



Red Hat Enterprise Linux

5

Para-virtualized Windows Drivers Guide

Using the para-virtualized drivers Microsoft Windows Guide
Edition 1.1

Perry Myers

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Red Hat Enterprise Linux 5 Para-virtualized Windows Drivers Guide

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Abstract

This guide covers installation and usage of the para-virtualized drivers for fully virtualized Xen-based Microsoft Windows guests on hosts running Red Hat Enterprise Linux 5.2 and later. The para-virtualized drivers provide fully virtualized Microsoft Windows guests with greater throughput and faster latency for storage and networking devices. This guide assumes the reader is familiar with system administration, software installation and configuration of Red Hat Enterprise Linux and Microsoft Windows environments.

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Chapter 1. Overview

Red Hat Enterprise Linux contains virtualization packages and tools which provide system administrators with the means to run fully virtualized, unmodified, operating system guests on Red Hat Enterprise Linux. This provides companies with the ability to consolidate older systems onto newer, more efficient hardware. This reduces physical space and operating costs involved with powering and cooling older, less efficient systems. Full virtualization incurs worse I/O performance than a native, also known as bare-metal, installations of operating systems.

Para-virtualization is a virtualization technique which involves running modified versions of operating systems. Para-virtualization has input/output (I/O) performance very close to running bare-metal, non-virtualized operating systems. Para-virtualization only works with certain operating systems.

These two techniques, para-virtualization and full virtualization, can be combined to allow unmodified operating systems to receive near native I/O performance by using para-virtualized drivers on fully virtualized operating systems. This guide covers installation and configure the Red Hat Enterprise Linux para-virtualized drivers package for fully virtualized Microsoft Windows® guests.

The para-virtualized drivers package contains storage and network device drivers for fully virtualized Microsoft Windows® guests. The drivers provide Microsoft Windows® guests running on Red Hat Enterprise Linux with enhanced disk and network I/O performance.

This guide requires Red Hat Enterprise Linux 5.2 or later for the virtualization host system. Several versions of Microsoft Windows® are supported as fully virtualized guests. For a complete list of supported guests and other restrictions, refer to [Chapter 2, Requirements and restrictions](#).



Note

Para-virtualized drivers for fully virtualized Red Hat Enterprise Linux guests are also available. Refer to [Para-virtualized Drivers Guide](#) or redhat.com/docs for the Red Hat Enterprise Linux *Para-virtualized Drivers Guide*.



Important

This guide is about the Xen para-virtualized drivers for Windows.

There are also para-virtualized drivers for KVM-based Windows guests available. The KVM para-virtualized drivers, the **virtio** drivers, are covered by the *Red Hat Enterprise Linux Virtualization Guide*.

Chapter 2. Requirements and restrictions

This chapter covers the hardware and software requirements for the para-virtualized Windows drivers.

The para-virtualized Windows drivers can be deployed on x86 (32 bit) and AMD64 or Intel 64 (64 bit) systems running Red Hat Enterprise Linux 5.2 or later. The Itanium platform is presently unsupported for the para-virtualized drivers.

Hosts running AMD64 or Intel 64 (64 bit) Red Hat Enterprise Linux can run 64 bit or 32 bit fully virtualized Windows guests. Mixing 32 bit and 64 bit guest operating systems is supported.

Hosts running x86 (32 bit) Red Hat Enterprise Linux can only run 32 bit guest operating systems.

You require all of the items in this list for the para-virtualized Windows drivers:

- ✧ one or more of the para-virtualized Windows drivers packages. The package installation process is described in [Section 3.2, “Installing the para-virtualized drivers”](#). You only require the packages for the guest architectures you run.
 - **xenpv-win-32bit** – The driver package for 32 bit Windows versions.
 - **xenpv-win-32bit-debug** – The debugging driver package for 32 bit Windows versions.
 - **xenpv-win-64bit** – The driver package for 64 bit Windows versions.
 - **xenpv-win-64bit-debug** – The debugging driver for 64 bit Windows versions.
- ✧ a system running Red Hat Enterprise Linux 5.2, or later, for the host.
- ✧ at least 10MB of free space on each Windows guest.
- ✧ administrator level access to the Windows virtual machine.
- ✧ root or **sudo** access to the Red Hat Enterprise Linux host.

Supported operating systems

This section covers the supported Windows virtualized guest operating systems.

Support for para-virtualized drivers is available to virtualized guests running the following Microsoft Windows operating system versions.

- ✧ Windows Server 2003 Service Pack 2 – 32 bit
- ✧ Windows Server 2003 Service Pack 2 – 64 bit
- ✧ Windows Server 2003 R2 Service Pack 2 – 32 bit
- ✧ Windows Server 2003 R2 Service Pack 2 – 64 bit
- ✧ Windows XP – Service Pack 2 – 32 bit
- ✧ Windows XP – Service Pack 3 – 32 bit
- ✧ Windows XP Professional x64 – Service Pack 1 – 64 bit
- ✧ Windows XP Professional x64 – Service Pack 2 – 64 bit
- ✧ Windows Vista – 32 bit

- ✧ Windows Vista – 64 bit
- ✧ Windows Vista Service Pack 1 – 32 bit
- ✧ Windows Vista Service Pack 1 – 64 bit



Important

All mentions of the term "64 bit" in this document refer to AMD64 and Intel 64 systems. Itanium systems are not supported at present by these drivers.

Other restrictions

Some additional technical restrictions apply to the para-virtualized drivers.

The system drive cannot run the para-virtualized block device drivers.

The system drive, identified by the `%SYSTEMDRIVE%` environment variable in Windows, is the device which contains boot information and system files for the Windows operating system. This device, usually labeled **C: drive**, contains the **Windows** directory and cannot use the para-virtualized drivers. The drivers can use a separate partition, logical volume or other physical block device to store applications and non-Windows data. This limitation is due to the limitations of the **qemu** package.

An example configuration utilizing the para-virtualized drivers.

- ✧ **C: drive** which contains Windows system files and uses the default, fully virtualized device drivers.
- ✧ **D: drive** which contains applications and utilizes the para-virtualized drivers.

The para-virtualized device drivers must be installed after the successful creation and installation of the guest operating system.

Chapter 3. Installing and configuring the para-virtualized drivers

These sections detail installing and configuring the para-virtualized drivers for Microsoft Windows guests on Red Hat Enterprise Linux.

Note that this guide is about Xen-based virtualized guests. Para-virtualized drivers for KVM-based guests are covered in the *Virtualization Guide*



Important

The para-virtualized drivers do not support guest booting from a para-virtualized disk. Booting the guest still requires the an emulated IDE driver. Files contained in the **Windows** directory cannot use the para-virtualized drivers.

3.1. Creating the guest

Creating new Microsoft Windows virtualized guests is outside the scope of this document. For information on creating guests refer to the *Red Hat Enterprise Linux Virtualization Guide* for information on installing Microsoft Windows virtualized guests. The *Red Hat Enterprise Linux Virtualization Guide* can be downloaded from www.redhat.com/docs.

3.2. Installing the para-virtualized drivers

This section details the process for installing the para-virtualized drivers on newly created Microsoft Windows guests using **virsh** or **virt-manager**.

You can access the Microsoft Windows para-virtualized drivers installer from your guest using either:

- hosting the files on a network accessible to the guest, or
- by creating a virtualized CD-ROM device on the guest of the installation disk .iso file.

This guide describes installation from the para-virtualized installer disk as a virtualized CD-ROM device.

Download the para-virtualized drivers package with **yum**. The package names in the list below are to assist you with choosing the right package for your guest.

Para-virtualized drivers package names

xenpv-win-32bit

The driver package for the 32 bit versions of Windows.

xenpv-win-32bit-debug

The package for debugging the drivers for the 32 bit versions of Windows.

xenpv-win-64bit

The driver package for the 64 bit versions of Windows.

xenpv-win-64bit-debug

The package for debugging the drivers for the 64 bit versions of Windows.

The debug packages (for example, **xenpv-win-64bit-debug**) are used for debugging the para-virtualized driver inside of the windows guests. These drivers provide users with more verbose reporting and additional tools for debugging and data logging.

To install the **.iso** file containing the drivers, use **yum** on a host with the Virtualization channel in RHN enabled.

