Linux

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Linux (LIN-uuks) is a family of open source Unix-like operating systems based on the Linux kernel, an operating system kernel first released on September 17, 1991, by Linus Torvalds. Linux is typically packaged as a Linux distribution (distro), which includes the kernel and supporting system software and libraries—most of which are provided by third parties—to create a complete operating system, designed as a clone of Unix and released under the copyleft GPL license.

Thousands of Linux distributions exist, many based directly or indirectly on other distributions; popular Linux distributions include Debian, Fedora Linux, Linux Mint, Arch Linux, and Ubuntu, while commercial distributions include Red Hat Enterprise Linux, SUSE Linux Enterprise, and ChromeOS. Linux distributions are frequently used in server platforms. Many Linux distributions use the word "Linux" in their name, but the Free Software Foundation uses and recommends the name "GNU/Linux" to emphasize the use and importance of GNU software in many distributions, causing some controversy. Other than the Linux kernel, key components that make up a distribution may include a display server (windowing system), a package manager, a bootloader and a Unix shell.

Linux is one of the most prominent examples of free and open-source software collaboration. While originally developed for x86 based personal computers, it has since been ported to more platforms than any other operating system, and is used on a wide variety of devices including PCs, workstations, mainframes and embedded systems. Linux is the predominant operating system for servers and is also used on all of the world's 500 fastest supercomputers. When combined with Android, which is Linux-based and designed for smartphones, they have the largest installed base of all general-purpose operating systems.

Linux kernel

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The Linux kernel is a free and open-source Unix-like kernel that is used in many computer systems worldwide. The kernel was created by Linus Torvalds in 1991 and was soon adopted as the kernel for the GNU operating system (OS) which was created to be a free replacement for Unix. Since the late 1990s, it has been included in many operating system distributions, many of which are called Linux. One such Linux kernel operating system is Android which is used in many mobile and embedded devices.

Most of the kernel code is written in C as supported by the GNU Compiler Collection (GCC) which has extensions beyond standard C. The code also contains assembly code for architecture-specific logic such as optimizing memory use and task execution. The kernel has a modular design such that modules can be integrated as software components – including dynamically loaded. The kernel is monolithic in an architectural sense since the entire OS kernel runs in kernel space.

Linux is provided under the GNU General Public License version 2, although it contains files under other compatible licenses.

Linux Mint

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Linux Mint is a community-developed Linux distribution based primarily on Ubuntu, with an alternative version based on Debian known as Linux Mint Debian Edition (LMDE). It is available for x86-64 systems, while LMDE also supports the IA-32 architecture. First released in 2006, Linux Mint is often noted for its ease of use, out-of-the-box functionality, and appeal to desktop users. It comes bundled with a selection of free and open-source software. The default desktop environment is Cinnamon, developed by the Linux Mint team, with MATE and Xfce available as alternatives.

Linux distribution

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A Linux distribution, often abbreviated as distro, is an operating system that includes the Linux kernel for its kernel functionality. Although the name does not imply product distribution per se, a distro—if distributed on its own—is often obtained via a website intended specifically for the purpose. Distros have been designed for a wide variety of systems ranging from personal computers (for example, Linux Mint) to servers (for example, Red Hat Enterprise Linux) and from embedded devices (for example, OpenWrt) to supercomputers (for example, Rocks Cluster Distribution).

A distro typically includes many components in addition to the Linux kernel. Commonly, it includes a package manager, an init system (such as systemd, OpenRC, or runit), GNU tools and libraries, documentation, IP network configuration utilities, the getty TTY setup program, and many more. To provide a desktop experience (most commonly the Mesa userspace graphics drivers) a display server (the most common being the X.org Server, or, more recently, a Wayland compositor such as Sway, KDE's KWin, or GNOME's Mutter), a desktop environment (most commonly GNOME, KDE Plasma, or Xfce), a sound server (usually either PulseAudio or more recently PipeWire), and other related programs may be included or installed by the user.

Typically, most of the included software is free and open-source software – made available both as binary for convenience and as source code to allow for modifying it. A distro may also include proprietary software that is not available in source code form, such as a device driver binary.

A distro may be described as a particular assortment of application and utility software (various GNU tools and libraries, for example), packaged with the Linux kernel in such a way that its capabilities meet users' needs. The software is usually adapted to the distribution and then combined into software packages by the distribution's maintainers. The software packages are available online in repositories, which are storage locations usually distributed around the world. Beside "glue" components, such as the distribution installers (for example, Debian-Installer and Anaconda) and the package management systems, very few packages are actually written by a distribution's maintainers.

