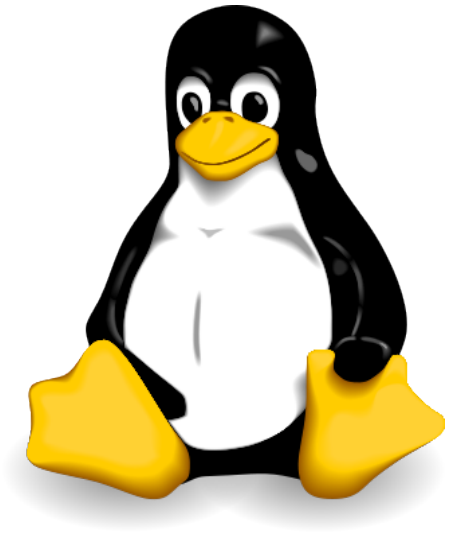
Introducing Linux -

A Beginner's Approach



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Operating System

An operating system (commonly abbreviated OS and O/S) is the software component of a computer system that is responsible for the management and coordination of activities and the sharing of the resources of the computer. The operating system acts as a host for application programs that are run on the machine. As a host, one of the purposes of an operating system is to handle the details of the operation of the hardware. This relieves application programs from

having to manage these details and makes it easier to write applications. Almost all computers, including hand-held computers, desktop computers, supercomputers, and even modern video game consoles, use an operating system of some type. Some of the oldest models may however use an embedded OS, which may be contained on a compact disk or other storage device.


Operating systems offer a number of services to application programs and users. Applications access these services through application programming interfaces (APIs) or system calls. By invoking these interfaces, the application can request a service from the operating system, pass parameters, and receive the results of the operation. Users may also interact with the operating system by typing commands or using a graphical user interface (GUI, commonly pronounced “gooey”). For hand-held and desktop computers, the GUI is generally considered part of the operating system. For large multi-user systems, the GUI is generally implemented as an application program that runs outside the operating system.

Common contemporary operating systems include Microsoft Windows, Mac OS X, Linux and Solaris. Microsoft Windows has a significant majority of market share in the desktop and notebook computer markets, while servers generally run on Linux or other Unix-like systems. Embedded device markets are split amongst several operating systems.

Linux

Linux (commonly pronounced IPA: /ˈlɪnəks/ in English; variants exist) is the name usually given to any Unix-like computer operating system that uses the Linux kernel. Linux is one of the most prominent examples of free software and open source development: typically all underlying source code can be freely modified, used, and redistributed by anyone.

The name "Linux" comes from the Linux kernel, originally written in 1991 by Linus Torvalds. The system's utilities and libraries usually come from the GNU operating system, announced in 1983 by Richard Stallman. The GNU contribution is the basis for the alternative name GNU/Linux.

Predominantly known for its use in servers, Linux is supported by corporations such as Dell, Hewlett-Packard, IBM, Novell, Oracle Corporation, Red Hat, and Sun Microsystems. It is used as an operating system for a wide variety of computer hardware, including desktop computers, supercomputers, video game systems, such as the PlayStation 2 and PlayStation 3, several arcade games, and embedded devices such as mobile phones, routers, and stage lighting systems.

History of Linux

The Unix operating system was conceived and implemented in the 1960s and first released in 1970. Its wide availability and portability meant that it was widely adopted, copied and modified by academic institutions and businesses, with its design being influential on authors of other systems.

The GNU Project, started in 1984 by Richard Stallman, had the goal of creating a "complete Unix-compatible software system" made entirely of free software. The next year Stallman created the Free Software Foundation and wrote the GNU General Public License (GNU GPL) in 1989. By the early 1990s, many of the programs required in an operating system (such as libraries, compilers, text editors, a Unix shell, and a windowing system) were completed, although low-level elements such as device drivers, daemons, and the kernel were stalled and incomplete. Linus Torvalds has said that if the GNU kernel had been available at the time (1991), he would not have decided to write his own.

Linux User Interface

Linux can be controlled by one or more of a text-based command line interface (CLI), graphical user interface (GUI) (usually the default for desktop), or through controls on the device itself (common on embedded machines).

