

Oracle® VM

Paravirtual Drivers for Microsoft Windows Release 3.4.5

ORACLE®

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Table of Contents

Preface	v
1 Getting Started with the Oracle VM PV Drivers for Microsoft Windows	1
1.1 Downloading the Oracle VM PV Drivers for Microsoft Windows	1
2 Supported Releases, Operating Systems, and Configuration Limits	3
2.1 Supported Oracle VM Releases	3
2.2 Supported Guest Operating Systems	3
2.3 Microsoft Windows Compatibility Signing	4
2.4 Configuration Limits	4
3 What's New with the Oracle VM PV Drivers for Microsoft Windows?	7
3.1 New in Release 3.4.5	7
3.2 New in Release 3.4.4	8
3.3 New in Release 3.4.3	8
3.4 New in Release 3.4.2	9
3.5 New in Release 3.4.1	10
3.6 New in Release 3.2.3	12
3.7 New in Release 3.2.2	12
3.8 New in Release 3.0.1	13
4 Installing the Oracle VM PV Drivers for Microsoft Windows	15
4.1 Configuring Policies for Device Installation	15
4.2 Installing Oracle VM PV Drivers for Microsoft Windows	15
4.3 Verifying the Oracle VM PV Drivers for Microsoft Windows Installation	18
4.4 Setting the MTU Size for Virtual Machines	19
5 Upgrading the Oracle VM PV Drivers for Microsoft Windows	21
6 Silently Installing or Upgrading the Oracle VM PV Drivers for Microsoft Windows	25
7 Finding the Version and Build Number of the Installed Oracle VM PV Drivers for Microsoft Windows ...	27
8 Uninstalling the Oracle VM PV Drivers for Microsoft Windows	29
9 Known Limitations and Workarounds	31
9.1 Hot-Added vCPUs Not Used By a Windows Virtual Machine Until It Is Rebooted	31
9.2 Security Alert for Unsigned Drivers	31
9.3 Upgrading on Microsoft Windows 32-bit	32
9.4 Windows Guest Kernel Panic	32
9.5 Crash Dump or Hibernation Fails	32
9.6 Unable to Modify Memory or vCPUs for Running PVHVM Guests	33
9.7 Microsoft Windows Server 2012 Data Center Guests with Failover Clustering Cannot Get IP Address	33
9.8 Upgrade Failure when Multiple Virtual Disks Attached to Windows Virtual Machine	33
9.9 Uninstall Failure for Oracle VM PV Drivers for Microsoft Windows Release 3.4.1	34
9.10 Microsoft Windows Blue Screen Error on Windows Server 2008 Guests	35
9.11 Incorrect Driver Version Displayed for Oracle VM Virtual Ethernet Adapter	35
9.12 Performance Impact when Windows Server Virtualization Support is not Enabled	36
Glossary	37

Preface

This document explains how to install, use, and troubleshoot the Oracle VM PV Drivers for Microsoft Windows.

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Audience

This document is intended for users and administrators of Oracle VM guests running the Microsoft Windows™ operating system. It includes a brief introduction of the Oracle VM PV Drivers for Microsoft Windows, how to install them, and describes potential issues and the corresponding workarounds you may encounter while using the drivers.

Oracle recommends that you read this document before installing and using the Oracle VM PV Drivers for Microsoft Windows.

Related Documents

For more information, see the [Oracle VM Documentation](#).

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Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
<code>monospace</code>	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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Chapter 1 Getting Started with the Oracle VM PV Drivers for Microsoft Windows

Table of Contents

1.1 Downloading the Oracle VM PV Drivers for Microsoft Windows 1

The Oracle VM PV Drivers for Microsoft Windows improve performance for network and block (disk) devices on Microsoft Windows™ [guests](#) running in a virtual environment on Oracle VM.

The Oracle VM PV Drivers for Microsoft Windows resolve common issues with Microsoft Windows guests, such as the following:

- Shutting down the guest does not shut down gracefully. Instead, it is the equivalent of turning the power off. In this case, if you are using the virtual machine console, the console would immediately turn to black instead of showing the shut down process.
- Restarting the virtual machine may display messages that the virtual machine was not properly shut down.
- Restarting the virtual machine requires disk checks and verification.



Important

- Oracle Support recommends that you install the latest release of Oracle VM PV Drivers for Microsoft Windows.
- To run Microsoft Windows guests as PVHVM-supported (paravirtual hardware virtual machine) operating systems, you must install the Oracle VM PV Drivers for Microsoft Windows. For a full list of Microsoft Windows guest operating systems that are PVHVM-supported, see [Section 2.2, “Supported Guest Operating Systems”](#).



Note

The Oracle VM PV Drivers for Microsoft Windows contain the Oracle VM Guest Additions. For detailed information about the implementation and functionality of the guest additions in Microsoft Windows guests, refer to the Windows-specific information in the chapter entitled [Installing and Using the Oracle VM Guest Additions](#) in the [Oracle VM Administration Guide for Release 3.4](#).

1.1 Downloading the Oracle VM PV Drivers for Microsoft Windows

Download the Oracle VM PV Drivers for Microsoft Windows from:

- My Oracle Support site: <http://support.oracle.com/>



Note

Download Windows PV Drivers 3.4.5 from My Oracle Support; search patch ID 23346086.

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

On the Oracle Software Delivery Cloud, the Oracle VM PV Drivers for Microsoft Windows are included with the Oracle VM media pack as a separate download. The Oracle VM PV Drivers for Microsoft Windows installer installs [paravirtualized](#) drivers for block (disk) and network devices.

Chapter 2 Supported Releases, Operating Systems, and Configuration Limits

Table of Contents

2.1 Supported Oracle VM Releases	3
2.2 Supported Guest Operating Systems	3
2.3 Microsoft Windows Compatibility Signing	4
2.4 Configuration Limits	4

Find out what Oracle VM releases are supported with the Oracle VM PV Drivers for Microsoft Windows in addition to the supported operating systems for each version of the Oracle VM PV Drivers for Microsoft Windows. Review information about Microsoft Windows compatibility signing. Get details on tested and recommended configuration limits for the Oracle VM PV Drivers for Microsoft Windows.

2.1 Supported Oracle VM Releases

The following table lists the supported Oracle VM releases for the Oracle VM PV Drivers for Microsoft Windows.

Table 2.1 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

2.2 Supported Guest Operating Systems

The following table lists the supported Microsoft Windows operating systems for the Oracle VM PV Drivers for Microsoft Windows.





Note

It is recommended that all of the latest Microsoft hotfixes are applied to the operating system before you install or update the Oracle VM PV Drivers for Microsoft Windows.

Table 2.2 Microsoft Windows Supported Guest Operating Systems

Guest Operating System with Oracle VM PV Drivers for Microsoft Windows Installed	64-bit	32-bit
Microsoft Windows Server 2019	Yes	N/A
Microsoft Windows Server 2016	Yes	N/A
Microsoft Windows Server 2012 R2	Yes	N/A

Guest Operating System with Oracle VM PV Drivers for Microsoft Windows Installed	64-bit	32-bit
Microsoft Windows Server 2012	Yes	N/A
Microsoft Windows Server 2008 R2 SP1	Yes	N/A
 <p>Note</p> <p>This operating system is supported only when all of the latest Microsoft hotfixes are applied including:</p> <ul style="list-style-type: none"> • http://support.microsoft.com/kb/983554/ • http://support.microsoft.com/kb/2957775/ 		
Microsoft Windows Server 2008 SP2	Yes	Yes
 <p>Note</p> <p>This operating system is supported only when all of the latest Microsoft hotfixes are applied including:</p> <ul style="list-style-type: none"> • http://support.microsoft.com/kb/983554/ 		
Microsoft Windows 10	Yes	Yes
Microsoft Windows 8.1	Yes	Yes
Microsoft Windows 8	Yes	Yes
Microsoft Windows 7 SP1	Yes	Yes

2.3 Microsoft Windows Compatibility Signing


Oracle VM PV Drivers for Microsoft Windows Release 3.4.5 have been signed by Microsoft for 64-bit versions of Microsoft Windows operating systems. This driver also has been certified for the Microsoft Windows Server software logo program. Additional information on the certifications can be found at the [Windows Server Catalog](#).

