
Fedora 7

Release Notes



Fedora Documentation Project

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1. Welcome to Fedora

The Fedora Project is a Red Hat sponsored and community supported open source project. Its goal is the rapid progress of free and open source software and content. The Fedora Project makes use of public forums, open processes, rapid innovation, meritocracy, and transparency in pursuit of the best operating system and platform that free and open source software can provide.



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

You can help the Fedora Project community continue to improve Fedora if you file bug reports and enhancement requests. Refer to <http://fedoraproject.org/wiki/BugsAndFeatureRequests> for more information about bugs. Thank you for your participation.

To find out more general information about Fedora, refer to the following Web pages:

- Fedora Overview (<http://fedoraproject.org/wiki/Overview>)
- Fedora FAQ (<http://fedoraproject.org/wiki/FAQ>)
- Help and Discussions (<http://fedoraproject.org/wiki/Communicate>)
- Participate in the Fedora Project (<http://fedoraproject.org/wiki/Join>)



Document Links

Many links may not work properly from within the installation environment, due to resource constraints. The release notes are also available post-installation as part of the desktop Web browser's default home page. If you are connected to the internet, use these links to find other helpful information about Fedora and the community that creates and supports it.

2. Release Highlights



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

2.1. Fedora Tour

You can find a tour filled with pictures and videos of this exciting new release at <http://fedoraproject.org/wiki/Tours/Fedora7>.

2.2. New in Fedora

This release includes significant new versions of many key components and technologies. The following sections provide a brief overview of major changes from the last release of Fedora.

2.2.1. Spins

For the first time, Fedora includes several different *spins*, which are variations of Fedora built from a specific set of software packages. Each spin has a combination of software to meet the requirements of a specific kind of end user. In addition to a very small **boot .iso** image for network installation, users have the following spin choices:

- GNOME and KDE desktop environment based bootable Live images that can be installed to a hard disk. These spins are meant for desktop users who prefer a single disk installation and for sharing Fedora with friends, family, and event attendees.

- A regular image for desktops, workstations, and server users. This spin provides a good upgrade path and similar environment for users of previous releases of Fedora.

2.2.2. Desktop

- This release features GNOME 2.18 and KDE 3.5.6.

<http://www.gnome.org/start/2.18/notes/en/>

<http://kde.org/info/3.5.6.php>

- Fast user switching is well integrated in this release. Developers have enabled this feature through extensive development work on *ConsoleKit* and full integration throughout the distribution.

<http://fedoraproject.org/wiki/Desktop/FastUserSwitching>

- Display devices can be hot plugged and work automatically, thanks to the inclusion of Xorg Server 1.3.
- This release provides a number of firmware packages for enhanced wireless networking. **NetworkManager** presents a graphical interface that allows user to quickly switch between wireless and wired networks for increased mobility. **NetworkManager** is installed by default in both GNOME and KDE Live CDs.
- Fedora 7 includes a refreshing new "Flying High" theme, which is part of a continuous team effort from the community and the Fedora Artwork Project:

<http://fedoraproject.org/wiki/Artwork>

- Firefox 2 includes a host of new features including an inline spell checker, built-in phishing protection, and the ability to resume browsing sessions.

<http://www.mozilla.com/en-US/firefox/2.0/releasenotes/>

- I18N support is much improved by the presence of SCIM input methods, which now work automatically after installation without any configuration. SCIM can handle nearly every alphabet/set of characters in use. Fedora is now more accessible to a wider audience by the default inclusion of a number of language packages and input methods in the GNOME based Live CD.
- A new comprehensive graphical administration tool for SELinux, **system-config-selinux** is available by default in this release. SELinux boolean settings have been removed from the **system-config-securitylevel** tool and added to this new administration tool instead.
- The SELinux troubleshooting tool `setroubleshoot` is enabled by default in this release. This tool provides notifications and detailed information to desktop users about any access denials by SELinux policy, along with suggestions on handling them.
- This release features integration of a new FireWire stack in the kernel for more robust device handling.

<http://thread.gmane.org/gmane.linux.kernel/472789>

- Fedora now includes improved power management through implementation of dynamic ticks in the kernel.

<http://lwn.net/Articles/223185/>

- This release partially consolidates dictionaries used by desktop applications, which provides a consistent desktop experience while saving resources.
- Fedora now integrates the experimental *nouveau* driver within **Xorg** and the kernel. The *nouveau* driver, which is disabled by default in this release, aims to provide free and open source 3D drivers for nVidia cards. End users are asked to provide feedback on this feature to the project developers, to further the goal of having fully functional 3D drivers by default.

2.2.3. Performance

- In this release, the performance of **yum**, **Pirut**, and **Pup** have been significantly improved.

2.2.4. System Administration

- This release integrates Kernel-based Virtual Machine (KVM) technology with Fedora's graphical **virt-manager** and command-line **virsh** tools. KVM provides a hardware accelerated virtualization solution, and users have a choice between KVM and Xen, along with Qemu, in this release.

<http://kvm.sourceforge.net/>

- In this release, all hard disk partitions follow a **/dev/sd*** naming convention due to a new *libata* driver interface in the kernel. The **Anaconda** installer eases the transition for release upgrades.
- The mac80211 (formerly called Devicescape) wireless stack has been integrated with the kernel.
- Smolt, an opt-in tool that sends anonymous hardware profile information to the Fedora Project, is integrated with **firstboot** in the installer. All data is available on the Smolt homepage. This profile information is used to leverage cooperation from vendors in improving end user hardware experience, and to prioritize development and quality assurance on commonly used hardware.

<https://hosted.fedoraproject.org/projects/smolt>

<http://smolt.fedoraproject.org>

- The Fedora Directory Server base is now part of the Fedora software repository. The graphical console and administration servers are available on the website and are planned to be included in the repository after a review process.

<http://directory.fedoraproject.org/>

- Python 2.5 is included in this release, and all of the Python software available in the repository uses it.

<http://docs.python.org/whatsnew/whatsnew25.html>

- This release of Fedora includes Liberation fonts, which are metric equivalents for several well-known proprietary fonts found throughout the Internet. These fonts give users better results when viewing and printing shared or downloaded documents.

2.3. Road Map

The proposed plans for the next release of Fedora are available at <http://fedoraproject.org/wiki/RoadMap>.

3. Feedback

Thank you for taking the time to provide your comments, suggestions, and bug reports to the Fedora community. By doing so, you help improve the state of Fedora, Linux, and free software worldwide.

3.1. Providing Feedback on Fedora Software

To provide feedback on Fedora software or other system elements, please refer to <http://fedoraproject.org/wiki/BugsAndFeatureRequests>. A list of commonly reported bugs and known issues for this release is available from <http://fedoraproject.org/wiki/Bugs/F7Common>.

3.2. Providing Feedback on Release Notes



Feedback for Release Notes Only

This section concerns feedback on the release notes themselves.

If you feel these release notes could be improved in any way, you can provide your feedback directly to the beat writers. Here are several ways to do so, in order of preference:

1. If you have a Fedora account, edit content directly at <http://fedoraproject.org/wiki/Docs/Beats>
2. Fill out a bug request using this template: <http://tinyurl.com/nej3u> - **This link is ONLY for feedback on the release notes themselves.** Refer to the admonition above for details.
3. Email relnotes@fedoraproject.org¹

4. Installation Notes



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.



Fedora Installation Guide

To learn how to install Fedora, refer to <http://docs.fedoraproject.org/install-guide/>.



Installation issues not covered in these release notes

If you encounter a problem or have a question during installation that is not covered in these release notes, refer to <http://fedoraproject.org/wiki/FAQ> and <http://fedoraproject.org/wiki/Bugs/Common>.

Anaconda is the name of the Fedora installer. This section outlines issues related to **Anaconda** and installing Fedora 7.



Downloading Large Files

If you intend to download the Fedora DVD ISO image, keep in mind that not all file downloading tools can accommodate files larger than 2 GiB in size. Tools without this limitation include **wget** 1.9.1-16 and above, **curl**, and **ncftpget**. **BitTorrent** is another method for downloading large files. For information about obtaining and using the torrent file, refer to <http://torrent.fedoraproject.org/>.

Anaconda tests the integrity of installation media by default. This function works with the CD, DVD, hard drive ISO, and NFS ISO installation methods. The Fedora Project recommends that you test all installation media before starting the installation process and before reporting any installation-related bugs. Many of the bugs reported are actually due to improperly-burned CDs or DVDs. To use this test, type **linux mediacheck** at the boot : prompt.