On desktop machines, KDE, GNOME and Xfce are the most popular user interfaces, though a variety of other user interfaces exist. Most popular user interfaces run on top of the X Window System (X), which provides network transparency, enabling a graphical application running on one machine to be displayed and controlled from another.

Other GUIs include X window managers such as FVWM, Enlightenment and Window Maker. The window manager provides a means to control the placement and appearance of individual application windows, and interacts with the X window system.

A Linux system usually provides a CLI of some sort through a shell, which is the traditional way of interacting with a Unix system. A Linux distribution specialized for servers may use the CLI as its only interface. A “headless system” run without even a monitor can be controlled by the command line via a protocol such as SSH or telnet.

Most low-level Linux components, including the GNU Userland, use the CLI exclusively. The CLI is particularly suited for automation of repetitive or delayed tasks, and provides very simple inter-process communication. A graphical terminal emulator program is often used to access the CLI from a Linux desktop.

Programming in Linux

Most distributions also include support for Perl, Ruby, Python and other dynamic languages. Examples of languages that are less common, but still well-supported, are C# via the Mono project, sponsored by Novell, and Scheme. A number of Java Virtual Machines and development kits run on Linux, including the original Sun Microsystems JVM (HotSpot), and IBM's J2SE RE, as well as many open-source projects like Kaffe. The two main frameworks for developing graphical applications are those of GNOME and KDE. These projects are based on the GTK+ and Qt widget toolkits, respectively, which can also be used independently of the larger framework. Both support a wide variety of languages. There are a number of Integrated development environments available including Anjuta, Code::Blocks, Eclipse, KDevelop, Lazarus, MonoDevelop, NetBeans, and Omnis Studio while the long-established editors Vim and Emacs remain popular.


Linux on the Desktop

Although there is a lack of Linux ports for some Mac OS X and Microsoft Windows programs in domains such as desktop publishing and professional audio, applications roughly equivalent to those available for Mac and Windows are available for Linux.

Most Linux distributions provide a program for browsing a list of thousands of free software applications that have already been tested and configured for a specific distribution. These free programs can be downloaded and installed with one mouse click and a digital signature guarantees that no one has added a virus or a spyware to these programs.

Many free software titles that are popular on Windows, such as Pidgin, Mozilla Firefox, Openoffice.org, and GIMP, are available for Linux. A growing amount of proprietary desktop software is also supported under Linux, examples being Adobe Flash Player, Acrobat Reader, Matlab, Nero Burning ROM, Opera, RealPlayer, and Skype. In the field of animation and visual effects, most high end software, such as AutoDesk Maya, Softimage XSI and Apple Shake, is available for Linux, Windows and/or Mac OS X. CrossOver is a proprietary solution based on the open source Wine project that supports running older Windows versions of Microsoft Office and Adobe Photoshop versions through CS2. Microsoft Office 2007 and Adobe Photoshop CS3 are known not to work.

Besides the free Windows compatibility layer Wine, most distributions offer Dual boot and X86 virtualization for running both Linux and Windows on the same computer.

Linux's open nature allows distributed teams to localize Linux distributions for use in locales where localizing proprietary systems would not be cost-effective. For example the Sinhalese language version of the Knoppix distribution was available for a long time before Microsoft Windows XP was translated to Sinhalese. In this case the Lanka Linux User Group played a major part in developing the localized system by combining the knowledge of university professors, linguists, and local developers.

The performance of Linux on the desktop has been a controversial topic, with at least one key Linux kernel developer, Con Kolivas, accusing the Linux community of favouring performance on servers. He quit Linux development because he was frustrated with this lack of focus on the desktop, and then gave a 'tell all' interview on the topic.

Gaming on Linux

A few original open source games have obtained notability:

- AssaultCube is a first-person shooter
- Battle for Wesnoth is a turn-based strategy game
- CodeRED: Alien Arena is a sci-fi first-person shooter derived from the Quake II engine
- Glest is a real-time strategy game, with optional multiplayer
- NetHack and Angband are text-based computer role-playing games
- Nexuiz is a first-person shooter
- OpenArena is a standalone Quake III Arena game
- Sauerbraten is a 3D first-person shooter with an integrated map editing mode
- Tremulous is a 3D first-person shooter/real-time strategy game
- Tux Racer is a 3D racing game featuring Tux

