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# Fedora 11

## Release Notes

Release Notes for Fedora 11



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## 1. Welcome to Fedora 11

### 1.1. Fedora 11 Overview

As always, Fedora continues to develop ([http://www.fedoraproject.org/wiki/Red\\_Hat\\_contributions](http://www.fedoraproject.org/wiki/Red_Hat_contributions)) and integrate the latest free and open source software (<http://www.fedoraproject.org/wiki/Features>). The following sections provide a brief overview of major changes from the last release of Fedora. For more details about other features that are included in Fedora 11, refer to their individual wiki pages that detail feature goals and progress:

<http://www.fedoraproject.org/wiki/Releases/11/FeatureList>

Throughout the release cycle, there are interviews with the developers behind key features giving out the inside story:

<http://www.fedoraproject.org/wiki/Interviews>

The following are major features for Fedora 11:

- Automatic font and mime-type installation - PackageKit was introduced in Fedora 9 as a cross-distro software management application for users. The capabilities it offers thanks to integration with the desktop became more visible in Fedora 10, where it provided automatic codec installation. Now in Fedora 11, PackageKit extends this functionality with the ability to automatically install fonts where needed for viewing and editing documents. It also includes the capability to install handlers for specific content types as needed. Some work is still being completed to provide automatic installation of applications.
- Volume Control - Currently, people using Fedora have to go through many levels of mixers in different applications to properly set up sound sources. These are all exposed in the volume control on the desktop, making for a very confusing user experience. PulseAudio allows us to unify the volume controls in one interface that makes setting up sound easier and more pain-free.

- Intel, ATI and Nvidia kernel modsetting - Fedora 10 provided the first steps by a major distribution into using the kernel modesetting (KMS) feature to speed up graphical boot. We indicated at the time that we would be adding greater support for additional video cards as time went on. KMS originally was featured only on some ATI cards. In Fedora 11, this work is extended to include many more video cards, including Intel and Nvidia, and additional ATI as well. Although not fully complete, we have increased enormously the video card coverage of the KMS feature, with more to come.
- Fingerprint - Extensive work has been done to make fingerprint readers easy to use as an authentication mechanism. Currently, using fingerprint readers is a bit of a pain, and installing/using fprint and its pam module take more time than should ever be necessary. The goal of this feature is to make it painless by providing all the required pieces in Fedora, together with nicely integrated configuration. To enable this functionality the user will register their fingerprints on the system as part of user account creation. After doing so, they will easily be able to log in and authenticate seamlessly using a simple finger swipe. This greatly simplifies one element of identity management and is a great step in the evolution of the linux desktop.
- IBus input method system - ibus has been rewritten in C and is the new default input method for Asian languages. It allows input methods to be added and removed dynamically during a desktop session. It supports Chinese (pinyin, libchewing, tables), Indic (m17n), Japanese (anthy), Korean (libhangul), and more. There are still some features missing compared to scim so testing is strongly encouraged and reports of problems and suggestions for improvements welcome.
- Presto - Normally when you update a package in Fedora, you download an entire replacement package. Most of the time (especially for the larger packages), most of the actual data in the updated package is the same as the original package, but you still end up downloading the full package. Presto allows you to download the difference (called the *delta*) between the package you have installed and the one you want to update to. This can reduce the download size of updates by 60% – 80%. It is not enabled by default for this release. To make use of this feature you must install the **yum-presto** plugin with **yum install yum-presto**.

For further details refer to the [Presto](#)<sup>1</sup> wiki page

Some other features in this release include:

- Ext4 filesystem - The ext3 file system has remained the mature standard in Linux for a long time. The ext4 file system is a major update that has an improved design, even better performance and reliability, support for much larger storage, and very fast file system checks and file deletions. It is now the default filesystem for new installations.
- Virt Improved Console - In Fedora 10 and earlier the virtual guest console is limited to a screen resolution of 800x600. In Fedora 11 the goal is to have the screen default to at least 1024x768 resolution out of the box. New installations of F11 provide the ability to use other interface devices in the virtual guest, such as a USB tablet, which the guest will automatically detect and configure. Among the results is a mouse pointer that tracks the local client pointer one-for-one, and providing expanded capabilities.
- MinGW (Windows cross compiler) - Fedora 11 provides MinGW, a development environment for Fedora users who wish to cross-compile their programs to run on Windows without having to use Windows. In the past developers have had to port and compile all of the libraries and tools they have needed, and this huge effort has happened independently many times over. MinGW eliminates duplication of work for application developers by providing a range of libraries and development tools already ported to the cross-compiler environment. Developers don't have to recompile the application stack themselves, but can concentrate just on the changes needed to their own application.

Features for Fedora 11 tracked on the feature list page:

<http://www.fedoraproject.org/wiki/Releases/11/FeatureList>

## 1.2. Hardware Requirements

### 1.2.1. Processor and memory requirements for PPC Architectures

- Minimum CPU: PowerPC G3 / POWER3
- Fedora 11 supports the New World generation of Apple Power Macintosh, shipped from circa 1999 onward. Although Old World machines should work, they require a special bootloader which is not included in the Fedora distribution. Fedora has also been installed and tested on POWER5 and POWER6 machines.
- Fedora 11 supports pSeries and Cell Broadband Engine machines.
- Fedora 11 also supports the Sony PlayStation 3 and Genesi Pegasos II and Efika.
- Fedora 11 includes new hardware support for the P.A. Semiconductor 'Electra' machines.
- Fedora 11 also includes support for Terrasoft Solutions powerstation workstations.
- Recommended for text-mode: 233 MHz G3 or better, 128MiB RAM.
- Recommended for graphical: 400 MHz G3 or better, 256MiB RAM.

### 1.2.2. Processor and memory requirements for x86 Architectures

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 11 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

### 1.2.3. Processor and memory requirements for x86\_64 architectures

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

### 1.2.4. Hard disk space requirements for all architectures

The complete packages can occupy over 9 GB of disk space. Final size is entirely determined by the installing spin and the packages selected during installation. 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 a larger installation.

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

### 1.3. Welcome to Fedora

Fedora is a Linux-based operating system that showcases the latest in free and open source software. Fedora is always free for anyone to use, modify, and distribute. It is built by people across the globe who work together as a community: the Fedora Project. The Fedora Project is open and anyone is welcome to join. The Fedora Project is out front for you, leading the advancement of free, open software and content.



#### Note

Visit <http://docs.fedoraproject.org/release-notes/> to view the latest release notes for Fedora, especially if you are upgrading. If you are migrating from a release of Fedora older than the immediately previous one, you should refer to older Release Notes for additional information.

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/Bugs\\_and\\_feature\\_requests](http://fedoraproject.org/wiki/Bugs_and_feature_requests) for more information about bug and feature reporting. 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>)

### 1.4. Common bugs

No software is without bugs. One of the features of free and open source software is the ability to report bugs, helping to fix or improve the software you use.

A list of common bugs is maintained for each release by the Fedora Project as a good place to start when you are having a problem that might be a bug in the software:

[https://fedoraproject.org/wiki/Common\\_F11\\_bugs](https://fedoraproject.org/wiki/Common_F11_bugs)

### 1.5. Feedback

Thank you for taking the time to provide your comments, suggestions, and bug reports to the Fedora community; this helps improve the state of Fedora, Linux, and free software worldwide.

### 1.5.1. Providing Feedback on Fedora Software

To provide feedback on Fedora software or other system elements, please refer to [http://fedoraproject.org/wiki/Bugs\\_and\\_feature\\_requests](http://fedoraproject.org/wiki/Bugs_and_feature_requests). A list of commonly reported bugs and known issues for this release is available from [http://fedoraproject.org/wiki/Common\\_F11\\_bugs](http://fedoraproject.org/wiki/Common_F11_bugs).

### 1.5.2. Providing Feedback on Release Notes

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

- If you have a Fedora account, edit content directly at [http://fedoraproject.org/wiki/Documentation\\_Beats](http://fedoraproject.org/wiki/Documentation_Beats).
- 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.
- Email [relnotes@fedoraproject.org](mailto:relnotes@fedoraproject.org).

## 2. Installation Notes



### Note

To learn how to install Fedora, refer to <http://docs.fedoraproject.org/install-guide/><sup>3</sup>. If you encounter a problem or have a question during installation that is not covered in these release notes, refer to <http://www.fedoraproject.org/wiki/FAQ><sup>4</sup> and <http://www.fedoraproject.org/wiki/Bugs/Common><sup>5</sup>.

**Anaconda** is the name of the Fedora installer. This section outlines issues related to **anaconda** and installing Fedora 11.

### 2.1. Installation in Text Mode



### Note

We recommend that you use the graphical installer to install Fedora on your computer wherever possible. If you are installing Fedora on a system that lacks a graphical display, consider performing the installation over a VNC connection (see "Chapter 12. Installing Through VNC" in the *Fedora 11 Installation Guide*). If your system has a graphical display, but graphical installation fails, try booting with the **xdriver=vesa** option (see "Chapter 9. Boot Options" in the *Fedora 11 Installation Guide*) or with the **Install system with basic video driver** option when booting from the Fedora 11 Distro DVD.

The text-mode installation option in Fedora 11 is significantly more streamlined than it was in earlier versions. Text-mode installation now omits the more complicated steps that were previously part of the process, and provides you with an uncluttered and straightforward experience.

These steps are now automated in text mode:

### Package selection

**Anaconda** now automatically selects packages only from the base and core groups. These packages are sufficient to ensure that the system is operational at the end of the installation process, ready to install updates and new packages.

### Advanced partitioning

**Anaconda** still presents you with the initial screen from previous versions that allows you to specify where **anaconda** should install Fedora on your system. You can choose to use a whole drive, to remove existing Linux partitions, or to use the free space on the drive. However, **anaconda** now automatically sets the layout of the partitions and does not ask you to add or delete partitions or file systems from this basic layout. If you require a customized layout at installation time, you should perform a graphical installation over a VNC connection or a kickstart installation. More advanced options yet, such as logical volume management (LVM), encrypted filesystems, and resizable filesystems are still only available only in graphical mode and kickstart.

### Bootloader configuration

**Anaconda** now performs bootloader configuration automatically.

## 2.1.1. Kickstart Installations in Text Mode

Text-mode installations using kickstart are carried out in the same way that they were in previous versions. However, because package selection, advanced partitioning, and bootloader configuration are now automated in text mode, **anaconda** cannot prompt you for information that it requires during these steps. You must therefore ensure that the kickstart file includes the packaging, partitioning, and bootloader configurations. If any of this information is missing, **anaconda** will exit with an error message.

## 2.2. Upgrade Notes

Upgrading from Fedora 9 directly to Fedora 11 using **yum** is not possible, you must upgrade to Fedora 10 first, then upgrade to Fedora 11. See <http://fedoraproject.org/wiki/YumUpgradeFaq><sup>6</sup> for more information. You can also use **preupgrade** to upgrade directly to Fedora 11 using **anaconda**, minimizing the system downtime by downloading the packages in advance.

Some modified configuration files will be replaced by their original versions during the upgrade. Your modified versions of these configuration files will be saved as **\*.rpmsave** files in that case.

