Abstract

1. Welcome to Fedora ................................................................. 3
2. Release Highlights ............................................................ 4
   2.1. Fedora Tour ................................................................. 4
   2.2. New in Fedora ............................................................. 4
2.3. Road Map ................................................................. 7
3. Feedback ................................................................. 7
  3.1. Providing Feedback on Fedora Software ..................... 7
  3.2. Providing Feedback on Release Notes .......................... 7
4. Installation Notes ....................................................... 7
  4.1. Changes in Anaconda .............................................. 9
  4.2. Installation Related Issues ..................................... 9
  4.3. Upgrade Related Issues ....................................... 10
5. Architecture Specific Notes ....................................... 12
  5.1. RPM multiarch support on 64-bit platforms (x86_64, ppc64) 12
  5.2. PPC Specifics for Fedora ......................................... 12
  5.3. x86 Specifics for Fedora ......................................... 14
  5.4. x86_64 Specifics for Fedora ..................................... 15
6. Fedora Live Images ................................................... 16
  6.1. Available Images .................................................. 16
  6.2. Usage Information ............................................... 16
  6.3. USB Booting ......................................................... 17
  6.4. Differences From a Regular Fedora Install ................... 17
7. Package Notes .......................................................... 17
  7.1. PC Speaker Enabled .............................................. 17
  7.2. The cdrtools Packages is Replaced by cdrkit ................ 17
  7.3. EM8300 Drivers Default to ALSA ............................. 18
  7.4. Gaim Renamed to Pidgin ...................................... 18
  7.5. Packages with ".fc6" Tag ......................................... 18
  7.6. Perl Package Split ................................................. 18
  7.7. Zope and Plone Not Yet Available ............................. 18
  7.8. Unstable liferea x86_64 Package ............................... 19
  7.9. Xfce URL opening focus issue ................................. 19
  7.10. System Tools ...................................................... 19
  7.11. Engineering and Scientific .................................. 19
  7.12. ATA over Ethernet ............................................. 19
  7.13. Graphics ............................................................ 20
8. Linux Kernel ............................................................ 20
  8.1. Version ............................................................... 21
  8.2. Changelog .......................................................... 21
  8.3. Kernel Flavors ..................................................... 21
  8.4. Reporting Bugs ................................................... 22
  8.5. Preparing for Kernel Development ............................ 22
9. Fedora Desktop ......................................................... 22
  9.1. Localized Common User Directories (xdg-user-dirs) ....... 22
  9.2. GNOME ............................................................ 23
  9.3. KDE ................................................................. 23
  9.4. Web Browsers ..................................................... 23
  9.5. Mail Clients ........................................................ 23
  9.6. Liberation Fonts .................................................. 23
10. File Systems .......................................................... 24
11. Mail Servers .......................................................... 25
  11.1. Sendmail .......................................................... 25
  11.2. exim-sa ............................................................. 25
12. Development .......................................................... 25
  12.1. Tools ................................................................. 25
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)

**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 users 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.


• 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.
Release Notes

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.org

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:

```bash
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


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 relabelling.

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:
Upgrade Related Issues

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:
5. Architecture Specific Notes

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](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](mailto:fedora-ppc@lists.fedoraproject.org) or the [#fedora-ppc](https://webchat.freenode.net/#fedora-ppc) channel on [FreeNode](https://freenode.net).

• **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

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/](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/


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.


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:

```xml
<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/](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 website:

http://www.kernel.org/

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

```
rpm -qpl 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

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 dnl 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 milters 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:


12. Development

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


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* (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.

---

*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/](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

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](http://fedoraproject.org/wiki/SELinux)
- Troubleshooting tips: [http://fedoraproject.org/wiki/SELinux/Troubleshooting](http://fedoraproject.org/wiki/SELinux/Troubleshooting)
- Details of confined domains: [http://fedoraproject.org/wiki/SELinux 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.


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

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:

```bash
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.


### 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/](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/](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](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](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](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](http://www.postgresql.org/docs/whatsnew).

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20. Internationalization (i18n)

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:

<table>
<thead>
<tr>
<th>Language</th>
<th>Trigger hotkeys</th>
</tr>
</thead>
<tbody>
<tr>
<td>all</td>
<td>Ctrl+Space</td>
</tr>
<tr>
<td>Japanese</td>
<td>Zenkaku_Hankaku or Alt+`</td>
</tr>
<tr>
<td>Korean</td>
<td>Shift+Space or Hangul</td>
</tr>
</tbody>
</table>

21. Backwards Compatibility

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:


### 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.com**, for users of Fedora releases
- **fedora-test-list@redhat.com**, for testers of Fedora test releases
- **fedora-devel-list@redhat.com**, for developers, developers, developers
- **fedora-docs-list@redhat.com**, 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)
- Amanpreet Singh Alam (translator - Punjabi)
- Andrew Martynov (translator - Russian)
- Andrew Overholt (beat contributor)
- Anthony Green (beat writer)
- Brandon Holbrook (beat contributor)
- Bob Jensen (beat writer)
- Chris Lennert (beat writer)
- Dave Malcolm (beat writer)
- David Eisenstein (beat writer)
- David Woodhouse (beat writer)
- Deepak Bhole (beat contributor)
- Diego Burigo Zacarao (translator - Brazilian Portuguese)
- Dimitris Glezos (translator - Greek, tools)
Release Notes

- **Domingo Becker** (translator - Spanish)
- **Francesco Tombolini** (translator - Italian)
- **Gavin Henry** (beat writer)
- **Hugo Cisneiros** (translator - Brazilian Portuguese)
- **Igor Miletic** (translator - Serbian)
- **Jeff Johnston** (beat contributor)
- **Jens Petersen** (beat writer)
- **Joe Orton** (beat writer)
- **Jose Nuno Coelho Pires** (translator - Portuguese)
- **Josh Bressers** (beat writer)
- **Karsten Wade** (beat writer, editor, co-publisher)
- **Kyu Lee** (beat contributor)
- **Licio Fonseca** (translator - Brazilian Portuguese)
- **Luya Tshimbalanga** (beat writer)
- **Magnus Larsson** (translator - Swedish)
- **Martin Ball** (beat writer)
- **Maxim Dziumanenko** (translator - Ukrainian)
- **Nikos Charonitakis** (translator - Greek)
- **Orion Poplawski** (beat contributor)
- **Patrick Barnes** (beat writer, editor)
- **Paul W. Frields** (tools, editor)
- **Pawel Sadowski** (translator - Polish)
- **Patrick Ernzer** (beat contributor)
- **Rahul Sundaram** (beat writer, editor)
- **Sam Folk-Williams** (beat writer)
- **Sekine Tatsu** (translator - Japanese)
- **Simos Xenitellis** (translator - Greek)
- **Steve Dickson** (beat writer)
- **Teta Bilianou** (translator - Greek)
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.

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

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