The **mediacheck** function is highly sensitive, and may report some usable discs as faulty. This result is often caused by disc writing software that does not include padding when creating discs from ISO files. For best results with **mediacheck**, boot with the following option:

```
linux ide=nodma mediacheck
```

After you complete the **mediacheck** function successfully, reboot to return DMA mode to its normal state. On many systems, this results in a faster installation process from the disc. You may skip the **mediacheck** option when rebooting.



BitTorrent Automatically Verifies File Integrity

If you use **BitTorrent**, any files you download are automatically validated. If your file completes downloading, you do not need to check it. Once you burn your CD or DVD, however, you should still use **mediacheck** to test the integrity of the media.

You may perform memory testing before you install Fedora by pressing **Esc** twice, then entering **memtest86** at the boot : prompt. This option runs the **Memtest86** stand alone memory testing software in place of **Anaconda**. **Memtest86** memory testing continues until the **Esc** key is pressed.



Memtest86 Availability

You must boot from Installation Disc 1, the DVD, or a rescue CD in order to use this feature.

Fedora 7 supports graphical FTP and HTTP installations. However, the installer image must either fit in RAM or appear on local storage, such as Installation Disc 1. Therefore, only systems with more than 192MiB of RAM, or which boot from Installation Disc 1, can use the graphical installer. Systems with 192MiB RAM or less fall back to using the text-based installer automatically. If you prefer to use the text-based installer, type **linux text** at the boot : prompt.

4.1. Changes in Anaconda

- Many minor user interface changes:
 - Ability to select the boot drive
 - Advanced storage options, including the ability to add an iSCSI target and disable dmraid devices
 - The time zone page includes a magnification slider to zoom into different areas of the world when choosing location
- Improved Live images support
- Ability to install from Live image running from RAM or USB stick
- Improved IEEE-1394 (Firewire) support
- Improved installation for Sony PlayStation 3
- French keyboard layout uses latin9
- Improved kickstart installation
- Use of **/dev/hdX** is deprecated on i386 and x86_64 for IDE drives, and has changed to **/dev/sdX** except on PPC. See note about the importance of labeling devices for upgrades from FC6.

4.2. Installation Related Issues

4.2.1. Sony VAIO Notebooks

Some Sony VAIO notebook systems may experience problems installing Fedora from CD-ROM. If this happens, restart the installation process and add the following option to the boot command line:

```
pci=off ide1=0x180,0x386
```

Installation should proceed normally, and any devices not detected are configured the first time Fedora is booted.

4.2.2. IDE RAID

Not all IDE RAID controllers are supported. If your RAID controller is not yet supported by *dmraid*, you may combine drives into RAID arrays by configuring Linux software RAID. For supported controllers, configure the RAID functions in the computer BIOS.

4.2.3. Multiple NICs and PXE Installation

Some servers with multiple network interfaces may not assign `eth0` to the first network interface as BIOS knows it, which can cause the installer to try using a different network interface than was used by PXE. To change this behavior, use the following in `pxelinux.cfg/*` config files:

```
IPAPPEND 2
APPEND ksdevice=bootif
```

The configuration options above causes the installer to use the same network interface as BIOS and PXE use. You can also use the following option:

```
ksdevice=link
```

This option causes the installer to use the first network device it finds that is linked to a network switch.

4.2.4. HP ProLiant DL360 with Smart Array

If you have difficulties with this installation not detecting the Smart Array card, try entering `linux isa` on the installer prompt. This lets you manually select the card.

4.3. Upgrade Related Issues

Refer to <http://fedoraproject.org/wiki/DistributionUpgrades> for detailed recommended procedures for upgrading Fedora.

4.3.1. Disk partitions must be labeled

A change in the way that the linux kernel handles storage devices means that device names like `/dev/hdX` or `/dev/sdX` may differ from the values used in earlier releases. Anaconda solves this problem by relying on partition labels. If these labels are not present, then Anaconda presents a warning indicating that partitions need to be labelled and that the upgrade can not proceed. Systems that use Logical Volume Management (LVM) and the device mapper usually do not require relabeling.

4.3.1.1. To check disk partition labels

To view partition labels, boot the existing Fedora installation, and enter the following at a terminal prompt:

```
/sbin/blkid
```

Confirm that each volume line in the list has a **LABEL=** value, as shown below:

```
/dev/hdd1: LABEL="/boot" UUID="ec6a9d6c-6f05-487e-a8bd-a2594b854406" SEC_TYPE="ext2"
TYPE="ext3"
```

4.3.1.2. Update the file system mount entries

If any filesystem labels were added or modified, then the device entries in `/etc/fstab` must be adjusted to match:

```
su -c 'cp /etc/fstab /etc/fstab.orig'
su -c 'gedit /etc/fstab'
```

An example of a mount by label entry is:

```
LABEL=f7-slash / ext3 defaults 1 1
```

4.3.1.3. Update the grub . conf kernel root entry

If the label for the / (root) filesystem was modified, the kernel boot parameter in the grub configuration file must also be modified:

```
su -c 'gedit /boot/grub/grub.conf'
```

A matching example kernel grub line is:

```
kernel /vmlinuz-2.6.20-1.2948.fc6 ro root=LABEL=f7-slash rhgb quiet
```

4.3.1.4. Test changes made to labels

If partition labels were adjusted, or the **/etc/fstab** file modified, then boot the existing Fedora installation to confirm that all partitions still mount normally and login is successful. When complete, reboot with the installation media to start the installer and begin the upgrade.

4.3.2. Upgrades versus fresh installations

In general, fresh installations are recommended over upgrades, particularly for systems that include software from third-party repositories. Third-party packages remaining from a previous installation may not work as expected on an upgraded Fedora system. If you decide to perform an upgrade anyway, the following information may be helpful:

- Before you upgrade, back up the system completely. In particular, preserve **/etc**, **/home**, and possibly **/opt** and **/usr/local** if customized packages are installed there. You may wish to use a multi-boot approach with a "clone" of the old installation on alternate partition(s) as a fallback. In that case, create alternate boot media, such as a GRUB boot floppy.



System Configuration Backups

Backups of configurations in **/etc** are also useful in reconstructing system settings after a fresh installation.

- After you complete the upgrade, run the following command:

```
rpm -qa --last > RPMS_by_Install_Time.txt
```

Inspect the end of the output for packages that pre-date the upgrade. Remove or upgrade those packages from third-party repositories, or otherwise deal with them as necessary. Some previously installed packages may no longer be available in any configured repository. To list all these packages, use the following command:

```
su -c 'yum list extras'
```

5. Architecture Specific Notes



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

This section provides notes that are specific to the supported hardware architectures of Fedora.

5.1. RPM multiarch support on 64-bit platforms (x86_64, ppc64)

RPM supports parallel installation of multiple architectures of the same package. A default package listing such as **rpm -qa** might appear to include duplicate packages, since the architecture is not displayed. Instead, use the **repoquery** command, part of the *yum-utils* package, which displays architecture by default. To install *yum-utils*, run the following command:

```
su -c 'yum install yum-utils'
```

To list all packages with their architecture using **rpm**, run the following command:

```
rpm -qa --queryformat "%{name}-%{version}-%{release}-%{arch}\n"
```

You can add this to **/etc/rpm/macros** (for a system wide setting) or **~/.rpmmacros** (for a per-user setting). It changes the default query to list the architecture:

```
%_query_all_fmt      %{name}-%{version}-%{release}-%{arch}
```

5.2. PPC Specifics for Fedora

This section covers specific information about Fedora and the PPC hardware platform.

5.2.1. Hardware Requirements for PPC

5.2.1.1. Processor and memory

- Minimum CPU: PowerPC G3 / POWER3
- Fedora 7 supports only the "New World" generation of Apple Power Macintosh, shipped from circa 1999 onward.
- Fedora 7 also supports IBM pSeries, IBM iSeries, IBM RS/6000, Genesi Pegasos II, and IBM Cell Broadband Engine machines.
- Fedora 7 includes new hardware support for Genesi Efika, and for the Sony PlayStation 3.

- Recommended for text-mode: 233 MHz G3 or better, 128MiB RAM.
- Recommended for graphical: 400 MHz G3 or better, 256MiB RAM.

5.2.1.2. Hard disk space

The disk space requirements listed below represent the disk space taken up by Fedora 7 after installation is complete. However, additional disk space is required during installation to support the installation environment. This additional disk space corresponds to the size of **/Fedora/base/stage2.img** (on Installation Disc 1) plus the size of the files in **/var/lib/rpm** on the installed system.