For the 32 bit package execute the follow command:

```
# yum install xenpv-win-32bit
```

For the 64 bit package execute the follow command:

```
# yum install xenpv-win-64bit
```

This extracts the packaged files to the **/usr/share/xenpv-win** directory. The **Bash** output below shows the contents of a **/usr/share/xenpv-win** directory with both 32 bit and 64 bit drivers and the debugging packages installed. Note the symbolic links (denoted by the **->** symbol) linking to the newest version of the para-virtualized drivers.

```
$ ls -al /usr/share/xenpv-win
total 13472
drwxr-xr-x  2 root root    4096 Jul 14 17:29 .
drwxr-xr-x 214 root root    4096 Jul 14 17:29 ..
-rw-r--r--  1 root root 3325952 Jul 11 14:58 xenpv-win-32bit-0.97.1.iso
-rw-r--r--  1 root root 3422208 Jul 11 14:58 xenpv-win-32bit-debug-
0.97.1.iso
lrwxrwxrwx  1 root root     32 Jul 14 17:29 xenpv-win-32bit-debug.iso ->
xenpv-win-32bit-debug-0.97.1.iso
lrwxrwxrwx  1 root root     26 Jul 14 17:29 xenpv-win-32bit.iso -> xenpv-
win-32bit-0.97.1.iso
-rw-r--r--  1 root root 3454976 Jul 11 14:58 xenpv-win-64bit-0.97.1.iso
-rw-r--r--  1 root root 3522560 Jul 11 14:58 xenpv-win-64bit-debug-
0.97.1.iso
lrwxrwxrwx  1 root root     32 Jul 14 17:29 xenpv-win-64bit-debug.iso ->
xenpv-win-64bit-debug-0.97.1.iso
lrwxrwxrwx  1 root root     26 Jul 14 17:29 xenpv-win-64bit.iso -> xenpv-
win-64bit-0.97.1.iso
```

The **.iso** files in the **/usr/share/xenpv-win** directory are mounted as virtual CD-ROM devices for the Windows guests in order to install the drivers.

To create the virtualized CD-ROM device you must choose to use either **virt-manager** (graphical) or **virsh** (command line).

Mounting the image with virt-manager

Follow [Procedure 3.1, "Using virt-manager to mount a CD-ROM image for a Windows guest"](#) to add a CD-ROM image with **virt-manager**.

Procedure 3.1. Using virt-manager to mount a CD-ROM image for a Windows guest

1. Open **virt-manager**, select your virtualized guest from the list of virtual machines and press the **Details** button.

2. Click the **Add** button in the **Details** panel.
3. This opens a wizard for adding the new device. Select **Storage device** from the drop down menu, then click **Forward**.



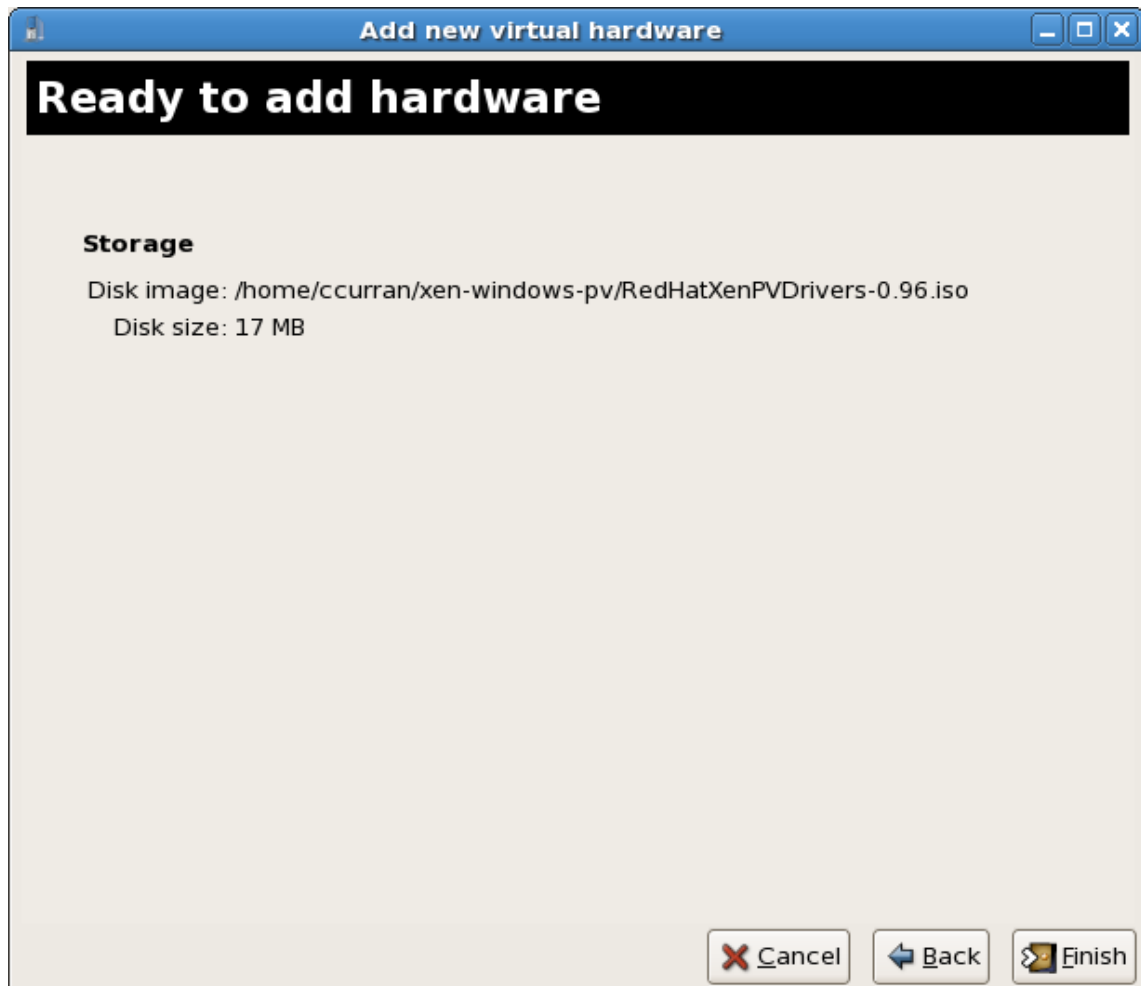
4. Choose the **Simple File** option and set the file location of the para-virtualized drivers .iso file. The location of the .iso files is `/usr/share/xenpv-win` if you used **yum** to install the para-virtualized driver packages.

If the drivers are stored physical CD, use the **Normal Disk Partition** option.

Set the **Device type** to **IDE cdrom** and click **Forward** to proceed.



5. The disk has been assigned and is available for the guest once the guest is started. Click **Finish** to close the wizard or back if you made a mistake.



Mounting the image with `virsh`

To mount `.iso` images with `virsh` guests must be either active (on) or inactive (off) state. For inactive guests refer to [Appendix A, Using `virsh` to mount a CD-ROM image on an inactive domain](#). For mounting the CD-ROM image on an active guest with `virsh`, follow [Procedure 3.2, “Mounting the driver installation CD-ROM image with `virsh` on an active guest”](#).

Procedure 3.2. Mounting the driver installation CD-ROM image with `virsh` on an active guest

1. Determine the required parameters, including:
 - a. An active domain. In the example the domain is called `w2k3_32`.
 - b. An unallocated block device label. The example in the next step uses `hdc`, if `hdc` is already allocated choose the next unallocated letter for example `hdd`. You can verify which drive labels are in use by reading the configuration file generated with the `virsh dumpxml w2k3_32 w2k3_32guest.xml`. This command generates a configuration file called `w2k3_32guest.xml` in the current directory.
 - c. The correct driver for your windows guest. In the example the `xenpv-win-32bit.iso` from the `xenpv-win-32bit` package.
2. Use the `virsh` command with the parameters modified for your guest.

```
# virsh attach-disk w2k3_32/usr/share/xenpv-win/xenpv-win-32bit.isohdc
--driver file --type cdrom --mode readonly
```



Warning

The above procedure only works on active domains. Refer to [Appendix A, Using virsh to mount a CD-ROM image on an inactive domain](#) for inactive domains.