Oracle VM PV Drivers for Microsoft Windows Release 3.4.5 have not been signed by Microsoft for 32-bit Microsoft Windows operating systems or Microsoft Windows Server 2003. A security alert occurs during installation on a Windows operating system for which Oracle VM PV Drivers for Microsoft Windows are not signed. See [Section 9.2, "Security Alert for Unsigned Drivers"](#).

2.4 Configuration Limits

The following table lists the tested and recommended maximum configuration limits for the Oracle VM PV Drivers for Microsoft Windows.

Table 2.3 Oracle VM PV Drivers for Microsoft Windows configuration maximums

Item	Maximum
Virtual CPUs on 32-bit guests	32
Virtual CPUs on 64-bit guests	64
Virtual RAM on 32-bit guests	64 GB
Virtual RAM on 64-bit guests	<p data-bbox="906 422 997 449">256 GB</p> <div data-bbox="919 491 987 569" style="display: inline-block; vertical-align: top;">  </div> <div data-bbox="1127 478 1187 506" style="display: inline-block; vertical-align: top; margin-left: 10px;"> Note </div> <div data-bbox="1127 537 1463 722" style="display: inline-block; vertical-align: top; margin-left: 10px;"> <p>Virtual RAM support has been increased to 1024 GB for the following guest operating systems in an Oracle VM Release 3.4.4 or later environment:</p> </div> <ul data-bbox="1127 753 1463 1171" style="list-style-type: none"> • Microsoft Windows Server 2019 • Microsoft Windows Server 2016 • Microsoft Windows Server 2012 R2 • Microsoft Windows Server 2012 • Microsoft Windows Server 2008 R2 SP1
Virtual disks / NICs	<p data-bbox="906 1192 1263 1220">40 virtual disks / 8 virtual NICs</p> <p data-bbox="906 1251 1511 1465">The maximum number of virtual disks includes the number of virtual NICs. If there are eight virtual NICs, only 32 virtual disks are supported. However, virtual disks are assigned a higher priority than virtual NICs. If you configure a virtual machine with 35 virtual disks and 8 virtual NICs, then 35 virtual disks and five virtual NICs are created.</p>

Chapter 3 What's New with the Oracle VM PV Drivers for Microsoft Windows?

Table of Contents

3.1 New in Release 3.4.5	7
3.2 New in Release 3.4.4	8
3.3 New in Release 3.4.3	8
3.4 New in Release 3.4.2	9
3.5 New in Release 3.4.1	10
3.6 New in Release 3.2.3	12
3.7 New in Release 3.2.2	12
3.8 New in Release 3.0.1	13

Each release of the Oracle VM PV Drivers for Microsoft Windows includes bug fixes and new features. Find out what's new in each release of the Oracle VM PV Drivers for Microsoft Windows.

For information about the latest features and enhancements, bug fixes, and known issues, see *Oracle VM Windows PV Driver: Latest Release Information (Doc ID 2852790.1)* on My Oracle Support at <https://support.oracle.com/oip/faces/secure/km/DocumentDisplay.jspx?id=2852790.1>.

3.1 New in Release 3.4.5

Release 3.4.5 of the Oracle VM PV Drivers for Microsoft Windows introduces new features and enhancements along with a cumulative list of bug fixes.

New Features and Enhancements

Oracle VM PV Drivers for Microsoft Windows release 3.4.5 provides the following new support:

- Support for Microsoft Windows Server 2019 64-bit guest operating systems in an Oracle VM Release 3.4.6 or later environment

Notable Bug Fixes

Release 3.4.5 provides a cumulative update of fixes, as follows:

- Under some conditions, uninstalling the Oracle VM PV Drivers for Microsoft Windows leaves older versions of the drivers in the system Driver Store. **Bug 31176082**
- When TCP receive checksum offload is enabled for an Oracle VM Virtual Ethernet Adapter and a packet is received with a TCP checksum value of 0xffff, the driver for the Oracle VM Virtual Ethernet Adapter incorrectly informs NDIS and the Windows TCP stack that the checksum was incorrect and the packet would be dropped. **Bug 28664657**
- A virtual machine might crash when it has a large number of virtual Ethernet adapters or disk devices configured. **Bug 30682645**
- Following an upgrade from a release version of Oracle VM PV Drivers for Microsoft Windows to a maintenance or patch version, the Oracle VM PV Drivers for Microsoft Windows version string does not reflect the correct maintenance or patch version number. **Bug 29584186**

- Virtual machines with high input/output running Microsoft Windows 2012 R2 crash due to a [xenpci](#) driver issue. **Bug 30680622**
- Packet reordering by xennet.sys causes really low TCP throughput across the WAN. **Bug 29200652**

3.2 New in Release 3.4.4

Release 3.4.4 of the Oracle VM PV Drivers for Microsoft Windows introduces new features and enhancements along with a cumulative list of bug fixes.

New Features and Enhancements

Oracle VM PV Drivers for Microsoft Windows release 3.4.4 provides the following new support:

- Support for a maximum configuration limit of 1024 GB virtual RAM and 64 virtual CPUs for the following 64-bit guest operating systems in an Oracle VM Release 3.4.6 or later environment
 - Microsoft Windows Server 2016
 - Microsoft Windows Server 2012 R2
 - Microsoft Windows Server 2012
 - Microsoft Windows Server 2008 R2 SP1
- Supports X86_64 ABI to allow for higher disk IOPS similar to that of Linux and Solaris operating systems.
- Support for setting Windows MTU in 100-step increments instead of 500-step increments which allows MTU settings of 8900, for example. **Reference 27996456**
- Support for configuring Windows guest operating systems using OVMAPI. **Reference 28447799**

Notable Bug Fixes

Release 3.4.4 provides a cumulative update of fixes, as follows:

- Windows 2012 Datacenter R2 guests with Oracle VM PV Drivers for Microsoft Windows Release 3.4.2 or Release 3.4.3 rebooted unexpectedly. **Bug 28309263**
- Upgrading Windows guests to Windows 10 failed if Oracle VM PV Drivers for Microsoft Windows Release 3.4.3 was installed. **Bug 28104969**
- Windows 2016 VM crashed when a ZFS storage array active/passive cluster takeover was executed. **Bug 27684947**
- During performance and failover testing of Oracle VM PV Drivers for Microsoft Windows Release 3.4.3 on Windows guest operating systems, the VM shut down unexpectedly on Windows 2012 R2. **Bug 27662016** and **Bug 27934031**
- When upgrading from Oracle VM PV Drivers for Microsoft Windows Release 3.4.2 to Release 3.4.3 on Windows guests and rebooting the VM, the IP address was not reported for the VNIC. **Bug 27465883**

3.3 New in Release 3.4.3

Release 3.4.3 of the Oracle VM PV Drivers for Microsoft Windows introduces new features and enhancements along with a cumulative list of bug fixes.

New Features and Enhancements

Release 3.4.3 provides the following new features and enhancements:

- Oracle VM PV Drivers for Microsoft Windows now supports Microsoft Windows Server 2016 with Oracle VM Manager Release 3.4.4 or later and Oracle VM Servers running at Release 3.4.2 or later.
- Performance improvements have been implemented that result in lower CPU utilization rates on Windows guests.
- Oracle VM PV Drivers for Microsoft Windows now supports a maximum configuration limit of 480 GB Virtual RAM for the following guest operating systems in an Oracle VM Release 3.4.4 or later environment:
 - Microsoft Windows Server 2016
 - Microsoft Windows Server 2012 R2
 - Microsoft Windows Server 2012
 - Microsoft Windows Server 2008 R2 SP1

Notable Bug Fixes

Release 3.4.3 provides a cumulative update of fixes, as follows:

- Microsoft Windows Server 2008 R2 SP1 and SP2 guests crash periodically. **Bug 25233360**
- Installation errors may be displayed during Oracle VM PV Drivers for Microsoft Windows installations on Windows Server 2008 SP2 guests. **Bug 25458370**
- Migrating multiple Microsoft Windows guests to a destination Oracle VM Server instance fails due to short interval times between migration jobs. **Bug 25676373**
- Windows blue screen occurs on Microsoft Windows guests under heavy load during live migration. **Bug 25769259**

3.4 New in Release 3.4.2

Release 3.4.2 of the Oracle VM PV Drivers for Microsoft Windows introduces new features and enhancements along with a cumulative list of bug fixes.

