Oracle® VM

Release Notes for 3.4.6

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Preface

The Oracle VM Release Notes contain information on Oracle VM Release 3.4 and supersedes the product documentation. This document contains last-minute information that could not be included the Oracle VM documentation. Read this document before installing Oracle VM. This document may be updated after it is released. To check for updates to this document, and to view other Oracle documentation, refer to the Documentation section on the Oracle Technology Network (OTN) Web site:

http://www.oracle.com/technology/documentation/

The release notes provided for each subsequent release of Oracle VM are published as individual documents at the time that the release is made available. You should check that you are referring the correct document for the release that you are interested in. The release notes for each of the Oracle VM 3.4.x releases is available at:

http://download.oracle.com/docs/cd/E64076_01

This document is intended for users, and administrators of Oracle VM. It includes describes potential issues and the corresponding workarounds you may encounter while using Oracle VM.

Oracle recommends that you read this document before installing and using Oracle VM.

Audience

This document is intended for Oracle VM administrators with privileged access to the physical and virtual resources of the Oracle VM environment. This guide assumes that you have an in depth knowledge of Oracle VM (see the *Oracle VM Manager User's Guide*), and that you are familiar with Oracle Linux system administration and Linux command line operation.

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 Licensing Information User Manual*

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:
	
	`dd if=/dev/rdsk/c0t1d0s6 of=/dev/rst0 bs=10b \`
	`count=10000`

braces { }	Braces indicate required items: `.DEFINE {macro1}`
brackets [ ]	Brackets indicate optional items: `cvtcrt termname [outfile]`
ellipses ...	Ellipses indicate an arbitrary number of similar items: `CHKVAL fieldname value1 value2 ... valueN`
italics	Italic type indicates a variable. Substitute a value for the variable: `library_name`
vertical line |	A vertical line indicates a choice within braces or brackets: `FILE filesize [K|M]`
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: `create Tag name=MyTag description="HR/'s VMs"`

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.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at
https://www.oracle.com/corporate/accessibility/.

Access to Oracle Support

Oracle customers that have purchased support have access to electronic support through My Oracle Support. For information, visit
https://www.oracle.com/corporate/accessibility/learning-support.html#support-tab.

Diversity and Inclusion

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

Chapter 1 Introduction

Oracle VM is a platform that provides a fully equipped environment for better leveraging the benefits of virtualization technology. Oracle VM enables you to deploy operating systems and application software within a supported virtualization environment. The components of Oracle VM are as follows:

Oracle VM Server for x86

Oracle VM Server for x86 (Oracle VM Server) is a self-contained virtualization environment designed to provide a lightweight, secure, server-based platform to run virtual machines on x86 hardware. Oracle VM Server is based upon an updated version of the underlying Xen hypervisor technology, and includes Oracle VM Agent. It also includes a Linux kernel with support for a broad array of devices and file systems. The Linux kernel is run as Dom0 to manage one or more DomU virtual machines, each of which could be Linux, Oracle Solaris, or Microsoft Windows.

Oracle VM Server for SPARC

Oracle VM Server for SPARC (previously called Sun Logical Domains) is Oracle's server virtualization and partitioning technology on SPARC servers. Oracle VM Server for SPARC leverages the SPARC hypervisor to subdivide supported platforms' resources (CPUs, memory, I/O, and storage) by creating logical domains, also called virtual machines, to take advantage of the massive thread scale offered by SPARC servers and the Oracle Solaris operating system.

Oracle VM Manager

Oracle VM Manager is a server side component that allows you to configure and manage your Oracle VM environment. Oracle VM Manager includes both a command line interface and a web-based user interface, which is a standard Application Development Framework (ADF) web application. Oracle VM Manager provides virtual machine management facilities, including creating virtual machines from installation media or from templates. It provides features such as power on, power off, deleting, importing, deploying, and live migration of virtual machines. Oracle VM Manager also manages resources, including ISO files, virtual machine templates, and shared virtual disks.

This document sets out to describe items of interest and relevance to the current release of Oracle VM. The release notes provided for each subsequent release of Oracle VM are published as individual documents at the time that the release is made available. You should check that you are referring to the correct document for the release that you are interested in. The release notes for each of the Oracle VM 3.4.x releases is available at:

http://download.oracle.com/docs/cd/E64076_01

> **Note**
>
> This errata update for Oracle VM Release 3.4 provides complete installation packages for Oracle VM Manager and Oracle VM Server. Starting with Oracle VM 3.4.6, the latest versions of these two components will be driven by the build number (for example, 3.4.6-21xx). The Oracle VM Server version stays at 3.4.6-2105 with the latest package updates posted to the Unbreakable Linux Network (ULN) channels and Yum repositories. Each errata update for Oracle VM includes all cumulative enhancements, bug fixes, and security updates since Oracle VM Release 3.4.1.

Chapter 2 Installing and Upgrading Oracle VM

The *Oracle VM Installation and Upgrade Guide* explains how to install and upgrade Oracle VM. For instructions on:

- Installing Oracle VM Server, see Installing Oracle VM Server.

- Installing Oracle VM Manager, see Installing Oracle VM Manager.

- Upgrading between Oracle VM 3.x releases, see Upgrading Oracle VM.

Restrictions for Upgrading

You can upgrade Oracle VM between 3.*x* Releases only; for example, upgrading from Oracle VM Release 3.3.1 to 3.4.1. You cannot upgrade from a Release 2.*x* to a Release 3.*x*, however. In this case, you must reinstall Oracle VM Servers and Oracle VM Manager.

Upgrading versions of Oracle VM Manager that are using an Oracle XE database as a back end repository is not supported in this release, as the Oracle XE database is no longer supported under Oracle VM. If you are currently running an Oracle XE database for an existing installation of Oracle VM Manager, you must migrate the Oracle XE database to Oracle SE or Oracle EE before performing an upgrade to Release 3.4.

As of Release 3.4.5, Oracle VM Manager uses the TLSv1.2 protocol as the default to secure all connections. 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 by default. When upgrading to Release 3.4.5, you need to temporarily enable TLSv1 until all Oracle VM Servers have been upgraded to the latest version. For instructions to enable TLSv1, and revert to the default and more secure TLSv1.2 protocol, see Enabling the TLS Version 1 Protocol in the *Oracle VM 3.4 Installation and Upgrade guide*.

As of 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. For more information, see Upgrading Oracle VM Server from Release 3.2.10 and Upgrading from Oracle VM Agent for SPARC Release 3.3.x or Between 3.4.x Errata Releases in the *Oracle VM 3.4 Installation and Upgrade guide*.

Starting with Oracle VM Manager 3.4.6, installations on Oracle Linux 5 or Red Hat Enterprise Linux 5 are no longer supported.

Chapter 3 What's New in Oracle VM?

Table of Contents

Review the new features and enhancements in each release of Oracle VM.

3.1 What's New in Oracle VM Release 3.4.6.3?

Oracle VM Release 3.4.6.3 includes features, enhancements, and security updates that were included in previous 3.4.x errata releases.

New features and enhancements included in Oracle VM Release 3.4.6.3 are as follows.

New Release Process

Oracle VM Changes to the Release Process	Oracle VM Release 3.4.6.3 continues to follow the release model introduced in Oracle VM Release 3.4.6.1, resulting in the following changes to the release process from earlier Oracle VM releases:

- Oracle VM Manager and Oracle VM Agent for SPARC are released as new build versions, while Oracle VM Server stays at build version 3.4.6-2105 with new packages being made available on the appropriate Oracle VM ULN channels and yum repositories.

- The latest versions of the Oracle VM Manager and Oracle VM Agent for SPARC can be downloaded from the Oracle Software Delivery Cloud (OSDC), My Oracle Support (MOS) or Oracle Technology Network (OTN).

- For Oracle VM Server, you must ensure that you have installed build version 3.4.6-2105 and have updated the packages using the appropriate Oracle VM ULN channels or yum repositories.

Usability

New in Release 3.4.6.3 is the Oracle VM Exporter Appliance utility which you can use to export hardware virtual machines and paravirtual hardware virtual machines from Oracle VM to Oracle Cloud Infrastructure in a few easy steps. For more information about Oracle VM Exporter Appliance, see:

- How Can a Virtual Machine be Moved or Migrated? in the *Oracle VM Concepts Guide*

- Installing and Configuring the Oracle VM Exporter Appliance in the *Oracle VM Administrator's Guide*

- Export to Oracle Cloud Infrastructure Using Oracle VM Exporter Appliance in the *Oracle VM Manager User's Guide*

- Chapter 10, *Known Limitations and Workarounds for Oracle VM Exporter Appliance* in the *Oracle VM Release Notes*

Security

Security updates included

Security updates included in this errata update release are as follows:

- **MySQL patch update:** This release of Oracle VM includes the April 2020 Critical Patch Update for MySQL. (30766032)

- **Oracle WebLogic Server patch updates:** This release of Oracle VM includes the April 2020 Critical Patch Update for Oracle WebLogic Server. (30766022)

- **Oracle Java 7 patch update:** This release of Oracle VM includes the April 2020 Critical Patch Update for Java. (30766027)

- **Oracle Java 8 patch update:** This release of Oracle VM includes the April 2020 Critical Patch Update for Java. (31202655)

- **Third party code:** This release of Oracle VM Manager includes updates for a number of a third party packages.

3.2 What's New in Oracle VM Release 3.4.6.2?

Oracle VM Release 3.4.6.2 includes features, enhancements, and security updates that were included in previous 3.4.x errata releases.

New features and enhancements included in Oracle VM Release 3.4.6.2 are as follows:

New Release Process

Oracle VM Changes to the Release Process

Oracle VM Release 3.4.6.2 continues to follow the release model introduced in Oracle VM Release 3.4.6.1, resulting in the following changes to the release process from earlier Oracle VM releases:

- Oracle VM Manager and Oracle VM Agent for SPARC are released as new build versions, while Oracle VM Server stays at build version 3.4.6-2105 with new packages being made available on the appropriate Oracle VM ULN channels and yum repositories.

- The latest versions of the Oracle VM Manager and Oracle VM Agent for SPARC can be downloaded from the Oracle Software Delivery Cloud (OSDC), My Oracle Support (MOS) or Oracle Technology Network (OTN).

- For Oracle VM Server, you must ensure that you have installed build version 3.4.6-2105 and have updated the packages using the appropriate Oracle VM ULN channels or yum repositories.

Documentation

The following changes apply to the Oracle VM 3.4 documentation library:

- Information has been added to the Oracle VM Installation and Upgrade Guide about Oracle VM Manager Release 3.4.6 (and later releases) no longer being supported on Oracle Linux 5 installations. For more information, see Chapter 2, *Installing and Upgrading Oracle VM* and the notes in Operating Systems in the *Oracle VM Installation and Upgrade Guide.* (29856593)

- A note has been updated in the Oracle VM Manager User's Guide to describe the revised error message that is displayed when the maximum memory size value does not equal the value specified for the memory size value for HVM and PVHVM guests. For more information, see Create Virtual Machine in the *Oracle VM Manager User's Guide.* (28320709)

Infrastructure

Support for Oracle Linux 8.*x*, Red Hat Enterprise Linux 8.*x*, and CentOS 8.*x*	As of this release, Oracle VM supports Oracle Linux 8.*x*, Red Hat Enterprise Linux 8.*x*, and CentOS 8.*x* guest operating systems. (30096578) See Chapter 5, *Supported Guest Operating Systems.*
Support for Microsoft Windows Server 2019	As of this release, Oracle VM supports Microsoft Windows Server 2019 guest operating systems. (30361971) See Chapter 5, *Supported Guest Operating Systems.*

Security

Security updates included   Security updates included in this errata update release are as follows:

- **MySQL patch update:** This release of Oracle VM includes the October 2019 Critical Patch Update for MySQL. (30212413)

- **Oracle WebLogic Server patch updates:** This release of Oracle VM includes the October 2019 Critical Patch Update for Oracle WebLogic Server. (30212407)

- **Oracle Java patch update:** This release of Oracle VM includes the October 2019 Critical Patch Update for Java. (30212408)

- **Third party code:** This release of Oracle VM Manager includes updates for a number of a third party packages.

3.3 What's New in Oracle VM Release 3.4.6.1?

Oracle VM Release 3.4.6.1 includes features, enhancements, and security updates that were included in previous 3.4.*x* errata releases.

New features and enhancements included in Oracle VM Release 3.4.6.1 are as follows:

New Release Process

Oracle VM Changes to the Release Process	A new release model has been put in place for Oracle VM Release 3.4.6.1, resulting in the following changes to the release process:

- Oracle VM Manager and Oracle VM Agent for SPARC are released as new build versions, while Oracle VM Server stays at build version 3.4.6-2105 with new packages being made available on the appropriate Oracle VM ULN channels and yum repositories.

- The latest versions of the Oracle VM Manager and Oracle VM Agent for SPARC can be downloaded from the Oracle Software Delivery

Cloud (OSDC), My Oracle Support (MOS) or Oracle Technology Network (OTN).

- For Oracle VM Server, you must ensure that you have installed build version 3.4.6-2105 and have updated the packages using the appropriate Oracle VM ULN channels or yum repositories.

Security

Security updates included

Security updates included in this errata update release are as follows:

- **MySQL patch update:** This release of Oracle VM includes the April 2019 Critical Patch Update for MySQL. (29515159)

- **Oracle WebLogic Server patch updates:** This release of Oracle VM includes the April 2019 Critical Patch Update for Oracle WebLogic Server and the Overlay Patch to address CVE-2019-2725. (29515018 and 29713285)

- **Oracle Java patch update:** This release of Oracle VM includes the April 2019 Critical Patch Update for Java. (29515182)

- **Third party code:** This release of Oracle VM Manager includes updates for a number of a third party packages.

3.4 What's New in Oracle VM Release 3.4.6?

Oracle VM Release 3.4.6 includes features, enhancements, and security updates that were included in previous 3.4.*x* errata releases.

New features and enhancements included in Oracle VM Release 3.4.6 are as follows:

Infrastructure

Oracle VM Agent for SPARC Support for Oracle Solaris 11.4

The Oracle VM Agent for SPARC has been updated to support Oracle Solaris 11.4. For more information, refer to the *Oracle VM Installation and Upgrade Guide*.

Update to the dom0 Kernel

The dom0 kernel for Oracle VM Server is updated to the latest Unbreakable Enterprise Kernel Release 4 Update 7 (UEK R4 U7) in this release. See the UEK R4 U7 Release Notes for information on new features and updates: Release Notes for Unbreakable Enterprise Kernel Release 4 Update 7.

Ksplice

Support for Ksplice patching for Xen and user space

Oracle VM Server now supports Ksplice patching for the Xen hypervisor and critical user space packages. This product enhancement extends the Ksplice kernel patching support already offered on the Oracle VM Server to cover the following Oracle VM components:

- Xen hypervisor

- glibc

- OpenSSL

- QEMU

  Oracle Ksplice technology allows you to update systems with new security errata (CVE) patches without the need to reboot. This enables you to remain current with operating system vulnerability patches while minimizing downtime. For additional information, see Updating Oracle VM Server with Oracle Ksplice in the *Oracle VM Administrator's Guide*

Usability

New User-Defined Validity in Months Option for Self-Signed SSL Certificates

A new `Validity in Months` option is now available when generating a new SSL certificate, allowing you to set the validity period for a self-signed SSL certificate in months. The default is 120 months (10 years). For more information, see Generating a New SSL Key in the Oracle VM Administrator's Guide.

New Option to Change the Location of a Running Virtual Machine

A new `Move this VM to a different Repository` option is now available to move a `vm.cfg` file from one repository to another while the virtual machine is in running state by creating an empty clone customizer. For more information, see Migrate or Move Virtual Machines in the Oracle VM Manager User's Guide.

Increased Virtual CPU Configuration Limit for HVM and PVHVM

The Virtual CPU limit has been increased to 64 for HVM Microsoft Windows guests and for PVHVM, if using Oracle VM Paravirtual Drivers for Microsoft Windows. For more information, see Table 7.3, "Virtual Machine Maximums".

Deprecated Features

Oracle VM Release 3.4.6 Deprecated Features

For information about features that have been deprecated or removed in Oracle VM Release 3.4.6, see Chapter 8, *Deprecated and Removed Oracle VM Features* in the Oracle VM Release Notes.

Security

Security updates included   Security updates included in this errata update release are as follows:

- **Oracle MySQL patch update:** This release of Oracle VM includes the October 2018 Critical Patch Update for MySQL. (28328418)

- **Oracle WebLogic patch update:** This release of Oracle VM includes the October 2018 Critical Patch Update for WebLogic. (28328407)

- **Oracle Java patch update:** This release of Oracle VM includes the October 2018 Critical Patch Update for Java. (28328428)

- **Xen security advisories:** The following Xen security advisories are included in this release:

  - XSA-263 (CVE-2018-3639)

  - XSA-267 (CVE-2018-3665)

- XSA-273 (CVE-2018-3620, CVE-2018-3646)

- XSA-282

3.5 What's New in Oracle VM Release 3.4.5?

Oracle VM Release 3.4.5 includes features, enhancements, and security updates that were included in previous 3.4.*x* errata releases.

New features and enhancements included in Oracle VM Release 3.4.5 are as follows:

Infrastructure

Update to the dom0 Kernel	The dom0 kernel for Oracle VM Server is updated to Unbreakable Enterprise Kernel Release 4 Update 7 (UEK R4 U7) in this release. See the UEK R4 U7 Release Notes for information on new features and updates: https://docs.oracle.com/cd/E93554_01/E94694/html/index.html.
Update to Boot Protocol Support for Xen	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.
Package Additions and Updates	The full list of package additions and updates is beyond the scope of this document, but the following list includes the notable package updates that are included in this release:

- cloud-init-0.7.5-8.0.1.el6_9.x86_64.rpm

- oswatcher-7.3.3-3.el6.x86_64.rpm

- boost-filesystem-1.41.0-28.el6.x86_64.rpm

- boost-regex-1.41.0-28.el6.x86_64.rpm

- boost-python-1.41.0-28.el6.x86_64.rpm

- libyaml-0.1.3-4.el6_6.x86_64.rpm

- PyYAML-3.10-3.1.el6.x86_64.rpm

- oracle-ofed-release-1.0.0-41.el6.x86_64.rpm

Several other user space packages were also updated to align with the latest Oracle Linux 6 Update 9 versions, or to resolve dependencies.

Performance and Scalability

Increased Performance for Microsoft Windows guest operating systems	This release provides the ability to enable the exposure of Windows virtualization (also referred to as viridian) compatible entitlements to Microsoft Windows guest operating systems. Enabling viridian support is strongly recommended to ensure improved performance for all Microsoft Windows guest operating systems. For more information about how to enable this support, see Create Virtual Machine in the Oracle VM Manager User's Guide.

Hybrid Columnar Compression Support

As of this release, Oracle VM provides support for Hybrid Columnar Compression (HCC) on Oracle Database Release 18c with Oracle ZFS Storage Appliance and Oracle FS1 Series Flash Storage Systems. Hybrid Columnar Compression is an Oracle Database compression technology that enables the highest levels of data compression and provides cost savings and performance improvements due to reduced I/O.

Note

The following RPM packages are required for Oracle VM to provide support for Hybrid Columnar Compression (HCC) on Oracle Database Release 18c:

- The `ovmport-1.0-8.el6.x86_64.rpm` package must be installed on the Oracle VM Server instance. This package is included by default with the Oracle VM Server Release 3.4.5 ISO.

- The `libxenstore` and `libxenstore-devel` packages must be installed on the Oracle Linux 6 or 7 guest. These packages are available from the addons channel for the Oracle Linux Yum Server.

For more information, see the Hybrid Columnar Compression section of the *Oracle Database Concepts* guide for Oracle Database Release 18c.

Usability

Additional VM Migration Check Added to Oracle VM Manager Stop and Restart Options

A `check_migrate` option is now available for use with the Oracle VM Manager stop and restart commands, allowing you to check for active VM migration jobs that are triggered by a server pool load balancing job. For more information, see Starting and Stopping Oracle VM Manager in the *Oracle VM Installation and Upgrade Guide*.

New Start Policy Available for Virtual Machines

A new virtual machine start policy called **Balance Server** is now available for selection when creating or editing a server pool or virtual machine. Virtual machines can be started on the best available Oracle VM Server as determined by CPU and memory utilizations, with CPU utilization taking precedence over memory utilization. This ensures that virtual machines are evenly distributed amongst all Oracle VM Servers in the server pool, starting with the least utilized Oracle VM Server first. For more information, see Servers and VMs Tab in the *Oracle VM Manager User's Guide*.

New LIP Scan Option for Fibre Channel Storage Arrays

A Loop Initialization Protocol (LIP) scan is now optional and can be enabled when modifying an Unmanaged FibreChannel Storage Array. A LIP issued to an Oracle VM Server connected to a fabric causes the Host Bus Adapter (HBA) driver to reset the SCSI bus and as a result, may also cause the target to reset. Disabling a LIP scan for an Unmanaged FibreChannel Storage Array may result in faster times

for storage array refreshes when configuring a new SCSI target on a Fibre Channel interconnect. For more information, see the Storage Tab section in the *Oracle VM Manager User's Guide* and the CLI Command Reference section in the *Oracle VM Manager Command Line Interface User's Guide* .

Server Upgrade Warning Events Displayed with Blue Icon

After an Oracle VM Manager upgrade, there are warning events associated with each Oracle VM Server that has not yet been upgraded to the latest version. Oracle recommends that you upgrade to the latest version of Oracle VM Server at your earliest convenience, but it is not a strict requirement. Previously, both warnings and errors were displayed in the Events perspective of the Oracle VM Manager Web Interface with the same red icon, although in practice there is a clear difference in severity level and priority. As of this release, the warning events for Oracle VM Servers requiring upgrade are displayed with a blue icon, to make them visually distinguishable.

Documentation

New Section Listing Oracle VM Release 3.4 Deprecated Features

As of Oracle VM Release 3.4.5, a new section called Chapter 8, *Deprecated and Removed Oracle VM Features* has been added to the Oracle VM Release Notes. This can be used to track features that have been deprecated and removed for current and previous Oracle VM Release 3.4.x release.

Security

Support for TLS Version 1.2 Protocol	As of this release, Oracle VM Manager uses the TLSv1.2 protocol for all connections to ensure enhanced security protection. 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 by default. It is strongly recommended to upgrade your Oracle VM Server instances to the latest version, but if this is not possible, you can enable the TLSv1 protocol, which is less secure. For instructions, see Enabling the TLS Version 1 Protocol in the *Oracle VM 3.4 Installation and Upgrade guide.*

Xen 4.4.x Performance and Scalability Updates

- **Idle Driver Updates:** The mwait idle driver has been improved to make use of deeper C-states on Broadwell and Skylake platforms. In addition, turbo boost works properly when C-states are in use.

- **Better ACPI Handling:** ACPI handling has been improved to enable turbo boost functionality on Oracle Server X7 based platforms.

- **Improved Memory Scrubbing:** The scrubbing mechanism allows better handling of memory assigned to a domain close to the host boundaries. This prevents out-of-memory issues when guest-driven reboots occur.

- **APICv Support:** On platforms that support it, APICv is exposed, allowing guests to use native MSI-X handling for PCI devices, instead of pirqs. This results in a latency improvement of approximately 10 percent for certain workloads.

Security updates included   Security updates included in this errata update release are as follows:

- **Oracle MySQL patch update:** This release of Oracle VM includes the April 2018 Critical Patch Update for MySQL. (26836018)

- **Oracle WebLogic patch update:** This release of Oracle VM includes the April 2018 Critical Patch Update for WebLogic. (26835998)

- **Oracle Java patch update:** This release of Oracle VM includes the April 2018 Critical Patch Update for Java. (26836007)

- **Xen security advisories:** The following Xen security advisories are included in this release:

  - XSA-231 (CVE-2017-14316)

  - XSA-233 (CVE-2017-14317)

  - XSA-234 (CVE-2017-14319)

  - XSA-236 (CVE-2017-15597)

  - XSA-237 (CVE-2017-15590)

  - XSA-239 (CVE-2017-15589)

  - XSA-240 (CVE-2017-15595)

  - XSA-241 (CVE-2017-15588)

  - XSA-242 (CVE-2017-15593)

  - XSA-243 (CVE-2017-15592)

  - XSA-244 (CVE-2017-15594)

  - XSA-246 (CVE-2017-17044)

  - XSA-247 (CVE-2017-17045)

  - XSA-248 (CVE-2017-17566)

  - XSA-249 (CVE-2017-17563)

  - XSA-250 (CVE-2017-17564)

  - XSA-251 (CVE-2017-17565)

  - XSA-252 (CVE-2018-7540)

  - XSA-254 (CVE-2017-5753, CVE-2017-5715, CVE-2017-5754)

  - XSA-255 (CVE-2018-7541)

  - XSA-260 (CVE-2018-8897)

  - XSA-261 (CVE-2018-10982)

  - XSA-262 (CVE-2018-10981)

3.6 What's New in Oracle VM Release 3.4.4?

Oracle VM Release 3.4.4 includes features, enhancements, and security updates that were included in previous 3.4.x errata releases.

