VMware Tools Installation Guide Operating System Specific Packages

ESX 4.0 and ESX 3i 3.5 Update 2 and later

VMware Tools

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About This Book

The *VMware Tools Installation Guide Operating System Specific Packages* provides information about how to use the operating system specific packages (OSP) for installing VMware Tools into virtual machines. OSPs are separately downloadable VMware Tools packages. These packages are specific to each operating system. The OSPs enable individual, and operating system (OS) specific, download, installation, and upgrade of VMware Tools.

NOTE Use either the VMware Tools automatic installation and update through the VI Client, vSphere Client or use the OSPs for individual manual installation and update. You cannot mix the two methods.

The OSPs support a specific list of Linux guest operating systems. See the *Guest Operating System Installation Guide* for a complete list of the guest operating systems supported by OSP.

Intended Audience

This book is intended for anyone who wants to install, upgrade, or use Operating System Specific Packages for VMware Tools. This book is for experienced Linux system administrators who are familiar with virtual machine technology and datacenter operations and are proficient with packaging and updating systems of their specific guest OS Linux distribution.

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Introduction to Operating System Specific Packages for VMware Tools 1

Operating system specific packages (OSP) for VMware ® Tools is a packaging and distribution mechanism for VMware Tools. These VMware Tools OSPs are packaged using the native package formats and standards, for example, rpm and deb, of the supported guest operating systems (guest OS).

OSPs are an alternative to the existing mechanism for installing VMware Tools from the VI Client or vSphere™ Client. Using the VMware Tools OSPs you can use your Operating System's native update mechanisms to automatically download, install and manage VMware Tools for these supported Operating Systems. This enables managing VMware Tools from within the guest in the same way as other standard software.

OSPs provide the option to configure the update managers on your Linux distributions to automatically check for updates to VMware Tools and upgrade as needed.

VMware Tools is installed in a virtual machine running a supported guest operating system. Several packages are required for the installation. Which packages are installed is determined by the host where the virtual machine is running. How the packages are installed is determined by the type of guest operating system.

Supported VMware Platforms

VMware Tools OSPs are available for ESX™ version 4.0, ESXi version 4.0, ESX version 3.5 Update 2 and later, and ESX 3i version 3.5 Update 2 and later.

Supported Guest Operating Systems

VMware Tools OSPs are available for 32-bit and 64-bit versions of the supported guest operating system. OSPs are also available for the most popular kernel variants (bigsmp, hugemem, pae, and so on.). Limited support for customized or otherwise nonstandard kernels is provided by kernel module source packages. See "Install Customized Kernel Module Packages" on page 33.

The supported operating systems include:

Table 1-1. Supported Guest Operating Systems for ESX Versions

	ESX/ESXi 3.5	ESX/ESXi 4.0
Red Hat Enterprise Linux 4 and 5 (RHEL)	X	X
SUSE Linux Enterprise Server 9 and 10 (SLES)	X	X
SUSE Linux Enterprise Server 11 (SLES)		X
Ubuntu 8.04 and 8.10	X	X
Community ENTerprise Operating System 4 and 5 (CENTOS)		X

For a current list of the supported versions of the VMware Tools OSPs, see the *Guest Operating System Installation Guide*, at:

http://www.vmware.com/pdf/GuestOS_guide.pdf

Prepare for Installation 2

This chapter describes the processes you need to perform before you install the VMware Tools OSPs. The topics in section guide include:

Identify the Packages to Install

VMware Tools are installed in a virtual machine running a supported guest operating system. Several packages required are for the installation. Which packages are installed is determined by the system where the virtual machine is running. How the packages are installed is determined by the type of guest operating system.

The system environment conditions that determine which VMware Tools OSPs are installed, include:

- Open Source Tools only
  - Desktop – does include X Window components (GUI)
  - Server – does not include X Window components
- Open Source Tools with VMware Proprietary Extensions
  - Desktop – does include X Window components (GUI)
  - Server – does not include X Window components

    Open Source Tools with VMware Proprietary Extensions and Server components corresponds to the standard VMware Tools installed through the VI Client or vSphere Client.

If you are running your virtual machine on a desktop platform running a guest operating system with VMware proprietary VMware Tools, all the VMware Tools OSPs are required.

If you are running your virtual machine using only a guest operating system or you are running your virtual machine on a server, Table 2-1 indicates which packages need to be installed.

The packages are listed in Table 2-1 appear in the order in which you install them. The sequence of package installation remains the same irrespective of the environment on which the virtual machine is running.

Table 2-1. VMware Tools OSP Installation Packages

Package		Description	Open Source Only		Open Source and Proprietary	
ESX/ESXi 3.5	**ESX/ESXi 4.0**		**Desktop**	**Server**	**Desktop**	**Server**
`open-vm-tools-kmod`	`vmware-open-vm-tools-kmod`	Provides kernel modules.	install	install	install	install
`open-vm-tools-common`	`vmware-open-vm-tools-common`	Provides all other modules not listed with other packages, such as, system daemons, command line tools, and other basic files.	install	install	install	install
`open-vm-tools-nox`	`vmware-open-vm-tools-nox`	Provides meta packages for server systems. Depends upon other packages, common files, and kernel.	install	install	install	install
`open-vm-tools-xorg-drv-mouse`	`vmware-open-vm-tools-xorg-drv-mouse`	Provides mouse driver.	install		install	
`open-vm-tools-xorg-drv-display`	`vmware-open-vm-tools-xorg-drv-display`	Provides display driver.	install		install	
`open-vm-tools-xorg-utilities`	`vmware-open-vm-tools-xorg-utilities`	Provides graphical elements, VMware user and VMware toolbox.	install		install	
`open-vm-tools`	`vmware-open-vm-tools`	Provides meta packages for systems with X Windows. Depends upon other packages, common files, and kernel.	install		install	
`vmware-tools-kmod`	*vmware-tools-kmod package no longer applies*	Provides VMware proprietary kernel modules.			install	install
`vmware-tools-common`	`vmware-tools-common`	Provides VMware proprietary modules not listed with other packages, such as, system daemons, command line tools, and other basic files.			install	install
`vmware-tools-nox`	`vmware-tools-nox`	Provides VMware proprietary meta package files for systems without X Windows. Depends upon other packages, common files, and kernel.			install	install
`vmware-tools`	`vmware-tools`	Provides VMware proprietary meta package files for systems with X Windows. Depends upon other packages, common files, and kernel.			install	

Prepare Your Virtual Machine

The processes described here apply to all supported guest operating systems.

To use VMware Tools Operating System Specific Packages, uninstall any previously installed version of VMware Tools that were installed from the VI Client or vSphere Client. This must be completed to prevent package conflicts and incorrect operation of VMware Tools

You do not need to remove previously installed VMware Tools OSPs.

The prompts provided in sample commands indicate:

- # root permission is required
- $ root permission is not required

To uninstall VI Client or vSphere Client installed VMware Tools

From the virtual machine command line, logged on as root, run the listed command.

