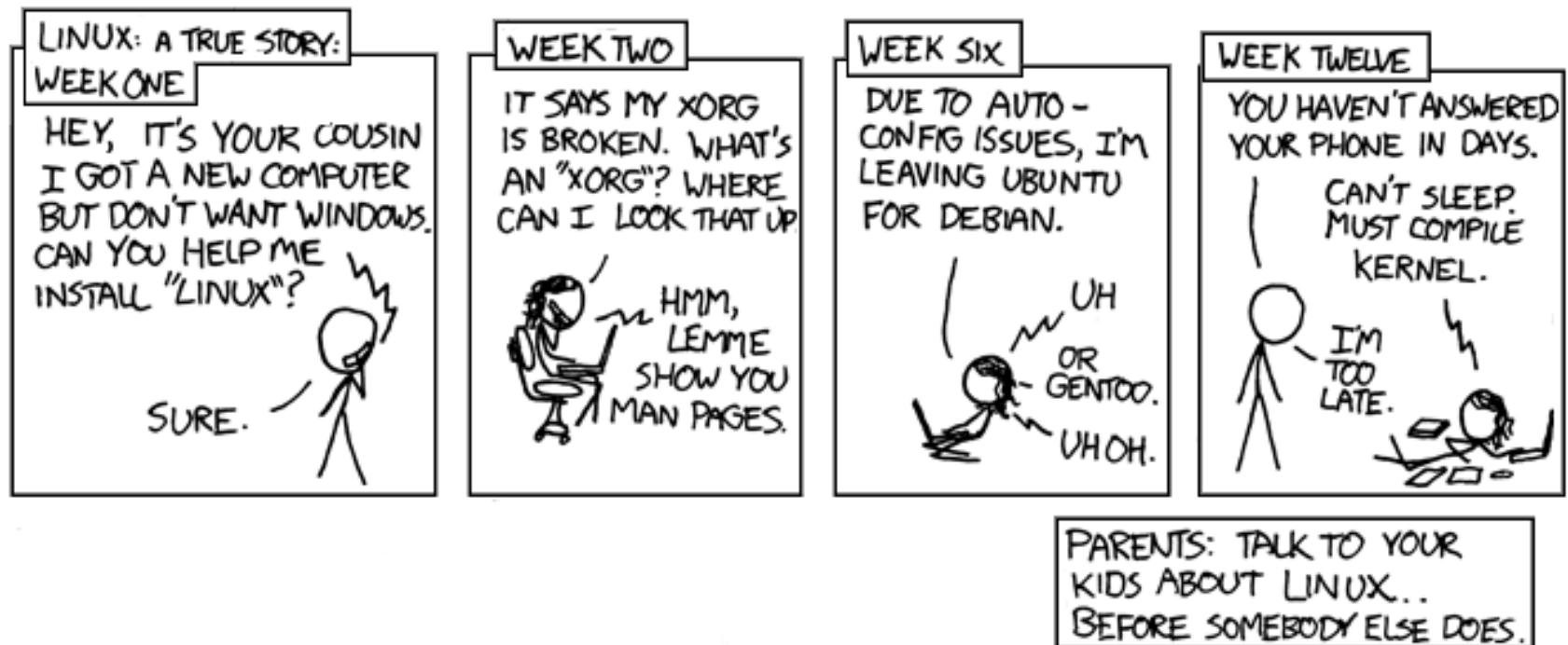


Linux I - Introduction

Safety Advice



Source: <https://xkcd.com/456/>

GNU / Linux

What is Linux:

- term is ambiguous!
- often (incorrectly) used to mean an operating system (OS)
- actually just the kernel used with an OS, e.g. 'GNU/Linux' → GNU toolset + Linux kernel
- a distribution ('distro'), i.e. a collection of software bundled with the GNU / Linux OS; often combined with a package management system; usually compiled / designed for a specific use-case (e.g. server vs. desktop)

What is GNU?

- GNU is a recursive acronym for 'GNU's Not UNIX'
- project started by Richard Stallman in 1983, in a time when only universities and large companies had computers and there was no legal and / or affordable way for personal use of software which also allowed changing / extending functionality (by having access to the source code)
- re-implementation of the most important UNIX (=proprietary) programs as free software
- also brought the first free software license, the GNU General Public License (GPL)

The (2 most important) people behind GNU / Linux



Richard M. Stallman

- Started the GNU project in 1983 at Berkeley University to create a free UNIX-like OS.
- Author of the first GNU General Public License (GPL)
- 1990s: GNU was almost a complete OS, except kernel

(Picture by: Thesupermat; CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=37264906>)

