

About Ubuntu

Ubuntu is a community developed Linux-based operating system that is perfect for laptops, desktops and servers. Whether you use it at home, at school or at work Ubuntu contains all the applications you'll ever need, from word processing and email applications, to web server software and programming tools.

Ubuntu is an African word meaning "Humanity to others", or "I am what I am because of who we all are". The Ubuntu distribution brings the spirit of Ubuntu



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Ubuntu CDs contain only free software applications; we encourage you to use free and open source software, improve it and pass it on.

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Ubuntu 11.04

Ubuntu Installation Guide



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Ubuntu 11.04

Ubuntu Installation Guide

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Abstract

This document contains installation instructions for the Ubuntu 11.04 system (codename "Natty Narwhal"), for the Intel x86 ("i386") architecture. It also contains pointers to more information and information on how to make the most of your new Ubuntu system.

Installing Ubuntu 11.04 "Natty Narwhal" For i386

We are delighted that you have decided to try Ubuntu, and are sure that you will find that Ubuntu's GNU/Linux distribution is unique. Ubuntu brings together high-quality free software from around the world, integrating it into a coherent whole. We believe that you will find that the result is truly more than the sum of the parts.

We understand that many of you want to install Ubuntu without reading this manual, and the Ubuntu installer is designed to make this possible. If you don't have time to read the whole Installation Guide right now, we recommend that you read the Installation Howto, which will walk you through the basic installation process, and links to the manual for more advanced topics or for when things go wrong. The Installation Howto can be found in Appendix A, *Installation Howto*.

With that said, we hope that you have the time to read most of this manual, and doing so will lead to a more informed and likely more successful installation experience.

Chapter 1.

Welcome to Ubuntu

This chapter provides an overview of the Ubuntu Project, and the Debian Project upon which it is based. If you already know about the Ubuntu Project's history and the Ubuntu distribution, feel free to skip to the next chapter.

1.1. What is Ubuntu?

Ubuntu is a complete desktop Linux operating system, freely available with both community and professional support. The Ubuntu community is built on the ideas enshrined in the Ubuntu Manifesto: that software should be available free of charge, that software tools should be usable by people in their local language and despite any disabilities, and that people should have the freedom to customize and alter their software in whatever way they see fit.

- *Ubuntu will always be free of charge*, and there is no extra fee for the "enterprise edition", we make our very best work available to everyone on the same Free terms.
- Ubuntu includes the *very best in translations and accessibility infrastructure* that the Free Software community has to offer, to make Ubuntu usable by as many people as possible.
- Ubuntu is shipped in stable and regular release cycles; *a new release will be shipped every six months*. You can use the current stable release or the current development release. A release will be supported for 18 months.
- Ubuntu is entirely committed to the principles of open source software development; we encourage people to use open source software, improve it and pass it on.

Ubuntu is suitable for both desktop and server use. The current Ubuntu release supports Intel x86 (IBM-compatible PC), AMD64 (Hammer) and PowerPC (Apple iBook and Powerbook, G4 and G5) architectures.

Ubuntu includes more than 1000 pieces of software, starting with the Linux kernel version 2.6 and GNOME 2.32, and covering every standard desktop application from word processing and spreadsheet applications to internet access applications, web server software, email software, programming languages and tools and of course several games.

1.1.1. Sponsorship by Canonical

The Ubuntu Project is sponsored by *Canonical Ltd.*¹ Canonical will not charge licence fees for Ubuntu, now or at any stage in the future. Canonical's business model is to provide technical support and professional services related to Ubuntu. We encourage more companies also to offer support for Ubuntu, and will list those that do on the Support pages of this web site.

1.2. What is Debian?

Debian is an all-volunteer organization dedicated to developing free software and promoting the ideals of the Free Software community. The Debian Project began in 1993, when Ian Murdock issued an open invitation to software developers to contribute to a complete and coherent software distribution based on the relatively new Linux kernel. That relatively small band of dedicated enthusiasts, originally funded by the *Free Software Foundation*² and influenced by the *GNU*³ philosophy, has grown over the years into an organization of around 890 *Debian Developers* .