In practical terms, additional space requirements may range from as little as 90 MiB for a minimal installation to as much as an additional 175 MiB for an "everything" installation. The complete packages can occupy over 9 GB of disk space.

Additional space is also required for any user data, and at least 5% free space should be maintained for proper system operation.

5.2.2. 4 KiB Pages on 64-bit machines

After a brief experiment with 64KiB pages in Fedora Core 6, the PowerPC64 kernel has now been switched back to 4KiB pages. The installer should reformat any swap partitions automatically during an upgrade.

5.2.3. The Apple keyboard

The **Option** key on Apple systems is equivalent to the **Alt** key on the PC. Where documentation and the installer refer to the **Alt** key, use the **Option** key. For some key combinations you may need to use the **Option** key in conjunction with the **Fn** key, such as **Option+Fn+F3** to switch to virtual terminal tty3.

5.2.4. PPC installation notes

Fedora Installation Disc 1 is bootable on supported hardware. In addition, a bootable CD image appears in the **images/** directory of this disc. These images behave differently according to your system hardware:

- On most machines, the bootloader automatically boots the appropriate 32-bit or 64-bit installer from the install disc. The default *gnome-power-manager* package includes power management support, including sleep and backlight level management. Users with more complex requirements can use the *apmud* package. To install *apmud* after installation, use the following command:

```
su -c 'yum install apmud'
```

- **64-bit IBM pSeries (POWER4/POWER5), current iSeries models**

After using OpenFirmware to boot the CD, the bootloader, **yaboot**, automatically boots the 64-bit installer.

- **IBM "Legacy" iSeries (POWER4)**

So-called "Legacy" iSeries models, which do not use OpenFirmware, require use of the boot image located in the **images/iSeries** directory of the installation tree.

- **32-bit CHRP (IBM RS/6000 and others)**

After using OpenFirmware to boot the CD, select the **linux32** boot image at the boot : prompt to start the 32-bit installer. Otherwise, the 64-bit installer starts and fails.

- **Genesi Pegasos II**

At the time of writing, firmware with full support for ISO9660 file systems has not yet been released for the Pegasos. You can use the network boot image, however. At the OpenFirmware prompt, enter the following command:

```
boot cd: /images/netboot/ppc32.img
```

You must also configure OpenFirmware on the Pegasos manually to make the installed Fedora system bootable. To do this, set the `boot-device` and `boot-file` environment variables appropriately.

- **Genesi Efika**

At the time of writing, the firmware of the Efika has bugs which prevent correct operation of the **yaboot** bootloader. An updated firmware should be available by April 2007, in advance of the release of Fedora 7. With a fixed firmware, installation on Efika should be the same as on Pegasos II.

- **Sony PlayStation 3**

For installation on PlayStation 3, first update to firmware 1.60 or later. The "Other OS" boot loader must be installed into the flash, following the instructions at <http://www.playstation.com/ps3-openplatform/manual.html>. A suitable boot loader image is located on the Fedora 7 install media. Once the boot loader is installed, the PlayStation 3 should boot from the Fedora install media. Select the **linux64** from the graphical boot menu. For more information on Fedora and the PlayStation3 or Fedora on PowerPC in general, join the [Fedora-PPC mailing list](#)² or the #fedora-ppc channel on [FreeNode](#)³.

- **Network booting**

Combined images containing the installer kernel and ramdisk are located in the **images/netboot/** directory of the installation tree. They are intended for network booting with TFTP, but can be used in many ways.

The **yaboot** loader supports TFTP booting for IBM pSeries and Apple Macintosh. The Fedora Project encourages the use of **yaboot** over the **netboot** images.

5.3. x86 Specifics for Fedora

This section covers specific information about Fedora and the x86 hardware platform.

5.3.1. Hardware requirements for x86

In order to use specific features of Fedora 7 during or after installation, you may need to know details of other hardware components such as video and network cards.

5.3.1.1. Processor and memory

The following CPU specifications are stated in terms of Intel processors. Other processors, such as those from AMD, Cyrix, and VIA that are compatible with and equivalent to the following Intel processors, may also be used with Fedora.

Fedora 7 requires an Intel Pentium or better processor, and is optimized for Pentium 4 and later processors.

- Recommended for text-mode: 200 MHz Pentium-class or better
- Recommended for graphical: 400 MHz Pentium II or better
- Minimum RAM for text-mode: 128MiB
- Minimum RAM for graphical: 192MiB
- Recommended RAM for graphical: 256MiB

5.3.1.2. Hard disk space

The disk space requirements listed below represent the disk space taken up by Fedora 7 after the installation is complete. However, additional disk space is required during the installation to support the installation environment. This additional disk space corresponds to the size of **/Fedora/base/stage2.img** on Installation Disc 1 plus the size of the files in **/var/lib/rpm** on the installed system.

In practical terms, additional space requirements may range from as little as 90 MiB for a minimal installation to as much as an additional 175 MiB for an "everything" installation. The complete packages can occupy over 9 GB of disk space.

Additional space is also required for any user data, and at least 5% free space should be maintained for proper system operation.

5.4. x86_64 Specifics for Fedora

This section covers specific information about Fedora and the x86_64 hardware platform.

5.4.1. Hardware requirements for x86_64

In order to use specific features of Fedora 7 during or after installation, you may need to know details of other hardware components such as video and network cards.

5.4.1.1. Memory requirements for x86_64

- Minimum RAM for text-mode: 256MiB
- Minimum RAM for graphical: 384MiB
- Recommended RAM for graphical: 512MiB

5.4.1.2. Hard disk space requirements for x86_64

The disk space requirements listed below represent the disk space taken up by Fedora 7 after the installation is complete. However, additional disk space is required during the installation to support the installation environment. This additional disk space corresponds to the size of **/Fedora/base/stage2.img** on Installation Disc 1 plus the size of the files in **/var/lib/rpm** on the installed system.

In practical terms, additional space requirements may range from as little as 90 MiB for a minimal installation to as much as an additional 175 MiB for an "everything" installation. The complete packages can occupy over 9 GB of disk space.

Additional space is also required for any user data, and at least 5% free space should be maintained for proper system operation.

6. Fedora Live Images



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

The Fedora release includes several live ISO images in addition to the traditional installation images. These ISO images are bootable, and you can burn them to media and use them to try out Fedora. They also include a feature that allows you to install the live image content to your hard drive for persistence and higher performance.

6.1. Available Images

There are three live images available for Fedora 7.

1. Fedora 7 i686 Desktop CD. This is a CD sized image for i686 machines. It includes the GNOME desktop environment, integrates all supported Fedora locales, and features a basic set of the productivity applications available in Fedora.
2. Fedora 7 x86_64 Desktop DVD. This is a DVD sized image for x86_64 machines. The feature set is the same as in the i686 Desktop CD and includes multilib packages.
3. Fedora 7 i686 KDE Desktop CD. This is a CD sized image for i686 machines. It includes the KDE Desktop environment and a large set of KDE applications. This image only has full support for the English language. The GNOME based Live images do not include the **OpenOffice.org** office suite to save space. Instead they include **Abiword** and support for more locales. The KDE Live CD uses parts of **koffice** instead. The Fedora Live images do not support i586 class machines. To install Fedora on an i586, you must use the classic installation method.
4. Fedora 7 x86_64 KDE Desktop DVD. This is a DVD sized image for x86_64 machines. The feature set is the same as in the i686 KDE Desktop CD and includes multilib packages.

6.2. Usage Information

To boot from the Live image, insert it into your computer and restart. To log in and use the desktop environment, enter the username `fedora`. Hit **Enter** at the password prompt, since there is no password on this account. The Live images do not automatically login so users can select a preferred language. After logging in, if you wish to install the contents of the live image to your hard drive, click on the **Install to Hard Drive** icon on the desktop.



No i586 Support

The i686 Live images will not boot on an i586 machine.

6.3. USB Booting

Another way to use these Live images is to put them on a USB stick. To do this, install the *livecd-tools* package from the development repository. Then, run the **livecd-iso-to-disk** script:

```
/usr/bin/livecd-iso-to-disk /path/to/live.iso /dev/sdb1
```

Replace */dev/sdb1* with the partition where you want to put the image.

This is *not* a destructive process; any data you currently have on your USB stick *is preserved*.

6.4. Differences From a Regular Fedora Install

The following items are different from a normal Fedora install with the live images.