New features and enhancements included in Oracle VM Release 3.4.4 are as follows:

Infrastructure

Support for Microsoft Windows Server 2016	As of this release, Oracle VM supports Microsoft Windows Server 2016 guest operating systems. See Chapter 5, *Supported Guest Operating Systems*.
Update to the dom0 Kernel	The dom0 kernel for Oracle VM Server is updated to Unbreakable Enterprise Kernel Release 4 Update 4 (UEK R4 U4) in this release. See the UEK R4 U4 Release Notes for information on new features and updates: https://docs.oracle.com/cd/E52668_01/E86280/html/index.html.
Support for Skylake processors	Oracle VM provides improved support for servers that use Skylake processors, including the Intel® Xeon® E3 v5, Intel® Xeon® Platinum 8100, Intel® Xeon® Gold 6100, Intel® Xeon® Gold 5100, Intel® Xeon® Silver 4100 and Intel® Xeon® Bronze 3100 families of processors. This support is available as part of the dom0 kernel update to UEK R4 U4.

Package Additions and Updates

The full list of package additions and updates is beyond the scope of this document, but the following list includes the notable package updates that are included in this release:

- This release adds the `network-scripts-vxlan` package.

- The `device-mapper-multipath`, `kpartx`, and `udev` packages are updated as follows:

  - `device-mapper-multipath-libs-0.4.9-100.0.3.el6.x86_64`

  - `device-mapper-multipath-0.4.9-100.0.3.el6.x86_64`

  - `kpartx-0.4.9-100.0.3.el6.x86_64`

  - `libgudev1-147-2.73.0.1.el6_8.2.x86_64`

  - `libudev-147-2.73.0.1.el6_8.2.x86_64`

  - `udev-147-2.73.0.1.el6_8.2.x86_64`

- The `irqbalance` package is updated to `irqbalance-1.0.9-2.0.1.el6.x86_64`.

Performance and Scalability

Increased Performance for Oracle VM	This release provides several enhancements to increase the performance of Oracle VM. These enhancements enable Oracle VM to utilize fewer resources and improve performance measurements such as input/output operations per second (IOPs).
Xen 4.4.4 Performance and Scalability Updates	- **Update to netfront and netback drivers:** Along with UEK R4 U4, this release of Oracle VM delivers updates to the netfront and netback drivers.
	-

Improved grant locking: Xen-netback multi-queue improvements take advantage of grant locking enhancements that are now available in Oracle VM Server Release 3.4.4.

- **Improved guest performance by recycling grants:** With both host and guest virtual machines using the latest dom0 kernel version UEK R4 U4, network and database performance is enhanced by recycling grants, resulting in improved guest virtual machine performance.

Usability

CentOS is now listed as a supported guest OS type in Oracle VM

Oracle VM now displays CentOS as a supported guest operating system in the Oracle VM Manager Web Interface, Oracle VM Manager Command Line Interface, and Oracle VM Web Services API.

Documentation

New Location for the Oracle VM Paravirtual Drivers for Microsoft Windows Documentation

As of Oracle VM Release 3.4.4, the Oracle VM Paravirtual Drivers for Microsoft Windows documentation has moved to a new library location: http://docs.oracle.com/cd/E88077_01/index.html.

> **Note**
>
> Oracle VM Release 3.4, Release 3.3, and Release 3.2 library pages are updated with a *Related Documentation* section that includes a link to the Oracle VM Paravirtual Drivers for Microsoft Windows library. For example, see http://docs.oracle.com/cd/E64076_01/index.html.

Security

Security updates included in this errata update release are as follows:

- **Oracle MySQL patch update:** This release of Oracle VM includes the July 2017 Critical Patch Update for MySQL. (26120786)

- **Oracle WebLogic patch update:** This release of Oracle VM includes the July 2017 Critical Patch Update for WebLogic. (26120775)

- **Oracle Java patch update:** This release of Oracle VM includes the July 2017 Critical Patch Update for Java. (26120782)

- **Xen security advisories:** The following Xen security advisories are included in this release:

  - XSA-216 (CVE-2017-10911)

  - XSA-217 (CVE-2017-10912)

  - XSA-218 (CVE-2017-10913, CVE-2017-10914)

  - XSA-219 (CVE-2017-10915)

  - XSA-220 (CVE-2017-10916)

  - XSA-221 (CVE-2017-10917)

- XSA-222 (CVE-2017-10918)

- XSA-223 (CVE-2017-10919)

- XSA-224 (CVE-2017-10920, CVE-2017-10921, CVE-2017-10922)

- XSA-226 (CVE-2017-12135)

- XSA-227 (CVE-2017-12137)

- XSA-228 (CVE-2017-12136)

- XSA-230 (CVE-2017-12855)

3.7 What's New in Oracle VM Release 3.4.3?

The new features and enhancements in Oracle VM Release 3.4.3 include:

Installation and Upgrades

Simplified UEFI PXE Boot for Oracle VM Server

As of this release, you do not need to manually build the GRUB 2 boot loader to install Oracle VM Server on UEFI-based systems in a PXE boot environment. The Oracle VM Server ISO image file provides the `/EFI/BOOT/grubx64.efi` boot loader for UEFI-based systems. See Installing Oracle VM Server for x86 from PXE Boot in the *Oracle VM Installation and Upgrade Guide*.

Note

If you plan to install Oracle VM Server on BIOS-based systems, you use the `pxelinux.0 boot` loader from the `syslinux` package on Oracle Linux.

Infrastructure

Support for Software RAID Devices with Oracle VM Server

You can now create kickstart configurations that assemble software RAID devices during the Oracle VM Server installation. See Software RAID Partitions in the *Oracle VM Installation and Upgrade Guide*.

You can also create software RAID devices in `dom0` after installation. Oracle VM Server then presents those software RAID devices to Oracle VM Manager so that you can use them as storage repositories or for virtual disks. See Configuring Software RAID for Storage in the *Oracle VM Administrator's Guide*.

Important

The following notes apply to using software RAID devices with Oracle VM Server in this release:

- 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.

- As a best practice, you should use software RAID devices as storage repositories in a test environment before using them in a production environment.

- In environments where you use software RAID devices as storage repositories for server pools, unexpected behavior can occur with certain virtual machine migration operations. For example, if you clone a virtual machine and then attempt to live migrate it to an instance of Oracle VM Server in the same server pool, the migration fails with an error that indicates the virtual machine disk does not exist. In this case, you must stop the virtual machine and then move it to the appropriate instance of Oracle VM Server.

Support for Microsoft Windows Server Failover Clustering	Microsoft Windows Server guests can now use SCSI-3 persistent reservation to form a Windows Server Failover Cluster (WSFC) with *Oracle VM Paravirtual Drivers for Microsoft Windows* Release 3.4.2 or later. See *Oracle VM Paravirtual Drivers for Microsoft Windows* for information about failover cluster capabilities on specific Microsoft Operating System versions.
Update to Oracle VM Agent for SPARC	As of this release, Oracle VM Agent for SPARC is updated to run Python 2.7.
Update to the dom0 Kernel	The dom0 kernel is updated to a newer Unbreakable Enterprise Kernel Release 4 (UEK R4) version `kernel-uek-4.1.12-61.40.1.el6uek.x86_64.rpm`.

Note

This UEK R4 kernel update is a quarterly update 2 (QU2) errata version.

If you received a one-off version of UEK R4 QU2 before this release, you should upgrade Oracle VM Server to UEK R4 QU4 after you upgrade to Oracle VM Release 3.4.3. Upgrading the kernel ensures your Oracle VM Servers include any bug fixes that were included in the one-off version of UEK R4 QU2.

If you are upgrading from an earlier release of Oracle VM, such as Release 3.4.2, and you

> have a mainstream version of UEK R4, you can optionally upgrade Oracle VM Server to UEK R4 QU4 after you upgrade to Oracle VM Release 3.4.3.
>
> The UEK R4 QU4 version of the kernel is available on the Oracle Linux Yum Server for all Oracle VM Release 3.4.3 users.

Package Additions and Updates	The full list of package additions and updates is beyond the scope of this document, but the following list includes the notable package updates that are included in this release:

- The tzdata package is updated to `tzdata-2017b-1.el6.noarch.rpm`.

- The Netscape Portable Runtime (NSPR) package is updated to `nspr-4.11.0-1.el6.x86_64.rpm`.

- The ovmport package is updated to `ovmport-1.0-6.el6.x86_64.rpm`.

Updates to Multipath Configuration for Oracle ZFS Storage Appliance	

- This release includes the Oracle Sun ZFS Storage.* product in the `multipath.conf` file, which includes the ZFS Storage 7350 and ZFS Storage 7330 products.

- The default value for the `multipath` configuration parameter `no_path_retry` is updated to **180**. This new default setting enhances the performance of the multipath daemon, `multipathd`, and improves response times when issuing the `multipath -ll` command.

Performance and Scalability

Oracle VM Manager Performance Enhancements

- **Improved Job completion performance:** Reduction in the time taken to complete certain jobs, for example cloning a virtual machine or template.

- **Improved Storage refresh performance:** Rescanning physical disks is enhanced to ensure that local storage on an Oracle VM Server is refreshed in a timely manner.

Improved Performance With Multiple Concurrent Connections to the Oracle VM Manager Command Line Interface	This release improves Oracle VM performance when there are multiple concurrent connections to the Oracle VM Manager Command Line Interface.

Usability

Password Modification for the MySQL root user

Oracle VM now lets you change the password for the MySQL root user that the Oracle VM Manager Administrator Tool uses to connect to the MySQL database instance. See Changing the Password for the MySQL Root User in the *Oracle VM Administrator's Guide*.

Documentation

The following changes apply to the Oracle VM Release 3.4.3 documentation library:

- The Oracle VM Manager Online Help has been updated in the Oracle VM Manager Web Interface.

- CentOS 7 is added to the list of supported guest operating systems in the Oracle VM Release Notes. See Chapter 5, *Supported Guest Operating Systems*.

- The Oracle VM Installation and Upgrade Guide has been corrected and no longer includes a statement that you cannot boot Oracle VM Server from SAN.

Security

- **Oracle MySQL patch update:** This release of Oracle VM includes the January 2017 Critical Patch Update for MySQL. (23087157)

- **Oracle WebLogic patch update:** This release of Oracle VM includes the January 2017 Critical Patch Update for WebLogic. (23087146)

- **Oracle Java patch update:** This release of Oracle VM includes the January 2017 Critical Patch Update for Java. (23087165).

- **Xen security advisories:** The following Xen security advisories are included in this release:

  - XSA-184 (CVE-2016-5403)

  - XSA-190 (CVE-2016-7777)

  - XSA-191 (CVE-2016-9386)

  - XSA-192 (CVE-2016-9382)

  - XSA-193 (CVE-2016-9385)

  - XSA-195 (CVE-2016-9383)

  - XSA-197 (CVE-2016-9381)

  - XSA-198 (CVE-2016-9379, CVE-2016-9380)

  - XSA-199 (CVE-2016-9637)

  - XSA-200 (CVE-2016-9932)

  - XSA-202 (CVE-2016-10024)

  - XSA-204 (CVE-2016-10013)

  - XSA-206 (no CVE yet assigned)

  - XSA-207 (no CVE yet assigned)

  - XSA-208 (CVE-2017-2615)

  - XSA-209 (CVE-2017-2620)

  - XSA-211 (CVE-2016-9603)

- XSA-212 (CVE-2017-7228)

- XSA-213 (CVE-2017-8903)

- XSA-214 (CVE-2017-8904)

- XSA-215 (CVE-2017-8905)

3.8 What's New in Oracle VM Release 3.4.2?

The new features and enhancements in Oracle VM Release 3.4.2 include:

Installation and Upgrades

Oracle VM Manager support for previous Oracle VM Server releases

As of Oracle VM Release 3.4.2, Oracle VM Manager supports current and previous Oracle VM Server releases. For more information, see Chapter 6, *Oracle VM Manager Support for Previous Oracle VM Server Releases*.

Infrastructure

Support for NVM Express (NVMe) devices

Oracle VM Server now discovers NVMe devices and presents them to Oracle VM Manager, where the NVMe device is available as a local disk that you can use to store virtual machine disks or create storage repositories.

The following rules apply to NVMe devices:

Oracle VM Server for x86

- To use the entire NVMe device as a storage repository or for a single virtual machine physical disk, you should not partition the NVMe device.

- To provision the NVMe device into multiple physical disks, you should partition it on the Oracle VM Server where the device is installed. If an NVMe device is partitioned then Oracle VM Manager displays each partition as a physical disk, not the entire device.

  You must partition the NVMe device outside of the Oracle VM environment. Oracle VM Manager does not provide any facility for partitioning NVMe devices.

- NVMe devices can be discovered if no partitions exist on the device.

- If Oracle VM Server is installed on an NVMe device, then Oracle VM

		Server does not discover any other partitions on that NVMe device.
	Oracle VM Server for SPARC	• Oracle VM Manager does not display individual partitions on an NVMe device but only a single device.

Oracle recommends that you create a storage repository on the NVMe device if you are using Oracle VM Server for SPARC. You can then create as many virtual disks as required in the storage repository. However, if you plan to create logical storage volumes for virtual machine disks, you must manually create ZFS volumes on the NVMe device. See Creating ZFS Volumes on NVMe Devices in the *Oracle VM Administrator's Guide*.

Using Oracle Ksplice to update the dom0 kernel	Oracle Ksplice capabilities are now available that allow you to update the dom0 kernel for Oracle VM Server without requiring a reboot. Your systems remain up to date with their OS vulnerability patches and downtime is minimized. A Ksplice update takes effect immediately when it is applied. It is not an on-disk change that only takes effect after a subsequent reboot.

Note

This does not impact the underlying Xen hypervisor.

Depending on your level of support, contact your Oracle support representative for assistance before using Oracle Ksplice to update the dom0 kernel for Oracle VM Server. For more information, see *Oracle VM: Using Ksplice Uptrack* Document ID 2115501.1, on My Oracle Support at: https://support.oracle.com/oip/faces/secure/km/DocumentDisplay.jspx?id=2115501.1.

Extended SCSI functionality available for virtual machines	Oracle VM now provides additional support for SCSI functionality to virtual machines:

• Linux guests can now retrieve vital product data (VPD) page 0x84 information from physical disks if the device itself makes it available.

• Microsoft Windows Server guests can use SCSI-3 persistent reservation to form a Microsoft Failover Cluster in an upcoming *Oracle VM Paravirtual Drivers for Microsoft Windows* release. See the *Oracle VM Paravirtual Drivers for Microsoft Windows* documentation for information about the availability of failover cluster capabilities on specific Microsoft Operating System versions.

Dom0 kernel upgraded

The dom0 kernel for Oracle VM Server is updated to Oracle Unbreakable Enterprise Kernel Release 4 Quarterly Update 2 in this release.

Package additions and updates

- The `ovmport-1.0-1.el6.4.src.rpm` package is added to the Oracle VM Server ISO to support Microsoft Clustering and enable communication between Dom0 and DomU processes using the `libxenstore` API.

- The Perl package is updated to `perl-5.10.1-141.el6_7.1.src.rpm`.

- The Netscape Portable Runtime (NSPR) package is updated to `nspr-4.11.0-1.el6.x86_64.rpm`.

- The openSCAP package is updated to `openscap-1.2.8-2.0.1.el6.rpm`.

- The Linux-firmware package is updated to `linux-firmware-20160616-44.git43e96a1e.0.12.el6.src.rpm`.

Performance and Scalability

Oracle VM Manager performance enhancements

This release enhances the performance of Oracle VM Manager by reducing the number of non-critical events that Oracle VM Server sends to Oracle VM Manager when a system goes down.

Note

If you are running a large Oracle VM environment, it is recommended to increase the amount of memory allocated to the Oracle WebLogic Server. This ensures that adequate memory is available when required. See Increasing the Memory Allocated to Oracle WebLogic Server in the *Oracle VM Administrator's Guide* for more information.

Oracle VM Server for x86 performance optimization

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.

Xen 4.4.4 performance and scalability updates

- **Improved memory allocation:** Host system performance is improved by releasing memory more efficiently when tearing down domains, for example, migrating a virtual machine from one Oracle VM Server to another or deleting a virtual machine. This ensures that the host system can manage other guest systems more effectively without experiencing issues with performance.

- **Improved aggregate performance:** Oracle VM Server now uses ticket locks for spinlocks, which improves aggregate performance on large scale machines with more than four sockets.

- **Improved performance for Windows and Solaris guests:** Microsoft Windows and Oracle Solaris guests with the HVM or PVHVM domain type can now specify local APIC vectors to use as upcall notifications for specific vCPUs. As a result, the guests can more efficiently bind event channels to vCPUs.

- **Improved workload performance:** Changes to the Linux scheduler ensure that workload performance is optimized in this release.

- **Improved grant locking:** Xen-netback multi-queue improvements take advantage of the grant locking enhancements that are now available in Oracle VM Server Release 3.4.2.

- **Guest disk I/O performance improvements:** Block scalability is improved through the implementation of the Xen block multi-queue layer.

Usability

Oracle VM Manager Rule for Live Migration

To prevent failure of live migration, and subsequent issues with the virtual machine environment, a rule has been added to Oracle VM Manager, as follows:

Oracle VM Manager does not allow you to perform a live migration of a virtual machine to or from any instance of Oracle VM Server with a Xen release earlier than `xen-4.3.0-55.el6.22.18`. This rule applies to any guest OS.

Table 3.1 Live Migration Paths between Oracle VM Server Releases using Oracle VM Manager Release 3.4.2

Using Oracle VM Manager Release 3.4.2		Live Migrate To:							
		Release 3.2.10	Release 3.2.11	Release 3.3.1	Release 3.3.2	Release 3.3.3	Release 3.3.4	Release 3.4.1	Release 3.4.2
Live Migrate From:	Release 3.2.10	Yes	Yes	Depends on Xen release	Depends on Xen release	Yes	Yes	Yes	Yes
	Release 3.2.11	Yes	Yes	Depends on Xen release	Depends on Xen release	Yes	Yes	Yes	Yes
	Release 3.3.1	No	No	Depends on Xen release	Depends on Xen release	Depends on Xen release	Depends on Xen release	Depends on Xen release	Depends on Xen release
	Release 3.3.2	No	No	Depends on Xen release	Depends on Xen release	Depends on Xen release	Depends on Xen release	Depends on Xen release	Depends on Xen release
	Release 3.3.3	No	No	Depends on Xen release	Depends on Xen release	Yes	Yes	Yes	Yes
	Release 3.3.4	No	No	Depends on Xen release	Depends on Xen release	Yes	Yes	Yes	Yes
	Release 3.4.1	No	No	No	No	No	No	Yes	Yes
	Release 3.4.2	No	No	No	No	No	No	Yes	Yes

Xen Release (from)	Xen Release (to)	Live Migration Available?
xen-4.3.0-55.el6.x86_64	xen-4.3.0-55.el6.0.17.x86_64	No
xen-4.3.0-55.el6.22.18.x86_64	and newer xen-4.3.0-55	Yes

For example, as a result of this live migration rule, all virtual machines in an Oracle VM server pool running Oracle VM Server Release 3.3.2 with Xen version `xen-4.3.0-55.el6.22.9.x86_64` must be stopped before migrating to Oracle VM Server Release 3.4.2.

> **Tip**
>
> Run the following command on Oracle VM Server to find the Xen version:
>
> ```
> # rpm -qa | grep "xen"
> ```

PVHVM hot memory modification

As of this release, it is possible to modify the memory allocated to running PVHVM guests without a reboot. Additionally, Oracle VM Manager now allows you to set the allocated memory to a value that is different to the maximum memory available.

> **Note**
>
> - Hot memory modification is supported on x86-based PVHVM guests running on Linux OS and guests running on Oracle VM Server for SPARC. For x86-based PVHVM guests running on Oracle Solaris OS, you cannot change the memory if the virtual machine is running.
>
> - See the *Oracle VM Paravirtual Drivers for Microsoft Windows* documentation for information about the availability of hot memory modification on PVHVM guests that are running a Microsoft Windows OS. You must use a Windows PV Driver that supports hot memory modification or you must stop the guest before you modify the memory.
>
> - Oracle VM supports hot memory modification through Oracle VM Manager only. If you have manually created unsupported configurations, such as device passthrough, hot memory modification is not supported.

Security

- **Oracle MySQL patch update:** This release of Oracle VM includes the July 2016 Critical Patch Update for MySQL. (23087189)

- **Oracle WebLogic patch update:** This release of Oracle VM includes the July 2016 Critical Patch Update for WebLogic. (23087185)

- **Oracle Java patch update:** This release of Oracle VM includes the July 2016 Critical Patch Update for Java. (23087198).

- **Xen security advisories:** The following Xen security advisories are included in this release:

  - XSA-154 (CVE-2016-2270)

  - XSA-170 (CVE-2016-2271)

  - XSA-172 (CVE-2016-3158 and CVE-2016-3159)

  - XSA-173 (CVE-2016-3960)

- XSA-175 (CVE-2016-4962)

- XSA-176 (CVE-2016-4480)

- XSA-178 (CVE-2016-4963)

- XSA-179 (CVE-2016-3710 and CVE-2016-3712)

- XSA-180 (CVE-2014-3672)

- XSA-182 (CVE-2016-6258)

- XSA-185 (CVE-2016-7092)

- XSA-187 (CVE-2016-7094)

- XSA-188 (CVE-2016-7154)

3.9 What's New in Oracle VM Release 3.4.1?

The new features and enhancements in Oracle VM Release 3.4.1 include:

Installation and Upgrades

Upgrading to Release 3.4	Oracle VM provides scripts that automate the upgrade process and minimize downtime for your virtualization infrastructure.	
	Upgrading Oracle VM Manager to Release 3.4	Use the `runInstaller.sh` script that is included with the Release 3.4 installation media. See Upgrading Oracle VM Manager in the *Oracle VM Installation and Upgrade Guide* for more information.
	Upgrading Oracle VM Server from Release 3.3.x	Upgrade server pools and multiple Oracle VM Servers directly through the Oracle VM Manager Web Interface. The Oracle VM Manager Web Interface provides an intuitive interface to perform upgrades either individually or across multiple servers at once in batch mode.

- See Upgrading Oracle VM Server for x86 from Release 3.3.x or Between 3.4.x Errata Releases in the *Oracle VM Installation and Upgrade Guide* for more information on upgrading from Oracle VM Server Release 3.3.x.

- See Update Server and Server Update Groups in the *Oracle VM Manager User's Guide* for more information on upgrading from

		the Oracle VM Manager Web Interface.
Upgrading Oracle VM Server from Release 3.2.10	Use the `UpgradeServers.py` script for Oracle VM Server for x86 or the `./upgrade` script for Oracle VM Server for SPARC
		• See Upgrading Oracle VM Server for x86 from Release 3.2.10 or later in the *Oracle VM Installation and Upgrade Guide* for more information on upgrading from Oracle VM Server Release 3.2.10.
		• See Upgrading Oracle VM Agent for SPARC in the *Oracle VM Manager User's Guide* for more information on upgrading Oracle VM Server for SPARC.
Local disk partitioning	Interactive installations of Oracle VM Server allow you to configure disk partitioning. See Installing Oracle VM Server From a DVD-ROM in the *Oracle VM Installation and Upgrade Guide* for more information.
Enabling Kdump during Oracle VM Server installation	During installation of Oracle VM Server, you can now choose to enable the Kdump service that captures a memory dump from dom0 and stores it on the filesystem to help you debug and diagnose issues in the event of a system crash.
		• See Installing Oracle VM Server From a DVD-ROM in the *Oracle VM Installation and Upgrade Guide* for information on enabling Kdump.
		• See Manually Configuring kdump for Oracle VM Server in the *Oracle VM Administrator's Guide* for information on configuring Kdump after installation.

Infrastructure

Support for Oracle VM Virtual Appliances	Oracle VM Manager now provides the ability to import and export Oracle VM Virtual Appliances as a single .ova (Open Virtualization Format Archive) file or a set of .ovf (Open Virtualization Format) and .img (disk image) files. See How are Virtual Appliances Managed? in the *Oracle VM Concepts Guide* for more information on virtual appliances.