Debian Developers are involved in a variety of activities, including *Web*⁴ and *FTP*⁵ site administration, graphic design, legal analysis of software licenses, writing documentation, and, of course, maintaining software packages.

In the interest of communicating our philosophy and attracting developers who believe in the principles that Debian stands for, the Debian Project has published a number of documents that outline our values and serve as guides to what it means to be a Debian Developer:

- The *Debian Social Contract*⁶ is a statement of Debian's commitments to the Free Software Community. Anyone who agrees to abide to the Social Contract may become a *maintainer*⁷. Any maintainer can introduce new software into Debian – provided that the software meets our criteria for being free, and the package follows our quality standards.
- The *Debian Free Software Guidelines*⁸ are a clear and concise statement of Debian's criteria for free software. The DFSG is a very influential document in the Free Software Movement, and was the foundation of the *The Open Source Definition*⁹.

¹ <http://www.canonical.com/>

² <http://www.fsf.org/>

³ <http://www.gnu.org/gnu/the-gnu-project.html>

⁴ <http://www.debian.org/>

⁵ <ftp://ftp.debian.org/>

⁶ http://www.debian.org/social_contract

⁷ <http://www.debian.org/doc/maint-guide/>

⁸ http://www.debian.org/social_contract#guidelines

- The *Debian Policy Manual*¹⁰ is an extensive specification of the Debian Project's standards of quality.

Debian developers are also involved in a number of other projects; some specific to Debian, others involving some or all of the Linux community. Some examples include:

- The *Linux Standard Base*¹¹ (LSB) is a project aimed at standardizing the basic GNU/Linux system, which will enable third-party software and hardware developers to easily design programs and device drivers for Linux-in-general, rather than for a specific GNU/Linux distribution.
- The *Filesystem Hierarchy Standard*¹² (FHS) is an effort to standardize the layout of the Linux file system. The FHS will allow software developers to concentrate their efforts on designing programs, without having to worry about how the package will be installed in different GNU/Linux distributions.
- *Debian Jr.*¹³ is an internal project, aimed at making sure Debian has something to offer to our youngest users.

For more general information about Debian, see the *Debian FAQ*¹⁴.

1.2.1. Ubuntu and Debian

Ubuntu and Debian are distinct but parallel and closely linked systems. The Ubuntu project seeks to complement the Debian project in the following areas:

1.2.1.1. Package selection

Ubuntu does not provide security updates and professional support for every package available in the open source world, but selects a complete set of packages making up a solid and comprehensive desktop system and provides support for that set of packages.

For users that want access to every known package, Ubuntu provides a "universe" component (set of packages) where users of Ubuntu systems install the latest version of any package that is not in the supported set. Most of the packages in Ubuntu universe are also in Debian, although there are other sources for universe too. See the Ubuntu Components page for more detail on the structure of the Ubuntu web distribution.

⁹ http://opensource.org/docs/definition_plain.html

¹⁰ <http://www.debian.org/doc/debian-policy/>

¹¹ <http://www.linuxbase.org/>

¹² <http://www.pathname.com/fhs/>

¹³ <http://www.debian.org/devel/debian-jr/>

¹⁴ <http://www.debian.org/doc/FAQ/>

1.2.1.2. Releases

Ubuntu makes a release every six months, and supports those releases for 18 months with daily security fixes and patches to critical bugs.

As Ubuntu prepares for release, we "freeze" a snapshot of Debian's development archive ("sid"). We start from "sid" in order to give ourselves the freedom to make our own decisions with regard to release management, independent of Debian's release-in-preparation. This is necessary because our release criteria are very different from Debian's.

As a simple example, a package might be excluded from Debian "testing" due to a build failure on any of the 11 architectures supported by Debian "sarge", but it is still suitable for Ubuntu if it builds and works on only three of them. A package will also be prevented from entering Debian "testing" if it has release-critical bugs according to Debian criteria, but a bug which is release-critical for Debian may not be as important for Ubuntu.