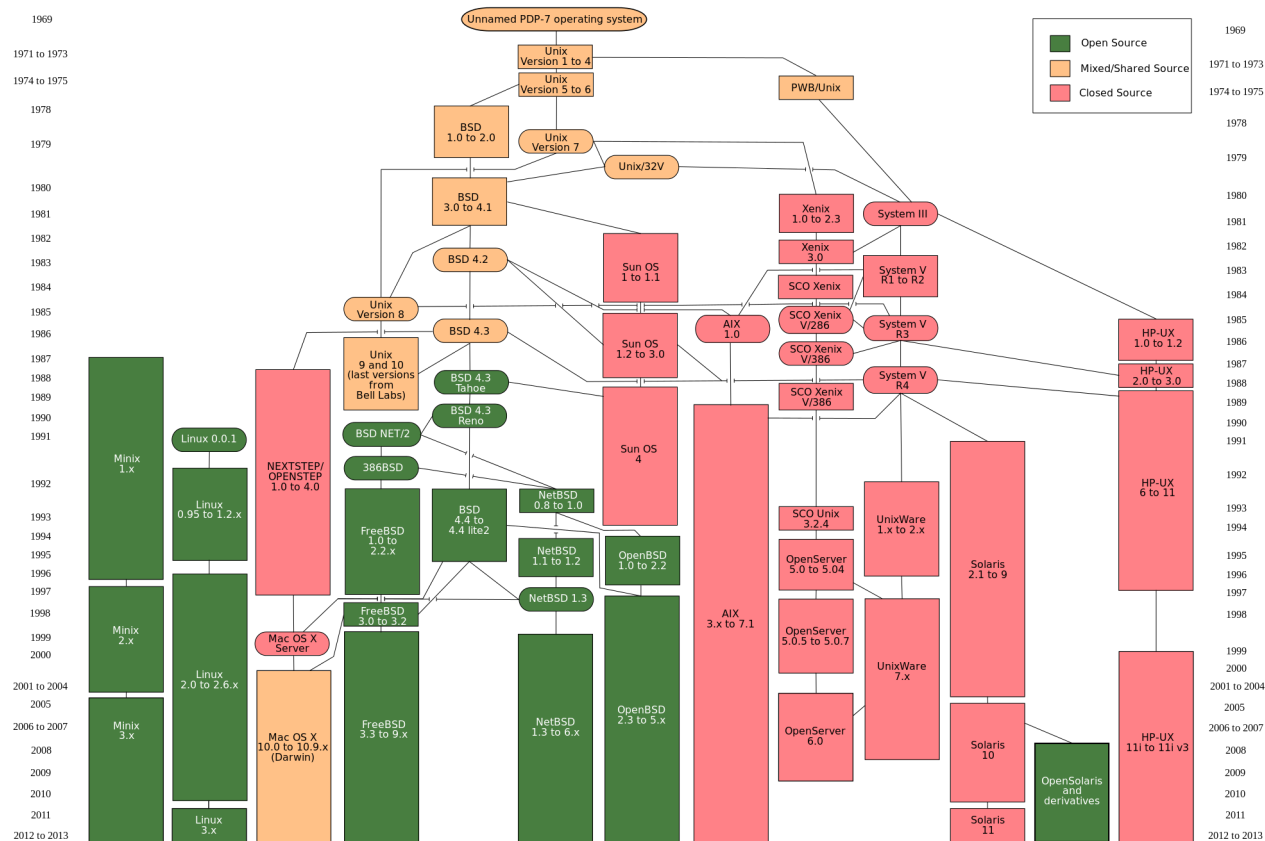


Linus Torvalds

- Wrote 1st version of Linux (kernel) as a student in 1991 at Helsinki University
- Used it together with GNU tools → GNU / Linux

(Picture by: thumperward; CC-BY-SA-3.0; [https://commons.wikimedia.org/wiki/File:%3ALinus_Torvalds_\(cropped\).jpg](https://commons.wikimedia.org/wiki/File:%3ALinus_Torvalds_(cropped).jpg))

Genealogy...



Picture credit: Eraserhead1, Infinity0; CC BY-SA 3.0;
https://commons.wikimedia.org/wiki/File:Unix_history-simple.en.svg

Free vs. Open Source Software

What is Free Software:

- The freedom to run the program as you wish, for any purpose (freedom 0).
- The freedom to study how the program works, and change it so it does your computing as you wish (freedom 1). Access to the source code is a precondition for this.
- The freedom to redistribute copies so you can help your neighbor (freedom 2).
- The freedom to distribute copies of your modified versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this.

What is Open Source Software?

- The term “open source” software is used by some people to mean more or less the same category as free software. It is not exactly the same class of software: they accept some licenses that we consider too restrictive, and there are free software licenses they have not accepted. However, the differences in extension of the category are small: nearly all free software is open source, and nearly all open source software is free. (— Free Software Foundation, <https://www.gnu.org/philosophy/categories.html>)

Which hardware / architectures does Linux run on?

