


# Ubuntu (operating system)

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| Ubuntu 10.04 LTS (Lucid Lynx)  |  |
| <b>Company / developer</b>   | Canonical Ltd. / Ubuntu Foundation   |
| <b>OS family</b>   | Unix-like  |
| <b>Working state</b>   | Current  |
| <b>Source model</b>  | Free and open source software  |
| <b>Initial release</b>   | 20 October 2004  |
| <b>Latest stable release</b>   | 10.04 / 29 April 2010 <sup>[1]</sup>   |
| <b>Available language(s)</b>   | Multilingual (more than 55)  |
| <b>Update method</b>   | APT (front-ends available)   |
| <b>Package manager</b>   | dpkg (front-ends like Synaptic available)  |
| <b>Supported platforms</b>   | IA-32, x86-64, lpia, SPARC, PowerPC, ARM, IA-64  |
| <b>Kernel type</b>   | Monolithic (Linux)   |
| <b>Userland</b>  | GNU  |
| <b>Default user interface</b>  | GNOME  |
| <b>License</b>   | Mainly the GNU GPL / plus proprietary binary blobs <sup>[2] [3]</sup> and various other licenses |
| <b>Official website</b>  | www.ubuntu.com <sup>[4]</sup>  |

**Ubuntu** (pronounced /uːˈbʊntuː/ *oo-BOON-too*),<sup>[5] [6]</sup> is a computer operating system based on the Debian GNU/Linux distribution.

It is named after the Southern African ethical ideology *Ubuntu* ("humanity towards others")<sup>[7]</sup> and is distributed as free and open source software with additional proprietary software available. Ubuntu provides an up-to-date, stable operating system for the average user, with a strong focus on usability and ease of installation. Web statistics suggest that Ubuntu's share of Linux desktop usage is about 50%,<sup>[8] [9]</sup> and upward trending usage as a web server.<sup>[10]</sup>

Ubuntu is composed of many software packages, of which the vast majority are distributed under a free software license (also known as open source). The main license used is the GNU General Public License (GNU GPL) which, along with the GNU Lesser General Public License (GNU LGPL), explicitly declares that users are free to run, copy, distribute, study, change, develop and improve the software. Ubuntu is sponsored by the UK-based company Canonical Ltd., owned by South African entrepreneur Mark Shuttleworth. By keeping Ubuntu free and open source,

Canonical is able to utilize the talents of community developers in Ubuntu's constituent components. Instead of selling Ubuntu for profit, Canonical creates revenue by selling technical support and from creating several services tied to Ubuntu.

Canonical endorses and provides support for three additional Ubuntu-derived operating systems: Kubuntu, Edubuntu and Ubuntu Server Edition. There are several other derivative operating systems including local language and hardware-specific versions.<sup>[11]</sup>

Canonical releases new versions of Ubuntu every six months and supports Ubuntu for eighteen months by providing security fixes, patches to critical bugs and minor updates to programs. LTS (Long Term Support) versions, which are released every two years,<sup>[12]</sup> are supported for three years on the desktop and five years for servers.<sup>[13]</sup> The latest version of Ubuntu, 10.04 (Lucid Lynx), is such an LTS version, and was released on April 29, 2010.

## History and development process

Ubuntu is a fork of the Debian project's code base.<sup>[14]</sup> The original aim was to release a new version of Ubuntu every six months, resulting in a more frequently updated system. Ubuntu's first release was on October 20, 2004.<sup>[15]</sup>

Ubuntu releases are timed about one month after GNOME releases.<sup>[16]</sup> In contrast to other forks of Debian, which extensively use proprietary and closed source add-ons, Ubuntu uses primarily free (*libre*) software, making an exception only for some proprietary hardware drivers.<sup>[17]</sup>

Ubuntu packages are based on packages from Debian's unstable branch: both distributions use Debian's deb package format and package management tools (APT and Synaptic). Debian and Ubuntu packages are not necessarily binary compatible with each other, however, and sometimes .deb packages may need to be rebuilt from source to be used in Ubuntu.<sup>[18]</sup> Many Ubuntu developers are also maintainers of key packages within Debian. Ubuntu cooperates with Debian by pushing changes back to Debian,<sup>[19]</sup> although there has been criticism that this does not happen often enough. In the past, Ian Murdock, the founder of Debian, has expressed concern about Ubuntu packages potentially diverging too far from Debian Sarge to remain compatible.<sup>[20]</sup> Before release, packages are imported from Debian Unstable continuously and merged with Ubuntu-specific modifications. A month before release, imports are frozen, and packagers then work to ensure that the frozen features interoperate well together.