As a community, we choose places to diverge from Debian in ways that minimize the difference between Debian and Ubuntu. For example, we usually choose to update to the very latest version of Gnome rather than the older version in Debian, and we might do the same for key other pieces of infrastructure such as X or GCC. Those decisions are listed as Feature Goals for that release, and we work as a community to make sure that they are in place before the release happens.

1.2.1.3. Development community

Many Ubuntu developers are also recognized members of the Debian community. They continue to stay active in contributing to Debian both in the course of their work on Ubuntu and directly in Debian.

When Ubuntu developers fix bugs that are also present in Debian packages -- and since the projects are linked, this happens often -- they send their bugfixes to the Debian developers responsible for that package in Debian and record the patch URL in the Debian bug system. The long term goal of that work is to ensure that patches made by the full-time Ubuntu team members are immediately also included in Debian packages where the Debian maintainer likes the work.

In Ubuntu, team members can make a change to any package, even if it is one maintained by someone else. Once you are an Ubuntu maintainer it's encouraged that you fix problems you encounter, although we also encourage polite discussions between people with an interest in a given package to improve cooperation and reduce friction between maintainers.

1.2.1.4. Freedom and Philosophy

Debian and Ubuntu are grounded on the same free software philosophy. Both groups are explicitly committed to building an operating system of free software.

Differences between the groups lie in their treatment of non-computer applications (like documentation, fonts and binary firmware) and non-free software. Debian distributes a small amount of non-free software from their Internet servers. Ubuntu will also distribute binary drivers in the "restricted" component on its Internet servers but will not distribute any other software applications that do not meet its own Ubuntu Licensing Guidelines.

1.2.1.5. Ubuntu and other Debian derivatives

There are many other distributions that also share the same basic infrastructure (package and archive format). Ubuntu is distinguished from them in a number of ways.

First, Ubuntu contributes patches directly to Debian as bugs are fixed during the Ubuntu release process, not just when the release is actually made. With other Debian-style distributions, the source code and patches are made available in a "big bang" at release time, which makes them difficult to integrate into the upstream HEAD.

Second, Ubuntu includes a number of full-time contributors who are also Debian developers. Many of the other distributions that use Debian-style packaging do not include any active Debian contributors.

Third, Ubuntu makes much more frequent and fresher releases. Our release policy of releasing every six months is (at the time of writing :-)) unique in the Linux distribution world. Ubuntu aims to provide you with a regular stable and security-supported snapshot of the best of the open source world.

1.3. What is GNU/Linux?

Linux is an operating system: a series of programs that let you interact with your computer and run other programs.

An operating system consists of various fundamental programs which are needed by your computer so that it can communicate and receive instructions from users; read and write data to hard disks, tapes, and printers; control the use of memory; and run other software. The most important part of an operating system is the kernel. In a GNU/Linux system, Linux is the kernel component. The rest of the system consists of other programs, many of which were written by or for the GNU Project. Because the Linux kernel alone does not form a working operating system, we prefer to use the term "GNU/Linux" to refer to systems that many people casually refer to as "Linux".

Linux is modelled on the Unix operating system. From the start, Linux was designed to be a multi-tasking, multi-user system. These facts are enough to make Linux different from other well-known operating systems. However, Linux is even more different than you might imagine. In contrast to other operating systems, nobody owns Linux. Much of its development is done by unpaid volunteers.

Development of what later became GNU/Linux began in 1984, when the *Free Software Foundation*¹⁵ began development of a free Unix-like operating system called GNU.

The *GNU Project*¹⁶ has developed a comprehensive set of free software tools for use with Unix™ and Unix-like operating systems such as Linux. These tools enable users to perform tasks ranging from the mundane (such as copying or removing files from the system) to the arcane (such as writing and compiling programs or doing sophisticated editing in a variety of document formats).

