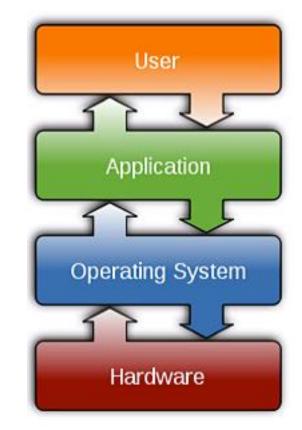


#### Bok, Jong Soon javaexpert@nate.com www.javaexpert.co.kr

### **Operating System**

- Is an interface between the hardware and the user for the management and sharing of the resources of the system.
- Every general-purpose computer must have an operating system to run other programs.



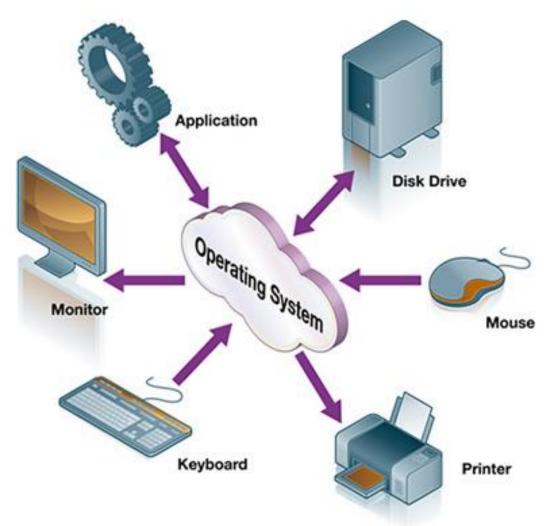


## **Operating System (Cont.)**

- Perform basic tasks, such as
  - Recognizing input from the keyboard
  - Sending output to the display screen
  - Keeping track of files and directories
     on the system disk
  - Managing communication with other peripheral devices such as external disk drives & other USB storage devices, printers & scanners and network communication.



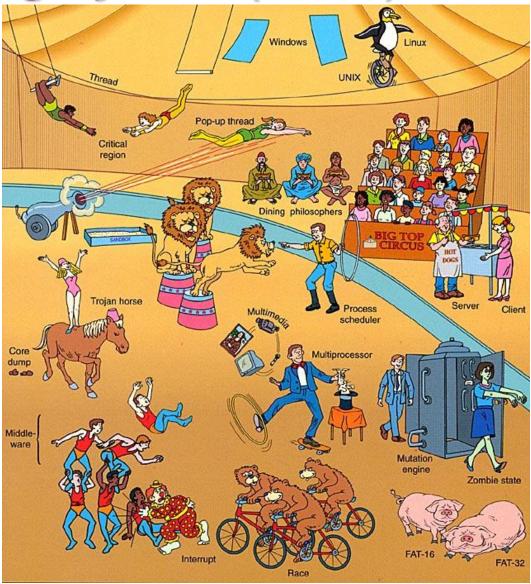
#### **Operating System (Cont.)**





http://www.ts.avnet.com/uk/products and solutions/storage/technology/operating systems.html

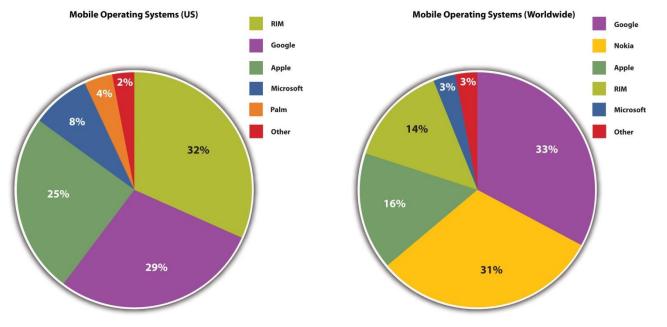
#### **Operating System (Cont.)**





http://stackoverflow.com/questions/403754/how-are-operating-systems-made

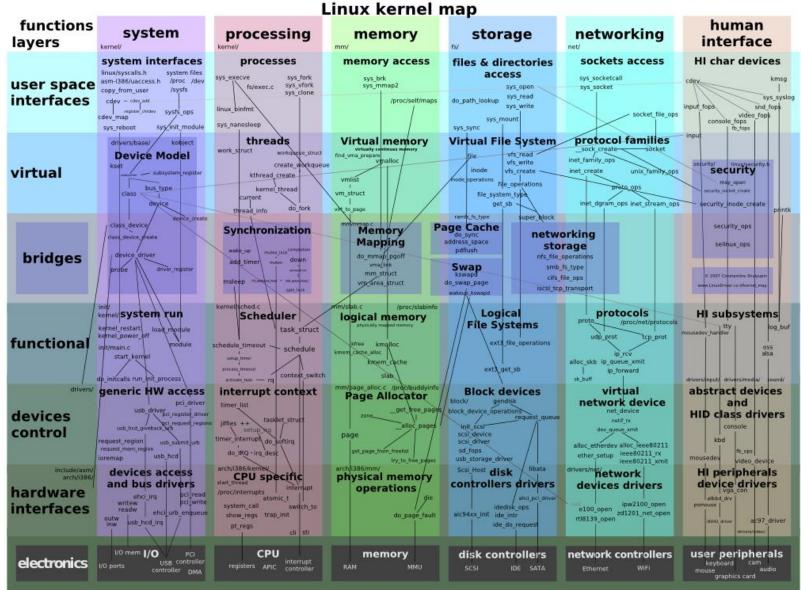
**Desktop Operating Systems** Server Operating Systems 1%~ Windows Windows Oper Mac Unix 4% 5% 13% Linux Linux Other Other 16% 49% 90% 22%



Q)

http://2012books.lardbucket.org/books/getting-the-most-out-of-information-systems-v1.3/s13-02-operating-systems.h

#### Kernel

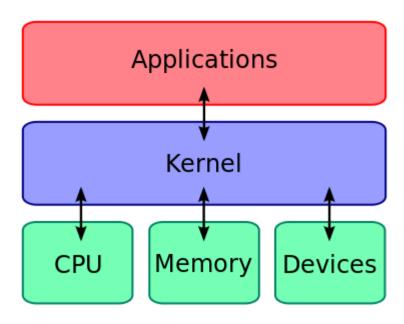


#### ) .3 LTS

## Kernel (Cont.)

Is a fundamental part of a modern computer operating system.

- Process Management System
- File Management System
- Hardware Interface



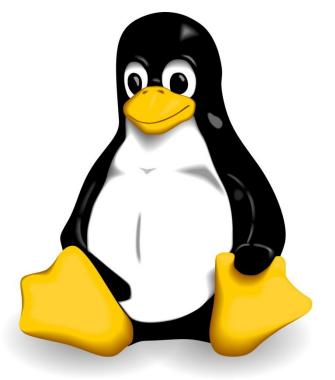
#### Kernel (Cont.)





#### Linux...

- Is an open source operating system based on Unix environment.
- Multi-user, Multitasking, Multiprocessor.