Distributions have been designed for a wide range of computing environments, including desktops, servers, laptops, netbooks, mobile devices (phones and tablets), and embedded systems. There are commercially backed distributions, such as Red Hat Enterprise Linux (Red Hat), openSUSE (SUSE) and Ubuntu (Canonical), and entirely community-driven distributions, such as Debian, Slackware, Gentoo and Arch Linux. Most distributions come ready-to-use and prebuilt for a specific instruction set, while some (such as Gentoo) are distributed mostly in source code form and must be built before installation.

List of Linux distributions

This page provides general information about notable Linux distributions in the form of a categorized list. Distributions are organized into sections

This page provides general information about notable Linux distributions in the form of a categorized list. Distributions are organized into sections by the major distribution or package management system they are based on.

Comparison of Linux distributions

Technical variations of Linux distributions include support for different hardware devices and systems or software package configurations. Organizational

Technical variations of Linux distributions include support for different hardware devices and systems or software package configurations. Organizational differences may be motivated by historical reasons. Other criteria include security, including how quickly security upgrades are available; ease of package management; and number of packages available.

These tables compare notable distribution's latest stable release on wide-ranging objective criteria. It does not cover each operating system's subjective merits, branches marked as unstable or beta, nor compare Linux distributions with other operating systems.

Arch Linux

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Arch Linux () is an open source, rolling release Linux distribution. Arch Linux is kept up-to-date by regularly updating the individual pieces of software that it comprises. Arch Linux is intentionally minimal, and is meant to be configured by the user during installation so they may add only what they require.

Arch Linux provides monthly "snapshots" which are used as installation media.

Pacman, a package manager written specifically for Arch Linux, is used to install, remove and update software packages. Also, the Arch User Repository (AUR), which is the community-driven software repository for Arch Linux provides packages not included in the official repositories and alternative versions of packages; AUR packages can be downloaded and built manually, or installed through an AUR 'helper'.

Arch Linux has comprehensive documentation in the form of a community-run wiki known as the ArchWiki.

Linux kernel version history

This article documents the version history of the Linux kernel. Each major version – identified by the first two numbers of a release version – is designated

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Each major version – identified by the first two numbers of a release version – is designated one of the following levels of support:

Supported until next stable version and 3 months after that

Long-term support (LTS); maintained for a few years

Super-long-term support (SLTS); maintained for many more years by the Civil Infrastructure Platform (CIP)

Fedora Linux

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Fedora Linux is a Linux distribution developed by the Fedora Project. It was originally developed in 2003 as a continuation of the Red Hat Linux project. It contains software distributed under various free and open-source licenses and aims to be on the leading edge of open-source technologies. It is now the upstream source for CentOS Stream and Red Hat Enterprise Linux.

Since the release of Fedora 21 in December 2014, three editions have been made available: personal computer, server and cloud computing. This was expanded to five editions for containerization and Internet of Things (IoT) as of the release of Fedora 37 in November 2022. A new version of Fedora Linux is released every six months.

As of February 2016, Fedora Linux has an estimated 1.2 million users, and is also the distribution used by Linus Torvalds, creator of the Linux kernel (as of May 2020).

Windows Subsystem for Linux

Windows Subsystem for Linux (WSL) is a component of Microsoft Windows that allows the use of a Linux environment from within Windows, foregoing the overhead

Windows Subsystem for Linux (WSL) is a component of Microsoft Windows that allows the use of a Linux environment from within Windows, foregoing the overhead of a virtual machine and being an alternative to dual booting. The WSL command-line interface tool is installed by default in Windows 11, but a distribution must be downloaded and installed through it before use. In Windows 10, WSL can be installed either by joining the Windows Insider program or manually via Microsoft Store or Winget.

The original version, WSL 1, differs significantly from the second major version, WSL 2. WSL 1 (released August 2, 2016), acted as a compatibility layer for running Linux binary executables (in ELF format) by implementing Linux system calls in the Windows kernel. WSL 2 (announced May 2019), introduced a real Linux kernel – a managed virtual machine (via Hyper-V) that implements the full Linux kernel. As a result, WSL 2 is compatible with more Linux binaries as not all system calls were implemented in WSL 1.

Microsoft offers WSL for a variety of reasons. Microsoft envisions WSL as "a tool for developers – especially web developers and those who work on or with open source projects". Microsoft also claims that "WSL requires fewer resources (CPU, memory, and storage) than a full virtual machine" (a common alternative for using Linux in Windows), while also allowing the use of both Windows and Linux tools on the same set of files.

The majority of WSL was released as open source software on May 19, 2025, although certain filesystem functions still rely on a proprietary library that is not open source at this time.