

Linux

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November 15, 2024

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What is Linux?

Linux is a generic name for a family of open-source Unix-like operating systems based on the Linux kernel.

Linux operating system is widely used in servers, personal computers, embedded systems, and other devices. It is built on the Linux kernel, which is the core of the operating system that manages communication between hardware and software.

Source: <https://en.m.wikipedia.org/wiki/File:Tux.svg>



Why Linux?

- Free and open-source operating system
- Open-source nature and customization flexibility
- Wide range of applications and tools
- Enhanced security
- High stability and reliability
- Community support and resources
- Cost-effectiveness compared to proprietary software
- Scalability for handling large amounts of data and traffic
- Compatibility with modern DevOps practices and configuration management
- Support for visualization

Source:

<https://www.logicmonitor.com/blog/9-reasons-linux-is-a-popular-choice-for-servers>

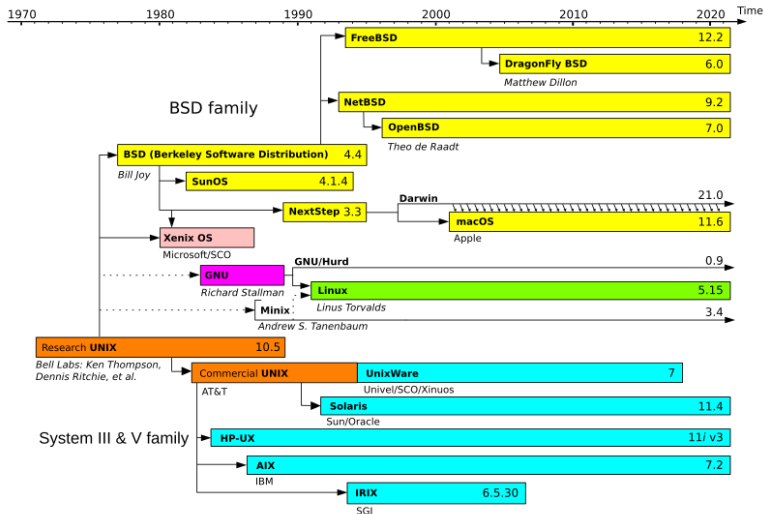
Where Linux is used?

- Servers
- Supercomputers
- Personal computers
- Embedded systems
- Networking equipment
- and many others...

- Developed in AT&T's Bell Labs in late 60s
- Designed as a multiuser, multitasking system
- Influenced many subsequent operating systems

- Origins at Bell Labs (1969-1970)
- UNIX Expansion (1970s)
 - Version 1 (1971): The first official version was released
 - Academic Adoption: By 1973, UNIX had been rewritten in C, making it more portable
 - Influence on Academia: UNIX became a popular teaching and research tool in academic circles, and many computer science students learned programming in this environment
- Commercialization and Fragmentation (1980s)
 - Version 1 (1971): AT&T began to commercialize UNIX more aggressively
 - System V (1983): AT&T's commercial version of UNIX, called System V, became a standard for many commercial UNIX systems. However, BSD continued to evolve separately, leading to a fragmentation of UNIX versions
- UNIX Wars (1980s-1990s)
 - Many different versions appeared
 - POSIX Standard was introduced
- Rise of Linux and Open Source (1990s)
- Modern UNIX and Legacy (2000s - Present)

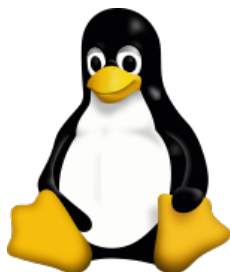
UNIX timeline



Source: https://en.m.wikipedia.org/wiki/File:Unix_timeline.en.svg

- Created by Linus Torvalds in 1991
- Initially developed as a hobby project inspired by UNIX
- Released under the GNU General Public License (GPL)
- Although Linux is not technically UNIX, it follows the UNIX philosophy and provides similar functionality
- It became popular due to its open-source nature and flexibility

- GNU Project initiated by Richard Stallman in 1983
- Aimed to create a free Unix-like operating system
- Linux kernel combined with GNU tools forms GNU/Linux



Linux supported platforms

- x86 (32-bit)
- x86_64 (64-bit)
- ARM (32-bit)
- AArch64 (ARM 64-bit)
- RISC-V (32-bit and 64-bit)
- PowerPC (32-bit and 64-bit)
- MIPS (32-bit and 64-bit)
- SPARC (32-bit and 64-bit)
- Itanium (IA-64, 64-bit)
- LoongArch
- and many others...