1 Log on as root.

2 Run the listed command:

- **If the tar installer** was used to install VMware Tools, run:

  ```
  # vmware-uninstall-tools.pl
  ```

- **If the RPM installer** was used to install VMware Tools, run:

  ```
  # rpm -e VMwareTools
  ```

Prepare the Guest Operating System for VMware Tools

The methods for configuring the guest operating systems for VMware Tools are:

- Using a package manager – A tool provided with the operating system that performs global tasks.
- Manually – Requires that you run each command individually.

The method used is specific to each supported guest operating system.

The supported operating system package managers include:

- yum – Red Hat Enterprise Linux 5, CentOS 5
- deb – Ubuntu 8.04 and 8.10
- rug – SUSE Linux Enterprise Server 10 and 11

The guest operating system versions that require a manual configuration include:

- Red Hat Enterprise Linux 4
- CentOS 4
- SUSE Linux Enterprise Server 9

Select the VMware Tools OSPs to Download

Installing the VMware Tools requires that you run an operating system specific installation command in the virtual machine. If the operating system has a package manager, the command you use installs all the required packages in a single command. If you install the VMware Tools packages manually, different commands are required and you might have to install each package individually.

Some of the packages are dependent on other packages either provided in the normal package repositories by Red Hat, SUSE or by packages provided in the VMware repository. If dependencies are not met, you must identify the missing packages and install them.

When installing the VMware Tools, the packages must be installed in the appropriate order for each installation type. This order applies for all guest operating systems.

See Table 2-2 for the list of packages required for an open source installation that does not include VMware proprietary packages. If you are on a server system, use the packages listed under Server. If you are on a desktop system running an X Windows GUI, use the packages listed under Desktop. Install the packages in the order listed.

Table 2-2. Open Source Packages and No VMware Proprietary Packages

Server		Desktop	
ESX/ESXi 3.5	**ESX/ESXi 4.0**	**ESX/ESXi 3.5**	**ESX/ESXi 4.0**
open-vm-tools-kmod open-vm-tools-common open-vm-tools-nox	vmware-open-vm-tools-kmod vmware-open-vm-tools-common vmware-open-vm-tools-nox	open-vm-tools-kmod open-vm-tools-common open-vm-tools-nox open-vm-tools-xorg-drv-mouse open-vm-tools-xorg-drv-display open-vm-tools-xorg-utilities open-vm-tools	vmware-open-vm-tools-kmod vmware-open-vm-tools-common vmware-open-vm-tools-nox vmware-open-vm-tools-xorg-drv-mouse vmware-open-vm-tools-xorg-drv-display vmware-open-vm-tools-xorg-utilities vmware-open-vm-tools

See Table 2-3 for the list of packages required for an open source installation that also includes the VMware proprietary packages. If you are on a server system, use the packages listed under Server. If you are on a desktop system running an X Windows GUI, use the packages listed under Desktop. Install the packages in the order listed.

Table 2-3. Open Source Packages With VMware proprietary Packages

Server		Desktop	
ESX/ESXi 3.5	**ESX/ESXi 4.0**	**ESX/ESXi 3.5**	**ESX/ESXi 4.0**
open-vm-tools-kmod open-vm-tools-common open-vm-tools-nox vmware-tools-kmod vmware-tools-common vmware-tools-nox	vmware-open-vm-tools-kmod vmware-open-vm-tools-common vmware-open-vm-tools-nox vmware-tools-common vmware-tools-nox	open-vm-tools-kmod open-vm-tools-common open-vm-tools-nox open-vm-tools-xorg-drv-mouse open-vm-tools-xorg-drv-display open-vm-tools-xorg-utilities open-vm-tools vmware-tools-kmod vmware-tools-common vmware-tools-nox vmware-tools	vmware-open-vm-tools-kmod vmware-open-vm-tools-common vmware-open-vm-tools-nox vmware-open-vm-tools-xorg-drv-mouse vmware-open-vm-tools-xorg-drv-display vmware-open-vm-tools-xorg-utilities vmware-open-vm-tools vmware-tools-common vmware-tools-nox vmware-tools

If you are using a package management tool, such as `yum`, `deb`, or `rug`, choose the configuration appropriate for your environment and install the top level package as listed.

- Open Source Tools, No Proprietary Extensions, With desktop components, ESX/ESXi 4.0

  `vmware-open-vm-tools`

- Open Source Tools, No Proprietary Extensions, With server components, ESX/ESXi 4.0

  `vmware-open-vm-tools-nox`

- Open Source Tools, No Proprietary Extensions, With desktop components, ESX/ESXi 3.5

  `open-vm-tools`

- Open Source Tools, No Proprietary Extensions, With server components, ESX/ESXi 3.5

  `open-vm-tools-nox`

- Open Source Tools, With Propriety Extensions, With desktop components

  `vmware-tools`

- Open Source Tools, With Propriety Extensions, With server components

  `vmware-tools-nox`

If you are not using a package management tool, install each package in the order listed in Table 2-2 and Table 2-3.

VMware Tools Installation 3

This chapter describes the VMware Tools installation processes. The topics are grouped by guest OS.

The topics in this section include:

Installing VMware Tools Using OSPs on a RHEL 5 Virtual Machine

The implementation is specific to each supported guest operating system, but the steps are basically similar for each method.

Generally, to configure a guest operating system with a package manager involves:

1 Import the VMware Packaging Public GPG Key.

2 (Optional) Edit the proxy.

3 Configure the package software.

4 Install VMware Tools.

Disable Signature Check

If you are using RHEL 5.3, the `rpm –– import` command does not properly install the public key that VMware uses to sign the OSPs. This, in turn, might cause OSP installation attempts to fail because the RHEL package management system cannot verify the validity of VMware package signatures.

NOTE If you previously installed the most recent VMware public key, then upgraded to RHEL 5.3, this error does not occur.

If you are experiencing this error, disable the signature check during OSP installation.

To disable the signature check during OSP installation

Follow the instructions for installing OSPs as outlined in the section, "Install VMware Tools for RHEL 5 Guest OS" on page 17, with the following exceptions:

- Skip the installation of the `VMWARE-PACKAGING-GPG-KEY.pub` file.
- Add the `--nogpgcheck` option to every invocation of the `yum` install command.

Download OSPs for the RHEL 5 Guest OS

The OSPs must be downloaded locally to the virtual machine where VMware Tools are to be installed.

To download RHEL 5 for VMware Tools

1 **If you have not already registered RHEL 5,** from the guest operating system of the virtual machine where the VMware Tools are to be installed, configure and register RHN (Red Hat Network).

This command registered the RHEL 5 GUI elements.

a Run:

```
# rhn_register
```

b Accept Red Hat Network configuration and registration defaults.

c Log in to the operating system using your existing licence credentials.