Para-virtualized drivers executable file names

Executable file name	Description
<code>xenpv-win-32bit.exe</code>	The para-virtualized driver package for 32 bit Microsoft Windows installations. This covers most installations.
<code>xenpv-win-32bit-debug.exe</code>	The para-virtualized driver debugging package for 32 bit Microsoft Windows installations.
<code>xenpv-win-64bit.exe</code>	The para-virtualized driver package for 64 bit Microsoft Windows installations. This covers Windows XP Professional® x64 (Service Pack 1 and Service Pack 2), Windows Vista® 64 bit (release and Service Pack 1), Windows Server® 2003 (64 bit) Service Pack 2 and Windows Server® 2003 R2 (64 bit) Service Pack 2.
<code>xenpv-win-64bit-debug.exe</code>	The para-virtualized driver debugging package for Microsoft Windows 64 bit installations.



Important

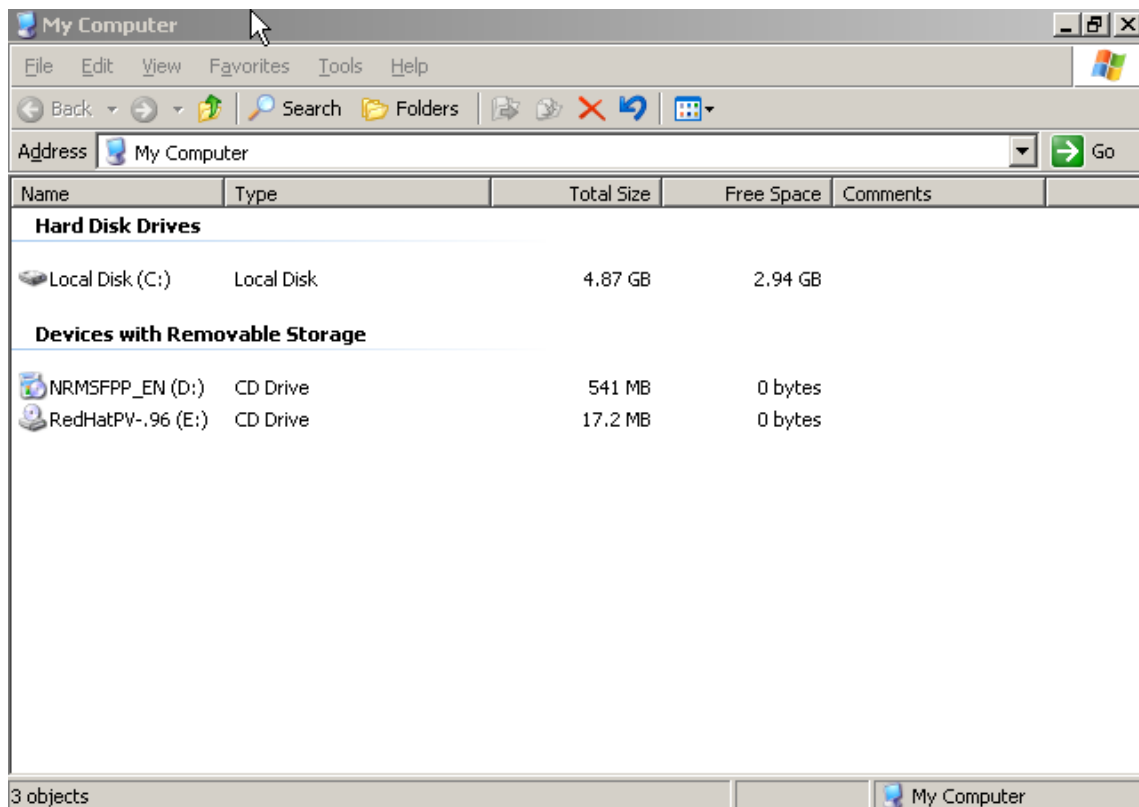
All mentions of the term "64 bit" in this document refer to AMD64 and Intel 64 systems. Itanium systems are not supported at this time by these drivers.

Procedure 3.3. Installing the para-virtualized drivers on the Windows® guest

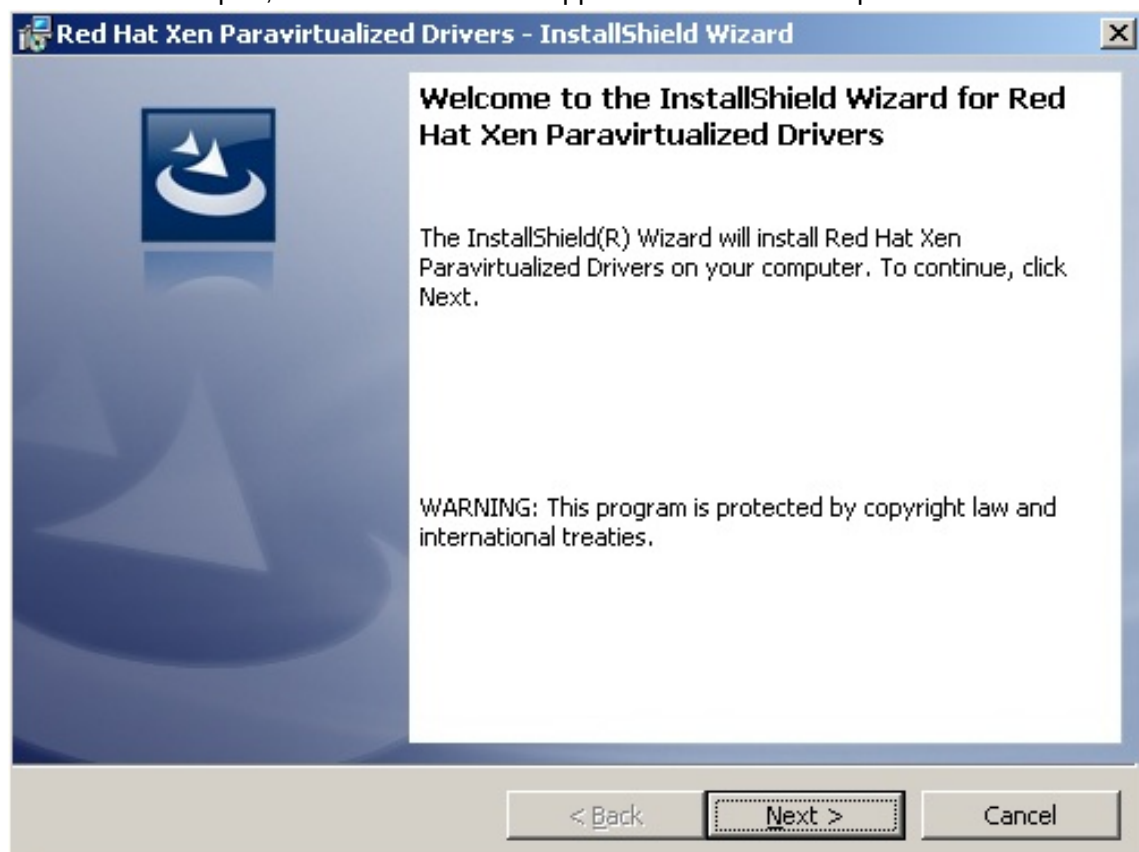
1. The installer may start automatically if you added the virtualized CD-ROM to an active guest. If this occurs skip this step and continue from step 2.

Start the installer by double clicking the CD drive (**E** in the example below).

If Autorun is disabled, start the installer by double clicking the `.exe` file on the CD.