## 2.3. Boot Menu

The boot menu for the Fedora Distro DVD includes a new option: **Install system with basic video driver**. This option boots the system with the generic vesa driver (using the **xdriver=vesa** boot option) and allows you to use Fedora's graphical installation mode even when **anaconda** cannot load the correct driver for your video card.

## 2.4. Updated boot .iso

The Fedora installation CDs and DVD provide you with an image file, **boot.iso**, that you can burn to a CD and use to boot a system and start the installation process. Typically, you would do this prior to installing Fedora from a local hard drive or from a location on a network. You can now use the CD produced from the **boot.iso** image to start installation on a system that uses Unified Extensible

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<sup>6</sup> <http://fedoraproject.org/wiki/YumUpgradeFaq>



Firmware Interface (UEFI). CDs produced from older versions of **boot.iso** only worked with systems that used Basic Input Output System (BIOS).

## 3. Architecture Specific Notes

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

### 3.1. x86 Specifics for Fedora

By default, the PAE kernel is used on 32-bit hardware, where supported by the hardware.

## 4. Changes in Fedora for Desktop Users

### 4.1. Fedora Desktop

#### 4.1.1. GNOME

Gnome-panel

Previously, users could move the gnome-panel to from one part of the desktop to another by clicking on the gnome-panel, dragging it to another location while holding down the mouse button, and releasing the mouse button. Now, users must also hold down a key on the keyboard while moving the gnome-panel. By default, this modifier key is the Alt key, but users may change it to any other key by using the windows preference tool (**System>Preferences>Windows**).

This change in behavior greatly reduces the chances of a user accidentally moving the panel, and makes moving the gnome-panel the same as moving windows in GNOME.

Bluetooth

The *bluez-gnome* Bluetooth management tools was replaced by *gnome-bluetooth*. This adds easy access to switching Bluetooth on/off for laptops, and an easier to use new device setup assistant , as well as the ability to connect to input and audio devices.

The ObexFTP browsing code now has full write support, and new support for the Wacom Bluetooth tablet is included.

Bluetooth audio support is included in gnome-bluetooth and pulseaudio as a technology preview.

Root User disabled for GNOME Display Manager

Root user is disabled by default for GNOME Display Manager (GDM) from Fedora 10 onwards. We strongly recommend that you avoid logging in as root user and instead use **su -c** or **sudo** for running commands requiring root access. If you wish to revert this setting however, refer to [http://fedoraproject.org/wiki/Enabling\\_Root\\_User\\_For\\_GNOME\\_Display\\_Manager](http://fedoraproject.org/wiki/Enabling_Root_User_For_GNOME_Display_Manager)<sup>7</sup>.

#### 4.1.2. KDE

This release features KDE 4.2.2. Compatibility libraries from KDE 3.5.10 are provided for the remaining KDE 3 applications.

<http://kde.org/announcements/announce-4.2.2.php>

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<sup>7</sup> [http://fedoraproject.org/wiki/Enabling\\_Root\\_User\\_For\\_GNOME\\_Display\\_Manager](http://fedoraproject.org/wiki/Enabling_Root_User_For_GNOME_Display_Manager)

KDE 4.2 is the latest release series of KDE 4 and provides several new features over 4.0 and 4.1, in particular most of the features known from KDE 3 and several new ones. KDE 4.2.2 is a bugfix release from the KDE 4.2 release series.

Fedora 11 includes a snapshot of the NetworkManager plasmoid *kde-plasma-networkmanagement*, which replaces the KDE 3 *knetworkmanager* snapshot in Fedora 10. As it was not considered ready for production use, the KDE Live images still use *nm-applet* from *NetworkManager-gnome* instead, as in Fedora 8, 9 and 10. The *gnome-keyring-daemon* facility saves passwords for *nm-applet*. If you wish to try *kde-plasma-networkmanagement*, it can be installed from the repository.

### Software Updates (PackageKit)

As the default updater in KDE is *kpackagekit* (since Fedora 10), the *gnome-packagekit* updater is no longer set up to run in KDE (as of Fedora 11). This avoids the situation where both update applets were trying to run at the same time. Users of Fedora 9 or 10 who were running *gnome-packagekit* under KDE should install *kpackagekit* when upgrading to Fedora 11.

### Desktop Effects

KDE 4.2 improves support for desktop effects in KWin, the KDE window manager, in particular, they should be more reliable, and more effects are provided, including the famous Cube effect known from Compiz. However, desktop effects are still disabled by default in Fedora due to stability and reliability concerns. Desktop effects can be enabled in the Desktop applet of the System Settings application.

Alternatively, Compiz may also be used with KDE. It can be installed from the repository by installing the *compiz-kde* package. Please note, however, that enabling desktop effects in KWin is the preferred way to use desktop effects in KDE 4.

### Package and Application Changes

- *kde-plasma-networkmanagement* replaces *knetworkmanager*. It has also been made available as an update for Fedora 10, but does not replace *knetworkmanager* there. Please note that the **nm-applet** from *NetworkManager-gnome* is still the default **NetworkManager** applet in Fedora 11.
- A KDE frontend for *PolicyKit* is now provided in the new *PolicyKit-kde* package. It replaces *PolicyKit-gnome* on the KDE Live CD. It includes both an authentication agent and an editor for authorization settings (**polkit-kde-authorization**).
- As KDE 4.2 includes a power management service, **PowerDevil**, as part of *kdebase-workspace*, the old *kpowersave* and *guidance-power-manager* packages have been dropped. Users upgrading from earlier Fedora releases should add the **Battery Status** plasmoid to their panel, which serves as a frontend for **PowerDevil**.
- The *kdeartwork* package has been split into subpackages to allow installing specific artwork items without the huge wallpapers and sounds. In Fedora 9 and 10 updates, these subpackages are required by the main package to ensure upgrade paths. In Fedora 11, these artificial dependencies have been removed, thus *kdeartwork-wallpapers* and *kdeartwork-sounds* can be installed or removed separately.

In addition, the following changes made since the Fedora 10 release, which have been backported to Fedora 10 updates, are also part of Fedora 11:

- KDE has been upgraded from version 4.1.2 to 4.2.2.
- *qt* and *PyQt4* have been upgraded from 4.4 to 4.5.

- The *phonon* library has been upgraded from 4.2 to 4.3.
- A *kdepim3* compatibility package, providing the KDE 3 version of *libkcal*, has been added to provide iCal support for taskjuggler again.
- A new subpackage *kdebase-workspace-googlegadgets* provides support for Google Gadgets in Plasma.
- The former package *qgtkstyle* is now part of *qt*.
- The former package *kde-plasma-lancelot* is now part of *kdeplasma-addons*.
- New *system-config-printer-kde* and *kdeutils-printer-applet* subpackages have been split out from *kdeadmin* and *kdeutils*, respectively.
- The subpackages *kdeartwork-extras* and *kdeartwork-icons* of *kdeartwork* have been renamed to *kdeartwork-screensavers* and *kdeclassic-icon-theme*, respectively, in order to better reflect their current contents.
- The Akonadi framework is now used in several kdepim applications. Some changes have been made to accommodate it:
  - The *akonadi* package now requires *mysql-server* so the default configuration works. The MySQL server does not have to be configured, as Akonadi starts up a per-user instance of *mysqld* with a default server configuration. It is also possible to set up Akonadi to use a manually-configured systemwide or remote MySQL server instance, however this is not the default.
  - A *kdepimlibs-akonadi* subpackage has been split out from *kdepimlibs* because some libraries from *kdepimlibs* are also used in non-PIM applications. The split allows installing these applications without installing Akonadi and MySQL.
- *kde-l10n* supports more languages.

## 4.2. Networking

### DNSSEC

The *bind* and *unbound* (recursive DNS servers) now enable DNSSEC validation in their default configuration. DNSSEC Lookaside Verification (DLV) is also enabled with the *dlv.sc.org* DLV Registry. This behavior can be modified in */etc/sysconfig/dnssec* by changing the DNSSEC and DLV settings.

With DNSSEC enabled, when a domain supplies DNSSEC data (such as .gov, .se, the ENUM zone and other TLD's) then that data will be cryptographically validated on the recursive DNS server. If validation fails due to attempts at cache poisoning, for example via a Kaminsky Attack, then the end user will not be given this forged/spoofed data. DNSSEC deployment is gaining speed rapidly, and is a crucial and logical step to make the Internet more secure for end users. DLV is used to add DNSSEC signed domains into TLD's that themselves are not yet signed, such as .com and .org.

### TigerVNC

TigerVNC is used as default VNC project. Package names were changed to *tigervnc*, *tigervnc-server* and *tigervnc-server-module*. Binary names are the same as in previous versions. The **libvnc.so** module has been moved to the **tigervnc-server-module** subpackage. Otherwise there should be no difference.

### 4.3. Printing

In this release, system-config-printer uses **PolicyKit** to control access to restricted cups functionality. The following functions are controlled via **PolicyKit** policies currently:

- add/remove/edit local printers
- add/remove/edit remote printers
- add/remove/edit classes
- enable/disable printer
- set printer as default printer
- get/set server settings
- restart/cancel/edit a job owned by another user
- restart/cancel/edit a job

### 4.4. International Language Support

This section includes information on language support under Fedora.

- Localization (translation) of Fedora is coordinated by the Fedora Localization Project -- <http://fedoraproject.org/wiki/L10N>
- Internationalization of Fedora is maintained by the Fedora Internationalization Project -- <http://fedoraproject.org/wiki/I18N>

#### 4.4.1. Language Coverage

Fedora features a variety of software that is translated in many languages. For a list of languages refer to the translation statistics for the Anaconda module, which is one of the core software applications in Fedora.

- <http://translate.fedoraproject.org/languages>
- <http://translate.fedoraproject.org/module/anaconda>

##### 4.4.1.1. Language Support Installation

To install langpacks and additional language support from the Languages group, 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, telegu, thai, and so on.

##### 4.4.1.2. Online Translation

Fedora uses the [Transifex](http://transifex.org/)<sup>8</sup> online tool to facilitate contributing translations of Fedora-hosted and other upstream projects by numerous translators.

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<sup>8</sup> <http://transifex.org/>

Using the [online web tool](http://translate.fedoraproject.org/)<sup>9</sup>, translators can contribute directly to any registered upstream project through one translator-oriented web interface. Developers of projects with no existing translation community can easily reach out to Fedora's established community for translations. In turn, translators can reach out to numerous projects related to Fedora to easily contribute translations.

<https://translate.fedoraproject.org/submit>

## 4.4.2. Fonts

Fonts for most languages are installed by default on the desktop to give good default language coverage.

### 4.4.2.1. Default Language for Han Unification

When GTK-based applications are not running in a Chinese, Japanese, or Korean (CJK) locale, Chinese characters (that is, Chinese Hanzi, Japanese Kanji, or Korean Hanja) may render with a mixture of Chinese, Japanese, and Korean fonts depending on the text. This happens when Pango does not have sufficient context to know which language is being used, due to the Han unification in Unicode. The current default font configuration seems to prefer Chinese fonts. If you normally want to use Japanese or Korean say, you can tell Pango to use it by default by setting the **PANGO\_LANGUAGE** environment variable. For example...

```
export PANGO_LANGUAGE=ja
```

...tells Pango rendering to assume Japanese text when it has no other indications.