Ubuntu is currently funded by Canonical Ltd.. On July 8, 2005, Mark Shuttleworth and Canonical Ltd. announced the creation of the Ubuntu Foundation and provided an initial funding of US\$10 million. The purpose of the foundation is to ensure the support and development for all future versions of Ubuntu. Mark Shuttleworth describes the foundation as an "emergency fund" [in case Canonical's involvement ends].<sup>[21]</sup>

Ubuntu 10.04, which was released on April 29, 2010, is the current Long Term Support (LTS) release.<sup>[22] [23] [24]</sup> Canonical releases LTS versions every two years, with Ubuntu 10.10 Maverick Meerkat (release number subject to change) as the next normal version for release in October 2010.

On March 12, 2009, Ubuntu announced developer support for 3rd party cloud management platforms, such as for those used at Amazon EC2.<sup>[25]</sup>

## Features

Ubuntu focuses on usability.<sup>[26]</sup> The Ubiquity installer allows Ubuntu to be installed to the hard disk from within the Live CD environment, without the need for restarting the computer prior to installation. Ubuntu also emphasizes accessibility and internationalization to reach as many people as possible. Beginning with 5.04, UTF-8 became the default character encoding,<sup>[27]</sup> which allows for support of a variety of non-Roman scripts. As a security feature, the sudo tool is used to assign temporary privileges for performing administrative tasks, allowing the root account to remain locked, and preventing inexperienced users from inadvertently making catastrophic system changes or opening security holes.<sup>[28]</sup> PolicyKit is also being widely implemented into the desktop to further harden the system through the principle of least privilege.

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Ubuntu comes installed with a wide range of software that includes OpenOffice.org, Firefox, Empathy (Pidgin in versions before 9.10), Transmission, GIMP (in versions prior to 10.04), and several lightweight games (such as Sudoku and chess). Additional software that is not installed by default can be downloaded using the package manager. Ubuntu allows networking ports to be closed using its firewall, with customized port selection available. End-users can install Gufw and keep it enabled.<sup>[29]</sup> GNOME (the current default desktop) offers support for more than 46 languages.<sup>[30]</sup> Ubuntu can also run many programs designed for Microsoft Windows (such as Microsoft Office), through Wine or using a Virtual Machine (such as VMware Workstation or VirtualBox).

## Installation

Installation of Ubuntu is generally performed with the Live CD. The Ubuntu OS can be run directly from the CD (albeit with a significant performance loss), allowing a user to "test-drive" the OS for hardware compatibility and driver support. The CD also contains the Ubiquity installer,<sup>[31]</sup> which then can guide the user through the permanent installation process. CD images of all current and past versions are available for download at the Ubuntu web site.<sup>[32]</sup> Installing from the CD requires a minimum of 256 MB RAM.

Users can download a disk image (.iso) of the CD, which can then either be written to a physical medium (CD or DVD), or optionally run directly from a hard drive (via UNetbootin or GRUB). Ubuntu is even available on the PowerPC platform (enabling users of older Macintosh computers to run Ubuntu natively on their machines); however, it is no longer officially supported.

Canonical offers Ubuntu<sup>[33]</sup> and Kubuntu<sup>[34]</sup> installation CDs at no cost, including paid postage for destinations in most countries around the world (via a service called ShipIt).

A Microsoft Windows migration tool, called Migration Assistant (introduced in April 2007),<sup>[35]</sup> can be used to import bookmarks, desktop background (wallpaper), and various settings from an existing MS Windows installation into a new Ubuntu installation.<sup>[36]</sup>

Ubuntu and Kubuntu can be booted and run from a USB Flash drive<sup>[37]</sup> (as long as the BIOS supports booting from USB), with the option of saving settings to the flashdrive. This allows a portable installation that can be run on any PC which is capable of booting from a USB drive.<sup>[38]</sup> In newer versions of Ubuntu, the USB creator program is available to install Ubuntu on a USB drive (with or without a LiveCD disc).