> **Note**
>
> In previous releases of Oracle VM, Oracle VM Virtual Appliances were referred to as assemblies.

Automated installation of VNC and Serial Console software	The Oracle VM Manager installer also manages the installation and upgrading of the VNC and Serial Console software package on the Oracle VM Manager host. Reducing administrative overhead during a deployment of the environment.

Storage live migration	You can now perform live migrations of running virtual machines that have virtual disks on local storage. Oracle VM uses features built into the OCFS2 file system on x86 platforms to provide this live migration capability that helps you achieve nearly uninterrupted uptime for virtual machines.
	Some restrictions apply to storage live migration. In particular, there are various requirements surrounding disk space on the source and target repositories. See How Can a Virtual Machine be Moved or Migrated? in the *Oracle VM Concepts Guide* for more information.
	Additionally, performing storage live migration can disrupt the cluster heartbeat function if the server pool file system is not separate to the cluster heartbeat file system. Additionally, you should ensure that you configure separate channels for live migration network traffic and other network functions such as cluster heartbeat. For more information about storage configuration guidelines, see Are there Guidelines for Configuring Storage? in the *Oracle VM Concepts Guide*. For more information about network channels, see How are Network Functions Separated in Oracle VM? in the *Oracle VM Concepts Guide*.
User interface enhancements for virtual disk allocation	As of this release, when editing virtual disks, Oracle VM Manager now displays the allocation type that was specified when the virtual disk was created. Additionally, tooltips are available in the Oracle VM Manager Web Interface to provide more information about how virtual disks are created and how subsequent virtual disk space is allocated. See Create Virtual Machine in the *Oracle VM Manager User's Guide* for more information on creating virtual machines and virtual disk allocation.
Fiber Channel over Ethernet (FCoE) support	Oracle VM provides support for installing Oracle VM Server into FCoE Storage Area Networks (SAN) over some Host Bus Adapters (HBA) or Converged Network Adapters (CNA). See Installing Oracle VM Server to Multipath Storage in the *Oracle VM Installation and Upgrade Guide* for more information.
Booting from UEFI	Oracle VM Server can now boot from systems that use Unified Extensible Firmware Interface (UEFI). See Installing Oracle VM Server From a DVD-ROM in the *Oracle VM Installation and Upgrade Guide* for more information about installing Oracle VM Server in UEFI mode.
	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.
	The following restrictions currently apply to UEFI mode:
	• You cannot create custom partition layouts if you are installing Oracle VM Server in UEFI mode.
	• You cannot boot Oracle VM Server from FCoE or iSCSI if you use UEFI mode.
SOAP API deprecated	The Oracle VM SOAP API is deprecated as of Release 3.4.1.

Oracle VM Utilities use Oracle VM Web Services API	The Oracle VM Utilities version 2.1 now communicate directly with Oracle VM Manager using a Oracle VM API. This change improves performance and usability of the Oracle VM Utilities. Additionally, in this release, a number of the Oracle VM Utilities scripts have been deprecated by the Oracle VM Manager Command Line Interface. For more information, see Using the Oracle VM Utilities in the *Oracle VM Administrator's Guide*.
P2V utility on Oracle VM Server ISO file	This release includes the P2V utility on the Oracle VM Server ISO file. You can use the P2V utility to convert physical hosts to virtual machines. For more information, see Converting Physical Hosts to Virtual Machines in the *Oracle VM Administrator's Guide*.
OSWatcher Utility Available on Oracle VM Server	As of this release, the OSWatcher utility is installed on Oracle VM Server by default and is enabled to run at boot. OSWatcher (oswbb) is a collection of shell scripts that collect and archive operating system and network metrics to diagnose performance issues with Oracle VM Server. For more information, see Working with the OSWatcher Utility on Oracle VM Server in the *Oracle VM Administrator's Guide*.
Repository apparent size	Oracle VM Manager now displays the apparent size, in GiB, of repositories. The apparent size is the total size of the entire repository. For more information, see Repositories Perspective in the *Oracle VM Manager User's Guide*.
dom0 kernel upgraded	The dom0 kernel for Oracle VM Server is updated to Oracle Unbreakable Enterprise Kernel Release 4 in this release.

Performance and Scalability

Increased supported limits	Oracle VM supports increased configuration limits, including a maximum of 256 virtual CPUs (vCPU) for virtual machines of PVM domain type. See Chapter 7, *Configuration Limits for Release 3.4* for a complete list of configuration limits for Oracle VM.
Improved performance	This release of Oracle VM includes several enhancements to overall performance and scalability, including the time it takes to discover a large number of servers.

The following table highlights performance improvements for the Oracle VM Manager Web Interface from Release 3.3.x to Release 3.4.1:

Action in the Oracle VM Manager Web Interface	First time	Subsequent times
Logging in	85%	80%
Switching from **Status Overview** to **Statistics** on the **Health** tab	23% faster response time	1 second
Expanding the **Server Pools** folder on the **Servers and VMs** tab	66% faster response time	0 seconds

Action in the Oracle VM Manager Web Interface	First time	Subsequent times
Switching from the **Servers and VMs** tab to the **Health** tab	62% faster response time	73% faster response time

Security

Improved character handling for filters	Improvements to Oracle VM Manager allow for better handling of characters used in filter fields to improve matching capabilities and to provide improved protection against attempted SQL injection attacks.
Improved handling of user passwords	This release of Oracle VM includes changes to how user passwords are stored on the system so that they are not exposed on the command line.
FIPS 140-2 Validation	This release supports enabling FIPS mode for OpenSSL to be compliant with Federal Information Processing Standard (FIPS) Publication 140-2. For more information about FIPS and Oracle VM security, see the *Oracle VM Security Guide*. Information on enabling FIPS mode for OpenSSL is provided in the *Oracle Linux 6 Security Guide*, available at: http://docs.oracle.com/cd/E37670_01/

Usability and Serviceability

Device mappings	Virtual machine configuration details under the **Servers and VMs** tab in the Oracle VM Manager Web Interface display device mappings that allow you to easily identify which physical resources, such as disks in the repository, correspond to virtual resources, such as virtual disks assigned to virtual machines. See Virtual Machines Perspective in the *Oracle VM Manager User's Guide* for more information.
Object topology view	You can view graphical representations, and generate reports, of virtual machine object nodes and attributes to quickly locate resources and view information about those resources. See Display VM Hierarchy Viewer in the *Oracle VM Manager User's Guide* for more information.
Context sensitive help	Online help for Oracle VM now launches directly from elements in the Oracle VM Manager Web Interface to the relevant help topics. This online help system eliminates the need to navigate through help topics to find information. See Help Icon in the *Oracle VM Manager User's Guide* for more information.
User preferences	Oracle VM Manager stores certain user preferences across sessions. See User Preference Persistence in the *Oracle VM Manager User's Guide* for more information about user preferences.
Simple names for repository objects	Oracle VM Manager persists simple names for repository objects as metadata. As a result, the simple names are retained when the repository is transferred to a different instance of Oracle VM Manager. Likewise, the metadata allows you to easily recover the simple names

in cases where Oracle VM Manager is manually restored without a database backup. For more information, see How is Object Metadata Stored in a Repository? in the *Oracle VM Concepts Guide*.

Generating XML reports

Oracle VM Manager lets you generate XML reports on objects, the object attributes, and direct subobjects. You can generate reports for virtual machines, Oracle VM Servers, server pools, and storage. For more information, see Reports in the *Oracle VM Manager User's Guide*.

Configuring database backups

The **Preferences** tab in the Oracle VM Manager Web Interface lets you set the interval for backing up the MySQL database and number of backups to keep. For more information, see Preferences in the *Oracle VM Manager User's Guide*.

Listing the locations of virtual machine disks

Oracle VM Manager provides detailed information on the location of virtual machine disks to facilitate backup tasks.

- See Virtual Machines Perspective in the *Oracle VM Manager User's Guide* for more information about locating virtual machine disks in the Oracle VM Manager Web Interface.

- See the *Oracle VM Manager Command Line Interface User's Guide* for more information about various commands that return attributes for the location of virtual machine disks.

Monitoring Oracle VM Server through SNMP

This release provides an SNMP shared object module that lets you retrieve details about Oracle VM Server, monitor Oracle VM Server health, and return a list of running virtual machines. See Monitoring Oracle VM Server with SNMP in the *Oracle VM Administrator's Guide* for more information on the Oracle VM Server shared object module.

Note

The Oracle VM Server object module applies to x86 systems only. This object module does not apply to Oracle VM Server for SPARC.

Viewing virtual machine configuration files

Oracle VM lets you easily retrieve the configuration files for virtual machines (vm.cfg).

- See View Virtual Machine Configuration File in the *Oracle VM Manager User's Guide* for more information on viewing a virtual machine configuration file in the Oracle VM Manager Web Interface.

- See getVmCfgFileContent in the *Oracle VM Manager Command Line Interface User's Guide* for more information on viewing a virtual machine configuration file in the Oracle VM Manager Command Line Interface.

Avoiding multiple physical disk allocation

Oracle VM provides detailed information about how physical disks are in use to avoid multiple physical disk allocation.

- See Physical Disks Perspective in the *Oracle VM Manager User's Guide* for more information on working with physical disks.

- See Local Storage in the *Oracle VM Concepts Guide* for more information about local storage and physical disks.

Virtual IP addresses for server pools

The field to specify a virtual IP address (VIP) while creating a server pool is deprecated in this release but available for backwards compatibility.

- See Create Server Pool in the *Oracle VM Manager User's Guide* for information on creating a server pool.

- See What is a Master Server and a Virtual IP Address? in the *Oracle VM Concepts Guide* for more details on why VIPs are deprecated for server pools in this release.

Chapter 4 Notable Bug Fixes

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Each Oracle VM release includes bug fixes that improve performance, usability, or resolve significant issues. Because each release contains many bug fixes, it is beyond the scope of this document to provide an exhaustive list of each bug fix. Rather, this chapter highlights the more notable bug fixes in each release.

4.1 Bug Fixes in Oracle VM 3.4.6.3

Oracle VM Release 3.4.6.3 includes the notable bugs that have been fixed in previous 3.4.x errata releases. Additionally, Oracle VM Release 3.4.6.3 includes a number of enhancements, as described in Section 3.1, "What's New in Oracle VM Release 3.4.6.3?".

Notable bugs fixed in Oracle VM Release 3.4.6.3 are as follows:

- Enhanced the SSH algorithms on port 10000. (30677425)

- Target repository is empty when moving a template to another repository using the Oracle VM Manager Web Interface. (31038365)

- Unable to edit the name of a virtual disk if the disk is on a virtual machine that is running in Oracle VM Manager Release 3.4.6. (30867812)

4.2 Bug Fixes in Oracle VM 3.4.6.2

Oracle VM Release 3.4.6.2 includes the notable bugs that have been fixed in previous 3.4.x errata releases. Additionally, Oracle VM Release 3.4.6.2 includes a number of enhancements, as described in Section 3.2, "What's New in Oracle VM Release 3.4.6.2?".

Notable bugs fixed in Oracle VM Release 3.4.6.2 are as follows:

- When regenerating a certificate or creating a custom certificate, the keytool retains the absolute path (`/u01/app/oracle/ovm-manager-3/domains/ovm_domain/security/`) of the certificate. (30393701)

- The Oracle VM Release 3.4.6.2 UI stores the current maximum index of the LUNs and correctly increases or decreases the index in the simple name when adding or deleting physical disks. (30418583, 29519004)

4.3 Bug Fixes in Oracle VM 3.4.6.1

Oracle VM Release 3.4.6.1 includes the notable bugs that have been fixed in previous 3.4.x errata releases. Additionally, Oracle VM Release 3.4.6.1 includes a number of enhancements, as described in Section 3.3, "What's New in Oracle VM Release 3.4.6.1?".

Notable bugs fixed in Oracle VM Release 3.4.6.1 are as follows:

- As of Release 3.4.6, support for Paravirtualized (PVM) guests is removed. In Release 3.4.6.1, Oracle VM Manager has been enhanced to properly raise warning messages for stopped virtual machines of the PVM domain type. (28914609)

- The `RestoreDatabase.sh` command script has been hardened to correctly cleanup data directories prior to restoring the database from a backup. (29388404)

- The `configure_client_cert_login.sh` command script has been improved for better error handling. (29407663)

- An issue has been addressed that would cause some upgrades of Oracle VM Manager to Release 3.4.6 to fail with an "WLSTException: Failed to generate CA certificate and trust store" failure message. (29457567)

4.4 Bug Fixes in Oracle VM 3.4.6

Oracle VM Release 3.4.6 includes the notable bugs that have been fixed in previous 3.4.x errata releases. Additionally, Oracle VM Release 3.4.6 includes a number of enhancements, as described in Section 3.4, "What's New in Oracle VM Release 3.4.6?".

Notable bugs fixed in Oracle VM Release 3.4.6 are as follows:

- Oracle VM Agent for SPARC has been updated to support the removal of the DefaultFixed network configuration profile (NCP) in Oracle Solaris 11.4. (27838128)

- Issues were addressed that were preventing Oracle VM Server from recognizing resources and PCE-e segmentation with HPE Superdome Flex. (28504712 and 28506351)

- An additional check has been implemented in the Oracle VM Manager to generate an error when there is an attempt to change the shareable flag in a physical or virtual disk attached to running virtual machine. When running, a virtual machine disk (physical or virtual) is not shareable. Previously, the logic of the Oracle VM Manager would allow such an attempt but would not actually perform the change or generate an error message. (27614615)

- The Oracle VM Manager Command Line Interface ciphers have been hardened to prevent connections that use weak CBC-based ciphers. (27793673)

- An issue was addressed in the Oracle VM Manager Command Line Interface that was causing high CPU utilization in CLI sessions. (28450026)

- The Oracle VM Manager MySQL installer script has been hardened to prevent a deadlock situation when deleting event data records. (26843931)

- Java Debug Wire Protocol (JDWP) access has been disabled in Oracle VM Manager. JDWP is intended only for debugging. (28543033)

- Oracle VM Manager has been enhanced to allow the moving of a `vm.cfg file` from one repository to another, even if the virtual machine is running in the BUI. For more information, see Migrate or Move Virtual Machines in the Oracle VM Manager User's Guide. (26757099)

- The Oracle VM Agent code has been improved to handle situations where the rpcbind service is disabled. Disabling this service was causing NFS repos to fail to mount after a reboot of Oracle VM Server. (28699279)

4.5 Bug Fixes in Oracle VM 3.4.5

Oracle VM Release 3.4.5 includes the notable bugs that have been fixed in previous 3.4.x errata releases. Additionally, Oracle VM Release 3.4.5 includes a number of enhancements, as described in Section 3.5, "What's New in Oracle VM Release 3.4.5?".

Notable bugs fixed in Oracle VM Release 3.4.5 are as follows:

- To resolve SSH connection issues with the Oracle VM Manager Command Line Interface, the SSH server implementation used by the CLI has been updated to support all required security algorithms. Systems accessing Oracle VM Manager using OpenSSH Release 7.0 can now connect to the CLI using the stronger default security protocols. (24742496)

- Connection leaking in the Oracle WebLogic component used by Oracle VM Manager has been fixed. This eliminates login failures, database corruption issues and connection errors experienced by some Oracle VM Manager users due to a lack of available resources. This fix reduces the occurrence of error messages such as "no resources available in pool ovm-odof-ds to allocate to applications" and "Waiting for connection". (26675991)

- The Oracle VM Server installer can now complete the installation process in case xen.gz is not present; for example in the case of ipxe-, uefi- ,and iscsi-based installation. (24376778)

- Virtual machine logging has been enhanced to indicate what causes the migration of a VM. For example, when a VM is live-migrated due to a DRS policy, administrators see information such as "CPU usage is at 41.1% which is over the threshold of 25.0%". (27911937)

- Several issues have been addressed with the Oracle VM Agent and generic Oracle Storage Connect plugin. This includes better retrieval of device mapping information when EMC Power Path is in use. (27901631)

- The RDMA functionality has been improved to correctly detect and configure Mellanox network interface cards, whether they provide Ethernet or InfiniBand connectivity. This allows Oracle VM to complete its boot sequence on systems with Mellanox cards installed and RDMA enabled. (25238309)

- Scripts in the Oracle VM Agent have been improved to correctly detect Ethernet and InfiniBand interfaces manufactured by Mellanox. This eliminates issues with creating bond interfaces on servers containing network interfaces of the affected types. (26541812)

- The Oracle VM devmon service has been hardened to correctly handle block devices with long names and paths, as well as multipath devices. This significantly reduces the risk of the service crashing due to a buffer overflow. (27486687 and 27486525)

- The method to persist certain server pool settings, such as the cluster timeout, has been improved. Customized server pool settings are now correctly preserved even after a regeneration of the Oracle VM Manager database. (26795755)

- If a virtual machine is configured with CPU pinning, it can now be cloned to a template. This operation failed in previous versions. (26789306 and 26365024)

- Statistics collection through the Oracle VM Agent has been improved to make sure that repository file system details are always communicated correctly to the Oracle VM Manager. (26003962)

- An issue was resolved where virtual machines configured with an amount of RAM close to the maximum provided by the host server, regularly failed to start or restart. The Oracle VM code now makes sure that there is enough scrubbed RAM available before the VM is started. (27534600)

- An issue in Xen 4.4.4-155.14 through 4.4.4-155.17 has been resolved to allow Oracle Solaris guests with multiple vCPUs to boot correctly. (27525698)

- The Oracle VM Manager code for operations on virtual machines with high availability enabled has been improved to ensure the correct VM status is always reported. (27241657)

- Thanks to better management of C-states in Xen, virtual machines can now take advantage of higher frequencies of physical CPUs at times when the load on other CPUs in the system is low. (27182738)

- When "Best Server" is selected as the VM start policy, an improved algorithm now selects a server more efficiently than before. This results in significantly better performance and shorter times for a virtual machine to start up or Live Migrate. (27161103)

- The upgrade code has been hardened to ensure that an Oracle VM Server can never be upgraded to a version higher than Oracle VM Manager. In a normal upgrade scenario, the Oracle VM Manager is upgraded first, and can be used to manage certain older Oracle VM Server versions until they are also upgraded. However, managing newer Oracle VM Server versions is not supported. (26988270)

- With certain devices, SCSI inquiry commands generate warning messages in the logs, because the commands are not supported by the device and considered illegal. Since there is no impact on functionality, the logging has been modified to write DEBUG instead of WARNING. (26932873)

- It is now acceptable that the URL of the Oracle VM Manager Web Interface starts with "`https://console.<domain>`". Previously, the word "console" at the start of the URL would be rejected, and the connection attempt would result in an "*Error 404: Page not found*". (26283106)

- Additional checks for resource locking have been included in Oracle VM Server for SPARC, to avoid crashes due to duplicate removal attempts and similar purge list issues. (26241929)

- Virtual machines running Oracle Linux with UEK R2 no longer lock up during live migration, thanks to a fix that allows processes to be frozen and thawed correctly through Xen. To take advantage of this fix, you must upgrade the virtual machine kernel to the latest version of UEK R2. (25644455)

- A newly implemented Xen boot parameter, `dom0_vcpus_pin`, allows administrators to specify how dom0 vCPUs are mapped to the server's physical CPUs. This results in more flexible and accurate CPU pinning. Further information on CPU pinning can be found in Oracle VM Virtual Machine Control, in the *Oracle VM Administrator's Guide*. (25559771)

- Code changes have been implemented to make sure that configuration updates to a virtual machine, such as disk migrations, are always represented correctly in the `vm.cfg` file. Previously, discrepancies sometimes occurred when jobs failed and modifications were not rolled back. (24626034)

- Several issues have been addressed with Template and Virtual Appliance data truncation in the MySQL database. Previously, origin file paths longer than 4,000 characters could result in job errors and Oracle VM upgrade failures. (23099378)

- In the storage configuration section of the Anaconda installer, a call to a non-existent kernel module has been removed. The many resulting non-fatal log messages no longer appear, which makes debugging much simpler. (27525259)

4.6 Bug Fixes in Oracle VM 3.4.4

Oracle VM Release 3.4.4 includes the notable bugs that have been fixed in previous 3.4.x errata releases. Additionally, Oracle VM Release 3.4.4 includes a number of enhancements, as described in Section 3.6, "What's New in Oracle VM Release 3.4.4?".

Notable bugs fixed in Oracle VM Release 3.4.4 are as follows:

- Fixes an issue where the Oracle VM Manager pre-upgrade script fails with the following error message: `cannot concatenate 'str' and 'javainstance' objects`. (25896467)

- Fixes an issue where Microsoft Windows guest virtual machines fail to migrate. (25801187)

- Fixes an issue where VNICs are displayed in the incorrect order when using the Oracle VM Manager Web Interface to edit a virtual machine with multiple VNICs. (25249076)

- Fixes an issue where it is not possible to delete storage repositories when error messages indicate that the storage device is busy and Oracle VM Server cannot unmount the file system for the repository. (26427886)

- Fixes an issue so that dom0 can reclaim space on the file system when a user domain makes space available. (25342487)

- Reduces the amount of time it takes to start virtual machines with large amounts of memory. (25860374)

- Fixes an issue where additional memory is incorrectly allocated to virtual machines when they are restarted. (26396728)

- Fixes an issue where removing block devices results in unresponsive behavior. (25498155)

- Fixes an issue where virtual machine migration hangs indefinitely. (25638583)

- Fixes an issue where it is not possible to add VNICs to running virtual machines after they are migrated. (25692157)

- Fixes an issue where virtual machines do not restart after stopping unexpectedly. (25729452)

- Fixes an issue where the operation to add or remove a VLAN exits with error messages instead of indicating if the VLAN already exists. (25796887)

- Fixes an issue in cases where Xen kernel panics occur when the Kdump service restarts. (25861742)

- Fixes an issue to persist the disabling of multicast snooping on a bridge. (25870875)

- Fixes an issue where it is not possible to create repository exports on Oracle VM Server. (26244801)

- Fixes an issue where the default maximum number of grant frames and PIRQs numbers for dom0 and user space domains must be increased. (26338166)

4.7 Bug Fixes in Oracle VM 3.4.3

The following notable bugs are fixed in Oracle VM Release 3.4.3:

- Fixes an issue where Link Local Discovery Protocol (LLDP) packages are enabled by default on Oracle VM Server. These packages are not required, and are disabled by default in this release. (25254072)

- Fixes an issue where the Oracle VM Server discovery process fails due to the Oracle VM Manager Yum repository configuration. (25107129)

- Fixes an issue where Desktop Bus (D-Bus) support is not available as part of the `libvirt` package that is supplied with Oracle VM Server. (25035614)

- Fixes an issue where you are unable to configure CPU pinning for a running virtual machine. As a result, there is no longer a requirement to stop and then start the virtual machine for the configuration to take effect. (24938500)

- Fixes an issue where the Oracle VM Agent is unable to distinguish local root disk partitions from LUN disk names when there are a large number of LUNs on the system. (25261502)

- Fixes an issue where slow response times are encountered when rescanning physical LUNs on Oracle VM Servers. (25105813)

- Fixes an issue where the vmcore memory size on the Management Domain (dom0) exceeds the total memory allocated to the dom0 . (24842742)

- Fixes an issue where instances of Oracle VM Server are not booting after installation to LUN targets larger than 2TB in size. (24811512)

- Fixes an issue where Guest VM creation is slow due an issue in the `XENMEM_populate_physmap` macro resulting in Xend 100% CPU usage. (24738858)

- Fixes an issue where MD RAID devices are disabled during Oracle VM Server upgrades. (24676299)

- Fixes an issue where importing a compressed virtual machine template may result in large system image files once the templates are unpacked. (23594530)

- Fixes an issue where you are unable to create kickstart configurations that assemble software RAID devices during the Oracle VM Server installation. (22204542)

- Fixes an issue where Oracle VM Server is unable to present software RAID devices to Oracle VM Manager. (21910748)

- Improves prompts used when changing the password for the MySQL root password to ensure instructions are clear. (25485730)

- Fixes an issue where you are unable to update the MySQL root password in the database so that it matches the MySQL root password that you set with the Oracle VM Manager Administrator Tool. (22973573)

- Fixes an issue where the **Edit Virtual Machine** dialog does not load vNICs in the correct order. (25904204)

- Fixes an issue where the **Export to Excel** option on the **Jobs** tab is unresponsive. (24805469)

- Fixes an issue where you may experience delays when rescanning physical disks from Oracle VM Manager. (25073132)

- Fixes an issue where Oracle VM Manager miss-interprets the `on_crash` parameter in the `vm.cfg` when the repository is refreshed. (25060508)