- The `sshd` service is disabled, since there is no password by default.
- **NetworkManager** is enabled by default in both GNOME and KDE based Live images.

7. Package Notes



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

The following sections contain information regarding software packages that have undergone significant changes for Fedora 7. For easier access, they are generally organized using the same groups that are shown in the installation system.

7.1. PC Speaker Enabled

The PC speaker is enabled by default in this release, but can be circumvented in a number of ways:

- Reduce its volume to an acceptable level or completely mute the PC speaker in **alsamixer** with the setting for **PC Speak**.
- As the root user, disable the PC speaker system-wide by running the following command in a console.

```
su -c '/sbin/modprobe -r pcspkr ; echo "install pcspkr :" >>/etc/modprobe.conf'
```

7.2. The *cdrtools* Packages is Replaced by *cdrkit*

Recent versions of *cdrtools* intermix code under the GPL and CDDL licenses, which are mutually incompatible. To avoid this problem, in this release *cdrtools* has been replaced by a fork called *cdrkit*.

Thanks to Joerg Jaspert (joerg AT debian.org) from Debian for initiating development of this software and reaching out to Fedora.

<http://lwn.net/Articles/195167/>

<http://www.cdrkit.org/>

<https://www.redhat.com/archives/fedora-advisory-board/2006-August/msg00409.html>

7.3. EM8300 Drivers Default to ALSA

The default audio mode of the em8300 device support utilities and kernel modules (*em8300* and *kmod-em8300-** packages) has changed from OSS to ALSA to follow upstream. However, numerous applications that support the em8300 still expect to find it in OSS mode. Users of these applications can use the **audio_driver=oss** option for the em8300 module in */etc/modprobe.conf* to make the card use OSS for audio.

7.4. Gaim Renamed to Pidgin

The **Gaim** instant messenger has been renamed to **Pidgin** to avoid possible trademark infringement issues.

<http://www.pidgin.im/index.php?id=177>

7.5. Packages with ".fc6" Tag

There have not been any major changes in the toolchain in Fedora 7. Therefore, some packages in Fedora 7 might retain ".fc6" in the release tag if they have been inherited from the previous release without any changes. Fedora maintainers have not rebuilt these packages for Fedora 7 to avoid making end users download the packages for only a release tag change. This measure ensures that the robustness is not affected by any potential changes evoked by rebuilds. This naming of packages is merely cosmetic, and does not in any way affect the functionality of the software.

7.6. Perl Package Split

Development related files have been split from Perl and are now available in the *perl-devel* package. As a temporary exception to the Fedora packaging guidelines, *perl* requires *perl-devel* to avoid rebuilding some *perl* dependent packages late in the development cycle. During the next release cycle of Fedora, maintainers will split up the rest of the dependent packages.

<https://www.redhat.com/archives/fedora-devel-list/2007-April/msg00886.html>

7.7. Zope and Plone Not Yet Available

This release of Fedora includes Python 2.5, which does not support **Zope**. As a result, the *zope* and *plone* packages have been removed from this release. Work is underway to alleviate this problem for **Zope 3**, and possibly create a restricted Python 2.5 implementation of **Zope 2**. Refer to <http://wiki.zope.org/zope3/Zope3UsingPython25> for additional information. Users who require the *zope* or *plone* packages are cautioned to plan appropriately, and use virtualized hosts or other methodologies to support their **Zope** and **Plone** needs.

7.8. Unstable liferea x86_64 Package

The **liferea** RSS/RDF feed reader has a known issue compiled for x86_64 platforms. This issue causes it to take 100% of the CPU time, becoming unresponsive. As a workaround until the bug is found and fixed, remove the *liferea.x86_64* package from your system, then install the i386 version. This package requires the *firefox.i386* package as well. For more information, refer to this bug report:

https://bugzilla.redhat.com/bugzilla/show_bug.cgi?id=231073

7.9. Xfce URL opening focus issue

If you use the Xfce desktop and click on a URL to open it in your browser, the active browser window moves to your current workspace. A hidden option named **ActivateAction** adjusts this behavior. Set this string value to **bring** (default), **switch** or **none**. To add this option to your settings edit your `~/.config/xfce4/mcs_settings/wmtweaks.xml` file and add a line like the following:

```
<option name="Xfwm/ActivateAction" type="string" value="none"/>
```

The **bring** option moves your browser to your current workspace and focuses it. The **switch** option moves you to the workspace with your browser in it and focuses it. The **none** option opens the URL in your browser in the background and keeps your focus in the current application.

Refer to http://bugzilla.xfce.org/show_bug.cgi?id=2961 for more information on this issue.

7.10. System Tools

7.10.1. Yum kernel handling plugin

By default Fedora includes and enables a yum plugin package *yum-installonlyn*. This plugin retains the latest two kernels, including the one running, when you perform updates on your system. To tune this feature to retain more or fewer kernels, or disable it entirely, edit the `/etc/yum/pluginconf.d/installonlyn.conf` file.

7.10.2. *apcupsd*

The *apcupsd* package has been upgraded to version 3.14.0. This version removes the old master/slave networking mode. Refer to the *apcupsd* release notes for more information.

http://sourceforge.net/project/shownotes.php?group_id=54413&release_id=485633

7.11. Engineering and Scientific

7.11.1. *paraview*

The *mpi* build and sub-package of *paraview* have been removed until **cmake** related build issues are resolved.

7.12. ATA over Ethernet

This release includes packages that support a kernel feature, providing ATA access over Ethernet. The packages are *aoetools*, the ATA over Ethernet tools, and *vblade*, a virtual EtherDrive blade daemon.

7.13. Graphics

7.13.1. Handling of GIMP Plugins Contained in Other Packages

The **GIMP** package in Fedora includes a helper script `/usr/sbin/gimp-plugin-mgr` for plugins contained in other packages, for example, *xsane-gimp*. This script manages symlinks from the **GIMP** plugin directory (which may change between upgrades) to the actual location of the plugins.

A bug has been fixed in the Fedora 7 release of **GIMP** that was in all older **GIMP** packages, including all those in the test releases. The bug concerns the execution order in which the symlinks are installed and removed, causing the symlinks to vanish when the **GIMP** package is updated.

Although the **GIMP** package contained in the final release has the execution order fixed, due to the nature of the problem it will show up once more when updating from an affected version to a fixed version. To add these symlinks back in, run this command, providing the root password when prompted:

```
su -c "/usr/sbin/gimp-plugin-mgr --install '*'"
```

8. Linux Kernel



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

This section covers changes and important information regarding the 2.6.21 based kernel in Fedora 7. The 2.6.21 kernel includes:

- Support for KVM virtualization.
- Tickless support for x86 32bit, which greatly improves power management.
- The devicescape wireless network stack, which includes support for several new wireless drivers.
- New IDE drivers that use the same libata code as the SATA drivers.



IDE Device Names Changed

The new IDE drivers now cause all IDE drives to have device names such as `/dev/sdX` instead of `/dev/hdX`.

If the `/etc/fstab` or `/etc/crypttab` files reference these devices by name, they must be migrated before the system can access those partitions.

- Support for version 2 of the Global File System (GFS2) has been integrated into the upstream kernel.
- Some elements of the realtime kernel project.

8.1. Version

Fedora may include additional patches to the kernel for improvements, bug fixes, or additional features. For this reason, the Fedora kernel may not be line-for-line equivalent to the so-called *vanilla kernel* from the kernel.org web site:

<http://www.kernel.org/>

To obtain a list of these patches, download the source RPM package and run the following command against it:

```
rpm -qp1 kernel-<version>.src.rpm
```

8.2. Changelog

To retrieve a log of changes to the package, run the following command:

```
rpm -q --changelog kernel-<version>
```

If you need a user friendly version of the changelog, refer to <http://wiki.kernelnewbies.org/LinuxChanges>. A short and full diff of the kernel is available from <http://kernel.org/git>. The Fedora version kernel is based on the Linus tree.

Customizations made for the Fedora version are available from <http://cvs.fedoraproject.org>.

8.3. Kernel Flavors

Fedora 7 includes the following kernel builds:

- Native kernel, for use in most systems. Configured sources are available in the *kernel-devel-<version>.<arch>.rpm* package.
- The kernel-PAE, for use in 32-bit x86 systems with > 4GB of RAM, or with CPUs that have an 'NX (No eXecute)' feature. This kernel support both uniprocessor and multi-processor systems.
- Virtualization kernel for use with the Xen emulator package. Configured sources are available in the *kernel-xen-devel-<version>.<arch>.rpm* package.
- The kdump kernel for use with kexec/kdump capabilities. Configured sources are available in the *kernel-kdump-devel-<version>.<arch>.rpm* package.