New Features and Enhancements

Release 3.4.2 provides the following new features and enhancements:

- The Oracle VM PV Drivers for Microsoft Windows now support Microsoft Windows Server Failover Clustering (WSFC) on the following guest operating systems in an Oracle VM Release 3.4.3 or later environment:

Guest Operating System with Oracle VM PV Drivers for Microsoft Windows	64-bit	32-bit
Microsoft Windows Server 2012 R2	Yes	N/A
Microsoft Windows Server 2012	Yes	N/A

Guest Operating System with Oracle VM PV Drivers for Microsoft Windows	64-bit	32-bit
Microsoft Windows Server 2008 R2 SP1	Yes	N/A
Microsoft Windows Server 2008 SP2	Yes	Yes



Note

Before using WSFC capabilities, you should review the following points:

- Physical disks only can be shared among Windows Server guests that use SCSI-3 persistent reservations to form a WSFC cluster.
- Live migration is not supported for Windows Server guests in WSFC clusters that have a shared physical disk assigned to them. The shared physical disk must be moved to another guest before live migration can occur.
- You cannot run Windows Server guests in the same WSFC cluster on the same instance of Oracle VM Server.

Notable Bug Fixes

Release 3.4.2 provides a cumulative update of fixes, as follows:

- Windows blue screen occurs on Microsoft Windows Server 2012 R2 guests during live migration. **Bug 23542956**
- Cannot copy large files to Microsoft Windows Server 2012 guests after installing Oracle VM PV Drivers for Microsoft Windows. **Bug 23326764**
- Packet loss occurs after installing Oracle VM PV Drivers for Microsoft Windows. **Bug 21430532**
- Microsoft Windows guests do not start correctly when using the Xen driver domain. **Bug 22243923**
- Performance issues occur on the host machine when you create a WSFC cluster from Microsoft Windows Server 2012 R2 guests that share 10 or more LUNs in a SAN array. **Bug 24595207**

3.5 New in Release 3.4.1

Release 3.4.1 of the Oracle VM PV Drivers for Microsoft Windows introduces new features and enhancements along with a cumulative list of bug fixes.

New Features and Enhancements

Release 3.4.1 provides the following new features and enhancements:

- Oracle VM PV Drivers for Microsoft Windows now supports Microsoft Windows 10.
- As of this release, Oracle VM PV Drivers for Microsoft Windows provides informative notifications to help you troubleshoot common installation issues.
- Oracle VM PV Drivers for Microsoft Windows introduces multipage ring buffer support in this release.
- The Oracle VM PV Drivers for Microsoft Windows installation program now verifies that the guest operating system is supported. If a user attempts to install Oracle VM PV Drivers for Microsoft Windows

on Microsoft Windows XP, or other operating system that is not supported, the installation program notifies the user.



Note

The Oracle VM PV Drivers for Microsoft Windows Release 3.4.1 have not been signed by Microsoft for the Windows software logo program. Because the Oracle VM Paravirtual Drivers for Microsoft Windows are not signed, Microsoft Windows does not recognize them as compatible and a security alert occurs during installation. See [Section 9.2, “Security Alert for Unsigned Drivers”](#).

Notable Bug Fixes

Release 3.4.1 provides a cumulative update of fixes, as follows:

- Windows blue screen occurs during the uninstallation process. **Bug 23198931**
- Windows blue screen occurs during the upgrade process. **Bug 22482031**
- Installer properties do not provide a build version. **Bug 23198943**
- Build number is not included as part of the release version. **Bug 22589921**
- Cannot create a dump file when Windows blue screen occurs. **Bug 23102589**
- Windows virtual machines reboots when using the lperf3 tool and the virtual machine MTU is set to 9000. **Bug 23032144**
- The Microsoft Windows device manager displays a black exclamation point (!) on a yellow field next to **Oracle VM Virtual Ethernet Adapter** after installation. **Bug 23022322**
- Low network throughput on Windows virtual machine. **Bug 22657587**
- Cannot dynamically access grant references for page ring order. **Bug 22518244**
- Virtual machine network TX performance issue when pinned to the NUMA node #0. **Bug 22342913**
- Virtual machines do not function as expected when using a Xen driver domain. **Bug 22243923**
- Windows domU behaves unexpectedly when using the lperf tool with the MTU set to 9000 in the Ethernet adapter properties. **Bug 22203768**
- Network delays occur after installation. **Bug 22201572**
- Windows blue screen occurs when running network performance tests. **Bug 22058506**
- Windows guests do not inherit IP addresses after installation. **Bug 21845785**
- RDP communication does not function after installation on Windows Server 2012. **Bug 21803860**
- Network performance issues occur after installation. **Bug 21458061**
- Cannot communicate with Windows guests using RDP or the Oracle VM console, even though the guests are running. **Bug 21457678**
- The Xen VBD driver causes a Windows blue screen to occur when running network performance tests. **Bug 21373489**
- Running network performance testing with the MTU set to 9000 on a guest causes Windows blue screen to occur. **Bug 21303484**

3.6 New in Release 3.2.3

Release 3.2.3 provides a cumulative update of fixes, as follows:

- Fixes a BSOD issue when running a netperf test with 10 TCP streams from a remote Dom0 to a Microsoft Windows guest. **Bug 21302935**
- Modifies the Oracle VM service to remove spaces from the executable path name. **Bug 20863991**
- Fixes an issue to allow more than 1Gbps speeds on 10GBE links. **Bug 19833775**
- Fixes a issue where packet loss occurred when pinging some virtual machines. **Bug 19820063**
- Fixes an issue where the default policy on virtual disks was set to write-caching, which resulted in a loss of data integrity. **Bug 19452465**
- Fixes an issue where the network interface of the Windows guest was lost when an Oracle VM Server was upgraded to Release 3.3 in Cisco UCS server. **Bug 19449368**
- Fixes an issue where the current network interface settings are not applied during an installation of Oracle VM PV Drivers for Microsoft Windows. **Bug 18865098**
- Fixes an issue where it is not possible to format disks on a Windows virtual machine in some circumstances. **Bug 18707840**
- Fixes an issue where a system crash, or fatal system error, occurs when upgrading from a previous release of Oracle VM PV Drivers for Microsoft Windows. **Bug 18702781**
- Fixes performance degradation issues if more than 16 virtual CPUs (vCPU) are configured on some Windows guests. **Bug 18593684** and **Bug 18558015**
- Fixes an issue where a virtual disk provisioning failure occurs if the virtual disk is greater than 1TB. **Bug 18553901**
- Fixes an issue where a system crash, or fatal system error, occurs on a 32-bit Windows operating system. **Bug 18361346**

3.7 New in Release 3.2.2

The new features and enhancements in Release 3.2.2 include additional support for the following new guest operating systems:

- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2012
- Microsoft Windows 8.1
- Microsoft Windows 8

The following maximum limit configurations have been tested with the Oracle VM PV Drivers for Microsoft Windows:

- Maximum number of virtual CPUs: 32
- Maximum RAM per 32-bit guest: 64 GB
- Maximum RAM per 64-bit guest: 256 GB

3.8 New in Release 3.0.1

Release 3.0.1 includes support for the Storport miniport driver, which delivers improved performance compared to the SCSI port driver.

Chapter 4 Installing the Oracle VM PV Drivers for Microsoft Windows

Table of Contents

4.1 Configuring Policies for Device Installation	15
4.2 Installing Oracle VM PV Drivers for Microsoft Windows	15
4.3 Verifying the Oracle VM PV Drivers for Microsoft Windows Installation	18
4.4 Setting the MTU Size for Virtual Machines	19

Installing the Oracle VM PV Drivers for Microsoft Windows involves configuring Microsoft Windows policies, running the installation program, and then verifying the installation.