- Has the X Window GUI.
- Is very similar to other operating systems, such as Windows and OS X.
- But something sets Linux apart from these operating systems.

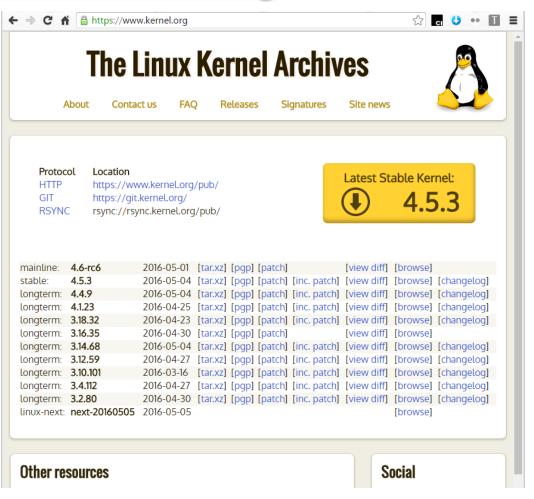
- As an open operating system, Linux is developed collaboratively.
- Source Code is available.



- Means no one company is solely responsible for its development or ongoing support.
- Begins as a server OS and has become useful as a desktop OS, can also be used on all of these devices.



#### https://www.kernel.org





- As of June 2013, more than 95% of the world's 500 fastest supercomputers run some variant of Linux.
- Also runs on embedded systems such as mobile phones, tablet computers, network routers, building automation controls, televisions and video game consoles.





- Typically, Linux is packaged in a format known as a *Linux distribution* for desktop & server use.
- Linux distributions include the Linux kernel, supporting utilities and libraries and usually a large amount of application software to fulfill the distribution's intended use.



- The Four Web Bigshots, Google, Amazon, Twitter and Facebook; They All Use Linux.
- Nuclear Submarines running on Linux.
- Linux on Air Traffic Control Systems.
- Linux helping in Power Particle Physics Research.
- Linux powers The New York Stock Exchange.



- In-Vehicle-Infotainment And Communications Systems Of Toyota runs Linux.
- High-Tech Road Traffic Control running on Linux.
- Linux powers Japan's Bullet Trains.
- The Most Powerful Supercomputers Today Run Linux.







Dell Inspiron Mini 9 and 12

Garmin Nuvi 860, 880, and 5000



Google Android Dev Phone 1



**TiVo Digital Video Recorder** 



HP Mini 1000



Lenovo IdeaPad S9



Motorola MotoRokr EM35 Phone



Volvo In-Car Navigation System



One Laptop Per Child XO2



Sony Bravia Television



Sony Reader



Yamaha Motif Keyboard







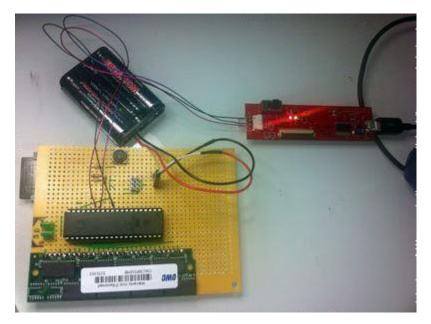


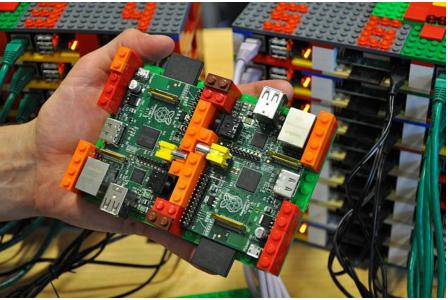
NimbRo-OP Humanoid TeenSize Open Platform





() 14.04.3 LTS











#### History

- An OS Kernel (The core of the Linux operating system) first released on October 5, 1991.
- By <u>Linus Benedict Torvalds</u> (born December 28, 1969)
- A Finn computer science student at the University of Helsinki.





On August 25, 1991, made the following announcement to the Usenet group comp.os.minux:

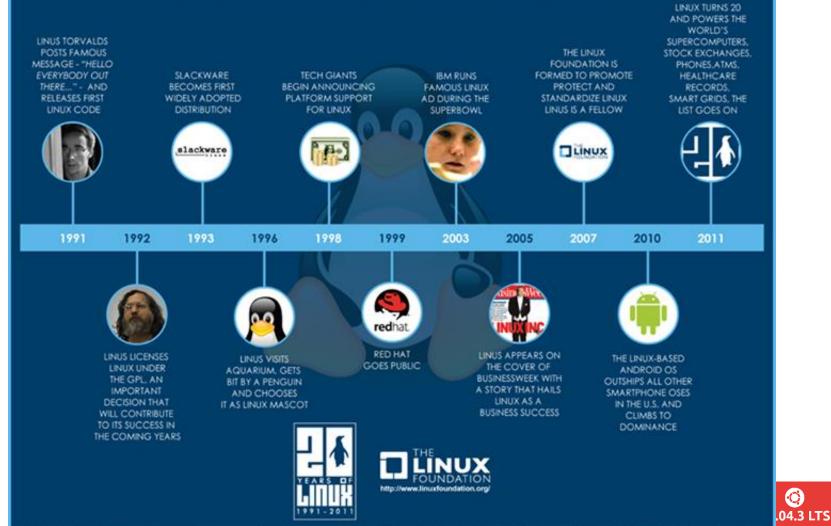
I'm doing a (free) operating system (just a hobby, won't be big and professional like gnu) for 386(486) AT clones. This has been brewing since April, and is starting to get ready. I'd like any feedback on things people like/dislike in minix<sup>\*</sup>, as my OS resembles it somewhat (same physical layout of the file-system (due to practical reasons) (among other things).

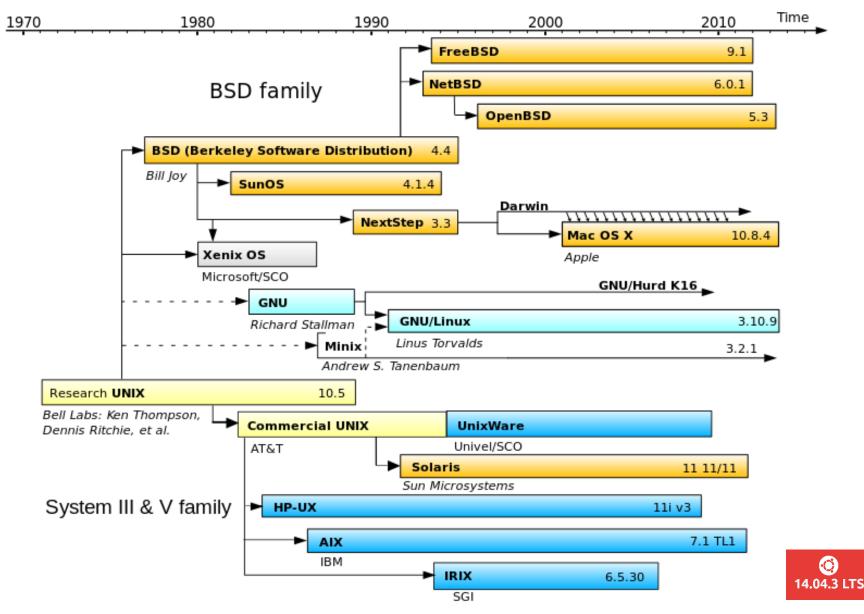


- Torvalds wanted to run on the x86-based consumer PCs of the day.
- GNU(GNU Is Not Unix) tools first put together by <u>Richard Stallman</u> in 1983.
- Stallman's GNU tools were from a project to create an operating system as well.