You may install kernel headers for all kernel flavors at the same time. The files are installed in the */usr/src/kernels/<version>-[PAE|xen|kdump]-<arch>/* tree. Use the following command:

```
su -c 'yum install kernel-{PAE,xen,kdump}-devel'
```

Select one or more of these flavors, separated by commas and no spaces, as appropriate. Enter the root password when prompted.



32bit Kernel Includes Kdump

The 32bit kernel is now relocatable, so kdump functionality is included. 64bit still requires installation of the *-kdump* kernel.



Default Kernel Provides SMP

There is no separate SMP kernel available for Fedora on i386, x86_64, and ppc64. Multiprocessor support is provided by the native kernel.



PowerPC Kernel Support

There is no support for Xen or kdump for the PowerPC architecture in Fedora. 32-bit PowerPC does still have a separate SMP kernel.

8.4. Reporting Bugs

Refer to <http://kernel.org/pub/linux/docs/lkml/reporting-bugs.html> for information on reporting bugs in the Linux kernel. You may also use <http://bugzilla.redhat.com> for reporting bugs that are specific to Fedora.

8.5. Preparing for Kernel Development

Fedora 7 does not include the *kernel-source* package provided by older versions since only the *kernel-devel* package is required now to build external modules. Configured sources are available, as described in the kernel flavors section.



Custom Kernel Building

For information on kernel development and working with custom kernels, refer to <http://fedoraproject.org/wiki/Docs/CustomKernel>.

9. Fedora Desktop



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

This section details changes that affect Fedora graphical desktop users.

9.1. Localized Common User Directories (xdg-user-dirs)

This release of Fedora now includes the new common user directory structure, *xdg-user-dirs*. Features of these new user directories include:

- Directory names can be localized (translated)

- Includes a set of common directories by default, such as for documents, music, pictures, and downloads.
- Appear as common bookmarks in the file browser, and are picked up by many applications as app-specific defaults. For example, a music player would start the file opening dialog in the default music directory.
- Configurable by users, who can move or rename the directories via the **Nautilus** file manager, or by editing `~/.config/user-dirs.dirs`.

If you do not want default folders to be created, remove the `xdg-user-dirs-gtk` package and associated dependencies.

http://www.freedesktop.org/wiki/Software_2fxdg_2duser_2ddirs

9.2. GNOME

This release features GNOME 2.18 (<http://www.gnome.org/start/2.18/>)

The GNOME splash screen has been disabled upstream intentionally. To enable it, use **gconf-editor** or the following command:

```
gconftool-2 --set /apps/gnome-session/options/show_splash_screen --type bool true
```

The lock screen dialog theme is not connected to the selected screensaver in this release. To enable it, use **gconf-editor** or the following command:

```
gconftool-2 --set --type string /apps/gnome-screensaver/lock_dialog_theme "system"
```

9.3. KDE

This release features KDE 3.5.6.

<http://kde.org/announcements/announce-3.5.6.php>

9.4. Web Browsers

This release of Fedora includes version 2.0 of the popular **Firefox** web browser. Refer to <http://firefox.com/> for more information about Firefox.

9.5. Mail Clients

The *mail-notification* package has been split. The **Evolution** plugin is now in a separate package called *mail-notification-evolution-plugin*. When you update the *mail-notification* package, the plugin is added automatically.

This release contains **Thunderbird** version 2.0, which has numerous performance improvements, folder viewing enhancements, and enhanced mail notification support.

9.6. Liberation Fonts

This release of Fedora includes a set of fonts called "Liberation." These fonts are metric equivalents for well-known proprietary fonts prevalent on the Internet. With these fonts, users will find better cross-

platform viewing and printing support for a variety of documents. Future versions of these fonts will be fully hinted.

10. File Systems



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

Fedora 7 provides basic support for encrypted swap partitions and non-root file systems. To use it, add entries to **/etc/crypttab** and reference the created devices in **/etc/fstab**.



Encrypted FS Support Unavailable During Install

Enable file system encryption after installation. **Anaconda** does not have support for creating encrypted block devices.

The following example shows an **/etc/crypttab** entry for a swap partition:

```
my_swap /dev/sdb1 /dev/urandom swap,cipher=aes-cbc-essiv:sha256
```

This creates an encrypted block device **/dev/mapper/my_swap**, which can be referenced in **/etc/fstab**. The next example shows an entry for a filesystem volume:

```
my_volume /dev/sda5 /etc/volume_key cipher=aes-cbc-essiv:sha256
```

The **/etc/volume_key** file contains a plaintext encryption key. You can also specify **none** as the key file name, and the system instead asks for the encryption key during boot.

The recommended method is to use **LUKS** for file system volumes: (using LUKS you can drop the **cipher=** part in **crypttab**).

1. Create the encrypted volume using **cryptsetup luksFormat**
2. Add the necessary entry to **/etc/crypttab**
3. Set up the volume manually using **cryptsetup luksOpen** or reboot
4. Create a filesystem on the encrypted volume
5. Set up an **/etc/fstab** entry

11. Mail Servers



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

This section concerns electronic mail servers or mail transfer agents (MTAs).

11.1. Sendmail

By default, the **Sendmail** mail transport agent (MTA) does not accept network connections from any host other than the local computer. To configure **Sendmail** as a server for other clients, edit `/etc/mail/sendmail.mc` and change the **DAEMON_OPTIONS** line to also listen on network devices, or comment out this option entirely using the **dn1** comment delimiter. Then install the *sendmail-cf* package and regenerate `/etc/mail/sendmail.cf` by running the following commands:

```
su -c 'yum install sendmail-cf'
su -c 'make -C /etc/mail'
```

11.2. exim-sa

The *exim-sa* package is deprecated since the previous release. It was the original implementation of SpamAssassin integration with Exim, and was functionally similar to **sendmail** filters or **postfix** filters. However, that functionality is rather limited, and Exim now has far better support for content checking, fully integrated into its general-purpose Access Control Lists.

Since the **sa_exim** feature was not enabled in the default configuration, the package can normally be safely uninstalled to allow Exim to be upgraded. Users who have modified their configuration to use **sa_exim** features should either reconfigure to use Exim's full content scanning abilities or rebuild the package for themselves to include the *exim-sa* subpackage. For further details on Exim's built-in content scanning, refer to the Exim documentation:

http://www.exim.org/exim-html-4.62/doc/html/spec_html/ch40.html

12. Development



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

This section covers various development tools and features.

12.1. Tools

12.1.1. GCC Compiler Collection

This release of Fedora has been built with GCC 4.1, which is included with the distribution.

12.1.2. Eclipse

This release of Fedora includes Fedora Eclipse, based on the Eclipse SDK version 3.2.2 (<http://www.eclipse.org>). The "New and Noteworthy" page for the 3.2.x series of releases can be accessed at http://download.eclipse.org/eclipse/downloads/drops/R-3.2-200606291905/new_noteworthy/eclipse-news.html. Release notes specific to 3.2.2 are available at http://www.eclipse.org/eclipse/development/readme_eclipse_3.2.2.html.

The Eclipse SDK is known variously as "the Eclipse Platform," "the Eclipse IDE," and "Eclipse." The Eclipse SDK is the foundation for the combined release of ten Eclipse projects under the Callisto combined release umbrella (<http://www.eclipse.org/callisto>). A few of these Callisto projects are included in Fedora: CDT (<http://www.eclipse.org/cdt>, for C/C++ development, EMF (<http://www.eclipse.org/emf>) the Eclipse Modeling Framework, and GEF (<http://www.eclipse.org/gef>), the Graphical Editing Framework.

Many third-party Eclipse projects are also available, including Subclipse (<http://subclipse.tigris.org/>) for integrating Subversion version control, *PyDev*⁴ (<http://pydev.sf.net>) for developing in Python, and PHPEclipse (<http://www.phpeclipse.de/>) for developing in PHP. Mylar (<http://eclipse.org/mylar>), a task-focused UI for Eclipse, is also available in Fedora with task connectors for Bugzilla and Trac. It was not part of Callisto but will be part of the forthcoming Europa combined Eclipse release.