2 Obtain and import the VMware Packaging Public GPG Key.

a If it does not exist, create the directory on your virtual machine to store the key:

```
/<key-path>/
```

b Using a Web browser, copy the packages from:

```
http://packages.vmware.com/tools/VMWARE-PACKAGING-GPG-KEY.pub
```

c Save the file to the directory you created:

```
/<key-path>/VMWARE-PACKAGING-GPG-KEY.pub
```

d Import the key. Run the command appropriate for your guest OS, for example:

```
# rpm --import /<key-path>/VMWARE-PACKAGING-GPG-KEY.pub
```

3 Configure the proxy, as needed.

```
# rhn_register --proxy=http://squid.example.com:3128
```

4 Create and edit the VMware repository directory and file.

a If it does not exist, create the directory and repository file on your virtual machine. This file can have any name, but it must end with `.repo`, for example:

```
/etc/yum.repos.d/vmware-tools.repo
```

b Open the repository file to edit.

c Add the following contents to the file and save the file.

```
[vmware-tools]
name=VMware Tools for Red Hat Enterprise Linux $releasever - $basearch
baseurl=http://packages.vmware.com/tools/esx/<esx-version>/rhel5/<arch>
enabled=1
gpgcheck=1
gpgkey=file:///<key-path>/VMWARE-PACKAGING-GPG-KEY.pub
```

`<arch>` is the architecture option. For 32-bit, this is `i686`. For 64-bit, this is `x86_64`.

`<esx-version>` is replaced with either 3.5u2, 3.5u3, 3.5u4, or 4.0 depending upon your ESX/ESXi version.

<key-path> is the path and directory you created when you obtained and imported the VMware Packaging Public GPG Key in Step 2.

Install VMware Tools for RHEL 5 Guest OS

Installing VMware Tools on a RHEL 5 virtual machine uses the package management tool, yum. Specify the package and yum installs the additional required VMware Tools packages. For a list of packages to install, see "Identify the Packages to Install" on page 9.

Before you install VMware Tools, complete "Prepare the Guest Operating System for VMware Tools" on page 11.

To Install VMware Tools in RHEL 5

1 Install the top level VMware Tools package, from the command line of the guest operating system virtual machine, type:

```
# yum install vmware-tools
```

When this command is run, all the other packages are installed in the correct order.

2 (Optional) Install VMware provided SVGA and/or mouse driver replacing the Red Hat provided versions. The installation skips these packages if they are older versions than the installed Red Hat versions.

```
# yum install vmware-open-vm-tools-xorg-drv-display
# yum install vmware-open-vm-tools-xorg-drv-mouse
```

If you later uninstall VMware OSPs and want to use the Red Hat provided drivers, you need to reinstall them.

Installing VMware Tools Using OSPs on a RHEL 4 Virtual Machine

The implementation is specific to each supported guest operating system, but the steps are basically similar for each method.

Download OSPs for the RHEL 4 Guest OS

Download the packages for your platform into a directory in the guest of the virtual machine where the VMware Tools will be installed. That is, download all the `.rpm` packages for a given distribution and architecture. For example, if you are using RHEL 4, download everything in the `rhel4/i586` directory.

This section applies to Red Hat Enterprise Linux 4. Higher level package management, such as yum, are not currently supported for Red Had Enterprise Linux 4 (RHEL 4).

See "Identify the Packages to Install" on page 9 for the complete list of packages to install.

To manually configure the guest OS

1 Locate the VMware Tools required packages.

2 Download the packages to the virtual machine where they are to be installed.

To download OSPs for VMware Tools RHEL 4

1 Browse the repository at:

```
http://packages.vmware.com/tools/esx/<esx-version>
```

<esx-version> is replaced with either 3.5u2, 3.5u3, 3.5u4, or 4.0 depending upon your ESX/ESXi version.

2 Locate the subdirectory:

Go to `/rhel4`

3 Identify the rpms required for VMware Tools installation. For example:

```
vmware-open-vm-tools-kmod-7.4.6-110268.130320.el4.i686.rpm
```

The naming convention used for packages is:

```
<package-name>-<version>-<tools-build>.<package-build>.<dist>.<arch>.rpm
```

<package-name> is the package name for each required file.

<version> is the version for the package.

<tools-build>.<package-build> is the release build for the tools and the package. Multiple versions might exist in the repository. Select the most recent (higher numbered) <tools-build>.<package-build>.

<dist> is Linux distribution version. For RHEL, this is rhel4.

<arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

4 Create a directory for the RPMS on the virtual machine where the VMware Tools are to be installed.

```
/<vmware-tools-path>/
```

5 Download RPMs into the directory you created.

Install VMware Tools for RHEL 4 Guest OS

Installing VMware Tools on a RHEL 4 virtual machine requires manually running rpm commands. Specify the package and rug installs the additional required VMware Tools packages. For a list of packages to install, see "Identify the Packages to Install" on page 9.

Before completing these steps, complete all steps in "Prepare the Guest Operating System for VMware Tools" on page 11.

To Install VMware Tools in RHEL 4

1 (Optional) Back up Red Hat provided SVGA driver, from the command line of the guest operating system virtual machine:

For 64-bit, type:

```
# cp /usr/X11R6/lib64/modules/drivers/vmware_drv.o
                /usr/X11R6/lib64/modules/drivers/vmware_drv.o.backup
```

For 32-bit, type:

```
# cp /usr/X11R6/lib/modules/drivers/vmware_drv.o
                /usr/X11R6/lib/modules/drivers/vmware_drv.o.backup
```

2 Install the VMware Tools packages, type:

```
# rpm -ivh vmware-open-vm-tools-*.rpm vmware-tools-*.rpm
```

When this command is run, all the other packages are installed in the correct order.

3 (Optional) Install VMware provided SVGA and/or mouse driver replacing the Red Hat provided versions. The automatic installation skips these package if they are older versions than the installed Red Hat versions.

If you uninstall VMware OSPs and want to use the Red Hat provided drivers, you need to reinstall them.

```
# rpm -ivh --force
                vmware-open-vm-tools-xorg-drv-display-<version>-<tools-build>.<package-build>.
                <dist>.<arch>.rpm
```

<version> is the version for the package.

<tools-build>.<package-build> is the release build for the tools and the package.

<dist> is the Linux distribution version. For RHEL this is rhel4.

<arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

Installing VMware Tools Using OSPs on a SLES 10 or SLES 11 Virtual Machine

The implementation is specific to each supported guest operating system, but the steps are basically similar for each method.

Generally, to configure a guest operating system with a package manager involves:

1 Import the VMware Packaging Public GPG Key.

2 (Optional) Edit the proxy.

3 Create the VMware repository.

Download OSPs for the SLES 10 or SLES 11 Guest OS

To download SLES 10 or SLES 11 for VMware Tools

1 Obtain and import the VMware Packaging Public GPG Key, from the guest operating system of the virtual machine where the VMware Tools are to be installed, at the command line type.

   a If it does not exist, create the directory on your virtual machine to store the key:

   ```
   /<key-path>/
   ```

   b Using a Web browser, copy the packages from:

   ```
   http://packages.vmware.com/tools/VMWARE-PACKAGING-GPG-KEY.pub
   ```

   c Save the file to the directory you created:

   ```
   /<key-path>/VMWARE-PACKAGING-GPG-KEY.pub
   ```

   d Import the key. Run the command appropriate for your guest OS, for example:

   ```
   # rpm --import /<key-path>/VMWARE-PACKAGING-GPG-KEY.pub
   ```

   <key-path> is the path you created to the directory on your virtual machine to store the key.

