Chapter 1

About the Linux Foundation:

Since its inception in 1991, Linux has grown to become a major force in computing - powering everything from the New York Stock Exchange, to mobile phones, supercomputers, and consumer devices.

The Linux Foundation partners with the world's leading developers and companies to solve the hardest technology problems and accelerate open technology development and commercial adoption. The Linux Foundation makes it its mission to provide experience and expertise to any initiative working to solve complex problems through open source collaboration, providing the tools to scale open source projects: security best practices, governance, operations and ecosystem development, training and certification, licensing, and promotion.

Linux is the world's largest and most pervasive open source software project in history. The Linux Foundation is home to Linux creator Linus Torvalds and lead maintainer Greg Kroah-Hartman, and provides a neutral home where Linux kernel development can be protected and accelerated for years to come. The success of Linux has catalyzed growth in the open source community, demonstrating the commercial efficacy of open source and inspiring countless new projects across all industries and levels of the technology stack.

The Linux Foundation's work today extends far beyond Linux, fostering innovation at every layer of the software stack.

The Linux Foundation is the umbrella organization for many critical open source projects that power corporations today, spanning all industry sectors:

- Big data and analytics: ODPi, R Consortium
- Networking: OpenDaylight, ONAP, OPNFV
- Embedded: Dronecode, Zephyr
- Web tools: JS Foundation, Node.js
- Cloud computing: Cloud Foundry, Cloud Native Computing Foundation, Open Container Initiative
- Automotive: Automotive Grade Linux
- Security: The Core Infrastructure Initiative
- Blockchain: Hyperledger

Linux Foundation Events

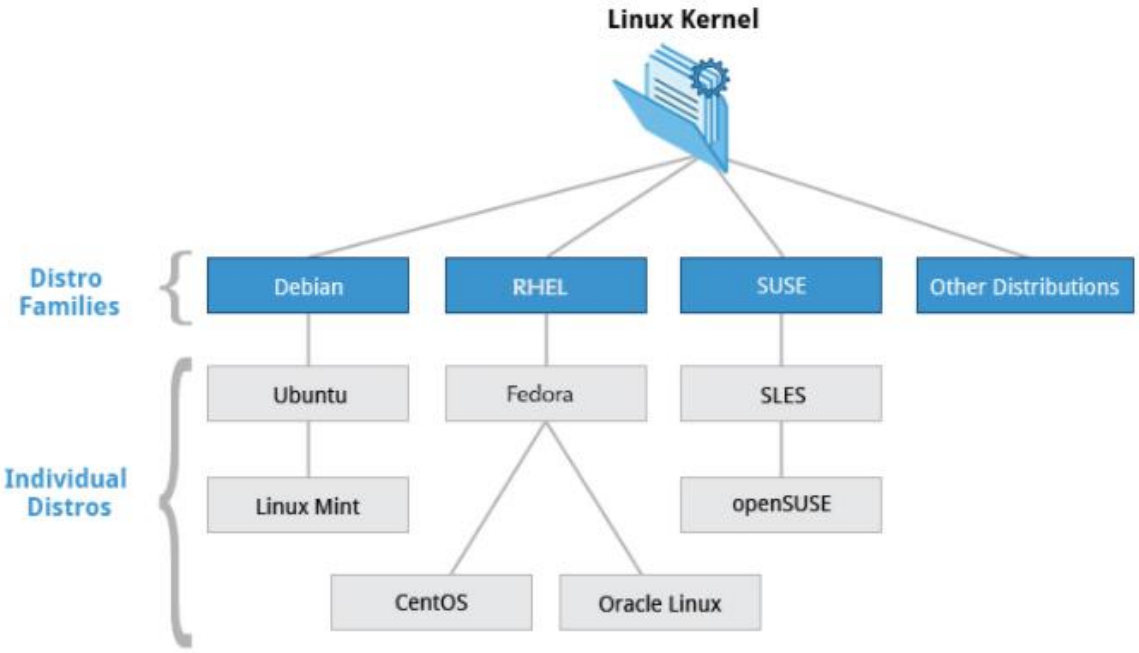
The Linux Foundation hosts conferences and other events throughout the world which bring community members together in person. These events:

- Provide an open forum for development of the next kernel (the actual operating system) release.
- Bring together developers and system administrators to solve problems in a real-time environment.
- Host workgroups and community groups for active discussions.
- Connect end users, system administrators, and kernel developers in order to grow Linux use in the enterprise.
- Encourage collaboration among the entire community.
- Provide an atmosphere that is unmatched in its ability to further the platform.

