM Package is installed ...
Removing ovmcore-console RPM Package installation ...

Product component : Java in '/u01/app/oracle/java/'
Java is installed ...

Removing Java installation ...

Product component : Oracle VM Manager in '/u01/app/oracle/ovm-manager-3/'
Oracle VM Manager is installed ...
Removing Oracle VM Manager installation ...

Product component : Oracle WebLogic Server in '/u01/app/oracle/Middleware/'
Oracle WebLogic Server is installed

Removing Oracle WebLogic Server installation ...
Service ovmm is deleted.
Service ovmcli is deleted.

Uninstall completed ...
```

The default behavior of an uninstall is to leave database backup files in place, in case there is a need to recover the database after a new installation. These files are located in `/u01/app/oracle/mysql/dbbackup`. If you wish to remove them after installation, you can do so manually.

4.6 Oracle VM Manager Installation Script (runInstaller.sh)

This section contains information about the [Oracle VM Manager](#) installation script, `runInstaller.sh`, and includes details on the usage, syntax and parameters. The `runInstaller.sh` script should always be run as the `root` user. Make sure you have met the requirements outlined in [Section 4.2, “Minimum Hardware and Software Requirements”](#) before running the `runInstaller.sh` script.

Syntax

```
runInstaller.sh [-h | --help] [{ -c | --config= } configfile.yml] [{ -u | --uid= } uid]
  [{ -i | --installtype= } { Install | Uninstall | Upgrade }] [{ -y | --assumeeyes }] [{ -n | --
  noprereq }] [{ -k | --cleanup }]
```

Options

Using the `runInstaller.sh` script with no options prompts you to enter any required options.

The following table shows the available options for this tool.

Option	Description
<code>[-h --help]</code>	Display the <code>runInstaller.sh</code> command parameters and options.
<code>{ -c --config= } <i>configfile.yml</i></code>	Specifies an install configuration file. This file is used to set install options in a silent installation. This command option is deprecated and should not be used.
<code>{ -u --uuid= } <i>uuid</i></code>	<p>Sets the UUID for Oracle VM Manager.</p> <ul style="list-style-type: none"> The UUID is generated automatically during installation and is 15 or 32 hex digit string starting with the values '0004fb'. You should not specify the UUID when installing the first instance of Oracle VM Manager on a host. You should only specify the UUID when recovering or upgrading an instance of Oracle VM Manager. You should specify all alphabetic characters in the UUID as lowercase. Some releases of Oracle VM Manager can behave unexpectedly if you specify uppercase characters in the UUID. The UUID is saved to <code>/u01/app/oracle/ovm-manager-3/.config</code>.
<code>{ -i --installtype= } { <i>Install</i> <i>Uninstall</i> <i>Upgrade</i> }</code>	Sets the install type to use without being prompted during the install. Use this option during a silent install.
<code>{ -y --assumeeyes }</code>	Sets each prompt during the install to respond as yes. If combined with the <code>--installtype=Install</code> option, performs a silent install with the default settings.
<code>{ -n --noprereq }</code>	Sets the installer to ignore all prerequisite system checks such as memory or operating system requirements.
<code>{ -k --cleanup }</code>	Cleans up all temporary installation configuration files after the install completes.

Example 4.3 Running Oracle VM Manager installer without checking system prerequisites

Running the installer without checking the host system prerequisites:

```
# ./runInstaller.sh --noprereq
```

Example 4.4 Running Oracle VM Manager installer with the UUID

Running the installer with the UUID of Oracle VM Manager to perform a recovery:

```
# ./runInstaller.sh --uuid=0004fb000000100002cb7f2df8a8d8
```

Chapter 5 Upgrading Oracle VM

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This chapter explains how to upgrade Oracle VM to Release 3.4.x.



Note

- You can upgrade to Oracle VM Release 3.4.5 or earlier from Oracle VM Release 3.2.10, or a later version, such as Release 3.2.11 or Release 3.3.x, without performing incremental upgrades.

However, beginning with Release 3.4.6, upgrades from Oracle VM Server for x86 at Release 3.2.10 or 3.2.11 and Oracle VM Agent for SPARC at Release 3.3.1 are not supported. Users on these older server releases must first upgrade to a supported version (e.g. 3.4.5) before upgrading to a later version.



Note

As of Release 3.4.6, management of Oracle VM Server for x86 at Release 3.2.10 and 3.2.11 is removed. For more information, see [Section 5.5.1, “Upgrading Oracle VM Server from Release 3.2.10”](#).

- Release 3.2.10 is the minimum supported version to upgrade to Release 3.4.x. If your Oracle VM version is earlier than Release 3.2.10, you must first upgrade to Release 3.2.10, Release 3.2.11, or Release 3.3.x before you can upgrade to Release 3.4.x.
- Oracle VM Release 3.x is not backward compatible with Oracle VM Release 2.x. If you are using Oracle VM Release 2.x you cannot upgrade to Release 3.x. You must reinstall your [Oracle VM Servers](#) and Oracle VM Manager.

You can, however, reuse your [virtual machine](#) templates from Oracle VM Release 2.x by importing them into Oracle VM Release 3.x.

For information on repository migration from Oracle VM Release 2 to Oracle VM Release 3, see the My Oracle Support website at: <https://support.oracle.com/oip/faces/secure/km/DocumentDisplay.jspx?id=1366216.1>

- There is no provision for upgrading releases where an Oracle Database XE has been used as a back-end repository for Oracle VM Manager. Oracle VM Manager no longer supports Oracle Database XE as a back-end repository and there is no way to migrate to the MySQL database back end supported in Oracle VM Release 3.4. If you are using Oracle VM Release 3.2 with a supported Oracle Database such as Oracle Database SE or Oracle Database EE, you should be aware that Oracle VM Release 3.4 no longer supports these databases to store Oracle VM configuration data. Instead, Oracle VM Release 3.4 uses its own bundled MySQL database for this purpose. The upgrade process includes a facility to help migrate Oracle VM configuration data from a previously supported Oracle Database into the bundled MySQL database.
- As of Oracle VM Release 3.4.2, Oracle VM Manager supports current and previous Oracle VM Server releases. For example, you can use Oracle VM Manager 3.4.2 to manage Oracle VM Server Release 3.4.x, 3.3.x, 3.2.10, or 3.2.11.



Important

Although Oracle VM Manager supports current and previous Oracle VM Server releases, it is highly recommended that you upgrade all instances of Oracle VM Server to the latest release version to ensure that you have the latest supported operations and features.

See the *Oracle VM Release Notes* for more information about Oracle VM Manager support for previous Oracle VM Server releases, as well as known issues and caveats that you should be aware of.

5.1 Upgrade Overview

From a high level, the steps to upgrade Oracle VM are as follows:

1. Download the Oracle VM software from the Oracle Software Delivery Cloud and then extract the software to the component ISO files.
2. Prepare the Oracle VM environment for upgrade. For example, you must ensure that the Oracle VM Server you want to upgrade is at Release 3.2.10 or later, has the minimum partition sizes, and that the Oracle VM Agent is running.

3. Upgrade Oracle VM Manager as follows:
 - a. Mount the Oracle VM Manager ISO image file or burn and load the bootable physical media on the Oracle VM Manager [host computer](#).
 - b. On the Oracle VM Manager host computer, run the `runInstaller.sh` script to upgrade Oracle VM Manager and select the [Upgrade](#) option.



Important

- You must upgrade [Oracle VM Manager](#) first and then upgrade each instance of [Oracle VM Server](#) that is managed by the upgraded Oracle VM Manager. Oracle does not support different versions of Oracle VM Server in a server pool. However, as of Oracle VM Release 3.4.2, you can have different versions of Oracle VM Server for different server pools. This is only possible if all instances of Oracle VM Server within each server pool are at the same release version. For example, Oracle VM Manager Release 3.4.2 can manage the following server pools:

- Server Pool A: consists of instances of Oracle VM Server at Release 3.2.11
- Server Pool B: consists of instances of Oracle VM Server at Release 3.3.4
- Server Pool C: consists of instances of Oracle VM Server at Release 3.4.2

Although Oracle VM Manager supports current and previous Oracle VM Server releases, it is highly recommended that you upgrade all instances of Oracle VM Server to the latest release version to ensure that you have the latest supported operations and features. See the *Oracle VM Release Notes* for more information about Oracle VM Manager support for previous Oracle VM Server releases, as well as known issues and caveats that you should be aware of.


- Do not use Oracle VM Manager Release 3.4 to discover or interact with any instances of Oracle VM Server earlier than Release 3.2.10.

If you discover an instance of Oracle VM Server that is earlier than Release 3.2.10 with Oracle VM Manager Release 3.4, an error message is returned for the job and conflicts occur between the databases that Oracle VM Manager requires for maintaining synchronization between internal components.

4. Upgrade Oracle VM Server using the appropriate steps for the platform, as follows:

Table 5.1 Oracle VM Server Upgrade Methods

Platform	Upgrade Path	Upgrade Method
x86	From Release 3.3.x	1. Set up a Yum repository which retrieves updates from the Oracle VM 3.x channel on the Unbreakable Linux Network (ULN).
	Or	
	Between Release 3.4.x Releases	You must have an Oracle Support contract to access ULN.
		2. From Oracle VM Manager, add the Yum repository as a server update repository.

Platform	Upgrade Path	Upgrade Method
		<p>3. Update each Oracle VM Server from the Oracle VM Manager Web Interface.</p> <div style="display: flex; align-items: flex-start; margin-top: 10px;"> <div style="margin-right: 10px;">  </div> <div> <p>Tip</p> <p>For detailed information about setting up a Yum repository to mirror a ULN channel, see the following document: http://www.oracle.com/technetwork/articles/servers-storage-admin/yum-repo-setup-1659167.html</p> </div> </div> <p>Alternatively, you can upgrade Oracle VM Server as follows:</p> <ol style="list-style-type: none"> 1. Burn the Oracle VM Server ISO file to bootable physical media, such as a DVD-ROM. 2. Upgrade each Oracle VM Server using the bootable physical media. <p>Another method to upgrade Oracle VM Server is to reinstall using the Release 3.4 installation media, as follows:</p> <ol style="list-style-type: none"> a. Remove the Oracle VM Server from the server pool and then delete the Oracle VM Server from Oracle VM Manager. b. Reinstall the Oracle VM Server using the Release 3.4 installation media. c. Discover the Oracle VM Server with Oracle VM Manager and add it back to the server pool after installation is complete.
x86	From Release 3.2.10 or a later version such as Release 3.2.11	<ol style="list-style-type: none"> 1. Set up two Yum repositories: <ul style="list-style-type: none"> • A transitional repository that contains the packages for Release 3.2 • A target repository that contains the packages for Release 3.4. 2. Run the <code>UpgradeServers.py</code> script on the Oracle VM Manager host to batch update servers as required. <p>Alternatively, you can upgrade Oracle VM Server as follows:</p>

Platform	Upgrade Path	Upgrade Method
		<ol style="list-style-type: none"> Remove the Oracle VM Server from the server pool and then delete the Oracle VM Server from Oracle VM Manager. Reinstall the Oracle VM Server using the Release 3.4 installation media. Discover the Oracle VM Server with Oracle VM Manager and add it back to the server pool after installation is complete.
SPARC	From Release 3.3.x Or Between 3.4.x Releases	<ol style="list-style-type: none"> Set up a Solaris IPS (Image Packaging System) repository to store the software packages used for the upgrade. The Oracle VM Server for SPARC packages are provided as part of the default Oracle Solaris installation packages. Download the Oracle VM Agent for SPARC software and manually transfer it to the IPS repository. Upgrade Oracle VM Server for SPARC or the Oracle VM Agent for SPARC using the Oracle VM Manager Web Interface or Oracle VM Manager Command Line Interface.
SPARC	From Release 3.2.10 or a later version such as Release 3.2.11	<ol style="list-style-type: none"> Upgrade to Oracle Solaris 11.3 or higher. Download the Oracle VM Agent for SPARC software. Upgrade the Oracle VM Agent for SPARC using the <code>update</code> script.

5.2 Preparing to Upgrade Oracle VM

The first step in the upgrade process is to prepare your Oracle VM environment. This task involves both understanding changes to Oracle VM in Release 3.4 and completing specific procedures before starting the upgrade process.

To ensure a successful upgrade, you should review this section carefully before you begin.

5.2.1 Checking Minimum System Requirements

You must ensure that your environment meets the minimum system requirements for both Oracle VM Manager and Oracle VM Server.

- Review the minimum system requirements for Oracle VM Manager at [Section 4.2.1, “Hardware Requirements”](#).

**Note**

If you increase the RAM available to your system, you should also increase the amount of swap space available. In general, you should set the swap space to an equivalent of the amount of physical RAM on your system if the amount of RAM exceeds 8 GB.

- Review the minimum system requirements for Oracle VM Server.
- Oracle VM Server for x86, see [Section 2.1.1.1, “Hardware Requirements”](#).
- Oracle VM Server for SPARC, see [Section 2.2.1.1, “Hardware Requirements”](#).

5.2.2 Validating Oracle VM Server Version Compatibility

To upgrade Oracle VM, you must ensure that all instances of Oracle VM Server are at the minimum supported version for upgrade and are at the same minor version within each server pool.

You cannot upgrade Oracle VM if:

- The Oracle VM Manager that you plan to upgrade manages an instance of Oracle VM Server earlier than Release 3.2.10. You can only upgrade to Release 3.4 if all Oracle VM Servers are at Release 3.2.10 or later, Release 3.3.x, or Release 3.4.x.

**Important**

Although Oracle VM Manager supports current and previous Oracle VM Server releases, it is highly recommended that you upgrade all instances of Oracle VM Server to the latest release version to ensure that you have the latest supported operations and features. See the *Oracle VM Release Notes* for more information about Oracle VM Manager support for previous Oracle VM Server releases, as well as known issues and caveats that you should be aware of.

- There are different minor versions of Oracle VM Server within a server pool. Each instance of Oracle VM Server within a server pool must be the same minor version. For example, all servers in a server pool must be at Release 3.2.10, Release 3.3.x, or Release 3.4.x. A server pool cannot contain a server at Release 3.2.10 and a server at Release 3.3.x. In this case you must upgrade each server at Release 3.2.10 in the server pool to Release 3.3.x before you start upgrading the servers to Release 3.4.x.

**Note**

This applies to all servers within the Oracle VM model, even if the servers are not running. If your environment contains servers with different minor versions that are not running, you should delete them if you do not plan to start them again in future.

As a pre-upgrade validation, you receive a warning message if:

- The **Unassigned Servers** folder contains servers with different minor versions.
- If any instances of Oracle VM Server within the Oracle VM model have different minor versions.

**Note**

You also receive a warning message if any virtual machines have the HugePages feature enabled. This feature is deprecated in Oracle VM Release 3.4.1 and will be

removed in a future release of Oracle VM. See the Oracle VM Release Notes for more information.

If you have HugePages enabled for any PVM guests, Oracle recommends that you change the domain type for virtual machines from Paravirtualized (PVM) to Hardware virtualized, with paravirtualized drivers (PVHVM). If you cannot change the domain type for a virtual machine, you should disable the HugePages setting and then restart the virtual machine.

5.2.3 Preparing to Upgrade Oracle VM Manager

Before you upgrade Oracle VM Manager, you must do the following:

- Review the *README* file and the *Oracle VM Release Notes* for any specific issues relating to the Oracle VM Manager release version that you are upgrading to.



Note

If you are running a version

- Ensure that no other Linux users have access to the Oracle VM Manager host and that any monitoring services are disabled for the duration of the upgrade.
- If necessary, set the umask default on Oracle VM Manager to `0022` before you begin the upgrade process. If umask is set to another value, it can cause the upgrade process to end unexpectedly.

Before you upgrade Oracle VM Manager, you should do the following:

- Perform a full backup of your Oracle VM Manager database and configuration file before you attempt to upgrade Oracle VM Manager. See [Backing up the Oracle VM Manager Configuration File](#) for information.



Caution

Database backups from an earlier 3.4.x release (for example 3.4.4) cannot be used in a later Oracle VM Manager deployment (for example 3.4.5) due to database schema changes.



Note

If necessary, set the location for storing backups of the local MySQL database for Oracle VM Manager to the default path before you attempt to upgrade Oracle VM Manager. Ensure that the default path is configured until the upgrade completes successfully. See [Backing up the MySQL Database Repository](#) for information on default paths and procedures.

- Make sure there are no database corruptions, as those would cause the upgrade to fail.

If the database has been corrupted, the Oracle VM Manager backup cannot complete. As a consequence, failed jobs occur in the event log, and no new files appear in the backup directory.

- Remove temporary files no longer required. For example, run the following command as the root user on the Oracle VM Manager host before you upgrade:

```
# rm -Rf /tmp/workdir_sel
# rm -Rf /tmp/ovm*
```

- When you start the upgrade process, you should ensure that no jobs are in progress or are started using the Oracle VM Manager Web Interface, the Oracle VM Manager Command Line Interface or the Oracle VM Web Services API. If a job starts while the upgrade is in progress, the upgrade might abort. In this case, you must wait for all jobs to complete and then restart the upgrade.



Note

When upgrading from Oracle VM Manager Release 3.2.10, the upgrade process deletes any existing job or event history. This step is required because the job and event models are changed in Release 3.4.x to improve performance. If your Oracle VM Manager Release 3.2.10 environment has large job and event histories, you should take this into account when planning your upgrade. It might take several day to complete an upgrade for a very large deployment that includes numerous servers and virtual machines.

5.2.4 Preparing to Upgrade Oracle VM Server

Before you upgrade Oracle VM Server, you must:

- Review the *README* file and the *Oracle VM Release Notes* for any specific issues relating to the Oracle VM Server release version that you are upgrading to.
- Ensure that all servers in the server pool that you plan to upgrade are at the same minor version.
- Ensure that there is sufficient capacity within the server pool to perform virtual machine migrations.

A general guideline is to identify which server in the pool has the most resources available. You should then ensure that there is another server with the same configuration. If necessary, you should add another server to the pool.

- Upgrade the [Oracle VM Manager](#) which manages them. See [Section 5.4, “Upgrading Oracle VM Manager”](#) for information on upgrading Oracle VM Manager.

You should also review the following important points:



Important

- Oracle does not support different versions of Oracle VM Server in a server pool. However, as of Oracle VM Release 3.4.2, you can have different versions of Oracle VM Server for different server pools. This is only possible if all instances of Oracle VM Server within each server pool are at the same release version. For example, Oracle VM Manager Release 3.4.2 can manage the following server pools:

- Server Pool A: consists of instances of Oracle VM Server at Release 3.2.11
- Server Pool B: consists of instances of Oracle VM Server at Release 3.3.4
- Server Pool C: consists of instances of Oracle VM Server at Release 3.4.2

Although Oracle VM Manager supports current and previous Oracle VM Server releases, it is highly recommended that you upgrade all instances of Oracle VM Server to the latest release version to ensure that you have the latest supported operations and features. See the *Oracle VM Release Notes* for more information about Oracle VM Manager support for previous Oracle VM Server releases, as well as known issues and caveats that you should be aware of.

- When upgrading Oracle VM Server, you can add an instance of Oracle VM Server to a server pool only if that instance is at the same version or later than the servers in that server pool. For example, if a server pool contains several servers at Release 3.3.x, you can add a server at either Release 3.3.x or at Release 3.4.x. If a server pool contains several servers at Release 3.4.x, you can add a server at Release 3.4.x only. In all cases, however, Oracle recommends that you add servers at Release 3.4.x.

5.2.4.1 Increasing Partition Sizes for Oracle VM Server

As a best practice, you should provision as much disk space as possible to Oracle VM Server. In future you will upgrade your environment between errata releases and new versions. Over time these operations consume disk space. While it is possible to remove unnecessary files and clean up disk space and resize partitions, you should plan to minimize disruption and avoid issues by allocating two or three times the minimum required disk space, where possible.

For Oracle VM Server Release 3.2.10, or later versions such as Release 3.2.11, the default disk partition sizes are 100MB for `/boot` and 3GB for the root partition, `/`. These default partition sizes are not adequate to upgrade Oracle VM Server to Release 3.4.

To upgrade Oracle VM Server from Release 3.2.10 you should increase the partition sizes to the following, at a minimum:

- 500MB for the `/boot` partition.
- 5GB for the root partition, `/`.

To upgrade Oracle VM Server from 3.3.x, you should also increase the partition sizes if you upgraded from Oracle VM Server Release 3.2.x and kept those default partition sizes.

You can do one of the following to ensure that Oracle VM Server has sufficient disk space:

- Resize the partitions before upgrading Oracle VM Server, if there is disk space available.

You can use any appropriate partition editor software to resize the partitions. However, Oracle provides an Oracle VM Server disk resizing utility, which you can download with patch ID 23189880 at: https://updates.oracle.com/Orion/PatchDetails/process_form?patch_num=23189880



Note

Before upgrading, you must remove the Oracle VM Server disk resizing utility once the partitions are resized.

- Reinstall Oracle VM Server with the Release 3.4 installation media, as follows:
 1. Upgrade Oracle VM Manager to Release 3.4.
 2. Migrate all virtual machines off the Oracle VM Server that you plan to upgrade.
 3. Unpresent all repositories from the Oracle VM Server.
 4. Delete the Oracle VM Server from Oracle VM Manager.
 5. Reinstall the Oracle VM Server with the Release 3.4 installation media.



Important

- Reinstalling Oracle VM Server deletes all configuration settings.
- When you start the Oracle VM Server installer, it detects the existing installation and prompts you to select between performing an upgrade or a new installation. If you are reinstalling from Release 3.2.10, you must perform a new installation. You cannot upgrade Oracle VM Server with the installation media if you are currently at Release 3.2.10.

6. Discover the Oracle VM Server with Oracle VM Manager and add it to the appropriate server pool after the installation is complete.
7. Re-configure the Oracle VM Server environment to restore the settings for networks, storage, repositories, and so on.

5.2.4.2 Checking the Oracle VM Agent Notification Service

You should ensure that the Oracle VM Agent notification service is working on each instance of Oracle VM Server that you plan to upgrade. Do the following:

1. Start an ssh session to Oracle VM Server.
2. Search `/var/log/ovs-agent.log` for messages such as the following:

```
ERROR (notification:44) Unable to send notification: (111, 'Connection refused')
```

3. If those messages exist in the log file, the notification service is not working and the Oracle VM Agent cannot send notifications to Oracle VM Manager.

To resolve this error, you should restart the Oracle VM Agent service on Oracle VM Server. Alternatively, you can retake ownership of the Oracle VM Server from Oracle VM Manager.

```
#service ovs-agent restart
```

5.2.4.3 Recommendations for Upgrading Oracle VM Server

You should review the following recommendations before you attempt to upgrade Oracle VM Server:

- It is good practice to perform an initial upgrade on a single Oracle VM Server before attempting to upgrade the rest of the servers in a deployment. This helps you to resolve and debug any potentially missing pre-upgrade requirements before you perform a full upgrade of your environment.
- When you have upgraded an Oracle VM Server, it is recommended that you ensure the Oracle VM Storage Connect plug-ins you are using are updated to their latest versions as well. If you are using the default generic storage plug-ins, they are updated during the upgrade, but if you are using plug-ins provided by a third party vendor, you must obtain the packages from the vendor and install them yourself. Instructions for installing Oracle VM Storage Connect plug-ins are provided in the [Oracle VM Administrator's Guide](#). If you are upgrading from Oracle VM Server Release 3.2.10, you may need to add the packages for your third party plug-ins to the upgrade repository before performing the upgrade, as described in [Section 5.5.1.1, "Setting Up the Yum Repositories"](#).
- The virtual IP address and master server is deprecated and partially supported in Oracle VM Manager Release 3.4. The virtual IP address and master server do not apply to server pools that contain instances of Oracle VM Server Release 3.4 and later. If you are upgrading Oracle VM Server to Release 3.4, the following rules apply after the first server in the server pool has been upgraded:

- You can add an instance of Oracle VM Server to a server pool only if that instance is at the same version or later than the servers in that server pool.
- You can re-master the pool between different servers of a release earlier than Release 3.4.
- You cannot set an instance of Oracle VM Server Release 3.4 as the master.
- You cannot remove the master server from the server pool unless the master server is the only instance of Oracle VM Server Release 3.3.x in the server pool.
- After the last instance of Oracle VM Server in the server pool is upgraded to Release 3.4, the master server and virtual IP address is cleared.

5.3 Downloading the Upgrade Software

Before you begin the Oracle VM upgrade, download the Oracle VM software from the Oracle Software Delivery Cloud at:

<http://edelivery.oracle.com/oraclevm>

More information on obtaining the software is covered in [Section 1.2, “Getting Installation ISOs and Packages”](#).

If you have an Oracle Support contract, you can also download Oracle VM patch updates from the My Oracle Support web site at:

<https://support.oracle.com>

5.4 Upgrading Oracle VM Manager

This section describes procedures for upgrading Oracle VM Manager.

5.4.1 Running the Script to Upgrade Oracle VM Manager

The `runInstaller.sh` script included on the Oracle VM Manager installation ISO includes an option that allows you to perform an upgrade of a previous version of Oracle VM Manager.

```
# ./runInstaller.sh

Oracle VM Manager Release 3.4.x Installer

Oracle VM Manager Installer log file:
/tmp/ovm-manager-3-install-yyyy-mm-dd-xxxxxx.log

Please select an installation type:
 1: Install
 2: Upgrade
 3: Uninstall
 4: Help

Select Number (1-4): 2

Verifying upgrading prerequisites ...
*** WARNING: Ensure that each Oracle VM Server for x86 has at least 200MB of available space for the /boot
Starting Upgrade ...

Reading database parameters from config ...
```

It is also possible to trigger the upgrade process by passing the correct `installtype` parameter on the command line:

```
# ./runInstaller.sh --installtype Upgrade
```

If you do not have both the `zip` and `unzip` packages installed on the system that you are upgrading, the installer exits with an error notifying you to install these packages before proceeding with the upgrade.

You are prompted to provide the passwords for each component during the upgrade procedure. You must enter the password you set for that component during the original installation, or the current password if it has been changed since installation.

A log of the upgrade is available in the `/var/log/ovmm/ovm-manager-3-install-date-id.log` file.



Important

After you successfully upgrade Oracle VM Manager to Release 3.4, you must not discover or interact with any instances of Oracle VM Server earlier than Release 3.2.10.

If you discover an instance of Oracle VM Server that is earlier than Release 3.2.10 with Oracle VM Manager Release 3.4, an error message is returned for the job and conflicts occur between the databases that Oracle VM Manager requires for maintaining synchronization between internal components.

To upgrade Oracle VM Manager:

1. Log in to the Oracle VM Manager [host computer](#) as the `root` user.
2. Oracle VM Manager must be running to perform the upgrade. If Oracle VM Manager is not running, start it. On Linux:

```
# service ovmm start
```

If Oracle VM Manager is not running when you run the installation script, an error is returned by the script and the installer exits.

3. Mount the Oracle VM Manager ISO file or create bootable physical media. See either [Section 1.3, “Installation From Bootable Physical Media”](#) or [Section 1.4, “Loopback ISO Mounts”](#) for more information.
4. Start the Oracle VM Manager installation script, for example:

```
# cd /mnt
# ./runInstaller.sh
```

The installer starts and presents you with a variety of options:

```
Oracle VM Manager Release 3.4.x Installer

Oracle VM Manager Installer log file:
/var/log/ovmm/ovm-manager-3-install-yyyy-mm-dd-xxxxxx.log

Please select an installation type:
 1: Install
 2: Upgrade
 3: Uninstall
 4: Help

Select Number (1-4): 2
Verifying upgrading prerequisites ...
*** WARNING: Ensure that each Oracle VM Server for x86 has at least 200MB of available space for the /boot
Starting Upgrade ...

Reading database parameters from config ...
```


Enter the menu number for the [Upgrade](#) option and press **Enter** to continue with the upgrade. You are prompted for the password that must be used to access the current Oracle VM Manager database:

```
Typically the current Oracle VM Manager database password will be the same as the
Oracle VM Manager application password.
```

```
Database Repository
=====
Please enter current Oracle VM Manager database password for user ovs:
```

Enter the password that should be used to access the database for the **ovs** user. If you set a system-wide password during the original installation and have not changed the database password at any stage, this password should be used here. This password continues to be used for the database after the upgrade is complete. If you enter this password incorrectly and the installer is unable to access the database, the installer exits with an error message.

The installer prompts you for the current Oracle VM Manager password. This is the same password that you use to log into the Oracle VM Manager Web Interface, using the **admin** username.

```
Oracle VM Manager application
=====
Please enter current Oracle VM Manager application password for user admin:
```

Enter the password. If you set a system-wide password during the original installation and have not changed the **admin** user password at any stage, this password should be used here. This password continues to function after the upgrade. If you intend to change it, you must do so after the upgrade is complete.

The installer prompts you to enter the Oracle WebLogic Server password.

```
Oracle WebLogic Server 12c
=====
Please enter the current password for the WebLogic domain administrator:
```

You are prompted for the system's FQDN (fully qualified domain name) or IP address to use during the generation of the SSL certificate that should be used for HTTPS connections to Oracle VM Manager:

```
Please enter your fully qualified domain name, e.g. ovs123.us.oracle.com,
(or IP address) of your management server for SSL certification
generation 192.168.0.254 [192.168.0.254]: manager.example.com
```

It is important that you specify the hostname, fully qualified domain name or the IP address that is to be used when accessing the Oracle VM Manager Web Interface, so that the SSL certificate hostname matches the hostname portion of the URL entered into the web browser.

The installer completes verification checks to see if the Oracle VM Manager database passwords for the **root** and **appfw** users match the database password for the user **ovs**. If either of these user passwords differ, the upgrade tool displays a password verification failure message for the user and then prompts you to enter the current Oracle VM Manager database password for the required user. For example, as follows for the user **root**:

```
Password verification for the user root failed
```

```
Please enter the current Oracle VM Manager database password for the user root:
```

The installer then verifies that the password entered matches the current database password for the user and displays a successful password verification message. For example, as follows for the user **root**:

```
Successfully verified password for user root
```

The installer displays the current release number and the release number to which Oracle VM Manager is to be upgraded, and presents a final option to exit from the upgrade process:

```
Verifying configuration ...
Verifying 3.x.y.z meets the minimum version for upgrade ...

Upgrading from version 3.x.y.z to version 3.4.v.w

Start installing the configured components:
  1: Continue
  2: Abort

Select Number (1-2): 1
```

Select the **Continue** option to continue with the upgrade process.

```
Running full database backup ...
Successfully backed up database to /u01/app/oracle/mysql/dbbackup/3.x.y_preUpgradeBackup-
yyyyymmdd_xxxxxx
```

The upgrade process automatically ensures that the database for the current installation is fully backed up prior to starting the upgrade. This ensures that you are able to roll back to the version that you currently have installed if something fails during the upgrade process. This backup file is located in `/u01/app/oracle/mysql/dbbackup/`.

A pre-upgrade script runs prior to the actual upgrade process to prepare the environment for upgrade. If you are upgrading from Oracle VM Manager Release 3.2.10, this script removes any existing job history. This process can take quite some time, depending on the number of jobs in the job history. The pre-upgrade process provides output that indicates the number of jobs that must be deleted at different stages of its progress so that you can monitor its status:

```
Running ovm_preUpgrade script, please be patient this may take a long time ...

timestamp: Deleting 4163 Jobs before upgrade.
timestamp: 200 Jobs have been deleted. 3963 Jobs remaining.
timestamp: 400 Jobs have been deleted. 3763 Jobs remaining.
timestamp: 600 Jobs have been deleted. 3563 Jobs remaining.
timestamp: 800 Jobs have been deleted. 3363 Jobs remaining.
...
timestamp: 3800 Jobs have been deleted. 363 Jobs remaining.
timestamp: 4000 Jobs have been deleted. 163 Jobs remaining.
timestamp: Jobs have been deleted.
```

Regardless of the release that you are upgrading from, the pre-upgrade script also checks for any jobs that are still running. In the case that it discovers jobs that are running, it prints the details of these jobs to the screen and provides the option to force quit and delete these jobs, or to abort the upgrade:

```
timestamp ERROR: Job test1 is in the
CONSTRUCTING state and was created on timestamp
Would you like to delete the jobs above? Saying no will cancel the upgrade:
  1: Yes
```

2: No

If you press **2** here, the upgrade process aborts and exits immediately. If you press **1** here, any running jobs are quit and deleted and the following output is displayed:

```
timestamp ERROR: Job test1 is in the
CONSTRUCTING state and was created on timestamp
timestamp: 1 jobs have been deleted.
```

The rest of the upgrade process is automated and continues as follows:

```
Exporting weblogic embedded LDAP users
Stopping service on Linux: ovmcli ...
Stopping service on Linux: ovmm ...
Exporting core database, please be patient this may take a long time ...
NOTE: To monitor progress, open another terminal session and run:
tail -f /var/log/ovmm/ovm-manager-3-install-YYYY-MM-DD-HHmms.log

Product component : Java in '/u01/app/oracle/java'
Java is installed ...

Removing Java installation ...

Installing Java ...

DB component : MySQL RPM package
MySQL RPM package installed by OVMM was found...
Removing MySQL RPM package installation ...

Installing Database Software...
Retrieving MySQL Database 5.6 ...
Unzipping MySQL RPM File ...
Installing MySQL 5.6 RPM package ...
Configuring MySQL Database 5.6 ...
Installing MySQL backup RPM package ...

Product component : Oracle VM Manager in '/u01/app/oracle/ovm-manager-3/'
Oracle VM Manager is installed ...
Removing Oracle VM Manager installation ...

Product component : Oracle WebLogic Server in '/u01/app/oracle/Middleware/'
Oracle WebLogic Server is installed

Removing Oracle WebLogic Server installation ...
Service ovmm is deleted.
Service ovmcli is deleted.

Retrieving Oracle WebLogic Server 12c and ADF ...
Installing Oracle WebLogic Server 12c and ADF ...
Applying patches to Weblogic ...
Applying patches to ADF ...

Installing Oracle VM Manager Core ...
Retrieving Oracle VM Manager Application ...
Extracting Oracle VM Manager Application ...

Retrieving Oracle VM Manager Upgrade tool ...
Extracting Oracle VM Manager Upgrade tool ...
Installing Oracle VM Manager Upgrade tool ...
Installing Oracle VM Manager WLST Scripts ...

Dropping the old database user 'appfw' ...
Dropping the old database 'appfw' ...
Creating new domain...
Creating new domain done.
Upgrading core database, please be patient this may take a long time ...
```

Running the Script to Upgrade Oracle VM Manager

```
NOTE: To monitor progress, open another terminal session and run:
tail -f /var/log/ovmm/ovm-manager-3-install-YYYY-MM-DD-HH:mm:ss.log
Starting restore domain's SSL configuration and create appfw database tables.
Restore domain's SSL configuration and create appfw database tables done.
AdminServer started.
Importing weblogic embedded LDAP users

Retrieving Oracle VM Manager CLI tool ...
Extracting Oracle VM Manager CLI tool...
Installing Oracle VM Manager CLI tool ...

Configuring Https Identity and Trust...
Deploying Oracle VM Manager Core container ...
Configuring Client Cert Login...
Deploying Oracle VM Manager UI Console ...
Deploying Oracle VM Manager Help ...
Disabling HTTP access...

Retrieving Oracle VM Manager Shell & API ...
Extracting Oracle VM Manager Shell & API ...
Installing Oracle VM Manager Shell & API ...

Retrieving Oracle VM Manager Wsh tool ...
Extracting Oracle VM Manager Wsh tool ...
Installing Oracle VM Manager Wsh tool ...

Retrieving Oracle VM Manager Tools ...
Extracting Oracle VM Manager Tools ...
Installing Oracle VM Manager Tools ...
Copying Oracle VM Manager shell to '/usr/bin/ovm_shell.sh' ...
Installing ovm_admin.sh in '/u01/app/oracle/ovm-manager-3/bin' ...
Installing ovm_upgrade.sh in '/u01/app/oracle/ovm-manager-3/bin' ...

Enabling Oracle VM Manager service ...
Shutting down Oracle VM Manager instance ...
Starting Oracle VM Manager instance ...
Waiting for the application to initialize ...
Oracle VM Manager is running ...

Please wait while WebLogic configures the applications...