While many groups and individuals have contributed to Linux, the largest single contributor is still the Free Software Foundation, which created not only most of the tools used in Linux, but also the philosophy and the community that made Linux possible.

The *Linux kernel*¹⁷ first appeared in 1991, when a Finnish computing science student named Linus Torvalds announced an early version of a replacement kernel for Minix to the Usenet newsgroup `comp.os.minix`. See Linux International's *Linux History Page*¹⁸.

Linus Torvalds continues to coordinate the work of several hundred developers with the help of a number of subsystem maintainers. There is an *official website*¹⁹ for the Linux kernel. More information about the `linux-kernel` mailing list can be found on the *linux-kernel mailing list FAQ*²⁰.

Linux users have immense freedom of choice in their software. For example, Linux users can choose from a dozen different command line shells and several graphical desktops. This selection is often bewildering to users of other operating systems, who are not used to thinking of the command line or desktop as something that they can change.

Linux is also less likely to crash, better able to run more than one program at the same time, and more secure than many operating systems. With these advantages, Linux is the fastest growing operating system in the server market. More recently, Linux has begun to be popular among home and business users as well.

1.4. Getting Ubuntu

For information on how to download Ubuntu from the Internet, see the *download web page*²¹. The *list of Ubuntu mirrors*²² contains a full set of official Ubuntu mirrors, so you can easily find the nearest one.

¹⁵ <http://www.fsf.org/>

¹⁶ <http://www.gnu.org/>

¹⁷ <http://www.kernel.org/>

¹⁸ <http://www.cs.cmu.edu/~awb/linux.history.html>

¹⁹ <http://www.kernel.org/>

²⁰ <http://www.tux.org/lkml/>

²¹ <http://www.ubuntu.com/download/>

Ubuntu can be upgraded after installation very easily. The installation procedure will help set up the system so that you can make those upgrades once installation is complete, if need be.

1.5. Getting the Newest Version of This Document

This document is constantly being revised. Updated versions of this installation manual are available from the *official Install Manual pages*²³.

1.6. Organization of This Document

This document is meant to serve as a manual for first-time Ubuntu users. It tries to make as few assumptions as possible about your level of expertise. However, we do assume that you have a general understanding of how the hardware in your computer works.

Expert users may also find interesting reference information in this document, including minimum installation sizes, details about the hardware supported by the Ubuntu installation system, and so on. We encourage expert users to jump around in the document.

In general, this manual is arranged in a linear fashion, walking you through the installation process from start to finish. Here are the steps in installing Ubuntu, and the sections of this document which correlate with each step:

1. Determine whether your hardware meets the requirements for using the installation system, in Chapter 2, *System Requirements*.
2. Backup your system, perform any necessary planning and hardware configuration prior to installing Ubuntu, in Chapter 3, *Before Installing Ubuntu*. If you are preparing a multi-boot system, you may need to create partitionable space on your hard disk for Ubuntu to use.
3. In Chapter 4, *Obtaining System Installation Media*, you will obtain the necessary installation files for your method of installation.
4. Chapter 5, *Booting the Installation System* describes booting into the installation system. This chapter also discusses troubleshooting procedures in case you have problems with this step.
5. Perform the actual installation according to Chapter 6, *Using the Ubuntu Installer*. This involves choosing your language, configuring peripheral driver modules, configuring your network connection, so that remaining installation files can be obtained directly from an Ubuntu server (if you are not installing from a CD), partitioning your hard drives and installation of a base system, then selection and

²² <http://wiki.ubuntu.com/Archive>

²³ <http://help.ubuntu.com/9.10/installation-guide/i386/>

installation of tasks. (Some background about setting up the partitions for your Ubuntu system is explained in Appendix C, *Partitioning for Ubuntu*.)

6. Boot into your newly installed base system, from Chapter 7, *Booting Into Your New Ubuntu System*.

Once you've got your system installed, you can read Chapter 8, *Next Steps and Where to Go From Here*. That chapter explains where to look to find more information about Unix and Ubuntu, and how to replace your kernel.