4.1 Configuring Policies for Device Installation

You must configure Microsoft Windows policies to allow the installation of the Oracle VM PV Drivers for Microsoft Windows, if these policies are not already configured. This task prevents the following error during installation: `The installation of this device is forbidden by system policy. Contact your system administrator.`

To configure policies for installation, do the following:

1. Open the Microsoft Windows virtual machine on which you want to install the Oracle VM PV Drivers for Microsoft Windows.
2. From the **Start menu**, select **Run**.
3. Enter `gpedit.msc` and then click **OK**.

The **Local Group Policy Editor** displays.

4. From the **Console Tree**, expand **Computer Configuration** then **Administrative Templates** then **System** then **Device Installation** and then select **Device Installation Restrictions**.

The list of device installation restrictions displays.

5. Edit policy settings so that no device installation restrictions are configured.

Alternatively, review each policy setting to determine the correct configuration for your business needs.

6. Exit the **Local Group Policy Editor**.
7. Restart the Microsoft Windows virtual machine.

When you are finished configuring the policy settings for device installation, you can proceed with the installation of the Oracle VM PV Drivers for Microsoft Windows.

4.2 Installing Oracle VM PV Drivers for Microsoft Windows

Before You Begin. Do the following before you start the installation process:

- Review the list of supported Microsoft Windows operating systems. See [Section 2.2, “Supported Guest Operating Systems”](#).

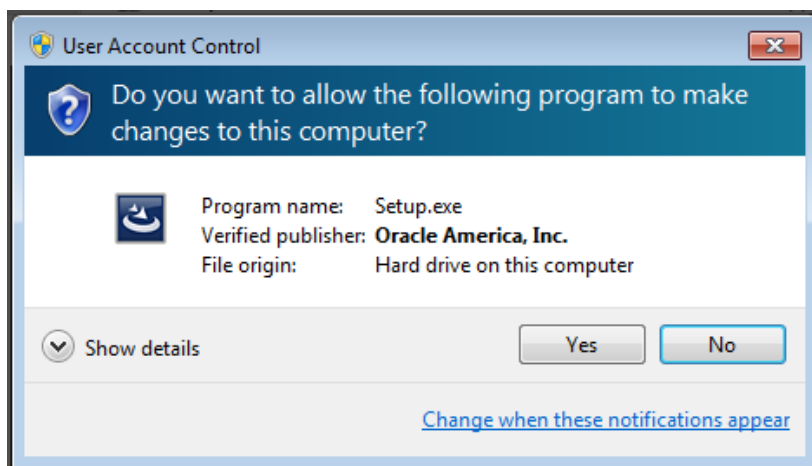
- Configure system policies to allow the installation. See [Section 4.1, “Configuring Policies for Device Installation”](#).

You can install the Oracle VM PV Drivers for Microsoft Windows using the graphical installation program or by performing a silent installation. You should use the graphical installation program if you are installing a single instance of the Oracle VM PV Drivers for Microsoft Windows. If you plan to silently install multiple instances of the Oracle VM PV Drivers for Microsoft Windows, you must run the graphical installation program in a command line window on at least one Microsoft Windows guest to create a response file. You can then use the response file to perform all subsequent installations silently.

To install the Oracle VM PV Drivers for Microsoft Windows, do the following:

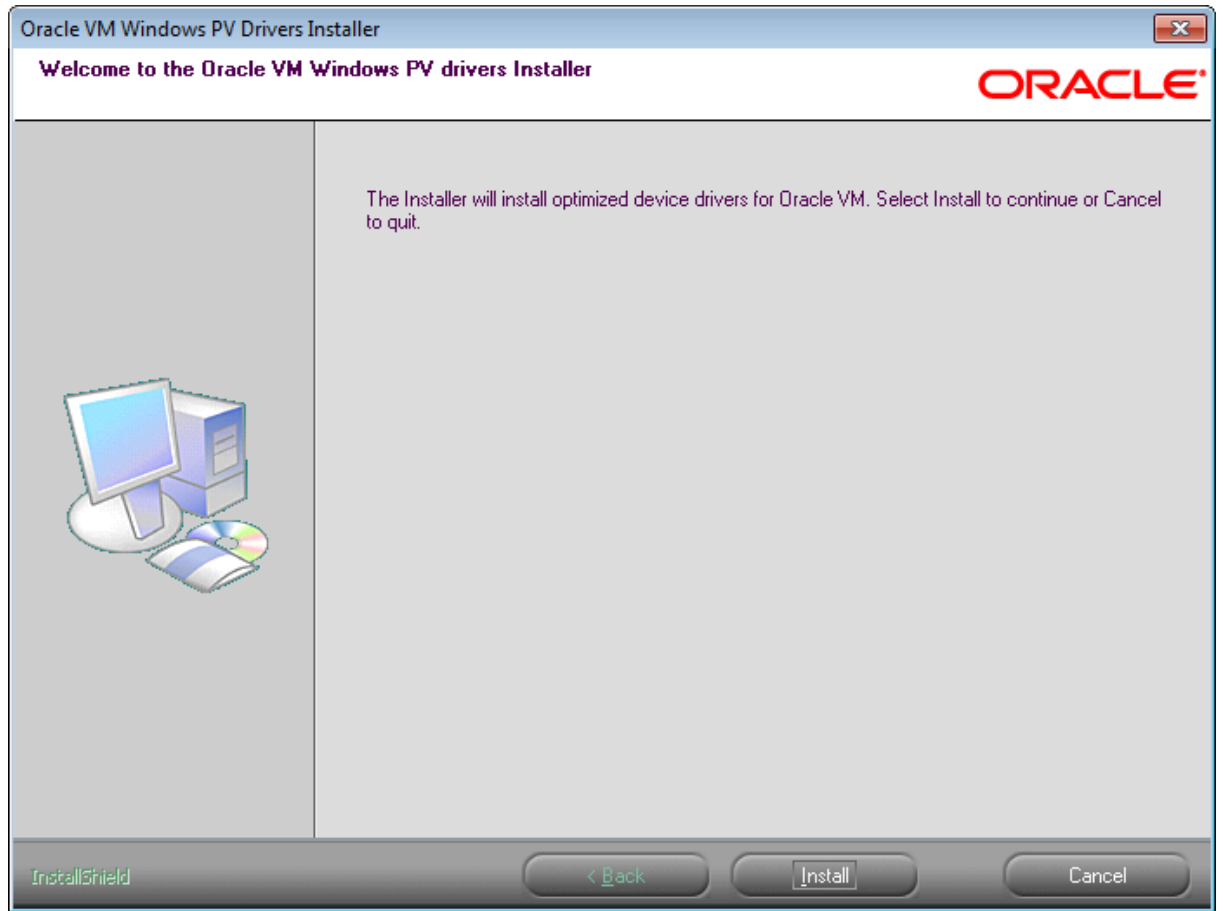
1. Create a new virtual machine and install a supported operating system.
2. Copy the Oracle VM PV Drivers for Microsoft Windows installation program, [Setup.exe](#), to the guest.
3. Do one of the following:
 - Double click [Setup.exe](#) to start the Oracle VM PV Drivers for Microsoft Windows installer.
 - Open a command line window and then:
 - a. Navigate to the directory where the [Setup.exe](#) file is located.
 - b. Run [Setup.exe -r](#) to start the Oracle VM PV Drivers for Microsoft Windows installer and create a response file for silent installations.
4. If prompted, select **Yes** in the **User Account Control** dialog to allow the Oracle VM PV Drivers for Microsoft Windows installer to proceed.

Figure 4.1 Oracle VM PV Drivers for Microsoft Windows user account control dialog



The initial installer window is displayed.