2 Configure the proxy, as needed, using rug:

```
# rug set-prefs proxy-url http://squid.example.com:3128
```

3 Create and edit the VMware rug repository.

   a Add the yum repository as a rug service.

   ```
   # rug service-add
                 --type=YUM http://packages.vmware.com/tools/esx/<esx-version>/<slesnn>/
                 <arch> vmware-tools-collection
   ```

   <slesnn> is the supported SLES version, either sles10 or sles11.

   <arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

   <esx-version> is replaced with either 3.5u2, 3.5u3, 3.5u4, or 4.0 depending upon your ESX/ESXi version.

   b Verify your repository configuration:

   ```
   # rug packages vmware-tools-collection
   ```

4 Subscribe to the rug catalog.

```
rug subscribe -a
```

Install VMware Tools for SLES 10 or SLES 11 Guest OS

Installing VMware Tools on a SLES 10 or SLES 11 virtual machine uses the package management tool, `rug`. Specify the package and `rug` installs the additional required VMware Tools packages. For a list of packages to install, see "Identify the Packages to Install" on page 9.

Before you install VMware Tools, complete the task "Prepare the Guest Operating System for VMware Tools" on page 11.

To Install VMware Tools in SLES 10 or SLES 11

Install the top level VMware Tools package, from the command line of the guest operating system virtual machine type:

```
# rug install –c vmware–tools–collection vmware–tools
```

When this command is run, all the other packages are automatically installed in the correct order.

Installing VMware Tools Using OSPs on a SLES 9 Virtual Machine

The implementation is specific to each supported guest operating system, but the steps are basically similar for each method.

Download OSPs for the SLES 9 Guest OS

Download the packages for your platform into a directory in the guest of the virtual machine where the VMware Tools will be installed. That is, download all the `.rpm` packages for a given distribution and architecture. For example, if you are using SLES 9, download everything in the `sles9/i586` directory.

This section applies to SUSE Linux Enterprise Server 9. Red Carpet repositories are not supported for SUSE Linux Enterprise Server 9.

See "Identify the Packages to Install" on page 9 for the complete list of packages to install.

Generally, to manually configure the guest OS:

1. Locate the VMware Tools required packages.
2. Download the packages to the virtual machine where they are to be installed.

To download OSPs for VMware Tools SLES 9

1. Browse the repository at:

   `http://packages.vmware.com/tools/esx/<esx–version>`

   `<esx–version>` is either 3.5u2, 3.5u3, 3.5u4, or 4.0 depending upon your ESX/ESXi version.

2. Locate the subdirectory, from the guest operating system of the virtual machine where the VMware Tools will be installed, at the command line, type:

   Go to `/sles9`

3. Identify the rpms required for VMware Tools installation. For example:

   `open–vmtools–7.7.2–11588.el4.i686.rpm`

   The naming convention used for packages is:

   `<package–name>–<version>–<tools–build>.<package–build>.<dist>.<arch>.rpm`

   `<package–name>` is the package name for each required file.

   `<version>` is the version for the package.

   `<tools–build>.<package–build>` is the release build for the tools and the package. Multiple versions might exist in the repository. Select the most recent (higher numbered) `<tools–build>.<package–build>`.

   `<dist>` is Linux distribution version. For SLES 9, this is `sles9`.

<arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

4 Create a directory for the RPMS on the virtual machine where the VMware Tools are to be installed.

```
/<vmware-tools-path>/
```

5 Download RPMs into the directory you created.

Install VMware Tools for SLES 9 Guest OS

Installing VMware Tools on a SLES 9 virtual machine requires manually running rpm commands. Specify the package and rug installs the additional required VMware Tools packages. For a list of packages to install, see "Identify the Packages to Install" on page 9.

Before you install VMware Tools, complete the task "Prepare the Guest Operating System for VMware Tools" on page 11.

To Install VMware Tools in SLES 9

1 (Optional) Back up SUSE provided SVGA driver.

For 64-bit, type:

```
# cp /usr/X11R6/lib64/modules/drivers/vmware_drv.o
              /usr/X11R6/lib64/modules/drivers/vmware_drv.o.backup
```

For 32-bit, type:

```
# cp /usr/X11R6/lib/modules/drivers/vmware_drv.o
              /usr/X11R6/lib/modules/drivers/vmware_drv.o.backup
```

2 (Optional) Install VMware provided SVGA and/or mouse driver replacing the SUSE provided versions. The automatic installation skips these package if they are older versions than the installed Red Hat versions.

If you uninstall VMware OSPs and want to use the SUSE provided drivers, you need to reinstall them.

```
# rpm -ivh --force
              vmware-open-vm-tools-xorg-drv-display-<version>-<tools-build>.<package-build>.
              sles9.<arch>.rpm
# rpm -ivh --force
              vmware-open-vm-tools-xorg-drv-mouse-<version>-<tools-build>.<package-build>.sl
              es9.<arch>.rpm
```

<version> is the version for the package.

<tools-build>.<package-build> is the release build for the tools and the package.

<arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

3 Install the VMware Tools packages, from the command line of the guest operating system virtual machine, type:

```
# rpm -ivh vmware-open-vm-tools-*.rpm vmware-tools-*.rpm
```

When this command is run, all the other packages are installed in the correct order.

Installing VMware Tools Using OSPs on a Ubuntu Virtual Machine

The implementation is specific to each supported guest operating system, but the steps are basically similar for each method.

Generally, to configure a guest operating system with a package manager involves:

1 Import the VMware Packaging Public GPG Key.

2 (Optional) Edit the proxy.

3 Create the VMware repository.

Download OSPs for the Ubuntu Guest OS

To download Ubuntu for VMware Tools

1 Obtain and import the VMware Packaging Public GPG Key.

   a If it does not exist, create the directory on your virtual machine to store the key:

   ```
   /<key-path>/
   ```

   b Using a Web browser, copy the packages from:

   ```
   http://packages.vmware.com/tools/VMWARE-PACKAGING-GPG-KEY.pub
   ```

   c Save the file to the directory you created:

   ```
   /<key-path>/VMWARE-PACKAGING-GPG-KEY.pub
   ```

   d Import the key. Run the command appropriate for your guest OS, for example:

   ```
   # apt-key add /<key-path>/VMWARE-PACKAGING-GPG-KEY.pub
   ```

   <key-path> is the path you created to the directory on your virtual machine to store the key.

2 Configure the proxy, as needed. From the guest operating system of the virtual machine where the VMware Tools will be installed:

   Add the following contents to the /etc/apt/apt-get configuration file. Create the file if needed.