- Vega Strike is a space flight simulation
- War§ow is a Quake-like, fast-paced first-person shooter

There are a larger number of open source clones and remakes of classic games:

- FreeCiv is a remake of Civilization II
- OpenTTD is a remake of Transport Tycoon Deluxe
- Frozen Bubble is an adaptation of Puzzle Bobble
- Scorched 3D is a 3D adaptation of Scorched Earth
- Ur-Quan Masters is based on the original source code for Star Control II
- Homeworld SDL is based on the original source code for Homeworld
- StepMania is a remake of Dance Dance Revolution
- Frets on Fire is a remake of Guitar Hero (video game)
- SuperTux is a remake of Super_Mario
- SuperTuxKart and TuxKart are remakes of Mario_kart
- Crack Attack! is inspired by Tetris Attack
- Various remakes of Doom, Wolfenstein 3D, and Quake are based on the engines for these games
- Two different remakes of Wing Commander: Privateer are based on the Vega Strike engine
- Spring originally is a remake of Total Annihilation, but actually is a platform for real time strategy games

In some cases, developers have released Linux versions of their games directly. id Software together with Raven Software ported Doom 3, the Quake series, and Return to Castle Wolfenstein and Enemy Territory: Quake Wars; Bioware released Neverwinter Nights; Epic Games released Unreal Tournament 2003 and Unreal Tournament 2004 and they will port Unreal Tournament 3; Croteam released the Serious Sam series; Introversion released Darwinia, Uplink, and DEFCON. Frictional Games released Linux version of both Penumbra: Black Plague and Penumbra: Overture. S2games released a Linux client of their title Savage 2

soon after it's launch. EVE Online is also available for Linux. Indie RPGs Eschalon: Book I and Penny Arcade Adventures: On the Rain-Slick Precipice of Darkness were developed cross-platform from the start of development, including a linux version. Space MMO Vendetta Online launched with Linux support, and now maintains both Linux/32 and Linux/64 clients. eGenesis released a Linux client for its MMO A Tale In The Desert

More commonly, an independent company has taken on the task of porting prominent Windows games to Linux. Loki Software was the first such company, and between 1998 and 2002 ported Descent³, Heretic II, Heroes of Might and Magic III, Kohan: Immortal Sovereigns, Myth II: Soulblighter, Railroad Tycoon II, Rune, Sid Meier's Alpha Centauri, Sim City 3000, Tribes II, and Unreal Tournament. Linux Game Publishing was founded in 2001 in response to the impending demise of Loki, and has brought Cold War, Postal², and X²: The Threat to Linux. icculus.org has ported Aliens versus Predator, Duke Nukem 3D, Medal of Honor: Allied Assault, and Rise of the Triad.

Linux on Servers and Supercomputers

Historically, Linux has mainly been used as a server operating system, and has risen to prominence in that area; Netcraft reported in September 2006 that eight of the ten most reliable internet hosting companies run Linux on their web servers. (As of June 2008, that figure has declined to five of the ten.) This is due to its relative stability and long uptime, and the fact that desktop software with a graphical user interface for servers is often unneeded. Enterprise and non-enterprise Linux distributions may be found running on servers. Linux is the cornerstone of the LAMP server-software combination (Linux, Apache, MySQL, Perl/PHP/Python) which has achieved popularity among developers, and which is one of the more common platforms for website hosting.

Linux is commonly used as an operating system for supercomputers. As of November 2007, out of the top 500 systems, 426 (85.2%) run Linux.

Linux on Embedded Systems

Due to its low cost and ability to be easily modified, an embedded Linux is often used in embedded systems. Linux has become a major competitor to the proprietary Symbian OS found in the majority of smartphones — 16.7% of smartphones sold worldwide during 2006 were using Linux — and it is an alternative to the proprietary Windows CE and Palm OS operating systems on mobile devices. Cell phones or PDAs running on Linux and built on open source platform became a trend from 2007, like Nokia N810, Openmoko's Neo1973 and the on-going Google Android. The popular TiVo digital video recorder uses a customized version of Linux. Several network firewall and router standalone products, including several from Linksys, use Linux internally, using its advanced firewall and routing capabilities. The Korg OASYS and the Yamaha Motif XS music workstations also run Linux. Furthermore, Linux is used in the leading stage lighting control system, FlyingPig/HighEnd WholeHogIII Console.