Wubi, which is included as an option on the Live CD,<sup>[39]</sup> allows Ubuntu to be installed and run from within a virtual Windows loop device (as a large image file that is managed like any other Windows program via the Windows Control Panel). This method requires no partitioning of a Windows user's hard drive. Wubi also makes use of the Migration Assistant to import users' settings. It is only useful for Windows users; it is not meant for permanent Ubuntu installations and it also incurs a slight performance loss.



## Remastering

Various programs (such as remastersys and Reconstructor) exist to produce customised remasters of the Ubuntu Live CDs.

## Package classification and support

Ubuntu divides all software into four domains to reflect differences in licensing and the degree of support available.<sup>[40]</sup> Some unsupported applications receive updates from community members, but not from Canonical Ltd..

|             | free software | non-free software |
|-------------|---------------|-------------------|
| supported   | Main          | Restricted        |
| unsupported | Universe      | Multiverse        |

Free software includes only software that has met the Ubuntu licensing requirements,<sup>[41]</sup> which roughly correspond to the Debian Free Software Guidelines. Exceptions, however, include firmware and fonts, in the Main category, because although they are not allowed to be modified, their distribution is otherwise unencumbered.<sup>[42]</sup>

Non-free software is usually unsupported (Multiverse), but some exceptions (Restricted) are made for important non-free software. Supported non-free software includes device drivers that can be used to run Ubuntu on some current hardware, such as binary-only graphics card drivers. The level of support in the Restricted category is more limited than that of Main, because the developers may not have access to the source code. It is intended that Main and Restricted should contain all software needed for a general-use GNU/Linux system. Alternative programs for the same tasks and programs for specialized applications are placed in the Universe and Multiverse categories.

In addition to the above, in which the software does not receive new features after an initial release, *Ubuntu Backports* is an officially recognized project to backport newer software from later versions of Ubuntu.<sup>[43]</sup> The repository is not comprehensive; it consists primarily of user-requested packages, which are approved if they meet quality guidelines. Backports receives no support at all from Canonical, and is entirely community-maintained.

The *-updates* repository provides updates to stable releases of Ubuntu and are generally installed through update-manager. Each release is given its own *-updates* repository (e.g. intrepid-updates). The repository is supported by Canonical Ltd. for packages in main and restricted, and by the community for packages in universe and multiverse. All updates to the repository must meet certain requirements and go through the *-proposed* repository before being made available to the public.<sup>[44]</sup> Updates will continue to be available until the end of life for the release.

In addition to the *-updates* repository, the unstable *-proposed* repository contains uploads which must be confirmed before being copied into *-updates*. All updates must go through this process to ensure that the patch does truly fix the bug and there is no risk of regression.<sup>[45]</sup> Updates in *-proposed* are confirmed by either Canonical or members of the community.

## Availability of third-party software

Ubuntu has a certification system for third party software.<sup>[46]</sup> Some third-party software that does not limit distribution is included in Ubuntu's multiverse component. The package *ubuntu-restricted-extras* additionally contains software that may be legally restricted, including support for MP3 and DVD playback, Microsoft TrueType core fonts, Sun's Java runtime environment, Adobe's Flash Player plugin, many common audio/video codecs, and unrar, an unarchiver for files compressed in the RAR file format.

Additionally, several third party application suites are available for purchase through the Canonical web-based store, including software for DVD playback and media codecs.

## Releases

| Version   | Code name                    | Release date               |
|-----------|------------------------------|----------------------------|
| 4.10      | Warty Warthog                | 2004-10-20                 |
| 5.04      | Hoary Hedgehog               | 2005-04-08                 |
| 5.10      | Breezy Badger                | 2005-10-13                 |
| 6.06 LTS  | Dapper Drake                 | 2006-06-01                 |
| 6.10      | Edgy Eft                     | 2006-10-26                 |
| 7.04      | Feisty Fawn                  | 2007-04-19                 |
| 7.10      | Gutsy Gibbon                 | 2007-10-18                 |
| 8.04 LTS  | Hardy Heron                  | 2008-04-24                 |
| 8.10      | Intrepid Ibex                | 2008-10-30                 |
| 9.04      | Jaunty Jackalope             | 2009-04-23 <sup>[47]</sup> |
| 9.10      | Karmic Koala <sup>[48]</sup> | 2009-10-29 <sup>[49]</sup> |
| 10.04 LTS | Lucid Lynx <sup>[50]</sup>   | 2010-04-29 <sup>[51]</sup> |
| 10.10     | Maverick Meerkat             | 2010-10-28 <sup>[52]</sup> |

There are two Ubuntu releases per year, using the year and month of the release as the version number. The first Ubuntu release, for example, was Ubuntu 4.10 and was released on October 20, 2004.<sup>[53]</sup> Version numbers for future versions are provisional; if the release is delayed the version number changes accordingly.