   ```
   ACQUIRE {
           http::proxy "http://[[user][:pass]@]host[:port]/"
           }
   ```

   For example

   ```
   ACQUIRE {
           http::proxy "http://proxyuser:proxypass@proxy.proxyprovider.com:3128"
           }
   ```

3 Create and edit the VMware repository directory and file.

   a If it does not exist, create the directory and repository file on your virtual machine. This file can have any name, but it must end with .list, for example:

   ```
   /etc/apt/sources.list.d/vmware-tools.list
   ```

   b Open the repository file to edit.

   c Add the following contents to the file and save the file.

   ```
   deb http://packages.vmware.com/tools/esx/<esx-version>/ubuntu hardy main restricted
   ```

   This is specific to each operating system version.

   <esx-version> is replaced with either 3.5u2, 3.5u3, 3.5u4, or 4.0 depending upon your ESX/ESXi version.

   d Update your local repository cache.

   ```
   # apt-get update
   ```

   This command lists the packages available for downloading and update on http://packages.vmware.com.

Ubuntu 8.10 OSP Installation Exception

Starting with the Ubuntu 8.10 release, Ubuntu is offering `open-vm-tools` packages as part of its multiverse repository. VMware does not support the use of these packages in VMware virtual machines. The version of tools available in the Ubuntu 8.10 multiverse repository is based on a development snapshot of the open-vm-tools project hosted on http://sourceforge.net. These packages are not official VMware Tools releases. VMware Global Support Services might require customers using the Ubuntu packages to remove these packages and install the official VMware Tools release as part of any support request related to Ubuntu 8.10.

If the unsupported tools kernel modules are installed in a virtual machine that already contains the official VMware Tools release, the VMware modules are overwritten. The Ubuntu packages have the same name as one of the VMware Tools OSPs, and this results in a package-name collision.This name collision might cause issues with the Ubuntu's packaging system when it attempts to install the supported VMware Tools OSP. The Ubuntu packaging system installs the incompatible Ubuntu-provided package instead of the appropriate VMware Tools OSP.

Due to this collision you might be unable to install the OSPs on Ubuntu 8.10 from the repositories if the multiverse repository is enabled. Care must also be taken to avoid installing these packages if VMware Tools is already installed through the tar installation method.

This issue affects you if:

- You have the multiverse repository enabled for software updates.
- You have the `open-vm-tools` package from Ubuntu's multiverse repository installed on their system.

If you suspect you might this conflict, perform the following tasks as needed, to replace the conflicting `open-vm-tool` package with supported versions of VMware Tools.

- "Uninstall Existing Ubuntu open-vm-tools Packages" on page 23
- "Disable Ubuntu Package Management System" on page 24
- "Silence the Update Manager Warnings" on page 24
- "Use the Regular VMware Tools Installer (Optional)" on page 24

Uninstall Existing Ubuntu open-vm-tools Packages

This task checks to see if you have Ubuntu installed, removes it, if it is installed, and verifies that it is uninstalled.

To uninstall Conflicting Versions of Ubuntu

1 Determine whether you have the Ubuntu `open-vm-tools` package installed, by running the following command.

```
# dpkg -s open-vm-tools | grep ^Maint
```

If the result states that the `open-vm-tools` package is not installed, or if the maintainer field, in the results output, lists the VMware Build Team, then you do not have the Ubuntu `open-vm-tools` package installed and can safely install or upgrade your OSPs.

If the maintainer field, in the results output, lists the Ubuntu MOTU Develop, then you have the Ubuntu package installed and must remove it before you update the OSPs.

2 Remove the Ubuntu package, by running the following command:

```
# sudo apt-get remove open-vm-tools
```

3 Verify that you do not have any versions of `open-vm-tools` installed on your system, by running the following command:

```
# sudo dpkg-query -s open-vm-tools
```

The confirming response indicates that the package `open-vm-tools` is not installed and no information is available.

Disable Ubuntu Package Management System

To successfully install VMware's OSPs through the apt-get program, you must disable the multiverse repository in the Ubuntu's package management system so it does not see the Ubuntu-provided package that conflicts with the VMware packages.

To disable the multiverse repository, from your Ubuntu virtual machine

1 Open **System > Administration > Software Sources application**.

2 In the Ubuntu Software tab, deselect the box **Software restricted by copyright or legal issues (multiverse)**.

3 Click **Close**.

4 When prompted to update software information, click **Reload**.

5 When multiverse is successfully disabled, proceed to install OSPs normally using `apt-get`.

If you enable the multiverse repository at any point in the future, you run the risk of the original problem where `open-vm-tools` packages are available from two different sources. Using the multiverse repository prevents you from updating your OSPs when newer versions are available and causes Update Manager to warn that not all packages could be installed, each time you open Update Manager.

Silence the Update Manager Warnings

If you must have the multiverse repository enabled, you can silence the Update Manager warning, by running the following command:

```
# echo 'open-vm-tools hold' | sudo dpkg --set-selections
```

This command instructs the package manager to never upgrade the `open-vm-tools` package.

If you want to upgrade the `open-vm-tools` package when newer versions of the OSPs are available, perform the following:

1 Re-enable updates, by running the following command:

```
# echo 'open-vm-tools install' | sudo dpkg --set-selection
```

2 Disable the multiverse repository. See the section, "Disable Ubuntu Package Management System" on page 24.

3 Upgrade the `open-vm-tools` package through the `apt-get` program.

Use the Regular VMware Tools Installer (Optional)

If you choose, you can use the `tar` installation method (described in the manual for your VMware product and the knowledge base article, Installing VMware Tools (KB 340) to install the VMware Tools OSPs.

The advantage of this approach is that it avoids the Ubuntu package management system entirely, side-stepping the problem introduced by the fact that an unsupported Ubuntu package and a VMware-supported OSP have the same package name.

The disadvantage is that the package management system does not recognize any of the files that have been installed. It cannot prevent unsupported packages from being installed. This might cause an overwrite of important files from the VMware Tools installation.

To use the tar installation method

1 Ensure that the Ubuntu `open-vm-tools` package is not installed. See the section, "Uninstall Existing Ubuntu open-vm-tools Packages" on page 23.

2 Follow the VMware Tools installation instructions from your product manual or the knowledge base article, Installing VMware Tools (KB 340).

3 Manually ensure that you do not later install the Ubuntu `open-vm-tools` package.

The package manager cannot prevent overwriting VMware Tools files with additional installations. There is no method to prevent accidental installation of the unsupported Ubuntu packages. Disabling the multiverse repository helps.

Install VMware Tools for Ubuntu Guest OS

Installing VMware Tools on a Ubuntu virtual machine uses the package management tool, `apt-get`. Specify the package and apt-get installs the additional required VMware Tools packages. For a list of packages to install, see "Identify the Packages to Install" on page 9.

Before installing VMware Tools, complete "Prepare the Guest Operating System for VMware Tools" on page 11.