Market Share

Many quantitative studies of open source software focus on topics including market share and reliability, with numerous studies specifically examining Linux. The Linux market is growing rapidly, and the revenue of servers, desktops, and packaged software running Linux is expected to exceed $35.7 billion by 2008.

IDC's report for Q1 2007 says that Linux now holds 12.7% of the overall server market. This estimate was based on the number of Linux servers sold by various companies.

Estimates for the desktop market share of Linux range from less than one percent to almost two percent. In comparison, Microsoft operating systems hold more than 90%.

The frictional cost of switching operating systems and lack of support for certain hardware and application programs designed for Microsoft Windows have been two factors that have inhibited adoption. Proponents and analysts attribute the relative success of Linux to its security, reliability, low cost, and freedom from vendor lock-in.

Also most recently Google has begun to fund Wine, which acts as a compatibility layer, allowing users to run some Windows programs under Linux.

The XO laptop project of One Laptop Per Child is creating a new and potentially much larger Linux community, planned to reach several hundred million schoolchildren and their families and communities in developing countries. Six countries have ordered a million or more units each for delivery in 2007 to distribute to schoolchildren at no charge. Google, Red Hat, and eBay are major supporters of the project. While the XO will also have a Windows option, it will be primarily deployed using RHEL.

Adoption of Linux

- 1983 (September): GNU project was announced publicly

- 1991 (September): first version of the Linux kernel was released to the Internet
- 2001 (second quarter): Linux server unit shipments at 15% annual growth rate
- 2004: Linux shipped on approximately 50% of the worldwide server blade units, and 20% of all rack-optimized servers
- 2005: Microsoft representatives accuse Brazilian college using Famelix of pirating Microsoft Windows
- 2007: Dell announces it will ship select models with Ubuntu Linux pre-installed
- 2007: Lenovo announces it will ship select models with SUSE Linux Enterprise Desktop 10 pre-installed
- 2007: HP announces that it will begin shipping computers preinstalled with Red Hat Linux in Australia
- 2007: ASUS launches the linux-based ASUS Eee PC
- 2008: Dell announces it will begin shipping Ubuntu based computers to Canada and Latin America
- 2008: Dell is shipping systems with Ubuntu pre-installed in China
- 2008: Acer launches the linux-based Acer Aspire One

As local governments come under pressure from institutions such as the World Trade Organization and the International Intellectual Property Alliance, some have turned to open source software as an affordable, legal alternative to both pirated material and expensive computer products from Microsoft, Apple and the like (see below). The spread of free software affords some leverage for these countries when companies from the developed world bid for government contracts (since a low-cost option exists), while furnishing an alternative path to development for countries like India and Pakistan that have many citizens skilled in computer applications but cannot afford technological investment at "First World" prices.

- Brazil's PC Conectado program
- City of Munich has chosen to migrate its 14,000 desktops to Debian-based LiMux
- The United States Department of Defense uses and develops open source software[citation needed
- The city of Vienna has chosen to start migrating its desktop PCs to Debian-based Wienux
- Spain has been noted as the furthest along the road to Linux adoption , for example with Linux distribution LinEx

- State owned Industrial and Commercial Bank of China (ICBC) is installing Linux in all of its 20,000 retail branches as the basis for its web server and a new terminal platform. (2005)
- In 2005 the Government of Peru voted to adopt open source across all its bodies. The 2002 response to Microsoft's critique is available online.

In the preamble to the bill, the Peruvian government stressed that the choice was made to ensure that key pillars of democracy were safeguarded: "The basic principles which inspire the Bill are linked to the basic guarantees of a state of law."