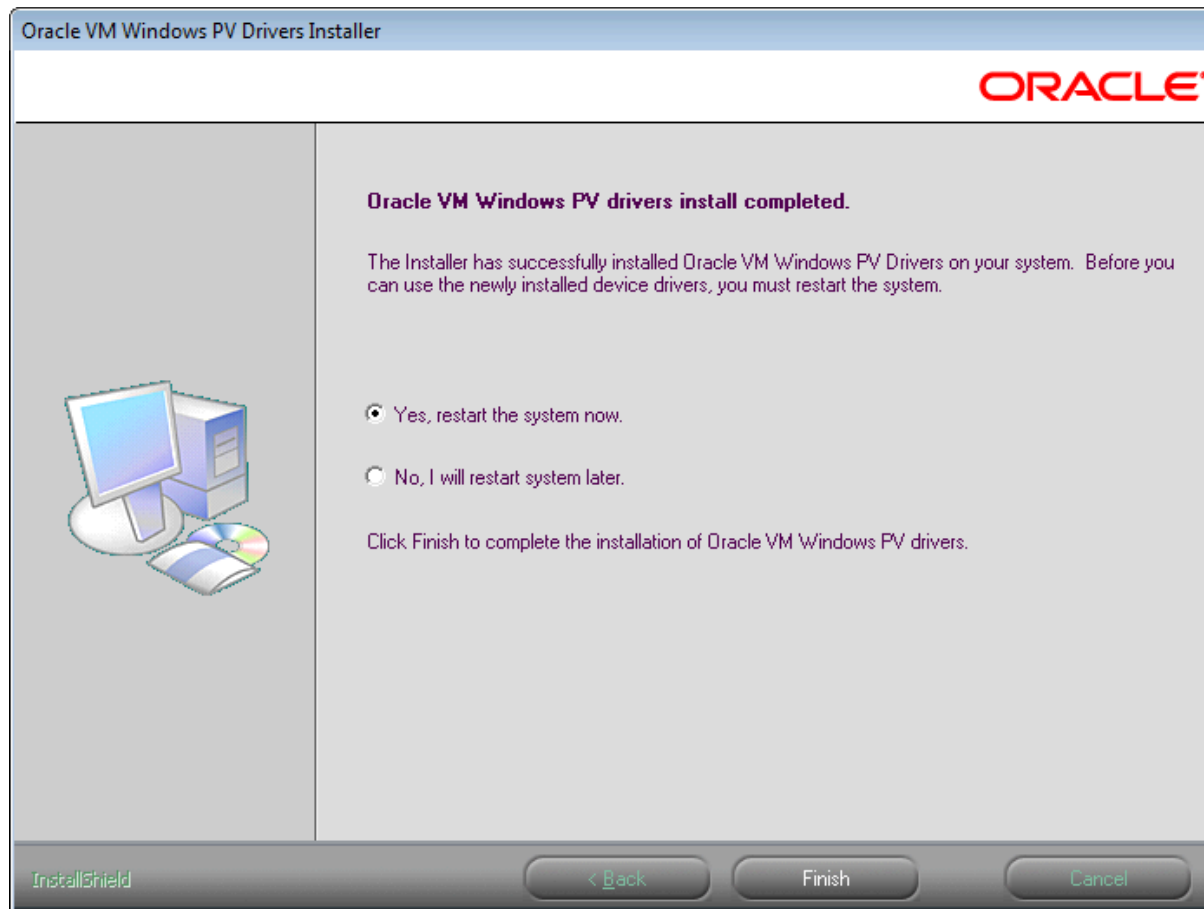
Figure 4.2 Oracle VM PV Drivers for Microsoft Windows installer window



5. Click **Install** to start the Oracle VM PV Drivers for Microsoft Windows installation.

The installer copies the Oracle VM PV Drivers for Microsoft Windows files, and installs the drivers on the guest. The **Installation Complete** window is displayed.

Figure 4.3 Installation Complete window



6. Check **Yes, restart the system now** and click **Finish**. The virtual machine is restarted.

If you used the `-r` option in the command line, the installation program creates a response file in the `C:\Windows` directory. You then use the response file, `setup.iss`, to perform silent installations on other Microsoft Windows guests. See [Chapter 6, Silently Installing or Upgrading the Oracle VM PV Drivers for Microsoft Windows](#).

4.3 Verifying the Oracle VM PV Drivers for Microsoft Windows Installation

To verify the Oracle VM PV Drivers for Microsoft Windows installed successfully, do the following:

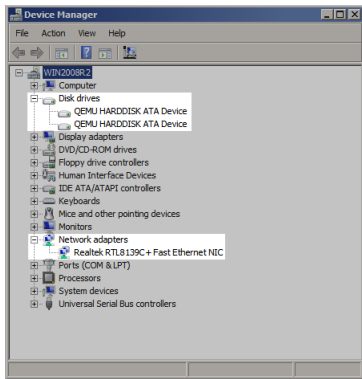
1. Open the Microsoft Windows virtual machine on which you installed the Oracle VM PV Drivers for Microsoft Windows.
2. Open the control panel and then locate and open the **Device Manager** window.
3. Expand **Disk drives** and verify that the following entry exists: `Oracle VM Virtual SCSI Disk Device`.

4. Expand **Network adapters** and verify that the following entry exists: [Oracle VM Virtual Ethernet Adapter](#).

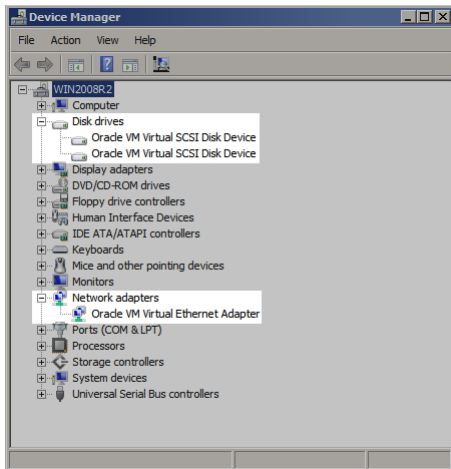
If both device entries exist, and do not have any device issue symbols next to them, then the Oracle VM PV Drivers for Microsoft Windows are installed successfully.

If a device issue symbol, such as a black exclamation mark on a yellow field, displays next to either device, you should attempt to reinstall the Oracle VM PV Drivers for Microsoft Windows. If the device issue symbol displays next to the device after you reinstall, either refer to the appropriate Microsoft Windows documentation for troubleshooting procedures or contact Oracle support.

The following image is an example of device drivers before installing the Oracle VM PV Drivers for Microsoft Windows:



The following image is an example of device drivers after successfully installing the Oracle VM PV Drivers for Microsoft Windows:



4.4 Setting the MTU Size for Virtual Machines

The Oracle VM PV Drivers for Microsoft Windows override the maximum transmission unit (MTU) settings in the virtual network adapters for Microsoft Windows virtual machines. After you successfully install and verify the Oracle VM PV Drivers for Microsoft Windows, you should set the MTU for each guest virtual machine.

To set the MTU size for a virtual machine, do the following:

1. Open the Microsoft Windows virtual machine.

2. Open the control panel and then locate and open the **Device Manager** window.
3. Expand **Network adapters** and select the appropriate [Oracle VM Virtual Ethernet Adpater](#).
4. Right-click the adapter, select **Properties**, and then select the **Advanced** tab.
5. Select the **MTU** property and set the value as appropriate. Click **OK** to save your changes.

Chapter 5 Upgrading the Oracle VM PV Drivers for Microsoft Windows

You can upgrade an existing installation of the Oracle VM PV Drivers for Microsoft Windows using the graphical installation program or by performing a silent upgrade. You should use the graphical installation program if you are upgrading a single instance of the Oracle VM PV Drivers for Microsoft Windows. If you plan to silently upgrade multiple instances of the Oracle VM PV Drivers for Microsoft Windows, you must run the graphical installation program in a command line window on at least one Microsoft Windows guest to create a response file. You can then use the response file to perform all subsequent upgrades silently.