Installation Summary
-----
Database configuration:
  Database type           : MySQL
  Database host name      : localhost
  Database name           : ovs
  Database listener port  : 49501
  Database user           : ovs

Oracle WebLogic Server configuration:
  Administration username : weblogic

Oracle VM Manager configuration:
  Username                 : admin
  Core management port     : 54321
  UUID                     : UUID

Passwords:
There are no default passwords for any users. The passwords to use for Oracle VM Manager,
Database, and Oracle WebLogic Server have been set by you during this installation. In the
case of a default install, all passwords are the same.

Oracle VM Manager UI:
  https://manager.example.com:7002/ovm/console
Log in with the user 'admin', and the password you set during the installation.
```

```
For more information about Oracle Virtualization, please visit:  
http://www.oracle.com/virtualization/
```

```
As of Oracle VM Release 3.4.5, the TLSv1.2 protocol is used for all connections and management of  
3.2.10/11 servers is not possible by default. TLSv1 protocol must be enabled, which is less secure.  
For instructions, see the Oracle VM 3.4 Installation and Upgrade guide.
```

```
Oracle VM Manager upgrade complete.
```

```
Please remove configuration file /tmp/ovm_configxyz.
```

5.4.2 Removing Temporary Files After Upgrade

If you have upgraded from a release prior to 3.4, you must remove the temporary files that are created as part of the upgrade process. These files can be used by Oracle Support to help you recover your environment if something goes wrong with your upgrade and you did not take adequate steps to backup your database before the upgrade. However, they also contain information about your entire environment that should not be left in temporary file space indefinitely.

It is important that you verify that your upgrade has completed successfully and that Oracle VM Manager is fully functional before you remove these temporary files. Log into the Oracle VM Manager Web Interface and check that your environment is configured as it was prior to upgrade. Check that you are able to perform actions on your Oracle VM Servers and storage via the Oracle VM Manager Web Interface. If your environment is functional, you can proceed with the removal of the temporary files generated by the upgrade.

To remove temporary files after upgrade, do the following as the root user on the Oracle VM Manager host:

```
# rm -Rf /tmp/workdir_sel*  
# rm -Rf /tmp/ovm*
```

On many systems, temporary files are deleted automatically on reboot. If you have any concern about security after an upgrade, in most cases a system reboot ensures that these files are cleaned up properly.

5.5 Upgrading Oracle VM Server for x86 from Release 3.2.10 or later

Complete the tasks in this section to upgrade to Release 3.4 from Oracle VM Server Release 3.2.10 or a later version such as Oracle VM Server Release 3.2.11.



Note

Beginning with Release 3.4.6, upgrades from Oracle VM Server for x86 at Release 3.2.10 or 3.2.11 and Oracle VM Agent for SPARC at Release 3.3.1 are not supported. Users on these older server releases must first upgrade to a supported version (e.g. 3.4.5) before upgrading to a later version.

Before you attempt to upgrade Oracle VM Server to Release 3.4, you must prepare your environment. See [Section 5.2, “Preparing to Upgrade Oracle VM”](#).

You must set up and configure both Yum repositories and use the `UpgradeServers.py` script to upgrade Oracle VM Server from Release 3.2.10. Oracle VM Manager does not allow you to upgrade from Release 3.2.10 with any other method.

As an alternative to using the `UpgradeServers.py` script, you can reinstall Oracle VM Server using the Release 3.4 installation media. However, reinstalling Oracle VM Server deletes all configuration settings.

5.5.1 Upgrading Oracle VM Server from Release 3.2.10

This section describes how to upgrade Oracle VM Server from Release 3.2.10, or a later version such as Release 3.2.11, with the `UpgradeServers.py` script.



Important

As of Oracle VM Release 3.4.5, management of Oracle VM Server for x86 at 3.2.1x and Oracle VM Agent for SPARC at Release 3.3.1 is deprecated. If management of Oracle VM Servers at these release versions is still required, see [Section 7.6, “Enabling the TLS Version 1 Protocol”](#) in the *Oracle VM 3.4 Installation and Upgrade guide*.

As of Oracle VM Release 3.4.6, management of Oracle VM Server for x86 at 3.2.1x and Oracle VM Agent for SPARC at Release 3.3.1 is removed. No error events are raised if Oracle VM Servers at these unsupported versions are discovered; however, the following message is displayed at the end of an upgrade, indicating that these versions are no longer supported: "3.2.10/3.2.11 Oracle VM x86 Servers and SPARC agent 3.3.1 managed Servers are no longer supported in Oracle VM Manager 3.4. Please upgrade your Server to a more current version for full support."

Beginning with Release 3.4.6, upgrades from Oracle VM Server for x86 at Release 3.2.10 or 3.2.11 and Oracle VM Agent for SPARC at Release 3.3.1 are not supported. Users on these older server releases must first upgrade to a supported version (e.g. 3.4.5) before upgrading to a later version.

5.5.1.1 Setting Up the Yum Repositories

The upgrade process from Release 3.2.10, or a later version such as Release 3.2.11, involves two steps. The first step is transitional and upgrades the kernel and core packages. The second step upgrades Oracle VM Server to Release 3.4.

The Yum repositories you must set up to upgrade Oracle VM Server from Release 3.2.10 to Release 3.4 are as follows:

- Transitional update repository
 - This repository contains the packages required to upgrade Oracle VM Server to a transitional state before upgrading to Release 3.4.
 - You must configure this repository as a server update repository in the Oracle VM Manager Web Interface. The repository name must be `3.4_trans_repo`.
 - The packages for this repository reside in the Oracle VM Server installation media in the `Transition/*` directory. You must make the Oracle VM Server installation media available over the network so that the contents of this directory are accessible. Alternatively, you can set up this Yum repository to mirror the contents of the `ovm3_x86_64_3.4_transition` ULN channel.
- Release 3.4 update repository
 - This repository contains the packages required to upgrade Oracle VM Server to Release 3.4.
 - This repository can contain additional packages such as third-party Oracle VM Storage Connect plug-ins.

- You must configure this repository as a server update repository in the Oracle VM Manager Web Interface. The repository name must be `3.4_ovs_repo`.
- The packages for this repository reside in the Oracle VM Server installation media in the `Server/*` directory. You must make the Oracle VM Server installation media available over the network so that the contents of this directory are accessible. Alternatively, you can set up this Yum repository to mirror the contents of the `ovm34_x86_64_latest` ULN channel.

Creating the Yum Repositories

You must create both Yum repositories on a system that is accessible through HTTP or HTTPS.

Oracle recommends that you copy the content of the Oracle VM Server installation media to the Yum repositories. However, you can set up your Yum repositories to mirror specific Oracle VM ULN channels.

Using the Oracle VM Server installation media

1. Download the most recent Oracle VM Server installation ISO file.
2. Create a folder to mount the ISO file, for example:

```
# mkdir /tmp/ovs-mount
```

3. Mount the ISO file, for example:

```
# mount -o loop OVS-3.4.1.iso /tmp/ovs-mount
```

4. Create a directory for repository access using any appropriate HTTP server, for example:

```
# mkdir /var/www/repos
```

5. Copy the mounted ISO folder to the directory using `-r` for recursive and `-p` for preserve, for example:

```
# cp -rp /tmp/ovs-mount/* /var/www/repos/
```

6. Check that both of the repositories are accessible. You should access both repositories on a different system, such as an instance of Oracle VM Server. To ensure both repositories are accessible, download a small file such as `repomd.xml` as follows:

```
# wget http://example.com/repos/Server/repodata/repomd.xml
# wget http://example.com/repos/Transition/repodata/repomd.xml
```



Tip

Temporarily serve your repositories with the Python SimpleHTTPServer module, as in the following example:

```
# cd /var/www
# python -m SimpleHTTPServer 80
```

Creating mirrors of ULN channels

Set up your Yum repositories to mirror the following ULN channels:

- `ovm3_x86_64_3.4_transition`

Contains the packages required to upgrade Oracle VM Server to a transitional state before upgrading to Release 3.4.

- `ovm34_x86_64_latest`

Contains the packages required to upgrade Oracle VM Server to Release 3.4.

For more detailed information about setting up a Yum repository to mirror a ULN channel, see the following document: <http://www.oracle.com/technetwork/articles/servers-storage-admin/yum-repo-setup-1659167.html>

Including Additional Packages

You can include additional packages for Oracle VM Server, such as a third-party Oracle VM Storage Connect plug-in, in the Release 3.4 update repository. These packages are then included in the upgrade for Oracle VM Server.



Note

Any additional packages that you add to the repository must be compatible with Oracle Linux 6.

To add packages to the Yum repository, do the following:

1. Download the packages from the appropriate vendors.
2. Copy the packages into the `Server/Packages` directory in the *Oracle VM Server 3.4 Update Repository*, for example:

```
# cp osc-sun7k.rpm /var/www/repos/Server/Packages/
```

3. Change directory so that you run the following commands from the root, for example:

```
# cd /var/www/repos/Server
```

4. Find the repository configuration file:

```
# find ./ -name "*comps-ovs-core.xml"
./repodata/3bbd98ef14e1e62734b8df6360825010001323218736-comps-ovs-core.xml
```

5. Use the filename for the repository configuration to recreate the repository:

```
# createrepo -g ./repodata/3bbd98ef14e1e62734b8df6360825010001323218736-comps-ovs-core.xml ./
```

Adding Server Update Repositories in Oracle VM Manager

After you set up both Yum repositories, you must add them in the Oracle VM Manager Web Interface as server update repositories in the **x86** server update group. The Oracle VM Manager Web Interface provides a **Create Server Update Repository** dialog where you specify details for both Yum repositories.

The following tables provide the information you need to create the server update repositories in the Oracle VM Manager Web Interface:

Table 5.2 Oracle VM Server 3.4 Transitional Update Repository

Field	Value	Notes
Name	<code>3.4_trans_repo</code>	By naming the repository in this way within Oracle VM Manager you are able to use the <code>UpgradeServers.py</code> script described in Section 5.5.1.2, "Running the UpgradeServers.py Script" . The name is case sensitive.

Field	Value	Notes
Repository Name	3.4_trans_repo	
URL	http://example.com/repos/Transition	Substitute this URL with the URL to your repository.
Enabled	Yes	This repository must be enabled if you intend to use the UpgradeServers.py script described in Section 5.5.1.2, "Running the UpgradeServers.py Script" .
Package Signature Type	GPG or None	If you want to verify the validity of packages provided by the repositories, set the signature type to use a GPG key. Alternatively, use NONE if there is no verification required.
Package Signature Key	http://example.com/repos/RPM-GPG-KEY-oracle-ol5	If you opted to verify the validity of packages provided by the repository, provide the verification signature for the repository. Substitute this URL with the URL to the verification signature for the repository. Note that this should be the GPG key provided for the Oracle Linux 5 repository.

Table 5.3 Oracle VM Server 3.4 Update Repository

Field	Value	Notes
Name	3.4_ovs_repo	By naming the repository in this way within Oracle VM Manager you are able to use the UpgradeServers.py script described in Section 5.5.1.2, "Running the UpgradeServers.py Script" . The name is case sensitive.
Repository Name	3.4_ovs_repo	
URL	http://example.com/repos/Server	Substitute this URL with the URL to your repository.
Enabled	Yes	This repository must be enabled if you intend to use the UpgradeServers.py script described in Section 5.5.1.2, "Running the UpgradeServers.py Script" .
Package Signature Type	GPG or None	If you want to verify the validity of packages provided by the repositories, set the signature type to use a GPG key. Alternatively, use NONE if there is no verification required.
Package Signature Key	http://example.com/repos/RPM-GPG-KEY-oracle	If you opted to verify the validity of packages provided by the repository, provide the verification signature for the repository. Substitute this URL with the URL to the verification signature for the repository. Note that this should be the GPG key provided for the Oracle Linux 6 repository.

For detailed instructions, see [Create New Server Update Repository](#) in the [Oracle VM Manager User's Guide](#).

5.5.1.2 Running the UpgradeServers.py Script

To upgrade Oracle VM Server with the `UpgradeServers.py` script:

- You must first upgrade Oracle VM Manager to Release 3.4.
- Oracle VM Manager must be running. The upgrade script does not work if Oracle VM Manager is stopped.
- The Oracle VM Server that you plan to upgrade must:
 - Be owned by the Oracle VM Manager from which you run the script.
 - Be running.
 - Be at Release 3.2.10 or Release 3.2.11.
 - Be on x86 hardware.
 - Cannot have any critical errors.
- Virtual machines that are running must be able to migrate to an Oracle VM Server within the server pool during the upgrade, otherwise you must stop the virtual machines before performing the upgrade.

To run the script, do the following:

1. Start an ssh session to the Oracle VM Manager host.
2. Change to the following directory:

```
/u01/app/oracle/ovm-manager-3/ovm_tools/bin/
```

3. Run the script, specifying any appropriate parameters:

```
$ ./UpgradeServers.py
```

When you run the script, maintenance mode operations occur to automatically migrate virtual machines between available servers. This ensures that Oracle VM Server can complete the upgrade process and restart with minimal downtime.

Syntax

```
UpgradeServers.py [ -h | --help | ? ] [ { --host-name | -H } host ] [ { -P | --port } port ] [ { -u | --user-name } user ] [ { -l | --pools } pool ] [ { -v | --servers } server ] [ { -L | --logfile } filepath ] [ --noprompt ]
```

Options

Using the `UpgradeServers.py` script with no options prompts you to enter the username and password for an instance of Oracle VM Manager on the localhost.

The following table shows the available options for this tool.

Option	Description
<code>[-h --help ?]</code>	Display the <code>UpgradeServers.py</code> command parameters and options.
<code>{ --host-name -H } host</code>	Host name of the server running Oracle VM Manager. The default value is <code>localhost</code> .

Option	Description
	This options is required only if you run the script on a system other than the Oracle VM Manager host.
<code>{ -P --port } port</code>	Port number for the Oracle VM Manager instance. The default is 7002.
<code>{ -u --user-name } user</code>	User to log into the Oracle VM Manager instance. You are prompted for the password.
<code>{ -l --pools } pool</code>	Names or IDs of any server pools to upgrade. To specify multiple server pools, enter them in a comma separated list, with no spaces.
<code>{ -v --servers } server</code>	Names or IDs of any Oracle VM Servers to upgrade. To specify multiple Oracle VM Servers, enter them in a comma separated list, with no spaces.
<code>{ -L --logfile } filepath</code>	Location of the <code>UpgradeServers.log</code> to which the script writes. The default path is the current working directory, or <code>/tmp</code> if the current directory is not writeable.
<code>--noprompt</code>	Do not prompt to continue the upgrade. If packages are missing, the upgrade exits immediately, see Non-native Packages . Otherwise, the upgrade continues without prompting.

Example 5.1 Upgrading Oracle VM Servers in a server pool

Upgrading all Oracle VM Servers in two server pools, named `pool1` and `pool2` and prompting for required options:

```
$ ./UpgradeServers.py -l pool1,pool2
```

Example 5.2 Upgrading Oracle VM Servers

Upgrading three Oracle VM Servers named `server1`, `server2` and `server3`, and suppressing all prompts (except errors and the password prompt):

```
$ ./UpgradeServers.py -v server1,server2,server3 --noprompt
```

Example 5.3 Upgrading Oracle VM Servers on a remote Oracle VM Manager

Upgrading Oracle VM Servers on a remote host that has an Oracle VM Manager instance:

```
$ ./UpgradeServers.py -H ovmmanger.example.com -u admin -v server1,server2,server3
```

Non-native Packages

If you have installed any packages on any of your Oracle VM Servers after the initial Oracle VM Server installation (non-native packages), it is possible that the presence of those packages may cause the upgrade to fail. For the script to succeed, you must place new Oracle Linux 6 compatible versions of these non-native packages in the *Oracle VM Server 3.4 Update Repository* before starting the upgrade. See [Creating the Yum Repositories](#) for more information on updating non-native packages.

Before starting any Oracle VM Server upgrades, the upgrade script checks for non-native packages that may have been installed on any of the servers to be upgraded. The script also checks the `3.4_ovs_repo` to determine whether any of these packages exist in that repository. To perform this check, the script makes use of a text file that enumerates the set of packages included in Oracle VM Server Release 3.2.10.

The upgrade script compares the list of packages on the server to the appropriate version in this file to determine the list of non-native packages on the server. This file is located at:

```
/u01/app/oracle/ovm-manager-3/ovm_tools/etc/UpgradeServersYumPkgLists.txt
```

The script displays the status of all detected non-native packages:

```
timestamp INFO: Non-native package      Status in 3.4_ovs_repo
timestamp INFO: -----
timestamp INFO: osc-oracle-netapp         OK: package exists
timestamp INFO: osc-oracle-s7k           OK: package exists
timestamp INFO: python-ontapi             OK: package exists
```

If a non-native package is found that is not in the **3.4_ovs_repo**, its status is described as **MISSING**, and you are prompted to fix the problem before proceeding with the upgrade. There are two approaches to dealing with a **MISSING** package:

- Manually add an Oracle Linux 6 compatible version of the package to the repository as described in [Creating the Yum Repositories](#) if you intend to continue to use it in your upgraded environment.
- On each Oracle VM Server where the package is currently installed, you can manually uninstall the package if it is not required in your upgraded environment, or if you intend to install an alternative after upgrade is complete.

Post-upgrade Storage Array Plug-in Reconciliation

After all Oracle VM Servers have been upgraded, it is possible that any non-generic Oracle VM Storage Connect plug-ins have also been updated to a newer version. In this situation, there may be a version mismatch in the configuration of the plug-in on any Oracle VM Server that is configured to use the storage array. This could result in errors whenever a storage array operation is performed since the expected plug-in version is no longer installed on any of the servers.

For this reason, when the upgrade is complete, the script checks the plug-ins for all storage arrays configured within Oracle VM Manager. If a plug-in is found within the Oracle VM Manager repository that no longer exists on any server that is configured for that storage array, the script attempts to determine whether a newer version of the same plug-in has been installed. If the script is able to find a newer version of the plug-in already installed on the servers, it automatically updates the configuration of the storage array to use the new plug-in.

Due to the way that this is handled, the storage array is only usable after the upgrade is complete, since the storage array's plug-in is not updated until all running servers using that plug-in have been upgraded.

Typical Output From the UpgradeServers.py Script

In the following example, the UpgradeServers.py script is used to update a single Oracle VM Server. The example shows typical output for the upgrade process, but you should be aware that output may vary depending on the parameters used when invoking the script:

```
$ cd /u01/app/oracle/ovm-manager-3/ovm_tools/bin/
$ ./UpgradeServers.py --noprompt -u admin -H localhost -v MyServer1
Enter your OVM Manager password:
timestamp INFO:
timestamp INFO: UpgradeServers script starting...
timestamp INFO: OVM Manager version: 3.4.x.y
timestamp INFO: Command line args: ['UpgradeServers.py', '--noprompt', '-v',
'MyServer1']
timestamp INFO:
timestamp INFO: Ensure the server(s) has at least 200MB of available space for the
/boot partition
and 3GB of available space for the / partition.
timestamp INFO:
```

```

timestamp INFO:
Enter YES to continue with upgrade: yes
timestamp INFO: Server: MyServer1. Transition Server Update Repository:
  3.4_trans_repo, URL/path: http://myrepos.example.com/ovs_upgrade_repo/Transition
timestamp INFO: Server: MyServer1. OVS Server Update Repository: 3.4_ovs_repo,
  URL/path: http://myrepos.example.com/ovs_upgrade_repo/Server
timestamp INFO: Getting update packages list in Server Update Repository:
  3.4_ovs_repo, using oldest server: MyServer1, version: 3.2.9-xxx
timestamp INFO: Disabling Server Update Repository: 3.4_trans_repo
timestamp INFO: Waiting up to 35 seconds for updates of the Server Update
  Repositories to complete on server MyServer1.
timestamp INFO: Finished updating Server Update Repositories.
timestamp INFO: Checking servers for non-native packages (those installed after
  initial server installation)
timestamp INFO: Non-native package status:

timestamp INFO: Non-native package                Status in 3.4_ovs_repo
make timestamp INFO: -----
timestamp INFO: osc-oracle-netapp                    OK: package exists
timestamp INFO: osc-oracle-s7k                          OK: package exists
timestamp INFO: python-ontapi                                    OK: package exists

timestamp INFO: Non-generic plug-ins have been found: [u'Oracle/Oracle NetApp
  Filer Plugin'], that are in use on existing storage arrays.
timestamp INFO: Evaluating server: MyServer1, version: 3.2.9-xxx, for
  upgrading. [1 of 1 servers].
timestamp INFO: Disabling Server Update Repository: 3.4_ovs_repo
timestamp INFO: Enabling Server Update Repository: 3.4_trans_repo
timestamp INFO: Waiting up to 35 seconds for updates of the Server
  Update Repositories to complete on server MyServer1.
timestamp INFO: Finished updating Server Update Repositories.
timestamp INFO: Starting upgrade of server: MyServer1, type: X86_64,
  version: 3.2.9-xxx, using Server Update Repository: 3.4_trans_repo
timestamp INFO: No VMs are on server: MyServer1, starting server upgrade.
timestamp INFO: Waiting for upgrade of server: MyServer1, to complete.
  The server is running. [RUNNING]
timestamp INFO: Server: MyServer1, upgraded successfully to version:
  3.2.9-xxx (using Server Update Repository: 3.4_trans_repo).
timestamp INFO: Disabling Server Update Repository: 3.4_trans_repo
timestamp INFO: Enabling Server Update Repository: 3.4_ovs_repo
timestamp INFO: Waiting up to 35 seconds for updates of the Server
  Update Repositories to complete on server MyServer1.
timestamp INFO: Finished updating Server Update Repositories.
timestamp INFO: Starting upgrade of server: MyServer1, type: X86_64,
  version: 3.2.9-xxx, using Server Update Repository: 3.4_ovs_repo
timestamp INFO: No VMs are on server: MyServer1, starting server upgrade.
timestamp INFO: Waiting for upgrade of server: MyServer1, to complete.
  The server is performing the upgrade. [STOPPING]
timestamp INFO: Waiting for upgrade of server: MyServer1, to complete.
  The server is performing the upgrade. [STOPPING]
...
timestamp INFO: Waiting for upgrade of server: MyServer1, to complete.
  The server is rebooting after the upgrade. [STOPPED]
timestamp INFO: Waiting for upgrade of server: MyServer1, to complete.
  The server is rebooting after the upgrade. [STOPPED]
...
timestamp INFO: Waiting for upgrade of server: MyServer1, to complete.
  The server is starting back up. [STARTING]
timestamp INFO: Server: MyServer1, upgraded successfully to version: 3.4.x-y
  (using Server Update Repository: 3.4_ovs_repo).
timestamp INFO: Evaluating if any storage arrays need their plug-ins updated.
timestamp INFO: No plug-ins were found that needed updating.
timestamp INFO: Log file is available at \
  /u01/app/oracle/ovm-manager-3/ovm_tools/bin/UpgradeServers.log
timestamp INFO: UpgradeServers script stopping...

```

5.5.1.3 Removing the Transitional Yum Repository

When the server upgrade is complete, the transitional Yum repository is no longer required. Subsequent upgrades perform a check to determine if any transitional Yum repositories exist and then automatically disable them. However, it is best practice to disable or remove the transitional Yum repository when you successfully complete the Oracle VM Server upgrade process. For more information about adding, editing and deleting server update repositories, see [Server Update Groups](#) in the *Oracle VM Manager User's Guide*.

5.5.2 Reinstalling Oracle VM Server

To upgrade Oracle VM Server from Release 3.2.10, or a later version such as Release 3.2.11, to Release 3.4, you can reinstall Oracle VM Server.

Reinstall Oracle VM Server as follows:

1. Migrate all virtual machines off the Oracle VM Server that you plan to upgrade. See [Migrate or Move Virtual Machines](#) in the *Oracle VM Manager User's Guide*.
2. Unpresent all repositories from the Oracle VM Server. See [Present or Unpresent Repository](#) in the *Oracle VM Manager User's Guide*.
3. Delete the Oracle VM Server from Oracle VM Manager. See [Delete Server](#) in the *Oracle VM Manager User's Guide*.
4. Reinstall the Oracle VM Server with the Release 3.4 installation media. See [Section 2.1.2, "Installing Oracle VM Server From a DVD-ROM"](#).



Important

- Reinstalling Oracle VM Server deletes all configuration settings.
- When you start the Oracle VM Server installer, it detects the existing installation and prompts you to select between performing an upgrade or a new installation. If you are reinstalling from Release 3.2.10, you must perform a new installation. You cannot upgrade Oracle VM Server with the installation media if you are currently at Release 3.2.10.

5. Discover the Oracle VM Server with Oracle VM Manager and add it to the appropriate server pool after the installation is complete. See [Discover Servers](#) in the *Oracle VM Manager User's Guide*.
6. Re-configure the Oracle VM Server environment to restore the settings for networks, storage, repositories, and so on.
7. Test the networking and storage connections of the Oracle VM Server that you reinstalled. You should confirm that failover redundancy and performance function correctly. You should also perform some testing on virtual machines and applications on the Oracle VM Server to ensure that they also function as expected. If you can confirm that the reinstalled Oracle VM Server is working correctly and no performance issues exist, you should then proceed with the incremental upgrade and verification of other Oracle VM Server instances.

5.6 Upgrading Oracle VM Server for x86 from Release 3.3.x or Between 3.4.x Errata Releases

To upgrade Oracle VM Server from Release 3.3.x or from one Release 3.4.x to another Release 3.4.y, you can:

- Configure a server update repository and use the Oracle VM Manager Web Interface. This upgrade method is recommended and allows you to upgrade multiple Oracle VM Servers.
- Create a bootable disc from the Oracle VM Server ISO file and perform the upgrade. You should use this upgrade method only if it is not possible to perform the upgrade from Oracle VM Manager.
- Reinstall Oracle VM Server.

Before you attempt to upgrade Oracle VM Server to Release 3.4, you must prepare your environment. See [Section 5.2, “Preparing to Upgrade Oracle VM”](#).

5.6.1 Upgrading Oracle VM Server Through Oracle VM Manager

Upgrading Oracle VM Server through Oracle VM Manager requires you to set up a Yum repository that:

- Mirrors the contents of the `ovm34_x86_64_latest` ULN channel. This ULN channel contains the packages required to upgrade Oracle VM Server to Release 3.4.

As an alternative to mirroring the ULN channel, you can make the Oracle VM Server installation media available over the network.

- Can contain additional packages such as third-party Oracle VM Storage Connect plug-ins.

After you set up a Yum repository, you add it as a server update repository in Oracle VM Manager. You can then upgrade each Oracle VM Server through Oracle VM Manager.

5.6.1.1 Creating the Yum Repository

You must create the Yum repository on a system that is accessible through HTTP or HTTPS.

You must create the Yum repository either by creating a mirror of the ULN channel or by copying the content of the Oracle VM Server installation media, as follows:

Creating a mirror of the ULN channel

Set up your Yum repository to mirror the following ULN channel: `ovm34_x86_64_latest`

The `ovm34_x86_64_latest` ULN channel contains the packages required to upgrade Oracle VM Server to Release 3.4.

For more detailed information about setting up a Yum repository to mirror a ULN channel, see the following document: <http://www.oracle.com/technetwork/articles/servers-storage-admin/yum-repo-setup-1659167.html>

Using the Oracle VM Server installation media

1. Download the most recent Oracle VM Server installation ISO file.
2. Create a folder to mount the ISO file, for example:

```
# mkdir /tmp/ovs-mount
```

3. Mount the ISO file, for example:

```
# mount -o loop OVS-3.4.1.iso /tmp/ovs-mount
```

4. Create a directory for repository access using any appropriate HTTP server, for example:

```
# mkdir /var/www/repos
```

- Copy the mounted ISO folder to the directory using `-r` for recursive and `-p` for preserve, for example:

```
# cp -rp /tmp/ovs-mount/* /var/www/repos/
```

- Check that the repository is accessible. You should access the repository on a different system, such as an instance of Oracle VM Server. To ensure the repository is accessible, download a small file such as `repomd.xml` as follows:

```
# wget http://example.com/repos/Server/repodata/repomd.xml
```



Tip

Temporarily serve your repository with the Python SimpleHTTPServer module, as in the following example:

```
# cd /var/www
# python -m SimpleHTTPServer 80
```

5.6.1.2 Including Additional Packages

You can include additional packages for Oracle VM Server, such as a third-party Oracle VM Storage Connect plug-in, in the Release 3.4 update repository. These packages are then included in the upgrade for Oracle VM Server.



Note

Any additional packages that you add to the repository must be compatible with Oracle Linux 6.



Tip

If you are upgrading an Oracle VM Server that has unsigned packages installed, you should create a separate Yum repository where these packages can be hosted. When you add the repository to Oracle VM Manager as a server update repository you must ensure that the `Package Signature Type` option is set to **None** for this repository. This prevents an upgrade from failing due to unsigned packages that are not part of the base Oracle VM Server installation repository.

To add packages to the Yum repository, do the following:

- Download the packages from the appropriate vendors.
- Copy the packages into the `Server/Packages` directory in the *Oracle VM Server 3.4 Update Repository*, for example:

```
# cp osc-sun7k.rpm /var/www/repos/Server/Packages/
```

- Change directory so that you run the following commands from the root, for example:

```
# cd /var/www/repos/Server
```

- Find the repository configuration file:

```
# find ./ -name "*comps-ovs-core.xml"
./repodata/3bbd98ef14e1e62734b8df6360825010001323218736-comps-ovs-core.xml
```


- Use the filename for the repository configuration to recreate the repository:

```
# createrepo -g ./repdata/3bbd98ef14e1e62734b8df6360825010001323218736-comps-ovs-core.xml ./
```

5.6.1.3 Adding Server Update Repositories in Oracle VM Manager

After you set up the Yum repository, you must add it in the Oracle VM Manager Web Interface.

- Log in to the Oracle VM Manager Web Interface.
- Either create a global server update group or a server update group for a specific server pool, as follows:

Creating a global server update group

- Select the **Reports and Resources** tab.
- Select the **Server Update Groups** subtab.
- Expand the **Server Update Groups** folder and then select **GlobalX86ServerUpdateConfiguration**.
- Expand the **Server Update Groups** folder, select **GlobalX86ServerUpdateConfiguration**, and then select **Create New Server Update Repository**.
- Create the server update group as described in [Table 5.4, "Oracle VM Server 3.4 Update Repository"](#).

Creating a server update group for a specific server pool

- Select the **Servers and VMs** tab.
- Expand the **Server Pools** folder and then select an appropriate server pool.
- Edit the server pool and select the **Override Global Server Update Group** option and then select **OK**.
- Select the **Server Update Repositories** perspective and then select **Create New Server Update Repository**.
- Create the server update group as described [Table 5.4, "Oracle VM Server 3.4 Update Repository"](#).

The following table describes the fields you need to specify to create a server update repository:

Table 5.4 Oracle VM Server 3.4 Update Repository

Field	Value	Notes
Name	<code>3.4_ovs_repo</code>	Specify a meaningful name for the server update configuration.
Repository Name	<code>3.4_ovs_repo</code>	Specify a meaningful name for the server update repository.
URL	<code>http://example.com/repos/Server</code>	Substitute this URL with the URL to your repository.
Enabled	Yes	This repository must be enabled.

Field	Value	Notes
Package Signature Type	GPG or None	If you want to verify the validity of packages provided by the repositories, set the signature type to use a GPG key. Alternatively, use NONE if there is no verification required.
Package Signature Key	http://example.com/repos/RPM-GPG-KEY-oracle	If you opted to verify the validity of packages provided by the repository, provide the verification signature for the repository. Substitute this URL with the URL to the verification signature for the repository. Note that this should be the GPG key provided for the Oracle Linux 6 repository.

For more information, see the following topics in the [Oracle VM Manager User's Guide](#):

- [Update Server](#)
- [Server Update Groups](#)

5.6.1.4 Upgrading Servers from Oracle VM Manager

After you set up the Yum repositories with the content to upgrade Oracle VM Server to Release 3.4 and create the server update repository, you can perform the upgrade from the Oracle VM Manager Web Interface, as follows:

1. Log in to the Oracle VM Manager Web Interface.
2. Select the **Servers and VMs** tab.
3. Expand the **Server Pools** folder and then select an appropriate server pool.
4. Select the **Servers** perspective.

The **Update Required** column in the **Servers** perspective indicates if an update is available for each server within the server pool.

5. Select each instance of Oracle VM Server that you want to update and then select **Update Server**.
6. Click **OK** when prompted to confirm the server upgrade.

Each Oracle VM Server is placed into maintenance mode and then upgraded. Any virtual machines running on an instance of Oracle VM Server are automatically migrated to another Oracle VM Server when it is put into maintenance mode. When the update is complete the Oracle VM Server is restarted and remains in maintenance mode.



Note

In certain cases, the automatic virtual machine migration may fail when the Oracle VM Server is placed into maintenance mode. For more information on the maintenance mode, see [Edit Server](#).

7. Edit each instance of Oracle VM Server to take it out of maintenance mode when the upgrade is complete.

5.6.2 Upgrading Oracle VM Server Using the ISO File

To upgrade the Oracle VM Server using the Oracle VM Server ISO file:

1. Burn the Oracle VM Server ISO file to a bootable disc.
2. Start the Oracle VM Server installer. The installer initially prompts you to test the installation media, configure the language and keyboard settings, and accept the EULA.

For more information about starting the installer and the initial installation screens, see [Section 2.1.2, "Installing Oracle VM Server From a DVD-ROM"](#).

3. Proceed through the initial installation screens. When the installer detects the existing Oracle VM Server installation, the **System to Upgrade** screen displays.

System to Upgrade

On the **System to Upgrade** screen, do the following:

1. Select **Oracle VM Server 3.x (disk)** to upgrade the existing installation.

Select **OK** and press **Enter**.

Upgrade Boot Loader Configuration

On the **Upgrade Boot Loader Configuration** screen, do the following:

1. Select one of the following:
 - **Update boot loader configuration** to update the existing boot loader.
 - **Skip boot loader updating** to make no changes to the boot loader and maintain your current configuration settings.



Note

If `kdump` settings were manually defined in the GRUB configuration before the upgrade, selecting this option ensures that these configuration settings are maintained after the upgrade.

2. Select **OK** and press **Enter**.

Package Installation and Finishing the Upgrade

After you specify the options for the Oracle VM Server upgrade, the installer performs a dependency check and then begins the upgrade process. A progress bar displays the status of the package installation. The **Finishing upgrade** screen then displays.

When the upgrade is finished, the **Complete** screen displays. Do the following to complete the upgrade:

1. Remove the Oracle VM Server installation disc from the drive.
2. Select **Reboot**.

After Oracle VM Server reboots, the console displays.

The Oracle VM Server upgrade is complete.

A log of the install is located in `/root/upgrade.log`. If the upgrade is not successful, review this log file to identify any issues.

5.6.3 Reinstalling Oracle VM Server

To upgrade Oracle VM Server from Release 3.3.x to Release 3.4, you can reinstall Oracle VM Server.



Important

Reinstalling Oracle VM Server deletes all configuration settings.

Reinstall Oracle VM Server as follows:

1. Migrate all virtual machines off the Oracle VM Server that you plan to upgrade. See [Migrate or Move Virtual Machines](#) in the *Oracle VM Manager User's Guide*.
2. Unpresent all repositories from the Oracle VM Server. See [Present or Unpresent Repository](#) in the *Oracle VM Manager User's Guide*.
3. Delete the Oracle VM Server from Oracle VM Manager. See [Delete Server](#) in the *Oracle VM Manager User's Guide*.
4. Reinstall the Oracle VM Server with the Release 3.4 installation media. See [Section 2.1.2, "Installing Oracle VM Server From a DVD-ROM"](#).
5. Discover the Oracle VM Server with Oracle VM Manager and add it to the appropriate server pool after the installation is complete. See [Discover Servers](#) in the *Oracle VM Manager User's Guide*.
6. Re-configure the Oracle VM Server environment to restore the settings for networks, storage, repositories, and so on.
7. Test the networking and storage connections of the Oracle VM Server that you reinstalled. You should confirm that failover redundancy and performance function correctly. You should also perform some testing on virtual machines and applications on the Oracle VM Server to ensure that they also function as expected. If you can confirm that the reinstalled Oracle VM Server is working correctly and no performance issues exist, you should then proceed with the incremental upgrade and verification of other Oracle VM Server instances.

5.7 Finalizing Upgrades on Oracle VM Server for x86

This section describes different post-upgrade steps that may be required after an upgrade.

5.7.1 Refreshing Server Pools To Validate Oracle VM Storage Connect plug-in

After an upgrade, it is good practice to refresh your server pools to ensure that the information presented within Oracle VM Manager is up to date and synchronized with the actual state of any servers in a server pool. More importantly, if you are using any third party Oracle VM Storage Connect plug-in for your storage devices, you may be unable to refresh your storage arrays until these plug-ins have been validated. Refreshing server pools allows the servers that have been presented to the storage to validate the Oracle VM Storage Connect plug-in that they are using. Once this has been done, operations on storage arrays can resume normally.

To refresh your server pools, refer to [Refresh All](#) in the *Oracle VM Manager User's Guide*.

5.7.2 Editing Boot Parameters To Enable Hypervisor Features

If you have upgraded from an earlier release, it is possible that some of the hypervisor boot parameters for your server may need editing to ensure that newer features are enabled. To update these boot parameters, on each affected Oracle VM Server, open the grub configuration in an editor. If you are using UEFI

boot, the grub configuration file is located at `/boot/efi/EFI/redhat/grub.cfg`, otherwise the grub configuration file is located at `/boot/grub2/grub.cfg`. Edit the line starting with `multiboot2 /xen.mb.efi` and append the required boot parameters.

For large servers with more than 20 physical CPUs

For Oracle VM Servers with more than 20 physical CPUs, performance can be improved by pinning virtual CPUs to dom0 and setting a maximum value for the number of virtual CPUs that can be used by dom0. On a new install where a system has more than 20 physical CPUs, this value is usually set to 20. To ensure that you get the best possible performance on an Oracle VM Server with more than 20 physical CPUs, set the Xen boot parameters `dom0_vcpus_pin` and `dom0_max_vcpus=20`. For example:

```
multiboot2 /xen.mb.efi dom0_mem=max:6144M dom0_vcpus_pin \
dom0_max_vcpus=20 placeholder ${xen_rm_opts}
```



Note

Some versions of the Xen 4.4.4 kernel require that you set the `dom0_vcpus_pin` parameter to `dom0_vcpus_pin=true` for the configuration to take effect. Run the following command on Oracle VM Server to find the Xen version: `rpm -qa | grep xen`.

If you have previously updated the Xen boot parameters on an earlier Oracle VM 3.4.x release, and then upgraded to Oracle VM Release 3.4.5 or later with Xen kernel version 4.4.4-130 or higher, either syntax for the parameter is accepted.

The standard syntax as of Oracle VM Release 3.4.5 is `dom0_vcpus_pin`; there is no need to append `=true`.

For Oracle VM Servers with fewer than 20 physical CPUs, you should ensure that the number of virtual CPUs specified is reduced accordingly and does not exceed the number of physical CPUs per socket. Assigning too many virtual CPUs can cause Non-Uniform Memory Access (NUMA) latency issues if the virtual CPUs are spread across sockets. For example, if an instance of Oracle VM Server with hyper-threading enabled has 2 sockets with 18 cores per socket and 2 CPU threads per core, this results in a total of 36 physical CPUs. In this case, it is correct to set `dom0_max_vcpus` to 20. However, with hyper-threading disabled, only 18 physical CPUs are on each socket and as a result, you should set the `dom0_max_vcpus` parameter to 18.

When you have finished modifying the grub configuration file, for example, `/etc/default/grub`, you must rebuild the system GRUB2 configuration that is used at boot time. This is done by running:

```
# grub2-mkconfig -o /boot/grub2/grub.cfg
```

You must also reboot the server for these settings to take effect.

For information on performance optimization goals and techniques for Oracle VM Server for x86, see *Optimizing Oracle VM Server for x86 Performance*, on Oracle Technology Network at: <http://www.oracle.com/technetwork/server-storage/vm/ovm-performance-2995164.pdf>.

5.7.3 Confirm kdump Service Settings after Upgrading

If the kdump service was enabled previously, it is recommended that you check and confirm the settings are correct after the upgrade or enable the kdump service after the upgrade if it was not enabled previously.

For more information, see [Manually Configuring kdump for Oracle VM Server](#) in the *Oracle VM Administrator's Guide*.

5.7.4 Handling Missing Disks, File Systems and Repositories

On a small number of systems, local physical disks may be allocated an alternate device mapper ID during the upgrade process. This only affects a few different ATA type disks. The change in device mapper ID can result in some local physical disks, their file systems and repositories as being marked as missing within Oracle VM Manager. Although the physical disk is discovered after the upgrade, it is detected as a new disk. The old entry within Oracle VM Manager, for the same disk, is retained but is marked as missing.

If you are affected by this, you may need to take some steps to reconfigure your environment for the change. This includes removing the missing disks and then refreshing the newly discovered disks, their file systems and any hosted repositories. The repository must additionally be presented to the affected Oracle VM Server again, so that it can be used.

If you have virtual machines that use local physical disks for storage, you may need to reconfigure these virtual machines to remove the missing disk and replace it with the newly discovered disk.

This section describes how to identify whether you are affected and the steps that you may need to take to return to a fully functioning environment.

Checking For Missing Disks

To see whether you are affected by this issue at all, you can use the Oracle VM Manager Web Interface to view the Physical Disks perspective for each Oracle VM Server in your environment. If a disk has been affected by the upgrade, it is displayed with a WARNING status. The event message shows "Physical disk is Offline".

In an environment with many Oracle VM Servers, it may not be practical to use the Oracle VM Manager Web Interface to check the status of the physical disks for every server. You can, however, use the Oracle VM Manager Command Line Interface in combination with the `grep` utility to quickly view all of the events that contain this event message. An example, where the command is run on the Oracle VM Manager host, follows:

```
$ ssh -l admin localhost -p 10000 "getEvents severity=WARNING" | grep -i "physical \
disk is offline"

id:3190      createTime:timestamp      modTime:timestamp
type:storage.device.offline.      severity:Warning      summary:Physical disk is
Offline      acked:No      description:OVMEVT_007005D_001 Rescan storage layer on
server [ovs237] did not return physical disk [3600605b0057feba01a0e216512d1b7aa]
for storage array [Generic Local Storage Array @ ovs237].
assocObjectId:0004fb0000180000833252939ba41cf9
```

Note that for these events, you must check that the event occurs for a Generic Local Storage Array. The server that is affected is displayed in the output, as is the id for the missing disk.

If this event message exists for any of the local physical disks attached to any of your Oracle VM Servers, then you are most likely affected by this issue and should continue with the rest of the steps described here.

Identifying Newly Discovered Disks and Matching Them To Missing Disks

By default, the simple names that Oracle VM Manager assigns to physical disks are based on the disk Page83 ID. If you have not renamed your physical disks, identifying newly discovered disks that map onto missing disks is simple, since the disk names can be compared to find matches. This is illustrated in the following output from the Oracle VM Manager Command Line Interface:

```
OVM> list physicalDisk
Command: list physicalDisk
```

```
Status: Success
Time: timestamp
Data:
  id:0004fb00001800007b2cdfbecb973c4d
  name:SATA_VBOX_HARDDISK_VBcdfe5359-5146ac3d_
  id:0004fb0000180000f9c966f19c14cc95
  name:SATA_VBOX_HARDDISK_VBcdfe5359-5146ac3d
```

In this output, the first physical disk listed is the original disk item, while the second disk is the newly discovered version of the same disk. The first physical disk is marked as missing in Oracle VM Manager. Since the second disk has the same name, with the exclusion of the final underscore character, it is easy to identify that these entries actually point to the same disk.

If you have changed the names for your physical disks, this process is fractionally more complicated since you must compare the Page83 ID of each disk to find the match. Obtaining the Page83 ID of a disk using the Oracle VM Manager Command Line Interface is illustrated below:

```
OVMS> show physicaldisk id=0004fb00001800009eed86fbc36b41bc
Command: show physicaldisk id=0004fb00001800009eed86fbc36b41bc
Status: Success
Time: timestamp
Data:
  Page83 ID = 350014ee20137ee44
  Server Reserved = No
  Shareable = No
  Size (GiB) = 465.76
  State = UNKNOWN
  Thin Provision = No
  Type = LUN
  Vendor = ATA
  File System 1 = 0004fb00000500000809e28f4fab56b1 [fs on 350014ee20137ee44]
  Volume Group = 0004fb00003200004dddc710a12aalb7 [Local Storage Volume Group]
  Id = 0004fb00001800009eed86fbc36b41bc [Server5 ATA Disk]
  Name = Server5 ATA Disk
  Description = WDC WD5001ABYS-0
  Locked = false
```

Note that the Page83 ID is shown as a property of the disk. You must obtain the Page83 ID for each missing disk and then find any physical disks that have their name or Page83 ID set to the same value. These disks are the newly discovered versions of the same physical disk.

Useful Steps Before Reconfiguring Your Environment

The names of any child objects of the missing disk, such as file system names, repository names and the names of any items within the repository are all associated with the missing disk. This information is lost when you delete the missing disk from your environment. If you have named any of these objects within Oracle VM Manager, you should take note of the names of these objects before continuing. Although this is not a necessary step, since the names are only helpful within Oracle VM Manager and do not affect the running of your environment, to return your environment to the same state after you delete any missing disks you may wish to rename these objects once they are associated with the newly discovered version of the same physical disk.

Using the Oracle VM Manager Command Line Interface you can run the following commands to obtain a dump of the names of all of these objects:

```
OVMS> list physicaldisk
OVMS> list filesystem
OVMS> list repository
OVMS> show repository id=0004fb0000030000e0f09683cd2ac72a
```

Substitute `0004fb0000030000e0f09683cd2ac72a` with the id for each repository in your environment, and run the same command for each repository.

The goal of this exercise is to obtain a listing of the names of any of the objects that may be affected when you remove the physical disk that they are associated with. Store the information returned by these commands in a place that you can refer to when you need to rename objects.

Steps To Deal With Affected Repositories

If you have made a record of the object names of all affected objects, it is safe to delete the missing disks, as illustrated in the following output from the Oracle VM Manager Command Line Interface:

```
OVM> delete physicalDisk id=0004fb00001800007b2cdfbecb973c4d
Command: delete physicalDisk id=0004fb00001800007b2cdfbecb973c4d
Status: Success
Time: timestamp
JobId: 1399409030129
```

These actions can also be performed in the Oracle VM Manager Web Interface, if preferred.

Once you have deleted the missing disk entry, you must perform the following actions:

- Identify the newly discovered disk that corresponds to the disk that you have deleted, and refresh it as described in [Refresh Physical Disk](#) in the *Oracle VM Manager User's Guide*.
- Now, refresh the file systems on the disk as described in [Refresh File System](#) in the *Oracle VM Manager User's Guide*.
- Next, you must refresh the repositories that are hosted on the local physical disk, as described in [Refresh Repository](#) in the *Oracle VM Manager User's Guide*.
- Finally, present the repository to the Oracle VM Server where the physical disk is located. See [Present or Unpresent Repository](#) in the *Oracle VM Manager User's Guide* for more information.

At this point, your environment is usable, although the names of various objects have been lost. For instance, any file system names, repository names, or the names of objects such as virtual machines in a repository are likely to have been reset to default values. If you kept a record of the object names affected, as recommended in the previous step, then you can manually rename objects as required.

Steps To Deal With Affected Virtual Machines

If you have any virtual machines that were configured to use a local physical disk that is marked as missing, you must remove the original disk mapping and then reconfigure the virtual machine to attach a new physical disk. When you select the new physical disk, you should select the physical disk with the same Page83 ID as the missing disk. To reconfigure these disk mappings, you must edit the virtual machine as described in [Edit Virtual Machine](#) in the *Oracle VM Manager User's Guide*.

5.8 Upgrading Oracle VM Agent for SPARC

Upgrade methods depend on the Oracle VM Agent for SPARC Release from which you are upgrading. For information about upgrade methods, see [Section 5.1, "Upgrade Overview"](#).

Before you attempt to upgrade the Oracle VM Agent for SPARC, you must:

- Update your system to Oracle Solaris 11.3 or Solaris 11.4.

On Oracle VM Agent for SPARC Release 3.2.10, or later versions such as Release 3.2.11, you must manually upgrade to Oracle Solaris 11.3.

As of Release 3.4.6, Oracle Solaris 11.4 is supported. If you are running Oracle VM Agent for SPARC Release 3.3.x, 3.4.1 or 3.4.2, and you plan to upgrade to Release 3.4.6, you must first upgrade to

Release 3.4.5 on Oracle Solaris 11.3. From Release 3.4.5, after a reboot you can then upgrade to Release 3.4.6 with Oracle Solaris 11.4.



Note

If you are running an older version of Oracle VM Agent for SPARC, upgrading to Release 3.4.5 ensures that your system has the latest 11.3 SRU available (Oracle Solaris 11.3 SRU 23 or later), which is required before you upgrade to Release 3.4.6 with Oracle Solaris 11.4.

On Oracle VM Agent for SPARC Release 3.3.x or Release 3.4.x, you set up an IPS repository to handle both the update to Oracle Solaris 11.3 and the upgrade of Oracle VM Agent for SPARC.

- Review all minimum requirements to ensure a successful upgrade. See [Table 2.2, “Required Software and System Firmware for SPARC Servers”](#).



Note

If you have a secondary service domain configured and you have successfully updated your system to Oracle Solaris 11.3 or Solaris 11.4 on the primary domain, the secondary service domain can also be upgraded using the same Oracle Solaris IPS repository as the primary domain. To upgrade the secondary service domain, you should upgrade from the Oracle Solaris command line using the following command:

```
# pkg update --accept
```

Reboot the system after the upgrade completes, as follows:

```
# init 6
```

For detailed install and upgrade instructions for Oracle Solaris 11.3, see http://docs.oracle.com/cd/E53394_01/.

For detailed instructions on updating to Oracle Solaris 11.4, see https://docs.oracle.com/cd/E37838_01/html/E60977/gmpdi.html

5.8.1 Installing the Distributed Lock Manager (DLM) Package

The distributed lock manager (DLM) package is required to support server pool clustering. The version of the DLM package must match the version of Oracle VM Agent for SPARC.

- If the DLM package is already installed on your system, download the Release 3.4 version of the DLM package and add it to the IPS repository before you attempt to upgrade.
- If the DLM package is not already installed, or you are upgrading from Oracle VM Agent for SPARC Release 3.2.10, you can install it before you upgrade Oracle VM Agent. Alternatively, you can install the DLM package after the upgrade is complete.

Download the DLM package, `ovs-dlm-3.4.x-bxxx.p5p`, from <https://edelivery.oracle.com/oraclevm>. For more information about downloading software, see [Section 1.2, “Getting Installation ISOs and Packages”](#).

To add the DLM package to an IPS repository, see [Section 5.8.3.1, “Setting Up IPS Repositories”](#).

To install the DLM package, do the following:

1. Stop the `ovs-config` service:

```
# svcadm disable -s ovs-config
```

2. Install the DLM package:

```
# pkg install -g ovs-dlm-3.4.x-bxxx.p5p dlm
```

3. Restart the ovs-config service:

```
# svcadm enable ovs-config
```

5.8.2 Upgrading from Oracle VM Agent for SPARC Release 3.2.10

Complete the tasks in this section to upgrade to Release 3.4 from Oracle VM Agent for SPARC Release 3.2.10 or a later version such as Release 3.2.11.

5.8.2.1 Placing Oracle VM Server for SPARC in Maintenance Mode

Before you begin any procedures to upgrade from Release 3.2.10, or a later version such as Release 3.2.11, you should ensure that no virtual machines are running on the server. For this reason you should place each Oracle VM Server for SPARC that you plan to upgrade in maintenance mode. After you place each Oracle VM Server for SPARC in maintenance mode, you should also check that no virtual machines are running on the servers you plan to upgrade. If any virtual machines are still running, you should stop them before attempting to upgrade Oracle VM Server for SPARC.

For instructions on editing a server and placing it in maintenance mode, see [Edit Server](#) in the *Oracle VM Manager User's Guide*.

5.8.2.2 Updating to Oracle Solaris 11.3 Manually

The first step to upgrade from Oracle VM Agent for SPARC Release 3.2.10, or a later version such as Release 3.2.11, is to manually update your system to Oracle Solaris 11.3 Support Repository Update (SRU) 19.



Note

- Oracle VM Agent for SPARC Release 3.2.10 cannot run on Oracle Solaris 11.3. For this reason, you should disable Oracle VM Agent for SPARC before you update to Solaris 11.3.

```
# svcadm disable ovs-agent
```

- Oracle VM Agent for SPARC Release 3.2.x does not allow installations higher than Oracle Solaris 11.3 SRU 19. This is due to the removal of Python 2.6 in SRU 20. Once Oracle VM Agent for SPARC Release 3.4.3 or later is installed, the Oracle Solaris system can be upgraded to a more recent version.
- This procedure should be used with Oracle VM Agent for SPARC Release 3.4.5 to update to the latest Oracle 11.3 SRU before rebooting the server and using the same procedure in Oracle VM Agent for SPARC Release 3.4.6 to update the server from Oracle Solaris 11.3 to Solaris 11.4.

If you have already set up the Oracle Solaris repository, you can update the system packages with the following command:

```
# pkg update --accept
```

Reboot the system after the upgrade completes, as follows:

```
# init 6
```

For detailed instructions on updating to Oracle Solaris 11.3, see http://docs.oracle.com/cd/E53394_01/html/E54845/toc.html.

For detailed instructions on updating to Oracle Solaris 11.4, see https://docs.oracle.com/cd/E37838_01/html/E60977/gmpdi.html

5.8.2.3 Downloading and Extracting the Oracle VM Agent for SPARC Software

Before you can upgrade Oracle VM Agent for SPARC to Release 3.4, you must download and extract the software.

1. Download the Oracle VM Agent for SPARC software for Release 3.4 from <https://edelivery.oracle.com/oraclevm>.

For more information about downloading software, see [Section 1.2, “Getting Installation ISOs and Packages”](#).

2. Extract the software, for example:

```
# tar xzf ovs-ldoms-3.4.x-bxxx.tar.gz
```

5.8.2.4 Upgrading Oracle VM Agent for SPARC

To upgrade Oracle VM Agent for SPARC from Release 3.2.10, or a later version such as Release 3.2.11, do the following:

1. Open a terminal connection to the system you plan to upgrade.
2. Change to the directory where you extracted the software: `ovs-ldoms-3.4.x-bxxx`
3. Run: `./update`
4. From Oracle VM Manager, rediscover the server and take it out of maintenance mode, if necessary.
5. Complete the update by performing a server upgrade from within the Oracle VM Manager Web Interface as described in [Update Server](#) in the *Oracle VM Manager User's Guide*.

Example Output

```
# ./update

Oracle VM Agent Release 3.4.1 Updater

- Stopping the Oracle VM Agent

- Updating Packages

Updating package cache                1/1
Caching catalogs ...