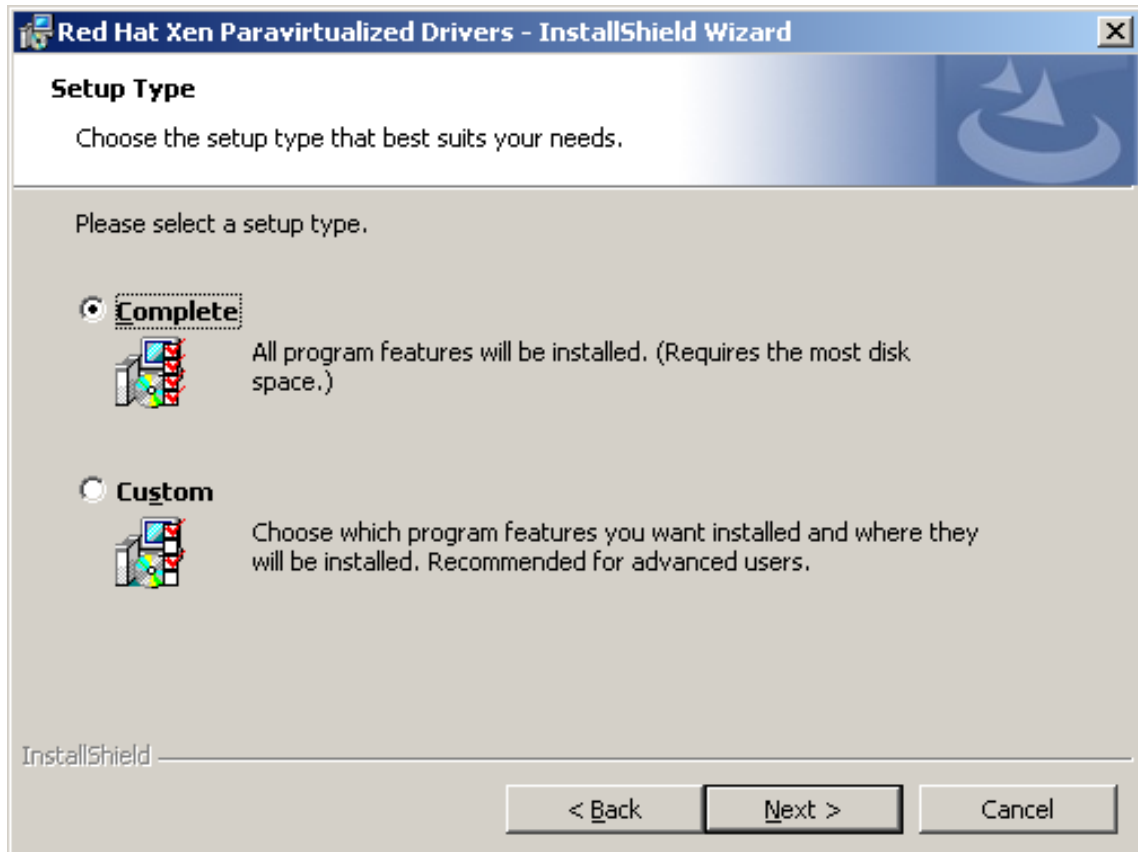
- Once the file is open, the **Welcome** screen appears. Select **Next** to proceed.



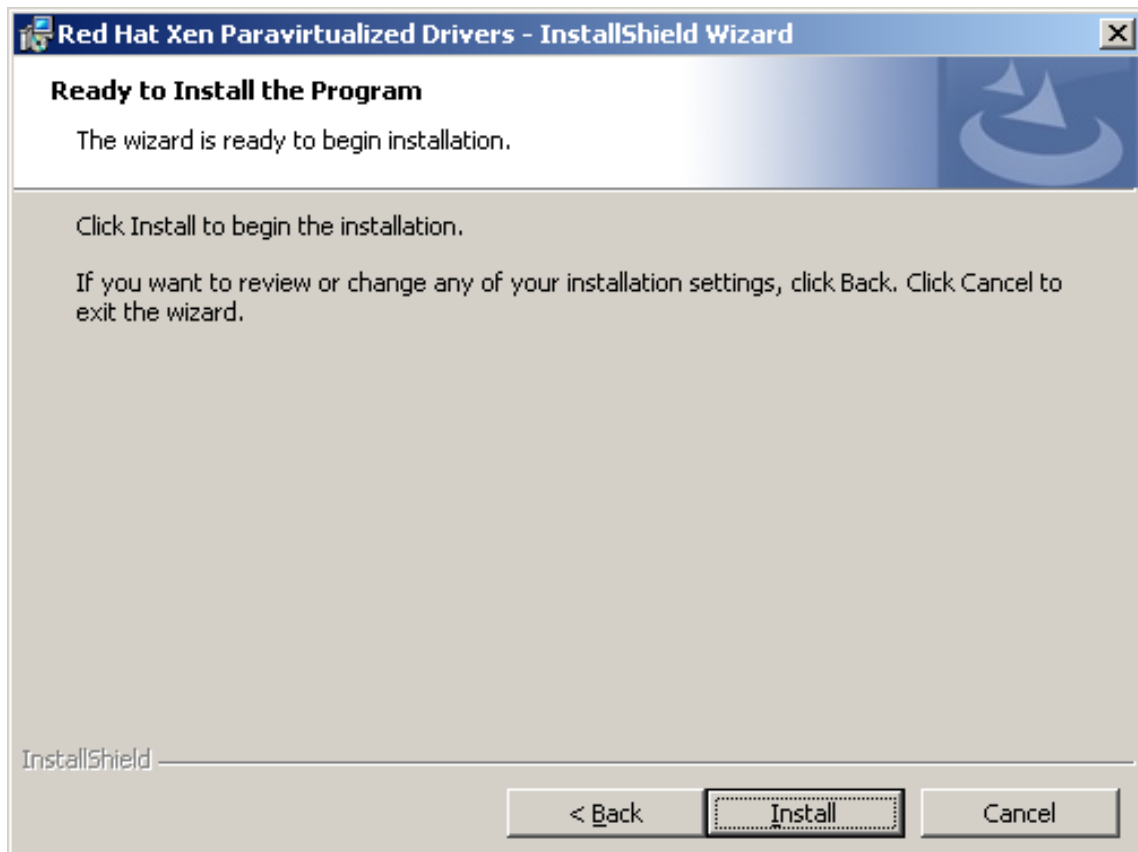
- You are now prompted to select the type of install you want.

The **Complete** option installs the network driver, disk driver and source code.

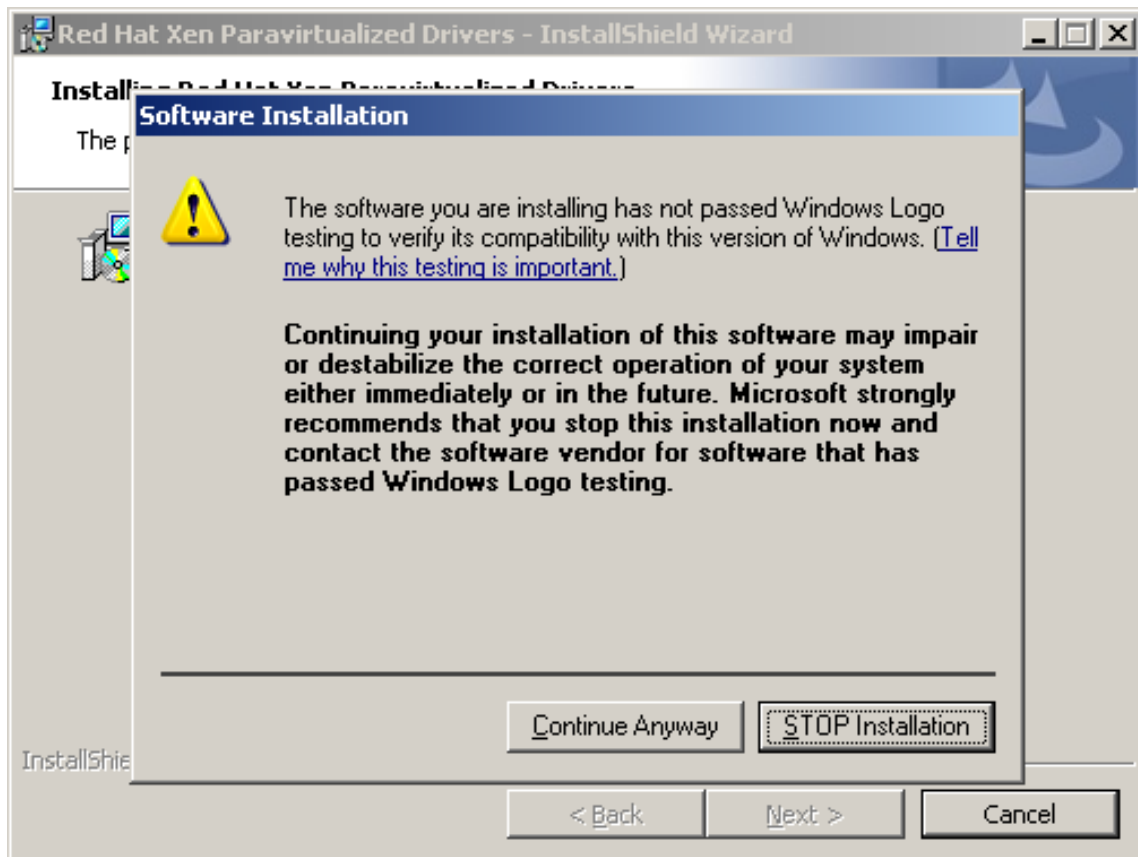
The **Custom** option opens another dialog box from which you can choose individual components to install.