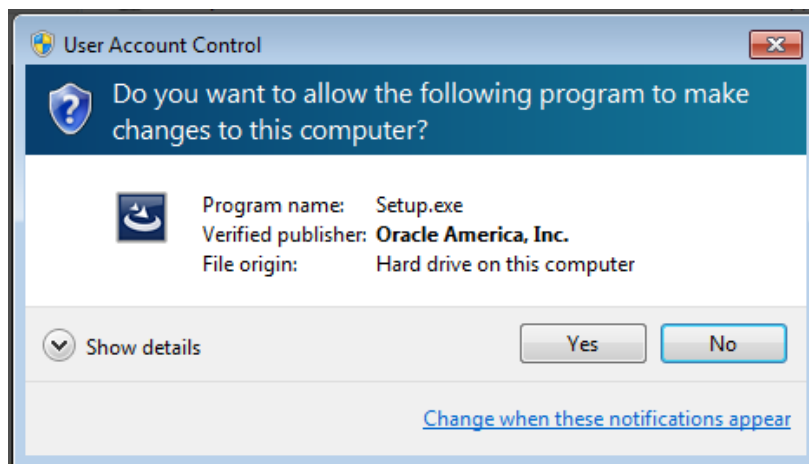
Note

A known issue exists when upgrading Oracle VM PV Drivers for Microsoft Windows Release 3.4.1 when the guest virtual machine has more than one virtual disk attached. For more information see [Section 9.8, “Upgrade Failure when Multiple Virtual Disks Attached to Windows Virtual Machine”](#).

To upgrade the Oracle VM PV Drivers for Microsoft Windows, do the following:

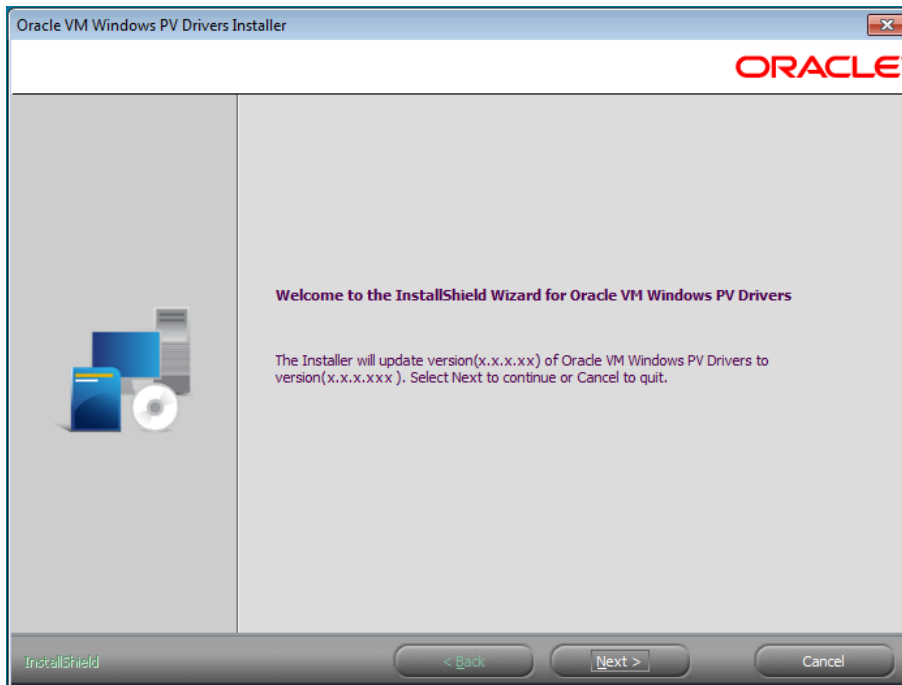
1. Copy the Oracle VM PV Drivers for Microsoft Windows installation program, [Setup.exe](#), to the guest.
2. Do one of the following:
 - Double click [Setup.exe](#) to begin the upgrade.
 - Open a command line window and then:
 - a. Navigate to the directory where the [Setup.exe](#) file is located.
 - b. Run [Setup.exe -r](#) to begin the upgrade and create a response file for silent installations.
3. If prompted, select **Yes** in the **User Account Control** dialog to allow the Oracle VM PV Drivers for Microsoft Windows installer to proceed.

Figure 5.1 Oracle VM PV Drivers for Microsoft Windows user account control dialog



The initial upgrade window is displayed.

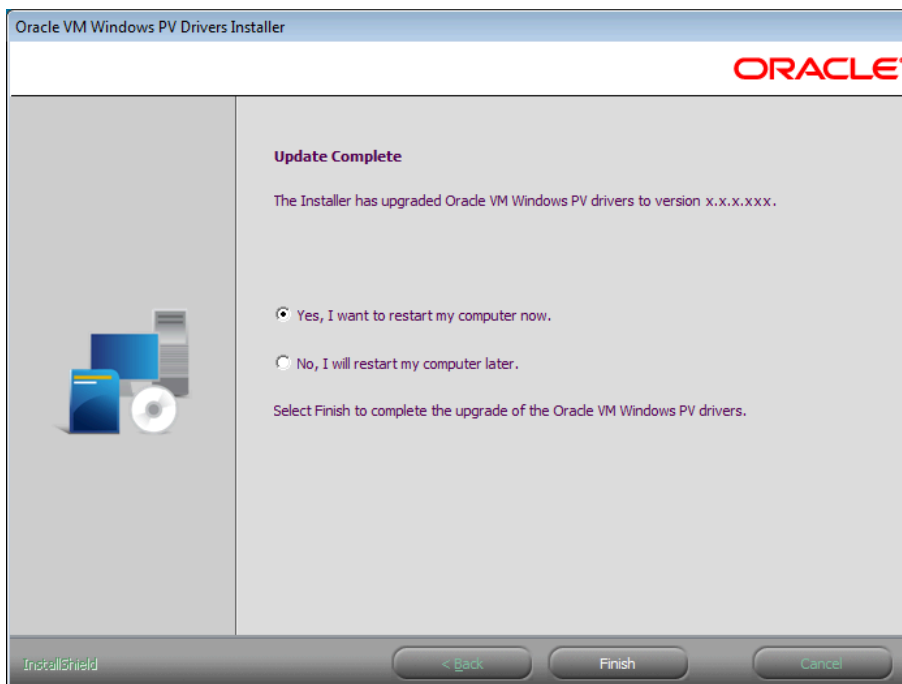
Figure 5.2 Oracle VM PV Drivers for Microsoft Windows installer window



4. Click **Next** to start the upgrade.

The installation program then copies new versions of the Oracle VM PV Drivers for Microsoft Windows to the system and updates the installed drivers. The **Update Complete** window is displayed.

Figure 5.3 Update Complete window



5. Check **Yes, I want to restart the system now** and then click **Finish**. The virtual machine is restarted.

If you used the `-r` option in the command line, the installation program creates a response file in the `C:\Windows` directory. You then use the response file, `setup.iss`, to perform silent upgrades on other Microsoft Windows guests. See [Chapter 6, *Silently Installing or Upgrading the Oracle VM PV Drivers for Microsoft Windows*](#).

Chapter 6 Silently Installing or Upgrading the Oracle VM PV Drivers for Microsoft Windows

You can use a response file that you create with the graphical installation program to silently install or upgrade the Oracle VM PV Drivers for Microsoft Windows. The response file provides the prompts that the installation program requires to successfully install or upgrade the Oracle VM PV Drivers for Microsoft Windows.



Important

- Oracle VM PV Drivers for Microsoft Windows must be signed by Microsoft to perform a silent installation or upgrade. See [Section 2.3, “Microsoft Windows Compatibility Signing”](#).
- You can perform a silent installation or upgrade only on supported 64-bit versions of Microsoft Windows. You cannot perform a silent installation or upgrade on any 32-bit version of Microsoft Windows. For more information, see [Section 2.2, “Supported Guest Operating Systems”](#).

Before You Begin. Complete at least one installation or upgrade of the Oracle VM PV Drivers for Microsoft Windows using the graphical installation program to create a response file. See [Section 4.2, “Installing Oracle VM PV Drivers for Microsoft Windows”](#) or [Chapter 5, *Upgrading the Oracle VM PV Drivers for Microsoft Windows*](#).

To install or upgrade the Oracle VM PV Drivers for Microsoft Windows silently, do the following:

1. Locate the response file, `setup.iss`, in the `C:\Windows` directory on the filesystem of the computer where you ran the graphical installation program.
2. Copy `setup.iss` to the same directory as the Oracle VM PV Drivers for Microsoft Windows installation program. Alternatively you can specify the location of the response file at the command line.
3. Open a command line window.
4. Run `Setup.exe -s` to silently install or upgrade the Oracle VM PV Drivers for Microsoft Windows with the response file.