### 4.4.2.2. Japanese

The *fonts-japanese* package has been renamed to *japanese-bitmap-fonts*.

### 4.4.2.3. Khmer

Khmer OS Fonts *khmeros-fonts* have been added to Fedora for Khmer coverage in this release.

### 4.4.2.4. Korean

The *un-core-fonts* packages replaces *baekmuk-ttf-fonts* as the new Hangul default fonts. *un-extra-fonts* packages have been added.

### 4.4.2.5. Complete List of Changes

All fonts changes are listed on their dedicated page: [http://fedoraproject.org/wiki/Fonts\\_inclusion\\_history#F11](http://fedoraproject.org/wiki/Fonts_inclusion_history#F11)



#### Note

Fonts in Fedora: The *Fonts SIG*<sup>10</sup> takes loving care of *Fedora fonts*<sup>11</sup>. Please *join*<sup>12</sup> this special interest group if you are interested in *creating*<sup>13</sup>, *improving*<sup>14</sup>, *packaging*<sup>15</sup>, or just *suggesting*<sup>16</sup> a font. Any help will be appreciated.

<sup>9</sup> <http://translate.fedoraproject.org/>

### 4.4.3. Input Methods

The **yum** group called input-methods (Input Methods) is installed by default providing standard input methods for many languages. This allows turning on the default input method system and immediately having the standard input methods for most languages available.

#### 4.4.3.1. iBus

Fedora 11 includes iBus, a new input method system that has been developed to overcome some of the architectural limitations of SCIM. <http://code.google.com/p/ibus>

It provides a number of input method engines and immodules:

- ibus-anthy (Japanese)
- ibus-chewing (Traditional Chinese)
- ibus-gtk (GTK+ immodule)
- ibus-hangul (Korean)
- ibus-m17n (Indic and many other languages)
- ibus-pinyin (Simplified Chinese)
- ibus-qt (Qt immodule)
- ibus-table (Chinese, etc.)

The first time ibus is run it is necessary to choose which input method engines are needed in the Preferences.

We encourage people upgrading from earlier releases to install iBus, turn it on with im-chooser, and test it for their language, and report any problems in Bugzilla.

The following hotkeys are available by default:

Language	Hotkey
general	Control + Space
Japanese	Zenkaku_Hankaku; Alt+`; Alt+Zenkaku_Hankaku
Korean	Hangul; Alt+Alt_R+Release

Table 1. Hotkeys

These are all defined by default for convenience: individual users may prefer to remove some of them and also add their own ibus hotkeys in ibus-setup.

#### 4.4.3.2. im-chooser and imsettings

Input Methods only start by default on desktops running in an Asian locale (specifically for the following locale: as, bn, gu, hi, ja, kn, ko, ml, mr, ne, or, pa, si, ta, te, th, ur, vi, zh). Use im-chooser via System > Preferences > Personal > Input Method to enable or disable input method usage on your desktop at any time with imsettings.

Under imsettings framework the GTK\_IM\_MODULE environment variable is no longer needed by default.

#### 4.4.3.3. Indic Onscreen Keyboard

iok is an onscreen virtual keyboard for Indian languages, which allows input using Inscript keymap layouts and other 1:1 key mappings. For more information refer to the homepage: <https://fedorahosted.org/iok>

#### 4.4.4. Indic Collation Support

Fedora 11 includes sorting support for Indic languages. This support fixes listing and order of menus in these languages, representing them in sorted order and making it easy to find desired elements. These languages are covered by this support:

- Gujarati
- Hindi
- Kannada
- Kashmiri
- Konkani
- Maithili
- Marathi
- Nepali
- Punjabi
- Sindhi
- Telugu

### 4.5. Multimedia

#### Freedom

Fedora 11 ships with support for Ogg Vorbis, Theora, FLAC, and Speex, giving you the freedom to watch or listen to your media in a free format. Not only are they all open source but no codec that ships with Fedora contains any harmful patents or licensing fees.

#### MP3 and Flash

Because of patent issues Fedora can not ship with an MP3 decoder, however if you are unable to convert to a patent free codec, such as Ogg Vorbis, Fluendo offers an MP3 decoder that follows all legal requirements set by the patent holder. Visit Fluendo's website (<http://www.fluendo.com/>) for more information.

Abode's Flash player is proprietary software and Fedora recommends installing either *swfdec* or *gnash* from the repositories.

#### Volume Control

An updated volume control manager application provides you with more control over your audio preferences. Better integrated with PulseAudio, you can now control individual application inputs and outputs along with the sources and destinations for the audio.

Using the new **PulseAudio**-based volume applet, there is no way to adjust ALSA sound levels. If they are set too low, raising the **PulseAudio** sound levels may not work acceptably. For this contingency, the old **gstreamer**-based volume application is also available by default. It is available under the name **Advanced Volume Control**, in the **System>Preferences** menu section. You will also need to use this application if you need to select an input channel for recording (for instance, line-in or mic-in).

For more information refer to <http://fedoraproject.org/wiki/Multimedia><sup>17</sup>.

## 4.6. Games and Entertainment

*Battle for Wesnoth*<sup>18</sup> (*wesnoth*) has been updated to the new 1.6 release.

## 4.7. Fedora Live Images

The *Games Spin*<sup>19</sup> provides a Live DVD with a sampling of the best games available in Fedora.

For electronic designers, the *Fedora Electronic Lab*<sup>20</sup> spin provides a complete toolchain for IC designers.

The Fedora Spins SIG (<http://fedoraproject.org/wiki/SIGs/Spins>) is continuously developing specialized Live images for specific purposes.

# 5. Changes in Fedora for System Administrators

## 5.1. Fedora 11 Boot Time

To reduce boot time, the `setroubleshootd` daemon and several small bottlenecks were removed. Regressions in using the `readahead` service were removed by setting low I/O priorities. `Readahead` now profiles the system every time the RPM database changes.

## 5.2. Security

This section highlights various security items from Fedora.

### 5.2.1. Fingerprint Readers

Fingerprint readers are now better integrated with Fedora 11. GNOME users can easily setup fingerprint authentication using *gnome-about-me*, and will allow the ability to login from both *gdm* and *gnome-screensaver*.

For further details refer to the *Configuring a fingerprint reader*<sup>21</sup> wiki page

### 5.2.2. DNSSEC

DNSSEC (DNS SECurity) is mechanism which provides integrity and authenticity of DNS data.

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<sup>17</sup> <http://fedoraproject.org/wiki/Multimedia>

<sup>18</sup> <http://www.wesnoth.org/>

<sup>19</sup> [https://fedoraproject.org/wiki/Games\\_Spin](https://fedoraproject.org/wiki/Games_Spin)

<sup>20</sup> <http://chitlesh.fedorapeople.org/FEL/>

<sup>21</sup> [https://fedoraproject.org/wiki/Configuring\\_a\\_fingerprint\\_reader](https://fedoraproject.org/wiki/Configuring_a_fingerprint_reader)



### 5.2.3. System Security Services Daemon

The SSSD is intended to provide several key feature enhancements to Fedora. The first being the addition of offline caching for network credentials. Authentication through the SSSD will potentially allow LDAP, NIS, and FreeIPA services to provide an offline mode, to ease the use of centrally managing laptop users.

The LDAP features will also add support for connection pooling. All communication to the ldap server will happen over a single persistent connection, reducing the overhead of opening a new socket for each request. The SSSD will also add support for multiple LDAP/NIS domains. It will be possible to connect to two or more LDAP/NIS servers acting as separate user namespaces.

### 5.2.4. SHA-2 support

Fedora now uses the SHA-256 digest algorithm for data verification and authentication in more places than before, migrating from the weaker SHA-1 and MD5 algorithms. Where possible, the migration was transparent; in other places the default configuration was changed or manual configuration is necessary to use the stronger algorithms.

## 5.3. Virtualization

Virtualization in Fedora 11 includes major changes, and new features, that continue to support KVM, Xen, and many other virtual machine platforms.

### 5.3.1. Improved VNC Authentication for Virtual Machine Management

Fedora 11 introduces the ability to use the SASL protocol for authenticating VNC connection to KVM and QEMU virtual machines. SASL is a pluggable system, allowing many different authentication mechanisms to be configured without changing the application code. The use of SASL, in combination with existing TLS encryption support, will allow clients like **vinagre**, **virt-viewer** and **virt-manager** to securely connect to remote virtual machine consoles hosted on Fedora servers. In environments where Kerberos is deployed, this further allows for secure single sign on to the VNC server. This new authentication capability obsoletes the traditional VNC password scheme which is not sufficiently secure.

For further details refer to the [Virtualization VNC Authentication](#)<sup>22</sup> wiki page

### 5.3.2. Improved Graphical Console for Virtual Machines

Previous Fedora virtual guest consoles were limited to a screen resolution of 800x600, and the PS2 mouse pointer operated in relative coordinate mode. This prevented the guest pointer from tracking the local client pointer one for one.

Fedora 11 provides more accurate mouse pointer positioning and higher screen resolutions for virtual machine consoles. Fedora 11 guests default to a screen resolution of at least 1024x768, and are provided with a USB tablet in absolute coordinate mode. This results in a mouse pointer which tracks the local client pointer one for one.

For further details refer to the [Improved Graphical Console for Virtual Guests](#)<sup>23</sup> wiki page

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<sup>22</sup> <https://fedoraproject.org/wiki/Features/VirtVNCAuth>

<sup>23</sup> <https://fedoraproject.org/wiki/Features/VirtImprovedConsole>

### 5.3.3. KVM PCI Device Assignment

Fedora 11 expands its virtualization capabilities to include KVM PCI device assignment support. KVM users can now give virtual machines exclusive access to physical PCI devices using Fedora's virtualization tools, including the Virtual Machine Manager application.



#### Note

Hardware requirements: Intel VT-d or AMD IOMMU hardware platform support is required in order for this feature to be available.

For further details refer to the [KVM PCI Device Assignment](#)<sup>24</sup> wiki page.

### 5.3.4. KVM and QEMU merge

QEMU provides a processor and system emulator which enables users to launch guest virtual machines of the same architecture as the host machine or of a dramatically different architecture. KVM provides kernel level support for running guests of the same architecture as the host.

QEMU takes advantage of KVM to run guests directly on the hardware without any translation needed by the host, allowing much higher levels of performance.

Fedora 11 includes a merge of the *qemu* and *kvm* RPMs. The *kvm* package is now obsoleted by [pngqemu-kvm](#).<sup>25</sup> The merging of the two code bases continues upstream, but the Fedora package maintainers have chosen to merge the packages now in order to reduce the maintenance burden and provide better support.

For further details refer to the [KVM and QEMU merge](#)<sup>26</sup> wiki page

### 5.3.5. SVirt Mandatory Access Control

Fedora 11 integrates SELinux's Mandatory Access Control with Virtualization. Virtual machines can now be much more effectively isolated from the host and one another, giving the increased assurance that security flaws cannot be exploited by malicious guests.

For further details refer to the [SVirt Mandatory Access Control](#)<sup>27</sup> wiki page.

### 5.3.6. Offline Manipulation of Virtual Machines

libguestfs is a new library for accessing and modifying guest disk images. Using Linux kernel and QEMU code, libguestfs can access any type of guest filesystem that Linux and QEMU can.

