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Fedora is a center for innovation in free and open source software, and creates a community where contributors of all kinds -- developers, documenters, artists, system administrators, and other free software and open source enthusiasts -- come together to advance the ecosystem for the benefit of everybody. The Fedora community contributes everything it builds back to the free and open source world and continues to make advances of significance to the broader community, as evidenced by the regular and rapid incorporation of its features into other Linux distributions. Regardless of which Linux distribution you use, you are relying on code developed within the Fedora Project.

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Fedora 15

Installation Guide

Installing Fedora 15 on x86, AMD64, and Intel 64 architectures



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Fedora 15 Installation Guide

Installing Fedora 15 on x86, AMD64, and Intel 64 architectures

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Abstract

Provides documentation for the installation process.

Preface

1. Document Conventions

This manual uses several conventions to highlight certain words and phrases and draw attention to specific pieces of information.

In PDF and paper editions, this manual uses typefaces drawn from the *Liberation Fonts*¹ set. The Liberation Fonts set is also used in HTML editions if the set is installed on your system. If not, alternative but equivalent typefaces are displayed. Note: Red Hat Enterprise Linux 5 and later includes the Liberation Fonts set by default.

1.1. Typographic Conventions

Four typographic conventions are used to call attention to specific words and phrases. These conventions, and the circumstances they apply to, are as follows.

Mono-spaced Bold

Used to highlight system input, including shell commands, file names and paths. Also used to highlight key caps and key-combinations. For example:

To see the contents of the file `my_next_bestselling_novel` in your current working directory, enter the `cat my_next_bestselling_novel` command at the shell prompt and press **Enter** to execute the command.

The above includes a file name, a shell command and a key cap, all presented in Mono-spaced Bold and all distinguishable thanks to context.

Key-combinations can be distinguished from key caps by the hyphen connecting each part of a key-combination. For example:

Press **Enter** to execute the command.

Press **Ctrl+Alt+F2** to switch to the first virtual terminal. Press **Ctrl+Alt+F1** to return to your X-Windows session.

The first sentence highlights the particular key cap to press. The second highlights two sets of three key caps, each set pressed simultaneously.

¹ <https://fedorahosted.org/liberation-fonts/>

Preface

If source code is discussed, class names, methods, functions, variable names and returned values mentioned within a paragraph will be presented as above, in `Mono-spaced Bold`. For example:

File-related classes include `filesystem` for file systems, `file` for files, and `dir` for directories. Each class has its own associated set of permissions.

Proportional Bold

This denotes words or phrases encountered on a system, including application names; dialogue box text; labelled buttons; check-box and radio button labels; menu titles and sub-menu titles. For example:

Choose **System > Preferences > Mouse** from the main menu bar to launch **Mouse Preferences**. In the **Buttons** tab, click the **Left-handed mouse** check box and click **Close** to switch the primary mouse button from the left to the right (making the mouse suitable for use in the left hand).

To insert a special character into a **gedit** file, choose **Applications > Accessories > Character Map** from the main menu bar. Next, choose **Search > Find...** from the **Character Map** menu bar, type the name of the character in the **Search** field and click **Next**. The character you sought will be highlighted in the **Character Table**. Double-click this highlighted character to place it in the **Text to copy** field and then click the **Copy** button. Now switch back to your document and choose **Edit > Paste** from the **gedit** menu bar.

The above text includes application names; system-wide menu names and items; application-specific menu names; and buttons and text found within a GUI interface, all presented in Proportional Bold and all distinguishable by context.

Note the **>** shorthand used to indicate traversal through a menu and its sub-menus. This is to avoid the difficult-to-follow 'Select **Mouse** from the **Preferences** sub-menu in the **System** menu of the main menu bar' approach.

Mono-spaced Bold Italic Or Proportional Bold Italic

Whether Mono-spaced Bold or Proportional Bold, the addition of Italics indicates replaceable or variable text. Italics denotes text you do not input literally or displayed text that changes depending on circumstance. For example:

To connect to a remote machine using `ssh`, type `ssh username@domain.name` at a shell prompt. If the remote machine is `example.com` and your username on that machine is `john`, type `ssh john@example.com`.

The `mount -o remount file-system` command remounts the named file system. For example, to remount the `/home` file system, the command is `mount -o remount /home`.

To see the version of a currently installed package, use the `rpm -q package` command. It will return a result as follows: *package-version-release*.

Note the words in bold italics above – *username*, *domain.name*, *file-system*, *package*, *version* and *release*. Each word is a placeholder, either for text you enter when issuing a command or for text displayed by the system.