You can include the following options at the command line:

- `-f1c:path\to\setup.iss` to specify the location of `setup.iss`. For example, `Setup.exe -s -f1c:\Users\Username\setup.iss`.
- `-f2c:path\to\setup.log` to specify the location of `setup.log`. By default, log files are written to the `C:\Windows` directory. For example, `Setup.exe -s -f2c:\Users\Username\setup.log`.

Chapter 7 Finding the Version and Build Number of the Installed Oracle VM PV Drivers for Microsoft Windows

To find the version and build number of the installed Oracle VM PV Drivers for Microsoft Windows through **Device Manager**, do the following:

1. Open **Device Manager**.
2. Do the following:
 - a. Expand **System devices**, select and right-click **Oracle VM Virtual PCI Bus**, and then select **Properties** from the drop-down list.

The installed Oracle VM PV Drivers for Microsoft Windows version and build numbers are listed under the **Driver** tab of the **Properties** window.

- b. Expand **Storage controllers**, select and right-click **Oracle VM Virtual Disk Controller**, and then select **Properties** from the drop-down list.

The installed Oracle VM PV Drivers for Microsoft Windows version and build numbers are listed under the **Driver** tab of the **Properties** window.

- c. Expand **Network adapters**, select and right-click **Oracle VM Virtual Ethernet Adapter**, and then select **Properties** from the drop-down list.

The installed Oracle VM PV Drivers for Microsoft Windows version and build number are listed under the **Driver** tab of the **Properties** window.

For Release 3.4.5, the version and build number of the Oracle VM PV Drivers for Microsoft Windows are listed as follows: [3.4.5-1940](#).



Note

You can click **Driver Details** to display additional information about the installed driver.

Chapter 8 Uninstalling the Oracle VM PV Drivers for Microsoft Windows

You can uninstall the Oracle VM PV Drivers for Microsoft Windows through the Microsoft Windows control panel or by running the installation program that you used to install the Oracle VM PV Drivers for Microsoft Windows.

To uninstall through the Microsoft Windows control panel, do the following:

1. Open the control panel and navigate to the **Uninstall or change a program** section. Note that the name of this section might be different, depending on your version of Microsoft Windows.
2. Locate and select **Oracle VM Windows PV Drivers**.
3. Right-click and select **Uninstall**.

The installation program starts and prompts you to confirm the uninstallation.

4. Select **Yes** when prompted to remove the application.

The installation program removes the Oracle VM PV Drivers for Microsoft Windows and deletes the binaries from your system.

5. When prompted, select **Yes, restart the system** and then click **Finish** to complete the uninstallation.

To uninstall with the installation program, do the following:

1. Double click [Setup.exe](#) to start the Oracle VM PV Drivers for Microsoft Windows installer.

The installation program starts and prompts you to modify the current installation.

2. Select **Remove** and then click **Next**.

The installation program removes the Oracle VM PV Drivers for Microsoft Windows and deletes the binaries from your system.

3. When prompted, select **Yes, restart the system** and then click **Finish** to complete the uninstallation.

Chapter 9 Known Limitations and Workarounds

Table of Contents

9.1 Hot-Added vCPUs Not Used By a Windows Virtual Machine Until It Is Rebooted	31
9.2 Security Alert for Unsigned Drivers	31
9.3 Upgrading on Microsoft Windows 32-bit	32
9.4 Windows Guest Kernel Panic	32
9.5 Crash Dump or Hibernation Fails	32
9.6 Unable to Modify Memory or vCPUs for Running PVHVM Guests	33
9.7 Microsoft Windows Server 2012 Data Center Guests with Failover Clustering Cannot Get IP Address	33
9.8 Upgrade Failure when Multiple Virtual Disks Attached to Windows Virtual Machine	33
9.9 Uninstall Failure for Oracle VM PV Drivers for Microsoft Windows Release 3.4.1	34
9.10 Microsoft Windows Blue Screen Error on Windows Server 2008 Guests	35
9.11 Incorrect Driver Version Displayed for Oracle VM Virtual Ethernet Adapter	35
9.12 Performance Impact when Windows Server Virtualization Support is not Enabled	36

This section contains information on known limitations and workarounds for the Oracle VM PV Drivers for Microsoft Windows.

9.1 Hot-Added vCPUs Not Used By a Windows Virtual Machine Until It Is Rebooted

If you hot-add vCPUs to a Windows virtual machine, the added processors are immediately visible in Windows Device Manager but are not used until you reboot the virtual machine.

Workaround: Reboot the Windows virtual machine after hot-adding vCPUs.

9.2 Security Alert for Unsigned Drivers

- The Oracle VM PV Drivers for Microsoft Windows Release 3.4.5, Release 3.4.4, Release 3.4.3, Release 3.4.2, and Release 3.2.3 have not been signed by Microsoft for 32-bit Microsoft Windows operating systems.
- The Oracle VM PV Drivers for Microsoft Windows Release 3.4.1 have not been signed by Microsoft for the Windows software logo program.

Because the Oracle VM PV Drivers for Microsoft Windows are not signed by Microsoft, the following security alert displays during installation:



To continue the installation, click **Yes** and then click **Continue Anyway** when the following screen displays:



Bug 18361346

9.3 Upgrading on Microsoft Windows 32-bit

Upgrading from Oracle VM PV Drivers for Microsoft Windows Release 3.2.2 to Release 3.2.3, and then uninstalling Release 3.2.3, might cause a fatal system error. This issue might occur on some Microsoft Windows 32-bit versions, such as Microsoft Windows 2008 SP2, Microsoft Windows 7, and Microsoft Windows 8.1.

Workarounds:

- Uninstall Oracle VM PV Drivers for Microsoft Windows Release 3.2.2 before you install Release 3.2.3.
- If you encounter this issue, restart the system and then use the Oracle VM PV Drivers for Microsoft Windows Release 3.2.3 installation program to completely uninstall Release 3.2.3. You should then uninstall Oracle VM PV Drivers for Microsoft Windows Release 3.2.2 before installing Release 3.2.3.

9.4 Windows Guest Kernel Panic

Microsoft Windows guests may experience kernel panic when the virtual machine is stopped and started several times. This may also occur if there is intensive I/O. The error in this case is:

```
(XEN) p2m_pod_demand_populate: Out of populate-on-demand memory!
```

Workaround: Set the **Maximum Memory** and the **Memory** fields to the same value in the **Create/Edit Virtual Machine** wizard in [Oracle VM Manager](#).

Bug 10334923

9.5 Crash Dump or Hibernation Fails

The stop error `0x000000D1` may occur when doing a crash dump or hibernation. This only occurs when using the Oracle VM PV Drivers for Microsoft Windows Release 3.0.1 on Microsoft Windows Server 2008 R2, Microsoft Windows Server 2008, and Microsoft Windows 7.

Workaround: Download and install the Microsoft hotfix:

<http://support.microsoft.com/kb/2320550/>

9.6 Unable to Modify Memory or vCPUs for Running PVHVM Guests

With this release of the Windows PV Driver, you cannot modify memory or vCPUs of running PVHVM guests on a Microsoft Windows OS without a reboot. A future release of the Windows PV Drivers may be delivered to enable hot changing memory and vCPUs for PVHVM guests that are running a Microsoft Windows OS.

Workaround: Stop the PVHVM guest before modifying the memory or vCPUs.

9.7 Microsoft Windows Server 2012 Data Center Guests with Failover Clustering Cannot Get IP Address

A Microsoft Windows Server 2012 data center guest may fail to get an IP address from a DHCP server or encounter a UDP connection failure after installing the Windows Server Failover Clustering feature and restarting the guest.



Note

This issue does not apply to Microsoft Windows Server 2012 R2. The issue affects only Microsoft Windows Server 2012.

Workaround:

- Install the following hotfix to correct this issue: <https://support.microsoft.com/en-us/kb/3062586>.
- If you experience further Windows Server Failover Clustering failures with Microsoft Windows Server 2012, see *Recommended hotfixes and updates for Windows Server 2012-based clusters* on Microsoft Support at: <https://support.microsoft.com/en-us/kb/2784261>.