The following tools are provided by libguestfs:

- *guestfish* - Provides an interactive shell for editing virtual machine filesystems and executing commands in the context of the guest.
- *virt-inspector* - Displays OS version, kernel, drivers, mount points, applications, etc. in a virtual machine.
- Bindings for OCaml, Perl, Python, Ruby, and Java programming languages.

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<sup>24</sup> [https://fedoraproject.org/wiki/Features/KVM\\_PCI\\_Device\\_Assignment](https://fedoraproject.org/wiki/Features/KVM_PCI_Device_Assignment)

<sup>25</sup> <http://admin.fedoraproject.org/pkgdb/packages/name/qemu-kvm>

<sup>26</sup> [https://fedoraproject.org/wiki/Features/KVM\\_and\\_QEMU\\_merge](https://fedoraproject.org/wiki/Features/KVM_and_QEMU_merge)

<sup>27</sup> [https://fedoraproject.org/wiki/Features/SVirt\\_Mandatory\\_Access\\_Control](https://fedoraproject.org/wiki/Features/SVirt_Mandatory_Access_Control)

For further details refer to:

- [Project page](#)<sup>28</sup>
- [Examples of guestfish usage](#)<sup>29</sup>

### 5.3.7. Other Improvements

Fedora also includes the following virtualization improvements:

#### 5.3.7.1. QEMU Updated to 0.10.0

QEMU is a generic and open source machine emulator and virtualizer.

When used as a machine emulator, QEMU can run OSes and programs made for one machine (e.g. an ARM board) on a different machine (e.g. your own PC). By using dynamic translation, it achieves very good performance.

When used as a virtualizer, QEMU achieves near native performance by executing the guest code directly on the host CPU. A host driver called the QEMU accelerator (also known as KQEMU) is needed in this case. The virtualizer mode requires that both the host and guest machine use x86 compatible processors.

New features and improvements since 0.9.1:

- TCG support - No longer requires GCC 3.x
- Kernel Virtual Machine acceleration support
- BSD userspace emulation
- Bluetooth emulation and host passthrough support
- GDB XML register description support
- Intel e1000 emulation
- HPET emulation
- VirtIO paravirtual device support
- Marvell 88w8618 / MusicPal emulation
- Nokia N-series tablet emulation / OMAP2 processor emulation
- PCI hotplug support
- Live migration and new save/restore formats
- Curses display support
- qemu-nbd utility to mount supported block formats
- Altivec support in PPC emulation and new firmware (OpenBIOS)
- Multiple VNC clients are now supported
- TLS encryption is now supported in VNC

- Many, many, bug fixes and new features

For further details refer to: <http://www.nongnu.org/qemu/about.html>

### 5.3.7.2. KVM Updated to 84

KVM (for Kernel-based Virtual Machine) is a full virtualization solution for Linux on x86 hardware.

Using KVM, one can run multiple virtual machines running unmodified Linux or Windows images. Each virtual machine has private virtualized hardware: a network card, disk, graphics adapter, etc.

New features and improvements since 74 - For further details refer to: <http://www.linux-kvm.org/page/ChangeLog>

### 5.3.7.3. libvirt Updated to 0.6.1

The *libvirt* package provides an API and tools to interact with the virtualization capabilities of recent versions of Linux (and other OSes). The **libvirt** software is designed to be a common denominator among all virtualization technologies with support for the following:

- The Xen hypervisor on Linux and Solaris hosts.
- The QEMU emulator
- The KVM Linux hypervisor
- The LXC Linux container system
- The OpenVZ Linux container system
- Storage on IDE/SCSI/USB disks, FibreChannel, LVM, iSCSI, and NFS

### New features and improvements since 0.4.6:

- new APIs for Node device detach reattach and reset
- sVirt mandatory access control support
- thread safety of the API and event handling
- allow QEmu domains to survive daemon restart
- extended logging capabilities
- support copy-on-write storage volumes
- support of storage cache control options for QEmu/KVM
- driver infrastructure and locking
- Test driver infrastructure
- parallelism in the daemon and associated config
- virsh help cleanups
- logrotate daemon logs

- more regression tests
- QEmu SDL graphics
- add --version flag to daemon
- memory consumption cleanup
- QEmu pid file and XML states for daemon restart
- gnu lib updates
- PCI passthrough for KVM
- generic internal thread API
- RHEL-5 specific Xen configure option and code
- save domain state as string in status file
- add locking to all API entry points
- new ref counting APIs
- IP address for Xen bridges
- driver format for disk file types
- improve QEmu/KVM tun/tap performances
- enable floppies for Xen fully virt
- support VNC password settings for QEmu/KVM
- qemu driver version reporting

There were also dozens of cleanups, documentation enhancements, portability and bug fixes. For further details refer to: <http://www.libvirt.org/news.html>

#### 5.3.7.4. virt-manager Updated to 0.7.0

The *virt-manager* package provides a GUI implementation of **virtinst** and **libvirt** functionality.

##### New features and improvements since 0.6.0:

- Redesigned 'New Virtual Machine' wizard
- Option to remove storage when deleting a virtual machine.
- File browser for libvirt storage pools and volumes, for use when attaching storage to a new or existing guest.
- Physical device assignment (PCI, USB) for existing virtual machines.
- VM disk and network stats reporting
- VM Migration support

- Support for adding sound devices to an existing VM
- Enumerate host devices attached to an existing VM
- Allow specifying a device model when adding a network device to an existing VM
- Combine the serial console view with the VM Details window
- Allow connection to multiple VM serial consoles
- Bug fixes and many minor improvements.

For further details refer to: <http://virt-manager.et.redhat.com/>

### 5.3.7.5. virtinst Updated to 0.400.3

The *python-virtinst* package contains tools for installing and manipulating multiple VM guest image formats.

#### New features and improvements since 0.400.0:

- New **virt-clone** option **--original-xml**, allows cloning a guest from an XML file, rather than require an existing, defined guest.
- New **virt-install** option **--import**, allows creating a guest from an existing disk image, bypassing any OS install phase.
- New **virt-install** option **--host-device**, for connecting a physical host device to the guest.
- Allow specifying **cache** value via **virt-install--disk** options
- New **virt-install** option **--nonetworks**
- Add virt-image to vmx format support to **virt-convert**, replacing virt-pack
- Add disk checksum support to **virt-image**
- Enhanced URL install support: Debian Xen paravirt, Ubuntu kernel and **boot.iso**, Mandriva kernel, and Solaris Xen Paravirt
- Expanded test suite
- Numerous bug fixes, cleanups, and improvements

For further details refer to: <http://virt-manager.org/>

### 5.3.7.6. Xen Updated to 3.3.1

Fedora 11 supports booting as a domU guest, but will not function as a dom0 host until such support is provided in the upstream kernel. Support for a pv\_ops dom0 is targeted for Xen 3.4.

#### Changes since 3.3.0:

Xen 3.3.1 is a maintenance release in the 3.3 series.

For further details refer to:

- <http://www.xen.org/download/roadmap.html> -- Xen roadmap
- [http://xenbits.xen.org/paravirt\\_ops/patches.hg/](http://xenbits.xen.org/paravirt_ops/patches.hg/) -- paravirt\_ops patch queue

### 5.3.8. Xen Kernel Support

The **kernel** package in Fedora 11 supports booting as a guest domU, but will not function as a dom0 until such support is provided upstream. Work is ongoing and hopes are high that support will be included in **kernel** 2.6.30 and Fedora 12.

The most recent Fedora release with dom0 support is Fedora 8.

Booting a Xen domU guest within a Fedora 11 host requires the KVM based xenner. Xenner runs the guest kernel and a small Xen emulator together as a KVM guest.



#### Important

KVM requires hardware virtualization features in the host system. Systems lacking hardware virtualization do not support Xen guests at this time.

For more information refer to:

- <http://sourceforge.net/projects/kvm>
- <http://kraxel.fedorapeople.org/xenner/>
- <http://fedoraproject.org/wiki/Features/XenPvops>
- <http://fedoraproject.org/wiki/Features/XenPvopsDom0><sup>30</sup>

## 5.4. Web and Content Servers

### Apache

The *httpd* server has been updated to version 2.2.11. This is primarily a bugfix release and no configuration changes should be required.

### WordPress

The *wordpress* package has been updated to 2.7.1. This is a major update and includes a number of new features such as sticky posts, a one-click plugin install and comment threading, plus many others.

See the Wordpress feature page at [http://codex.wordpress.org/Version\\_2.7](http://codex.wordpress.org/Version_2.7) for complete information.

### moin

The *moin* package has been updated to 1.8.2. Users should review the files in **/usr/share/doc/moin-1.8.2/\***. The **CHANGES** file lists changes, **UPDATE** describes how to update. **README.migration** describes how to migrate your existing data.

### 5.5. Mail Servers

#### dovecot

Fedora 11 includes version 1.1.11 of the *dovecot* mail server. This is a bugfix release. For a complete list of changes, refer to <http://www.dovecot.org/list/dovecot-news/2009-February/000099.html>.

### 5.6. Database Servers

Fedora includes both the MySQL and PostgreSQL database servers.

#### mysql

MySQL has been updated to 5.1.31.

#### postgresql

Fedora 11 includes version 8.3.6 of PostgreSQL. A dump/restore is not required for those running 8.3.X. However, it is recommended to REINDEX all GiST indexes after the upgrade.

### 5.7. File Servers

#### vsftpd

*vsftpd* 2.1.0 is included in Fedora 11. This update includes enhanced SSL support and a number of fixes. A detailed change log may be found at <ftp://vsftpd.beasts.org/users/cevans/untar/vsftpd-2.1.0/Changelog>.

### 5.8. Samba (Windows Compatibility)

This section contains information related to Samba, the suite of software Fedora uses to interact with Microsoft Windows systems.

#### samba

*samba* 3.3.1 is the latest bugfix release for Samba. Major enhancements in Samba 3.3.1 include:

- Fix net ads join when "ldap ssl = start tls".
- Fix renaming/deleting of files using Windows clients.
- Fix renaming/deleting a "not matching/resolving" symlink.
- Fix remotely adding a share via the Windows MMC.

#### system-config-samba

*system-config-samba* has been updated to version 1.2.71.

### 5.9. System Daemons

#### Power Management

In order to allow users to monitor the behavior of their systems and to improve power consumption in general, several improvements were done for Fedora 11:

- Provide two new systemtap scripts to monitor disk and network activity of running applications
- Add a workload framework package called BLTK to offer reproducible tests
- Improved applications to reduce unnecessary disk and/or network activity



- Enabled several new features to save power:
  - `relatime` option for root filesystem /
- Automated start/stop of services related to hardware
- Enable USB autosuspend for known working devices
- Add optional tuned service to dynamically adapt system settings to the current use

Users of Fedora 11 should therefore see a reduction in power usage of their system.

#### `pm-utils`

The `pm-utils` power management utilities have been updated to 1.2.4. Some improvements have been made in logging and configuration.

#### `mdadm`

`mdadm` has been updated to 3.0. The significant change which justifies the new major version number is that `mdadm` can now handle metadata updates entirely in userspace. This allows `mdadm` to support metadata formats that the kernel knows nothing about.