#### MEMORABLE LINUX MILESTONES CELEBRATING 20 YEARS OF LINUX





#### **Philosophy of Linux**

# Openness

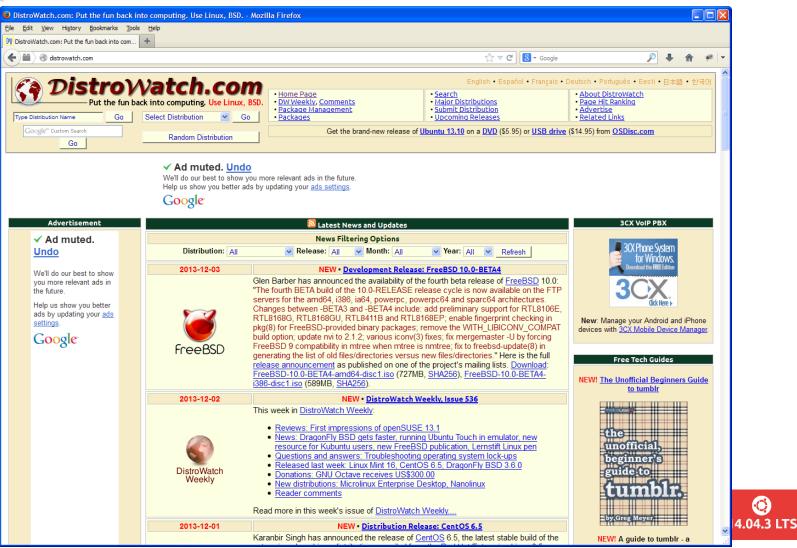
# Efficiency

# Stability



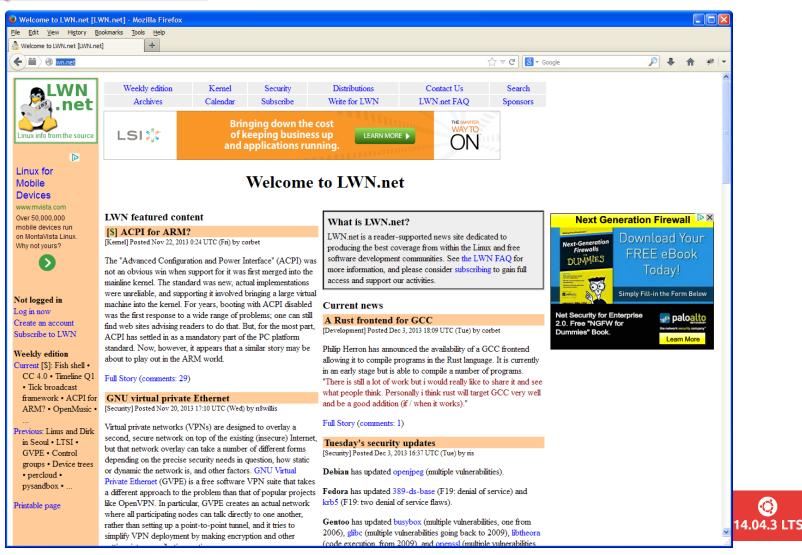
#### Linux Distributions

#### http://distrowatch.com/



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#### http://lwn.net/



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#### http://www.linux.org/resources/categories/lin ux-distributions.18/

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Home → Resources →			C'		
Categories	(Red Hat, Debian, Ubuntu, etc). Feel free to add your favorites! st Updates Newest Resources Top Resources Most Downloaded				
Linux Distributions 38 Linux Desktop Environments 13 Notable Linux People 3	Univention Corporate Server (UCS) 3.1.1 abatielos, Aug 8, 2013 UCS is an Enterprise Linux IT infrastructure management solution across different platforms	Downloads: Updated:	0 votes 162 Nov 20, 2013		
Shells 11 Text Editors 6	Elementary OS Tuxer, Nov 14, 2013 Short description of eOS	<mark>하여 하여</mark> Updated:	0 votes Nov 14, 2013		
Top Resources Linux Mint LinuxDotOrg A modern, elegant and comfortable operating system which is both powerful	Bodhi Linux 2.4.0 ryanvade, Nov 13, 2013 A Linux Distribution based on Ubuntu and the Enlightenment Desidop.	Downloads: Updated:	0 votes 100 Nov 13, 2013		
and easy to use. Fedora LinuxDotOrg Freedom. Friends. Features. First.	Tizen 2.2.1 ryanvade, Jul 26, 2013 Phones, cars, and more.	Downloads: Updated:	0 votes 210 Nov 13, 2013		
Android DevynCJohnson Linux-based mobile operating system Arch Linux LinuxDotOrg A lightweight and fexible Linux	Ultimate Edition 4.0 ryanvade, Jul 21, 2013 The Ultimate Edition Linux Distribution.	Downloads: Updated:	0 votes 1,704 Nov 13, 2013		
distribution that tries to Keep It Simple. CentOS LinuxOntOrg The Community Enterprise Operating System	Anitaos 2013-11-09 Darren Hale, Nov 10, 2013 A Kitset distro for the Really old Computers that have been otherwise considered Landfill	Downloads: Updated:	0 votes 53 Nov 10, 2013		
3	Funtoo 2013-11-01 Sergio Basurto, Nov 3, 2013 Funtoo Linux is a Linux-based operating system created by Daniel Robbins	Downloads: Updated:	0 votes 75 Nov 3, 2013		
3	Gentoo Linux 2013-11-01 Sergio Basurto, Nov 3, 2013	Downloads:	0 votes 141		×