To Install VMware Tools in Ubuntu

1 Identify the kernel module for your Ubuntu OS, for example, from the command line of the guest operating system virtual machine:

```
$ uname -r
```

The command returns kernel type and version. The type options are:

- generic
- server
- virtual

2 Install the kernel modules for the kernel type and version, for example:

For ESX/ESXi 3.5

```
# apt-get install open-vm-tools-kmod-<type> vmware-tools-kmod-<type>
```

`<type>` is the value returned in Step 1.

For ESX/ESXi 4.0

Installing the kernel modules separately is no longer needed.

3 Install the remaining components:

```
# apt-get install vmware-tools
```

When this command is run, all the other packages are automatically installed in the correct order.

Installing VMware Tools Using OSPs on a CentOS 5 Virtual Machine

The implementation is specific to each supported guest operating system, but the steps are basically similar for each method.

Generally, to configure a guest operating system with a package manager involves:

1 Import the VMware Packaging Public GPG Key.

2 (Optional) Edit the proxy.

3 Configure the package software.

4 Install VMware Tools.

NOTE OSPs are not installable in a CentOS 5 guest on an ESX/ESXi 3.5 server.

Download OSPs for the CentOS 5 Guest OS

The OSPs must be downloaded locally to the virtual machine where VMware Tools are to be installed.

To download CentOS 5 for VMware Tools

1 **If you have not already registered CentOS 5,** from the guest operating system of the virtual machine where the VMware Tools are to be installed, configure and register CentOS.

This command registered the CentOS 5 GUI elements.

a Run:

```
# centos_register
```

b Accept CentOS configuration and registration defaults.

c Log in to the operating system using your existing licence credentials.

2 Obtain and import the VMware Packaging Public GPG Key.

a If it does not exist, create the directory on your virtual machine to store the key:

```
/<key-path>/
```

b Using a Web browser, copy the packages from:

```
http://packages.vmware.com/tools/VMWARE-PACKAGING-GPG-KEY.pub
```

c Save the file to the directory you created:

```
/<key-path>/VMWARE-PACKAGING-GPG-KEY.pub
```

d Import the key. Run the command appropriate for your guest OS, for example:

```
# rpm --import /<key-path>/VMWARE-PACKAGING-GPG-KEY.pub
```

3 Configure the proxy, as needed.

```
# centos_register --proxy=http://squid.example.com:3128
```

4 Create and edit the VMware repository directory and file.

a If it does not exist, create the directory and repository file on your virtual machine. This file can have any name, but it must end with `.repo`, for example:

```
/etc/yum.repos.d/vmware-tools.repo
```

b Open the repository file to edit.

c Add the following contents to the file and save the file.

```
[vmware-tools]
name=VMware Tools for CentOS $releasever - $basearch
baseurl=http://packages.vmware.com/tools/esx/<esx-version>/rhel5/<arch>
enabled=1
gpgcheck=1
gpgkey=file:///<key-path>/VMWARE-PACKAGING-GPG-KEY.pub
```

CentOS 5 uses the RHEL 5 base, and is in the `rhel5` directory.

`<arch>` is the architecture option. For 32-bit, this is `i686`. For 64-bit, this is `x86_64`.

`<esx-version>` is replaced with either 3.5u2, 3.5u3, 3.5u4, or 4.0 depending upon your ESX/ESXi version.

`<key-path>` is the path and directory you created when you obtained and imported the VMware Packaging Public GPG Key in Step 2.

Install VMware Tools for CentOS 5 Guest OS

Installing VMware Tools on a CentOS 5 virtual machine uses the package management tool, `yum`. Specify the package and yum installs the additional required VMware Tools packages. For a list of packages to install, see "Identify the Packages to Install" on page 9.

Before you install VMware Tools, complete "Prepare the Guest Operating System for VMware Tools" on page 11.

To Install VMware Tools in CentOS 5

1 Install the top level VMware Tools package, from the command line of the guest operating system virtual machine, type:

```
# yum install vmware-tools
```

When this command is run, all the other packages are installed in the correct order.

2 (Optional) Install VMware provided SVGA and/or mouse driver replacing the CentOS provided versions. The installation skips these packages if they are older versions than the installed CentOS versions.

```
# yum install vmware-open-vm-tools-xorg-drv-display
# yum install vmware-open-vm-tools-xorg-drv-mouse
```

If you later uninstall VMware OSPs and want to use the CentOS provided drivers, you need to reinstall them.

Installing VMware Tools Using OSPs on a CentOS 4 Virtual Machine

The implementation is specific to each supported guest operating system, but the steps are basically similar for each method.

NOTE OSPs are not installable in a CentOS 4 guest on an ESX/ESXi 3.5 server.

Download OSPs for the CentOS 4 Guest OS

Download the packages for your platform into a directory in the guest of the virtual machine where the VMware Tools will be installed. That is, download all the `.rpm` packages for a given distribution and architecture. For example, if you are using CentOS 4, download everything in the `centos4/i586` directory.

This section applies to CentOS 4. Higher level package management, such as `yum`, are not currently supported for CentOS 4.

See "Identify the Packages to Install" on page 9 for the complete list of packages to install.

To manually configure the guest OS

1 Locate the VMware Tools required packages.

2 Download the packages to the virtual machine where they are to be installed.

To download OSPs for VMware Tools CentOS 4

1 Browse the repository at:

`http://packages.vmware.com/tools/esx/<esx-version>`

`<esx-version>` is replaced with either 3.5u2, 3.5u3, 3.5u4, or 4.0 depending upon your ESX/ESXi version.

2 Locate the subdirectory:

Go to `/rhel4`

CentOS 4 uses the RHEL 4 base, and is in the `rhel4` directory.

3 Identify the rpms required for VMware Tools installation. For example:

```
vmware-open-vm-tools-kmod-7.4.6-110268.130320.el4.i686.rpm
```

The naming convention used for packages is:

```
<package-name>-<version>-<tools-build>.<package-build>.<dist>.<arch>.rpm
```

<package-name> is the package name for each required file.

<version> is the version for the package.

<tools-build>.<package-build> is the release build for the tools and the package. Multiple versions might exist in the repository. Select the most recent (higher numbered) <tools-build>.<package-build>.

<dist> is Linux distribution version. For CentOS, this is CentOS4.

<arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

4 Create a directory for the RPMS on the virtual machine where the VMware Tools are to be installed.

```
/<vmware-tools-path>/
```

5 Download RPMs into the directory you created.

Install VMware Tools for CentOS 4 Guest OS

Installing VMware Tools on a CentOS 4 virtual machine requires manually running rpm commands. Specify the package and rug installs the additional required VMware Tools packages. For a list of packages to install, see "Identify the Packages to Install" on page 9.

Before completing these steps, complete all steps in "Prepare the Guest Operating System for VMware Tools" on page 11.