Currently two such metadata formats are supported:

- DDF - The SNIA standard format
- Intel Matrix - The metadata used by recent Intel ICH controllers.

Also the approach to device names has changed significantly.

#### `ntfs-3g`

`ntfs-3g` has been updated to 2009.2.1 (from 1.5012). There are many changes in this new driver; see the upstream's release history at <http://www.ntfs-3g.org/releases.html> for complete details.

#### `pm-utils`

The `pm-utils` power management utilities have been updated to 1.2.4. Some improvements have been made in logging and configuration.

## 5.10. File Systems

### 5.10.1. Ext4 - The default file system

Fedora 11 utilizes ext4 as the default file system. ext4 brings significant new features and performance enhancements including:

- Improvements in file systems and sizes
  - File system size increased to one exabyte (1 EiB)
  - File size limit is sixteen terabytes (16 TiB)
  - No limit on number of sub-directories
- Performance
  - Extents increase performance in certain situations, especially large files
  - Multiblock allocation is a new file block allocation method with faster write speed
  - These combine with delayed allocation of blocks for better performance and fragmentation

### 5.10.1.1. Buffered Data Loss Mitigation

The recent news about buffered data loss experienced during a system crash with ext4 has resulted in upstream, and thus F11, flushing file data on a truncate or rename to mitigate this issue.

### 5.10.1.2. Migration from ext3 to ext4

It is generally recommended that users wishing to make use of ext4 start with a freshly formatted partition. However you may install with the **ext4migrate** boot option if you wish to convert your legacy ext3 partitions to ext4. Users are cautioned that they will not realize many of the benefits ext4 since the data currently residing on the partition will not make use of extents. New data will make use of extents. Please note that as suggested by the requirement to pass a boot option that migration to ext4 has not been heavily tested and users are urged to backup filesystems before attempting migration

### 5.10.1.3. No grub support

Currently **grub** doesn't support booting from an ext4 partition so make sure to utilize ext2/3 for /boot

## 5.10.2. btrfs - next-generation Linux filesystem

Fedora 11 makes btrfs, the next-generation Linux filesystem available as a technology preview. To enable btrfs pass **icantbelieveitsnotbtr** as a boot option. Users are warned that btrfs is still experimental and under heavy development. The on-disk format may yet change and much functionality is still missing such as a fully operative fsck or even proper out-of-space handling.

### 5.10.2.1. No grub support

Currently **grub** doesn't support booting from a btrfs partition so make sure to utilize ext2/3 for /boot

## 5.11. X Window System (Graphics)

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

### 5.11.1. X server

The key combination **Ctrl+Alt+Backspace** to kill the X server has been *disabled by default*<sup>31</sup> as a decision of the upstream Xorg project. You can change the default by adding the following section to your **xorg.conf** file. If one does not exist, you can create it manually at **/etc/X11/xorg.conf** using a text editor and Xorg will honor that setting.

```
Section "ServerFlags"
Option "DontZap" "false"
EndSection
```

If you use kickstart or want to use scripts to change this setting automatically across multiple systems, you can use the following snippet:

```
%post
```

---

<sup>31</sup> <http://cgit.freedesktop.org/xorg/xserver/commit/?id=9d135ac10a7374c7ccda705f1eeb02cc53076c34>

```

grep -q -s DontZap /etc/X11/xorg.conf
append=$?
if [ $append -ne 0 ]; then
    cat >> /etc/X11/xorg.conf << EOF
    Section "ServerFlags"
    Option "DontZap" "false"
    EndSection
    EOF
fi
%end

```

The Xorg project has changed the default DontZap setting to "true" after complaints from desktop users that accidentally hit **Ctrl+Alt+Backspace** when trying to type **Alt+Backspace**, **Ctrl+Backspace**, or **Shift+Backspace**, or who had StickyKeys enabled. **Ctrl+Alt+Backspace** is also a keyboard shortcut for deleting certain expressions in C and Java modes in Emacs.

### 5.11.2. Third-party Video Drivers

Refer to the Xorg third-party drivers page for detailed guidelines on using third-party video drivers: <http://fedoraproject.org/wiki/Xorg/3rdPartyVideoDrivers>

## 5.12. HA Cluster Infrastructure

This section highlights changes and additions to the clustering tools in Fedora 10.

### 5.12.1. New Features

This section details new high-availability clustering information.

- The Corosync Cluster Engine
  - Plug-in based cluster engine using the virtual synchrony communication model
    - Well considered plugin model and plugin API
    - Ultra-high performance messaging, up to 300k messages/second to a group of 32 nodes for service engine developers.
    - Provides most services for service engine developers
    - Standard on many other Linux distributions for portable application development.
    - Works with mixed 32/64 bit user applications, 32/64 bit big and little endian support.
    - Full IPv4 and IPv6 support
  - Provides the following plug-in service engines and C APIs
    - Closed Process Group Communication C API for cluster communication
    - Extended Virtual Synchrony passthrough C API for cluster communications at a lower level.
    - Runtime Configuration Database C API for cluster configuration
    - Configuration C API for runtime cluster operations

- Quorum engine C API for providing information related to quorum
- Reusable C libraries or headers tuned for high performance and quality
- Totem Single Ring and Redundant Ring Multicast Protocol library
- Shared memory IPC library with sync and async communications models usable by other projects
- logsys flight recorder which allows logging and tracing of complex applications and records state in core files or at user command library
- 64 bit handle to data block mapping with handle verification header
- The openais Standards Based Cluster Framework which provides an implementation of the Service Availability Forum Application Interface Specification to provide high availability through application clustering:
  - Packaging and design changes
    - All core features from openais related to clustering merged into The Corosync Cluster Engine.
    - openais modified to work as plugins to the Corosync Cluster Engine
  - Provides implementation of various Service Availability Forum AIS Specifications as corosync service engines and C APIs:
    - Cluster Membership Service B.01.01
    - Checkpoint Service B.01.01
    - Event Service B.01.01
    - Message Service B.01.01
    - Distributed Lock Service B.01.01
    - Timer Service A.01.01
    - Experimental Availability Management Framework B.01.01
- cluster is now based on both corosync and openais and offers:
  - pluggable configuration mechanism:
    - XML (default)
      - Configuration schema updated moved from Conga to cluster
    - LDAP
    - corosync/openais file format
  - Cluster manager (cman):
    - Now runs as part of corosync

- Provides quorum to all corosync subsystems
- Enhanced configuration-free running
- Better handling of configuration updates
- Quorum disk (optional) now supports mixed-endian clusters
- fence / fence agents:
  - Improved daemon logging options
  - New operation 'list' that prints aliases with port numbers
  - Support for new devices and firmware: LPAR HMC v3, Cisco MDS, interfaces MIB (ifmib)
  - Fence agents produce resource-agent style metadata
  - Support for 'unfence' operation on boot
- rgmanager:
  - Better handling of configuration updates
  - Uses same logging configuration as the rest of the cluster stack
- clvmd:
  - Run-time switchable between cman or corosync/dlm cluster interfaces

### 5.12.2. Packaging Changes

A lot of effort has been expended to cleanup the packages and to make them as complete, intuitive and modular as possible, allowing also external entities to reuse most of the infrastructure without the requirement to pull the whole stack in.

With the new package reorganization, users will find it easier to update their cluster. The introduction of fence-agent and resource agent packages will avoid the pain for users to restart cluster nodes for simple script updates.

## 6. Changes in Fedora for Developers

### 6.1. Development

This section covers various development tools and features.

### 6.2. Runtime

#### Backwards Comparability

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** 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.

### bash

Fedora 11 includes *bash* 4.0. This is a significant upgrade with new features.

### gcc

Fedora 11 includes *gcc* 4.4, and with it, *libgcc* 4.4. This may require recompiling your programs.

### DBus Policy

Previous releases of Fedora shipped with a security policy for the DBus system bus that was unintentionally permissive (see CVE-2008-4311). In Fedora 11, the policy has been changed to deny method calls by default.

## 6.3. Tools

The following packages are new or updated for Fedora 11:

### 6.3.1. Appliance Tools

#### ace

The *ace* suite of appliance tools has been upgraded to version 0.0.6, including *ace*, *ace-apache*, *ace-banners*, *ace-basic-site*, *ace-mysql*, *ace-php*, *ace-postgres*, and *ace-ssh*.

### 6.3.2. Languages

#### clisp

*clisp* (Common Lisp) has been updated to 2.47. There are a number of changes, please review the project's site (<http://clisp.cons.org>).

#### gcc

The gcc compiler suite has been updated to 4.4.0 including *gcc*, *gcc-c++*, *gcc-gfortran*, *gcc-gnat*, and *gcc-objc*.



**Some of the changes involve syntax changes that have the potential to break existing code.**

Please review the NEWS files at <http://gcc.gnu.org> carefully before upgrading.

#### gcl

GNU Common Lisp is updated to 2.68pre. This long awaited release fixes a great many bugs. Project site: <http://www.gnu.org/software/gcl>.

#### gforth

Fast and portable implementation of the ANS Forth language.

Fedora 11 includes version 0.7.0 of *gforth*.

There are a large number of changes to *gforth* in this release. A developer is strongly encouraged to view the project site before proceeding.

Project site: <http://www.jwtdt.com/~paysan/gforth.html>.

#### gprolog

GNU Prolog has been updated to version 1.3.1. The changes since 1.3.0 are largely of a bug fix nature. The programmer may wish to review the NEWS file at <http://www.gprolog.org/NEWS>.

#### iasl

The Intel Advanced Configuration and Power Interface compiler has been upgraded to version 20090123. This is the first update since 2006 and a number of functions have changed names. The developer should review <http://www.acpica.org/download/changes.txt> before proceeding.

#### mingw32-gcc

Fedora 11 now includes the MinGW compiler. This is a major new feature allowing developers to build application for Microsoft Windows and Linux from the same source code.

#### nasm

The *nasm* package has been upgraded from 2.03.01 to 2.05.01. This change involves a large number of bug fixes as well as the addition of a number of new directives. Refer to the project's change list at <http://www.nasm.us/doc/nasmdocc.html> for complete details.

#### ocaml

Some of the highlights in release 3.11 are:

- The Dynlink library is now available in native code on some platforms.
- **ocamldebug** is now supported under Windows (MSVC and Mingw ports) but without the replay feature. (Contributed by Dmitry Bely and Sylvain Le Gall at OCamlCore with support from Lexifi.)
- New port: MacOS X, AMD/Intel, 64 bits.

For more information, please consult the comprehensive list of changes at <http://caml.inria.fr/pub/distrib/ocaml-3.11/notes/Changes>.

#### pl

The Edinburgh compatible Prolog compiler has been updated to 5.7.6. In addition to a number of bugfixes, enhancements include faster labeling for complex optimization expressions, improvements in handling additional dialects, smarter loading of libraries and extensions to YAP compatibility. Project site: <http://www.swi-prolog.org>.

#### sbcl

Version 1.0.25 of Steel Bank Common Lisp includes a large number of enhancements and fixes over the previous 1.0.21 version. Refer to <http://sbcl.sourceforge.net/news.html> for a complete list.