Assistance in getting more projects packaged and tested with GCJ is always welcome. Contact the interested parties through `fedora-devel-java-list` (<http://www.redhat.com/mailman/listinfo/fedora-devel-java-list/>) and/or `#fedora-java` on freenode.

Fedora also includes plugins and features that are particularly useful to FLOSS hackers, ChangeLog editing with *eclipse-changelog*, and Bugzilla interaction with *eclipse-mylar-bugzilla*. Our CDT package also includes the work-in-progress GNU Autotools plugin. This plugin allows end-users to use Eclipse to build and maintain C/C++ projects that use GNU autotools. Enhancements to the CDT include:

- Performing configuration prior to build
- Special editors for *autoconf/automake* input files
- Special help for *autoconf* macros
- Hover help for C library functions
- A special console for configuration

The latest information regarding these projects can be found at the Fedora Eclipse Project page: <http://sourceware.org/eclipse/>.

This release includes 21 language packs for the Eclipse SDK. Each language is packed into a separate package, such as *eclipse-sdk-nls-ko* for the Korean translation.

12.1.2.1. Non-packaged Plugins/Features

Fedora Eclipse contains a patch to allow non-root users to make use of the Update Manager functionality for installing non-packaged plugins and features. Such plugins are installed in the user's home directory under the `.eclipse` directory. Please note, however, that these plugins do not have associated GCJ-compiled bits and may therefore run slower than expected.

⁴ [/wiki/PyDev](http://wiki/PyDev)

12.1.2.2. Alternative Java Runtime Environments

The Fedora free JRE does not satisfy every user, so Fedora does allow the installation of alternative JREs. A caveat exists, however, for installing proprietary JREs on 64-bit machines.

The 64-bit JNI libraries shipped by default on x86_64 systems in Fedora do not run on 32-bit proprietary JREs. In other words, do not try to run Fedora's x86_64 Eclipse packages on Sun's 32-bit JRE. They fail in confusing ways. Either switch to a 64-bit proprietary JRE, or install the 32-bit version of the packages, if available. To install a 32-bit version, use the following command:

```
yum install <package_name>.i386
```

Likewise, the 32-bit JNI libraries shipped by default on ppc64 systems do not run with a 64-bit JRE. To install the 64-bit version, use the following command:

```
yum install <package_name>.ppc64
```

12.1.2.3. Europa/Eclipse 3.3

In June 2007, the Eclipse community is releasing the Europa combined release of an assortment of plugins and features. This will be based on and include version 3.3 of the Eclipse SDK. This is a major change and because of that, Fedora Eclipse is not going to be re-basing on Europa until Fedora 8. This means that versions of Eclipse-based applications included in Fedora such as RSSOwl and Azureus may lag upstream releases if they require features only available in Eclipse 3.3.

13. Security



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

This section highlights various security items from Fedora.

13.1. General Information

A general introduction to the many proactive security features in Fedora, current status, and policies is available at <http://fedoraproject.org/wiki/Security>.

13.1.1. SELinux

The SELinux project pages have troubleshooting tips, explanations, and pointers to documentation and references. Some useful links include the following:

- New SELinux project pages: <http://fedoraproject.org/wiki/SELinux>
- Troubleshooting tips: <http://fedoraproject.org/wiki/SELinux/Troubleshooting>
- Frequently Asked Questions: <http://docs.fedoraproject.org/selinux-faq/>
- Listing of SELinux commands: <http://fedoraproject.org/wiki/SELinux/Commands>
- Details of confined domains: <http://fedoraproject.org/wiki/SELinux/Domains>

14. Java and java-gcj-compat



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

This release of Fedora includes a free and open source Java environment called *java-gcj-compat*. The *java-gcj-compat* collection includes a tool suite and execution environment that is capable of building and running many useful programs that are written in the Java programming language.



Fedora Does Not Include Java

Java is a trademark of Sun Microsystems. *java-gcj-compat* is an entirely free software stack that is **not** Java, but may run Java software.

The java-gcj infrastructure has three key components: a GNU Java runtime (*libgcj*), the **Eclipse** Java compiler (**ecj**), and a set of wrappers and links (*java-gcj-compat*) that present the runtime and compiler to the user in a manner similar to other Java environments.

The Java software packages in this Fedora release use the *java-gcj-compat* environment. These packages include **OpenOffice.org Base**, **Eclipse**, and **Apache Tomcat**. Refer to the Java FAQ at <http://www.fedoraproject.org/wiki/JavaFAQ> for more information on the *java-gcj-compat* free Java environment in Fedora.



Include Location and Version Information in Bug Reports

When making a bug report, be sure to include the output from these commands:

```
which java && java -version && which javac && javac -version
```

14.1. Handling Java and Java-like Packages

In addition to the *java-gcj-compat* free software stack, Fedora lets you install multiple Java implementations and switch between them using the **alternatives** command line tool. However, every Java system you install must be packaged using the JPackage Project packaging guidelines to take advantage of **alternatives**. Once these packages are installed properly, the root user may switch between **java** and **javac** implementations using the **alternatives** command:

```
alternatives --config java
alternatives --config javac
```

14.2. Handling Java Applets

This release of Fedora includes a preview release of *gcjwebplugin*, a Firefox plugin for Java applets. *gcjwebplugin* is not enabled by default because although the security implementation in GNU

Classpath is being actively developed, it is not mature enough to run untrusted applets safely. That said, the AWT and Swing implementations in GNU Classpath are now sufficiently mature that they can run many applets deployed on the web. Adventurous users who want to try *gcjwebplugin* can read `/usr/share/doc/libgcj-4.1.2/README.libgcjwebplugin.so`, as installed by the *libgcj* package. The **README** explains how to enable the plugin and the risks associated with doing so.

14.3. Fedora and the JPackage Java Packages

Fedora includes many packages derived from the JPackage Project, which provides a Java software repository. These packages are modified in Fedora to remove proprietary software dependencies and to make use of GCJ's ahead-of-time compilation feature. Use the Fedora repositories to update these packages, or use the JPackage repository for packages not provided by Fedora. Refer to the JPackage website at <http://jpackage.org> for more information on the project and the software it provides.



Mixing Packages from Fedora and JPackage

Research package compatibility before you install software from both the Fedora and JPackage repositories on the same system. Incompatible packages may cause complex issues.

Refer to the latest release notes pertaining to Eclipse at <http://fedoraproject.org/wiki/Docs/Beats/Devel/Tools/Eclipse>.

14.4. Maven (v2)

This release of Fedora includes *maven2*, a Java project management and project comprehension tool. Maven can be invoked by the **mvn** and **mvn-jpp** commands. The former makes Maven behave just like upstream Maven, while the latter calls **mvn** with additional properties that make off-line building easier.

The *maven2* package in Fedora is modified to work in a fully off-line mode. With no additional properties defined (the **mvn** command), **maven2** works exactly like upstream Maven. Users may define additional properties to facilitate off-line builds, or call **mvn-jpp**, a wrapper that defines the most commonly used properties for off-line building. The properties and their usage details are described in the `/usr/share/doc/maven2-2.0.4/maven2-jpp-readme.html` file, which comes from the *maven2-manual* package.

15. Multimedia



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

Fedora includes applications for assorted multimedia functions, including playback, recording, and editing. Additional packages are available through the Fedora Package Collection software repository. For additional information about multimedia in Fedora, refer to the Multimedia section of the Fedora Project website at <http://fedoraproject.org/wiki/Multimedia>.

15.1. Multimedia Players

The default installation of Fedora includes **Rhythmbox** and **Totem** for media playback. The Fedora repositories include many other popular programs such as the **XMMS** player and KDE's **amaroK**. Both GNOME and KDE have a selection of players that can be used with a variety of formats. Third parties may offer additional programs to handle other formats.

Fedora also takes full advantage of the Advanced Linux Sound Architecture (ALSA) sound system. Many programs can play sound simultaneously, which was once difficult on Linux systems. When all multimedia software is configured to use ALSA for sound support, this limitation disappears. For more information about ALSA, visit the project website at <http://www.alsa-project.org/>. Users may still experience issues when multiple users log into the system. Depending upon hardware and software configurations, multiple users may not be able to use the sound hardware simultaneously.

15.2. Ogg and Xiph.Org Foundation Formats

Fedora includes complete support for the Ogg media container format and the Vorbis audio, Theora video, Speex audio, and FLAC lossless audio formats. These freely-distributable formats are not encumbered by patent or license restrictions. They provide powerful and flexible alternatives to more popular, restricted formats. The Fedora Project encourages the use of open formats in place of restricted ones. For more information on these formats and how to use them, refer to the Xiph.Org Foundation's web site at <http://www.xiph.org/>.