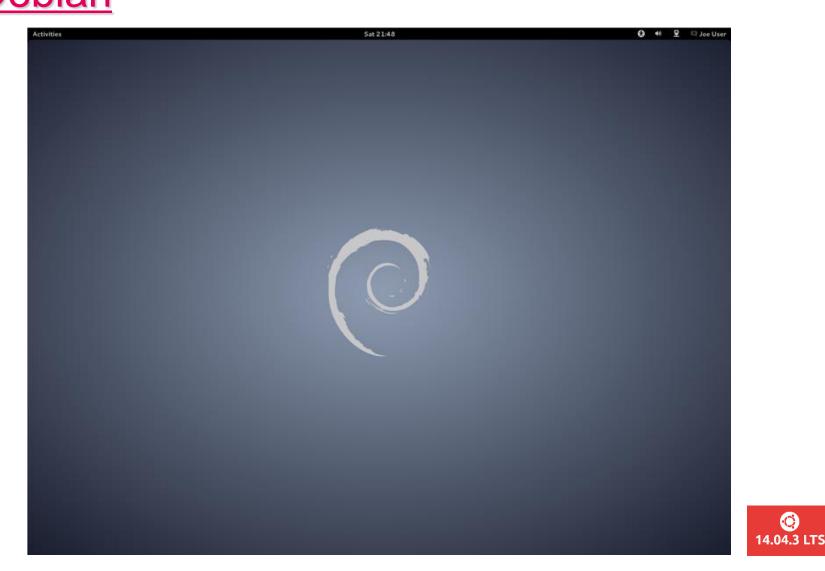


#### https://en.wikipedia.org/wiki/Linux\_distribution

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WIKIPEDIA	Article Talk Linux distribution		& Not lo Read Edit View hist	ogged in Talk Contributions	Create account Log in		
The Free Encyclopedia Main page Contents Featured content Current events Random article	From Wikipedia, the free encyclopedia A Linux distribution (often called a distro for short) is an operating system made from a software collection, which is based upon the Linux kernel and, often, a package management system. Linux users usually obtain their operating system by downloading one of the Linux distributions, which are available for a wide variety of systems ranging from embedded devices (for example, OpenWrt) and personal computers to powerful supercomputers (for example, Rocks Cluster Distribution). A typical Linux distribution comprises a Linux kernel, GNU tools and libraries, additional software, documentation, a window system (the most common being the X Window System), a window manager, and a desktop environment. Most of the included software is free and open-source software made available both as compiled binaries and in source code form, allowing modifications to the original software. Usually, Linux distributions optionally include some proprietary software that may not be available in source code form, such as binary blobs required for some device drivers. <sup>[1]</sup> Almost all Linux distributions are Unix-like; the most notable exception is Android, which does not include a command-line interface and programs made for typical Linux distributions. <sup>[2]</sup>						
Donate to Wikipedia Wikipedia store Interaction Help About Wikipedia Community portal Recent changes							
Contact page Tools What links here Related changes Upload file Special pages Permanent link	A Linux distribution may also be described as a example), packaged together with the Linux ker adapted to the distribution and then packaged online in so-called repositories, which are stora distribution installers (for example, Debian-Insta are originally written from the ground up by th	rnel in such a way that its capab l into software packages by the c ige locations usually distributed a aller and Anaconda) or the packa	lities meet the needs o istribution's maintainer round the world. <sup>[4][5]</sup> B ge management syster	f many users. <sup>[3]</sup> The software packages eside glue components,	vare is usually are available such as the		
Permanent link Page information Wikidata item Cite this page	Almost six hundred Linux distributions exist, wit improved. <sup>[6]</sup> Because of the huge availability of desktops, servers, laptops, netbooks, mobile ph	f software, distributions have take	n a wide variety of for	ms, including those suital	ole for use on		
Print/export Create a book Download as PDF Printable version	There are commercially backed distributions, su driven distributions, such as Debian, Slackware, instruction set, while some distributions (such a	Gentoo and Arch Linux. Most di	stributions come ready	to use and pre-compiled	for a specific		
In other projects	Contents [hide]						

14.04.3 LTS

#### Q **Linux Distributions (Cont.)** debian Debian



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Image: Second	
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# Linux Distributions (Cont.) Fedora fedora









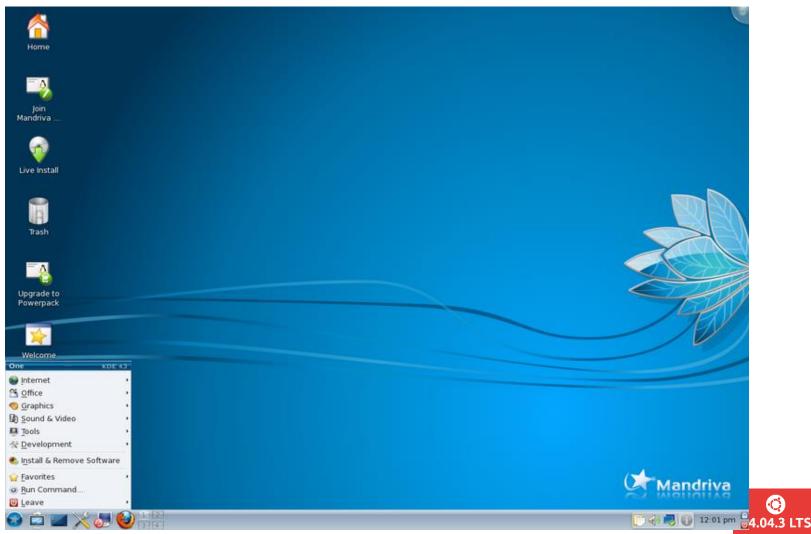
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#### CentOS

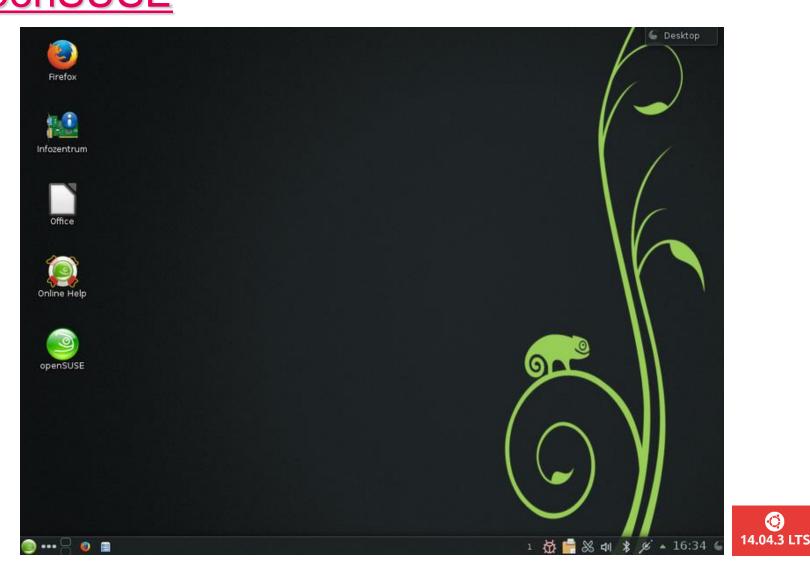
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## Linux Distributions (Cont.) Mandriva