Once you have made your selection, click **Next** to continue.



4. Select **Install** to complete the installation.
5. The unsigned driver warning (**Network and Disk driver has not been digitally signed**) dialog box pops up. Select **Continue Anyway** to install drivers. This dialog box will appear four times, twice for each driver, **rhelscsi** and then **rhelnet**.



Note

Future releases of Red Hat Para-virtualized Driver for Microsoft Windows will be digitally signed by Windows Hardware Quality Labs (WHQL). Once certified the warning will not appear.

6. Select **Show the README file** to view the release notes for the drivers.



Click **Finish** to complete the installation.

7. Reboot the guest.

The the para-virtualized drivers should now be installed on the Microsoft Windows guest.

3.3. Post-installation host configuration

This section covers the post-installation configuration processes required to utilize the para-virtualized drivers. Para-virtualized drivers must be installed on the guest before commencing this section.

Network devices available to guests automatically use the para-virtualized drivers when the guests are rebooted after installation of the drivers. Adding network devices requires special configuration steps, refer to [Section 4.2, “Adding para-virtualized network devices”](#).

Block devices require additional configuration.

Block device configuration

This section covers the procedure for adding and modifying disk entries to enable the para-virtualized drivers. Each guest requires modification in order to utilize the drivers.

Para-virtualized drivers cannot be used for the disk containing the Windows system files. Only secondary disks can be used with the para-virtualized drivers at this time.



Warning

Only make changes to the configuration files in the `/etc/xen` directory with the **libvirt** based tools, **virsh** and **virt-manager**. Manually editing configuration files in the `/etc/xen` directory is not recommended and could render your guests inoperable.

Use **virsh dumpxml** to export the configuration of the virtual machine.

```
# virsh dumpxml virt-machine-name > guest.xml
```

Update the guest configuration to enable the para-virtualized drivers. Red Hat Enterprise Linux 5.2 automatically enables para-virtualized network drivers. Only the block and disk device drivers must be updated.

The **guest.xml** file locate the section containing the disk configuration should resemble this example. This example uses a hard disk partition called `/dev/hda6`.

```
<disk type='file' device='disk'>
  <driver name='file' />
  <source file='/var/lib/xen/images/disk1.img' />
  <target dev='hda' />
</disk>
<disk type='file' device='disk'>
  <driver name='file' />
  <source file='/dev/hda6' />
  <target dev='hdb' />
</disk>
```

In this example, the secondary disk updated to use the para-virtualized driver. Change the driver from “**file**” to “**tap:aio**” and change the target device from “**hdb**” to “**xvdb**”.

```
<disk type='file' device='disk'>
  <driver name='file' />
  <source file='/var/lib/xen/images/disk1.img' />
  <target dev='hda' />
</disk>
<disk type='file' device='disk'>
  <driver name='tap' type='aio' />
  <source file='/dev/hda6' />
  <target dev='xvdb' />
</disk>
```

Redefine the guest using the updated guest configuration file, **guest.xml**.

```
# virsh define guest.xml
```

The guest can now be restarted with **virt-manager** or **virsh**. To restart a guest named `virt-machine-name`:

```
# virsh reboot virt-machine-name
```

Chapter 4. Administration tasks

This chapter covers additional administration tasks for guests using the para-virtualized Windows® drivers.

4.1. Hot plugging para-virtualized disks

The para-virtualized drivers allow disk hot plugging for Windows fully virtualized guests. To hot plug para-virtualized disks use the `virsh` command modifying `<domain>`, `<disk image file>` and `<device node>`:

```
# virsh attach-disk --driver tap --subdriver aio <domain> <disk image file>
<device node>
```

Using `virsh` to attach a new, hot plugged disk, labeled `/var/lib/xen/images/wxp32-2.img`, with the alias `/dev/xvdb` to the guest named `wxp32`:

```
# virsh attach-disk --driver tap --subdriver aio wxp32
/var/lib/xen/images/wxp32-2.img /dev/xvdb
```

To detach a disk dynamically, use `virsh` with the `detach-disk` option:

```
virsh detach-disk <domain> <device node>
```

This example detaches a disk, `/dev/xvdb`, from a guest named `wxp32`:

```
# virsh detach-disk wxp32 /dev/xvdb
```

4.2. Adding para-virtualized network devices

This section covers installation procedures for adding para-virtualized network devices. A key cause problems when not address is the original fully virtualized Realtek device must be disabled to allow the para-virtualized device to work properly. This devices appears in the **Device Manager** and [Procedure 4.1, "Configuring additional para-virtualized network devices"](#) describes how to remove it.

Procedure 4.1. Configuring additional para-virtualized network devices

1. Follow the standard driver installation procedure from [Chapter 3, Installing and configuring the para-virtualized drivers](#).
2. Once the installation is complete and the para-virtualized drivers are activated, open **Device Manager** on your guest. Notice that there are two network devices: one labeled **rhelnet** and one labeled **Realtek**. The Realtek device is the fully virtualized network device created by Xen. The Realtek device for the primary network interface should be marked disabled by the installation, if not disable it now.
3. Shut down the guest before attaching additional network interface controllers.
4. Add network interface controllers as required.
5. Boot the guest and log in.
6. Complete all **"Install new hardware wizard"** windows which appear after you have logged in.

7. Open **Device Manager**. Two new network interface devices appear. Every new physical device has a "**rhelnet**" device and a "**Realtek**" device in **Device Manager**. Right click on every new Realtek device and select **Disable**.
8. Your guest now uses the para-virtualized drivers for all network interface devices.

You must use [Procedure 4.1, "Configuring additional para-virtualized network devices"](#) every time you install additional physical network interface devices if you require the para-virtualized drivers for your guests.

Chapter 5. Upgrading the para-virtualized drivers

Future updates for the para-virtualized Windows drivers package will be available as bugs are fixed and new features are developed. Follow the procedures documented in this section to update the drivers to newer versions when they become available.

To update the para-virtualized drivers to the latest supported version you require the **Virtualization** channel from the [Red Hat Network](#). The list para-virtualized driver packages:

xenpv-win-32bit

The driver package for the 32 bit versions of Windows.

xenpv-win-32bit-debug

The package for debugging the drivers for the 32 bit versions of Windows.

xenpv-win-64bit

The driver package for the 64 bit versions of Windows.

xenpv-win-64bit-debug

The package for debugging the drivers for the 64 bit versions of Windows.



Warning

A bug in the drivers causes a Realtek network device to appear for each para-virtualized network device in the guest when the drivers are upgraded or new devices are added. This device can interfere with the para-virtualized network device, including preventing it from functioning.

It is advised to remove these devices *before* and *after* upgrading. To avoid this issue, remove the Realtek network devices from the Windows guests before upgrading. For instructions on removing the superfluous devices refer to [Procedure 4.1, “Configuring additional para-virtualized network devices”](#).

Use **yum** command to install the packaged .iso files to the `/usr/share/xenpv-win` directory. Modify `xenpv-win-32bit` with the package name you require from the list.

```
# yum update xenpv-win-32bit
```

Once **yum** completes, create a virtualized CD-ROM device containing the updated `.iso` file for the guest.

Follow [Procedure 5.1, “Attach the CD-ROM image with `virsh`”](#) to attach a CD-ROM image with **virsh**.