Aside from standard usage for presenting the title of a work, italics denotes the first use of a new and important term. For example:

When the Apache HTTP Server accepts requests, it dispatches child processes or threads to handle them. This group of child processes or threads is known as a *server-pool*. Under Apache HTTP Server 2.0, the responsibility for creating and maintaining these server-pools has been abstracted to a group of modules called *Multi-Processing Modules* (MPMs). Unlike other modules, only one module from the MPM group can be loaded by the Apache HTTP Server.

1.2. Pull-quote Conventions

Two, commonly multi-line, data types are set off visually from the surrounding text.

Output sent to a terminal is set in Mono-spaced Roman and presented thus:

```
books      Desktop  documentation  drafts  mss    photos  stuff  svn
books_tests Desktop1 downloads    images  notes  scripts svgs
```

Source-code listings are also set in Mono-spaced Roman but are presented and highlighted as follows:

```
package org.jboss.book.jca.ex1;

import javax.naming.InitialContext;

public class ExClient
{
    public static void main(String args[])
        throws Exception
    {
        InitialContext iniCtx = new InitialContext();
        Object          ref    = iniCtx.lookup("EchoBean");
        EchoHome        home   = (EchoHome) ref;
        Echo            echo   = home.create();

        System.out.println("Created Echo");

        System.out.println("Echo.echo('Hello') = " + echo.echo("Hello"));
    }
}
```

1.3. Notes and Warnings

Finally, we use three visual styles to draw attention to information that might otherwise be overlooked.



Note

A note is a tip or shortcut or alternative approach to the task at hand. Ignoring a note should have no negative consequences, but you might miss out on a trick that makes your life easier.



Important

Important boxes detail things that are easily missed: configuration changes that only apply to the current session, or services that need restarting before an update will apply. Ignoring Important boxes will not cause data loss but may cause irritation and frustration.



Warning

A Warning should not be ignored. Ignoring warnings will most likely cause data loss.

2. We Need Feedback!

If you find a typographical error in this manual, or if you have thought of a way to make this manual better, we would love to hear from you! Please submit a report in Bugzilla: <http://bugzilla.redhat.com/bugzilla/> against the product **Fedora Documentation**.

When submitting a bug report, be sure to mention the manual's identifier: *install-guide*

If you have a suggestion for improving the documentation, try to be as specific as possible when describing it. If you have found an error, please include the section number and some of the surrounding text so we can find it easily.

3. Acknowledgements

Certain portions of this text first appeared in the *Fedora Installation Guide*, copyright © 2009 Red Hat, Inc. and others, published by the Fedora Project at <http://docs.fedoraproject.org/install-guide/>.

Introduction

This guide covers installation of Fedora, a Linux distribution built on free and open source software. This manual helps you install Fedora on desktops, laptops, and servers. The installation system is easy to use even if you lack previous knowledge of Linux or computer networks. If you select default options, Fedora provides a complete desktop operating system, including productivity applications, Internet utilities, and desktop tools.

This document details the full range of installation options, including those that apply only in limited or unusual circumstances. The *Fedora 15 Installation Quick Start Guide* provides a much-abbreviated set of instructions for downloading Fedora, creating an installation disc, and installing Fedora on a typical desktop or laptop computer. The *Fedora 15 Installation Quick Start Guide* is available from <http://docs.fedoraproject.org/installation-quick-start-guide/>.

1. Background

1.1. About Fedora

To find out more about Fedora, refer to <http://fedoraproject.org/>. To read other documentation on Fedora related topics, refer to <http://docs.fedoraproject.org/>.

1.2. Getting Additional Help

For information on additional help resources for Fedora, visit <http://fedoraproject.org/wiki/Communicate>.

2. About This Document

2.1. Goals

This guide helps a reader:

1. Understand how to locate the Fedora distribution online
2. Create configuration data that allows a computer to boot Fedora
3. Understand and interact with the Fedora installation program
4. Complete basic post-installation configuration of a Fedora system



Other Sources of Documentation

This guide does not cover use of Fedora. To learn how to use an installed Fedora system, refer to <http://docs.fedoraproject.org/> for other documentation.

2.2. Audience

This guide is intended for Fedora users of all levels of experience. However, it treats the installation process and its many options in far greater detail than most novice users are likely to require. You do not need to read and understand this entire document to install Fedora on a computer. This document is most likely to help experienced users perform advanced and unusual installations.

Chapter 1.