#### Mandriva Linux



## Linux Distributions (Cont.) openSUSE



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**狂旗**® Linux

VietSoftware

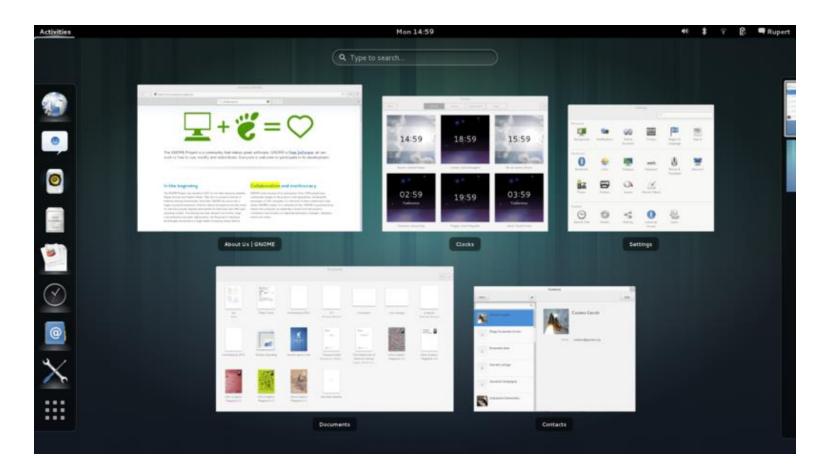
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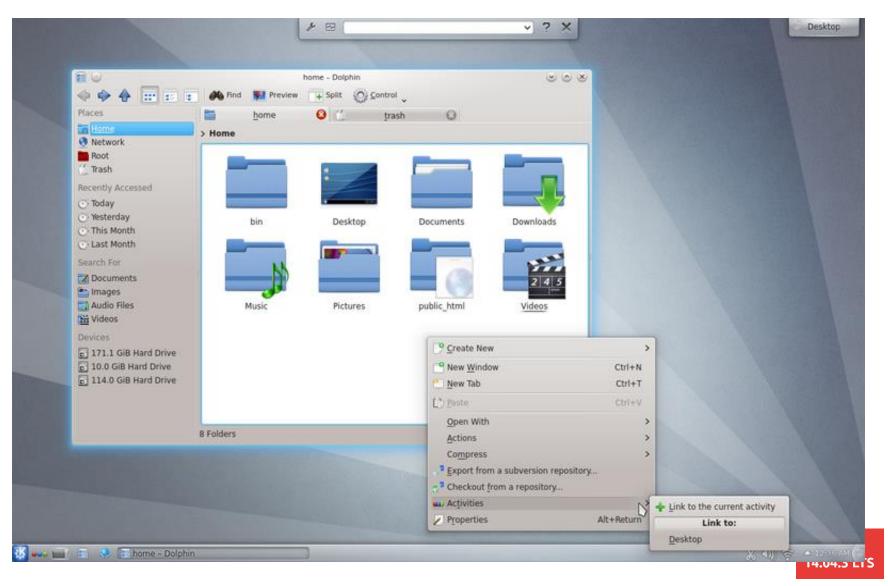