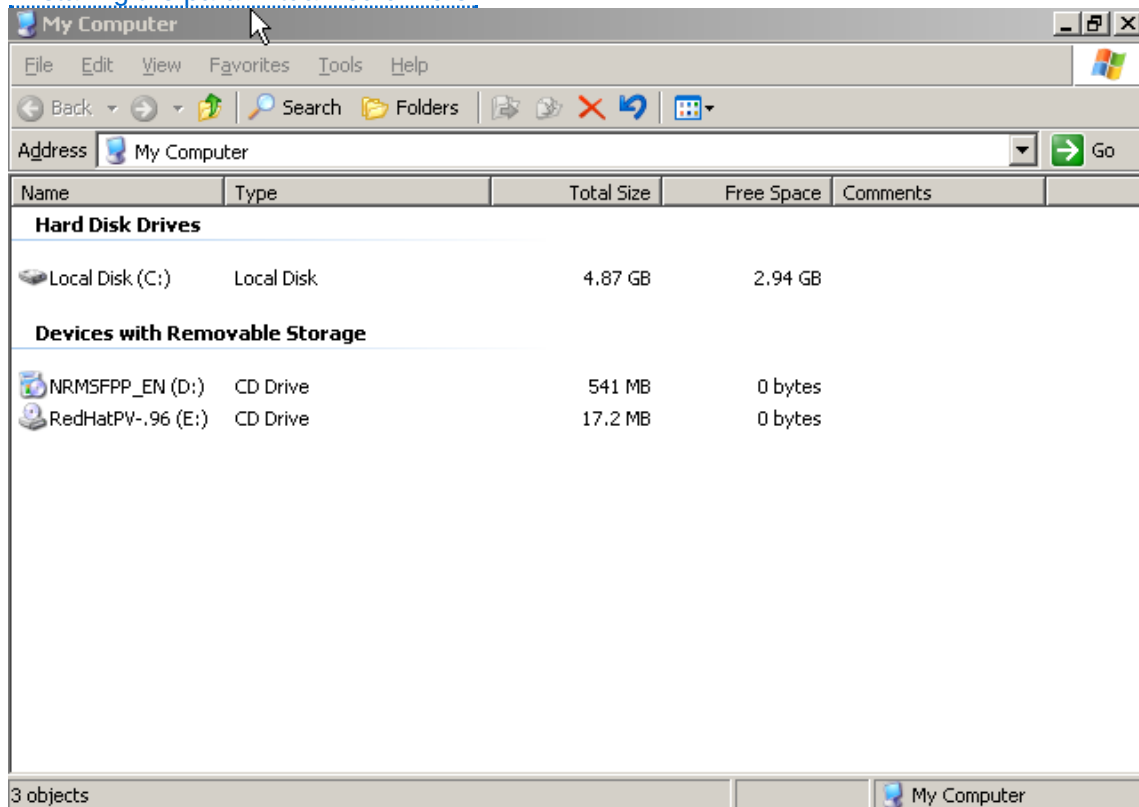
Procedure 5.1. Attach the CD-ROM image with `virsh`

1. Use the **virsh** command with the parameters modified for your guest. Refer to [Mounting the image with `virsh`](#) for more information on this step.

```
# virsh attach-disk w2k3_32 /usr/share/xenpv-win/xenpv-win-32bit.iso  
hdc --driver file --type cdrom --mode readonly
```

2. Open **My Computer** on the guest and open the CD drive (**E** in the example below). Double click the executable file for your architecture on the CD-ROM drive. The installer may automatically start when

the CD-ROM is detected. This starts the installer process which is described in [Section 3.2, “Installing the para-virtualized drivers”](#)



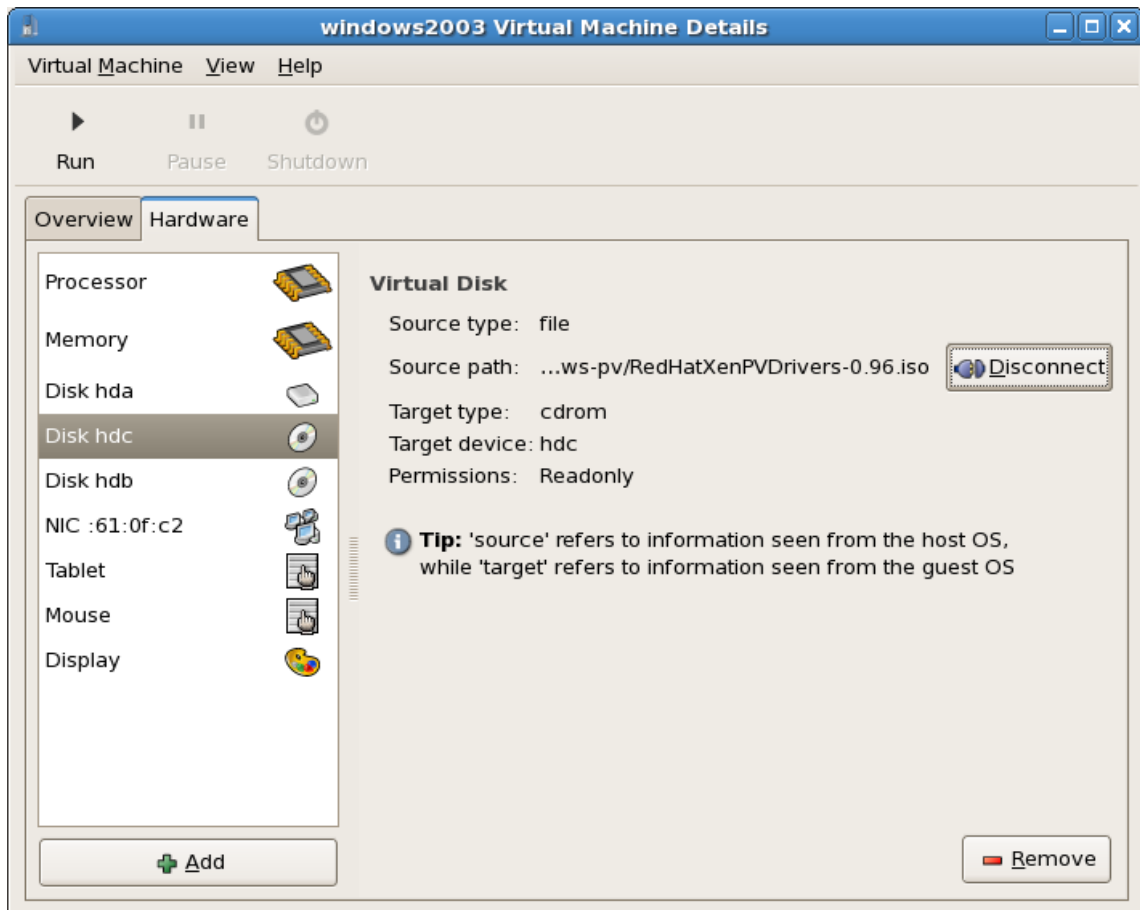
After upgrading to the latest driver superfluous Realtek network devices may appear on the guest. These devices are due to a bug in the driver and must be removed to ensure your guests operate properly. To remove the superfluous devices refer to [Procedure 4.1, “Configuring additional para-virtualized network devices”](#).