- In January 2006, law in Venezuela went into effect, mandating a two year transition to open source in all public agencies.
- In April 2006, the US Federal Aviation Administration announced that it had completed a migration to Red Hat Enterprise Linux in one third of the scheduled time and saved 15 million dollars.
- The Government of Pakistan established a Technology Resource Mobilization Unit in 2002 to enable groups of professionals to exchange views and coordinate activities in their sectors and to educate users about free software alternatives. Linux is an option for poor countries which have little revenue for public investment; Pakistan is using open source software in public schools and colleges, and hopes to run all government services on Linux eventually.
- The Ministry of Defence in Singapore began migrating its computers from Microsoft to free software in 2004, while South Korea, China and Japan agreed to cooperate in creating new Linux-based programs.
- The French Parliament has switched to using Ubuntu on desktop PCs.
- The Government of India has set up a resource centre for Free and Open Source Software managed jointly by C-DAC Chennai and Anna University, Chennai. It has one of its node in Mumbai at VJTI College
- The Federal Employment Office of Germany (Bundesagentur für Arbeit) has migrated 13,000 public workstations from Windows NT to OpenSuse.
- Czech Post (state owned) migrated 4000 servers and 12000 clients to Novell Linux in 2005

Linux is often used in technical disciplines at universities and research centres. This is due to several factors, including that Linux is available free of charge and includes a large body of free/open source software. To some extent, technical competence of computer science and software engineering academics is also a contributor, as is stability, maintainability, and upgradability. IBM ran an advertising campaign entitled "Linux is Education" featuring a young boy who was supposed to be "Linux".

Examples of large scale adoption of Linux in education include the following:

- The OLPC XO-1 (previously called the MIT $100 laptop and The Children's Machine), is an inexpensive laptop running Linux, which will be distributed to millions of children as part of the One Laptop Per Child project, especially in developing countries.
- Republic of Macedonia deployed 5,000 Linux desktops running Ubuntu across all 468 public schools and 182 computer labs (December 2005)
- Schools in Bolzano, Italy have switched to a custom distribution of Linux (FUSS Soledad GNU/Linux), which will be used by the 16,000 students in the area when they return on 12 September 2005.
- Brazil has around 20,000 Linux desktops running in elementary and secondary public schools.
- The Netherlands has an initiative called Open Source en standaarden in het onderwijs, "Open source and standards in education".
- Government officials of Kerala, India announced they will use only free software, running on the Linux platform, for computer education, starting with the 2,650 government and government-aided high schools.
- 22,000 students in the US state of Indiana had access to Linux Workstations at their high schools in 2006.
- Germany has announced that 560,000 students in 33 universities will migrate to Linux.
- The Philippines has deployed 13,000 desktops of Fedora, the first 10,000 where delivered in December 2007 by ASI. Another 10,000 desktops of Edubuntu and Kubuntu are planned.
- Russia announced in October 2007 that all its school computers will run on Linux. This is to avoid cost of licensing current unlicensed software.
- 9,000 computers to be converted to Linux and OpenOffice.org in school district Geneva, Switzerland by September 2008
- An Indian state Tamil Nadu plans to distribute 100,000 Linux laptops to its students.

Linux is also used in some corporate environments as the desktop platform for its employees, with commercially available solutions including Red Hat Enterprise Linux, SUSE Linux Enterprise Desktop, and Linspire.

- Ernie Ball, a company manufacturing guitar strings, and known for its famous Super Slinky guitar strings, has used Linux as its desktop operating system since 2000.

- Novell is undergoing a migration from Windows to Linux. Of its 5500 employees, 50% were successfully migrated as of April, 2006. This was expected to rise to 80% by November.
- Wotif, the Australian hotel booking website, migrated from Windows to Linux servers to keep up with the growth of its business.
- Union Bank of California announced in January 2007 that it would standardize its IT infrastructure on Red Hat Enterprise Linux in order to lower costs.
- Peugeot, the European car maker, announced plans to deploy up to 20,000 copies of Novell's Linux desktop, SUSE Linux Enterprise Desktop, and 2,500 copies of SUSE Linux Enterprise Server, in 2007.
- Mindbridge, a software company, announced in September, 2007 that it had migrated a large number of Windows servers onto a smaller number of Linux servers and a few BSD servers. It claims to have saved "bunches of money."
- Virgin America, the low cost U.S. airline, uses Linux to power its in-flight entertainment system, RED.

Why Linux is better?

Forget about viruses

If your computer shuts itself down without asking you, if strange windows with text you don't understand and all kinds of advertisements appear when you don't ask for them, if emails get sent to all your contacts without your knowing it, then your computer probably has a virus. The main reason for this is because it runs Windows.