#### ucblogo

Version 6.0 of *ucblogo* fixes a problem with the PowerPC.

#### yasm

Complete rewrite of the NASM assembler. Changes from 0.7.1 to 0.7.2:

- Add PIC support to 64-bit Mach-O.

- Add **--prefix** and **--suffix** options for naming globals.
- Make **rel foo wrt ..gotpc** generate **GOTPCREL** in elf64 (alias for **rel foo wrt ..gotpcrel**).
- Add support for newly specified AVX/AES instructions not in original spec.
- Remove invalid 256-bit form of VPBLENDVB.
- Optimize non-strict push with 66h override to byte size if possible.
- Fix address printing in bin map file.
- Fix GAS syntax handling of no section flags.
- Name the absolute symbol in **coff/win32/win64** output.
- Miscellaneous other fixes.

### 6.3.3. Debug tools

#### allegro

Version 0.9.4 of *allegro* is a minor bugfix update.

#### gdb

The version of *gdb* included in Fedora (*Archer*) contains patches and modifications not in the upstream GDB. Notable changes from upstream include:

- *gdb* can debug programs compiled with **-fpie**.
- *gdb* can be scripted using Python. This is used to support the new type-specific pretty-printing feature.
- *gdb* lazily reads debug info, resulting in faster startup when the debuggee uses many shared libraries.
- A new **catch syscall** command has been added. This will cause *gdb* to stop your program when a syscall is entered or exited.
- C++ debugging support has been improved. The expression parser handles more cases correctly, and *gdb* can now properly handle exceptions thrown during an inferior function call.



#### Consider the Python API to be unstable

The Python API to *gdb* is still under development. We cannot currently guarantee that future revisions to the API will remain compatible.

#### memtest86+

Stand-alone memory tester for x86 and x86-64 computers updated to 2.10. Enhancements in v2.10 :

- Added support for Intel Core i7 (Nehalem) CPU
- Added support for Intel Atom Processors
- Added support for Intel G41/G43/G45 Chipsets



- Added support for Intel P43/P45 Chipsets
- Added support for Intel US15W (Poulsbo) Chipset
- Added support for Intel EP80579 (Tolapai) SoC CPU
- Added support for ICH10 Southbridge (SPD/DMI)
- Added detection for Intel 5000X
- Now fully aware of CPU w/ L3 cache (Core i7 & K10)
- Added workaround for DDR3 DMI detection
- Fixed Intel 5000Z chipset detection
- Fixed Memory Frequency on AMD K10
- Fixed cache detection on C7/Isaiah CPU
- Fix Memtest86+ not recognized as Linux Kernel

#### nemiver

In addition to some bug fixes, 0.6.4 of *nemiver* now allows setting breakpoints even when it cannot get the current source editor.

#### pylint

The *pylint* 0.16.0 package includes a number of bug fixes and minor enhancements. Refer to the project site at <http://www.logilab.org/projects/pylint> for complete details.

#### valgrind

3.4.0 is a feature release with many significant improvements and the usual collection of bug fixes. This release supports X86/Linux, AMD64/Linux, PPC32/Linux, and PPC64/Linux. Support for recent distros (using gcc 4.4, glibc 2.8 and 2.9) has been added. Refer to the complete valgrind release notes at <http://www.valgrind.org/docs/manual/dist.news.html>.

### 6.3.4. Documentation Tools

#### colordiff

The *colordiff* package has been updated to 1.08a. Changes (from the project website) include: Support for numeric colours added, for 256-colour terminals (thanks to Gautam Iyer). Diff-types can now be specified explicitly, for use when diff-type detection doesn't work or isn't possible. Return diff's exit code, patch from Tim Connors. Allow extraneous diff text to be coloured separately.

#### doxygen

The new *doxygen* 1.5.8 includes a completely rewritten **doxywizard**, enhanced extension mapping, support for Vietnamese and better support for Turkish. In addition there are numerous bug fixes as outlined in <http://www.stack.nl/~dimitri/doxygen/changelog.html>.

#### highlight

Version 2.7 of *highlight* includes (from <http://www.andre-simon.de/>):

- improved XML- and VHDL highlighting

- added support for Clojure
- added wrapping arrows in LaTeX output

### texinfo

Version 4.13 of *texinfo* includes a reference card, better support for HTML, and support for multibyte character sets. For full details, see the project site: <http://www.gnu.org/software/texinfo/>.

## 6.3.5. IDEs and Editors

### emacs

Release 22.3 of *emacs* is primarily concerned with cleaning out old/obsolete features. Refer to the NEWS file (<http://www.gnu.org/software/emacs/NEWS.22.3>) for full details.

### eric

Fedora 11 includes version 4.3.0 of the *eric* Python IDE. Refer to <http://eric-ide.python-projects.org/eric-news.html> for full details.

### ipython

The *ipython* 0.9.1 version is included, an update from 0.8.4. This is a major release. Refer to <http://ipython.scipy.org/announcements/ann-ipython-0.9.txt> for the full story.

### monodevelop

The updated *monodevelop* 1.9.2 includes a large number of new features. You can review these features at [http://monodevelop.com/Release\\_notes\\_for\\_MonoDevelop\\_2.0\\_Beta\\_1](http://monodevelop.com/Release_notes_for_MonoDevelop_2.0_Beta_1).

### plt-scheme

This is a bugfix release.

## 6.3.6. Issue and Bug Tracking Tools

### mantis

The *mantis* package has been upgraded to 1.1.6. "This release fixes once and for all the caching troubles from previous stable releases, some access permissions bugs, and a few various other issues. This release also improves the existing source control integration by allowing remote checkins." For a complete list of all other changes refer to <http://www.mantisbt.org/>.

### trac

0.11.3 of *trac* contains a number of new features, including a new template engine for generating content, new configurable workflow, and finer grained control of permissions.

### trac-mercurial-plugin

The *trac-mercurial-plugin* 0.11.0.7 package works with the *trac* 0.11 release, and provides added features including quickjump to a tag or branch, blame support, and custom property renderers.

## 6.3.7. Lexical and Parsing Tools

### bison

Fedora 11 includes version 2.4.1 of *bison*. This is a minor upgrade.

### 6.3.8. Make and Build Tools

#### automake

Improvements in *automake* 1.10.2 include:

- Changes to Libtool support:
  - The **distcheck** command works with Libtool 2.x even when LT\_OUTPUT is used, as **config.lt** is removed correctly now.
- Miscellaneous changes:
  - The manual is now distributed under the terms of the GNU FDL 1.3.
- When the **automake --add-missing** command causes the COPYING file to be installed, it will also warn that the license file should be added to source control.

In addition a few bugs were fixed.

#### cmake

The *cmake* has been upgraded to version 2.6.3. This update includes many bug fixes. For a complete list visit <http://www.cmake.org/files/v2.6/CMakeChangeLog-2.6.3>.

#### cpanspec

Fedora 11 includes version 1.78 of *cpanspec*. In addition to a number of bug fixes, there are some additional command line options.

#### meld

*meld* 1.2.1:

- *Pygtk* version 2.8 now required.
- Port to **gtk.UIManager**.
- Handle spaces in Subversion paths.
- Command-line auto-compare all option on startup.
- Command-line can launch several comparisons.
- Several UI tweaks (better focus behavior, better defaults.)

#### patchutils

Version 0.3.1 includes a number of minor enhancements and bug fixes.

### 6.3.9. Revision Control Tools

#### bzr

The *bzr* package has been upgraded to 1.12 which includes a large number of new features and bug fixes over the 1.7 version in Fedora 10. The **bzr** user is encouraged to visit the project's webpage at <http://www.bazaar-vcs.org/> to review these improvements.

#### cvs2svn

The *cvs2svn* package has been updated to 2.2.0. In addition to bugfixes, there are a large number of new features. Visit <http://cvs2svn.tigris.org/source/browse/cvs2svn/tags/2.2.0/CHANGES> for the details.

### darcs

Version 2.2.0 of *darcs* includes a number of new features in addition to a number of bugfixes. Refer to the changelog at <http://allmydata.org/trac/darcs-2/browser/NEWS>.

### giggle

Most important changes in 0.4.90:

- The user interface has been cleaned up dramatically.
- The file browsing view was restored and has annotation support now.
- The compact view is gone.
- There are the basics of a plugin system now.
- The revision view shows avatars retrieved from Gravatar.

### git

The *git* package has been updated to 1.6.2. In addition to other changes, the Fedora packages now follow upstream defaults and install the majority of **git-\*** commands outside the default PATH. If you have scripts that call **git-\*** binaries, you are encouraged to change them to use the **git foo** style. If this is not feasible, you can adjust your PATH. Git provides a convenient method to do this:

```
PATH=$(git --exec-path):$PATH
```

It is worth noting that *git* hooks are run with **\$(git --exec-path)** in their PATH.

### mercurial

Version 1.1.2 is included in Fedora 11 with a large number of new features. Refer to the release notes for *mercurial* at <http://www.selenic.com/mercurial/wiki/index.cgi/WhatsNew>.

### monotone

In addition to a number of bugfixes, the new *monotone* 0.42 includes the following changes:

- The output of **automate show\_conflicts** has been changed; a default resolution for file content conflicts and user resolutions for other conflict types has been added. **directory\_loop\_created** changed to **directory\_loop**.
- The French, Brazilian-Portuguese, and Japanese translations were outdated and thus have been removed from the distribution. In case you care about them and want them back, drop us a note at <mailto:monotone-devel@nongnu.org>.

... and the following new features:

- New **mtn ls duplicates** command which lets you list duplicated files in a given revision or the workspace.
- New option **--no-workspace**, to make *monotone* ignore any workspace it might have been run in.
- New command group **mtn conflicts \*** provides asynchronous conflict resolutions for merge and propagate.

- New **automate file\_merge** command which runs the internal line merger on two files from two revisions and outputs the result.
- New **automate lua** command to call *lua* functions over **automate**, similar to *monotone* hooks. This is particularly useful to get user defaults, like ignorable files, branch keys and passwords, which are managed through one or more **monotonerc** files.
- New **automate read\_packets** command that reads data packets like public keys similar to **mtn read**.
- The **merge** and **propagate** commands accept user commit messages; the **merge rev rev** or **propagate branch branch** message will be prefixed to the user message. **--no-prefix** removes the prefix.

#### subversion

User-visible changes in 1.5.5:

- Allow prop commits on dirs with modified children.
- Make Cyrus auth implementation always prefer EXTERNAL to ANONYMOUS.
- Do not create mergeinfo for wc-wc moves or copies
- Do not autoupgrade old BDB filesystems to 1.5 or 1.4 format
- Return mergeinfo to prior state during reverse merges
- Remove mergeinfo deleted by merge
- Make proxy slaves pass through txn GET and PROPFIND requests
- Merge can now use targets with inconsistent newlines2
- Don't allow empty-string changelists
- Remove false positive **ra\_neon** mergeinfo errors
- Improve performance of **svn merge --reintegrate**
- Fixed: foreign merges keep UUID of foreign repository
- Fixed: properly encode diff headers used in conflict resolution
- Fixed: segfault in **svn cp --parents**
- Fixed: mergeinfo for '...' maps to empty revision range
- Fixed: segfault in BDB backend node-origins cache
- Fixed: broken merge if target's history includes resurrections
- Fixed: invalid mergeinfo created on a subtree during merge

#### svn2cl

The *svn2cl* package has been updated to 0.11. Changes since release 0.10:

- Small portability improvements.