Alternate procedure: upgrade with virt -manager

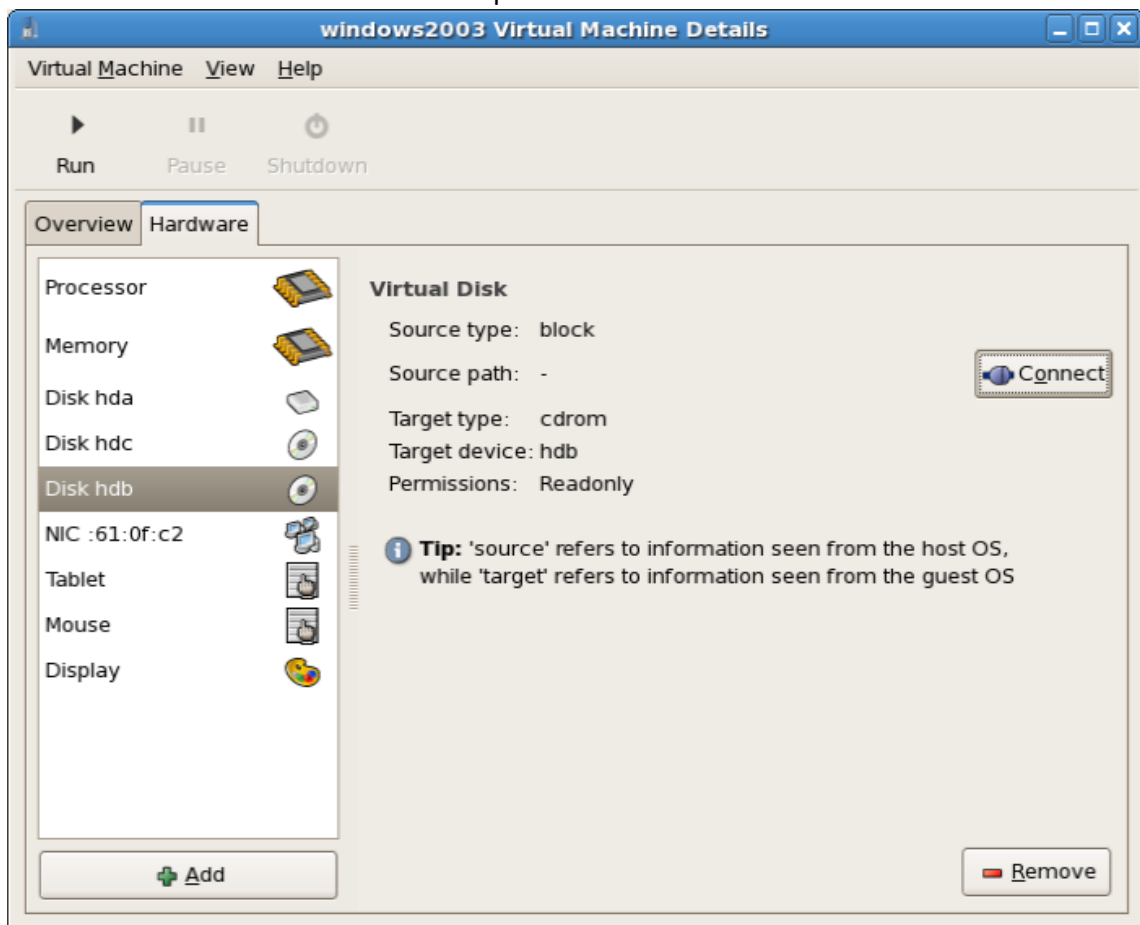
You can re-use existing virtualized CD-ROM devices to upgrading the drivers. To re-use a CD-ROM device with virt-manager:

Procedure 5.2. Re-using a CD-ROM device with virt -manager

1. Select a CD-ROM device from the list that you no longer need and click the **Disconnect** button.



2. Click **Connect** to choose another disk path.



3. In the pop up window, choose the location of the para-virtualized drivers .iso image and select **OK** to allow the guest access on the next boot.



A CD-ROM inserted message appears on the guest and the new CD-ROM image is available on the guest. The drivers can now be installed by running the setup on the CD-ROM. Refer to [Section 3.2, “Installing the para-virtualized drivers”](#) for information on using the installer.

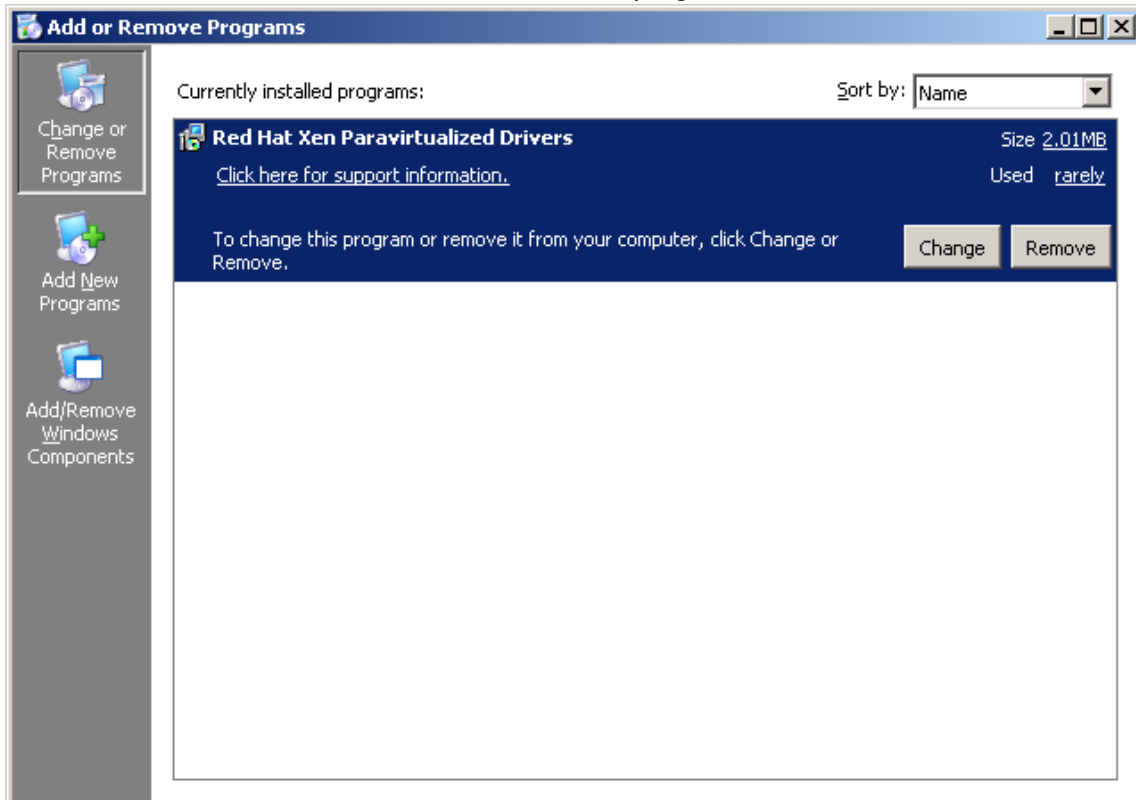
After upgrading to the latest driver superfluous Realtek network devices may appear on the guest. These devices are due to a bug in the driver and must be removed to ensure your guests operate properly. To remove the superfluous devices refer to [Procedure 4.1, “Configuring additional para-virtualized network devices”](#).

Chapter 6. Uninstalling the para-virtualized drivers

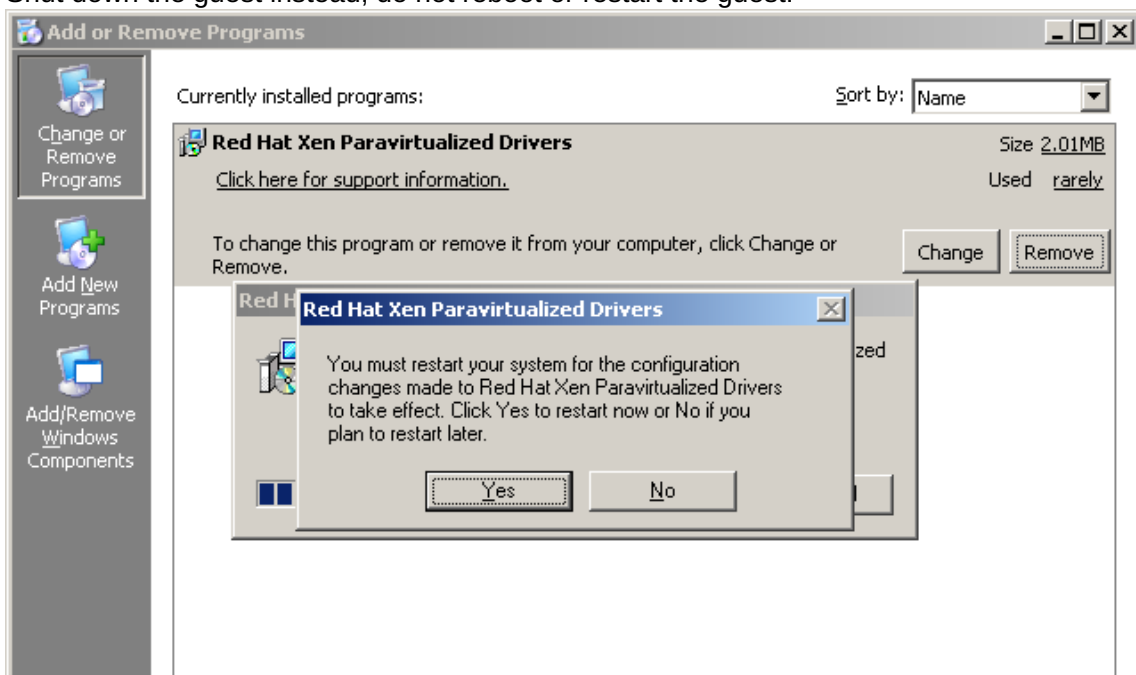
This section details the process for uninstalling the para-virtualized drivers from your Microsoft Windows guests.