Linux is the most versatile operating system and runs on more architectures than any other OS:

- PC: x86 (386, 486 Pentium, Celeron, Xeon); x86_64 (Core2, Athlon64, Opteron)
- PowerPC: Apple hardware before 2007, IBM, Sony PS3
- SPARC(32bit): Sun-4, SPARCstation
- UltraSPARC(64bit): Sun Ultra, Sun Blade, Sun Fire
- Intel IA-64: Itanium I/II
- ARM: phones (Nokia N800/N900, Qualcomm Snapdragon, Nvidia Tegra), some iPods, Nintendo DS,
- MIPS: Sony PS2 & PSP, Broadcom chipsets
- Many more...

Market share of operating systems (by category)

Category	Source	Date	Linux	Unix and Unix-like	Windows	In-house	Other
Desktop, laptop (excluding Android and Chrome OS)	Net Applications ^[193]	Oct 2016	2.18% (Ubuntu, etc.)	6.43% (macOS)	91.39% (10, 8.1, 7, Vista)		
Smartphone, tablet	StatCounter Global Stats ^[194]	Nov 2016	68.31% (Android)	23.35% (iOS)	1.25% (Windows 10 Mobile, Windows Phone 8.1 and older)		9.86%
Server (web)	W3Techs ^[195]	Sep 2014	36.72% (Debian, Ubuntu, CentOS, RHEL, Gentoo)	30.18% (AIX, FreeBSD, HP-UX, macOS Server)	33.10% (W2K3, W2K8, W2K12)		
Supercomputer	TOP500 ^[188]	Jun 2016	99.79% (Custom)	0.21%			
Mainframe	Gartner ^[186]	Dec 2008	28% (SLES, RHEL)	72% (z/OS) UNIX System Services			
Gaming console, Handheld game console (7th & 8th generation only)	VGChartz ^[196]	Oct 2016		34.1% (PS4, PS3, Vita, PSP)	16.36% (Xbox One, Xbox 360)	49.54% (Wii U, Wii, 3DS, DS)	0%
Embedded	UBM Electronics ^[197]	Mar 2012	29.44% (Android plus other non-Android Linux)	4.29% (QNX)	11.65% (WCE 7)	13.5% ("Inhouse/custom" is most popular, single choice)	41.1%

Source: https://en.wikipedia.org/wiki/Usage_share_of_operating_systems

What is a Linux distribution?

A Linux distribution (often called a distro for short) is an operating system made as a software collection based on the Linux kernel and, often, on a package management system. There are countless different distros, each one usually built for a specific use-case / audience:

Binary distributions:

- Debian: *buntu (Ubuntu, Kubuntu, Xubuntu, Mint, Edubuntu), Kali, Knoppix
- Fedora: Red Hat EL, CentOS, Oracle Linux, Scientific Linux
- OpenSUSE: SUSE LE
- Slackware
- (Android)

Source-based distributions:

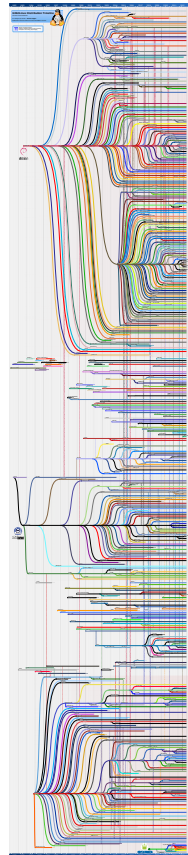
- Gentoo Linux: Funtoo, Sabayon, ChromeOS
- Arch Linux: Manjaro

Considerations when choosing a distribution:

In general there are more similarities than differences between distributions, but it's good asking yourself some question before installing a specific distribution:

- Which hardware?
- Server vs. desktop?
- Which specific use case?
- Stable vs. bleeding edge?
- Binary vs. source based?
- Which package manager?
- Which desktop environment?
- Commercial support vs. community support?

Distributions overview



Sources and further reading:

- <http://www.linuxfoundation.org/what-is-linux>
- <https://www.linux.com/learn/new-user-guides/376-linux-is-everywhere-an-overview-of-the-linux-operating-system>
- https://en.wikipedia.org/wiki/GNU/Linux_naming_controversy
- https://en.wikipedia.org/wiki/Linux_distribution
- https://en.wikipedia.org/wiki/List_of_Linux_distributions
- https://en.wikipedia.org/wiki/Linux_kernel
- https://en.wikipedia.org/wiki/List_of_Linux-supported_computer_architectures
- <http://www.tuxradar.com/content/how-choose-best-linux-distro>
- <http://tuxradar.com/content/distro-picker-0>
- <https://www.fsf.org/>
- <http://opensource.org/>
- <http://www.linuxalt.com/>
- http://wiki.mikejung.biz/Linux_documentaries