- Fix for OpenBSD's ksh.

### tkcvs

Changes in version 8.2:

- The Branch Browser can now draw merge arrows for merges tracked by Subversion 1.5's mergeinfo property and CVSNT's mergepoint feature. The work-around of using tags is no longer necessary, if your Subversion or CVSNT server and client support their own merge tracking.
- The Branch Browser has a new search ability, so you can highlight a revision on the diagram by its version, date, tag, or author.
- The Log button in the Branch Browser always produces a full log of revisions on the selected branch instead of inappropriately following the Directory Browser's "Log Detail" setting.
- If your SVN repository has a structure that's functionally similar to trunk, branches, and tags but with different names, you can tell TkCVS about it by setting variables in **tkcvs\_def.tcl**:
  - `cvscfg(svn_trunkdir)`
  - `cvscfg(svn_branchdir)`
  - `cvscfg(svn_tagdir)`

## 6.3.10. Other Development Tools

### amqp

The AMQP specification has been updated to 1.0.738618 reflecting recent work on the specification. Project site: <http://www.amqp.org>.

### binutils

The *binutils* package has been updated to 2.19.51.0.2. This is a minor update, refer to <http://sources.redhat.com/binutils>.

### coccinelle (spatch)

The *coccinelle* package enables semantic patches to be written for C code, particularly Linux kernel patches.

Refer to the LWN article about semantic patching (<http://lwn.net/Articles/315686/>) and the Coccinelle home page (<http://www.emn.fr/x-info/coccoinelle>).

### cproto

In addition to a few bugfixes, the following changes have been made:

- Modified **c++** command to redirect stderr to **/dev/null** if **-q** option is given, for consistency with the non-c++ mode
- Added **configure --disable-leaks** option.
- Use configure macro **CF\_XOPEN\_SOURCE** macro to make `mkstemp()` prototyped on Linux.
- Removed `isascii()` usage.

<http://freshmeat.net/projects/cproto/>

### elfutils

The *elfutils* package has been updated to 0.140 (from 0.137). In addition to a number of bug fixes, it adds Intel SSE4 disassembler support and automatic decompression of ELF files. For the full story, refer to the NEWS file at <http://fedorahosted.org/elfutils/browser/NEWS>.

### libtool

Fedora 11 includes *libtool* 2.2.6, which is a complete rewrite of the version 1.5 in Fedora 10. The upstream project has released a number of interim versions that were not reflected in Fedora. For a complete history, refer to <http://www.gnu.org/software/libtool/news.html>.

### livecd-tools

The *livecd-tools* version 021 includes a number of bug fixes and corrects some oversights, including support for ext4 filesystems and creating large ISOs using UDF.

### mcrypt

Version 2.6.8 of *mcrypt* is largely a source code cleanup and should not affect functionality. Refer to the NEWS file for details.

### scons

*scons* 1.2.0 is a minor upgrade to 1.0.0. Refer to <http://www.scons.org/CHANGES.txt> for a detailed list of changes.

### srecord

Version 1.46 includes the following changes:

- There is a new option for the **-x-e-length** filters, they can now accept a width, and this is divided into the byte length, so that you can insert the length in units of words (2) or longs (4).
- Some small corrections have been made to the documentation.
- The **-minimum** and **-maximum** options have been renamed **-minimum-address** and **-maximum-address**, to avoid a command line grammar syntax problem.

### swig

The *swig* package connects C/C++/Objective C to some high-level programming languages. Fedora 11 includes version 1.3.38 with a number of changes:

- Enhancement to directors to wrap all protected members.
- Optimization feature for objects returned by value.
- A few bugs fixes in the PHP, Java, Ruby, R, C#, Python, Lua, and Perl modules.
- Other minor generic bug fixes.

Project site: <http://swig.sourceforge.net/>

### translate-toolkit

The *translate-toolkit* has been updated to 1.3.0. There are a large number of changes that affect specific languages. Refer to the ChangeLog file for full details.

## 6.4. Java

### 6.4.1. netbeans

*netbeans* has been updated to version 6.5. *netbeans* 6.5 is a significant update of *netbeans* 6.1 and includes the following changes:

- PHP support with code completion, Xdebug and web service features.
- JavaFX 1.0 supports animation, graphics and media codecs for rich content application development.
- New Support for Groovy and Grails.
- Improved JavaScript, AJAX and Ruby support.
- Automatic Compile and Deploy on Save for Java and Java EE applications.
- Improved database support: SQL history, SQL completion, and results viewing and editing improvements.
- Improved Java ME support for Data Binding, SVG and Custom Component creation.
- GUI Builder: Support for Nimbus and simple class names.
- JUnit: single test method support.
- Debugger: Redesign of Step into feature.

For information about the main development features in NetBeans IDE, see:

- NetBeans IDE 6.5 Release Information <http://www.netbeans.org/community/releases/65/index.html>
- New and Note Worthy NB65 <http://wiki.netbeans.org/NewAndNoteWorthyNB65>
- NetBeans IDE 6.5 Release Notes <http://www.netbeans.org/community/releases/65/relnotes.html>

## 6.5. Eclipse

The *eclipse* package has been updated to 3.4.2. Along with this update, many plugins and tools have also been updated. These are largely bugfix updates and with a few exceptions, users should not see any differences.

Users should visit the Eclipse web site at <http://www.eclipse.org/> for the latest news on Eclipse.

Version 1.2.1 of *eclipse-phpeclipse* corrects a problem with word selection. Refer to <http://phpeclipse.net/>.

The *pydev-mylyn* has been updated to 1.4.4. See <http://pydev.sourceforge.net> for details.



## 6.6. Haskell

The [Fedora Haskell SIG](https://fedoraproject.org/wiki/SIGs/Haskell)<sup>32</sup> has been busy updating [Haskell packages](https://admin.fedoraproject.org/pkgdb/users/packages/haskell-sig)<sup>33</sup> and our [Packaging Guidelines](https://fedoraproject.org/wiki/PackagingDrafts/Haskell)<sup>34</sup>. The new guidelines and [cabal2spec](http://fedorahosted.org/cabal2spec)<sup>35</sup> now make it very easy to package Haskell Cabal packages for Fedora.

For Fedora 11 the various packages have been updated to new versions including *ghc-6.10.1*, *darcs-2.2.0*, and *ghc-gtk2hs-0.10.0*. Newly added packages include *cabal-install*, *cpphs*, *ghc-HTTP*, *ghc-paths*, *ghc-zlib*.

There is also a new #fedora-haskell IRC channel on Freenode for discussion.

## 6.7. Embedded Development

Fedora 11 includes a range of packages to support development of embedded applications on various targets. There is broad support for the AVR and related parts as well as for the Microchip PIC. In addition, there are packages to support development on older, less popular parts such as the Z80, 8051, and others. For a more complete description refer to [Packages for embedded development on the wiki](#)<sup>36</sup>.

Fedora 11 includes version 5.1 of *dfu-programmer*, a command-line programmer for Atmel (8051 & AVR) chips with a USB bootloader supporting ISP. A command line option was added to support the AVR32 trampoline. All known Atmel USB AVR/8051/AVR32 devices are now supported.

## 6.8. Backwards Compatibility

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 **ApplicationsAdd/Remove Software** 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.

## 6.9. Linux Kernel

This section covers changes and important information regarding the 2.6.29 based kernel in Fedora 11.

### 6.9.1. Improved Performance and Reduced Power with *relatime*

The *relatime*<sup>37</sup> option is now enabled by default in Fedora 11. It improves filesystem performance and reduces power consumption.

The POSIX standard requires operating systems to keep track of the last time each file was accessed by an application or the user, and to store this timestamp as part of the filesystem data. This

<sup>32</sup> <https://fedoraproject.org/wiki/SIGs/Haskell>

<sup>33</sup> <https://admin.fedoraproject.org/pkgdb/users/packages/haskell-sig>

<sup>34</sup> <https://fedoraproject.org/wiki/PackagingDrafts/Haskell>

<sup>35</sup> <http://fedorahosted.org/cabal2spec>

<sup>36</sup> [https://fedoraproject.org/wiki/Packages\\_For\\_Embedded\\_Development](https://fedoraproject.org/wiki/Packages_For_Embedded_Development)

<sup>37</sup> <http://lwn.net/Articles/244829/>

timestamp, called *atime*, is used in finding out which files are never used (to clean up the `/tmp` directory for example) or if a file has been looked at after it was last changed.

A significant downside to *atime* is that every time a file is accessed, the kernel has to write a new timestamp to the disk, at least after a few seconds of activity. These disk writes keep the disk and the link to the disk busy, which costs both performance and power.

Because some programs use *atime*, disabling by default is not practical. The Linux kernel has a feature called *relatime*, which is an effective compromise between having some of the information that *atime* provides, without having the disk time updated as regularly. It works by updating the *atime* field on disk only if the file hasn't been accessed since the last time it was accessed (to provide the new email detection capability) or when the last access was more than 1 day ago (to help programs and users clean up unused files in the `/tmp` directory). An improved version of *relatime* has been *merged upstream*<sup>38</sup> by Fedora developers in the 2.6.30 kernel and backported to the Fedora 11 kernel.