Procedure 6.1. Removing the para-virtualized drivers

1. Open the **Add or Remove Programs** in the **Control Panel** menu.
2. Select the **Red Hat Xen Para-virtualized Drivers** program from the list and click the **Remove** button.



3. Once the uninstall process finishes you are prompted to reboot the guest. Click **No** to the prompt. Shut down the guest instead, do not reboot or restart the guest.



- After shutting down the guest, use **virsh dumpxml** to create an XML configuration file for the guest. Change *guest-name* and *guest.xml* to match the name of your guest and the file for saving the configuration.

```
# virsh dumpxml guestname > guest.xml
```

For every disk entry (refer to [Example 6.1, "Para-virtualized disk entry"](#)) in the *guest.xml* file modify the para-virtualized disk entry to use the generic virtualized drivers (refer to [Example 6.2, "Generic disk entry"](#)).

Example 6.1. Para-virtualized disk entry

```
<disk type='file' device='disk'>
  <driver name='tap' type='aio' />
  <source file='/var/lib/xen/images/disk2.img' />
  <target dev='xvdb' />
</disk>
```

Example 6.2. Generic disk entry

```
<disk type='file' device='disk'>
  <driver name='file' />
  <source file='/var/lib/xen/images/disk2.img' />
  <target dev='hdb' />
</disk>
```



Warning

Xen is limited to 4 fully virtualized IDE devices. You cannot presently convert more than 3 para-virtualized disks to fully virtualized disks due to this limitation.

- Restart the guest.
- The installer automatically enables the para-virtualized disk driver during the install. The uninstall wizard removed the driver but the device node remains in Windows **Device Manager** after rebooting. The device node appears as a device named "**PCI Device**".

This device causes a "**Add New Hardware Wizard**" to appear. You can safely close the wizard with the **Cancel** button.

To permanently disable the para-virtualized disk driver after uninstalling the driver package you must use the provided scripts in the **C:\Program Files\RedHat\XenPV** directory. The para-virtualized drivers files are in the directory chosen during the installation process.

- ✦ **disableRedHatSCSIDriver.bat** - this script disables the para-virtualized disk driver
- ✦ **enableRedHatSCSIDriver.bat** - this script enables the para-virtualized disk driver

Double click the **disableRedHatSCSIDriver.bat** file or execute **disableRedHatSCSIDriver.bat** from an MS-DOS prompt.

**Note**

To run executable batch files in Windows Vista you must right click the file and select **Run as Administrator** from the menu that appears. Double clicking on the file runs the batch script without the appropriate privileges to run successfully.

After running the disable script the "**PCI Device**" in the **Device Manager** displays a red **X** icon, indicating that it is disabled.

**Note**

To re-install the para-virtualized drivers the **enableRedHatSCSIDriver.bat** script must be executed before the installation program. Ensure that the red X is gone from the device node before attempting to re-install the drivers using the installer package.

Using **virt-manger** to uninstall devices

virt-manager can be used instead of **virsh** to remove devices.

To remove devices, use the **Remove** for the para-virtualized devices. Removed devices can be added again with the **Add** wizard.

Once a device has been removed re-adding removed devices causes the device to use the the generic drivers. Use the procedure for adding devices to force the devices to use the para-virtualized drivers. Refer to [Block device configuration](#).

Appendix A. Using virsh to mount a CD-ROM image on an inactive domain

This appendix describes a process which allows users to mount CD-ROM images on inactive domains.

Procedure A.1. Mounting CD-ROM images with virsh on inactive domains

1. Create an XML configuration file for your guest, replacing *guestname* with your guest domains name and *windowsguest.xml*:

```
# virsh dumpxml guestname windowsguest.xml
```

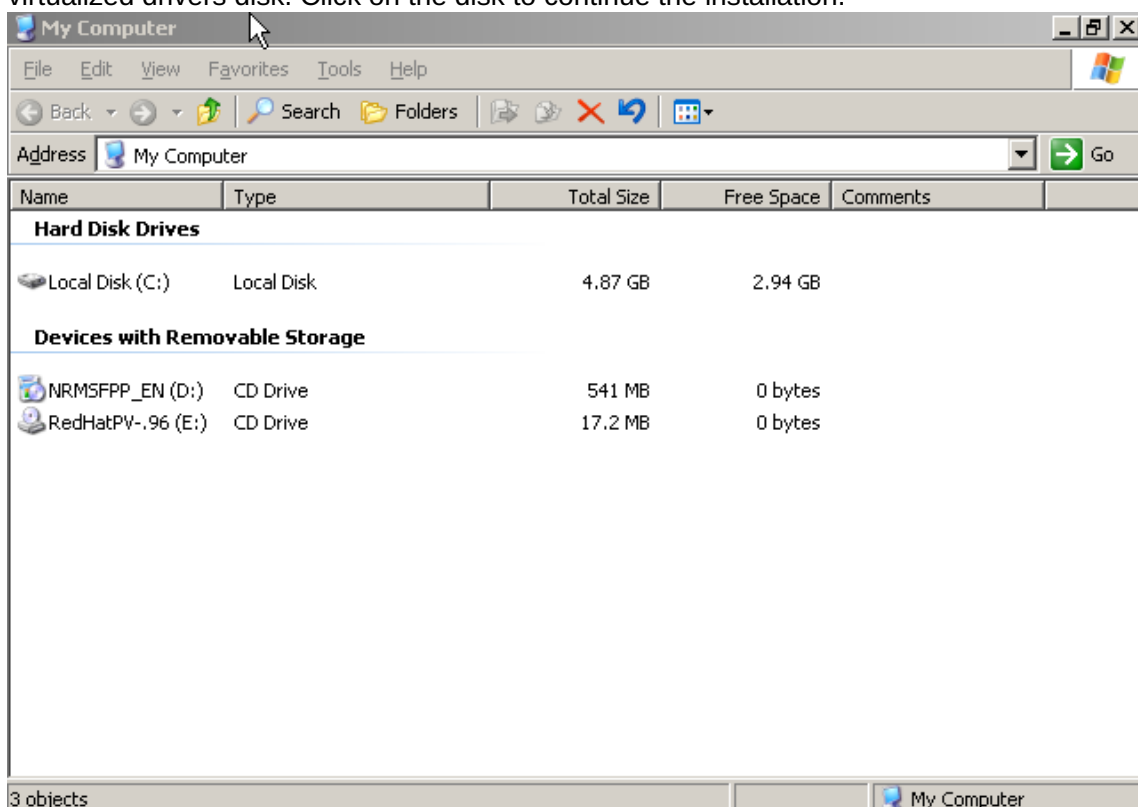
2. Add the following entry under the devices tag in the XML configuration file (*windowsguest.xml* in this example). You must change the **source file=** parameter to the location of the drivers .iso file and adjust the **dev=** parameter if you already have a **hdb** entry.

```
<disk type='file' device='cdrom'>
  <driver name='file' />
  <source file='/usr/share/xenpv-win-32bit/xenpv-win-32bit.iso' />
  <target dev='hdb' />
  <readonly />
</disk>
```

3. Recreate the guest with the updated configuration file

```
# virsh define windowsguest.xml
```

4. The guest now has a CD-ROM device containing the para-virtualized drivers once rebooted.
5. Once the Windows guest has booted, open **My Computer** and you should see the Red Hat Para-virtualized drivers disk. Click on the disk to continue the installation.



Appendix B. Revision History

Revision 1.1-8.400 Rebuild with publican 4.0.0	2013-10-31	Rüdiger Landmann
Revision 1.1-8 Rebuild for Publican 3.0	2012-07-18	Anthony Towns
Revision 1.1-0 Minor edits.	Thu Apr 16 2009	Chris Curran
Revision 1.1-0 Copy edit. Fixes bugs: 481253 and 438748	Fri Jan 23 2009	Chris Curran
Revision 1.0-0 First version.	Thu May 01 2008	Chris Curran