Full up-to-date list:

https://en.wikipedia.org/wiki/List_of_Linux-supported_computer_architectures

What is a Distribution?

A Linux distribution is an operating system made from a software collection, which includes the Linux kernel and often a package management system.

Examples:

- Ubuntu
- Fedora
- Debian
- Arch Linux
- Red Hat Enterprise Linux

Debian:

- Debian was first created in 1993 by Ian Murdock
- One of the oldest distributions
- Known for its stability and robustness

Ubuntu:

- Ubuntu was first released on October, 2004. It was developed by Canonical Ltd., founded by Mark Shuttleworth, a South African entrepreneur
- Based on Debian
- Created user-friendly and widely used for desktops
- Has regular releases and strong community support



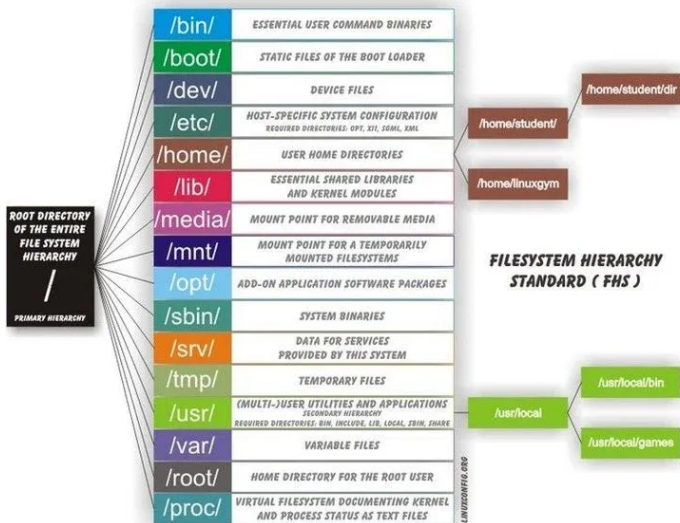
Package managers

- APT (Advanced Package Tool) for Debian-based systems.
- YUM/DNF for Red Hat-based systems.
- Pacman for Arch Linux.

Purpose of Package Managers

Package managers simplify the process of installing, updating, and removing software packages.

File system overview



Source: Linux File System Hierarchy - Explained

- `pwd` : Print working directory
- `ls` : List directory contents
- `cd` : Change directory
- `mkdir` : Create a new directory

Examples

- `ls -l` : Detailed list
- `cd /home/user` : Navigate to user's home

File Manipulations

- `touch` : Create an empty file or update timestamp
- `cp` : Copy files or directories
- `mv` : Move or rename files
- `rm` : Remove files or directories
- `cat` : Concatenate and display files

Examples

- `touch file.txt` : Create a new file
- `rm -r folder` : Remove a directory and its contents

- **nano** : Simple text editor
- **vim** : Advanced text editor with modal editing
- **code** : Visual Studio Code (GUI only)

Opening a File

- `nano file.txt`
- `vim file.txt`
- `code file.txt`

Demo

Thank You!

- 1 The Linux command line for beginners
<https://ubuntu.com/tutorials/command-line-for-beginners>
- 2 The Linux command line for beginners
<https://ubuntu.com/tutorials/command-line-for-beginners>
- 3 Top 50+ Linux Commands You MUST Know
<https://www.digitalocean.com/community/tutorials/linux-commands>