

Linux System Programming

Linux

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Linux (LIN-uuks) is a family of free and open-source software Unix-like operating systems based on the Linux kernel, which was first released on 17 September 1991 by Linus Torvalds. Some members of the family are typically packaged as a distribution (a.k.a. distro), which includes the kernel alongside supporting system software and libraries developed by third parties—such as GNU, Red Hat, and X.Org—to create a complete operating system; however, not all Linux-based operating systems are considered distros, with Android being an example. Linux was originally designed as a clone of Unix and is distributed under the copyleft GPL license.

There are many thousands of Linux distributions, many based directly or indirectly on other distributions; popular Linux distros 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...

Linux on IBM Z

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Linux on IBM Z, Linux on zSystems, or zLinux are collective terms for the Linux operating system compiled to run on IBM mainframes, especially IBM Z, zSystems, and LinuxONE servers. Similar terms which imply the same meaning are Linux/390, Linux/390x, etc. The three Linux distributions certified for usage on the IBM Z hardware platform are Red Hat Enterprise Linux, SUSE Linux Enterprise Server, and Ubuntu.

== History ==

Linux on IBM Z originated as two separate efforts to port Linux to IBM's System/390 servers. The first effort, the "Bigfoot" project, developed by Linas Vepstas in late 1998 through early 1999, was an independent distribution and has since been abandoned. IBM published a collection of patches and additions to the Linux 2.2.13 kernel on December 18, 1999, to start today's mainline Linux on IBM Z. Formal product announcements quickly followed in 2000, including the Integrated Facility for Linux (IFL) engines. Think Blue Linux was an early mainframe distribution consisting mainly of Red Hat packages added to the IBM kernel. Commercial Linux distributors introduced mainframe editions very quickly after the initial kernel work. The first lines of mainframes supported by Linux...

Linux kernel interfaces

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The Linux kernel provides multiple interfaces to user-space and kernel-mode code. The interfaces can be classified as either application programming interface (API) or application binary interface (ABI), and they can be classified as either kernel-user space or kernel-internal.

== Linux API ==

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 functions. Although the term 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 a Linux kernel and many other components. Commonly, it includes a package manager, an init system (such as systemd, OpenRC, SysVinit, or runit), GNU tools and libraries, documentation, Internet Protocol (IP) network configuration utility software (utilities), the getty TTY setup program, and many more. Programs used 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...

Linux Foundation

open-source operating system kernel Linux. They merged in 2007. The foundation has since evolved to promote open-source projects beyond the Linux OS as a "foundation"

The Linux Foundation (LF) is a nonprofit organization formed in 2007 to support the development of Linux and open-source software. The foundation provides hosted projects with governance structures and shared legal and operational services.

Originally focused primarily on Linux, the foundation has expanded into an umbrella organization for open-source projects and foundations across areas including cloud computing, artificial intelligence, software security, networking, and embedded systems. Its ecosystem includes the Cloud Native Computing Foundation (CNCF), which hosts Kubernetes; the PyTorch Foundation; and the Open Source Security Foundation (OpenSSF).

== History ==

The Linux Foundation started as the Free Standards Group and Open Source Development Labs in 2000 to standardize and promote the open-source operating system kernel Linux. They merged in 2007. The foundation has since evolved to promote open-source projects beyond the Linux OS as a "foundation of foundations" that hosts a variety of projects spanning topics such as cloud, networking, blockchain, and hardware. The foundation also hosts annual educational events among the Linux community, including the Linux Kernel Developers...

Arch Linux

Arch Linux (/ɑ:rtʃ/) is an open source, rolling release Linux distribution. Arch Linux is kept up-to-date by regularly updating the individual pieces

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. It provides monthly "snapshots" which are used as installation media. Arch Linux is intentionally minimal, and is meant to be configured by the user during installation to add only what is needed.

Pacman, a package manager written specifically for Arch Linux, is used to install, remove and update software packages. The Arch User Repository (AUR) serves as a community-driven software repository for Arch Linux and 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' such as yay

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

== History ==

Inspired by CRUX, another minimalist distribution, Judd Vinet began the Arch Linux project in March 2002. The name was chosen because Vinet liked the word's meaning of "the principal," as in "arch-enemy".

Originally only for IA-32 (32-bit x86) CPUs, the first x86-64 installation standard ISO image...

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.

== History ==

The Linux Programming Interface

Linux Programming Interface: A Linux and UNIX System Programming Handbook is a book written by Michael Kerrisk, which documents the APIs of the Linux

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Michael Kerrisk, which documents the APIs of the Linux kernel and the GNU C Library (glibc).

== Book ==

The book covers topics related to the Linux operating system and operating systems in general. It chronicles the history of Unix and how it led to the creation of Linux. The book provides samples of code written in C, and learning exercises at the end of chapters. The author is a former writer for the Linux Weekly News and the a maintainer for the Linux man pages project since 2004.

The Linux Programming Interface has been translated into Chinese, Japanese, Russian, and Korean.

Linux console

The Linux console is a system console internal to the Linux kernel. A system console is the device which receives all kernel messages and warnings and

The Linux console is a system console internal to the Linux kernel. A system console is the device which receives all kernel messages and warnings and which allows logins in single user mode. The Linux console provides a way for the kernel and other processes to send text output to the user, and to receive text input from the user. The user typically enters text with a computer keyboard and reads the output text on a computer monitor. The Linux kernel supports virtual consoles – consoles that are logically separate, but which access the same physical keyboard and display. The Linux console (and Linux virtual consoles) are implemented by the VT (virtual terminal) subsystem of the Linux kernel, and do not rely on any user space software. This is in contrast to a terminal emulator, which is a user space process that emulates a terminal, and is typically used in a graphical display environment.

The Linux console was one of the first features of the kernel and was originally written by Linus Torvalds in 1991 (see history of Linux). There are two main implementations: framebuffer and text mode. The framebuffer implementation is the default in modern Linux distributions, and together with...

Mandriva Linux

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Mandriva Linux, a fusion of the French distribution Mandrake Linux and the Brazilian distribution Conectiva Linux, is a discontinued Linux distribution developed by Mandriva S.A.

Each release's lifetime was 18 months for base updates (Linux, system software, etc.) and 12 months for desktop updates (window managers, desktop environments, web browsers, etc.). Server products received full updates for at least five years after their release.

The last release of Mandriva Linux was in August 2011. Most developers who were laid off went to Mageia. Later on, the remaining developers teamed up with community members and formed OpenMandriva, a continuation of Mandriva.

== History ==

The first release of Mandrake was based on Red Hat Linux (version 5.1) and K Desktop Environment 1 in July 1998. After that, it moved away from the Red Hat standard and Red Hat inspiration and influence on its own design and implementation, and became a completely separate distribution. Mandrake included a number of original tools that make system configuration less difficult. It was the brainchild of Gaël Duval, who wanted to focus on ease of use for new users.

This goal was met as Mandrake Linux gained a reputation...

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