### 6.9.2. 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><sup>39</sup>

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
```

### 6.9.3. 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>.

### 6.9.4. Preparing for Kernel Development

Fedora 11 does not include the *kernel-source* package provided by older versions since only the *kernel-devel* package is required now to build external modules.



#### Custom Kernel Building

For information on kernel development and working with custom kernels, refer to [http://fedoraproject.org/wiki/Building\\_a\\_custom\\_kernel](http://fedoraproject.org/wiki/Building_a_custom_kernel).

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<sup>38</sup> <https://www.redhat.com/archives/fedora-devel-list/2009-March/msg01612.html>

<sup>39</sup> <http://www.kernel.org/>

### 6.9.5. 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.

## 7. Changes in Fedora for Specific Audiences

### 7.1. What's new in science and mathematics

Fedora 11 includes a range of packages for science and mathematics. The following packages have been updated for Fedora 11.

#### 7.1.1. Mathematics

*freefem++*

*freefem++* is a finite element analysis package which has been updated to 3.0.

Highlights:

- complete change of the graphical interface (*freefem++* replaced *freefem++-nw*)
- added **medit** (visualization software by P. Frey) inside *freefem++* under the name **ffmedit**
- the IDE version is gone until Antoine Le Hyaric writes a good one. Refer to: <http://www.ann.jussieu.fr/~lehyaric/ffcs><sup>41</sup>
- introduced client-server architecture *freefem++*
- *ffglut* visualizer using glut library

Full upstream changelog is here: <http://www.freefem.org/ff++/ftp/INNOVATION><sup>42</sup>

#### 7.1.2. Chemistry

*gabedit*

*gabedit* is a GUI for a number of computational chemistry packages. Highlights of version 2.1.17 include:

- full undo/redo for geometry changes
- full control over displayed bonds
- support for reading connectivities from *gabedit*, *hin*, *pdb*, *mol2* and *mol* files
- molecular dynamics conformational searches using MM potential (Amber 99) and Semi-Empirical method (from Open Mopac or PCGameSS)
- migration from GDK drawing functions to Cairo
- geometry and plots can be exported to EPS, PS, PDF, or SVG formats

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<sup>42</sup> <http://www.freefem.org/ff++/ftp/INNOVATION>

For complete details see the upstream changelog at: <http://sites.google.com/site/alloucheat/Home/gabedit/download/changelog>

## 7.2. Electronic Design Automation

Fedora Electronic Lab is Fedora's high-end hardware design and simulation platform. This platform provides different hardware design flows based on the semiconductor industry's current trend. FEL maps in three methodologies {design, simulation, and verification} with open source EDA software.

FEL's website : <http://chitlesh.fedorapeople.org/FEL/>.

The latest methodology included on FEL platform is the means for verifications and debugging for digital based designs.

The Perl modules included for F11 bring a new methodology under the Fedora umbrella. This methodology is verification together with possibilities for co-simulation based design and simulation. Fedora remains the sole Linux distribution distributing FEL methodologies for hardware design, simulation, and verification.

Updates of the existing RPM packages have improved design experience in terms of development time and debugging. While FEL understands Moore's Law is important for its userbase, these improvements allow users to design a more efficient and successful design with open source software.

These enhancements brought to the Fedora umbrella increase chances that Fedora users can complete their high-end hardware design even if scaled to 90nm and wrap up their project with final tapeout.

FEL bridges 2 different open source communities :

- open source software community
- open source hardware community

After 3 consecutive and successive releases, FEL/Fedora is regarded as the leader in this field by both communities due to its 3-years of experience and quality EDA solutions.

Below entails the highlights of the major development items to put the quality barrier higher than the previous releases:

- Perl modules to extend *vhdl* and *verilog* support. These Perl modules together with *rawhide's gtkwave* improves chip testing support.
- Introduction of Verilog-AMS modeling into *ngspice*
- Improved VHDL debugging support with *gcov*.
- Improved support for re-usable HDL packages as IP core
- Improved PLI support on both *iverilog* and *ghdl*
- Introduction of C-based methodologies for HDL testbenches and models.
- Improved co-simulation based hardware design.
- Introduction of design tools for DSP design flow

Users are using the standard Fedora Live media or the "Electronic Lab" **yum** group to deploy this high-end hardware design, simulation, and verification platform. To install run the following command:

```
su -c "yum groupinstall 'Electronic Lab'"
```

## 7.3. What's new for amateur radio operators

Fedora 11 includes a number of applications and libraries that are of interest to amateur radio operators and electronic hobbyists. Many of these applications are included in the Fedora Electronic Lab spin. For a complete list of amateur radio applications available within Fedora see [Applications for amateur radio](#)<sup>43</sup> on the wiki.

### 7.3.1. Sound card applications

#### **fldigi**

Fedora 11 includes version 3.10 of **fldigi**. Changes from Fedora 10 include many enhancements to the waterfall and logging, along with dozens of minor changes to the user interface and bug fixes. For a complete list of changes see the upstream project's site at <http://www.w1hkj.com/fldigi-distro/>

#### **xfhell**

Version 1.9 of **xfhell** includes some improvements in handling the PTT line and additional flexibility in adjusting window sizes, as well as some bug fixes. The project's site is at <http://5b4az.chronos.org.uk/pages/digital.html>

#### **soundmodem**

**soundmodem** is now back in Fedora. **soundmodem** 0.10 provides a way to use your sound card as a modem for digital applications such as AX.25. The upstream's project page is <http://www.baycom.org/~tom/ham/soundmodem/>

#### **HamFax**

**HamFax** 0.54 is new to Fedora. **HamFax** is an application for sending and receiving facsimiles in amateur radio and for receiving public facsimile broadcasts like weather maps. Supported interfaces are sound cards and the SCS-PTCII from Special Communication Systems.

#### **wxapt**

**wxapt** is a console application for decoding and saving weather images transmitted in the APT format of NOAA and METEOR satellites. **wxapt** is a new addition to Fedora.

### 7.3.2. Software Defined Radio

#### **gnuradio**

**gnuradio** has been updated to version 3.1.3. This is largely a bugfix update.

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<sup>43</sup> [https://fedoraproject.org/wiki/Applications\\_for\\_Amateur\\_Radio](https://fedoraproject.org/wiki/Applications_for_Amateur_Radio)

### 7.3.3. Circuit Design and Simulation

The gEDA suite has been updated to 20081231. This includes the packages *geda-docs*, *geda-examples*, *geda-gattrib*, *geda-gnetlist*, *geda-gschem*, *geda-gsymcheck*, *geda-symbols* and *geda-utils*. These are all bugfix releases. In addition, *gerbv*, *pcb*, and *ngspice* are a part of the gEDA suite, but released separately.

#### gerbv

**gerbv** 2.1.0 includes improvements to object selection, improved exporting, and more flexibility in dealing with drill files. The complete release notes for this package can be found at <http://gerbv.sourceforge.net/ANNOUNCEMENT-2.1.0>

#### pcb

**pcb** has been updated to 20081128. Included among the improvements is a new 'Ben mode' that exports a 'photograph' of the board as a .png file. There are also some minor improvements in drill handling and a number of bug fixes. The complete release notes for this version are available at <http://pcb.sourceforge.net/news.html#20081128>

#### ngspice

**ngspice** has been updated to version 18. Changes include:

- Tcspice simulator library has been merged with ngspice. Now you can compile ngspice or tcspice by asserting a configure switch. See README.tcl
- New options have been introduced: brief, listing, autostop and scale
- Support for .lib file has been introduced. This allows the use of third party model libraries in ngspice.
- .measure statements: avg, integ, rms, max, min, delay, param
- .global statements support for global nodes whose name is not expanded when flattening the netlist.
- .func macros for inlining functions into netlists
- Improved the numparam library to support fully parametrized netlists.
- BSIM model binning.
- new multi-input gate VCVS using XSPICE extensions.

#### iverilog

**iverilog** has been updated to 0.9.20081118. This is largely a bugfix update.

### 7.3.4. Logging and related applications

#### LinLog

LinLog has been updated to version 0.4.



### Note

Before updating to 0.4 you should export your database to ADIF. Then install 0.4, create a new database, and import the ADIF. Step-by-step instructions are available at <http://linlogbook.sourceforge.net/doc/LinLocDoc.html>

### qle

**qle** 0.0.10 is new to Fedora 11. **qle** is a graphic QSO log viewer, log editor and QSO logger. It logs (or modifies) QSOs directly in a fast and light-weight SQLite database.

### ibp

A tool to show which IBP beacons are transmitting. The International Beacon Project is a set of 18 amateur (ham) radio transmitters around the world, each of which transmit every 3 minutes on a set of 5 short-wave frequencies. This allows short-wave radio users to quickly assess the current worldwide propagation conditions. Much more information can be found on <http://www.ncdxf.org/beacons.html>

### xwota

xwota is intended for amateur radio operators who want to make use of the WOTA database. It can be used to find out who is on the air, the band and frequency they are operating on, and their location by country, state, county, grid, and latitude/longitude. xwota is new to Fedora 11.

If you don't know what is the WOTA database, please read some infos at <http://www.wotadb.org>.

## 7.3.5. Antenna Modeling

### xnec2c

Fedora includes *nec2c*, the powerful antenna modeling program, and *xnec2c* which provides a graphical user interface to *nec2c*. Both of these packages have been updated to version 1.2 in Fedora 11. The changes are minor bugfixes. Project site: <http://5b4az.chronos.org.uk/pages/nec2.html>

## 7.3.6. Internet and Related Applications

### thebridge

**thebridge** is an ILink/EchoLink compatible conference bridge. This is a new feature in Fedora 11.

### cwirc

X-Chat plugin for sending and receiving raw morse code over IRC. New to Fedora 11.

### svxlink-server

**svxlink server** is a general purpose voice services system for ham radio use. Each voice service is implemented as a plugin called a module. Some examples of voice services are: Help system, Simplex repeater, EchoLink connection. The core of the system handles the radio interface and is

quite flexible as well. It can act both as a simplex node and as a repeater controller. *svxlink-server* 0.10.1 is new to Fedora with this release. For programmers, there is also a development package, *svxlink-server-devel*.

### qtel

**qtel** 0.11.1 is an Echolink client. Note that it is a client only, not a full link. If you want to create a link, install *svxlink-server*. If you need a conference bridge, use *thebridge*. *qtel* is new with Fedora 11.

## 7.3.7. Other applications

### hamlib

Fedora 11 includes version 1.28 of **hamlib**. There are a large number of new models supported and fixes to support for existing models. There are a number of new commands. See the project's website at <http://hamlib.sourceforge.net> for complete details.

### xdx

The DX cluster client *xdx* has been updated to 2.4.1. This is a bugfix update

### xdemorse

**xdemorse** has been updated to 1.3. This is a bugfix update.

### ssbd

**ssbd** (Single-Side Band daemon) is voice keyer for hamradio use. It's written as part of Tucnak, contest log for VHF contests, but is possible to use *ssbd* with any other program. **ssbd** is new to Fedora with this release.

### gpsman

**gpsman** has been updated to 6.4. See the details at [http://www.ncc.up.pt/gpsman/wGPSMan\\_4.html](http://www.ncc.up.pt/gpsman/wGPSMan_4.html)

### splat

*splat-utils* has been removed from Fedora and the contents included in the *splat* package. It is no longer necessary to install *splat-utils* to use **splat**.

## A. Legal Information

The Fedora Project is sponsored by Red Hat, Inc.

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## A.6. More Information

Additional legal information surrounding this document and Fedora Project releases is available on the Fedora Project website: <http://fedoraproject.org/wiki/Legal><sup>1</sup>

## B. Revision History

Revision 1.5	Fri May 22 2009	Rüdiger Landmann <a href="mailto:r.landmann@redhat.com">r.landmann@redhat.com</a>
Re-add Common bugs section		
Add libguestfs		
Revision 1.4	Mon May 18 2009	Rüdiger Landmann <a href="mailto:r.landmann@redhat.com">r.landmann@redhat.com</a>
Update Volume Control		
Fix XML table glitch in I18n section		
Add moin update		
Link to wiki page on fingerprint readers		
Add Presto		
Add Archer		
Revision 1.3	Tue Mar 31 2009	John McDonough <a href="mailto:jjmcd@fedoraproject.org">jjmcd@fedoraproject.org</a>
Development Tools updates		
Revision 1.2	Mon Mar 30 2009	John McDonough <a href="mailto:jjmcd@fedoraproject.org">jjmcd@fedoraproject.org</a>

<sup>1</sup> <http://fedoraproject.org/wiki/Legal>

## Release Notes

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Add changes in boot menu  
New Gnome and KDE content  
Multimedia Beat

Revision 1.1      Sun Mar 15 2009

John McDonough  
[jjmcd@fedoraproject.org](mailto:jjmcd@fedoraproject.org)

Add Scientific and Technical section

Revision 1.0      Tue Feb 10 2009

Ryan Lerch [ryanlerch@fedoraproject.org](mailto:ryanlerch@fedoraproject.org)

First Draft