15.3. MP3, DVD, and Other Excluded Multimedia Formats

Fedora software repositories cannot include support for MP3 or DVD video playback or recording. The MP3 formats are patented, and the patent holders have not provided the necessary patent licenses. DVD video formats are patented and equipped with an encryption scheme. The patent holders have not provided the necessary patent licenses, and the code needed to decrypt CSS-encrypted discs may violate the Digital Millennium Copyright Act, a copyright law of the United States. Fedora also excludes other multimedia software due to patent, copyright, or license restrictions, including Adobe's Flash Player and Real Media's Real Player. For more on this subject, please refer to <http://fedoraproject.org/wiki/ForbiddenItems>.

While other MP3 options may be available for Fedora, Fluendo now offers a free MP3 plugin for GStreamer that has the necessary patent license for end users. This plugin enables MP3 support in applications that use the GStreamer framework as a backend. Fedora does not include this plugin since we prefer to support and encourage the use of patent unrestricted open formats instead. For more information about the MP3 plugin, visit Fluendo's website at <http://www.fluendo.com/>.

15.4. CD and DVD Authoring and Burning

Fedora software repositories includes a variety of tools for easily mastering and burning CDs and DVDs. GNOME users can burn directly from the Nautilus file manager, choose the *gnomebaker* or *graveman* packages, or utilize the older *xcdroast* package from Fedora. KDE users can use the robust *k3b* package for these tasks. Console tools include *cdrecord*, *readcd*, *mkisofs*, and other popular applications.

15.5. Screencasts

You can use Fedora to create and play back *screencasts*, which are recorded desktop sessions, using open technologies. Fedora Package Collection software repository includes *istanbul*, which creates screencasts using the Theora video format. These videos can be played back using one of several

players included in Fedora. This is the preferred way to submit screencasts to the Fedora Project for either developer or end-user use. For a more comprehensive how-to, refer to <http://fedoraproject.org/wiki/ScreenCasting>.

15.6. Extended Support through Plugins

Most of the media players in Fedora software repositories can use plugins to add support for additional media formats and sound output systems. Some use powerful multimedia frameworks, like the *gstreamer* package, to handle media format support and sound output. Fedora software repositories offer plugin packages for these backends and for individual applications. Third parties may provide additional plugins to add even greater capabilities.

16. Games and Entertainment



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

Fedora provides a selection of games that cover a variety of genres. Users can install a small package of games for GNOME (called *gnome-games*) and KDE (*kdegames*). There are also many additional games that span every major genre available in the repositories.

The Fedora Project website features a section dedicated to games that details many of the available games, including overviews and installation instructions. For more information, refer to <http://fedoraproject.org/wiki/Games>.

For a list of other games that are available for installation, use the **Pirut** graphical utility (**ApplicationsAdd/Remove Software**), or via the command line:

```
yum groupinfo "Games and Entertainment"
```

For help using **yum** to install the assorted game packages, refer to the guide available at:

<http://docs.fedoraproject.org/yum/>

16.1. Haxima

Fedora 7 includes version 0.5.6 of the Nazghul old-school role playing game engine and its companion game Haxima. This version is not compatible with saved games from previous Nazghul versions, so those with Haxima games in progress need to restart their games after updating to Fedora 7.

17. Virtualization



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

Virtualization in Fedora 7 supports both Xen and KVM virtualization platforms. The `libvirt` API and its corresponding tools, **virt-manager** and **virsh**, have been updated to support both KVM and Xen. Users can choose which virtualization platform to install, and use the same tools without regard to that choice.

Xen in Fedora 7 is based on version 3.1.0.

KVM in Fedora 7 is based on version 19-1.

For more information on the differences between Xen and KVM, refer to <http://virt.kernelnewbies.org/TechComparison>. For more information on installing and using virtualization in Fedora 7, refer to <http://fedoraproject.org/wiki/Docs/Fedora7VirtQuickStart>.

17.1. Types of Virtualization

Using Xen 3.0.4, both paravirtualization and full virtualization can be implemented. Under KVM, only full virtualization is supported. Full virtualization requires a VT-capable processor. Paravirtualization does not require special hardware, but does require the guest OS to be modified.

17.2. Guest Operating Systems

The Fedora 7 development team has tested Xen with Fedora Core 6, Fedora 7, and Red Hat Enterprise Linux 4.5 and 5.0 guests. Other guests have not been tested. With full virtualization, users can expect reasonable success with a larger variety of operating systems, including some proprietary operating systems.

17.3. Changes to the Virtualization Packages

The following improvements have been made in the virtualization packages in Fedora 7:

- The applications **virt-manager** and **virsh** can now work with inactive domains. Previously, only **xm** could handle inactive domains.
- The mouse cursor problems with the virtual frame buffer have been fixed, for a better user experience in GUI modes.
- Miscellaneous other small improvements and fixes have been made.
- 32-bit paravirtualized guests can run on a 64-bit hypervisor.
- Fully virtualized guests support save, restore, and migration.
- When migrating guests, the guest config is saved on the destination host.
- The Xen **network-bridge** script does not use the `netloop` kernel module anymore. The default bridge device is now called `eth0` instead of `xenbr0`. The physical device is still renamed to `peth0`.
- The **virt-manager** utility provides a virtual network enabling NAT for guests on laptops, instead of the Xen **network-bridge** script.
- The **virt-manager** utility is translated into more languages.
- The **virt-manager** can add and remove disks and interfaces to existing guests.

- The **virt-manager** utility provides progress feedback when downloading images, creating disks, and starting guests.

18. X Window System (Graphics)



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

This section contains information related to the X Window System implementation, X.org, provided with Fedora.

18.1. X Configuration Changes

The X.org 7.2 X server has been modified to automatically detect and configure most hardware, eliminating the need for users or administrators to modify the `/etc/X11/xorg.conf` configuration file. The only hardware configured by default in the `xorg.conf` file written by anaconda is:

- The graphics driver
- The keyboard map

All other hardware, such as monitors (both LCD and CRT), USB mice, and touchpads should be detected and configured automatically.

The X server queries the attached monitor for supported resolution ranges, and attempts to pick the highest resolution available with the correct aspect ratio for the display. Users can set their preferred resolution in **System** → **Preferences** → **Screen Resolution**, and the default resolution for the system can be changed with **System** → **Administration** → **Display**.

If the `/etc/X11/xorg.conf` configuration file is not present, X also automatically detects the appropriate driver, and assumes a 105-key US keyboard layout.

18.2. Intel Driver Notes

Fedora 7 contains two drivers for Intel integrated graphics controllers:

- The default **i810** driver, which contains support for Intel graphics chipsets up to and including i945 and i965
- The experimental **intel** driver, which contains support for Intel graphics chipsets up to and including i945

The **i810** driver is limited to resolutions available in the BIOS. If you need support for non-standard resolutions, such as those used in some widescreen displays, you may want to switch to the **intel** driver. You may switch drivers by using **system-config-display**, available in the menus under **System** → **Administration** → **Display**.

We welcome feedback on the experimental **intel** driver. Please report success in [Bugzilla](#)⁵, attaching the full output of **lspci -vn** for your machine. Given success reports, various chipsets may be switched to use the **intel** driver by default.

18.3. Third Party Video Drivers

If you intend to use third party video drivers, refer to the Xorg third party drivers page for detailed guidelines:

<http://fedoraproject.org/wiki/Xorg/3rdPartyVideoDrivers>

19. Database Servers



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

19.1. MySQL

Fedora now provides MySQL 5.0. For a list of the enhancements provided by this version, refer to <http://dev.mysql.com/doc/refman/5.0/en/mysql-5-0-nutshell.html>.

For more information on upgrading databases from previous releases of MySQL, refer to the MySQL website at <http://dev.mysql.com/doc/refman/5.0/en/upgrade.html>.

19.1.1. DBD Driver

The MySQL DBD driver has been dual-licensed and the related licensing issues have been resolved (https://bugzilla.redhat.com/bugzilla/show_bug.cgi?id=222237). The resulting *apr-util-mysql* package is now included in the Fedora software repositories.

19.2. PostgreSQL

This release of Fedora includes PostgreSQL 8.2. For more information on this new version, refer to <http://www.postgresql.org/docs/whatsnew>.