Quick Start for Experts

This section offers a very brief overview of installation tasks for experienced readers who are eager to get started. Note that many explanatory notes and helpful hints appear in the following chapters of this guide. If an issue arises during the installation process, consult the appropriate chapters in the full guide for help.



Experts Only

This section is intended only for experts. Other readers may not be familiar with some of the terms in this section, and should move on to *Chapter 2, Obtaining Fedora* (see page 29) instead.

1.1. Overview

The installation procedure is fairly simple, and consists of only a few steps:

1. Download files to make media or another bootable configuration.
2. Prepare system for installation.
3. Boot the computer and run the installation process.
4. Reboot and perform post-installation configuration.

1.2. Download Files

Do any one of the following:



Verify your downloads

Downloads may fail for any number of reasons. Always verify the sha256sum of the downloaded files.

1. Download the ISO image for a Live image. Create CD media from the ISO file using your preferred application. You may also use the `livecd-tools` package to write the image to other bootable media such as a USB flash disk. To install the distribution to your hard disk, use the shortcut on the desktop after you log in.
2. Download the ISO images for the full distribution on CD or DVD. Create CD or DVD media from the ISO files using your preferred application, or put the images on a Windows FAT32 or Linux ext2, ext3, or ext4 partition.

3. Download the `boot.iso` image for a minimal boot CD or USB flash drive. Write the image to the appropriate physical media to create bootable media. The boot media contains no packages but must be pointed at a hard disk or online repository to complete the installation.
4. Download the `vmlinuz` kernel file and the `initrd.img` ramdisk image from the distribution's `isolinux/` directory. Configure your operating system to boot the kernel and load the ramdisk image. For further information on installation without media, refer to *Chapter 11, Installing Without Media* (see page 161).

For information on setting up a network boot server from which you can install Fedora, refer to *Chapter 11, Setting Up an Installation Server* (see page 163).

To learn how to turn ISO images into CD or DVD media, refer to *Making Fedora Discs* available from <http://docs.fedoraproject.org/readme-burning-isos/>.

1.3. Prepare for Installation

Back up any user data you need to preserve.



Resizing Partitions

The installation program provides functions for resizing ext2, ext3, ext4, and NTFS formatted partitions. Refer to *Section 8.16, Creating a Custom Layout or Modifying the Default Layout* (see page 105) for more information.

1.4. Install Fedora

Boot from the desired media, with any options appropriate for your hardware and installation mode. Refer to *Chapter 10, Boot Options* (see page 151) for more information about boot options. If you boot from the Live CD, select the "Install to Hard Disk" option from the desktop to run the installation program. If you boot from minimal media or a downloaded kernel, select a network or hard disk resource from which to install.

Proceed through all the steps of the installation program. The installation program does not change your system until you make a final confirmation to proceed. When installation is finished, reboot your system.

1.5. Perform Post-installation Steps

After the system reboots, it displays additional configuration options. Make appropriate changes to your system and proceed to the login prompt.

Refer to *Chapter 16, Firstboot* (see page 233) or the Firstboot page on the Fedora wiki: <http://fedoraproject.org/wiki/FirstBoot> for more detail.

Part I.

Preparing for Installation

This part of the Fedora Installation Guide covers decisions that you should make and resources that you should gather before installing Fedora, including:

- the decision whether to upgrade an existing installation of Fedora or install a new copy.
- hardware considerations, and hardware details that you may need during installation.

Chapter 2.

Obtaining Fedora

This chapter explains how to get the files you need to install and run Fedora on your computer. Concepts in this chapter may be new, especially if this is your first free and open source operating system. If you have any trouble with this chapter, find help by visiting the Fedora Forums at <http://www.fedoraforum.org/>.

The Fedora Project distributes Fedora in many ways, mostly free of cost and downloaded over the Internet. The most common distribution method is CD and DVD media. There are several types of CD and DVD media available, including:

- A full set of the software on DVD media
- Live images you can use to try Fedora, and then install to your system if you so choose
- Reduced-size bootable CD and USB flash disk images you can use to install over an Internet connection
- Source code on DVD media

Most users want the Fedora Live image or the full set of installable software on DVD or CDs. The reduced bootable images are suitable for use with a fast Internet connection and install Fedora on one computer. Source code discs are not used for installing Fedora, but are resources for experienced users and software developers.

Users with a broadband Internet connection can download *ISO images* of CD and DVD media or images of USB flash disks. An ISO image is a copy of an entire disc in a format suitable for writing directly to a CD or DVD. A USB flash disk image is a copy of an entire disk in a format suitable for writing directly to a USB flash disk.