Linux hardly has any viruses. And that's not like "Oh well, not very often, you know". That's like "If you've ever heard of a real Linux virus, please tell me". Of course, a Linux virus is not impossible to get. However, Linux makes it very hard for this to happen, for several reasons:

- Most people use Microsoft Windows, and pirates want to do as much damage (or control) as possible: therefore, they target Windows. But that's not the only reason; the Apache web server (a web server is a program located on a remote computer that sends web pages to your browser when you ask for them), which is open source software, has the biggest market share (against Microsoft's IIS server), but it still suffers from much fewer attacks/flaws than the Microsoft one.

- Linux uses smart authorization management. In Windows you (and any program you install) usually have the right to do pretty much anything to the system. If you feel like punishing your PC because it just let your precious work disappear, you can go inside the system folder and delete whatever you want: Windows won't complain. Of course, the next time you reboot, trouble begins. But imagine that if you can delete this system stuff, other programs can, too, or just mess it up. Linux doesn't allow that. Every time you request to do something that has to do with the system, an administrator password is required (and if you're not an administrator on this system, you simply can't do it). Viruses can't just go around and delete or modify what they want in the system; they don't have the authorization for that.
- More eyes make fewer security flaws. Linux is Open source software, which means that any programmer in the world can have a look at the code (the "recipe" of any program), and help out, or just tell other developers "Hey, what if blah blah, isn't this a security flaw?".

Is your system unstable?

Have you ever lost your precious work because Windows crashed? Do you always shut down your computer the proper way, or do you sometimes just switch it off because Windows has gone crazy and doesn't let you do anything anymore? Have you ever gotten the "blue screen of death" or error messages telling you that the computer needs to be shut down for obscure reasons?

The latest versions of Windows, especially the "Professional" ones are becoming more stable than before. Nevertheless this kind of problem still happens fairly often.

Of course, no operating system is perfect, and people who tell you that theirs can never ever crash are lying. However, some operating systems can be so stable that most users never see their systems crash, even after several years. This is true for Linux. Here's a good way to see this. When a system crashes, it needs to be shut down or restarted. Therefore, if your computer can stay up and running for a long time, no matter how much you use it, then you can say the system is stable. Well, Linux can run for years without needing to be restarted (most internet servers run Linux, and they usually never restart). Of course, with heavy updates, it still needs to be restarted (the proper way). But if you install Linux, and then use your system as much as you want, leaving your computer on all the time, you can go on like that for years without having any trouble.

Most of the time, you won't leave your computer on for such a long time, but this shows how stable Linux is.

Don't pay $300 for your operating system (And don't copy them illegally)

You're probably saying to yourself: "Oh, I didn't pay for Windows". Are you absolutely sure? If your computer came with a copy of Windows, then you paid for it, even if the store didn't tell you about that. The price for a Windows license amounts to an average of one fourth of each new computer's price. So unless you obtained Windows illegally, you probably paid for it. Where do you think Microsoft gets its money from?

On the other hand, you can get Linux completely free of charge. That's right, all these guys all around the world worked very hard to make a neat, secure, efficient, good-looking system, and they are giving their work away for everybody to use freely (if you wonder why these guys do such things, drop me an email and I'll try to explain the best I can :)). Of course, some companies are making good business by selling support, documentation, hotline, etc., for their own version of Linux, and this is certainly a good thing. But most of the time, you won't need to pay a cent.

Freedom!

Linux and "Open Source" software are "free". This means their license is a "free license", and the most common is the GPL (General Public License). This license states that anyone is allowed to copy the software, see the source code (the "recipe"), modify it, and redistribute it as long as it remains licensed with the GPL.

So what do you care about freedom? Imagine that Microsoft disappears tomorrow (okay, that's not very likely, but what about in 5 years, 10 years?). Or imagine it suddenly triples the price for a Windows or Office license. If you're tied to Windows, there's nothing you can do. You (or your business) relies on this one company, on its software, and you can't possibly make things work without it (what good is a computer without an operating system?). Isn't that a serious problem? You're depending on one single company and trusting it wholeheartedly to let something so important nowadays as your computers work the way they should. If Microsoft decides to charge $1000 for the next version of Windows, there's nothing you can do about it (except switch to Linux, of course). If Windows has a bug that bothers you very much and Microsoft won't fix it, there's nothing you can do (and submitting bugs to Microsoft isn't that easy, see the "Report bugs" section).