#### Linux Graphical Desktop Environments -GNOME Shell





#### Linux Graphical Desktop Environments -KDE Plasma

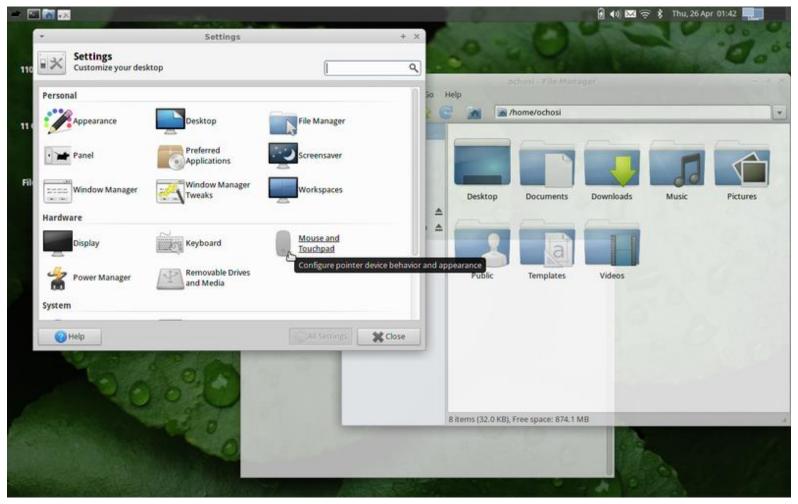


# Linux Graphical Desktop Environments -Unity





## Linux Graphical Desktop Environments -Xface



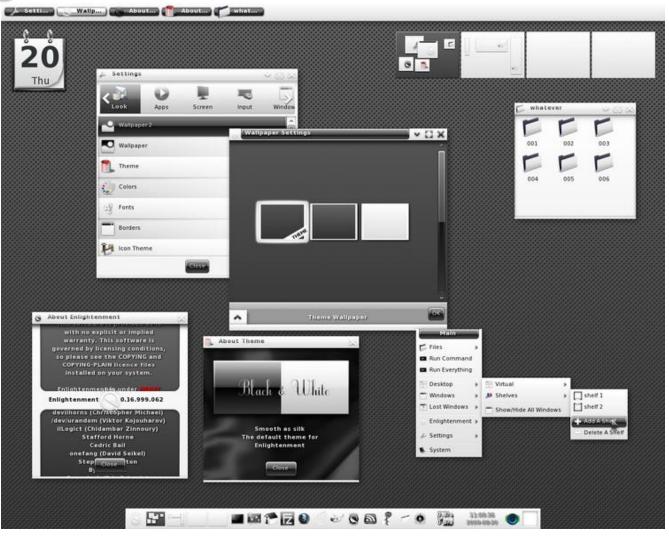


## Linux Graphical Desktop Environments -LXDE





#### Linux Graphical Desktop Environments -Enlightenment



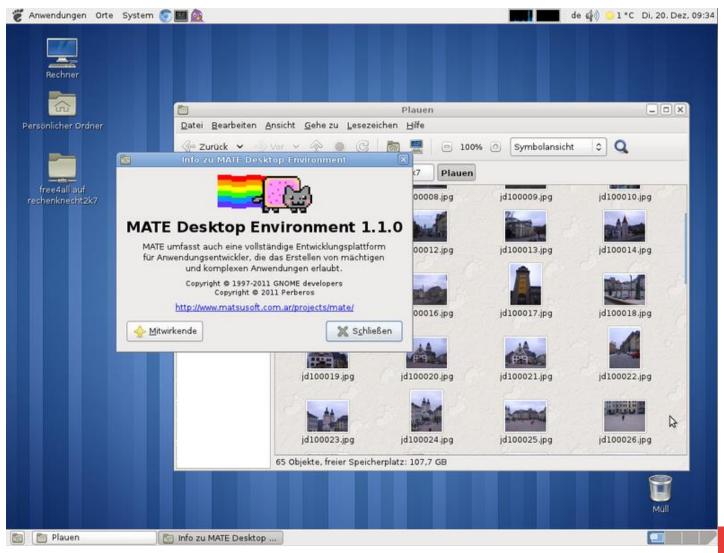


#### Linux Graphical Desktop Environments -Cinnamon



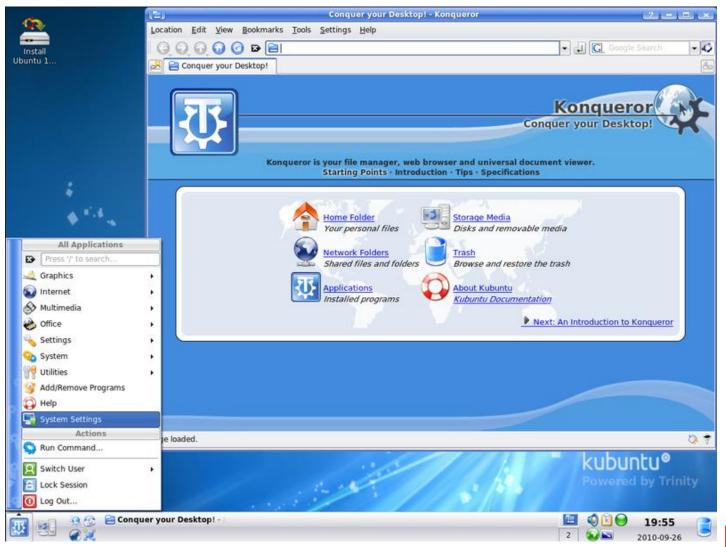


### Linux Graphical Desktop Environments -MATE (GNOME 2)



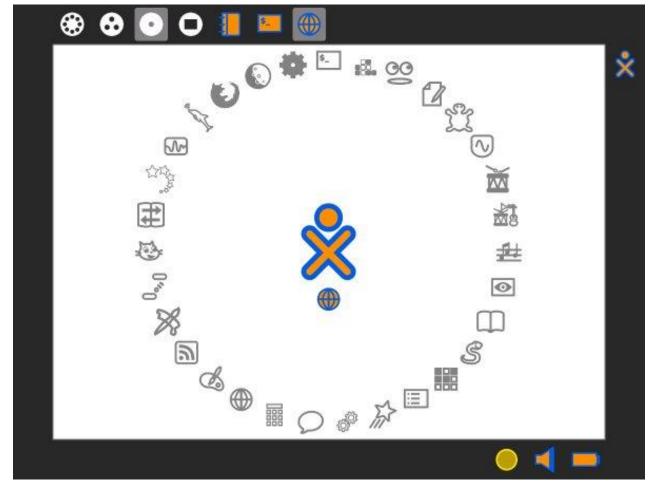


## Linux Graphical Desktop Environments -Trinity (KDE 3)





## Linux Graphical Desktop Environments -Sugar



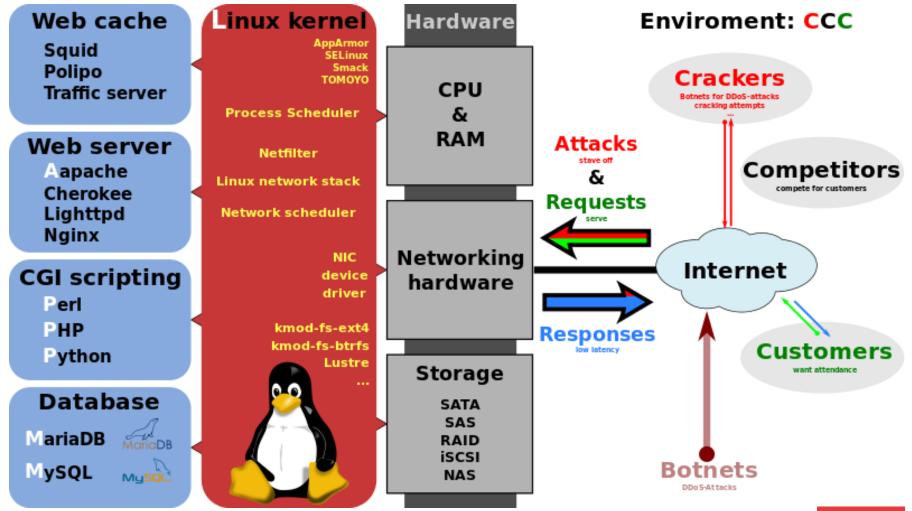


#### Linux Graphical Desktop Environments -Pantheon





## **Linux Server Environment - LAMP**





## What is Ubuntu ?

- Ubuntu, pronounced oŏ'boŏntoō, is actually three different things:
  - A philosophy
  - A worldwide collaborative software project, and
  - A computer operating system





## **Ubuntu Philosophy**

Is a traditional African concept originating from the *Bantu* languages of southern Africa.
 Roughly translates to *human kindness*.

Ubuntu is an ancient African word meaning 'humanity to others'. It also means 'I am what I am because of who we all are'.

Refer to http://www.ubuntu.com/about/about-ubuntu



#### Proprietary Software vs Free / Libre Open-Source Software

- Examples of proprietary operating systems include Microsoft Windows and Mac OS X.
- Ubuntu, on the other hand, is NOT proprietary software because it is actively maintained by the FLOSS community.
  - FREE to use
  - FREE to share, and
  - FREE to develop



## Ubuntu...

- Is a Debian-based Linux operating system.
- Has Unity as its default desktop environment
- Is based on free software.
- Development is led by <u>Canonical Ltd</u>.
- UTF-8 is a default character encoding.
- First release was on October 2004.
- Releases every six month.
- Every fourth release is a so-called LTS(Long Term Support).



## Ubuntu... (Cont.)

- Each Ubuntu release has a version number that consists of the year and month number of the release.
  - i.e. 14.04, 14.10
- Each release has an alliterative code name using an adjective and an animal.
- Code names are in consecutive alphabetic order.
  - i.e. Ubuntu 14.04 (Trusty Tahr)