For more information on burning CDs and DVDs, refer to *Chapter 3, Making Media* (see page 34).

If downloading the Fedora ISO images and burning them to CD or DVD is impossible or impractical for you, refer to *Section 2.2, Obtaining Fedora on CD or DVD* (see page 33) to learn about other ways that you can obtain Fedora.

2.1. Downloading Fedora

2.1.1. How Do I Download Installation Files?



Download Links

To follow a Web-based guide to downloading, visit <http://get.fedoraproject.org/>. For guidance on which architecture to download, refer to *Section 2.1.2, Which Architecture Is My Computer?* (see page 31).

Fedora software is available for download at no cost in a variety of ways.

2.1.1.1. From a Mirror

The Fedora installation files are freely available from web servers located in many parts of the world. These servers *mirror* the files available from the Fedora Project. If you visit <http://download.fedoraproject.org/>, you are redirected to a mirror, based on a calculation of which mirror is likely to offer you the best download speed. Alternatively, you can choose a mirror from the list maintained at <http://mirrors.fedoraproject.org/publiclist>. This page lists mirrors according to geographic location. The mirrors geographically closest to you are likely to provide you with the fastest downloads. If the company or organization that provides your internet access maintains a mirror, this mirror is likely to provide you with the fastest downloads of all.

Mirrors publish Fedora software under a well-organized hierarchy of folders. For example, the Fedora 15 distribution normally appears in the directory `fedora/linux/releases/15/`. This directory contains a folder for each architecture supported by that release of Fedora. CD and DVD media files appear inside that folder, in a folder called `iso/`. For example, you can find the file for the DVD distribution of Fedora 15 for `x86_64` at `fedora/linux/releases/15/Fedora/x86_64/iso/Fedora-15-x86_64-DVD.iso`.

2.1.1.2. From BitTorrent

BitTorrent is a way to download information in cooperation with other computers. Each computer cooperating in the group downloads pieces of the information in a particular torrent from other peers in the group. Computers that have finished downloading all the data in a torrent remain in the swarm to *seed*, or provide data to other peers. If you download using BitTorrent, as a courtesy you should seed the torrent at least until you have uploaded the same amount of data you downloaded.

If your computer does not have software installed for BitTorrent, visit the BitTorrent home page at <http://www.bittorrent.com/download/> to download it. BitTorrent client software is available for Windows, Mac OS, Linux, and many other operating systems.

You do not need to find a special mirror for BitTorrent files. The BitTorrent protocol ensures that your computer participates in a nearby group. To download and use the Fedora BitTorrent files, visit <http://torrent.fedoraproject.org/>.



Minimal Boot Images

Minimal boot CD and USB flash disk images are not available through BitTorrent.

2.1.2. Which Architecture Is My Computer?

Releases are separated by *architecture*, or type of computer processor. Use the following table to determine the architecture of your computer according to the type of processor. Consult your manufacturer's documentation for details on your processor, if necessary.

Processor manufacturer and model	Architecture type for Fedora
Intel (except Atom 230, Atom 330, Core 2 Duo, Centrino Core2 Duo, and recent vintage Xeon); AMD (except Athlon 64, Athlon x2, Sempron 64, and Opteron); VIA C3, C7	i386
Intel Atom 230, Atom 330, Core 2 Duo, Centrino Core 2 Duo, and Xeon; AMD Athlon 64, Athlon x2, Sempron64, and Opteron; Apple MacBook, MacBook Pro, and MacBook Air	x86_64

Table 2.1. Processor and architecture types



i386 Works for Most Windows Compatible Computers

If you are unsure what type of processor your computer uses, choose `i386`.

The exception is if your computer is a non-Intel based Apple Macintosh. Refer to *Table 2.1. Processor and architecture types* above for more information.



Intel Atom Processor Architectures Vary

The N and Z Series Atom processors are based on the `i386` architecture. The 230 and 330 Series Atom processors are based on the `x86_64` architecture. Refer to <http://ark.intel.com/cpugroup.aspx?familyID=29035> for more details.

2.1.3. Which Files Do I Download?

You have several options to download Fedora. Read the options below to decide the best one for you.

Each file available for download in a Fedora distribution includes the architecture type in the file name. For example, the file for the DVD distribution of Fedora 15 for `x86_64` is named `Fedora-15-x86_64-DVD.iso`. Refer to *Section 2.1.2, Which Architecture Is My Computer?* (see page 31) if you are unsure of your computer's architecture.