- Fixes an issue where Oracle VM ULN and public ULN channels do not contain the latest tzdata package. The tzdata package is now updated to `tzdata-2017b-1.el6.noarch.rpm`. (24847941)

- Enhances the Oracle VM Agent to automatically include existing vSwitches to the Oracle VM Agent network database. (18508248)

- Fixes an issue where memory release is unacceptably slow during graceful VM shutdown. (20816669)

- Fixes an issue where the Kdump service fails to start on the user domain (domU). (19807079)

4.8 Bug Fixes in Oracle VM 3.4.2

The following notable bugs are fixed in Oracle VM Release 3.4.2:

- Fixes an issue where multiple sets of `PortUp` and `PortDown` events are unnecessarily generated when a server is discovered or when the port on a server goes up or down, resulting in a slow down in performance on Oracle VM Manager. (23738392)

- Fixes an issue where duplicate server scan events are generated when re-discovering a server, resulting in a slow down in performance on Oracle VM Manager. (2888398)

- Updates to the Oracle VM Utilities to resolve some issues are now posted on My Oracle Support (MOS) at patch 13602094. (24303705, 24300124, 24300120)

- Enables network configuration operations on a Xsigo port for Oracle Private Cloud Appliance. (22694975)

- Fixes an issue where the `block` hotplug script does not account for gaps in used Loop devices. (22875089)

- Fixes an issue where some Oracle VM Manager jobs fail with operations on Dell Storage with Dell multipath.conf. (22909259)

- Adds the `libxenstore` and `libxenstore-devel` packages to the *addons* channel for the Oracle Linux Yum Server, so they can be used with Oracle Linux 6 guests. (22909892)

- Fixes an issue where it takes an excessive amount of time to release memory from a guest during a live migration. (23095319)

- Adds a new command to add, delete, or show routes on a given interface from the Oracle Private Cloud Appliance User Interface. (23154685)

- Fixes an issue where a server cluster failure occurs in some cases during a server reboot, when managing a large number of LUNs. (23169165)

- Fixes an issue where the VM console in the Oracle VM Manager Web Interface hangs during some live migration events. (23253588)

- Fixes an issue where a DNS Round-Robin configuration forces NFS to be mounted multiple times due to multiple IP assignments. (23577814)

- Enhancement added to the Xen hypervisor that makes devices assignable and unassignable. (23749204)

- Adds `/etc/grub.d/30_linux` to the Oracle VM Server installation to enable bare metal Linux installs for some Cloud operators. (24348702)

- Fixes an issue where a VM cannot start due to frequent duplicate Xend child processes. (24371183)

- Fixes an issue where the `storage_plugin_listFileSystems` command is not returning complete discovery data to Oracle VM Manager. (24414865)

- Fixes an issue where GRUB2 does not inherit the *crashkernel* parameters when upgrading Oracle VM Server from Release 3.2.x or 3.3.x to Release 3.4.2. If you have manually installed and configured the kdump service on Oracle VM Server Release 3.2.*x* or Release 3.3.*x*, and you then upgrade Oracle

VM Server to Release 3.4.1, the kdump service no longer functions. See Confirm kdump Service Settings after Upgrading in the *Oracle VM Installation and Upgrade Guide*. (24512683)

- Fixes an issue with yum upgrades from 3.2.10 or 3.2.11 due to the removal of the `ql2xxx-firmware` from Oracle VM Release 3.4. (24529773)

- Fixes a Kdump failure and kernel panic in Oracle Server X5-8 with the QLogic 25Gb NIC. (24554631)

- Fixes an issue where several VM related jobs cannot complete after an upgrade from Oracle VM Release 3.3.x. (23134128)

- Fixes an issue where a user is unable to set more than 512GB of memory for Solaris 11 guests on Oracle VM Server for SPARC. (23206373)

- Fixes an issue where some upgrades fail with the following message: `Error upgrading core database, upgrade cannot continue!` and the following entry in the log files: `UpdateUserAndCertEntities does not exit`. (23283190)

- Fixes an issue where a user is unable to discover a server using the Oracle VM Manager Web Interface due to the use of uppercase alphabetic characters in the UUID. (23635359)

- Fixes an issue where a user cannot login to Oracle VM Manager with an `AUTHORIZED_GROUP` and is using Microsoft Active Directory authentication. (23744937)

- Fixes an issues where the Oracle VM Manager upgrade terminates in some cases shortly after running the `ovm_preUpgrade` script. (24009772)

- Fixes an issue where a running VM is moved to a different shared repository. (24387377)

4.9 Bug Fixes in Oracle VM 3.4.1

Oracle VM Release 3.4.1 includes the notable bugs that have been fixed in the earlier 3.3.x errata releases. Additionally, Oracle VM 3.4.1 includes a number of enhancements, as described in Section 3.9, "What's New in Oracle VM Release 3.4.1?".

Oracle VM Manager build 1369 is an errata update for the Release 3.4.1 build 1350. Build 1369 offers fixes for bugs that were identified after build 1350 was released. Oracle VM Manager Release 3.4.1 build 1369 has been validated in combination with Oracle VM Server Release 3.4.1 build 1351 and Oracle VM Agent for SPARC Release 3.4.1 build 1350.

Notable bugs fixed in Oracle VM Manager Release 3.4.1 build 1369 are as follows:

- Fixes an issue where the upgrade does not complete when VM origin URLs or network install path is greater than 512 characters. (23003986)

- Fixes an issue where OVA files with URLs that are greater than 512 characters cannot be imported. (23012337)

- Fixes an issue where the user cannot proceed beyond the web UI login prompt after successfully entering user credentials. (23017746)

- Fixes an issue where in some cases the pre-upgrade script fails with an error "cannot concatenate 'str' and 'javainstance' objects". (23031621)

Chapter 5 Supported Guest Operating Systems

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The guest virtual machines you create must be one of the supported configurations listed in this section. The supported guest operating systems differ virtual machines created in x86-based server pools, and SPARC-based server pools.

5.1 Oracle VM Server for x86 Supported Guest Operating Systems

On Oracle VM Server for x86, guest virtual machines based on Linux and Solaris can be either Hardware Virtualized (HVM) or Hardware Virtualized with PV Drivers (PVHVM).

The following table lists support for virtual machines with an HVM domain type and a Linux operating system. Refer to the notes that follow the table for additional support information.

Table 5.1 HVM-Supported Linux Guest Operating Systems

Guest Operating System	HVM 32-bit	HVM 64-bit
Oracle Linux Release 8.*x*	N/A	Yes
Oracle Linux Release 7.*x*	N/A	Yes
Oracle Linux Release 6.*x*	Yes	Yes
Oracle Linux Release 5.*x*	Yes	Yes
Oracle Linux Release 4.*x*	Yes	Yes
Red Hat Enterprise Linux 8.*x*	N/A	Yes
Red Hat Enterprise Linux 7.*x*	N/A	Yes
Red Hat Enterprise Linux 6.*x*	Yes	Yes
Red Hat Enterprise Linux 5.*x*	Yes	Yes
Red Hat Enterprise Linux 4.*x*	Yes	Yes
CentOS 8.*x*	N/A	Yes
CentOS 7.*x*	N/A	Yes
CentOS 6.*x*	Yes	Yes
CentOS 5.*x*	Yes	Yes
SUSE Linux Enterprise Server 11.*x*	No	Yes
SUSE Linux Enterprise Server 12 SP2 or later	No	Yes

Note

Additional support information for HVM-supported Linux guest operating systems is as follows:

- You can create HVM guest virtual machines for Oracle Linux, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, and CentOS. However, the Xen PV drivers are included by default with the kernels. Creating PVHVM guest virtual machines is recommended for hardware virtualization to improve performance.

- The minimum required kernel version for SUSE Linux Enterprise Server (SLES) 11 is `3.0.31-0.9`.

The following table lists support for virtual machines with a PVHVM domain type and a Linux operating system. Refer to the notes that follow the table for additional support information.

Table 5.2 PVHVM-Supported Linux Guest Operating Systems

Guest Operating System	PVHVM 32-bit	PVHVM 64-bit
Oracle Linux Release 8.*x*	N/A	Yes
Oracle Linux Release 7.*x*	N/A	Yes
Oracle Linux Release 6.*x*	Yes	Yes
Oracle Linux Release 5.*x*	Yes	Yes
Oracle Linux Release 4.*x*	Yes	Yes
Red Hat Enterprise Linux 8.*x*	N/A	Yes
Red Hat Enterprise Linux 7.*x*	N/A	Yes
Red Hat Enterprise Linux 6.*x*	Yes	Yes
Red Hat Enterprise Linux 5.*x*	Yes	Yes
Red Hat Enterprise Linux 4.*x*	Yes	Yes
CentOS 8.*x*	N/A	Yes
CentOS 7.*x*	N/A	Yes
CentOS 6.*x*	Yes	Yes
CentOS 5.*x*	Yes	Yes
SUSE Linux Enterprise Server 11.*x*	No	Yes
SUSE Linux Enterprise Server 12 SP2 or later	No	Yes

Note

Additional support information for PVHVM-supported Linux guest operating systems is as follows:

- Oracle Linux, Red Hat Enterprise Linux, SUSE Linux Enterprise Server, and CentOS 5.*x* include the Xen PV drivers in the `kernel-xen` variant of the kernel. Oracle Linux 5.*x* also includes the PV drivers in `kernel-uek`, the Unbreakable Enterprise Kernel (UEK). Creating PVHVM guest virtual machines is recommended for hardware virtualization with these kernels.

- Oracle Linux, Red Hat Enterprise Linux and SUSE Linux Enterprise Server require the `kernel-xenU` variant of the kernel to use the PV drivers mode.

- The minimum required kernel version for SUSE Linux Enterprise Server (SLES) 11 is `3.0.31-0.9`.

- To start a PVHVM guest on SLES 11, you must perform the following steps:

1. Install the operating system and upgrade to the `3.0.31-0.9` kernel version.

2. Shutdown the virtual machine.

3. In Oracle VM Manager, set the domain type for the virtual machine to `Xen PVM`.

4. Restart the virtual machine.

The following table lists support for virtual machines with either an HVM or a PVHVM domain type and a Solaris operating system. Refer to the notes that follow the table for additional support information.

Table 5.3 HVM and PVHVM-Supported Solaris Guest Operating Systems

Guest Operating System	PVHVM 32-bit	HVM 32-bit	PVHVM 64-bit	HVM 64-bit
Oracle Solaris 11	N/A	N/A	Yes	N/A
Oracle Solaris 10	Yes	N/A	Yes	N/A

Note

Additional support information for HVM and PVHVM-supported Solaris guest operating systems is as follows:

• Oracle Solaris support begins with Solaris 10 1/13 (update 11). The Solaris 10 or Solaris 11 OS runs as a hardware virtual machine (HVM), which requires HVM support (Intel VT or AMD-V) on the underlying hardware platform. By default, Solaris 10 or Solaris 11 OS has the required PV drivers installed as part of the OS. Oracle Solaris 10 supports x86 32-bit and 64-bit architecture. 32-bit or 64-bit mode is selected at OS boot time by examining the hypervisor and the underlying hardware. Oracle Solaris 11 supports x86 64-bit architecture only.

For details about Oracle software certification, refer to My Oracle Support Document 464754.1, titled *Certified Software on Oracle VM* at https://support.oracle.com/oip/faces/secure/km/DocumentDisplay.jspx?id=464754.1.

Also visit the Oracle VM resource page at http://www.oracle.com/us/technologies/virtualization/oraclevm/resources/index.html to learn about the support plans for available for Oracle VM, Oracle Linux and Oracle Solaris.

Table 5.4 CPU Paravirtualized Supported Guest Operating Systems

Guest Operating System	Paravirtualized 32-bit (3.4.5)	Paravirtualized 64-bit (3.4.5)	Paravirtualized 32-bit and 64-bit (3.4.6)
Oracle Linux Release 8.*x*	No	No	No
Oracle Linux Release 7.*x*	No	No	No [a]
Oracle Linux Release 6.*x*	Yes	Yes	No [a]
Oracle Linux Release 5.*x*	Yes	Yes	No [a]
Oracle Linux Release 4.*x*	Yes	Yes	No [a]
Red Hat Enterprise Linux 8.*x*	No	No	No
Red Hat Enterprise Linux 7.*x*	No	No	No [a]

Guest Operating System	Paravirtualized 32-bit (3.4.5)	Paravirtualized 64-bit (3.4.5)	Paravirtualized 32-bit and 64-bit (3.4.6)
Red Hat Enterprise Linux 6.*x*	Yes	Yes	No [a]
Red Hat Enterprise Linux 5.*x*	Yes	Yes	No [a]
Red Hat Enterprise Linux 4.*x*	Yes	Yes	No [a]
CentOS 8.*x*	No	No	No
CentOS 7.*x*	No	No	No [a]
CentOS 6.*x*	Yes	Yes	No [a]
CentOS 5.*x*	Yes	Yes	No [a]
SUSE Linux Enterprise Server 11.*x*	No	Yes	No [a]
SUSE Linux Enterprise Server 12 SP2 or later	No	No	No [a]

[a] PVM guests continue to operate when upgraded to 3.4.6, but should be converted to PVHVM.

Table 5.5 Microsoft Windows Supported Guest Operating Systems

Guest Operating Systems	64-bit	32-bit	HVM	HVM with Oracle VM Paravirtual Drivers for Microsoft Windows
Microsoft Windows Server 2019	Yes	N/A	Supported	Supported
Microsoft Windows Server 2016	Yes	N/A	Supported	Supported
Microsoft Windows Server 2012 R2	Yes	N/A	Supported	Supported
Microsoft Windows Server 2012	Yes	N/A	Supported	Supported
Microsoft Windows Server 2008 R2 SP1	Yes	N/A	Supported	Supported
Microsoft Windows Server 2008 SP2	Yes	Yes	Supported	Supported
Microsoft Windows Server 2003 R2 SP2	Yes	Yes	Supported	Supported
Microsoft Windows 10	Yes	Yes	Supported	Supported
Microsoft Windows 8.1	Yes	Yes	Supported	Supported
Microsoft Windows 8	Yes	Yes	Supported	Supported
Microsoft Windows 7 SP1	Yes	Yes	Supported	Supported
Microsoft Windows Vista SP2	Yes	Yes	Supported	Supported

Note

To run Microsoft Windows guests as PVHVM-supported operating systems, you must install the Oracle VM Paravirtual Drivers for Microsoft Windows. For a full list of Microsoft Windows guest operating systems that are PVHVM-supported, see *Oracle VM Paravirtual Drivers for Microsoft Windows*.

Table 5.6 Oracle VM PV Drivers for Microsoft Windows Supported Releases

Oracle VM Releases	Oracle VM PV Drivers for Microsoft Windows Release 3.0.1	Oracle VM PV Drivers for Microsoft Windows Release 3.2.2 and above
Oracle VM 3.0	Yes	No
Oracle VM 3.1	Yes	No
Oracle VM 3.2	Yes	Yes
Oracle VM 3.3	No	Yes
Oracle VM 3.4	No	Yes

5.2 Oracle VM Server for SPARC Supported Guest Operating Systems

Guest virtual machines in an Oracle VM Server for SPARC-based server pool must run at:

• Oracle Solaris 10 11/06 as a minimum.

• Oracle Solaris 11 or later as a recommended guest OS.

See *Creating and Starting a Guest Domain* in the *Oracle VM Server for SPARC Administration Guide*.

For detailed information about supported firmware and operating systems, see *System Firmware Versions and Oracle Solaris OS Versions* in the *Oracle VM Server for SPARC Installation Guide*.

For information about specific patches and additional information about supported guest operating systems, see the *Oracle VM Server for SPARC Release Notes* and *Oracle VM Server for SPARC Installation Guide*.

> **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.

Chapter 6 Oracle VM Manager Support for Previous Oracle VM Server Releases

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 or later to manage Oracle VM Server Release 3.4.*x* or 3.3.*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.

The following table shows the backward compatibility support that Oracle VM Manager Release 3.4.2 or later provides for previous Oracle VM Server releases:

Table 6.1 Oracle VM Manager Backward Compatibility Support

Oracle VM Manager Release	Oracle VM Server Releases	Oracle VM Server for x86	Oracle VM Server for SPARC
Release 3.4.2 or later	Release 3.4.*x*	Yes	Yes
Release 3.4.2 or later	Release 3.3.*x*	Yes	Yes
Release 3.4.2 to Release 3.4.5	Release 3.2.10 or 3.2.11	Yes	Yes
Release 3.4.6 or later	Release 3.2.10 or 3.2.11	No	No

📝 **Note**

As of Release 3.4.5, Oracle VM Manager uses the TLSv1.2 protocol as the default to secure all connections. 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 by default. When upgrading to Release 3.4.5, you need to temporarily enable TLSv1 until all Oracle VM Servers have been upgraded to the latest version. For instructions to enable TLSv1, and revert to the default and more secure TLSv1.2 protocol, see Enabling the TLS Version 1 Protocol in the *Oracle VM 3.4 Installation and Upgrade guide*.

📝 **Note**

As a 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. For more information, see Chapter 8, *Deprecated and Removed Oracle VM Features* in the Oracle VM Release Notes.

If your Oracle VM environment consists of Oracle VM Manager Release 3.4.2 or later and one or more instances of Oracle VM Server at a different release, you should review the list of supported and unsupported operations and features, as follows:

Supported Operations

Oracle VM supports most common operations when using Oracle VM Manager to manage an instance of Oracle VM Server that is at an

earlier release, for example, creating virtual machines (VMs), cloning VMs, starting and stopping VMs, migrating VMs, adding a server to an existing server pool, and so on.

Unsupported Operations and Features

In general, if you are using Oracle VM Manager to manage an instance of Oracle VM Server that is at an earlier release, you cannot use capabilities and features that were added in a later release than a given Oracle VM Server release. For example, Oracle VM Release 3.4.1 introduced support to export Oracle VM virtual machines. This feature is available only if you are using both Oracle VM Manager and Oracle VM Server Release 3.4.1 or later. This capability is not available if you are using Oracle VM Manager Release 3.4.2 to manage Oracle VM Server Release 3.3.4.

The following operations and features are not supported in an Oracle VM environment where Oracle VM Manager 3.4.2 or later is managing one or more instances of Oracle VM Server at an earlier release, for example Release 3.3.4:

- Exporting Oracle VM virtual machines.

- Performing live migrations of virtual machines that have virtual disks on local storage.

- Persisting simple names for repository objects as metadata.

- Calculating the apparent size (GIB) of storage repositories.

- Using NVM Express (NVMe) devices as storage repositories or for local storage of virtual machine disks.

- Using Microsoft Windows Failover Clustering functionality.

- Discovering vital product data (VPD) page 0x84 information from LUNs on Linux-based guests.

Known Issues and Caveats with Backward Compatibility

In the case where you are using Oracle VM Manager to manage an instance of Oracle VM Server that is at an earlier release, certain known issues and conditions exist. Before you attempt to upgrade your Oracle VM environment or use mixed Oracle VM Manager and Oracle VM Server releases, you should review the following points:

Oracle VM Server for x86

- You must ensure that you upgrade all instances of Oracle VM Server to Release 3.2.10 or later before you upgrade to Oracle VM Manager Release 3.4. You can upgrade to Release 3.4 only if all instances of Oracle VM Server are at Release 3.2.10 or later.

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 Chapter 8, *Deprecated and Removed Oracle VM Features* in the Oracle VM Release Notes.

- You must ensure that each instance of Oracle VM Server within a server pool is at the same minor version. For example, all servers in a server pool must be at Release 3.2.10, 3.2.11, 3.3.*x*, or Release 3.4.*x*.

- It is not possible to change the Oracle VM Agent password if you are using Oracle VM Manager 3.4.2 or later to manage instances of Oracle VM Server at Release 3.2.x. You should remove ownership of the server, then use the `ovs-agent-password` on Oracle VM Server to change the Oracle VM Agent password, and then discover Oracle VM Server from Oracle VM Manager.

- The repository apparent size displays incorrect values if you present NFS-based storage repositories that share the same file system on the same NFS server to one or more Oracle VM Server(s).

Oracle VM Server for SPARC

- All instances of Oracle VM Server for SPARC must be at 3.3.*x* or later, if you are using Oracle VM Manager 3.4.2 or later to manage previous instances of Oracle VM Server for SPARC.

Note

As of Release 3.4.6, management of Oracle VM Agent for SPARC at Release 3.3.1 is removed. For more information, see Chapter 8, *Deprecated and Removed Oracle VM Features* in the Oracle VM Release Notes.

- You must ensure that each instance of Oracle VM Server within a server pool is at the same minor version. For example, all servers in a server pool must be at Release 3.3.*x*, or Release 3.4.*x*.

- The repository apparent size displays incorrect values if you present NFS-based storage repositories that share the same file system on the same NFS server to one or more Oracle VM Server(s).

Chapter 7 Configuration Limits for Release 3.4

Configuration limits for Oracle VM represent tested and recommended limits, and are fully supported by Oracle.

Table 7.1 Server Pool and Cluster Maximums

Item	x86 Maximum	SPARC Maximum
Oracle VM Servers in a server pool (unclustered)	64	64
Oracle VM Servers in a server pool (clustered)	32	32
Number of servers	256 (16 servers * 16 server pools)	256 (16 servers * 16 server pools)
Number of server pools	16	16
Number of configured virtual machines	5120 (20 virtual machines * 256 servers)	5120 (20 virtual machines * 256 servers)
Number of running virtual machines	2,560 (10 virtual machines per server * 256 servers)	32768 (128 virtual machines per server * 256 servers) • Fujitsu M10-4S server, this limitation is 65536 (256 virtual machines per server * 256 servers) • Oracle SPARC M-series servers, this limitation is 128 virtual machines per server * the number of physical domains (PDoms). Each physical domain acts as its own server with its own set of logical domains.

Note

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.

Table 7.2 Oracle VM Server Maximums

Item	x86 Maximum	SPARC Maximum
CPUs	384 (Tested) 2048 (Designed)	Equivalent to the number of available CPUs. • SPARC M7-16 server, this is equal to 4096 • SPARC M6-series servers, this is equal to 3072. • SPARC M5-series servers, this is equal to 1536. • SPARC T5-series servers, this is equal to 1024. • Fujitsu M10-series servers, this is equal to 2048 (fully configured).
Virtual CPUs per host	4096	8 per core on Oracle M-series and Oracle T-series servers • SPARC M5-series servers have 6 cores per socket. • SPARC M6-series servers have 12 cores per socket. • SPARC T5-series servers have 16 cores per socket. 2 per core on Fujitsu M10 • Fujitsu M10-series servers have 16 cores per socket.
RAM	6 TB	Equivalent to available RAM. • 32 TB on Fujitsu M10-series servers, SPARC M5-series servers, or SPARC M6-series servers. • 2 TB on a SPARC T7-4 server. • 8 TB on a SPARC M7-16 server. • 4 TB on SPARC T5-series servers. A small amount of RAM is required for the hypervisor.

Item	x86 Maximum	SPARC Maximum
Concurrently Running Virtual Machines	1024 The maximum number of concurrently running virtual machines depends on the virtual machine configuration, hardware resources, and workloads the virtual machines are running. For this reason, the practical limit for concurrently running virtual machines is 300.	128 per physical domain (PDOM) SPARC M5 or M6-series server each have a maximum of 512 logical domains (128 logical domains per physical domain * 4 physical domains). However, when following Oracle best practices that allocate full cores for guests, the maximum number of logical domains is 192 on SPARC M5-series servers and 384 on SPARC M6-series servers.

Note

- By default, when you install Oracle VM Server, dom0 is configured with a maximum of 20 vCPUs. This configuration optimizes performance for large systems and is suitable for most deployments.

  If you plan to change the number of maximum vCPUs for dom0, Oracle Corporation recommends that you set the number of vCPUs for dom0 to no greater than the number of physical CPUs per socket. Oracle Corporation also recommends that you pin dom0 vCPUs to physical CPUs on the first socket. If you use hyper-threading, you should count in units of threads instead of cores. For more information see Editing Boot Parameters To Enable Hypervisor Features in the *Oracle VM Installation and Upgrade Guide*.

- 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.