Finally, information about this document and how to contribute to it may be found in Appendix E, *Administrivia*.

1.7. About Copyrights and Software Licenses

We're sure that you've read some of the licenses that come with most commercial software — they usually say that you can only use one copy of the software on a single computer. This system's license isn't like that at all. We encourage you to put a copy of Debian GNU/Linux on every computer in your school or place of business. Lend your installation media to your friends and help them install it on their computers! You can even make thousands of copies and *sell* them — albeit with a few restrictions. Your freedom to install and use the system comes directly from Ubuntu being based on *free software*.

Calling software *free* doesn't mean that the software isn't copyrighted, and it doesn't mean that CDs containing that software must be distributed at no charge. Free software, in part, means that the licenses of individual programs do not require you to pay for the privilege of distributing or using those programs. Free software also means that not only may anyone extend, adapt, and modify the software, but that they may distribute the results of their work as well.



Note

The Ubuntu project, as a pragmatic concession to its users, does make some packages available that do not meet our criteria for being free. These packages are not part of the official distribution, however, and are only available from the **multiverse** area of Ubuntu mirrors; see the *Ubuntu web site*²⁴ for more information about the layout and contents of the archives.

Many of the programs in the system are licensed under the *GNU General Public License*, often simply referred to as "the GPL". The GPL requires you to make the *source code* of the programs available whenever you distribute a binary copy of the program; that provision of

²⁴ <http://www.ubuntu.com/ubuntu/components>

the license ensures that any user will be able to modify the software. Because of this provision, the source code²⁵ for all such programs is available in the Ubuntu system.

There are several other forms of copyright statements and software licenses used on the programs in Ubuntu. You can find the copyrights and licenses for every package installed on your system by looking in the file `/usr/share/doc/package-name/copyright` once you've installed a package on your system.

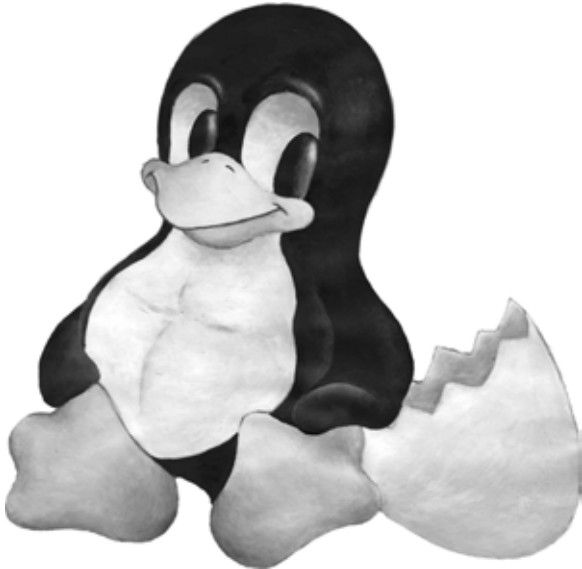
For more information about licenses and how Ubuntu determines whether software is free enough to be included in the main distribution, see the *Ubuntu License Policy*²⁶.

The most important legal notice is that this software comes with *no warranties*. The programmers who have created this software have done so for the benefit of the community. No guarantee is made as to the suitability of the software for any given purpose. However, since the software is free, you are empowered to modify that software to suit your needs – and to enjoy the benefits of the changes made by others who have extended the software in this way.

²⁵ For information on how to locate, unpack, and build binaries from Ubuntu source packages, see the *Debian FAQ* (<http://www.debian.org/doc/FAQ/>), under "Basics of the Debian Package Management System".

²⁶ <http://www.ubuntu.com/ubuntu/licensing>

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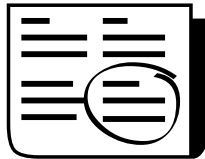


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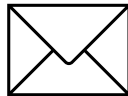


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