Upgrading Databases

Before upgrading an existing Fedora system with a PostgreSQL database, it could be necessary to follow the procedure described at <http://www.postgresql.org/docs/8.1/interactive/install-upgrading.html>. Otherwise the data may be not accessible by the new version of PostgreSQL.

⁵ <http://bugzilla.redhat.com/bugzilla/>

20. Internationalization (i18n)



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

This section includes information on language support under Fedora.

20.1. Language Installation

To install additional language support from the Languages group, use **Pirut** via **Applications** → **Add/Remove Software**, or run this command:

```
su -c 'yum groupinstall <language>-support'
```

In the command above, *<language>* is one of **assamese**, **bengali**, **chinese**, **gujarati**, **hindi**, **japanese**, **kannada**, **korean**, **malayalam**, **marathi**, **oriya**, **punjabi**, **sinhala**, **tamil**, **thai**, or **telegu**.

Users upgrading from earlier releases of Fedora are strongly recommended to install *scim-bridge-gtk*, which works well with 3rd party C++ applications linked against older versions of *libstdc++*.

20.2. SCIM Input Method Defaults

The core SCIM packages are now installed by default, but the input method only starts by default on desktops running in an Asian locale (the current list is: *as*, *bn*, *gu*, *hi*, *ja*, *kn*, *ko*, *ml*, *mr*, *ne*, *or*, *pa*, *si*, *ta*, *te*, *th*, *ur*, *vi*, *zh*). You can use **im-chooser** via **System** → **Preferences** → **Personal** → **Input Method** to enable or disable SCIM on your desktop, or to select other installed input methods.

In a non-Asian locale set **Use custom input method** → **scim** in **im-chooser** and restart your desktop session to activate SCIM on your desktop by default.

When SCIM is installed, it runs by default for users of all locales. If SCIM is installed but you do not wish to run it on your desktop, disable it using **im-chooser**.

The following table lists the default trigger hotkeys for different languages:

Language	Trigger hotkeys
all	Ctrl+Space
Japanese	Zenkaku_Hankaku or Alt+`
Korean	Shift+Space or Hangu1

21. Backwards Compatibility



Latest Release Notes on the Web

These release notes may be updated. Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora.

Fedora provides legacy system libraries for compatibility with older software. This software is part of the **Legacy Software Development** group, which is not installed by default. Users who require this functionality may select this group either during installation or after the installation process is complete. To install the package group on a Fedora system, use **Applications** → **Add/Remove Software (Pirut)** or enter the following command in a terminal window:

```
su -c 'yum groupinstall "Legacy Software Development"'
```

Enter the password for the root account when prompted.

21.1. Compiler Compatibility

The *compat-gcc-34* package has been included for compatibility reasons:

<https://www.redhat.com/archives/fedora-devel-list/2006-August/msg00409.html>

22. Package Changes

For a list of which packages were updated since the previous release, refer to <http://fedoraproject.org/wiki/Docs/Beats/PackageChanges/UpdatedPackages>. You can also find a comparison of major packages between all Fedora versions at <http://distrowatch.com/fedora>.

23. Fedora Project

The goal of the Fedora Project is to work with the Linux community to build a complete, general-purpose operating system exclusively from open source software. Development is done in a public forum. The project produces releases of Fedora approximately 2 times a year, with a public release schedule available at <http://fedoraproject.org/wiki/Releases/Schedule>. The Red Hat engineering team continues to participate in building Fedora and invites and encourages more outside participation than was possible in the past. By using this more open process, we hope to provide an operating system more in line with the ideals of free software and more appealing to the open source community. For more information, refer to the Fedora Project website at <http://fedoraproject.org>.

The Fedora Project is driven by the individuals that contribute to it. As a tester, developer, documenter, or translator, you can make a difference. See <http://fedoraproject.org/wiki/Join> for details. For information on the channels of communication for Fedora users and contributors, refer to <http://fedoraproject.org/wiki/Communicate>.

In addition to the website, the following mailing lists are available:

- fedora-list@redhat.com⁶, for users of Fedora releases
- fedora-test-list@redhat.com⁷, for testers of Fedora test releases
- fedora-devel-list@redhat.com⁸, for developers, developers, developers
- fedora-docs-list@redhat.com⁹, for participants of the Documentation Project

To subscribe to any of these lists, send an email with the word "subscribe" in the subject to `<listname>-request`, where `<listname>` is one of the above list names. Alternately, you can subscribe to Fedora mailing lists through the Web interface at <http://www.redhat.com/mailman/listinfo/>.

The Fedora Project also uses several IRC (Internet Relay Chat) channels. IRC is a real-time, text-based form of communication, similar to Instant Messaging. With it, you may have conversations with

multiple people in an open channel, or chat with someone privately one-on-one. To talk with other Fedora Project participants via IRC, access the Freenode IRC network. Refer to the Freenode website at <http://www.freenode.net/> for more information.

Fedora Project participants frequent the #fedora channel on the Freenode network, while Fedora Project developers may often be found on the #fedora-devel channel. Some of the larger projects may have their own channels as well. This information may be found on the webpage for the project, and at <http://fedoraproject.org/wiki/Communicate>.

In order to talk on the #fedora channel, you need to register your nickname, or *nick*. Instructions are given when you `/join` the channel.



IRC Channels

The Fedora Project and Red Hat have no control over the Fedora Project IRC channels or their content.

24. Colophon

As we use the term, a *colophon*:

- recognizes contributors and provides accountability, and
- explains tools and production methods.

24.1. Contributors

- [Alain Portal](#) (translator - French)¹⁰
- [Amanpreet Singh Alam](#)¹¹ (translator - Punjabi)
- [Andrew Martynov](#)¹² (translator - Russian)
- [Andrew Overholt](#)¹³ (beat contributor)
- [Anthony Green](#)¹⁴ (beat writer)
- [Brandon Holbrook](#)¹⁵ (beat contributor)
- [Bob Jensen](#)¹⁶ (beat writer)
- [Chris Lennert](#)¹⁷ (beat writer)
- [Dave Malcolm](#)¹⁸ (beat writer)
- [David Eisenstein](#)¹⁹ (beat writer)
- [David Woodhouse](#)²⁰ (beat writer)
- [Deepak Bhole](#)²¹ (beat contributor)
- [Diego Burigo Zacarao](#)²² (translator - Brazilian Portuguese)
- [Dimitris Glezos](#)²³ (translator - Greek, tools)

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- [Jose Nuno Coelho Pires](#)³² (translator - Portuguese)
- [Josh Bressers](#)³³ (beat writer)
- [Karsten Wade](#)³⁴ (beat writer, editor, co-publisher)
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- [Martin Ball](#)³⁹ (beat writer)
- [Maxim Dziumanenko](#)⁴⁰ (translator - Ukrainian)
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- [Paul W. Frields](#)⁴⁴ (tools, editor)
- [Pawel Sadowski](#)⁴⁵ (translator - Polish)
- [Patrick Ernzer](#)⁴⁶ (beat contributor)
- [Rahul Sundaram](#)⁴⁷ (beat writer, editor)
- [Sam Folk-Williams](#)⁴⁸ (beat writer)
- [Sekine Tatsuo](#)⁴⁹ (translator - Japanese)
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- [Steve Dickson](#)⁵¹ (beat writer)
- [Teta Bilianou](#)⁵² (translator - Greek)

- [ThomasCanniot](#)⁵³ (translator - French)
- [Thomas Gier](#)⁵⁴ (translator - German)
- [Thomas Graf](#)⁵⁵ (beat writer)
- [Tommy Reynolds](#)⁵⁶ (tools)
- [Valnir Ferreira Jr.](#)⁵⁷ (translator - Brazilian Portuguese)
- [Will Woods](#)⁵⁸ (beat contributor)
- [Yoshinari Takaoka](#)⁵⁹ (translator, tools)
- [Yuan Yijun](#)⁶⁰ (translator - Simplified Chinese)
- [Zhang Yang](#)⁶¹ (translator - simplified Chinese)

... and many more translators. Refer to the Web-updated version of these release notes as we add translators after release:

<http://docs.fedoraproject.org/release-notes/>

24.2. Production Methods

Beat writers produce the release notes directly on the Fedora Project Wiki. They collaborate with other subject matter experts during the test release phase of Fedora to explain important changes and enhancements. The editorial team ensures consistency and quality of the finished beats, and ports the Wiki material to DocBook XML in a revision control repository. At this point, the team of translators produces other language versions of the release notes, and then they become available to the general public as part of Fedora. The publication team also makes them, and subsequent errata, available via the Web.