Table 7.3 Virtual Machine Maximums

Item	x86 Maximum	SPARC Maximum
Virtual CPUs	PVM: 256 **Note** As of Release 3.4.6, support for Paravirtualized (PVM) guests is removed. For more information, see Chapter 8, *Deprecated and*	Equivalent to the number of available CPUs on the server. - SPARC M7-16 server available CPUs is equal to 4096. - SPARC M6-series servers available CPUs is equal to 3072. - Fujitsu M10-series server (fully configured) available CPUs is equal to 2048. These maximums do not account for CPUs allocated to any other domains, such as the control domain. The hypervisor can

Item	x86 Maximum	SPARC Maximum
	Removed Oracle VM Features HVM: 128; or 32 for Microsoft Windows guests. **Note** As of Release 3.4.6, the HVM limit is 64 for Microsoft Windows guests. PVHVM: 128; or 32 if using Oracle VM Paravirtual Drivers for Microsoft Windows. **Note** As of Release 3.4.6, the PVHVM limit is 64 if using Oracle VM Paravirtual Drivers for Microsoft Windows.	allocate subsets of the overall CPU, memory, and I/O resources of a server to any given logical domain.
Virtual RAM on 32-bit guests	PVM: 64 GB **Note** As of Release 3.4.6, support for Paravirtualized (PVM) guests is removed. For more information, see *Chapter 8, Deprecated and*	N/A

Item	x86 Maximum	SPARC Maximum
	Removed Oracle VM Features HVM: 64 GB PVHVM: 64 GB	
Virtual RAM on 64-bit guests	PVM: 500,000 MB **Note** The amount of memory supported is dependent on the guest kernel. Oracle has tested 470GB with Oracle VM Release 3.4.2. **Note** As of Release 3.4.6, support for Paravirtualized (PVM) guests is removed. For more information, see Chapter 8, *Deprecated and Removed Oracle VM Features* HVM: 1,000,000 MB Exceeding the 1 TB limit may work, but can result in slow boot times and the possibility that the	Equivalent to the amount of available RAM installed on the server. • 32 TB on Fujitsu M10-series servers, SPARC M5-series servers or SPARC M6-series servers. • 2 TB on an SPARC T7-4 server. • 8 TB on an SPARC M7-16 server. A small amount of RAM is required for the hypervisor. These maximums do not account for RAM that is allocated to any other domains, such as the control domain. The hypervisor can allocate subsets of the overall CPU, memory, and I/O resources of a server to a given logical domain.

Item	x86 Maximum	SPARC Maximum
	virtual machine hangs at boot and soft lockups occur on the hosting Oracle VM Server. If your environment needs to support live migration for HVM guests, this value must not exceed 1 TB. PVHVM: 2,000,000 MB; or 256 GB if using Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.2.3 and later.	
Virtual NICs	PVM: 31 **Note** As of Release 3.4.6, support for Paravirtualized (PVM) guests is removed. For more information, see Chapter 8, *Deprecated and Removed Oracle VM Features* HVM: 8 PVHVM: 8 The limit to the number of virtual disks and virtual NICs is shared when using the Oracle VM Paravirtual Drivers for Microsoft Windows. Therefore, if you define 8 virtual NICs, only 32 virtual disks can be defined for the same virtual machine.	Depends on the total number of available Logical domain channels (LDC). Total number of virtual NICs and virtual disks per domain for SPARC is no more than the total number of available LDCs of the supported SPARC server. For more information, see *Using Logical Domain Channels* in the *Oracle VM Server for SPARC Administration Guide*.
Virtual disks	Limits provided here are imposed by the guest kernel and not the hypervisor. The maximums presented depend on the capabilities of the guest operating system.	Depends on the total number of available Logical domain channels (LDC). Total number of virtual NICs and virtual disks per domain for

Item	x86 Maximum	SPARC Maximum
	PVM: 104 **Note** As of Release 3.4.6, support for Paravirtualized (PVM) guests is removed. For more information, see Chapter 8, *Deprecated and Removed Oracle VM Features* HVM: 4 IDE (including CD-ROM) PVHVM: 107; or 40 if using Oracle VM Paravirtual Drivers for Microsoft Windows Release 3.2.3 and later. The limit to the number of virtual disks and virtual NICs is shared when using the Oracle VM Paravirtual Drivers for Microsoft Windows. Therefore, if you define 8 virtual NICs, only 32 virtual disks can be defined for the same virtual machine.	SPARC is no more than the total number of available LDCs of the supported SPARC server. For more information, see *Using Logical Domain Channels* in the *Oracle VM Server for SPARC Administration Guide*.
Virtual disk size	OCFS2: 64 TB NFS: 10 TB	Equivalent to the size of available disks on the server. The Oracle Solaris limit is 2^{63}.

Note

- For information on the configuration limits used for the latest Oracle VM Paravirtual Drivers for Microsoft Windows release, see http://docs.oracle.com/cd/E88077_01/index.html.

- Virtual machine maximums assume a single virtual machine using all available resources.

- 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.

Table 7.4 Storage Maximums

Item	x86 Maximum	SPARC Maximum
LUNs in a storage array This limit should not be confused with multipath devices. Each identical LUN connected to a single multipath device is considered to be a separate LUN with regard to this limit. Examples of supported configurations of iSCSI LUNs: • 1,000 LUNs with 2 paths each • 500 LUNs with 4 paths each • 250 LUNs with 8 paths each Examples of supported configurations of Fibre Channel LUNs: • 1,000 LUNs with 2 paths each • 1,000 LUNs with 4 paths each • 500 LUNs with 8 paths each • 250 LUNs with 16 paths each	iSCSI: • 1,000 LUNs • 2,000 Paths Fibre Channel (FC): • 1,000 LUNs • 4,000 Paths	2^{32} targets.
OCFS2 volume size	64 TB	N/A
Files per OCFS2 volume	30,000	N/A

Table 7.5 Network Maximums

Item	x86 Maximum	SPARC Maximum
NICs/ports per network bond	256	255 per bond or aggregate.
Network bonds per Oracle VM Server	No limit	No limit
Number of VLANs	1024	1024
Number of MAC addresses	10240	10240

Chapter 8 Deprecated and Removed Oracle VM Features

Table of Contents

Review deprecated and removed features in this release of Oracle VM.

8.1 Removed Features in 3.4.6

The following Oracle VM features are removed:

- **Paravirtualized (PVM) guests**: Support for Paravirtualized (PVM) guests is removed. For instructions on how to convert your PVM guests to hardware virtualized, with paravirtualized drivers (PVHVM) or hardware virtualized (HVM), see Disabling Paravirtualized Guests on Oracle VM Server in the *Oracle VM Administrator's Guide*.

- **Management of Oracle VM Server for x86 at Release 3.2.10 and 3.2.11, and Oracle VM Agent for SPARC at Release 3.3.1**: 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. For more information, see Upgrading Oracle VM, Upgrading Oracle VM Server from Release 3.2.10 and Upgrading from Oracle VM Agent for SPARC Release 3.3.x or Between 3.4.x Errata Releases in the *Oracle VM 3.4 Installation and Upgrade guide*.

  > **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.

8.2 Deprecated Features in 3.4.6

The following previously deprecated Oracle VM features will be removed from a future release of this software:

- **Oracle VM SOAP API** : The Oracle VM SOAP API is deprecated.

- **Oracle VM Utilities scripts**: A number of the Oracle VM Utilities scripts are deprecated by the Oracle VM Manager Command Line Interface. For more information, see Using the Oracle VM Utilities in the *Oracle VM Administrator's Guide*

- **Virtual IP address (VIP)** : The field to specify a virtual IP address (VIP) while creating a server pool is deprecated but is still available for backwards compatibility.

  - See Create Server Pool in the *Oracle VM Manager User's Guide* for information on creating a server pool.

  - See What is a Master Server and a Virtual IP Address? in the *Oracle VM Concepts Guide* for more details on why VIPs are deprecated for server pools in this release.

- **YAML formatted configuration file** : The function to install Oracle VM Manager silently using a predefined YAML formatted configuration file is deprecated for customer use and is only intended for internal use during testing at Oracle.

- **HugePages support**: The HugePages feature is deprecated. You should not enable HugePages when creating or editing virtual machines with a domain type of PVM in the Oracle VM Manager Web Interface or Oracle VM Manager Command Line Interface.

- **Assembly terminology**: The use of the term Assembly to refer to Oracle VM Virtual Appliances is deprecated.

Chapter 9 Known Limitations and Workarounds

Table of Contents

Find information on known limitations and workaround procedures for Oracle VM.

The titles of known issues contain platform designations as follows:

• If an issue applies to Oracle VM Server for x86 only, the title includes *x86 Only*.

• If an issue applies to Oracle VM Server for SPARC only, the title includes *SPARC Only*.

• If an issue applies to both Oracle VM Server and Oracle VM Server for SPARC, the title does not include
any platform designation.

9.1

9.1.1 Integration Between Oracle VM Server for SPARC and Oracle VM Manager

In addition to known issues that might apply for a given release of Oracle VM, limitations exist for managing Oracle VM Server for SPARC with Oracle VM Manager.

There are currently several features in Oracle VM Server for SPARC that cannot be represented in Oracle VM Manager. These features include the following:

- Physical I/O domains such as SR-IOV, direct I/O, and root domains.

- Certain network options such as Private VLAN (PVLAN), "vNICs on VNets" or multiple MAC addresses per virtual network device, and Quality of Service (QoS) configurations.

- Crypto accelerators assigned to guest domains. This is a feature on SPARC servers prior to the T4 series that required some administrative effort. With the T4 series and later, crypto accelerators are always available without any administrative effort required.

- Whole-core and max-cores constraints, although these can be configured by editing the configuration file named `/etc/ovs-agent/agent.ini` that is used by the Oracle VM Agent for SPARC on each Oracle VM Server.

- Multiple service domains, also known as 'shadow service domains', which are typically used to provide redundancy. Initial support for these has been implemented in the Oracle VM Agent for SPARC.

There are a number of limitations that exist in Oracle VM Manager for server pools that contain Oracle VM Server for SPARC servers. These limitations include the following:

- ISCSI or Fibre Channel storage cannot be used to store a repository or a server pool cluster file system. However, these disks can be used for direct virtual machine assignment. NFS storage should be used if you need to set up a server pool cluster file system. Either NFS, ZFS or a local disk may be used to configure a repository.

- Huge page support on SPARC systems is not controlled by Oracle VM. All the page sizes available on the underlying hardware are always available to the guest virtual machine.

- Virtual machine suspend and resume functionality is not available for virtual machines running in a SPARC-based server pool.

- Support for a secondary service domain, running alongside the primary service domain, has been added to the Oracle VM Agent. This feature allows you to restart the primary service domain without causing any interruption to network or disk I/O for any of your running virtual machines.

9.2 Known Issues and Workarounds

9.2.1 After Upgrading To Release 3.4.6 Unable To Log Into the Oracle VM Manager Web Interface Using Custom Certificates

During an upgrade to Oracle VM Manager Release 3.4.6 files in /u01/app/oracle/ovm-manager-3/domains/ovm_domain/security are cleaned and only files created and managed by Oracle VM Manager are preserved and restored. Files created by users are not preserved, except for relevant keystore files.

Workaround: For more information, see My Oracle Support (MOS) article 2629033.1 at http://metalink.oracle.com.

Bug 30365865

9.2.2 Oracle VM Server Virtual Machine Fails To Reboot After Saving vmcore

The kdump reboot may fail on Oracle VM Manager Release 3.4 if the gap between kdump boot and kdump reboot is less than 10s.

Workaround: There is no workaround for this issue.

Bug 30995725

9.2.3 Server Operation Succeeded But Job Failed Due to a Late Lock Exception

Occasionally, during Oracle VM Server operations a late lock exception error may appear.

Workaround: To resolve this problem, refresh the storage repository and the server. For more information, see MOS article 1672620.1 at http://metalink.oracle.com.

Bug 31014915

9.2.4 Upgrading Oracle VM Agent for SPARC Release 3.3.x/3.4.1/3.4.2 to Release 3.4.6 Fails

Upgrading Oracle VM Agent for SPARC Release 3.3.x, 3.4.1, or 3.4.2 to Release 3.4.6 results in errors and eventually fails to upgrade the server.

Workaround: The workaround is to first upgrade Oracle VM Agent for SPARC Release 3.3.x, 3.4.1 or 3.4.2 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. For more information, refer to the *Oracle VM Installation and Upgrade Guide*.

Bug 28902444

9.2.5 Editing a Bond Port Fails on Oracle VM Server for SPARC Running Oracle Solaris 11.4

Editing a bond port fails on Oracle VM Server for SPARC running Oracle Solaris 11.4 with an command error message similar to the following:

```
/usr/sbin/dladm: -m is no longer supported.
```

This failure occurs because of a change in Oracle Solaris 11.4.

Workaround: The workaround is to remove the targeted port from the network and to delete the VLAN interfaces using the port so that this bond port can be deleted and recreated with the appropriate mode.

Note

A running virtual machine that is using the network or port must either be stopped or migrated to another server before the workaround operation can be performed.

Bug 28821715

9.2.6 Cannot Install or Upgrade Oracle VM Manager Release 3.4.5 or 3.4.6 on Oracle Linux 7 Update 6 Guest Virtual Machines

Upgrading Oracle VM Manager Release 3.4.5 to 3.4.6 fails on an Oracle Linux guest virtual machine when the guest OS is first upgraded to Oracle Linux 7 Update 6. Similarly, installing Oracle VM Release 3.4.6 on guest virtual machines running Oracle Linux 7 Update 6 is failing.

Workaround: Upgrade the guest OS to Oracle Linux 7 Update 6 after Oracle VM Manager Release 3.4.6 is running on the virtual machine.

Bugs 28907767 and 28898808

9.2.7 Attached Disks Not Visible at Startup on Oracle Solaris 11.4 Virtual Machine

After creating a Oracle Solaris 11.4 virtual machine on Oracle VM Release 3.4.6, attached disks are not visible at startup when running the `format` command.

Workaround: The workaround is to run the `format` command from the `/dev/rdsk/` directory to display all attached disks.

Bugs 28797606

9.3 Known Issues and Workarounds

9.3.1 Cannot Re-install Oracle VM Server Across Multiple Disks or LUNs using a Kickstart Configuration

If you try to re-install Oracle VM Server using a kickstart configuration across multiple LUNS, with one LUN dedicated to swap, the installation fails with a device error message, similar to the following:

```
DeviceError: ('cannot replace active format', 'sdh')
```

This occurs because during the re-installation, the anaconda installation wizard fails to reformat the LUN dedicated to swap as it is already in use from the previous installation, resulting in the error.

Workaround: There is no workaround for this issue. Oracle VM Release 3.4 supports installations of Oracle VM Server onto a single disk or LUN only. As a result, kickstart installations across multiple disks in a non-software RAID configuration is not supported.

Bug 27021529

9.3.2 Oracle VM Server Installation Hangs with RAID10 Boot Partition

If you install Oracle VM Server on a machine with a RAID10 disk configuration, the installation process hangs at the end, because the command `mdadm --wait-clean --scan` cannot be completed. This issue is caused by the fact that boot partitions are not supported on RAID10, but only on RAID1.

Workaround: Configure the software RAID on the server such that the `/boot` partition is written to a RAID1 device. Restart the Oracle VM Server installation on the supported configuration.

Bug 27525377

9.3.3 Cannot Retrieve Information for File System Mounted on Invalid Mount Point

If you are utilizing Oracle VM Server for SPARC in your Oracle VM environment and you are mounting a file system, you must ensure that no white spaces or invalid characters are specified in the mount point directory path. This also applies when mounting devices using the automounter mechanism. Mounting file systems on invalid mount points can result in file system information retrieval failures, similar to:

```
AttributeError: 'NoneType' object has no attribute 'split'
```

Workaround: If possible, rename the device or alternatively, unmount the invalid mount point and mount the device to a mount point that contains no white spaces or invalid characters. Refer to the Oracle Solaris 11.3 documentation for information on managing file systems: https://docs.oracle.com/cd/E53394_01/html/E54785/.

Bug 27479482

9.3.4 Cannot Configure the Oracle Solaris Support Repository using the Oracle VM Manager Web Interface

If you are updating a set of local Oracle VM Servers running on SPARC hardware, you may want to utilize the Oracle Solaris Support Repository with it's associated SSL key and certification. Currently, the Oracle VM Manager Web Interface does not provide any option to insert the required key and certification when creating a new server update repository.

Workaround: Instructions on installing a certificate and key can be found in the book titled *Install a Certificate and Key for the Oracle Solaris Support Repository* in the *Oracle Solaris 11.3 Information Library* at: https://docs.oracle.com/cd/E53394_01/html/E54747/installkeycert.html

Bug 27572483

9.3.5 Backup Failure for the MySQL Database Repository

If you specify a new MySQL database backup directory, you may encounter a failure during the MySQL database backup if the new directory does not exist, or does not have the correct permissions assigned. By default, the MySQL database backup files are stored within `/u01/app/oracle/mysql/dbbackup` on the Oracle VM Manager host, but it is possible to set a different directory if required.

Workaround: When changing the default MySQL database backup directory, you must ensure that the new directory exists and has the correct permissions assigned on the Oracle VM Manager host as follows:

1. Create the new directory that you want to use for the MySQL database backup files, for example:

   ```
   # mkdir /u01/app/oracle/mysql/new-backup-dir
   ```

2. Ensure the right permissions are set for the new directory:

   ```
   # chmod 777 /u01/app/oracle/mysql/new-backup-dir
   ```

3. Update `/etc/sysconfig/ovmm` and specify the new directory for the `DBBACKUP` parameter:

   ```
   DBBACKUP=/u01/app/oracle/mysql/new-backup-dir
   ```

4. Save and close `/etc/sysconfig/ovmm` for the new directory to take effect.

For more information on backing up the MySQL Database repository, see Backing up and Restoring Oracle VM Components in the *Oracle VM Administrator's Guide*.

Bug 27582009

9.3.6 Unable to Login into the Oracle VM Web Services API

Connections to the Oracle VM Web Services API fail if you are using a Java runtime version lower than `1.7.0_131_b31`. As of Oracle VM Release 3.4.5, the SSL TLS version 1 (TLSv1) protocol is disabled within Oracle VM Manager for security reasons and connections using the TLSv1.2 protocol are only accepted. The TLSv1.2 protocol is the default in Java runtime version 1.7.0_131-b31, and as a result, connections to the Oracle VM Web Services API fail if a lower Java runtime version is used.

Workaround: Make sure you are using Java runtime version `1.7.0_131-b31` or higher. The Java runtime version that ships with Oracle VM Manager Release 3.4.5 is sufficient. Alternatively, for lower versions of Java runtime, update the Java client and make sure that the *SSLContext ctx* attribute is set as follows:

```
SSLContext ctx = SSLContext.getInstance("TLSv1.2");
```

For more information about authentication against the REST API in the Java Client, see the Java topic in the *Oracle VM Web Services API Developer's Guide*.

Bug 27611305

9.3.7 Incorrect PVM Migration Error Message Displayed when Secure VM Migration Enabled

As of Oracle VM Release 3.4.5, you can disable PVM guests from running on your Oracle VM Server instance. As a result, migrating PVM guests to a destination Oracle VM Server instance with PVM guests disabled is not possible and the following error message is displayed:

```
stderr: Error: PV guests disabled by xend.
```

However, when migrating PVM guests with secure vm migration enabled to a destination Oracle VM Server instance with PVM guests disabled, the following incorrect message is displayed:

```
stderr: Error: [Errno 9] Bad file descriptor
```

Workaround: The incorrect migration error message should be ignored. The PVM migration is still prevented regardless of whether secure vm migration is enabled or not for the server pool where the vm resides.

For information on how to disable PVM guests on your Oracle VM Server instance, see Disabling Paravirtualized Guests on Oracle VM Server in the *Oracle VM Administrator's Guide*. For information on secure VM migrations when creating a server pool, see the Create Server Pool topic in the *Oracle VM Manager User's Guide*.

Bug 27679547

9.3.8 Default VM Start Policy Is Different in Oracle VM Manager Command Line Interface and Oracle VM Manager Web Interface

In Oracle VM Release 3.4.5, the start policies for virtual machines have changed. At the server pool level, the Oracle VM Manager Command Line Interface and Oracle VM Manager Web Interface apply a different

default start policy: a server pool created through the web UI uses the "Best Server" policy, while a server pool created through the CLI uses the "Current Server" policy.

Workaround: There is no functional issue. The difference in behavior between both interfaces will not be addressed, because changing the default policy may break existing customers' CLI automation. Set the virtual machine start policy within your server pools as required.

Bug 27805945

9.3.9 Virtual Machine Fails to Boot with `kexec`

If you attempt to boot a virtual machine into a different kernel using `kexec`, the sequence sometimes fails due to certain devices not loading. Issues have been reported with missing networking or logical volumes, on a variety of kernel combinations. No root cause has been identified.

Workaround: The issue is intermittent, so you can retry. There is currently no workaround.

Bug 27338786

9.4 Known Issues and Workarounds

9.4.1 Missing Physical Disk Warning for Oracle VM Server Instance After Upgrading Oracle VM Manager

If you are using Oracle VM Manager Release 3.4.2 or later to manage previous versions of Oracle VM Server that have not yet been upgraded, warnings about missing physical disks in the internal ZFS storage appliance may be displayed in the Oracle VM Manager **Storage** tab and the **Physical Disks** perspective of the **Servers and VMs** tab. For example:

```
OVMEVT_007005D_000 Discover storage elements on server [ovcacn10r1] did not return
physical disk [SUN (2)] for storage array [OVCA_ZFSSA_Rack1].
```

Workaround: Upgrade all instances of Oracle VM Server to the same release version of Oracle VM Manager.

Bug 26320569

9.4.2 Suspend Error During Storage Live Migration

When migrating running virtual machines that use local storage, the virtual disks are migrated first from the source server's local repository to the destination server's local repository. In certain cases, during the storage live migration, a suspend error may occur for the source Oracle VM Server guest virtual machine when there is additional disk activity. For example, additional disk activity may involve a process that is running on the guest virtual machine that is writing to the virtual disk on the source server's local repository while it is being migrated to the destination server's local repository.

The suspend operation requires more time to complete due to the additional disk activity, resulting in a suspend error that causes the storage live migration to fail. A suspend error similar to the following is displayed in the `/var/log/xen/xend.log` on the source Oracle VM Server instance:

```
[timestamp 2792] DEBUG (XendDomainInfo:3509) waitForSuspend: domain 1 state:
[timestamp 2792] INFO (XendCheckpoint:430) [9836] xc: error:
Suspend request failed: Internal error
[timestamp 2792] DEBUG (XendDomainInfo:1943) XendDomainInfo.handleShutdownWatch
[timestamp 2792] INFO (XendCheckpoint:430) [9836] xc: error: Domain appears not
```

```
to have suspended: Internal error
```

A timeout error is also displayed in the kernel log on the source Oracle VM Server guest virtual machine:

```
timestamp server kernel: [ 1601.227167] Freezing of tasks failed
after xx seconds (0 tasks refusing to freeze, wq_busy=1):
```

Workaround: Update the `/sys/power/pm_freeze_timeout` parameter, which is specified in milliseconds on the source Oracle VM Server guest virtual machine to ensure adequate time is available when additional disk activity occurs during storage live migration:

1. Log in to the guest virtual machine.

2. It is strongly recommended to update the `pm_freeze_timeout` parameter to the maximum downtime that you can afford, up to a maximum of 5 minutes, or 300000 milliseconds. For example, to update the `/sys/power/pm_freeze_timeout` parameter to 5 minutes, run the following command on the guest virtual machine:

   ```
   # echo "300000" > /sys/power/pm_freeze_timeout
   ```

   > **Note**
   >
   > The value you set for the `pm_freeze_timeout` parameter impacts the amount of time the source Oracle VM Server guest virtual machine remains offline during storage live migration.

3. Perform the live migration with storage again and no suspend errors should occur.

If a suspend error still occurs for the source Oracle VM Server guest virtual machine after the `pm_freeze_timeout` parameter is updated, you may need to avoid storage live migration until the additional disk activity completes, or reconsider the maximum time you can afford for the guest virtual machine to remain offline during storage live migration.

Bug 26289880

9.4.3 Cannot Change Memory Configuration of Running PVHVM Guests Based on CentOS 6

For PVHVM guests based on CentOS 6, the available memory is set to the maximum memory in the virtual machine configuration when the virtual machine starts. Any operations to modify the memory while the guest is running complete successfully but do not take effect.

Workaround: Stop the virtual machine and then change the memory configuration.

Bug 26542210

9.4.4 PVHVM Guests Based on CentOS 5 Do Not Start Successfully After Conversion from PVM

> **Note**
>
> As of Release 3.4.6, support for PVM guests is removed. For information information, see Section 8.1, "Removed Features in 3.4.6".