Ubuntu releases are also given alliterative code names, using an adjective and an animal (e.g., "Dapper Drake" and "Intrepid Ibex"). With the exception of the first three releases, code names are in alphabetical order, allowing a quick determination of which release is newer. Commonly, Ubuntu releases are referred to using only the adjective portion of the code name.<sup>[54]</sup>

Releases are timed to be approximately one month after GNOME releases (which in turn are about one month after releases of X.org). Consequently, every Ubuntu release comes with an updated version of both GNOME and X. Selected releases (such as 6.06 Dapper Drake and 8.04 Hardy Heron) have been labeled as Long Term Support (LTS) versions, indicating that they are supported (with updates) for three years on the desktop and five years on the server,<sup>[55]</sup> as compared to the 18-month support period for non-LTS releases.<sup>[56]</sup>

The current release is 10.04 LTS Lucid Lynx, released on April 29, 2010.

## Variants

Several official and unofficial Ubuntu variants exist. These Ubuntu variants install a set of packages that differ from the original Ubuntu distribution.

Official variants store packages and updates in the same repositories as Ubuntu, so that the same software is available for each of them and is generally compatible between the official variants. The Ubuntu derivatives that are fully supported by Canonical are:<sup>[11]</sup>

- Kubuntu, a desktop distribution using KDE rather than GNOME.
- Edubuntu, a GNOME-based subproject and add-on for Ubuntu, designed for school environments and home users.<sup>[57]</sup>
- Ubuntu Server Edition.
- Ubuntu JeOS, "Just enough Operating Systems" for virtual appliances.<sup>[58] [59]</sup>

The following are Canonical-sponsored derivatives:<sup>[60]</sup>

- Xubuntu, a "lightweight" distribution based on the Xfce desktop environment instead of GNOME, designed to run more efficiently on low-specification computers.
- Lubuntu, which uses the LXDE desktop environment, targeted at "normal computers" with 128Mb of RAM as the bottom line configuration<sup>[61]</sup>
- Ubuntu MID Edition, an Ubuntu edition that targets Mobile Internet Devices.<sup>[62]</sup>
- Ubuntu Netbook Edition, (formerly **Ubuntu Netbook Remix**)<sup>[63] [64]</sup> designed for netbooks and other ultra-portables.

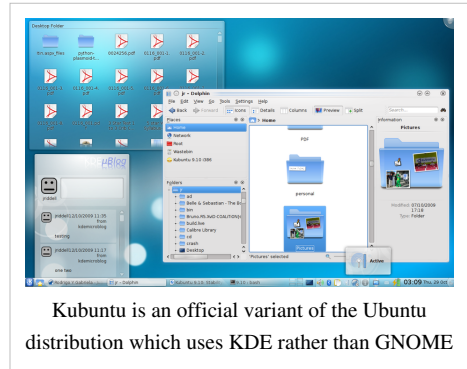
There are also many unofficial variants, unsponsored derivatives, and other localizations and customizations not controlled or guided by Canonical Ltd., which generally contain customizations that have been created for specific goals.

## System requirements

The desktop version of Ubuntu currently supports the Intel x86, AMD64, and ARM<sup>[65]</sup> architectures. Some server releases also support the SPARC architecture.<sup>[66] [67]</sup> Unofficial support is available for the PowerPC,<sup>[68]</sup> IA-64 (Itanium) and PlayStation 3 architectures (note however that Sony officially removed support for OtherOS on the PS3 with firmware 3.21, released on April 1, 2010<sup>[69]</sup>).

| Recommended Minimum System Requirements <sup>[70] [71] [72]</sup> | CLI (Server) | GUI* (Desktop) |
|---|--------------|----------------|
| Processor (x86)   | 300 MHz      | 1 GHz          |
| Memory  | 128 MB       | 512 MB         |
| Hard Drive (free space)   | 1 GB         | 5 GB           |
| Monitor Resolution  | 640×480      | 1024×768       |

\*Note: If visual effects are desired, a supported GPU is required.