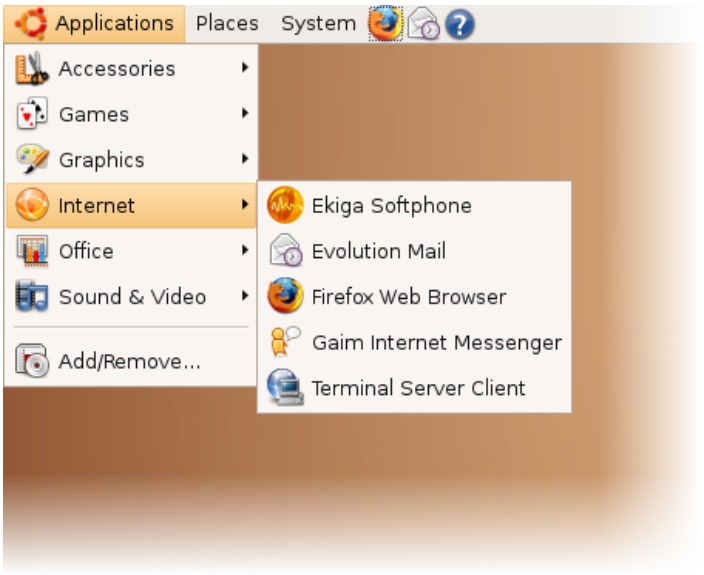
With Open Source, if a particular project or support company dies, all the code remains open to the community and people can keep improving it. If this project is especially useful to you, you can even do this yourself. If a particular bug annoys you, you can submit it, talk with the developers, but even better, you can fix it yourself (or hire someone to do so), and send the changes back to the upstream developers so that everyone gets the improvement as well. You're free to do (nearly) whatever you want with the software.

When the system has installed, why would you still need to install stuff ?

Installing Windows is just the beginning. Imagine you just installed your brand new copy of Windows XP and prepare to unleash your computer skills. A friend sends you an email with an attached PDF file : damn, you don't have a program to read it. You need to go online, search for a website that will let you download Adobe Reader (or another PDF viewer), download it, install it, maybe even reboot. Whew, all right, now you're all set. Attached to your friend's email you find a text document, file.doc. Your Windows can't read that either, right now: great. Either you go buy your copy of Microsoft Office, or you just download OpenOffice, but still, you need to find it, download it (let's hope you have a broadband connection), install it, etc. Your friend also sent you an image, but it has a bad contrast, bad luminosity, and needs a good crop. So you can now go and buy Photoshop (how many hundred bucks is that again ?), or download the GIMP (this is the name of the free program that can do nearly as much as Photoshop) : search, download, install, etc. That's enough : you get the idea, Windows is far from complete, and installing it is just the beginning of trouble.

When you get Linux (such as Ubuntu, Mandriva, Fedora, etc., these are different "flavors" of Linux), you also get, without installing anything more :

- Everything you need to write texts, edit spreadsheets, make neat presentations, draw, edit equations.
- A web browser (eg Firefox) and an email program (eg Thunderbird, or Evolution).
- An image editor (GIMP) nearly as powerful as Photoshop.
- An instant messenger.
- A movie player.
- A music player and organizer.
- A PDF reader.
- Everything you need to uncompress archives (ZIP, etc.).
- etc.



Update all your software with a single click.

Windows has a pretty convenient tool called "Windows update", which allows you to update your system with the latest updates available.

But what about all your non-Microsoft software ? Adobe applications ? ZIP compresser ? Burning program ? Non-Microsoft web browsers and email clients, etc. ? You need to update all of them, one by one. And that takes time, since each one of them has its own (auto-)updating system.

Linux has a central place called the "Package manager", which takes care of everything installed on your system, but also every single piece of software your computer has. So if you want to keep *everything* up-to-date, the only thing you need to do is press the "Install Updates" button down there.

Need new software? Don't bother searching the web, Linux gets it for you.

If you want to check out a new piece of software in Windows, you'll need to:

1. Search the web to find which piece of software suits your needs.
2. Find a web site that allows you to download it.
3. Maybe pay for it.
4. Actually download the software.
5. Install it.