If you change the domain type of a virtual machine based on CentOS 5 from PVM to PVHVM, and then attempt to start the virtual machine, it does not boot successfully. The following error displays in the virtual machine console:

```
Error 13: Invalid or unsupported executable format
```

Workaround: There is no workaround for this issue.

Bug 26537271

9.4.5 PVM Guests Based on CentOS 5 Do Not Start Successfully After Conversion from PVHVM

Note

As of Release 3.4.6, support for PVM guests is removed. For information information, see Section 8.1, "Removed Features in 3.4.6".

If you change the domain type of a virtual machine based on CentOS 5 from PVHVM to PVM, and then attempt to start the virtual machine, it does not boot successfully. The following error message is displayed:

```
ELF image has no shstrtab
```

Workaround: There is no workaround for this issue.

Bug 26537152

9.4.6 Guests Based on CentOS 5.11 Start with the Maximum Memory Configuration

Virtual machines based on CentOS 5.11 start running with a total memory that is equal to the maximum memory instead of the available memory, as defined in the virtual machine configuration.

Workaround: Change the memory configuration in the running virtual machine.

Bug 26536834

9.4.7 Guests Based on CentOS 5 Display Incorrect Number of VNICs

If you create a virtual machine based on CentOS 5 and then add a VNIC to the virtual machine, that VNIC is duplicated when you reboot the virtual machine. For example, if you add one VNIC, duplicate settings are displayed for the `eth0` and `eth1` interfaces.

The duplicate VNIC is caused by an issue with the CentOS 5 kernel that loads two drivers for the same network interface.

Workaround: There is no workaround for this issue.

Bug 26535868

9.4.8 Live Migrating Oracle Solaris Guests to Oracle VM Server Release 3.4.4 or Later Results in Guest Reboot

Live migrating Oracle Solaris HVM or PVHVM 64-bit guests from previous versions of Oracle VM Server to a destination Oracle VM Server at Release 3.4.4 or later results in an Oracle Solaris guest reboot. The following message is quickly displayed on the Oracle Solaris guest console, followed by a reboot:

```
gnttab_maps: Invalid pfn
```

Workaround: The following migration options are available:

Live migrate Oracle Solaris HVM or PVHVM 64-bit guests to Oracle VM Server Release 3.4.4 or later		**Note** The following points should be reviewed before proceeding with this solution: • To ensure minimal disruption, it is recommended to complete the instructions described in this solution immediately after upgrading to Oracle VM Server Release 3.4.4 or later and before the Oracle VM Server is returned to service. • All Oracle VM Server instances at Release 3.4.4 or later in the server pool must be updated based on the instructions described in this solution. • The configuration setting update described in this solution will be carried forward during future Oracle VM Server upgrades.

1. Using the Oracle VM Manager Web Interface, edit the destination Oracle VM Server and place it into maintenance mode. For more information, see Edit Server.

> **Note**
>
> If you have just upgraded to Oracle VM Server Release 3.4.4 or later, the Oracle VM Server may already be in maintenance mode.

2. On the Oracle VM Server instance, open `/etc/default/grub` for editing.

3. Add `gnttab_max_frames=64` to the `GRUB_CMDLINE_XEN` line.

4. Regenerate the GRUB2 configuration.

   • BIOS-based systems:

   ```
   grub2-mkconfig -o /boot/grub2/grub.cfg
   ```

   • UEFI-based systems:

   ```
   grub2-mkconfig -o /boot/efi/EFI/redhat/grub.cfg
   ```

5. Reboot the Oracle VM Server instance for the update to take effect.

6. Edit the Oracle VM Server on the Oracle VM Manager Web Interface and take it out of maintenance mode by unchecking the **Maintenance Mode** check box.

7. Proceed to live migrate the Oracle Solaris guest to the destination Oracle VM Server instance.

Migrate Oracle Solaris HVM or PVHVM 64-bit guests to Oracle VM Server Release 3.4.4 or later		**Note** Although live migration of Oracle Solaris guests to Oracle VM Server Release 3.4.4 or later is not possible with this solution, you avoid updating the configuration setting on the Oracle VM

> Server instance and the consequent required server reboot. In addition, there will be improved guest performance and the custom parameter `gnttab_max_frames=64` will not need to be maintained on any future installations of Oracle VM Server.

1. Before migrating the Oracle Solaris guest to the destination Oracle VM Server, you must stop the virtual machine guest on the source server.

2. Migrate the Oracle Solaris guest to the destination Oracle VM Server.

3. Once migration completes, restart the Oracle Solaris guest on the destination Oracle VM Server.

For more information, see Migrate or Move Virtual Machines.

Bug 26594820

9.5 Known Issues and Workarounds

9.5.1 Cannot Remove Software RAID Devices from Oracle VM Manager

You cannot use Oracle VM Manager to remove physical disks that are included in a software RAID. If you attempt to remove software RAID devices from Oracle VM Manager, the job fails with the following error message:

```
OVMRU_007016E: Operation is not supported for local storage.
```

Workaround: Manually remove the software RAID devices from Oracle VM Server. For more information, see Removing Software RAID Devices in the *Oracle VM Administrator's Guide*.

Bug 25554732

9.5.2 VNICs Deleted When Editing Virtual Machine

Modifying a virtual machine configuration deletes the VNICs associated with that virtual machine if edit jobs are in progress. For example, if you modify a virtual machine and then perform a subsequent modification before the first job completes, the VNICs associated with that virtual machine are deleted.

Workaround: When editing a virtual machine, you must wait until all previous edit jobs complete before making any further modifications.

Bug 24961613

9.5.3 Enable High Availability Option is Disabled Due to Restart Option

If you edit a virtual machine configuration to enable high availability, and the **Restart** or **Restart After Dump** option is set to either **Stop** or **Stop After Dump**, the **Enable High Availability** option is disabled on the Oracle VM Manager Web Interface.

Workaround: To enable the **Enable High Availability** option, you must first edit the virtual machine configuration and set the **Restart Action on Crash** option to **Restart** or **Restart After Dump** and then save the configuration before you attempt to enable high availability.

Bug 24961613

9.5.4 Cannot Upgrade Oracle VM Manager Due to Presence of Temporary Files

When upgrading Oracle VM Manager Release 3.3.3 to Release 3.4.x, the upgrade procedure may fail due to the presence of temporary files.

Workaround: Delete any temporary files that cause the upgrade failure. For example, run the following command as the root user on the Oracle VM Manager host:

```
# rm -Rf /tmp/workdir_sel
# rm -Rf /tmp/ovm*
```

Once these files are removed, restart the upgrade procedure again.

Bug 25394965

9.5.5 Job List Excel Spreadsheet Name Contains Unexpected Characters

In the Oracle VM Manager Web Interface, when you export the job list as a Microsoft Office Excel spreadsheet, the browser Save/Open File dialog may display the Job List Excel spreadsheet name with unexpected characters, for example, `=_UTF-8_Q_JobList=2Exls_=`. This issue occurs if you are using Microsoft Internet Explorer 11 as your browser, and you are using a language setting other than English.

Workaround: Although the Excel spreadsheet can be successfully downloaded and opened, it is recommended to remove the unexpected characters and rename the spreadsheet to `JobList.xls`.

Bug 25574313

9.5.6 Oracle Linux 6 HVM Guest Virtual Machine with Hard Disk of 2TiB in Size Hangs on Boot

You cannot start hardware virtualized (HVM) guests running Oracle Linux 6 if the guest boots from hard disks of 2TiB in size.

Workaround:

1. Host the contents of the Oracle VM Server ISO image file over the network so that you can access the required GRUB2 package files.

2. Log in to the Oracle VM Manager Web Interface.

3. Clone the Oracle Linux 6 virtual machine and ensure that it is not attached to a hard disk of 2TiB in size.

4. Attach the 2TiB hard disk to the cloned virtual machine.

5. Install the `grub2` packages on the 2TiB hard disk that you attached to the cloned virtual machine, for example:

```
# cd /tmp
# wget --no-proxy /path/grub2-version.rpm
# wget --no-proxy /path/grub2-tools-version.rpm
# mkdir tmp
# cd tmp
# rpm2cpio ../grub2version.rpm | cpio -iumd
# rpm2cpio ../grub2-tools-version.rpm | cpio -iumd
# /usr/sbin/grub2-install -d ./usr/lib/grub/i386-pc/ --force /dev/sdb
  Installing for i386-pc platform.
  ./usr/sbin/grub2-install: warning: this GPT partition label contains no BIOS Boot
  Partition; embedding won't be possible.
```

```
./usr/sbin/grub2-install: warning: Embedding is not possible. GRUB can only be
installed in this setup by using blocklists. However, blocklists are UNRELIABLE and
their use is discouraged.
Installation finished. No error reported.
```

Note

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

- Substitute *version* with the `grub2` package version contained in your Oracle VM Server instance.

- Substitute */dev/sdb* with the device name for the 2TiB hard disk that you attached to the cloned virtual machine.

6. Create the `/boot/grub2/grub.cfg` configuration as follows:

```
set default="0"
set timeout=5
menuentry 'Linux' {
    insmod part_gpt
    insmod ext2
    set root='hd0,gpt1'
    linux /vmlinuz-version ro root=/dev/mapper/VolGroup-lv_root
    initrd /initramfs-version.img
}
```

Note

Update the `vmlinuz` and `initramfs version` accordingly based on the Oracle Linux 6 version installed.

7. Re-attach the 2TiB hard disk to the virtual machine that you could not boot.

Bug 25655807

9.5.7 Kernel Panic when Assigning More Than 32 virtual CPUs to Oracle Linux 32-bit PVM Guests

Note

As of Release 3.4.6, support for PVM guests is removed. For information information, see Section 8.1, "Removed Features in 3.4.6".

You cannot assign more than the 32 virtual CPUs to Oracle Linux 32-bit Paravirtualized (PVM) guests running Oracle Unbreakable Enterprise Kernel (UEK) Release 2. Oracle Linux 32-bit PVM guests running UEK Release 2 support a maximum of 32 virtual CPUs. If you assign more than the maximum virtual CPUs allowed, kernel panic may occur.

Workaround: Set the maximum virtual CPUs to 32 or less. Use the `uname` command to determine the UEK version you are running on the guest virtual machine and from the result, you can determine the maximum number of virtual CPUs supported, for example:

```
# uname -r
2.6.39-400.278.3.el6uek.i686
# cat config-2.6.39-400.278.3.el6uek.i686 | grep CONFIG_NR_CPUS
CONFIG_NR_CPUS=32
```

Bug 25745578

9.5.8 Live Migration of Guest Virtual Machine Fails Due to Linux Kernel Version

Running Linux UEK x86_64 `2.6.39-400.109.1.el6` as the guest kernel may cause issues during live migration. For example, live migration may fail with an unresponsive guest virtual machine on the VNC Console.

Workaround: Upgrade the guest kernel to the latest version.

Bug 25644455

9.5.9 PVHVM Guest Boot Delayed by Xen Balloon Driver

Booting PVHVM guests takes longer than expected and the following message is written to stack trace:

```
INFO: task <task_name>:234 blocked for more than 120 seconds
"echo 0 > /proc/sys/kernel/hung_task_timeout_secs" disables this message.
```

This issue occurs when the virtual machine configuration includes a maximum memory value that is much larger than the available memory value. This configuration causes the Xen balloon driver to shrink the guest memory to the target size. As a result, the boot time for the virtual machine takes longer than expected.

Workaround: The greater the difference between the values for maximum memory and available memory, the longer it takes to boot PVHVM guests. If you encounter this issue, you should either decrease the maximum memory or increase the available memory in the virtual machine configuration.

Bug 25709221

9.5.10 Oracle VM Server Cannot Boot from Software RAID Devices with Disks that are 2TB or Larger

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.

Workaround: There is no workaround for this issue.

Bug 25608136

9.5.11 Oracle VM Server Does Not Boot After Installation to LUN Targets Larger Than 2TB

In some cases, Oracle VM Server does not have a valid boot entry after installation to Fibre Channel or Fiber Channel over Ethernet (FCoE) LUNs. As a result, Oracle VM Server cannot boot successfully. This issue affects both BIOS and UEFI-based environments and is the result of outdated firmware for the host bus adapter (HBA) or other host controller on the target server.

As of Release 3.4.3, support for installation of Oracle VM Server to systems where Fibre Channel or FCoE LUNs are greater than 2TB in size applies to the following tested versions only:

Server	Host Adapter or Controller	Part Number	Firmware version	BIOS or UEFI
Oracle Server X4-4	Sun StorageTek Dual 8 Gb Fibre Channel PCIe HBA	SG-XPCIE2FC-QF8-Z	8.05.00	UEFI

Server	Host Adapter or Controller	Part Number	Firmware version	BIOS or UEFI
Oracle Server X5-2	Sun Storage 16 Gb Fibre Channel PCIe Universal HBA, QLogic	7101674	8.05.00	UEFI
Oracle Server X5-4	Sun Storage 16 Gb Fibre Channel PCIe Universal HBA, Emulex	7101684	11.1.160.6	BIOS and UEFI
Oracle Server X5-8	Sun Storage 16 Gb Fibre Channel PCIe Universal HBA, QLogic	7101674	8.05.00	UEFI

Note

- Legacy BIOS SAN boot is not supported for Fibre Channel or FCoE LUNs that are greater than 2TB in size for QLogic HBA or other host controllers on the target server.

- UEFI SAN boot for Qlogic HBA or other host controllers are supported, but the firmware for the HBA or other host controllers on the target server may need to be updated.

- Both Legacy BIOS and UEFI SAN boot for HBA or other host controllers, such as Emulex are supported, but the firmware for the HBA or other host controllers on the target server may need to be updated.

Workaround: Update the firmware for the host bus adapter (HBA) or other host controller on the target server.

Bug 25701247

9.5.12 Oracle VM Server Boot Delay and I/O Error Messages with Oracle ZFS Storage Array

A known issue with the Oracle ZFS SCSI storage driver causes significant delays during Oracle VM Server boot and writes a large number of I/O error messages to the kernel log. This issue occurs because the storage driver loads before the SCSI device handler modules (`scsi_dh`) are available. As a result, the system issues I/O operations to SCSI multipath devices before the devices can handle them.

Workaround: Add the SCSI device handler modules (`scsi_dh`) to the kernel command line parameters as follows:

1. Open `/etc/default/grub` for editing.

2. Add `rdloaddriver=scsi_dh_alua` to the `GRUB_CMDLINE_LINUX` line.

3. Regenerate the GRUB2 configuration.

   - BIOS-based systems:

     ```
     grub2-mkconfig -o /boot/grub2/grub.cfg
     ```

   - UEFI-based systems:

     ```
     grub2-mkconfig -o /boot/efi/EFI/redhat/grub.cfg
     ```

Bug 25686610

9.5.13 FIPS Integrity Error Message for SSH Connections from Oracle VM Server

If you are logged in to Oracle VM Server and you establish an SSH connection to another system, the following message is displayed:

```
FIPS integrity verification test failed.
```

This message indicates that Oracle VM Server cannot enable FIPS mode for outbound SSH connections. However, Oracle VM Server can still establish an SSH connection to the remote system but that connection is not validated by FIPS cryptographic algorithms.

Workaround: There is no workaround for this issue.

Bug 25831585

9.5.14 Incorrect MAC Address Displayed for Bond Port

In some cases, Oracle VM Manager displays an incorrect MAC address for bond ports instead of the MAC address assigned for the bond port on Oracle VM Server for SPARC.

Workaround: Ensure the bond port is up by running the `dladm show-aggr -x` command on the primary domain of the SPARC server, and then rediscover the instance of Oracle VM Server for SPARC.

Bug 25768560

9.6 Known Issues and Workarounds

9.6.1 Kernel Panic when Booting Guest Virtual Machine with 100 or more Virtual Disks

Adding 100 or more virtual disks to a guest virtual machine and then booting the virtual machine with a UEK2, UEK3, or UEK4 kernel results in a kernel panic, as the virtual machine does not recognize all the virtual disks and loses network connectivity.

Workaround: For more information on this issue and the workaround, see *Oracle VM: VM Guest With 100+ Virtual Disks Does Not Recognize Them All And Loses Connectivity* Document ID 2038050.1, on My Oracle Support at: https://support.oracle.com/oip/faces/secure/km/DocumentDisplay.jspx?id=2038050.1.

Bug 24428913

9.6.2 Different Default Values for the serverAffinityType when Creating Anti-Affinity Groups

When you create an anti-affinity group, the default value for the affinity group type that is returned for the `getServerAffinityType` method is different, depending on whether you create the anti-affinity group in the Oracle VM Manager Web Interface or the Oracle VM Web Services API. If you create the anti-affinity group in the Oracle VM Manager Web Interface, the server affinity type is set to ANTI_AFFINITY . If you create the anti-affintity group using the Oracle VM Web Services API, the server affinity type is set to NO_AFFINITY .

Workaround: There is no workaround for this issue.

Bug 23542910

9.6.3 Performance Impact when Less than 8 CPUs Configured for dom0

For best performance, if dom0 is configured with less than 8 CPUs, the `xen_netback max_queues` option in the `ovs.conf` file should be set to the number of CPUs configured for dom0. For example, if you configure dom0 with 6 CPUs, then you should set the value of the `xen_netback max_queues` option to 6.

Workaround:

1. Start an ssh session to Oracle VM Server.

2. Open `/etc/modprobe.d/ovs.conf` for editing.

3. Set the value of the `xen_netback max_queues` option equal to the number of CPUs configured for dom0.

4. Reboot Oracle VM Server for the setting to take effect.

Bug 24329130

9.6.4 Upgrading Oracle VM Server from Release 3.2.10 to 3.3.4 and then to 3.4.2 fails

When upgrading Oracle VM Server Release 3.2.10 to Release 3.4.2, and your upgrade path is from Release 3.2.10 to 3.3.4 and then to Release 3.4.2, the upgrade fails with the following message:

```
kernel-uek-firmware-2.6.39-400.249.3.el5uek.noarch has missing requires of aic94xx-firmware
```

Workaround: After upgrading to Oracle VM Server Release 3.3.4, remove the `kernel-uek-firmware-2.6.39-400.249.3.el5uek.noarch` rpm package before upgrading to Release 3.4.2. For example, run the following command to delete the rpm package:

```
# rpm -e --justdb kernel-uek-firmware-2.6.39-400.249.3.el5uek.noarch
```

Bug 24665394

9.6.5 Logical Volume Manager (LVM) is enabled on Oracle VM Server Release 3.4.1

By default, Logical Volume Manager (LVM) should not be enabled. However, in Oracle VM Server Release 3.4.1 LVM is not disabled correctly. As a result, LVM disks are inadvertently activated. This setting also applies to Oracle VM Server instances that you upgrade from Oracle VM Server Release 3.4.1.

Workaround: Disable LVM on Oracle VM Server. If you plan to upgrade to a later version, you should complete these steps before upgrading:

1. Start an ssh session to Oracle VM Server Release 3.4.1.

2. Open `/etc/lvm/lvm.conf` for editing.

3. Locate the `global {` section of the file and comment out the `global_filter = [ "r/.*/" ]` setting option, so it is displayed as follows:

```
# For OVS, don't even open any device
# global_filter = [ "r/.*/" ]
```

4. Locate the `devices {` section of the file. Uncomment the `global_filter = []` setting and update it as follows:

```
# Since "filter" is often overridden from command line, it is not suitable
# for system-wide device filtering (udev rules, lvmetad). To hide devices
# from LVM-specific udev processing and/or from lvmetad, you need to set
# global_filter. The syntax is the same as for normal "filter"
# above. Devices that fail the global_filter are not even opened by LVM.
global_filter = [ "r/.*/" ]
```

5. Save and close the file.

6. If LVM disks are activated, you must manually deactivate them or reboot Oracle VM Server for the updates to take effect.

7. If LVM disks are not activated, no further action is required.

Bug 24583291

9.6.6 Btrfs Root File System Not Supported on PVM Guest Virtual Machines

Note

As of Release 3.4.6, support for PVM guests is removed. For information information, see Section 8.1, "Removed Features in 3.4.6".

Btrfs root file system is not supported on x86-based PVM guest virtual machines. For example, updating the domain type of PVHVM guests running on SUSE Linux Enterprise Server 12 SP2 or later to PVM results in the virtual machine failing to start-up. This occurs as btrfs is the default file system on SUSE Linux Enterprise Server 12 SP2 or later operating system.

Workaround: There is no workaround for this issue.

Bug 25040512

9.6.7 SUSE Linux Enterprise Server 12 SP2 and Later Not Supported For PVM Guest Virtual Machines

Although SUSE Linux Enterprise Server 12 SP2 or later is supported for both hardware virtualization (HVM) and hardware virtualization with paravirtual drivers (PVHVM), it is not possible to run this operating system as a paravirtualized domain (PVM). This is due to the default btrfs file system on SUSE Linux Enterprise Server 12 SP2 or later not being supported on PVM.

Bug 25040512

9.7 Known Issues and Workarounds

9.7.1 Cannot Connect to the Oracle VM Manager Web Interface with Microsoft Internet Explorer

In some cases, if you attempt to connect to the Oracle VM Manager Web Interface with Microsoft Internet Explorer version 10 or lower, the Oracle VM Manager Web Interface does not respond when you enter login credentials. No messages are written to the AdminServer.log file to indicate errors or provide debugging information.

Workaround: Do one of the following:

• Reset Internet Explorer settings.

- Use Internet Explorer version 11 or a different browser, such as Mozilla Firefox, to connect to the Oracle VM Manager Web Interface.

Bug 20691432

9.7.2 The Virtual Machine Console Window in the Oracle VM Manager Web Interface Opens in the Background when using Microsoft Internet Explorer

The virtual machine VNC or serial console windows, that can be opened from within the Oracle VM Manager Web Interface, may initially open in the background and not have immediate focus when using Microsoft Internet Explorer. This means that after you click on the menu option to open a console dialog, it initially appears as if nothing has happened as the main browser window remains in the foreground. However, the console window has opened but is in the background. This is the result of a bug in the underlying framework that is used for the development of the Oracle VM Manager Web Interface.

Workaround: Do one of the following:

- Check in the Windows task bar to determine whether another window has been opened in the background, or use the Alt-Tab key combination to cycle through open windows.

- Use a different browser, such as Mozilla Firefox or Chrome to connect to the Oracle VM Manager Web Interface.

Bug 21235816

9.7.3 Inconsistent Value for SPARC Domain Type

In the Oracle VM Manager Web Interface, you can select **OVM/SPARC** as a value for the `Domain Type` option used to create or edit a virtual machine. In the Oracle VM Manager Command Line Interface, and in the Oracle VM Web Services API, the value for the `DomainType` option can be set as **LDOMS_PVM**. These two values should be understood to be equivalent and refer to the hypervisor that is available on an Oracle VM Server for SPARC.

You are unable to use these values interchangeably and must use the correct value for the interface that you are using to configure the virtual machine. Check the appropriate documentation if you are unsure of the values that can be set for this option.

Workaround: There is no workaround for this issue.

Bug 20786024

9.7.4 Integer Only Values for the statValue Option

In the Oracle VM Manager Command Line Interface, you must use only integers to specify values for the `statValue` option when using the `equalityType` option for the `getStatListByQuery` command. Floats and decimals are not supported values for the `statValue` option.

Workaround: There is no workaround for this issue.

Bug 21046910

9.7.5 Aborting a Server Discovery Operation Results in Server Listed with an Unknown Operational State

Aborting a server discovery operation within Oracle VM Manager can result in the server being listed within the Oracle VM Manager Web Interface with an unknown operational state. Equally, the server object may

appear as locked within the Oracle VM Manager Web Interface. This is because events triggered by the discovery operation may cause the state of the Oracle VM Manager Web Interface to fall out-of-sync with the actual state of the environment.

Workaround: To correct the operational state returned by Oracle VM Manager, rediscover any Oracle VM Servers that are affected. If you wish to remove these servers, delete them after you have performed the discovery operation.

Bug 21495833, 21495187

9.7.6 Automatic Discovery Operations can Conflict with Server Configuration Operations

In certain rare cases, an automatic server rediscovery is triggered by an error condition at the same time that a server configuration operation is taking place. In this situation, it is possible that this conflict can result in configuration information specific to the Oracle VM Server falling out-of-sync with the information reflected by Oracle VM Manager.

Workaround: To correct the information returned by Oracle VM Manager, rediscover any Oracle VM Servers that are affected.

Bug 21341236

9.7.7 Solaris 11 x86 Virtual Machine Disk Type Can Cause Kernel Panic on Boot

On Oracle VM, Solaris 11 x86 virtual machines are all installed and run with Xen Virtual Disk (XVD) disks by default. Exporting a Solaris 11 x86 virtual machine as a virtual appliance (OVA), and then importing it to a virtualization platform that supports a different disk type or disk controller, changes the path to the boot disk for the virtual machine. As a result, a kernel panic occurs for the Solaris 11 x86 virtual machine because it cannot locate the boot disk.