## Development

The *Ubuntu Developer Summit* is a gathering of software developers which occurs prior to the release of a new public version of Ubuntu.

At the beginning of a new development cycle, Ubuntu developers from around the world gather to help shape and scope the next release of Ubuntu. The summit is open to the public, but it is not a conference, exhibition or other audience-oriented event. Rather, it is an opportunity for Ubuntu developers, who usually collaborate online, to work together in person on specific tasks.



UDS Karmic Group Photo

## Reception

In an August 2007 survey of 38,500 visitors on DesktopLinux.com, Ubuntu was the most popular distribution with 30.3% of respondents claiming to use it.<sup>[73]</sup>

In January 2009, the New York Times reported that Ubuntu had over ten million users and in June 2009 ZDNet reported, "Worldwide, there are 13 million active Ubuntu users with use growing faster than any other distribution."<sup>[74] [75]</sup>

Ubuntu was awarded the Reader Award for best Linux distribution at the 2005 LinuxWorld Conference and Expo in London,<sup>[76]</sup> has been favorably reviewed in online and print publications,<sup>[77] [78] [79]</sup> and has won InfoWorld's 2007 Bossie Award for *Best Open Source Client OS*.<sup>[80]</sup>

In April 2010, Chris Kenyon, vice president for OEM at Canonical Ltd. estimated that there were 12 million Ubuntu users.<sup>[81]</sup> Jamie Hyneman, co-host of the television series *Mythbusters*, has advocated Linux, specifically giving the example of Ubuntu, as an alternative to proprietary software, citing software bloat as a major hurdle in proprietary operating systems.<sup>[82] [83]</sup>

Ubuntu has also received negative assessments. In early 2008 *PC World* criticized the lack of an integrated desktop effects manager, although this did not prevent them from naming Ubuntu the "best all-around Linux distribution available today".<sup>[84]</sup>

The Ministry of Education and Science of Republic Of Macedonia deployed more than 180,000 Ubuntu GNU/Linux based classroom desktops, and has encouraged every student in the country to use Ubuntu-powered computer workstations.<sup>[85]</sup>

The French police are in the process of installing Ubuntu on 90,000 workstations, demonstrating a 70% saving on the IT budget without having to reduce its capabilities.<sup>[86]</sup>

## Local Communities (LoCos)

In an effort to reach out to less technical users, and to foster a sense of community around the distribution, Local Communities<sup>[87]</sup>, better known as "LoCos", have been established throughout the world. Originally, each country had one LoCo Team. However, in some areas, most notably, the United States, each state may establish a team. A LoCo Council approves teams based upon their efforts to either aid in the development or the promotion of Ubuntu.

## Vendor support

A number of vendors offer computers with Ubuntu pre-installed, including Dell,<sup>[88]</sup> Tesco, OP3, Gliese IT, System76,<sup>[89]</sup> Sharp Corporation<sup>[90]</sup> and the South African company Bravium Computers.<sup>[91]</sup> Dell and System76 customers are able to choose between 30-day, three-month, and yearly Ubuntu support plans through Canonical.<sup>[92]</sup> Dell computers (running Ubuntu 8.04 or 9.04) include extra support for ATI Video Graphics, Dell Wireless, Fingerprint Readers, HDMI, Bluetooth, DVD Playback (using LinDVD), and MP3/WMA/WMV.<sup>[93]</sup>

## See also

- List of Ubuntu-based distributions
- Ubuntu Certified Professional
- List of Linux distributions

## Literature

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- William von Hagen. *Ubuntu Linux Bible*. pp. 744. ISBN 0470038993.
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## External links

- Official website<sup>[4]</sup>
- Ubuntuforums.org<sup>[94]</sup> - Official Ubuntu Forums
- Ubuntu Guide (unofficial)<sup>[95]</sup> - Help manual, tips, FAQ, and software guide
- Launchpad.net<sup>[96]</sup> - Ubuntu at Launchpad

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