1. Full Distribution on DVD

If you have plenty of time, a fast Internet connection, and wish a broader choice of software on the install media, download the full DVD version. Once burned to DVD, the media is bootable and includes an installation program. The DVD version contains a mode to perform rescue operations on your Fedora system in an emergency. You can download the DVD version directly from a mirror, or via BitTorrent.

2. Full Distribution on a set of CDs

If the DVD image is too large for you to download conveniently, or you want to have a broad choice of software to install on a system with a CD drive but no DVD drive, you can download the full distribution as a set of CDs. The total size of the images that make up the CD set is approximately the same as the size of the DVD image. You can download the images that make up the CD set directly from a mirror, or via BitTorrent.

3. Live Image

If you want to try Fedora before you install it on your computer, download the Live image version. If your computer supports booting from CD or USB, you can boot the operating system without making any changes to your hard disk. The Live image also provides an `Install to Hard Disk` desktop shortcut. If you decide you like what you see, and want to install it, simply activate the selection to copy Fedora to your hard disk. You can download the Live image directly from a mirror, or using BitTorrent.

4. Minimal Boot Media

If you have a fast Internet connection but do not want to download the entire distribution, you can download a small boot image. Fedora offers images for a minimal boot environment on CD. Once you boot your system with the minimal media, you can install Fedora directly over the Internet. Although this method still involves downloading a significant amount of data over the Internet, it is almost always much less than the size of the full distribution media. Once you have finished installation, you can add or remove software to your system as desired.



Download Size

Installing the default software for Fedora over the Internet requires more time than the Live image, but less time than the entire DVD distribution. Actual results depend on the software you select and network traffic conditions.

The following table explains where to find the desired files on a mirror site. Replace *arch* with the architecture of the computer being installed.

Media type	File locations
Full distribution on DVD	<code>fedora/linux/releases/15/Fedora/arch/iso/Fedora-15-arch-DVD.iso</code>
Full distribution on a set of CDs	<code>fedora/linux/releases/15/Fedora/arch/iso/Fedora-15-arch-disc1.iso</code> , <code>fedora/linux/releases/15/Fedora/arch/iso/Fedora-15-arch-disc2.iso</code> , <code>fedora/linux/releases/15/Fedora/arch/iso/Fedora-15-arch-disc3.iso</code> , and similar.
Live image	<code>fedora/linux/releases/15/Live/arch/iso/Fedora-15-arch-Live.iso</code> , <code>fedora/linux/releases/15/Live/arch/iso/Fedora-15-KDE-arch-Live.iso</code>
Minimal CD boot media	<code>fedora/linux/releases/15/Fedora/arch/os/images/boot.iso</code>

Table 2.2. Locating files

2.2. Obtaining Fedora on CD or DVD

If you do not have a fast Internet connection, or if you have a problem creating boot media, downloading may not be an option. Fedora DVD and CD distribution media is available from a number of online sources around the world at a minimal cost. Use your favorite Web search engine to locate a vendor, or refer to <http://fedoraproject.org/wiki/Distribution>.

Revision History

Revision History	Data	Author
Revision 1.0-0 Updates for Fedora 15	Tue May 24 2011	Rüdiger Landmann

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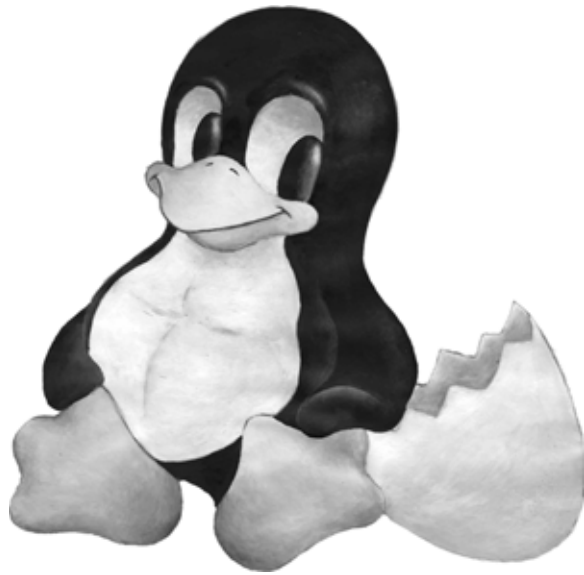
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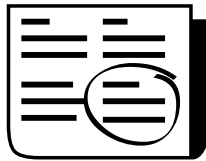
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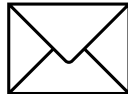


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