Workaround: Use the Solaris 11 x86 live installation ISO to boot the Solaris virtual machine. When the live installation GUI displays, open a terminal window and change to the root user. Run `zpool import -f rpool` and then run `shutdown`. After the virtual machine shuts down, remove the live installation ISO and boot from the disk.

Bug 21253581

9.7.8 Solaris 10 x86 Virtual Machine Installation Fails To Boot

On Oracle VM, virtual machines that are installed with Solaris 10 directly from the installation ISO may fail to boot immediately after installation and can return the error: 'Bad PBR Sig'.

This bug is related to the way in which virtual disks are referenced in the virtual machine configuration file, where they are configured as Xen Virtual Disk (XVD) disks by default. For Solaris to recognize this disk type, a patch needs to be applied to the Solaris installer to recognize the new disk type and to allow it to write to the boot block of the disk. This patch can been applied for network installs, but is not applied to the installation ISO, therefore additional steps must be taken when performing an installation from the ISO.

Workaround: The workaround provided here has been tested for Solaris 10u11. If you require that you complete an installation of Solaris 10u11 from ISO, it is possible to rectify the issue described here by performing the following steps:

- Reboot the virtual machine and use the ISO to perform the boot.

- During the boot process select the option to go to command line mode (option 6).

- At the command prompt, run `installgrub` to manually install the grub loader to the boot partition, as follows:

```
/a/sbin/installgrub -m /a/boot/grub/stage1 /a/boot/grub/stage2 /dev/rdsk/c1t0d0s0
```

  Substitute `c1t0d0s0` with your device as appropriate.

- Reboot the virtual machine and the installation completes.

Solaris 11 is unaffected by this issue.

Bug 21775043

9.7.9 Oracle Linux 7 Virtual Machines Imported from a VirtualBox Virtual Appliance Do Not Start on Oracle VM

Virtual machines running Oracle Linux 7 exported from Oracle VirtualBox as a virtual appliance and then imported into Oracle VM may not boot correctly and may exit to an emergency shell. This is caused by a missing xen-blkfront driver in the initramfs image. Typically, output during boot, for affected systems, appears as follows:

```
[ OK ] Reached target Basic System.
dracut-initqueue[227]: Warning: Counld not boot.
dracut-initqueue[227]: Warning: /dev/mapper/ol-root does not exist
dracut-initqueue[227]: Warning: /dev/ol/root does not exist
dracut-initqueue[227]: Warning: /dev/ol/swap does not exist
             Starting Dracut Emergency Shell ...
Warning: /dev/mapper/ol-root does not exist
Warning: /dev/ol/root does not exist
Warning: /dev/ol/swap does not exist
```

Workaround: There are two workarounds to this problem. The first involves adding the missing drivers prior to exporting the Oracle Linux 7 virtual machine from Oracle VirtualBox. To do this, run the following command as root before you perform the export:

```
# dracut --add-drivers "xen-blkfront xen-netfront" --force
```

If you are unable to perform this step prior to the export, you can temporarily boot the virtual machine as an HVM and add the following boot option in GRUB prior to boot:

```
xen_emul_unplug=never
```

Once the virtual machine has booted, you can add the missing drivers by running the following command as root:

```
# dracut --add-drivers "xen-blkfront xen-netfront" --force
```

Reboot the virtual machine once the drivers have been added to the initramfs.

Bug 21244825

9.7.10 (x86 Only) IOStat Stays at 100% Util for Oracle Linux Virtual Machines After a Storage Migration

When a virtual machine running a kernel prior to UEK 3.8.13-68.2.1 is migrated from a local repository using the 'live migrate with storage' option, and all IO has been terminated, the IOStat on the virtual machine remains stuck at 100% Util.

This is related to a kernel bug where a call to the Xen blkfront driver caused the IO statistics to not be properly refreshed after a migration was completed, causing the accounting to fall out of sync with actual IO activity.

Workaround: This bug is resolved in UEK 3.8.13-68.2.1 and greater. To avoid this issue, upgrade the kernel used by your virtual machine.

Bug 21614184

9.7.11 Serial Console Does Not Respond for Oracle Linux 7 HVM Virtual Machines

The serial console does not respond, or provide any output, for virtual machines based on Oracle Linux 7 that are of domain type HVM or PVHVM.

Workaround: Configure the GRUB bootloader for the virtual machine as follows:

1. Add the following lines to the `/etc/default/grub` file:

    ```
    GRUB_CMDLINE_LINUX=" console=ttyS0 console=tty0 crashkernel=auto \
      rd.lvm.lv=ol/root rd.lvm.lv=ol/swap rhgb quiet"
    GRUB_TERMINAL="serial console"
    GRUB_SERIAL_COMMAND="serial --unit=0"
    ```

2. Run the following command to update the `grub.cfg` file:

    ```
    grub2-mkconfig -o /boot/grub2/grub.cfg
    ```

3. Restart the virtual machine.

Note that the preceding lines provide suggested configuration. You should consult the GNU GRUB manual for descriptions of each line and additional configuration options to suit your business needs. The GNU GRUB manual is available from the following directory on the virtual machine: `usr/share/doc/`. Additionally, you should refer to the *About the GRUB2 Boot Loader* section of the Oracle Linux Administrator's Guide for more information.

> **Tip**
>
> Use the following keys to navigate the boot menu: **v** for down-arrow and **^** for up-arrow.

Bug 21229730

9.7.12 Error When Attaching CD-ROM Drives to Running HVM Virtual Machines

If you attempt to attach a CD-ROM drive to an available slot on a running virtual machine of domain type HVM, an error occurs and it is no longer possible to use the specified slot. For example, after you attempt to attach a CD-ROM drive to slot 2, you then attempt to attach a virtual disk to slot 2. In both cases an error occurs and slot 2 becomes unusable.

This issue occurs because running HVM virtual machines do not support the function to attach CD-ROM drives.

Workaround: Stop the virtual machine and then attach the CD-ROM drive.

Bug 21300944

9.7.13 Deleting Bond Ports for VLANIF Interfaces Deletes the VLANIF

Deleting a bond port that is in use by a VLANIF interface configuration also deletes the VLANIF interface.

Workaround: There is no workaround for this issue.

Bug 21217364

9.7.14 (SPARC Only) NFSv4 Delegation Interferes with Cluster Heartbeat, Using NFSv3 Results in RPC Error PROGRAM/VERSION MISMATCH

Server pool clustering on SPARC based server pools can cause servers to automatically fence due to NFSv4 write delegation revocation timeouts which exceed the timeout value for the cluster.

It is not possible to use NFSv3 as this results in an RPC error reporting a "PROGRAM/VERSION MISMATCH" and can cause the cluster database to hang due to the NFSv3 locking mechanism. This is expected behavior.

Workaround: There is no workaround for this issue. Only NFSv4 is supported for SPARC clustering, and you must disable delegation for this to work.

Bugs 18997487, 20443098, 21317571

9.7.15 Cannot Import OVF Files into Oracle VirtualBox

You cannot successfully import a virtual appliance into Oracle VirtualBox if you exported that virtual appliance from Oracle VM as an extracted OVF that includes three separate files, a `package.ovf` file, a `package.mf` file, and a `disk.vmdk` file.

Workaround: Delete the `package.mf` file before you import the virtual appliance into Oracle VirtualBox. Alternatively, export the virtual appliance from Oracle VM as an OVA file.

Bug 21261077

9.7.16 Oracle VM Manager Cannot Receive Messages from SPARC Virtual Machines

After sending messages to a virtual machine running on Oracle VM Server for SPARC to configure network settings, Oracle VM Manager does not receive messages that indicate that the network was configured successfully.

Workaround: There is no workaround for this issue.

Bug 21062991

9.7.17 Cannot Boot Oracle VM Server Installed on an HP DL380 Gen9 Server in UEFI mode

In some cases, after you install Oracle VM Server on an HP DL380 Gen9 server in UEFI mode, you cannot successfully boot Oracle VM Server. This is the result of an issue with HP Smart Array firmware versions lower than 2.52.

Workaround: Update the HP Smart Array firmware to version 2.52 or higher.

Bug 21466879

9.7.18 (x86 Only) Cannot Boot Oracle VM Server with Broadcom 57840S CNA Card After PXE Install

If you perform a network installation of Oracle VM Server on an x86 system using the Broadcom 57840S CNA Card, you are unable to boot using FCoE. This issue is the result of a bug in the anaconda installer, where the installer is unable to see all of the disks when the system is booted using PXE.

Workaround: Do not use PXE boot to install systems that make use of this hardware.

Bug 20830496

9.7.19 Changing to Dynamic Mode IP Address Assignment Does Not Rollback if the Server is Unable to Obtain an IP Address

If you choose to change the IP address assignment mode to 'Dynamic' for any Oracle VM Server network interface or port within Oracle VM Manager, the operation that is triggered is a multi-step operation. First, the network configuration is changed on the server and within the Oracle VM Manager database. Then the server attempts to obtain an IP address from the DHCP server. If this second operation fails, the server returns an error but the Oracle VM Manager is unable to rollback the initial operation. The result is that the server remains configured for DHCP but the port does not have an IP address assigned.

If the port is used for the Management Network, it is possible that the server is no longer accessible to the Oracle VM Manager and you must correct the networking manually on the server. This may require you to reissue a DHCP request by running the `dhclient` command on the command line of the server, or it may require that you reconfigure the network interface with a static IP address and network mask. You may do this temporarily using the `ip addr` command on the command line. Once your server has an IP address within the management network range, you must rediscover the server.

Workaround: There is no workaround for this issue. You must ensure that your infrastructure is fully functional and that servers are able to obtain IP addresses from the DHCP server if you choose to use Dynamic Mode for IP address assignment for a server. Alternately, use Static IP addressing.

Bug 21370280

9.7.20 Drag and Drop from Blank Space of Object

It is not possible to drag and drop one or more virtual machines or Oracle VM Servers if you select the text area of the object or the expansion arrow next to the object.

Workaround: Select an area of blank space in the object to drag and drop that object.

Bug 21687716

9.7.21 Error When Using the Administrator Tool in Parallel

If two or more users connect to the same instance of Oracle VM Manager and simultaneously attempt to create users with the Oracle VM Manager Administrator Tool (ovm_admin), an error occurs and the following message is written to `AdminServer.log`:

```
Problem invoking WLST - Traceback (innermost last): File
"/u01/app/oracle/ovm-manager-3/ovm_wlst/jython/ovm/admin/createuser.py"
```

Workaround: Ensure that only one user at a time connects to Oracle VM Manager to use the Oracle VM Manager Administrator Tool (ovm_admin).

Bug 21679271

9.7.22 Oracle VM Manager Command Line Interface TCP Port Conflicts With Port Reserved for NDMP

The Oracle VM Manager Command Line Interface uses TCP port 10000 by default. This port is usually reserved for the Network Data Management Protocol (NDMP).

Workaround: Change the default port for the Oracle VM Manager Command Line Interface if you require TCP port 10000 for other applications that use NDMP, see SSH Port in the *Oracle VM Manager Command Line Interface User's Guide*.

Bug 21960034

9.7.23 When A Virtual Machine Using A Shared Virtual Disk Is Moved To Another Repository, The Shared Virtual Disk Is Cloned

When a virtual machine that is using a shared virtual disk is moved to another repository, the shared virtual disk is cloned during the move process to allow the virtual machine to continue to use the resources on the shared virtual disk. This may not be the behavior that you expect when you move a virtual machine and could result in duplicated data resources that could eventually become unsynchronized and difficult to reconcile.

This design decision allows virtual machines to be restarted after a move with minimum impact as all used resources continue to be available. However, the behavior is not intuitive and may be modified in subsequent releases.

Workaround: Be aware of the existing behavior and detach any shared disks before moving the virtual machine. If the virtual machine needs to make use of resources on the shared disk, detach the shared disk from all virtual machines and move it separately before reconfiguring your virtual machine to use it again. Make sure that all virtual machines that require access to the same shared disk are located in the same repository.

Bug 21316001

9.7.24 Unable to Remove a Storage Array if a File System Exists on a LUN

In the case where a repository is hosted on a LUN on a storage array and ownership of the repository is released, a rule violation is reported if you attempt to delete the storage array. This issue only affects storage arrays. File servers are unaffected.

Workaround: To resolve this issue you must completely unconfigure the elements of the storage array before attempting to remove it. Remove ownership of any repositories hosted on the storage array, remove the storage server from any access groups and finally delete the storage array.

Bug 22313650

9.7.25 Cluster Failure After An Offline Server is Removed From the Cluster While Another Cluster Member is Offline

If more than one Oracle VM Server within a clustered server pool is offline at the same time, and one of those servers is removed from the server pool, when the other offline servers come back online, the cluster remains in a failed state. This is because the cluster configuration falls out of sync across the members of the cluster.

Whenever a server is added or removed from a cluster, Oracle VM Manager triggers an operation on each Oracle VM Server in the cluster to update the cluster configuration information. However, if any servers are offline at this time, they are unable to receive the updated configuration resulting in a configuration

mismatch between the cluster configuration on the server and the actual configuration for the rest of the cluster. As a result, the server is no longer able to participate in the cluster.

On an x86 platform, this situation is simply represented within Oracle VM Manager and can be easily resolved from within Oracle VM Manager. On a SPARC platform, this can cause a server to repeatedly reboot when it comes online again due to a cluster panic.

Workaround (SPARC): In the case where a SPARC server is rebooting continuously, the problem is caused by the server attempting to rejoin the cluster even though it is no longer a member of the cluster. As a result, the server can panic repeatedly with a message similar to the following:

```
panic[cpu5]/thread=2a102a13c60:
 **** dlm FENCING this system by PANICing
```

If this issue occurs and a server is repeatedly panicking then you can prevent the server from panicking again by stopping the ovs-agent service and deconfiguring the cluster. To do so, connect to the server as root and run the following commands:

```
# svcadm disable -s ovs-agent
# dlmcconf -S
```

If you are unable to run these commands because the server is panicking too quickly, then boot the server in single-user mode:

```
ok boot -s
```

Disable the ovs-agent service:

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

Reboot the server. The server stops panicking while the ovs-agent service is disabled. If you want to re-enable the ovs-agent service, then you must resolve the cluster configuration issue first.

Once you have resolved the cluster configuration issue, you can acknowledge the server cluster failure event within Oracle VM Manager to resume normal operations.

Workaround (x86): To restore the environment to normal operation, you must first acknowledge the server cluster failure event within Oracle VM Manager. Remove any servers from the server pool that were offline when you made the configuration change, and then add them back to the server pool, so that the cluster configuration information can be properly refreshed for that server.

Bug 22304185, 18776654

9.7.26 LSI Logic / Symbios Logic MegaRAID SAS 1078 is not supported on Oracle VM Server

Oracle VM Server may not be able to detect disks on systems using the Dell PowerEdge Expandable RAID Controller 5 which uses LSI Logic/Symbios Logic MegaRAID SAS 1078. This is due to the unavailability of compatible driver firmware to enable device support within UEK4 from the hardware manufacturer. You may not be able to successfully upgrade servers using this hardware to Oracle VM Server 3.4.1 or above.

There are no workarounds for this issue. You must upgrade your hardware.

Bug 21843131, 21223382

9.7.27 (SPARC Only) Hot-added CD-ROM Device is Detected As Hard Disk

If you hot add a virtual CD-ROM device to a virtual machine running on Oracle VM Server for SPARC, the CD-ROM device is not detected as a removable device and is not shown when you run the `rmformat` or

`format` commands. Instead, the device is listed as a virtual disk and is mapped this way as a device alias. This can be verified using the OpenBoot PROM to run the `show-disks` and `devalias` commands.

Workaround: There is no workaround to this issue. Remain aware that when hot-adding a virtual CD-ROM device, this is detected as a virtual disk instead and is mapped in Solaris as a `/dev/dsk/c1dXsX` entry.

Bug 21278127

9.7.28 Fibre Channel LUNs Missing From Oracle VM Manager After Refresh

In some instances, after you refresh physical disks in the *Storage* tab in Oracle VM Manager Web Interface, fibre channel LUNs might not be included in the refresh. As a result, the LUNs appear to be missing even though they are online at the server.

Workaround: You should first examine all components of the infrastructure, such as switches, cables, and HBAs, to ensure that no defects or failures exist. If, after a subsequent refresh, the LUNs still appear to be missing, you can perform the following steps to resolve this issue:

1. List all attached SCSI devices.

```
# lsscsi
[0:0:0:0]    disk    HP        LOGICAL VOLUME   1.34   /dev/sda
[0:0:0:1]    disk    HP        LOGICAL VOLUME   1.34   /dev/sdb
[0:3:0:0]    storage HP        P440ar           1.34   -
[1:0:0:0]    disk    SUN       ZFS Storage 7330 1.0    /dev/sdc
[1:0:0:1]    disk    SUN       ZFS Storage 7330 1.0    /dev/sdd
[1:0:0:2]    disk    SUN       ZFS Storage 7330 1.0    /dev/sde
[1:0:1:0]    disk    SUN       ZFS Storage 7330 1.0    /dev/sdf
[1:0:1:1]    disk    SUN       ZFS Storage 7330 1.0    /dev/sdg
[1:0:1:2]    disk    SUN       ZFS Storage 7330 1.0    /dev/sdh
[1:0:2:1]    disk    NETAPP    LUN              7330   /dev/sdo
[1:0:2:2]    disk    NETAPP    LUN              7330   /dev/sdp
[1:0:2:3]    disk    NETAPP    LUN              7330   /dev/sdq
```

2. Change to the SCSI address of the affected LUNs.

   Based on the preceding example, you can enter `rport-1:0-2` to cover [1:0:2:1], [1:0:2:2], [1:0:2:3], and so on.

```
# cd /sys/class/fc_remote_ports/rport-1:0-2/
```

3. Check the timeout value of the `fast_io_fail_tmo` option.

```
# cat fast_io_fail_tmo
5
```

4. Increase the timeout value to just over the amount of time it takes for the LUN to return to the running state. The value that you set should be less than the value of the `dev_loss_tmo option` in the same directory. You should need to change only one of the affected LUNs.

```
# echo 15 > fast_io_fail_tmo
```

5. Add the command to `/etc/rc.local` to make the change permanent.

```
# cat /etc/rc.local
#!/bin/sh
#
# This script will be executed *after* all the other init scripts.
# You can put your own initialization stuff in here if you don't
# want to do the full Sys V style init stuff.
```

```
echo 15 > /sys/class/fc_remote_ports/rport-1:0-2/fast_io_fail_tmo
```

Bug 22322461

9.7.29 (SPARC Only) Size of Physical Disk in Oracle VM Manager Incorrect When LUN Size is Decreased on Storage Array

In the event that a LUN is resized directly on the storage array and that LUN is used by an Oracle VM Server for SPARC, the size of the LUN may not be correctly updated in Oracle VM Manager if the LUN size was decreased. This is due to the mechanism that the Oracle VM Agent for SPARC uses to obtain and report on the LUN size, which does not update once the disk is mapped on the server.

This problem does not occur when the LUN size is increased.

Workaround: The reported LUN size can be updated by rebooting the Oracle VM Server for SPARC where the LUN is mapped as a physical disk after you have resized the LUN. Once the server is back online, you must refresh the storage array where the affected LUN is located. The correct size is displayed for the LUN within Oracle VM Manager.

Bug 22087392

9.7.30 The Apparent Size of a Repository in Oracle VM Manager Web Interface Does Not Update Automatically

The apparent size of a repository filesystem is displayed in the Oracle VM Manager Web Interface on the Repositories tab in the Info perspective for a selected repository. This information is a statistical value that is updated periodically within Oracle VM Manager but which is not updated automatically within the table within the Oracle VM Manager Web Interface. The information displayed for this value matches the information available within Oracle VM Manager at the time that the page loads.

Workaround: To refresh the information displayed for the apparent size of a repository within the Oracle VM Manager Web Interface, you may click on an alternate tab and then return to the view of the repository to force the page to refresh.

Bug 22147488

9.7.31 Virtual Disks Do Not Display on Solaris 10 Guests

If you add virtual disks to a Solaris 10 virtual machine that is stopped, those virtual disks do not display when you list the virtual disks for the virtual machine.

Workaround: This is a Solaris 10 issue that you can resolve as follows:

1. Start the virtual machine.

2. Run the following command on the virtual machine: `devfsadm -v`

Bug 22460766

9.7.32 Oracle Linux 5 Virtual Machines Converted from Physical Hosts Do Not Boot

In some cases, virtual machines based on Oracle Linux 5 do not boot when started. This can occur if you used the P2V utility to convert a physical host based on Oracle Linux 5 to a virtual machine and then imported that virtual machine to Oracle VM Manager.

Unbreakable Enterprise Kernel version kernel-uek-2.6.32-100.34.1 adds support for paravirtualized drivers in a HVM guest on Oracle VM. Starting with this kernel version, the default is to present only paravirtualized drivers when running in a hardware virtualized guest. To run kernel-uek, including the drivers, fully hardware virtualized, an additional kernel boot parameter `xen_emul_unplug=never` must be added to the boot parameters in `/etc/grub.conf`.

Workaround: Add the kernel boot parameter as follows:

```
kernel /vmlinuz-2.6.32-100.34.1.el5uek ro root=/dev/VolGroup00/LogVol00  xen_emul_unplug=never
```

Bug 22285006

9.7.33 SSL Exception in AdminServer Log File

In rare cases, the following SSL exception is written to `AdminServer.log` after attempting to perform an operation on a virtual machine:

```
<Error> <ovm.mgr.ras.WebSocketHandler>
<SSLException, writeNWBuf: java.nio.HeapByteBuffer[pos=0 lim=27 cap=16971] is
not large enough for SSLEngine.unwrapAndHandleResults, results: Status =
BUFFER_OVERFLOW HandshakeStatus = NOT_HANDSHAKING
bytesConsumed = 0 bytesProduced = 0
java.io.IOException: SSLException, writeNWBuf: java.nio.HeapByteBuffer[pos=0
lim=27 cap=16971] is not large enough for SSLEngine.unwrapAndHandleResults,
results: Status = BUFFER_OVERFLOW HandshakeStatus = NOT_HANDSHAKING
bytesConsumed = 0 bytesProduced = 0
```

Workaround: This exception is due to a known issue with Oracle WebLogic Server. You can ignore the exception. Subsequent attempts to edit or perform an operation on the virtual machine should be successful.

Bug 22451280

9.7.34 Oracle VM Servers in a Server Pool Must Be at the Same Minor Version

Each instance of Oracle VM Server in a server pool must be at the same minor version. In other words, all servers in a server pool must be at Release 3.2.x, or Release 3.3.x, or Release 3.4.x. For example, a server pool cannot contain one or more instances of Oracle VM Server Release 3.3.1 and one or more instances of Oracle VM Server Release 3.2.10.

During an upgrade, each instance of Oracle VM Server in the server pool is upgraded separately, which results in a mixed version server pool until the upgrade process is complete. For this reason, mixed version server pools are supported only during an upgrade of Oracle VM Server.

Workaround: There is no workaround for this issue.

Bug 22516403

9.7.35 Oracle VM Manager Displays Incorrect Details for ZFS Storage Appliances After Cluster Failover

In environments where two or more ZFS storage appliances are in an active/active cluster configuration, and a cluster failover occurs, it is possible for Oracle VM Manager to display incorrect IP addresses and file system information.

Workaround: Stop all running virtual machines, unpresent the repositories, and then delete the NFS servers from Oracle VM Manager.

Bug 21466858

9.7.36 Oracle VM Server Upgrade Not Possible with NetApp Storage plug-in

It is not possible to upgrade Oracle VM Server from Release 3.3.*x* to Release 3.4.1 if the NetApp Storage plug-in, `netapp-osc-linux`, is installed.

Workaround: Remove the `netapp-osc-linux` plug-in before you upgrade Oracle VM Server to Release 3.4.1. When the upgrade successfully completes, reinstall the `netapp-osc-linux` plug-in.

Bug 21052337

9.7.37 Oracle VM Manager Web Interface Incorrectly Displays Oracle VM Server Upgrade Required

The **Update Required** column incorrectly indicates that an update is required for Oracle VM Server when you create a server update repository but do not enable that repository and then refresh the servers to which that server update repository applies. If you subsequently attempt to upgrade Oracle VM Server, the upgrade does not occur.

> **Note**
>
> The **Update Required** column is located in the **Servers** perspective in the management pane on the **Servers and VMs** tab.