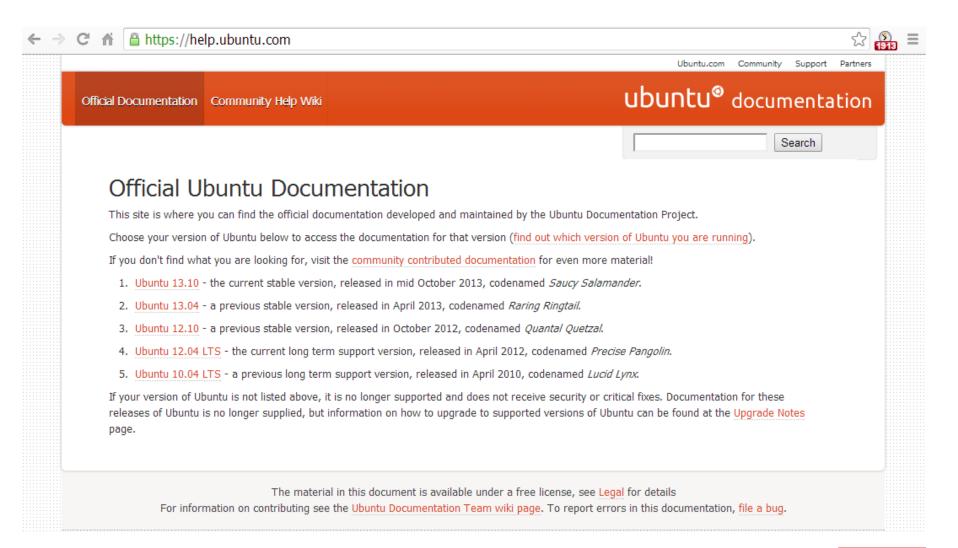


## Ubuntu... (Cont.)

Version	Code name	Release date	Supported until	
12.04 LTS	Precise Pangolin	2012-04-26	2017-04-26	
12.10	Quantal Quetzal	2012-10-18	2014-05-16	
13.04	Raring Ringtail	2013-04-25	2014-01-27 <sup>[23]</sup>	
13.10	Saucy Salamander	2013-10-17	2014-07-17	
14.04 LTS <sup>[66]</sup>	Trusty Tahr	2014-04-17	2019-04	
14.10	Utopic Unicorn <sup>[67]</sup>	2014-10-23 <sup>[68]</sup>	2015-07-23	
15.04	Vivid Vervet <sup>[69]</sup>	2015-04-23	2016-02-04	
15.10	Wily Werewolf <sup>[70]</sup>	2015-10-22 <sup>[71]</sup>	2016-07	
16.04 LTS	Xenial Xerus <sup>[72]</sup>	2016-04-21 <sup>[2]</sup>	2021-04	
16.10	Yakkety Yak <sup>[73]</sup>	2016-10-20 <sup>[74]</sup>	N/A	
Old version	Older version, still supp	orted Latest vers	sion Future release	

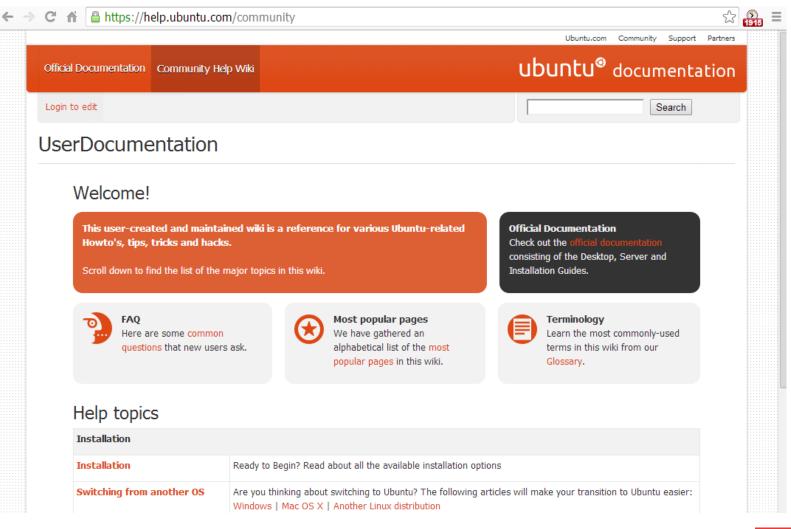
3 14.04.3 LTS

## **Official Documentation**





## **Community Documentation**





## **Ten Reasons to Try Ubuntu Linux**

- 1. Want your computer to boot really fast and to be fully functional after that.
- 2. Want to use a sleek and modern operating system (OS) but are reluctant to buy a Mac.
- 3. Are an idealist who thinks that software should be free.
- 4. Are a materialist who would rather have software for free.



## Ten Reasons to Try Ubuntu Linux (Cont.)

- 5. Have seen Ubuntu Linux installed in a friend's PC and want the same "wow" computer experience for yourself.
- 6. Are tired of being exposed to hackers and malicious users every time you open MSIE.
- 7. Just bought a netbook and it either
  - Comes loaded with an old OS, or
  - Has a brand new OS that limits you on what you can do.



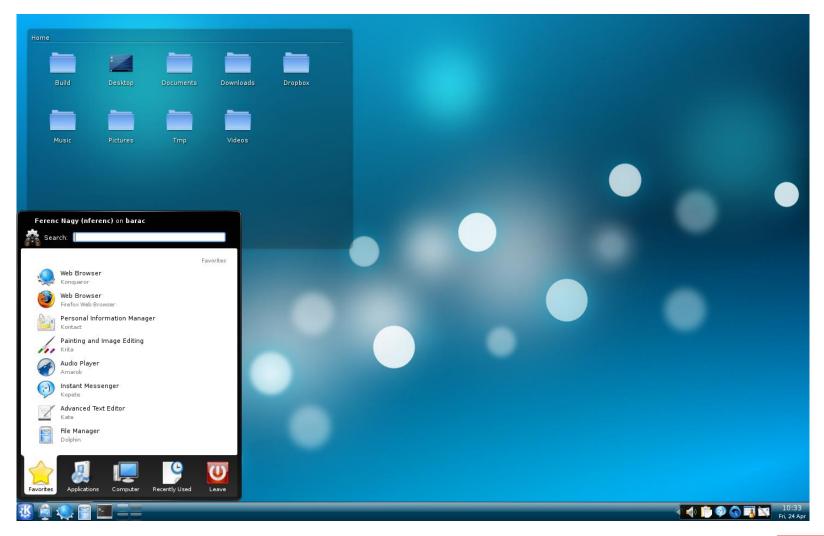
## Ten Reasons to Try Ubuntu Linux (Cont.)

- Have an old PC that you don't want to throw away just yet, but which is nearly useless under the latest versions of Windows.
- Are a hardcore Linux user who wants to figure out why Ubuntu has been chosen the best Linux desktop distribution so many times.
- 10. Have been asked by your boss to evaluate Ubuntu Linux as a replacement for Windows on your organization's desktop computers. Or maybe you are the boss and want to motivate your crew with a great project.

Apress, Beginning Ubuntu Linux 5<sup>th</sup> Ed., 2010, p.3.