To Install VMware Tools in CentOS 4

1 (Optional) Back up CentOS provided SVGA driver, from the command line of the guest operating system virtual machine:

For 64-bit, type:

```
# cp /usr/X11R6/lib64/modules/drivers/vmware_drv.o
                /usr/X11R6/lib64/modules/drivers/vmware_drv.o.backup
```

For 32-bit, type:

```
# cp /usr/X11R6/lib/modules/drivers/vmware_drv.o
                /usr/X11R6/lib/modules/drivers/vmware_drv.o.backup
```

2 Install the VMware Tools packages, type:

```
# rpm -ivh vmware-open-vm-tools-*.rpm vmware-tools-*.rpm
```

When this command is run, all the other packages are installed in the correct order.

3 (Optional) Install VMware provided SVGA and/or mouse driver replacing the CentOS provided versions. The automatic installation skips these package if they are older versions than the installed CentOS versions.

If you uninstall VMware OSPs and want to use the CentOS provided drivers, you need to reinstall them.

```
# rpm -ivh --force
                vmware-open-vm-tools-xorg-drv-display-<version>-<tools-build>.<package-build>.
                <dist>.<arch>.rpm
```

<version> is the version for the package.

<tools-build>.<package-build> is the release build for the tools and the package.

<dist> is the Linux distribution version. For CentOS this is CentOS4.

<arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

Verify Installation

After installation is complete, verify that VMware Tools are installed and functioning properly.

To verify VMware Tools installation

1 Reboot the virtual machine. This enables 32-bit machines to use `vmxnet`.

2 To verify that `guestd` is running, type:

```
/etc/init.d/vmware-tools status
```

3 **If installed packages included desktop components,** verify that `vmware-user` is running.

View the VMware Tools icon on the virtual machine toolbar.

4 Search for a specific kernel module, for example:

```
# lsmod | grep ^vmmemctl

# vmmemctl
```

5 **If VMware Tools are installed on a GUI system,** restart the virtual machine GUI.

This action verifies that the new SVGA and/or mouse drivers or configuration are functioning.

6 To verify that the mouse drivers are working:

a Click in the virtual machine and perform a task.

b Click outside the virtual machine into the Windows screen and perform a task.

If the mouse driver is working correction, you should be able to perform these tasks without using **Ctrl-Alt** to shift the mouse from one window to the next.

7 To verify the SVGA drivers, verify that you can change resolutions using one of the following methods:

- **System > Preferences > Screen Resolution**. (Depending upon your OS.)
- Command line as the logged in user.

```
$ xrandr --size 1024x768
$ xrandr --size 800x600
```

Post Installation OSP Tasks 4

This section describes tasks that you perform after VMware Tools installation. Topics in this section include:

Check Updates for Operating System Specific Packages

Updates for operating system specific packages are placed in the repository at:

http://packages.vmware.com

Using your guest OS package manager, search this repository for updates to each distribution. Most package managers search for and apply the updates.

Manually Check for OSP Updates

Red Hat Enterprise Linux 4 and SUSE Linux Enterprise Server 9 do not have a package manager installed and configured. You need to manually browse the contents of the repository at http://packages.vmware.com for updates.

To check for package updates with RHEL 4 and SLES 9

1 Go to the repository at http://packages.vmware.com for updates.

2 Review the packages for RHEL 4 and SLES 9 and check for `<version>-<tools-build>.<package-build>` updates.

`<version>` is the version for the package.

`<tools-build>.<package-build>` is the release build for the tools and the package.

3 If you identify any updates, see Chapter 3, "VMware Tools Installation," on page 15.

Use Package Managers to Check for OSP Package Updates

Each guest OS package manager has a feature for checking for updates. From the command line of the guest OS virtual machine, run the following commands.

To use the package manager to check for updates to OSP packages

Check for updated packages. For the appropriate guest OS, run the command listed:

- Red Hat Enterprise Linux 5

  ```
  # yum update
  ```

- Ubuntu 8.04 and 8.10

  ```
  # apt-get update
  # apt-get upgrade
  ```

- SUSE Linux Enterprise Server 10 and 11

  ```
  # rug update -c vmware-tools-collection
  ```

Uninstall Operating System Specific Packages

To uninstall the VMware Tools OSP packages, remove the packages. From the command line of the guest OS virtual machine, use the commands for each guest OS.

Uninstall VMware Tools on RHEL 5

To remove all the VMware Tools packages in a single command, type:

```
# yum remove 'vmware-tools-*' 'open-vm-tools-*'
```

Uninstall VMware Tools on SLES 10 or SLES 11

To remove all the VMware Tools packages in a single command, type:

```
# rug remove vmware-tools-* open-vm-tools-*
```

Uninstall VMware Tools on Ubuntu

To remove all the VMware Tools packages in a single command, type:

```
# apt-get remove --purge vmware-tools-* open-vm-tools-*
```

Uninstall VMware Tools on RHEL 4 or SLES 9

RHEL 4 and SLES 9, both use rpm distributions. On rpm based distributions, manual removal of the installed OSPs must be done in a specific order due to package dependencies. The uninstallation order is the reverse of the package installation order.

To uninstall OSPs

1 Remove the installed OSPs in the listed order, for each package type:

  ```
  # rpm -e <packagename>
  ```

  If a package is not installed, the command skips the action and returns the prompt.

  For ESX/ESXi 4.0 the package order is:

  - vmware-tools
  - vmware-tools-nox
  - vmware-tools-common
  - vmware-open-vm-tools

- vmware-open-vm-tools-xorg-utilities
- vmware-open-vm-tools-xorg-drv-display (if installed)
- vmware-open-vm-tools-xorg-drv-mouse (if installed)
- vmware-open-vm-tools-nox
- vmware-open-vm-tools-common
- vmware-open-vm-tools-kmod

For ESX/ESXi 3.5 the package order is:

- vmware-tools
- vmware-tools-nox
- vmware-tools-common
- vmware-tools-kmod
- open-vm-tools
- open-vm-tools-xorg-utilities
- open-vm-tools-xorg-drv-display (if installed)
- open-vm-tools-xorg-drv-mouse (if installed)
- open-vm-tools-nox
- open-vm-tools-common
- open-vm-tools-kmod

2 Reinstall any distribution provided `xorg` display and mouse drivers.

As a part of the uninstall, the default display and mouse drivers are reset to `vesa` and the system mouse. To use a different display and mouse driver, edit your `xorg` configuration file.

Install Customized Kernel Module Packages

VMware OSPs work with unmodified kernels from your OS distributor. This enables the use of customized kernels. When customized kernels are similar enough to the distributor kernel, OSPs function by using kernel module source packages. Kernel module source packages are packages in standard distributor format (source `rpm` files and kernel source `deb` files).

To install customized kernel module packages

1 Ensure that your environment meets the build dependencies, such as `gcc` and `kernel-source/headers/devel packages`.

2 Unpack and recompile the source packages (`rpm` or `deb`) with your own kernel into usable binary packages.

If you do not want to install these dependencies on the target guest, use a staging host for compilation.