Workaround: There is no workaround for this issue.

Bug 22374697

9.7.38 The Oracle VM Manager Silent Install Option Using A YAML Configuration File Is Deprecated

The function to install Oracle VM Manager silently using a predefined YAML formatted configuration file is intended only for internal use during testing at Oracle. The option to install using this facility is deprecated for customer use and is undocumented in this release.

Workaround: There is no workaround for this issue.

Bug 22478672

9.7.39 Aborting An Oracle VM Server Upgrade Initiated By The UpgradeServers.py Script May Result In Inconsistent Reporting on Upgrade Status

In the unlikely case that an Oracle VM Server is in the process of being upgraded using the UpgradeServers.py Script and the upgrade job is aborted from within Oracle VM Manager, the upgrade on the Oracle VM Server may complete but the UpgradeServers.py script may also report that the upgrade has failed. Equally, Oracle VM Manager may report an incorrect version or upgrade status for the Oracle VM Server.

Workaround: Reboot the affected server and then disable maintenance mode on the server.

Bug 22488078

9.7.40 Kdump On Oracle VM Server Only Supports Dump Levels 0 and 1

The `makedumpfile` command, used to manually trigger a vmcore dump file is documented to support dump levels from 0 to 31 using the `-d` switch. Notably, the manual page states that it is possible to specify a value higher than 1 on an x86_64 machine running the Xen hypervisor. This is not the case for Oracle VM Server. Only the values 0 and 1 can be specified for this parameter, or a vmcore file is not generated.

Workaround: There is no workaround. Only use dump levels of 0 or 1 if using the `makedumpfile` command.

Bug 22329501

9.7.41 Network Receive Statistics For A Virtual Machine Are Invalid And Set To -1

DRS/DPM algorithms that monitor network load on a virtual machine do comparisons between the most recent network statistics and the previous network statistics to determine the deltas that can then be evaluated in terms of user-defined thresholds.

The network statistics are captured as unsigned integers. This means that they have a range of [0, 4294967295]. If the number of bytes received is greater than 4 GB the value of the integer overflows and begins from 0 again. In this situation, it is possible the start value for the statistic recorded by Oracle VM Manager is greater than the end statistic. Once this has occurred, Oracle VM Manager sets this statistic to -1 as it is no longer meaningful or valid.

If you have a DRS/DPM policy set to trigger on network load, the following error may appear in the log:

```
VM rx stats are not valid, the stats wrapped around.
```

In the event that an invalid network statistic is returned, the statistic is ignored by the DRS/DPM algorithm for that cycle. Normal behavior resumes on the next cycle. This bug has a very limited effect and is only noticeable on very loaded networks where the occasional log message may appear.

Workaround: There is no workaround required for this issue. It is expected behavior and the issue is resolved automatically by the environment.

Bug 22550810

9.7.42 CPU Affinity After Live Migration of Virtual Machine on Non-Uniform Memory Access (NUMA) Systems

After a live migration of a virtual machine between two servers with NUMA architecture, the CPU affinity is set to "any CPU". As a result, the migrated virtual machine uses memory across multiple nodes, which degrades performance of the virtual machine.

Workaround: Before performing the live migration of virtual machines, configure CPU pinning in the guest `vm.cfg` file. For example, to pin a virtual machine with 4 VCPUs to physical CPUs 4, 5, 6, and 7, add the following line to the `vm.cfg`:

```
cpu = "4-7"
```

Bug 22382809

9.7.43 Virtual Machines Based on Oracle Solaris 11 Do Not Boot

In some cases virtual machines based on Oracle Solaris 11 lower than 11.3 do not boot.

Workaround: Upgrade the guest operating system to Oracle Solaris 11.3 or higher.

Bug 22085158

9.7.44 Changing Domain Type from Xen HVM to Xen HVM PV Drivers Causes Informational Messages in AdminServer.log

Changing the domain type of a virtual machine from **Xen HVM** to **Xen HVM PV Drivers** results in the following informational messages of type `vm.domain.mismatch` and `vm.os.mismatch` being written to `AdminServer.log`.

This issue occurs because Oracle VM Server does not distinguish between the **Xen HVM** and **Xen HVM PV Drivers** domain types. When the domain type of the virtual machine changes to **Xen HVM PV Drivers**, Oracle VM Server reports the domain type of the virtual machine as **Xen HVM** to Oracle VM Manager. As a result, Oracle VM Manager falsely detects an error and logs the informational messages.

Workaround: You can ignore the informational messages and change the domain type of the virtual machine to **Xen HVM PV Drivers**. The virtual machine successfully loads the PV drivers despite these messages.

Bug 21163194

9.7.45 Single-Stream TCP Throughput is Degraded for Guest Virtual Machines Running UEK Release 4

The single-stream TCP throughput in the TX subgroup is degraded for guest virtual machines running Oracle Unbreakable Enterprise Kernel (UEK) Release 4.

Workaround: This issue occurs because UEK Release 4 includes support for the TCP Small Queues (TSQ) mechanism. To resolve this issue, you can configure the guest virtual machine with the following command:

```
echo 1048576 > /proc/sys/net/ipv4/tcp_limit_output_bytes
```

Bug 22546060

9.7.46 Error Partitioning Caused by Disk Label or Format in UEFI Mode

If you attempt to install Oracle VM Server in UEFI mode on a virtual drive that is not GPT or only MBR, a partitioning error occurs in the Anaconda installation program.

Workaround: Do the following to work around this issue:

1. Select **OK** to return to the previous installer screen.

2. Enter **Alt+F2** to open a shell prompt.

3. Use the `parted` command to change the label of the disk. Alternatively, use the `dd` command to clean up the disk.

4. Return to the installation program and then select **Back** to return to the previous installer screen.

5. Ensure that storage is discovered and then continue the installation.

Bug 22503847

9.7.47 Kernel Panic when Booting Guest Virtual Machine with Oracle Solaris 11.2

When creating a virtual machine with a guest operating system of Oracle Solaris 11.2 on Oracle VM Server, a kernel panic occurs when the virtual machine boots.

Workaround: Upgrade the guest operating system to Oracle Solaris 11.3.

Bug 22457279

9.7.48 Oracle VM Manager Web Interface Goes to Blank Screen with Mozilla Firefox on a Linux System

When creating a new repository, the Oracle VM Manager Web Interface temporarily displays a blank screen and the following message is written to `AdminServer.log`:

```
<Error>
<oracle.adfinternal.controller.application.AdfcExceptionHandler> <ADFC-50018>
<ADFc: No exception handler was found for an application exception.
javax.faces.FacesException: Broken pipe
```

This issue occurs when using a version of Mozilla Firefox that is lower than Version 44.0 on a Linux system to access the Oracle VM Manager Web Interface. This issue does not affect the jobs in Oracle VM Manager to create a new repository.

Workaround: Upgrade to Mozilla Firefox Version 44.0.

Bug 22553553

9.7.49 HugePages Deprecated for PVM Guests as of Oracle VM Release 3.4.1

The HugePages feature is deprecated in Oracle VM Release 3.4.1. You should not enable HugePages when creating or editing virtual machines with a domain type of PVM in the Oracle VM Manager Web Interface or Oracle VM Manager Command Line Interface. This feature will be removed in a future release of Oracle VM.

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.

Workaround: There is no workaround for this issue.

Bug 22540900

9.7.50 HugePages Does Not Display as Selected in Oracle VM Manager Web Interface

The **Enable Huge Pages** option in the **Edit Virtual Machine** dialog box does not display as selected when virtual machines with a PVM domain type are running.

Workaround: There is no workaround for this issue. However, Oracle recommends that you do not enable HugePages for any PVM guests. See Section 9.7.49, "HugePages Deprecated for PVM Guests as of Oracle VM Release 3.4.1".

Bug 22746016

9.7.51 Kdump Service Hangs at Discovery of FCoE Device with Broadcom CNA on HP Servers

If you install Oracle VM Server in Fiber Channel over Ethernet (FCoE) LUNs over Broadcom Converged Network Adapters (CNA) on HP servers, the kdump service hangs when discovering FCoE LUNs.

Workaround: There is no workaround for this issue.

Bug 22508971

9.7.52 Do Not Discover Oracle VM Servers Earlier than Release 3.2.10

If you attempt to discover an instance of Oracle VM Server that is earlier than Release 3.2.10 with Oracle VM Manager Release 3.4, the following occurs:

- The discovery job fails with the following error message:

```
OVMAPI_4010E Attempt to send command: update_core_api_bindings to server:
server_fqdn failed. OVMAPI_4004E Sync command failed on
server: server_ip. Command: update_core_api_bindings, Server error:
org.apache.xmlrpc.XmlRpcException: urlgrabber.grabber.URLGrabError:[Errno 14]
problem making ssl connection
```

- Conflicts occur between the databases that Oracle VM Manager requires for maintaining synchronization between internal components. As a result, the Oracle VM Manager Web Interface can display inaccurate information about the Oracle VM environment.

- The instances of Oracle VM Server, earlier than Release 3.2.10, that you discover cannot be removed with either the Oracle VM Manager Web Interface or the Oracle VM Manager Command Line Interface.

Workaround: 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.

Bug 22735203

9.7.53 (SPARC Only) Cannot Export Virtual Appliance with Physical Disk Access

If you create a virtual machine on an Oracle VM Server for SPARC with a physical disk access, it is not possible to export that virtual machine as a virtual appliance.

In this case, when you attempt to export the virtual machine as a virtual appliance with the Oracle VM Manager Command Line Interface, the following error message is displayed:

```
Server error: vbox-img didn't return expected value (0,)

    CMDERR:
      vbox-img: error: VD: error VERR_FILE_NOT_FOUND opening image file '/dev/mapper/<disk_Id>'
      vbox-img: error: Error while opening source image: File not found.
(VERR_FILE_NOT_FOUND)
```

Workaround: There is no workaround for this issue.

Bug 22745868

9.7.54 (SPARC Only) MTU Resets to the Default of 1500 After Server Power Off

If you configure the MTU parameter of a network interface for an ethernet bridge and then power off the Oracle VM Server for SPARC, the MTU used by the bridge after the boot can be reset to the default value of `1500` instead of the configured value.

Workaround: When the interface used for the bridge is persistently plumbed in the primary domain, the bridge is created with the appropriate MTU parameter after the server power off and reboot. Use the `ipadm(1M)` command to persistently plumb a network interface, as in the following example:

```
# ipadm create-ip net0
```

Bug 22705349

9.7.55 Oracle VM Server Installer Fails When Modifying Swap Partitions

An exception occurs and the Oracle VM Server installer stops abruptly if you select **File System Options** while editing a swap partition from the **Partitioning Type** screen.

Workaround: Do one of the following from the **Review Partition Layout** screen:

• Select **Yes** to review and modify the partitioning layout. On the **Partitioning** screen, delete the swap and then create a new one.

• Select **No** to skip the partitioning layout check and proceed with the installation.

Bug 22807435

9.7.56 Kernel Startup is Slow after Upgrading to UEK4 on PVHVM Guests

If you upgrade the kernel on a PVHVM virtual machine to UEK4, the kernel init process takes several minutes to complete.

Workaround: Upgrade GRUB to the most recent version.

Bug 22761370

9.7.57 Cannot Enable High Availability (HA) for Virtual Machines with HugePages

If you attempt to enable HA for a running virtual machine that has HugePages enabled, the job to enable HA fails with the following error message:

```
OVMRU_005002E Operation not allowed- Virtual Machine: vm_name, is not STOPPED. It is RUNNING.
```

This error occurs if you attempt to enable HA in either the Oracle VM Manager Web Interface or the Oracle VM Manager Command Line Interface.

The preceding error message does not accurately describe the issue. The fact that the virtual machine is in the running state does not affect the ability to enable HA. The error results from the fact that HugePages is enabled for the virtual machine.

Workaround: Disable the HugePages setting and then restart the virtual machine. After the virtual machine starts, enable HA.

Bug 22753803

9.7.58 Kdump is Not Supported on FCoE SANs

Kdump is not supported if you install Oracle VM Server on an Fiber Channel over Ethernet (FCoE) SAN .

Workaround: There is no workaround for this issue.

Bug 22816860

9.7.59 Cannot Edit Running Virtual Machines with HugePages and HA Enabled

It is not possible to edit a running virtual machine through the Oracle VM Manager Web Interface if that virtual machine has both HugePages and high availability (HA) enabled. The job to edit the virtual machine fails with the **OVMRU_005002E Operation not allowed** error message.

Workaround: There is no workaround for this issue.

Bug 22814818

9.7.60 Import URL Cannot Exceed Maximum Character Length

The maximum character length of the URL to import objects into Oracle VM Manager, such as virtual appliances, virtual disks, or ISO files, is 3,988. The maximum character length of the URL to import templates is 3,985.

If you attempt to import an object from a URL that exceeds the maximum character length, an error occurs and the import fails, as in the following example:

```
OVMAPI_D000E Cannot set description on object: my_virtual_appliance.ova.
 Its length: 4,012, exceeds the maximum size: 4,000.
```

Even though the error message indicates the maximum character length is 4,000, a prefix is automatically added to the URL during the import job. As a result, the effective character limit for the URL is 3,988 or 3,985.

Workaround: There is no workaround for this issue. Ensure that the origin URL for any object that you plan to import into Oracle VM Manager is not greater than the maximum character limit.

Bug 23073177

Chapter 10 Known Limitations and Workarounds for Oracle VM Exporter Appliance

Table of Contents

Find information on known limitations and workaround procedures for Oracle VM Exporter Appliance.

For more information about Oracle VM Exporter Appliance, see:

- How Can a Virtual Machine be Moved or Migrated? in the *Oracle VM Concepts Guide*

- Installing and Configuring the Oracle VM Exporter Appliance in the *Oracle VM Administrator's Guide*

- Export to Oracle Cloud Infrastructure Using Oracle VM Exporter Appliance in the *Oracle VM Manager User's Guide*

10.1 ISO Image Attached to Virtual Machine Is Not Uploaded

When you try to export a virtual machine with an attached ISO image from Oracle VM to Oracle Cloud Infrastructure, the **Export VM to OCI** wizard does not list the ISO image in the **Boot Disk** or **Additional Disks** lists. The attached ISO image does not upload.

Workaround: There is no workaround for this issue.

Bug 31202000

10.2 Export Process Is Aborted If Oracle VM Exporter Appliance Is Restarted or Stopped

When you restart or stop the Oracle VM Exporter Appliance during the export process, the export process fails with an error message.

Workaround: Resume the export operation from Oracle VM Manager once the Oracle VM Exporter Appliance is up and running or do not restart and stop the virtual machine during the export process.

Bug 31233553

10.3 Export Virtual Machine Job Hangs After Disabling the Storage Network Interface

If the Oracle VM Exporter Appliance has a vNIC connected to a separate storage network and during the export you disable the storage NIC, the export job should fail gracefully. Instead it remains in a **Converting**

disk image... state because virt-v2v does not timeout or error out when the network connection to storage is lost.

Workaround: You have the following options to workaround this issue:

- Review the `/var/log/vmexporter/virt-v2v_vm_id.log` file to check and see if virt-v2v is stuck waiting or still progressing.

- Abort the job.

- Retry the export. If the storage network connection is still out, you receive an error. If the network connection exists, the job resumes restarting at the virt-v2v conversion.

Bug 31202320

10.4 An Oracle Linux 5 Virtual Machine Instance Cannot Be Accessed Using SSH or Serial Console

When an Oracle Linux 5 (64-bit or 32-bit) virtual machine is exported to Oracle Cloud Infrastructure, you cannot ssh to the virtual machine instance or access it using a serial console.

Workaround: There is no workaround for this issue.

Bug 31187778

10.5 Oracle VM Manager Limits VMAPI Messages to 1024 Characters

When you configure a virtual machine to send VMAPI messages and select the **Log Message** check box in the **Create VM Message** dialog box, you get a pop-up error stating the number of characters is out of range because the Oracle VM Manager certificate is a string of more than 1400 characters. Only messages containing between 1 and 1024 characters can be logged. If you attempt to log the message using the Oracle VM Manager Command Line Interface, you get a `Job failed on Core` error message.

Workaround: Do not check **Log Message** during Oracle VM Exporter Appliance provisioning because the Oracle VM Manager certificate that is sent using VMAPI is a string of more than 1400 characters.

Bug 31085768

10.6 UI Allows Setting of Incorrect Boot Volume Size for Windows Virtual Machine

Even though the valid boot volume range for a Windows virtual machine is between 256 GB and 32 TB, the Oracle VM Manager Web Interface logic lets you set the boot volume size outside of this range.

Workaround: Set the Windows virtual machine boot volume size within range of 256 GB and 32 TB.

Bug 31353494

10.7 ovmd Service Start Is Delayed for Exported Oracle Linux 6 Virtual Machine

If you create an Oracle Linux 6 virtual machine with `ovmd` service enabled and export the virtual machine to Oracle Cloud Infrastructure, it takes several minutes for the `ovmd` service to start in Oracle Cloud Infrastructure.

Workaround: Stop the `ovmd` service using `chkconfig ovmd off` and restart the virtual machine in Oracle Cloud Infrastructure.

Bug 31323718

Chapter 11 Additional Software for Oracle VM

Table of Contents

Additional software for Oracle VM includes tools and plugins to help you configure and integrate your environment.

11.1 Oracle VM Paravirtual Drivers for Microsoft Windows

The Oracle VM Paravirtual Drivers for Microsoft Windows improve performance for network and block (disk) devices on Microsoft Windows™ guests running in a virtual environment on Oracle VM.

For more information, see the Oracle VM Paravirtual Drivers for Microsoft Windows documentation at: http://docs.oracle.com/cd/E88077_01/index.html

11.2 Oracle VM Storage Connect plug-ins

Release 3.4 provides full support for the Oracle VM Storage Connect plug-ins that were added in Oracle VM Release 3.1. Support for iSCSI multipath, which was added in Oracle VM Release 3.2.1, is also fully supported in this release.

For more information, see Installing Oracle VM Storage Connect plug-ins in the *Oracle VM Administrator's Guide*.

11.3 Oracle VM Guest Additions

The Oracle VM Guest Additions are a set of packages that you install on virtual machines in an Oracle VM environment. The Oracle VM Guest Additions let you communicate with virtual machines from Oracle VM Manager and provide an easy method to configure virtual machines.

To find more information about the Oracle VM Guest Additions, see:

- Installing and Using the Oracle VM Guest Additions in the *Oracle VM Administrator's Guide*

- What are the Oracle VM Guest Additions? in the *Oracle VM Concepts Guide*

11.4 Oracle VM Utilities

The Oracle VM Utilities are a collection of command line scripts that allow you to perform basic management tasks in an Oracle VM environment. Release 3.4 works with the Oracle VM Utilities version 2.1.

To find more information about the Oracle VM Utilities, see:

- Using the Oracle VM Utilities in the *Oracle VM Administrator's Guide*

- Oracle VM Utilities in the *Oracle VM Concepts Guide*

11.5 Oracle Enterprise Manager

Oracle Enterprise Manager Release 13.2 or later is required to manage Oracle VM Release 3.4.x. Oracle VM Manager integrates with Oracle Enterprise Manager so that you can manage the entire Oracle VM environment from within Oracle Enterprise Manager.

For more information about Oracle Enterprise Manager Release 13.2 or later, see the Oracle Enterprise Manager documentation at: http://www.oracle.com/technetwork/oem/grid-control/documentation/oem-091904.html

For example, for specific information on how to register Oracle VM Manager when setting up Cloud for Infrastructure as a Service (IaaS), refer to the following section in the *Enterprise Manager Release 13.2 Cloud Administration Guide*: https://docs.oracle.com/cd/E73210_01/EMCLO/GUID-152C4D4A-6FC2-42B0-ABE3-5884D6A466F4.htm#EMCLO183

11.6 Oracle VM Exporter Appliance

New in Release 3.4.6.3 is the Oracle VM Exporter Appliance utility which you can use to export virtual machines from Oracle VM to Oracle Cloud Infrastructure. For more information about Oracle VM Exporter Appliance, see:

- How Can a Virtual Machine be Moved or Migrated? in the *Oracle VM Concepts Guide*

- Installing and Configuring the Oracle VM Exporter Appliance in the *Oracle VM Administrator's Guide*

- Export to Oracle Cloud Infrastructure Using Oracle VM Exporter Appliance in the *Oracle VM Manager User's Guide*

- Chapter 10, *Known Limitations and Workarounds for Oracle VM Exporter Appliance* in the *Oracle VM Release Notes*

11.7 Third Party Software

Oracle Corporation supports certain third party software in combination with Oracle VM.

For information about supported third party software, see the *Oracle VM Partners* page at: http://www.oracle.com/technetwork/server-storage/vm/partners/index.html

> **Note**
>
> If you plan to install third party software in an Oracle VM environment and are not sure if it is supported, contact your Oracle Corporation support representative.

For information about hardware certified for Oracle VM, see the Hardware Certification List (HCL) for Oracle Linux and Oracle VM at: https://linux.oracle.com/hardware-certifications.

Chapter 12 Oracle VM Accessibility Features

Accessibility features help people who have a physical disability, such as restricted mobility or limited vision, to use information technology products successfully.

Oracle VM documentation is provided in the following formats:

- Electronic format (HTML) is provided and is accessible.

- PDF format is provided but is not accessible.

- Online Help is provided in Oracle Help for Web (OHW) format for the Oracle VM Manager Web Interface. This format is accessible but known issues exist. For more information see Documentation Accessibility Bugs.

Oracle VM Manager Accessibility Features

As part of the effort to make Oracle products, services, and supporting documentation accessible and usable to the disabled community, Oracle VM Manager Web Interface allows you to configure the following accessibility features:

- Support for Screen Reader.

- Support for High Contrast.

- Support for Large Fonts.

You can enable these features when logging in to the Oracle VM Manager Web Interface or you can set or change the accessibility options once you have logged in.

To enable accessibility options when logging in:

1. On the login page of the Oracle VM Manager Web Interface, click the arrow to expand **Accessibility Options**.

2. Select one or more check box from the following accessibility options:

   - `I use a screen reader.`

   - `I use high contrast.`

   - `I use large fonts.`

3. Alternatively, if you have already selected specific accessibility options during a previous session, you are able to restore these settings by ensuring that the `'Use saved accessibility options'` checkbox is checked.

To set or change accessibility options while you are logged in:

1. In the Global Links at the top of the right-hand-side of the Oracle VM Manager Web Interface, click **Settings**.

2. From the drop-down list, select from the following accessibility options:

   - `I use a screen reader.`

   - `I use high contrast.`

- `I use large fonts.`

These settings are persistent across each user login, as described in User Preference Persistence. To ensure that the same settings are applied on each subsequent login you should ensure that the `Use saved accessibility options` checkbox is checked on the login page when you login.

Oracle VM Manager HTML Access Keys

To access menus without using a mouse, you can use the HTML access keys. The shortcut key for a user interface item is shown as an underline of the shortcut key letter in the item name, for example, the shortcut key for the **Servers and VMs** tab is S, as that is the letter underlined in the tab text.

To access the shortcut key, enter the HTML access key for your browser, plus the access key letter. For example, to access a shortcut key on Microsoft Internet Explorer, press **Alt** + *shortcut_key* at the same time. See your web browser documentation to find the key combination to use for HTML access keys for your browser.

Documentation HTML Access Keys

To use the documentation without using a mouse, you can use HTML access keys. Enter the HTML access key for your browser, plus the access key letter. For example, using Mozilla Firefox, press Alt+Shift+n to go to the next page. See your web browser documentation to find the key combination to use for HTML access keys. The following table lists the tasks you can perform using access keys.

Task	Access Key
Go to the next page	n
Go to the previous page	p
Go to the document home page	h
Go up a level in the document	u
Activate the Contents tab	c
Activate the Search tab	s

In addition to the HTML access keys, the following keyboard shortcuts are available:

Task	Shortcut Key
Toggle hide and show the sidebar	Ctrl+Left Arrow
Toggle hide and show page header	Ctrl+Up Arrow

Documentation Accessibility Bugs

Oracle VM documentation currently exhibits the following known accessibility issues:

- HTML page heading levels might not start at h1 (Bug ID 26717728)

- Book title can extend off the screen with 200% zoom (Bug ID 26717874)

- docs.oracle.com Help drawer HTML heading tags have structure violation (Bug ID 26560104)

- Navigation header/footer uses inaccessible tables (Bug ID 26751108)

- OHW - TOC has no summary defined in Online Help viewer window (Bug ID 26758534)

- OHW - Unable to open TOC topics when using keyboard only functions in Online Help viewer window (Bug ID 26758747)