The Linux Foundation events include:

- Open Source Summit North America, Europe, Japan, and China
- MesosCon North America, Europe, and China
- Embedded Linux Conference/OpenIoT Summit North America and Europe
- Open Source Leadership Summit
- Automotive Linux Summit
- Apache: Big Data North America & ApacheCon
- KVM Forum
- Linux Storage Filesystem and Memory Management Summit
- Vault
- Open Networking Summit

List of Linux Distributions available: https://lwn.net/Distributions/

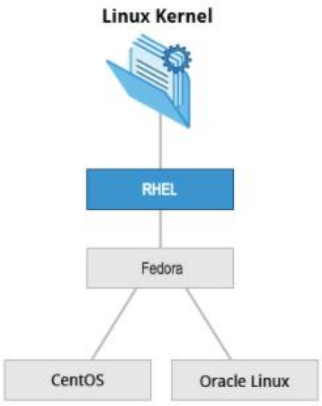


The Red Hat Family

Red Hat Enterprise Linux (RHEL) heads the family that includes CentOS, Fedora and Oracle Linux.

Fedora has a close relationship with RHEL and contains significantly more software than Red Hat's enterprise version. One reason for this is that a diverse community is involved in building Fedora, with many contributors who do not work for Red Hat. Furthermore, it is used as a testing platform for future RHEL releases.

The basic version of CentOS is also virtually identical to RHEL, the most popular Linux distribution in enterprise environments.



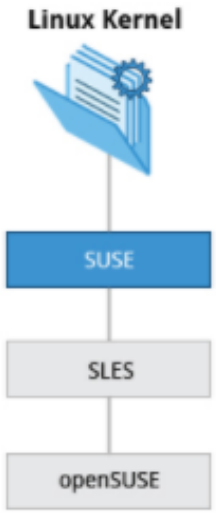
ARUNDHATI BANDOPADHYAYA (arundhati.bandopadhyaya@gmail.com)

Some of the key facts about the Red Hat distribution family are:

- Fedora serves as an upstream testing platform for RHEL.
- CentOS is a close clone of RHEL, while Oracle Linux is mostly a copy with some changes (in fact, CentOS has been part of Red Hat since 2014).
- A heavily patched version 3.10 kernel is used in RHEL/CentOS 7, while version 4.18 is used in RHEL/CentOS 8.
- It supports hardware platforms such as Intel x86, Arm, Itanium, PowerPC, and IBM System z.
- It uses the yum and dnf RPM-based yum package managers (covered in detail later) to install, update, and remove packages in the system.
- RHEL is widely used by enterprises which host their own systems.

The SUSE Family

The relationship between SUSE (SUSE Linux Enterprise Server (SLES)) and openSUSE is similar to the one described between RHEL, CentOS, and Fedora.



Some of the key facts about the SUSE family are listed below:

- SUSE Linux Enterprise Server (SLES) is upstream for openSUSE.
- Kernel version 4.12 is used in openSUSE Leap 15.
- It uses the RPM-based zypper package manager (we cover it in detail later) to install, update, and remove packages in the system.
- It includes the YaST (Yet Another Setup Tool) application for system administration purposes.
- SLES is widely used in retail and many other sectors.

The Debian Family

The Debian distribution is upstream for several other distributions, including Ubuntu. In turn, Ubuntu is upstream for Linux Mint and a number of other distributions. It is commonly used on both servers and desktop computers. Debian is a pure open source community project (not owned by any corporation) and has a strong focus on stability.

Debian provides by far the largest and most complete software repository to its users of any Linux distribution.

Ubuntu aims at providing a good compromise between long term stability and ease of use. Since Ubuntu gets most of its packages from Debian's stable branch, it also has access to a very large software repository.

Some key facts about the Debian family are listed below:

- The Debian family is upstream for Ubuntu, and Ubuntu is upstream for Linux Mint and others.
- Kernel version 4.15 is used in Ubuntu 18.04 LTS.
- It uses the DPKG-based APT package manager (using apt, apt-get, apt-cache, etc. which we cover in detail later) to install, update, and remove packages in the system.
- Ubuntu has been widely used for cloud deployments.
- While Ubuntu is built on top of Debian and is GNOME-based under the hood, it differs visually from the interface on standard Debian, as well as other distributions.

Summary:

- The Linux Foundation is the umbrella organization for many critical open source projects that power corporations, spanning all industry sectors. Its work today extends far beyond Linux, fostering innovation at every layer of the software stack.
- The Linux Foundation training is for the community and by the community. Linux training is distribution-flexible, technically advanced, and created with the leaders of the Linux development community.
- There are three major distribution families within Linux: **Red Hat, SUSE** and **Debian**. In this course, we will work with representative members of all of these families throughout.