6. Sometimes reboot your computer.

Whew, that's a lot of work to just try out something new!

With Linux, everything is **much simpler**. Linux has what is called a "package manager": each piece of software is contained in its own "package". If you need some new software, just open the package manager, type a few keywords, choose which software you want to install and press "Apply" or "OK". Or you can just browse existing software (that's a lot of choice!) in categories.

Here I just typed "mine game" to search for a mine sweeper (actually, I already had one coming with my Linux, but anyway). If I want to install a new program, I'll just tick the checkbox on the left, and click "Apply" ("Appliquer" in French - which is greyed out for now, since there is nothing to be installed yet)

Does your digital life seem fragmented ?

If you already know what fragmentation is, and are already used to defragmenting your disk every month or so, here is the short version : Linux doesn't need defragmenting.

Now imagine your hard disk is a huge file cabinet, with millions of drawers (thanks to Roberto Di Cosmo for this comparison). Each drawer can only contain a fixed amount of data. Therefore, files that are larger than what such a drawer can contain need to be split up. Some files are so large that they need thousands of drawers. And of course, accessing these files is much easier when the drawers they occupy are close to one another in the file cabinet.

Now imagine you're the owner of this file cabinet, but you don't have time to take care of it, and you want to hire someone to take care of it for you. Two people come for the job, a woman and a man.

- The man has the following strategy : he just empties the drawers when a file is removed, splits up any new file into smaller pieces the size of a drawer, and randomly stuffs each piece into the first available empty drawer. When you mention that this makes it rather difficult to find all the pieces of a particular file, the response is that a dozen boys must be hired every weekend to put the chest back in order.
- The woman has a different technique : she keeps track, on a piece of paper, of contiguous empty drawers. When a new file arrives, she searches this list for a sufficiently long row of empty drawers, and this is where the file is placed. In this way, provided there is enough activity, the file cabinet is always tidy.

Without a doubt, you should hire the woman (you should have known it, women are much better organized :)). Well, Windows uses the first method ; Linux uses the second one. The more you use Windows, the slower it is to access files ; the more you use Linux, the faster it is. The choice is up to you!

Why does your Windows get slower day after day?

Windows has a number of design flaws, resulting in it becoming slower and slower and not lasting very long. You've probably heard more than once someone say "My computer is getting sluggish, I'm gonna reinstall". Reinstalling Windows solves the problem... until next time.

You may think this is just how computers work, they're very new technology, and still not really stable. Well, try Linux and you'll be surprised. Five years from now, your system will be just as fast and responsive as the day you installed it, not to mention that you won't have any viruses, adwares, trojans, worms, etc., that would force you reinstall anyway.

I have managed to convince many people to switch to Linux, while keeping Windows on their hard disk, because they needed to use some piece of software that Linux doesn't have (eg Autocad), so they use both systems. Since the day they switched, most of them have reinstalled Windows about once in a year or two; but Linux didn't let them down, and is still running perfectly well and snappy today.

Linux lets you spend more time working, less time reinstalling over and over again.

Let your old computer have a second life

Windows requires more and more hardware power as its version number increases (95, 98, 2000, Me, XP, etc.). So if you want to keep running Windows, you need to constantly buy new hardware. But I can't see any good reason for so fast an evolution. Of course, many people need a lot of computer power and new hardware and technologies are really helping them. But for most users, who surf the web, read and write emails, write text files and slides, what's the point of buying a new computer every 2, 3 or 4 years, apart from letting computer vendors earn more money? What is exactly the profound reason why your computer can't do any more of what it did perfectly well 5 years ago?

Linux runs perfectly well on older hardware, on which Windows XP would probably even refuse to install, or let you wait 20 seconds after each click. Of course, Linux won't make a race-winner out of your 12-year old computer, but it will run very well on it and allow you to perform usual tasks (surfing the web, writing documents, etc.) just fine. The very computer that delivers this page to you is not very young and runs Linux: if you can read this, then it is up and running (and if the website loads slowly, blame my Internet connection only).

Conclusion

So, what OS should the end user choose to run on his/her system?

The answer necessarily depends on that user’s own choice. Linux is all about freedom.

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