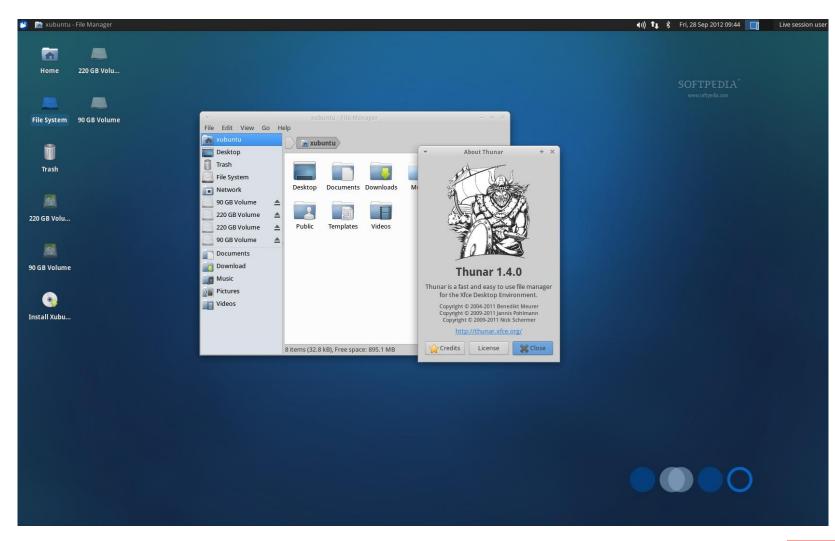
## **Ubuntu Brothers - Kubuntu**



Downloads from : <u>http://www.kubuntu.org/getkubuntu</u>



## **Ubuntu Brothers - Xubuntu**



Downloads from : http://xubuntu.org/getxubuntu/



## **Ubuntu Brothers – Edubuntu**



Downloads from : http://www.edubuntu.org/download



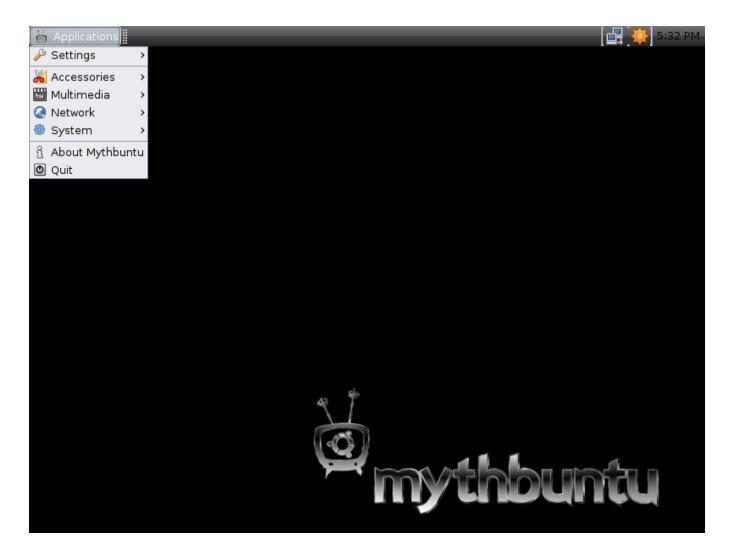
## **Ubuntu Brothers – Lubuntu**

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Downloads from : <u>https://help.ubuntu.com/community/Lubuntu/GetLubuntu</u>



## Ubuntu Brothers – Mythbuntu



Downloads from : http://www.mythbuntu.org/downloads



## **Ubuntu Brothers – UbuntuStudio**



Downloads from : https://ubuntustudio.org/download/



## **Ubuntu Brothers - Mint**



Downloads from : <u>https://www.linuxmint.com/download.php</u>

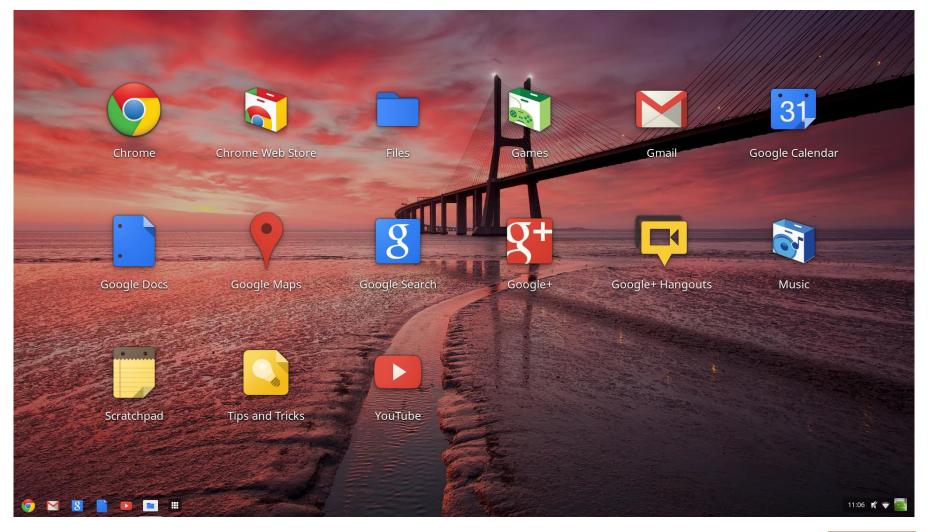


### **Ubuntu Brothers – Ubuntu Touch**





## **The others – Google Chrome OS**



Downloads from : <u>https://www.chromium.org/chromium-os</u>



#### **The others – Steam OS**



Downloads from : http://store.steampowered.com/steamos/?l=english



#### The others

Le + \* O Ubuntu Releases × \ → C f [] releases.ubuntu.com/?\_ga=1.93451357.1775650044.1461934063 c 🔮 💀 🔳 🗏 52 Ubuntu Releases The following releases of Ubuntu are available Ubuntu 16 04 LTS (Xenial Xerus) Ubuntu 15.10 (Wily Werewolf) Ubuntu 14.04.4 LTS (Trusty Tahr) Ubuntu 12.04.5 LTS (Precise Pangolin) We are happy to provide hosting for the following projects via the cdimage server. While they are not commercially supported by Canonical, they receive full support from their communities. Edubuntu Kubuntu Lubuntu Mythbuntu Ubuntu GNOME UbuntuKylin Ubuntu MATE UbuntuStudio Xubuntu The cdimage server also hosts releases of other Ubuntu images not found on this server, such as builds for less popular architectures and other non-standard and unsupported images. For Ubuntu Desktop and Server on popular architectures, please see the links above instead. Unsupported Ubuntu Images For old releases, see old-releases.ubuntu.com Name Last modified Size Description <u>12.04.5/</u> 08-Jun-2015 21:11 - Ubuntu 12.04.5 LTS (Precise Pangolin) 12.04/ 03-Jun-2015 21:11 - Ubuntu 12.04.5 LTS (Precise Pangolin) 14.04.4/ 25-Mar-2018 03:07 - Ubuntu 14.04.3 LTS (Trusty Tahr) 14 04/ 25-Mar-2018 03:07 - Ubuntu 14.04.3 LTS (Trusty Tahr) 15.04/ 22-Apr-2018 13:55 - Ubuntu 15.04 (Vivid Vervet) 15.10/ 22-Oct-2015 09:52 - Ubuntu 15.10 (Wily Werewolf) 18.04/ 21-Apr-2018 17:44 - Ubuntu 18.04 LTS (Xenial Xerus)

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 Ubuntu 12.04.5 LTS (Precise Pangolin)

 Image: precise/
 25-Mar-2018 03:07
 Ubuntu 14.04.8 LTS (Trusty Tahr)

 Image: precise/
 22-Apr-2018 13:55
 Ubuntu 15.04 (Vivid Vervet)



### Resources

- http://www.linux.com
- http://video.linuxfoundation.org
- http://ldn.linuxfoundation.org
- http://linuxfoundation.org
- <u>https://help.ubuntu.com</u>
- http://ubuntuforums.org
- <u>http://askubuntu.com</u>
- http://www.ubuntu-manual.org