Bug 24594337

9.8 Upgrade Failure when Multiple Virtual Disks Attached to Windows Virtual Machine

A Windows blue screen error may occur when upgrading from Oracle VM PV Drivers for Microsoft Windows Release 3.4.1 to a later release on a Windows guest virtual machine with more than one virtual disk attached.

Workaround:

1. Shut down the virtual machine where Oracle VM PV Drivers for Microsoft Windows Release 3.4.1 is installed.
2. Before upgrading, you must detach the virtual disks individually from the virtual machine using the Oracle VM Manager Web Interface as follows:
 - a. Click the **Servers and VMs** tab.
 - b. Select the server pool on which the virtual machine resides in the navigation tree.
 - c. Select **Virtual Machines** from the **Perspective** drop-down list. Select the virtual machine in the management pane, and click **Edit...** in the management pane toolbar.

- d. The **Edit Virtual Machine** dialog box is displayed.
- e. Select the **Disks** tab, and set the **Disk Type** for the first virtual disk to **Empty** and click **Ok**.



Note

There is no requirement to detach the System boot disk, for example **CD/DVD**.

- f. Repeat step c, d, and e for all remaining virtual disks, except the System boot disk.
 - g. When all data virtual disks are detached, start the virtual machine.
3. Proceed to upgrade Oracle VM PV Drivers for Microsoft Windows Release 3.4.1. For more information see [Chapter 5, Upgrading the Oracle VM PV Drivers for Microsoft Windows](#).
 4. After a successful upgrade, if required, you can re-attach the virtual disks to the Windows virtual machine using the Oracle VM Manager Web Interface as follows:
 - a. Click the **Servers and VMs** tab.
 - b. Select the server pool on which the virtual machine resides in the navigation tree.
 - c. Select **Virtual Machines** from the **Perspective** drop-down list. Select the virtual machine in the management pane, and click **Edit...** in the management pane toolbar.
 - d. The **Edit Virtual Machine** dialog box is displayed.
 - e. Select the **Disks** tab and change the **Disk Type** from **Empty** to **Virtual Disk**.
 - f. Click **Select a Virtual Machine Disk** to select the virtual disks that were previously removed from the virtual machine before upgrade.
 - g. Once all virtual disks are re-attached, click **Ok**.

Upgrade of Oracle VM PV Drivers for Microsoft Windows Release 3.4.1 to a later release is now complete on the Windows guest virtual machine with multiple virtual disks attached.

Bug 25135637

9.9 Uninstall Failure for Oracle VM PV Drivers for Microsoft Windows Release 3.4.1

A Windows blue screen error may occur when uninstalling Oracle VM PV Drivers for Microsoft Windows Release 3.4.1 on a Windows guest virtual machine with more than one virtual disk attached.

Workaround:

1. Shut down the virtual machine where Oracle VM PV Drivers for Microsoft Windows Release 3.4.1 is installed.
2. Before uninstalling, you must detach the virtual disks individually from the virtual machine using the Oracle VM Manager Web Interface as follows:
 - a. Click the **Servers and VMs** tab.

- b. Select the server pool on which the virtual machine resides in the navigation tree.
- c. Select **Virtual Machines** from the **Perspective** drop-down list. Select the virtual machine in the management pane, and click **Edit...** in the management pane toolbar.
- d. The **Edit Virtual Machine** dialog box is displayed.
- e. Select the **Disks** tab, and set the **Disk Type** for the first virtual disk to **Empty** and click **Ok**.

**Note**

There is no requirement to detach the System boot disk, for example **CD/DVD**.

- f. Repeat step c, d, and e for all remaining virtual disks, except the System boot disk.
3. When all data virtual disks are detached, start the virtual machine.
 4. Proceed to uninstall the Oracle VM PV Drivers for Microsoft Windows Release 3.4.1 from the Windows guest. For more information see [Chapter 8, Uninstalling the Oracle VM PV Drivers for Microsoft Windows](#).

Bug 25355611

9.10 Microsoft Windows Blue Screen Error on Windows Server 2008 Guests

During intensive I/O traffic, Windows blue screen error `0x000000BE` or `0x000000D1` may be displayed on Windows Server 2008 R2 SP1 and Windows Server 2008 SP2 guests.

Workaround:

For Windows Server 2008 R2 SP1 guests, download and install the following Microsoft hotfixes:

- <http://support.microsoft.com/kb/983554/>
- <http://support.microsoft.com/kb/2957775/>

For Windows Server 2008 SP2 guests, only Microsoft hotfix [983554](#) is required:

- <http://support.microsoft.com/kb/983554/>

Bug 24594337

9.11 Incorrect Driver Version Displayed for Oracle VM Virtual Ethernet Adapter

For Oracle VM PV Drivers for Microsoft Windows Release 3.4.3 or earlier, the **Driver Version** displayed in the **Device Manager** for **Oracle VM Virtual Ethernet Adapter** Network adapter devices may be incorrect. For example, multiple **Oracle VM Virtual Ethernet Adapter** devices may display different driver version numbers even though they are using the same `xennet.sys` driver.

Workaround: If you suspect that the driver version is incorrect in the **Device Manager** for an **Oracle VM Virtual Ethernet Adapter** device, you can obtain the correct driver version by checking the `xennet.sys` file version as follows:

1. On the Microsoft Windows guest, open the control panel and navigate to `%SystemRoot%\System32\drivers\xennet.sys`.
2. Right-click on the `xennet.sys` file, select **Properties**, and open the **Details** tab.
3. The **File Version** displayed is the correct version for the `xennet.sys` driver.

Bug 26646025

9.12 Performance Impact when Windows Server Virtualization Support is not Enabled

Microsoft Windows guests running Oracle VM PV Drivers for Microsoft Windows may sometimes experience slow performance issues, for example, slow performance may be encountered during database start-up on Microsoft Windows Server 2016.

From Microsoft Windows Server 2008 onwards, you can 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 running Oracle VM PV Drivers for Microsoft Windows.

Workaround: Use the Oracle VM Manager Web Interface Release 3.4.5 or later to edit the Microsoft Windows guest virtual machine and enable viridian support.



Note

Enabling viridian support is permitted for all Microsoft Windows guest operating system types. However, it is only effective from Microsoft Windows Server 2008 onwards.

Bug 27333866

Glossary

D

dom0

An abbreviation for *domain zero*. The management domain with privileged access to the hardware and device drivers. Dom0 is the first domain started at boot time. Dom0 has more privileges than domU. It can access the hardware directly and can manage the device drivers for other domains. It can also start new domains.

domU

An unprivileged domain with no direct access to the hardware or device drivers. Each domU is started by dom0.

G

guest

A guest operating system that runs within a domain in Oracle VM Server. A guest may be paravirtualized or hardware virtualized. Multiple guests can run on the same Oracle VM Server.

O

Oracle VM Manager

Oracle VM Manager is the management platform, which offers an easy-to-use, web-browser interface as well as a command-line interface (CLI). Oracle VM Manager tracks and manages the resources available in your virtual environment and allows you to easily manage Oracle VM Server pools. Oracle VM Manager lets you manage the virtual machine life cycle, including creating virtual machines from templates or from installation media, deleting, powering off, uploading, deployment and live migration of virtual machines. Oracle VM Manager also lets you manage resources including ISO files, templates and shared virtual disks.

P

paravirtualized machine (PVM)

A virtual machine with a kernel that is recompiled to be made aware of the virtual environment. Runs at near native speed, with memory, disk and network access optimized for maximum performance.

Paravirtualized guests use generic, idealized device drivers, which are part of the guest's OS. The I/O operations using these generic device drivers are mapped to the real device drivers in dom0. The generic, abstracted drivers in the guest seldom change and provide excellent guest stability. The dom0 domain, alternatively, can use the native hardware vendor drivers, and the guests can safely migrate to another dom0 with slightly different drivers.

For other resources such as CPU and memory, paravirtualized kernels make special "hypercalls" to the Xen hypervisor. These hypercalls provide better performance by reducing the number of instructions and context switches required to handle an incoming request. By contrast, on an emulated (hardware virtualized) guest, driver requests engage the guest's interrupt handler, increasing the I/O operation overhead.