3 Distribute the resulting binary packages to the target guest.

Customized Kernels for RHEL 4, RHEL 5, SLES 9, SLES 10, and SLES 11

The rpm based distributions include RHEL 4, RHEL 5, SLES 9, and SLES 10. This section describes how to build a customized binary kernel module packages and how to install VMware Tools OSPs. This process includes the following tasks:

- Build the binary kernel module packages
- Install custom built binary kernel module packages

To build the binary kernel module packages for RHEL 5

1 Download from the http://packages.vmware.com repository.

For ESX/ESXi 3.5 there are two kmod source packages. ESX/ESXi 4.0 does not require these kmod source packages.

```
open-vm-tools-kmod-<version>-<release>.src.rpm
vmware-tools-kmod-<version>-<release>.src.rpm
```

Locate the packages at:

```
http://packages.vmware.com/tools/esx/<esx-version>/rhel5/SRPMS
```

<esx-version> is replaced with either 3.5u2, 3.5u3, 3.5u4, or 4.0 depending upon your ESX/ESXi version.

2 Install yum-utils. This provides yum-builddep.

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

3 Use yum-builddep to satisfy build dependencies.

```
# yum-builddep /<key-path>/open-vm-tools-kmod-<version>-<tools-build>.<package-build.src.rpm
```

<key-path> is the path and directory you created for the key.

<version> is the version for the package.

<tools-build>.<package-build> is the release build for the tools and the package.

4 Compile the source packages into binary packages.

```
# rpmbuild --rebuild /<key-path>/open-vm-tools-kmod-<version>-<release>.src.rpm
```

<key-path> is the path and directory you created for the key.

<version> is the version for the package.

<tools-build>.<package-build> is the release build for the tools and the package.

This builds a binary kmod package suitable for use with the running kernel.

5 To build a binary kmod package from some other kernel, pass the additional parameter to rpmbuild:

```
'--define "kversion 2.6.myversion"'
```

The new installable binary package is placed in /usr/src/redhat/RPMS/<arch>.

<arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

As with all other packages, there is an accompanying -debuginfo package containing debugging symbols that can be useful. The -debuginfo package is not typically installed, but it is available for installation.

To build the binary kernel module packages for RHEL 4

1 Download from the http://packages.vmware.com repository.

There are two kmod source packages.

For ESX/ESXi 3.5 there are two kmod source packages. ESX/ESXi 4.0 does not require these kmod source packages.

```
open-vm-tools-kmod-<version>-<release>.src.rpm
vmware-tools-kmod-<version>-<release>.src.rpm
```

Locate the packages at:

```
http://packages.vmware.com/tools/esx/<esx-version>/rhel5/SRPMS
```

<esx-version> is replaced with either 3.5u2, 3.5u3, 3.5u4, or 4.0 depending upon your ESX/ESXi version.

2 Install the kernel headers for the kernel for which you building the kernel module packages.

3 Install gcc and rpmbuild.

4 Compile the source packages into binary packages.

```
# rpmbuild --rebuild /<key-path>/open-vm-tools-kmod-<version>-<release>.src.rpm
```

<key-path> is the path and directory you created for the key.

<version> is the version for the package.

<tools-build>.<package-build> is the release build for the tools and the package.

This builds a binary kmod package suitable for use with the running kernel.

5 To build a binary kmod package from some other kernel, pass the additional parameter to rpmbuild:

```
'--define "kversion 2.6.myversion"'
```

The new installable binary package is placed in /usr/src/redhat/RPMS/<arch>.

<arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

As with all other packages, there is an accompanying -debuginfo package containing debugging symbols that can be useful. The -debuginfo package is not typically installed, but it is available for installation.

To build the binary kernel module packages for SLES 10

1 Download from the http://packages.vmware.com repository.

There are two kmod source packages.

For ESX/ESXi 3.5 there are two kmod source packages. ESX/ESXi 4.0 does not require these kmod source packages.

```
open-vm-tools-kmod-<version>-<release>.src.rpm
vmware-tools-kmod-<version>-<release>.src.rpm
```

Locate the packages at:

```
http://packages.vmware.com/tools/esx/<esx-version>/rhel5/SRPMS
```

<esx-version> is replaced with either 3.5u2, 3.5u3, 3.5u4, or 4.0 depending upon your ESX/ESXi version.

2 Install the kernel headers for the kernel for which you building the kernel module packages.

3 Install gcc and rpmbuild.

4 Compile the source packages into binary packages.

```
# rpmbuild --rebuild /<key-path>/open-vm-tools-kmod-<version>-<release>.src.rpm
```

<key-path> is the path and directory you created for the key.

<version> is the version for the package.

<tools-build>.<package-build> is the release build for the tools and the package.

This builds a binary kmod package suitable for use with the running kernel.

5 To build a binary kmod package from some other kernel, pass the additional parameter to rpmbuild:

```
'--define "kversion 2.6.myversion"'
```

The new installable binary package is placed in /usr/src/redhat/RPMS/<arch>.

<arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

As with all other packages, there is an accompanying -debuginfo package containing debugging symbols that can be useful. The -debuginfo package is not typically installed, but it is available for installation.

To build the binary kernel module packages for SLES 9

1 Download from the http://packages.vmware.com repository.

There are two kmod source packages.

For ESX/ESXi 3.5 there are two kmod source packages. ESX/ESXi 4.0 does not require these kmod source packages.

```
open-vm-tools-kmod-<version>-<release>.src.rpm
vmware-tools-kmod-<version>-<release>.src.rpm
```

Locate the packages at:

```
http://packages.vmware.com/tools/esx/<esx-version>/rhel5/SRPMS
```

<esx-version> is replaced with either 3.5u2, 3.5u3, 3.5u4, or 4.0 depending upon your ESX/ESXi version.

2 Install the kernel headers for the kernel for which you building the kernel module packages.

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The new installable binary package is placed in /usr/src/redhat/RPMS/<arch>.

<arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

As with all other packages, there is an accompanying -debuginfo package containing debugging symbols that can be useful. The -debuginfo package is not typically installed, but it is available for installation.

To install custom built binary kernel module packages

1 Install your custom binary package using rpm:

```
# rpm -ivh /path/to/open-vm-tools-kmod-<kernelversion>-<version>-<release>.<arch>.rpm
```

<arch> is the architecture option. For 32-bit, this is i686. For 64-bit, this is x86_64.

2 Complete the installation using yum:

```
# yum install vmware-tools
```

Build Customized Kernels for Ubuntu

This section describes how to build a customized Ubuntu binary kernel and how to install VMware Tools OSPs.

To build customized kernels for Ubuntu

1 Install the kernel source packages, type:

```
# apt-get install open-vm-tools-kmod-source vmware-tools-kmod-source
```

2 Prepare for the build, type:

```
# module-assistant prepare
```

3 Build the kernel modules for each package, type:

```
# module-assistant build open-vm-tools-kmod vmware-tools-kmod
```

This produces two `.deb` files in `/usr/src` by default.

4 Install the produced binary packages, type:

```
# module-assistant install open-vm-tools-kmod vmware-tools-kmod
```

See the `module-assistant` manpage.