      Packages to install:           1
      Packages to update:           6
      Services to change:            1
Estimated space available: 523.69 GB
Estimated space to be consumed: 748.24 MB
      Create boot environment:       No
      Create backup boot environment: Yes
      Rebuild boot archive:          No
```

```

Changed packages:
ovm
  ovm/storage-connect/plugins/oracle-zfs
    None -> 1.0.0,5.11-3.4.1.0.0.914:20150805T065013Z
  ovm/extra/urlgrabber
    3.9.1,5.11-3.2.10.0.0.759:20150924T063650Z -> 3.9.1,5.11-3.4.1.0.0.914:20150805T064943Z
  ovm/extra/vbox-img
    1.0.0,5.11-3.2.10.0.0.759:20150924T063654Z -> 1.0.0,5.11-3.4.1.0.0.1087:20151021T045254Z
  ovm/ovs-agent
    3.2.10,5.11-3.2.10.0.0.760:20150929T055226Z -> 3.4.1,5.11-3.4.1.0.0.1085:20151020T044541Z
  ovm/ovs-release
    3.2.10,5.11-3.2.10.0.0.760:20150929T055240Z -> 3.4.1,5.11-3.4.1.0.0.1087:20151021T045318Z
  ovm/storage-connect/plugin-manager
    1.2.8,5.11-3.2.10.0.0.759:20150924T063700Z -> 1.2.8,5.11-3.4.1.0.0.1033:20150928T170453Z
  ovm/storage-connect/plugins/oracle-generic
    1.1.0,5.11-3.2.10.0.0.760:20150929T055232Z -> 1.1.0,5.11-3.4.1.0.0.914:20150805T064958Z

Services:
  restart_fmri:
    svc:/system/manifest-import:default

DOWNLOAD                                PKGS          FILES        XFER (MB)   SPEED
Completed                                7/7           310/310      0.8/0.8     589k/s

PHASE                                     ITEMS
Removing old actions                      5/5
Installing new actions                    187/187
Updating modified actions                 209/209
Updating package state database           Done
Updating package cache                   6/6
Updating image state                      Done
Creating fast lookup database             Done
Updating package cache                    2/2
Updating package cache                    1/1

- Updating the OVS Agent Configuration

Network Configuration
Network Configuration OK
Storage Configuration
Storage Configuration OK
OVS Agent Configuration
OVS Agent Configuration OK
Cluster Configuration
Cluster Configuration OK
LDoms Manager Configuration
LDoms Manager Configuration OK
Virtual I/O Services Configuration
Virtual I/O Services Configuration OK
LDoms Configuration
LDoms Configuration OK
Enabling Oracle VM Agent Services

Update Completed.

```

5.8.3 Upgrading from Oracle VM Agent for SPARC Release 3.3.x or Between 3.4.x Errata Releases

Complete the tasks in this section to upgrade to Release 3.4 from Oracle VM Agent for SPARC Release 3.3.x or from one Release 3.4.x to another Release 3.4.y.



Important

As of Oracle VM Release 3.4.5, management of Oracle VM Server for x86 at 3.2.1x and Oracle VM Agent for SPARC at Release 3.3.1 is deprecated. If management

of Oracle VM Servers at these release versions are still required, see [Section 7.6, “Enabling the TLS Version 1 Protocol”](#) in the *Oracle VM 3.4 Installation and Upgrade guide*.

As of Oracle VM Release 3.4.6, management of Oracle VM Server for x86 at 3.2.1x, and Oracle VM Agent for SPARC at Release 3.3.1 is removed. No error events are raised if Oracle VM Servers at these unsupported versions are discovered; however, the following message is displayed at the end of an upgrade, indicating that these versions are no longer supported: "3.2.10/3.2.11 Oracle VM x86 Servers and SPARC agent 3.3.1 managed Servers are no longer supported in Oracle VM Manager 3.4. Please upgrade your Server to a more current version for full support."

5.8.3.1 Setting Up IPS Repositories

Upgrades for Oracle VM Servers that are running on SPARC hardware can be handled by setting up two Oracle Solaris Image Package System (IPS) repositories. Your IPS repositories can be hosted on any system, either x86 or SPARC, as long as it is running Oracle Solaris 11 or later. The system where you configure these repositories must be accessible over the network by all of the SPARC based Oracle VM Servers that you wish to upgrade.

The first repository should be set up to handle Oracle Solaris updates and should have its publisher set to `solaris`. This repository can be used to keep the Oracle Solaris software in your control domains up to date. It is critical that this repository contains the packages for Oracle Solaris 11.3 or higher. This repository must be enabled if you intend to upgrade from a version equal to or prior to Oracle VM Server for SPARC release 3.3.x. The Oracle Solaris system repository can also be copied locally if you are updating a set of local Oracle VM Servers running on SPARC hardware. Instructions on setting up and copying IPS repositories can be found in the book titled *Creating Package Repositories in Oracle Solaris 11.4* in the *Oracle Solaris 11.4 Information Library* at:

https://docs.oracle.com/cd/E37838_01/html/E60982/index.html

The second IPS repository should be set up to contain the Oracle VM Agent for SPARC and associated packages. This repository can be used to ensure that the latest version of Oracle VM Agent for SPARC is available to be installed on your Oracle VM Servers. You can also use this repository to store commonly required packages such as the distributed lock manager (DLM) package required for cluster support. This repository should have its publisher set to `ovm`. The instructions that follow explain how to set up and configure this IPS repository.

To set up an IPS repository for Oracle VM Agent for SPARC

1. If you have not already created a package repository that is accessible over HTTP, you must create one by performing the following actions on the system where you intend to host your repositories:

```
# pkgrepo create /path/to/my-repository
# svccfg -s application/pkg/server setprop pkg/inst_root=/path/to/my-repository
# svccfg -s application/pkg/server setprop pkg/port=8888
# svcadm refresh application/pkg/server
# svcadm enable application/pkg/server
```

2. Check that the package repository server is online:

```
# svcs pkg/server
STATE      STIME      FMRI
online     timestamp  svc:/application/pkg/server:default
```

3. Download the latest Oracle VM Agent for SPARC software from <https://edelivery.oracle.com/oraclevm>, as described in [Section 1.2, “Getting Installation ISOs and Packages”](#).

4. Extract the software, for example:

```
# tar xzf ovs-ldoms-3.4.x-bxxx.tar.gz
```

5. Copy the software to the package repository, for example:

```
# pkgrecv -s ovs-ldoms-3.4.x-bxxx/ovs-ldoms.p5p -d /path/to/my-repository 'ovm/*'
# pkgrecv -s ovs-dlm-3.4.x-bxxx.p5p -d /path/to/my-repository 'ovm/*'
```

6. Restart the package repository server and ensure that it is online:

```
# svcadm restart application/pkg/server
# svcs pkg/server
```

7. If the package repository server is in maintenance status, clear the service:

```
# svcadm clear pkg/server
```

8. Check that the contents of the repository are available, for example:

```
# pkgrepo list -s /path/to/my-repository
# pkgrepo list -s http://my-repo-server:8888/
```

5.8.3.2 Creating Server Update Repositories in Oracle VM Manager

The IPS repositories must be set up within the Oracle VM Manager Web Interface, so that the upgrade script can identify them accurately and use them to perform the upgrade on the specified Oracle VM Servers. The repositories are called *server update repositories* in the Oracle VM Manager Web Interface.

Use the Oracle VM Manager Web Interface to create two server update repositories, one for each repository. Make sure you create these server update repositories in the **Sparc** server update group. The following tables contain the information you need to create the server update repositories using the **Create Server Update Repository** dialog box.

Full instructions for creating a server update repository in the Oracle VM Manager Web Interface are provided in [Create New Server Update Repository](#) in the *Oracle VM Manager User's Guide*.

Table 5.5 Solaris Repository

Field	Value	Notes
Name	<code>solaris</code>	You may name this repository as you prefer within Oracle VM Manager, but choose a name that makes it easy for you to understand what the repository contains.
Repository Name	<code>solaris</code>	This should be set to the same name that you used for the IPS publisher.
URL	<code>http://my-repo-server:8888/solaris</code>	Substitute this URL with the URL to your Solaris IPS repository.
Enabled	Yes	You can enable or disable this repository to control whether only the Oracle VM Agent software is updated, or whether other Solaris packages are updated as well. If the server is running a version of Solaris that is lower than 11.3, the repository must be enabled. Likewise the repository must contain

Field	Value	Notes
		the packages for Oracle Solaris 11.3 at a minimum.
Package Signature Type	None	No package signature type is required here.

Table 5.6 OVM Repository

Field	Value	Notes
Name	<code>ovm-agent</code>	You may name this repository as you prefer within Oracle VM Manager, but choose a name that makes it easy for you to understand what the repository contains.
Repository Name	<code>ovm</code>	This should be set to the same name that you used for the IPS publisher.
URL	<code>http://my-repo-server:8888/ovm</code>	Substitute this URL with the URL to your Oracle VM Agent for SPARC IPS repository.
Enabled	Yes	You can enable or disable this repository to control whether the Oracle VM Agent software is updated, or whether only Solaris packages are updated. This repository must be enabled if you intend to upgrade the Oracle VM Agent.
Package Signature Type	None	No package signature type is required here.

5.8.3.3 Upgrading Oracle VM Agent for SPARC



Note

Before you begin any procedures to upgrade from Release 3.2.10, or a later version such as Release 3.2.11, you should ensure that no virtual machines are running on the server. For this reason you should place each Oracle VM Server for SPARC that you plan to upgrade in maintenance mode. After you place each Oracle VM Server for SPARC in maintenance mode, you should also check that no virtual machines are running on the servers you plan to upgrade. If any virtual machines are still running, you should stop them before attempting to upgrade Oracle VM Server for SPARC.

For instructions on editing a server and placing it in maintenance mode, see [Edit Server](#) in the *Oracle VM Manager User's Guide*.

With your IPS repositories configured, you can perform server upgrades from within the Oracle VM Manager Web Interface as described in [Update Server](#) in the *Oracle VM Manager User's Guide*. If you have defined repositories for the Solaris operating system and for the Oracle VM Agent, then an update action is performed for both the Solaris operating system and the Oracle VM Agent. If you only want to update a particular component, either the Solaris operating system or the Oracle VM Agent, disable the repository with the component that you do not want to update within Oracle VM Manager.

5.9 Rolling Back from an Upgrade

This section describes steps that you can perform to rollback from an upgrade. Provision is made for a rollback from an upgrade of Oracle VM Manager if something goes wrong during the upgrade process.

Rollback of Oracle VM Server upgrades is not catered for, and in this instance you must reinstall the version of Oracle VM Server that you wish to roll back to, and then rediscover the server in Oracle VM Manager.

The Oracle VM Manager automatically performs a full data backup of the database, if you are currently using the bundled MySQL database, when you run the installer with the upgrade option. This backup is stored in `/u01/app/oracle/mysql/dbbackup`. The name of the backup is printed to the screen during the upgrade process and is named similarly to `3.4.1_preUpgradeBackup-YYYYMMDD_hhmmss`.

If your Oracle VM Manager was using the bundled MySQL database, you must first uninstall the Oracle VM Manager Release 3.4 software, then install the previous version of the software, and finally restore the database from this backup. The release that you are restoring from should include instructions for rolling back the database from a backup in the provided documentation. You may also refer to [Restoring Oracle VM Manager](#) in the *Oracle VM Administrator's Guide*.

If your Oracle VM Manager was using a remote Oracle Database, and you have left this database intact through the upgrade process, rolling back simply requires that you uninstall the Oracle VM Manager Release 3.4 software, then install the previous version of the software, taking care to provide the details for the existing Oracle Database tablespace during the installation process.

Instructions for both of these scenarios follow.

Rolling Back Oracle VM Manager to a previous release using MySQL:

1. Uninstall Oracle VM Manager Release 3.4 software using the instructions provided at [Section 4.5, "Uninstalling Oracle VM Manager"](#).



Important

Do not remove the database backup directory after you have completed the uninstall process. The database backup generated during the upgrade process is required to restore your previous environment.

2. Install the previous Oracle VM Manager version, following the installation instructions provided in the documentation for that version.
3. Stop the `ovmm`, and `ovmm_mysql` services respectively.
4. Before you restore the database, ensure that no database files already exist on the Oracle VM Manager host:

```
# cd /u01/app/oracle/mysql/data/
# rm -rf appfw ibdata1 ib_logfile0 ib_logfile1 mysql ovs performance_schema
```



Important

Do not remove any of the following files from `/u01/app/oracle/mysql/data/`:

- `auto.cnf`
- `my.cnf`
- `.mysqlconfig`
- `mysql_upgrade_info`

This file may only exist if there was an upgrade to the current version. It does not exist on systems where a fresh installation was performed.

5. Run the database restore utility with the database backup that was created during the beginning of the upgrade. If you are rolling back to a 3.3.x release, you can issue the following command:

```
# cd /u01/app/oracle/ovm-manager-3/ovm_tools/bin
# su oracle -c "sh ./RestoreDatabase.sh 3.4.1_preUpgradeBackup-YYYYMMDD_hhmmss"
```

If you are rolling back to Release 3.2.10, or a later version such as Release 3.2.11, the RestoreDatabase.sh script is located at a different path, so issue the following command instead :

```
# cd /u01/app/oracle/ovm-manager-3/ovm_shell/tools
# su oracle -c "sh ./RestoreDatabase.sh 3.4.1_preUpgradeBackup-YYYYMMDD_hhmmss"
```

Substitute `3.4.1_preUpgradeBackup-YYYYMMDD_hhmmss` with the name of the backup that you wish to restore to. This is typically the name of the pre-upgrade backup that is printed in the output of the upgrade process.

6. Start the `ovmm_mysql` and `ovmm` services respectively.
7. If you are rolling back to a 3.3.x release, it is necessary to reconfigure the certificates used to authenticate components such as the Oracle VM Manager Web Interface and Oracle VM Manager Command Line Interface. This is achieved by running the following script to reconfigure the Oracle WebLogic Server:

```
# export MW_HOME=/u01/app/oracle/Middleware
# /u01/app/oracle/ovm-manager-3/ovm_upgrade/bin/ovmkeytool.sh setupWebLogic
```

Once you have run this command, you must restart Oracle VM Manager and then run the client certificate configuration script:

```
# /sbin/service ovmm restart
# /u01/app/oracle/ovm-manager-3/bin/configure_client_cert_login.sh
```

The script requires that Oracle VM Manager is running, and prompts you for the administrator username and password that should be used to access Oracle VM Manager. The script makes changes that may require Oracle VM Manager to be restarted:

```
# /sbin/service ovmm restart
```

8. Log into the Oracle VM Manager Web Interface and check that the configuration matches what was in place prior to the upgrade process. Use the [Refresh All](#) option within the Oracle VM Manager Web Interface to refresh all of your server pools to ensure that all of your virtual machine resources are available.

Rolling Back Oracle VM Manager to a previous release using an Oracle Database:

1. If you have not left the Oracle Database OVM tablespace (`ovs`) intact since your upgrade, you must restore the data from a backup before attempting to rollback.
2. Uninstall the Oracle VM Manager Release 3.4 software using the instructions provided at [Section 4.5, "Uninstalling Oracle VM Manager"](#).
3. Install the previous Oracle VM Manager version, following the installation instructions provided in the documentation for that version. During the installation, the installer detects the presence of the old database table space (`ovs`) and provides an option to use the old database table space. Select this option to restore Oracle VM Manager to the state that it was in when the database was last backed up.
4. Log into the Oracle VM Manager Web Interface and check that the configuration matches what was in place prior to the upgrade process.

Chapter 6 Troubleshooting Oracle VM Installation or Upgrade

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This chapter gives you details on troubleshooting problems with installing Oracle VM.

This chapter contains information on known issues you may encounter when installing Oracle VM, and explains how to resolve them. If you contact Oracle Support for assistance with an [Oracle VM Manager](#) installation, please include the installation logs. See [Section 4.3.3, “Installation Logs”](#) for information on log file names and locations.

For additional troubleshooting information, see the following Oracle support sites:

- My Oracle Support, <http://support.oracle.com>
- Oracle Virtualization Forum, <http://forums.oracle.com/forums/forum.jspa?forumID=823>

6.1 Troubleshooting Oracle VM Server Installation or Upgrade

6.1.1 FCoE SAN not Listed as Available Drive

If you are attempting to install Oracle VM Server into a Fiber Channel over Ethernet (FCoE) SAN that the installer does not list, you must manually rediscover the FCoE SAN. Start the Oracle VM Server installation program and complete the following steps:

1. Advance to the **Partitioning Type** screen and then press **F2** to enter the **Advanced Storage Options** screen.
2. Select the **Add the FCoE SAN** option and then select **OK**.
3. On the **Add the FCoE SAN** screen, select the NIC that is connected to the FCoE SAN, deselect the **Use DCB** option, and then select **OK**.

The installer connects to the FCoE SAN and returns to the **Partitioning Type** screen. Continue with the installation of Oracle VM Server as described in [Section 2.1.2, “Installing Oracle VM Server From a DVD-ROM”](#).

6.1.2 Oracle VM Server Cluster Configuration Warning After Upgrade

In some cases, after upgrading Oracle VM Server, you can encounter warning messages that indicate the cluster service for the server pool is not running. An example of the warning message is as follows:

```
OVM EVT_003500D_003 Active data was not found. Cluster service is probably not running.
```

To resolve this issue, refresh the affected server pool and the file system.

6.2 Troubleshooting Oracle VM Manager Installation or Upgrade

6.2.1 libaio Not Installed

The following error is displayed during installation of Oracle VM Manager if the prerequisite libaio package is not installed:

```
libaio is not installed...
```

To fix this error, install the libaio package. For information on how to install libaio, see [Section 4.2.2.3, "Prerequisite Packages"](#) in the *Oracle VM Installation and Upgrade Guide*.

6.2.2 Cannot Install MySQL

The Oracle VM Manager installer may fail to install MySQL and displays the message:

```
Failed: The database instance is not available.
```

You can check the log file at `/tmp/ovmm-installer.selfextract_id/ovm-manager-3-install-date.log` for more detailed information.

There are two workarounds to this issue.

1. Make sure that MySQL is not installed, or has installed correctly. Use the following command to check the status:

```
$ service ovmm_mysql status
```

If MySQL is running, run the Oracle VM Manager installation script to uninstall it, and reinstall Oracle VM Manager.

2. Make sure the computer's host name matches the host name in the `/etc/hosts` file. See [Section 4.2.2.5, "Network"](#) to configure the host name.

6.2.3 Cannot Create OVS Database Schema

The Oracle VM Manager install may fail and display the following message:

```
Creating the Oracle VM Manager database schema ... Failed.
```

You can check the log file at `/tmp/ovmm-installer.selfextract_id/ovm-manager-3-install-date.log` for more detailed information.

Possible workarounds for this issue are:

1. Make sure that MySQL has installed correctly. Use the following command to check the status:

```
$ service ovmm_mysql status
```

If MySQL is running, run the Oracle VM Manager installation script to uninstall it, and reinstall Oracle VM Manager.

2. Reinstall Oracle VM Manager.

6.2.4 Installation Fails on Non-English Character Set

If the operating system is a non-English character set or language, the Oracle VM Manager installer may display the following error:

```
Update default password failed.
```

Oracle VM Manager only supports the English language and character set.

You can check the log file at `/tmp/ovmm-installer.selfextract_id/ovm-manager-3-install-date.log` for more detailed information.

To workaroud this issue, set the character set to `en_US.UTF-8`:

1. Run the following command to check if the value of LANG is `en_US.UTF-8`:

```
# env | grep LANG
```

2. If the character set is not `en_US.UTF-8`, change it to `en_US.UTF-8`:

```
# export LC_CTYPE="en_US.UTF-8"
```

3. Reinstall Oracle VM Manager.

6.2.5 Installation Fails When Using an NIS-based Oracle User Account

If the *oracle* user account is created using NIS-based authentication (Network Information Services), the Oracle VM Manager installation fails during the prerequisite check, and the following error is displayed:

```
Verifying installation prerequisites ...
hardnofiles should be set to 8192 but was 0
Configuration verification failed ...
```

Or the installation may pass prerequisite check, but may fail later during the installation of the Application Development Framework:

```
Retrieving Oracle Application Development Framework (ADF) ...
Unzipping Oracle ADF ...
Installing Oracle ADF ...
Installing Oracle ADF Patch...
```

To workaroud this issue, disable ypbind service and create a non-NIS-based *oracle* user account using `createOracle.sh` on the host computer and rerun the installer:

```
# /sbin/service ypbind stop
# service ypbind status
ypbind is stopped
# ./createOracle.sh
# ./runInstaller.sh
```

6.2.6 Upgrading Oracle VM Manager from Release 3.2.10 to Release 3.4.x Fails

In some cases, it is not possible to successfully upgrade Oracle VM Manager from Release 3.2.10 to Release 3.4.x and the installer output indicates a failure running the `ovm_preUpgrade` script, as in the following example:

```
# ./runInstaller.sh

Oracle VM Manager Release 3.4.x Installer
```

```
Oracle VM Manager Installer log file:
/var/log/ovmm/ovm-manager-3-install-yyyy-mm-dd-xxxxxx.log

Verifying upgrading prerequisites ...

Starting Upgrade ...

Reading database parameters from config ...

Verifying configuration ...

Upgrading from version 3.2.10 to version 3.4.x

Running ovm_preUpgrade script, please be patient this may take a long time
...
time_stamp: All jobs in the job log will now be deleted.
time_stamp: Deleting 183 jobs before upgrade.
time_stamp: 183 jobs have been deleted.
4 jobs are still in the job log.

Failure running the ovm_preUpgrade script, upgrade cannot continue!
```

This failure occurs because an instance of Oracle VM Server is in an erroneous state. As a result, automatic discovery jobs fail and then re-occur. These automatic discovery jobs prevent the `ovm_preUpgrade` script from running successfully.

To work around this issue, do the following:

1. Identify the instance of Oracle VM Server that is in an erroneous state.
2. Shut down or live migrate the virtual machines running on the instance of Oracle VM Server.
3. Stop the instance of Oracle VM Server.
4. Ensure that no pending jobs exist in Oracle VM Manager.
5. Run the script to upgrade Oracle VM Manager.

Chapter 7 What Next?

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The information contained within this chapter is not part of the default installation process for Oracle VM, however to ensure that your environment runs smoothly and that all elements within your deployment are functional and can be supported, you should perform a number of additional steps to fully configure your environment. These steps are discussed in the following sections.

7.1 Configuring a Secondary Service Domain for SPARC

If you are running a SPARC environment, and you do not intend to make use of the clustering features included in this release, you may want to consider setting up and configuring a secondary service domain to improve the availability of virtual machines in the instance where the primary control domain may need to be restarted, or may fail.

Instructions on configuring and setting up a secondary service domain are provided in [Configuring a Secondary Service Domain](#) in the *Oracle VM Administrator's Guide*. This is an advanced configuration that imposes some limitations on how you are able to use the product.

7.2 Installing Diagnostic Tools for Oracle VM Server

As an optional post-installation step, Oracle recommends that you also install and configure diagnostics tools on all [Oracle VM Servers](#). These tools can be used to help debug and diagnose issues such as system crashes, hanging, unscheduled reboots, and [OCFS2](#) cluster errors. The output from these tools can be used by Oracle Support and can significantly improve resolution and response times. See [Diagnostic Tools for Oracle VM Server](#) in the *Oracle VM Administrator's Guide* guide for information on installing the diagnostic and support tools.



Note

When installing Oracle VM Server, you are given the option to enable Kdump. Kdump is a crash dumping mechanism that captures a memory dump image for dom0 in the event of a system crash. Oracle strongly recommends that you enable Kdump during installation. See [Section 2.1.2, "Installing Oracle VM Server From a DVD-ROM"](#) for more information.

7.3 Configure the NTP Service on the Oracle VM Manager Host

When an Oracle VM Server is discovered in Oracle VM Manager, NTP (Network Time Protocol) is automatically configured and enabled to ensure time synchronization. Oracle VM automatically configures

the Oracle VM Manager [host computer](#) as the NTP source for all Oracle VM Servers under its control, unless other NTP servers are configured for each server.

If you do not set up your own list of NTP servers, and want to use the Oracle VM Manager host computer to provide NTP time synchronization services, NTP must first be installed and configured on the Oracle VM Manager host server. Make sure that your Oracle VM Manager host is either registered with the [Unbreakable Linux Network \(ULN\)](#) or configured to use the [Oracle Linux Yum Server](#).



Note

It is not recommended to use the Oracle VM Manager host as a single NTP server. It is best practice to configure 3 NTP servers at a minimum.

To configure NTP on the Oracle VM Manager host:

1. Install the NTP package.

```
# yum install ntp
```

When NTP is installed, configure it to both synchronize with upstream servers and provide time services to the local network, where the Oracle VM Servers reside.

2. Enable upstream synchronization by defining the upstream time servers in the `ntp.conf` file.

Oracle Linux uses three public NTP servers as upstream time sources by default. Check with your network administrator if time services are provided on the corporate network and, if necessary, replace the default entries with the names or IP addresses of your NTP servers.

Use your favorite text editor to modify `/etc/ntp.conf`. Search for these entries:

```
# vi /etc/ntp.conf
server 0.rhel.pool.ntp.org
server 1.rhel.pool.ntp.org
server 2.rhel.pool.ntp.org
```

3. Configure downstream access for the Oracle VM Servers in your local network. To do so, disable the default `"noquery"` option for the Oracle VM Server management network.

Again in the `/etc/ntp.conf` file, search for this entry:

```
#restrict 192.168.1.0 mask 255.255.255.0 nomodify notrap
```

Remove the `#` character at the start of the line to uncomment this entry. Replace `192.168.1.0` with the network address of your Oracle VM Server management network. You may also need to adjust the netmask (`255.255.255.0`). Once you have finished editing, save the `/etc/ntp.conf` file.

4. Start the NTP service and set it to launch automatically upon boot.

```
# service ntpd start
# chkconfig ntpd on
```

5. When NTP is running, check upstream synchronization. The `ntpq` command should output something similar to this example:

```
# ntpq -p
      remote           refid      st t when poll reach   delay   offset  jitter
-----
lists2.luv.asn. 203.161.12.165 16 u  25  64   3  3.495  -3043.1  0.678
```



```
ns2.novatelbg.n 130.95.179.80 16 u 27 64 3 26.633 -3016.1 0.797
spl.mycdn.fr 130.234.255.83 16 u 24 64 3 4.314 -3036.3 1.039
```

When upstream NTP is working properly, delay and offset values should be non-zero and the jitter value should be below 100.

6. Test downstream synchronization from another server in the management network to ensure that NTP services are working. Note that it may take several minutes before your NTP server is able to provide time services to downstream clients. Begin by checking the *stratum level* of your server:

```
# ntpq -c rv
assID=0 status=c011 sync_alarm, sync_unspec, 1 event, event_restart,
version="ntpd 4.2.4p8@1.1612-o Tue Jul 6 21:50:26 UTC 2010 (1)",
processor="x86_64", system="Linux/2.6.32-200.19.1.el6uek.x86_64",
leap=11, stratum=16, precision=-20, rootdelay=0.000,
rootdispersion=1.020, peer=0, refid=INIT,
reftime=00000000.00000000 Thu, Feb 7 2036 17:28:16.000, poll=6,
clock=d21d4a96.a26c5962 Fri, Sep 16 2011 14:09:58.634, state=0,
offset=0.000, frequency=0.000, jitter=0.001, noise=0.001,
stability=0.000, tai=0
```

If the server is showing `stratum=16`, wait a few minutes and try again. It may take up to 15 minutes for an NTP server to stabilize sufficiently to lower its stratum level.

Downstream clients will not synchronize with a server at stratum level 16. Once the stratum level has dropped, log in to an available Linux host in your management network, not running Oracle VM Manager, and issue the following command:

```
# ntpdate -d manager.hostname
[...]
16 Sep 13:58:25 ntpdate[1603]: step time server 192.168.1.1 offset 3.009257 sec
```

This command runs `ntpdate` in debug mode, in which case the availability of the remote time server is checked. If the debug run ends in a line similar to the one in this example, the test is successful. In case the stratum level is still too high, the error message `"Server dropped: strata too high"` is displayed.

When you have confirmed with these tests that NTP is working properly for your environment, you should not need to check this again.



Caution

NTP communicates over UDP port 123. Ensure that no firewall is blocking this traffic.

7.4 Change the Backup and Restore Path for the Oracle VM Manager Database

Oracle VM Manager automatically performs backups of the Oracle VM Manager database. By default, these backups are located in `/u01/app/oracle/mysql/dbbackup`. If you have network attached storage available, it is strongly recommended that you change the default path for these backups to use a mount point on an external device, particularly if you can make use of some form of RAID to further protect this data.

The path where database backups are stored is defined in `/etc/sysconfig/ovmmn`.

Please refer to [Backing up the MySQL Database Repository](#) in the *Oracle VM Administrator's Guide* for more information on this parameter and on the backup and restore process in general.

7.5 Starting and Stopping Oracle VM Manager

This section discusses the methods of starting and stopping Oracle VM Manager. For information on starting and stopping the Oracle VM Manager Command Line Interface, see [Starting and Stopping the CLI](#) in the *Oracle VM Manager Command Line Interface User's Guide*.

It is important to understand that Oracle VM Manager is dependent on the Oracle VM Manager MySQL server instance. These components are separated to run as independent services. In the case where the Oracle VM Manager MySQL service is stopped, it is not possible to start the Oracle VM Manager service. In the case where the Oracle VM Manager service is already running and the Oracle VM Manager MySQL service is stopped, errors are generated by Oracle VM Manager and are logged to the relevant Oracle VM Manager log files. This behavior is documented further in [Working with the MySQL Instance](#) in the *Oracle VM Administrator's Guide*.

Instructions for Oracle VM Manager on Linux for x86

When Oracle VM Manager is installed, it is set to automatically start when the operating system starts. If you want to disable this, enter:

```
# chkconfig ovmm off
```

To manually start or stop Oracle VM Manager, and to verify its status, log in as the *root* user, and use the syntax:

```
/sbin/service ovmm [start|stop|status|restart]
```

For example, to start Oracle VM Manager:

```
# /sbin/service ovmm start
```

To stop Oracle VM Manager, you must first stop the Oracle VM Manager Command Line Interface, then Oracle VM Manager:

```
# /sbin/service ovmm stop
```

To restart Oracle VM Manager:

```
# /sbin/service ovmm restart
```

As of Oracle VM Release 3.4.5, a `check_migrate` option can be used with the `stop` or `restart` commands, allowing you to check for active VM migration jobs that are triggered by a server pool load balancing job. VM migration jobs of this type must be completed first before you stop or restart your Oracle VM Manager instance. Log in as the *root* user, and use the syntax:

```
/sbin/service ovmm [stop check_migrate|restart check_migrate]
```



Note

The `check_migrate` option does not execute when issuing the stop or restart commands on an Oracle Linux 7 environment. Interactive scripts are not permitted with the `systemctl` command and as a result, you must run the following command first to check if active VM migration jobs that are triggered by a server pool load balancing job are present, before proceeding to stop or restart the Oracle VM Manager instance:

```
# /u01/app/oracle/ovm-manager-3/ovm_shell/ovm_shell.sh -u admin -i check_migrate_job.py
```

For example, on an Oracle Linux 6 environment append `check_migrate` to the Oracle VM Manager `/sbin/service ovmm stop` command as follows:

```
# /sbin/service ovmm stop check_migrate
```

The `check_migrate` option displays the following confirmation message and prompts you for the current Oracle VM Manager password:

```
check_migrate option is passed. Script will check for active VM Migrate jobs triggered by
PoolLoadBalancer, before proceeding with ovmm stop
# Enter ovmm Password:
```

If the password is accepted, the `check_migrate` option executes a script to check for any active VM migration jobs triggered by a server pool load balancing job. If no VM migration jobs are active, a success message is displayed and Oracle VM Manager is stopped:

```
Enter ovmm Password:
SUCCESS
Stopping Oracle VM Manager
```

If active VM migration jobs are found as a result of the `check_migrate` option, the `ovmm stop` command is not executed. Instead, an error message is displayed containing the VM migration and pool load balancer job IDs:

```
Enter ovmm Password:
ERROR: VM Migrate Job with id : [OVMJOB_ID] PoolLoadBalancer-ID is still active
```

You must wait until these VM migration jobs are complete before attempting stop or restart Oracle VM Manager. Use the Oracle VM Manager Command Line Interface `show Job` command to monitor the progress of the VM migration job to determine when the job completes. For more information, see the [CLI Command Reference](#) section in the *Oracle VM Manager Command Line Interface User's Guide*.

To check the status of Oracle VM Manager:

```
# /sbin/service ovmm status
```

The `status` option returns whether the Oracle VM Manager service is running or stopped.

If the Oracle VM Manager [host computer](#) runs a full graphical desktop environment, you can also use the **Services** dialog to start and stop the CLI. From the **Applications** menu, select **System Settings > Server Settings > Services**. Or by running the following command in a terminal to display the **Services** dialog:

```
# /usr/bin/system-config-services
```

In the **Service Configuration** dialog, select `ovmm` to check the status, and start or stop it.

Instructions for Oracle VM Manager on Solaris for SPARC

When Oracle VM Manager is installed, it runs as a service that can be managed using the standard Solaris Service Management Facility (SMF) tools. Therefore, to obtain a report on the status of the service, you can simply use the `svcs` tool:

```
# svcs ovmm
```



Tip

You can use the `-l` to print a more detailed listing, including the full FMRI and restarter service paths.

Starting, stopping and restarting the service can be handled using the `svcadm` command. This can either be done on a temporary basis using the `-t` option, or can be enforced permanently to set the start-up behavior of the service.



Note

As of Oracle VM Release 3.4.5, a `check_migrate` option can be used with the `disable` or `restart` commands, allowing you to check for active VM migration jobs that are triggered by a server pool load balancing job. VM migration jobs of this type must be completed first before you stop or restart your Oracle VM Manager instance.

For example, to stop Oracle VM Manager from starting up on start-up, run the command:

```
# svcadm disable ovmm
```

To stop Oracle VM Manager from running temporarily:

```
# svcadm disable -t ovmm
```

To start Oracle VM Manager:

```
# svcadm enable ovmm
```

To restart Oracle VM Manager, provided that no migrations for load balancing are ongoing:

```
# svcadm restart ovmm check_migrate
```

7.6 Enabling the TLS Version 1 Protocol

As of Oracle VM Release 3.4.5, the SSL TLS version 1 (TLSv1) protocol is disabled within Oracle VM Manager for security reasons. By default, only connections using the TLSv1.2 protocol are accepted. As a result, management of Oracle VM Server for x86 at Release 3.2.10 or 3.2.11, and Oracle VM Agent for SPARC at Release 3.3.1, is not possible after the upgrade to Oracle VM Manager 3.4.5 or later release versions.

Although it is strongly recommended to upgrade your Oracle VM Servers to the latest release version, in Oracle VM Release 3.4.5 in it is possible to enable the management of Oracle VM Server for x86 at Release 3.2.10 or 3.2.11, and Oracle VM Agent for SPARC at Release 3.3.1. To do this, you must enable the TLSv1 protocol, which is less secure, as follows:



Important

As of Oracle VM Release 3.4.6, management of Oracle VM Server for x86 at Release 3.2.10 or 3.2.11, and Oracle VM Agent for SPARC at Release 3.3.1 is removed.

1. Start an ssh session to the Oracle VM Manager instance.
2. Open `/etc/sysconfig/ovmm` for editing and add the following line:

```
ALLOWTLS1=YES
```

3. Save and close `/etc/sysconfig/ovmm`.
4. Restart Oracle VM Manager for the setting to take effect:

```
# /sbin/service ovmm restart
```

When all your Oracle VM Servers have been upgraded to the latest release, it is recommended that you reset the security protocol in Oracle VM Manager to the default. Disable TLSv1 and revert to the TLSv1.2 protocol as follows:

1. Start an ssh session to the Oracle VM Manager instance.
2. Open `/etc/sysconfig/ovmm` for editing and remove the following line:

```
ALLOWTLS1=YES
```

3. Save and close `/etc/sysconfig/ovmm`.
4. Restart Oracle VM Manager for the setting to take effect:

```
# /sbin/service ovmm restart
```

7.7 Logging in to Oracle VM Manager

To open the Login page of Oracle VM Manager, enter the following address in a Web browser:

`https://hostname:port/ovm/console`

Where, *hostname* refers to the host name or IP address of the Oracle VM Manager host, and *port* refers to the port number on which Oracle VM Manager is listening.



Important

The *hostname* should match the fully qualified domain name or IP address that you configured during installation of Oracle VM Manager. The SSL certificate that was generated for HTTPS traffic is specific to this hostname. If you enter an alternate hostname or IP address, the SSL certificate may fail validation and you may see an error in your browser.



Note

In previous version of Oracle VM Manager unencrypted HTTP traffic was allowed by default. This has been disabled to always encrypt traffic using the Secure Sockets Layer (SSL). Therefore, you should always use *https* within the protocol portion of the URL to access the Oracle VM Manager.

To connect to Oracle VM Manager on a host named `myserver.example.com`, use:

`https://myserver.example.com:7002/ovm/console`



Important

You should ensure that if you are accessing Oracle VM Manager through a firewall, the firewall should be configured to allow TCP traffic on the port configured in Oracle VM Manager. By default, this is set to 7002.

Enter your Oracle VM Manager administration username (which is *admin* by default) in the **Username** field. This is the administration username you create during the Oracle VM Manager install. Enter the password for the Oracle VM Manager administration username in the **Password** field.



Warning

In addition to the default *admin* user, you can also log into Oracle VM Manager using other default accounts created by the Oracle VM Manager installer, namely:

- *OracleSystemUser*
- *weblogic*

Make sure the passwords for all accounts are secure. See [Oracle VM Manager Administrator Tool \(ovm_admin\)](#) in the *Oracle VM Administrator's Guide* for information on managing Oracle VM users and passwords.

Now you are logged in, you can create storage repositories, server pools, add Oracle VM Servers, and create virtual machines, import resources, and so on.

The user interface displays context sensitive information, relevant to the selection in the navigator and content panes. For further information on using the user interface, please refer to the [Oracle VM Manager Getting Started Guide](#) and the [Oracle VM Manager User's Guide](#).

7.8 Configuring JVM Memory Allocation for Oracle VM Manager

Some performance tuning is required in Oracle VM environments where you manage more than 80 instances of Oracle VM Server with a single instance of Oracle VM Manager. In these environments, you should increase JVM memory allocation to 8G and reduce the interval of statistics collection. See the following topics for more information:

- [Increasing the Memory Allocated to Oracle WebLogic Server](#) in the *Oracle VM Administrator's Guide*
- [Preferences](#) in the *Oracle VM Manager User's Guide*

Oracle Support can apply additional tuning configurations to optimize Oracle VM Manager performance, such as reducing the number of events that Oracle VM Manager processes. Contact Oracle Support for more information.

7.9 Administrative Changes

There are a number of systems administration tasks that may be performed at any time after you have completed your deployment. These include tasks such as changing the default self-signed SSL certificate that Oracle VM Manager uses, to a CA signed certificate of your own choosing, installing third-party Oracle VM Storage Connect plug-ins, or changing the Oracle VM Manager administrator password. These additional steps are discussed in the [Oracle VM Administrator's Guide](#).

Appendix A Appendix

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The appendix contains additional information for the Oracle VM installation process.

A.1 Setting Up PXE Boot for Oracle VM Server Release 3.4.1 and Release 3.4.2

If you are performing a PXE boot installation of Oracle VM Server Release 3.4.1 and Release 3.4.2, you should refer to the procedures in this section.

A.1.1 Setting up the GRUB2 Boot Loader

You must use the GRUB2 boot loader if you plan to perform PXE boot with UEFI-based PXE clients. You can also use the GRUB2 boot loader if your environment includes BIOS-based PXE clients as well as UEFI-based PXE clients.

A.1.1.1 Building the GRUB2 Boot Loader

Oracle VM Release 3.4.1 and Release 3.4.2 require you to build the boot loader for PXE clients.

You must mount the Oracle VM Server ISO image file and then build the GRUB2 boot loader.



Note

- Oracle Linux 7 or later provide the [grub2-tools](#) package that is required to build the GRUB2 boot loader. For this reason, you cannot build the GRUB2 boot loader on Oracle Linux 6 or earlier.
- The Oracle VM Server Release 3.4.1 and Release 3.4.2 ISO image files include a [grubx64.efi](#) boot loader in the [EFI/BOOT/](#) directory. However, this boot loader is configured for installing Oracle VM Server on UEFI-based systems directly from bootable physical media. You cannot use this boot loader to perform a PXE boot.

Build the GRUB2 boot loader as follows:

1. Place the contents of the Oracle VM Server ISO image file in a directory where you have write privileges, for example, on an Oracle Linux 7 system you could do the following:

```
# mkdir tmp
# cd tmp
# mkdir iso
# mount -o loop /tmp/OracleVM-Server.iso /iso
# mkdir iso-contents
# cp -p -R iso/* iso-contents/
```

2. Change to the following directory: [path/grub2/bin](#)

Substitute `path` with the path to the contents of the Oracle VM Server ISO image file on your file system. Following on from the example in step 1:

```
# cd iso-contents/grub2/bin/
```

3. Build the boot loader with the `grub2-mkimage` command.

- For BIOS-based PXE clients:

```
grub2-mkimage -O i386-pc-pxe -d ../lib/grub/i386-pc/ \
-o core.0 -p '(tftp)/grub2' pxe tftp
```

- For UEFI-based PXE clients:

```
grub2-mkimage -O x86_64-efi -d ../lib/grub/x86_64-efi/ \
-o core.efi -p '(tftp)/grub2' efinet tftp
```

In the preceding command example:

- `-O i386-pc-pxe|x86_64-efi` generates an image in the `i386` or `x86_64` format.
- `-d` specifies the directory where the GRUB2 images and modules reside.
- `-o` specifies the output file.
- `-p '(tftp)/grub2'` specifies that the `grub.cfg` boot loader configuration file, GRUB2 modules, and other required files reside in the `grub2` directory on the TFTP server.
- `pxe|efinet tftp` adds the GRUB2 `pxe` or `efinet` module and the `tftp` module.

A.1.1.2 Hosting the GRUB2 Boot Loader

Host the GRUB2 boot loader on the TFTP server so PXE clients can access it over the network, as follows:

1. Create a `grub2` directory in the TFTP root.
2. Copy the boot loader to the `grub2` directory.

- For BIOS-based PXE clients:

```
# cp -r path/grub2/bin/core.0 /tftpboot/grub2/
```

- For UEFI-based PXE clients:

```
# cp -r path/grub2/bin/core.efi /tftpboot/grub2/
```

Substitute `path` with the directory where you built the GRUB2 boot loader.

3. Copy the GRUB2 modules and files to the appropriate directory.

- For BIOS-based PXE clients:

```
# cp -r path/grub2/lib/grub/i386-pc/*.{lst,mod} /tftpboot/grub2/i386-pc
```

- For UEFI-based PXE clients:

```
# cp -r path/grub2/lib/grub/x86_64-efi/*.{lst,mod} /tftpboot/grub2/x86_64-efi
```

Substitute `path` with the path to the contents of the Oracle VM Server ISO image file on your file system.

A.1.1.3 Configuring the GRUB2 Boot Loader

You must create a `grub.cfg` boot loader configuration file on the TFTP server. You can use the same boot loader configuration file for both BIOS-based PXE clients and UEFI-based PXE clients.

Complete the following steps:

1. Create a `grub.cfg` file.

```
# touch /tftpboot/grub2/grub.cfg
```

2. Configure `grub.cfg` as appropriate. See [Example grub.cfg](#).

Example grub.cfg

The following is an example of `grub2/grub.cfg`:

```
set default="1"

function load_video {
    insmod efi_gop
    insmod efi_uga
    insmod video_bochs
    insmod video_cirrus
    insmod all_video
}

load_video
set gfxpayload=keep
insmod gzio
insmod part_gpt
insmod ext2

set timeout=60
### END /etc/grub.d/00_header ###

search --no-floppy --set=root -l 'Oracle VM Server'

### BEGIN /etc/grub.d/10_linux ###

menuentry 'Install Oracle VM Server' --class fedora --class gnu-linux --class gnu --class os {
    echo 'Loading Xen...'
    insmod multiboot2
    multiboot2 /tftpboot/ovs/xen.mn.efi dom0_mem=max:128G dom0_max_vcpus=20 noreboot
    echo 'Loading Linux Kernel...'
    # Note that the module2 statement must be a single line, the \ delimiter
    # indicates line breaks that you should remove
    module2 /tftpboot/ovs/vmlinuz ip=dhcp \
    repo=nfs:n.n.n.n:/srv/install/ovs \
    ks=nfs:n.n.n.n:/srv/install/kickstart/OVS_ks.config \
    ksdevice=eth0
    echo 'Loading initrd...'
    module2 /tftpboot/ovs/initrd.img
}
```

In the preceding example of `efi/grub.cfg`:

- Some parameters in `module2` statement are broken into separate lines with the `\` delimiter for readability purposes. A valid configuration contains all parameters and values in a single line.
- The Xen hypervisor is loaded first from `ovs/xen.mb.efi` in the TFTP server root.
- Limits are applied to dom0 for the installer to ensure that the installer is stable while it runs. This is achieved using the default parameters: `dom0_mem=max:128G` and `dom0_max_vcpus=20`.

- The installer kernel is located within the path `ovs/vmlinuz` in the TFTP server root.
- The IP address for the installer kernel is acquired using DHCP.
- You should substitute `n.n.n.n` with the IP address of the NFS or HTTP server that hosts the contents of the Oracle VM Server ISO image file.
- The `ksdevice` parameter specifies the network interface to use. You should specify a value that reflects your network configuration, such as `eth0`, a specific MAC address, or an appropriate keyword. Refer to the appropriate kickstart documentation for more information.
- The initial ramdisk image is located within the path `ovs/initrd.img` in the TFTP server root.

Glossary

C

control domain

A privileged domain that creates and manages other logical domains and services. This term is often used in SPARC environments to refer to domains that behave like dom0. The control domain is named [primary](#).

See Also: [domain](#)

See Also: [dom0](#)

See Also: [domU](#)

D

dom0

An abbreviation for *domain zero*. The management domain with privileged access to the hardware and device drivers. Dom0 is the first domain started at boot time. Dom0 has more privileges than domU. It can access the hardware directly and can manage the device drivers for other domains. It can also start new domains.

See Also: [control domain](#)

domain

A configurable set of resources, including memory, virtual CPUs, network devices and disk devices, in which virtual machines run. A domain is granted virtual resources and can be started, stopped and rebooted independently.

See Also: [dom0](#)

See Also: [domU](#)

See Also: [control domain](#)

domU

An unprivileged domain with no direct access to the hardware or device drivers. Each domU is started by dom0.

G

GPG key

The GPG key (or GnuPG key) is the key used in the GNU project's implementation of the OpenPGP key management standard. The GPG key is used to check the validity of a YUM repository, and any packages (RPMs) downloaded from the repository.

guest

A guest operating system that runs within a domain in Oracle VM Server. A guest may be paravirtualized or hardware virtualized. Multiple guests can run on the same Oracle VM Server.

H

hardware virtualized machine (HVM)

A hardware virtualized guest runs on the virtualization platform as it would on a physical host. Because the device drivers of the hardware virtualized guest are emulated, dom0 must contain device emulation code to support the guest's device drivers. The other types of privileged instructions issued by the hardware virtualized guest, for

example, for CPU or memory access, are not emulated, but are trapped, which also requires support from CPU vendors.

The guest's OS does not require any modification to run as a hardware virtualized guest.

A virtual machine with an unmodified guest operating system. It is not recompiled for the virtual environment. There may be substantial performance penalties running as a hardware virtualized guest. Enables Microsoft Windows™™ operating system to be run, as well as legacy operating systems. Hardware virtualization is only available on Intel® VT or AMD SVM CPUs.

high availability

High availability (HA) help ensure the uninterrupted availability of a virtual machine. If HA is configured for your virtual machine, and if the Oracle VM Server on which it is running fails or shuts down, the virtual machine is restarted on another available Oracle VM Server in the server pool. The server pool must be clustered. You must enable high availability for both the server pool and the virtual machine.

host computer

The physical computer on which the software is installed. Typically used to refer to either the computer on which Oracle VM Server or Oracle VM Manager is running.

L

live migration

Live migration is a process to move a running virtual machine from one Oracle VM Server to another, while applications on the existing virtual machine continue to run. You can only live migrate virtual machines from one Oracle VM Server to another within the same server pool.

M

migrate

The act of moving a virtual machine from one Oracle VM Server to another, or to the Unassigned Virtual Machines folder. Technically, a migration can only be performed on a running virtual machine, however the Oracle VM Manager Web Interface and Oracle VM Manager Command Line Interface may combine multiple operations to make it appear that you can perform a migration on either a running or a stopped virtual machine.

O

OCFS2

Oracle Cluster File System (OCFS2) is a general-purpose shared-disk cluster file system for Linux capable of providing both high performance and high availability. OCFS2 is developed by Oracle and is integrated within the mainstream Linux kernel. OCFS2 is used within Oracle VM to facilitate clustered server pools, storage of virtual machine images and for the purpose of allowing guests to share the same file system.

A clustered server pool always uses an OCFS2 file system to store the cluster configuration and to take advantage of OCFS2's heartbeat facility. There are two types of heartbeats used in OCFS2 to ensure high availability:

- The disk heartbeat: all Oracle VM Servers in the cluster write a time stamp to the server pool file system device.
- The network heartbeat: all Oracle VM Servers communicate through the network to signal to each other that every cluster member is alive.

These heartbeat functions exist directly within the kernel and are fundamental to the clustering functionality that Oracle VM offers for server pools. The server pool file system should be stored on a separate NFS server or on a small LUN if possible, as OCFS2's heartbeat facility can be disturbed by intensive I/O operations taking place on the same physical storage.

A storage repository configured on a LUN-based repository must be linked to a clustered server pool due to the nature of the OCFS2 file system. As a result, LUN-based repositories cannot be shared between multiple server pools, although it is possible to move an OCFS2 repository from one server pool to another.

For more information on OCFS2, please refer to <https://oss.oracle.com/projects/ocfs2/>.

Oracle VM Agent

An application installed with Oracle VM Server. The Oracle VM Agent receives and processes management requests, and provides event notifications and configuration data to the Oracle VM Manager. Oracle VM Manager manages the virtual machines running on Oracle VM Server by communicating with Oracle VM Agent. It contains three components: master Oracle VM Server, Utility Server, and Virtual Machine Server.

Oracle VM Manager

Oracle VM Manager is the management platform, which offers an easy-to-use, web-browser interface as well as a command-line interface (CLI). Oracle VM Manager tracks and manages the resources available in your virtual environment and allows you to easily manage Oracle VM Server pools. Oracle VM Manager lets you manage the virtual machine life cycle, including creating virtual machines from templates or from installation media, deleting, powering off, uploading, deployment and live migration of virtual machines. Oracle VM Manager also lets you manage resources including ISO files, templates and shared virtual disks.

Oracle VM Server

A self-contained virtualization environment designed to provide a lightweight, secure, server-based platform for running virtual machines. The Oracle VM Server comprises a hypervisor and a privileged domain (called dom0) that allow multiple domains or guest operation systems (such as Linux, Solaris, and Windows) to run on one physical machine. Includes Oracle VM Agent to enable communication with Oracle VM Manager.

The Oracle VM Server for x86 incorporates an open source Xen hypervisor component, which has been customized and optimized to integrate into the larger, Oracle - developed virtualization server. The Oracle VM Server for x86 is also responsible for access and security management and generally acts as the server administrative entity, because the hypervisor's role is limited.

On Oracle VM Server for SPARC systems, the SPARC hypervisor is built into the SPARC firmware and is generally referred to as the Logical Domains Manager. As with the Xen hypervisor, each virtual machine is securely executed on a single computer and runs its own guest Oracle Solaris operating system

S

server pool

Server pools logically organize one or more Oracle VM Servers into groups where virtual machines can run.

Each server pool can have up to 32 physical servers. Each Oracle VM Server can be a member of only one server pool. The server pool is the operational unit of Oracle VM. Policies are configured and enforced at the server pool level.

A minimum cluster of three Oracle VM Server nodes in each server pool is strongly recommended for high availability. If one node in the cluster experiences a hardware failure or is shut down for maintenance, failover redundancy is preserved with the other two nodes. Having a third node in the cluster also provides reserve capacity for production load requirements.

V

virtual machine (VM)

A guest operating system and the associated application software that runs within Oracle VM Server. May be paravirtualized or hardware virtualized machines. Multiple virtual machines can run on the same Oracle VM Server.

VLAN

A layer-2 network may be segregated into partitions, at the switch or router, so that network traffic is isolated to a distinct broadcast domain. VLANs can be tagged so that a trunk can transport data for all of the different VLANs in a network.

VLANs are commonly used in large networks to help simplify network design, provide mechanisms to achieve better scalability, and to improve security.

W

WebLogic

Oracle WebLogic Server is a platform that includes an application server that can run java applications within a web-based framework. Oracle VM Manager runs as an application within Oracle WebLogic Server, taking advantage of many of Oracle WebLogic Server's many features to deliver a robust web UI through which Oracle VM can be fully managed.

The installation process behind Oracle VM Manager automatically installs and configures Oracle WebLogic Server on the system where Oracle VM Manager is installed. During this process, a *weblogic* user is set up within Oracle WebLogic Server to manage Oracle WebLogic Server configuration and to administer the underlying system. An *admin* user is also set up within Oracle WebLogic Server and is given permission to access the Oracle VM Manager application. A typical setup uses the same password for both of these users, although this is not always the case and it is possible to configure a different password for each user depending on your requirements.

In general, users of the Oracle VM Manager application should avoid attempting to access the underlying Oracle WebLogic Server, or to change any configuration parameters here without guidance from Oracle Support.

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