Linux

Introduction

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What is Linux?

- A free and open-source operating system
- Usually meant as "family of open-source Unix-like operating systems based on the Linux kernel."
- Implements POSIX specification and was derived from UNIX

Linux is also the kernel's name

- The operating system was originally named GNU and developed by Richard Stallman
- Linux was the name of the kernel developed by Linux Torvalds in 1991
- Since the GNU's tolling and Linux kernel were frequently bundled together, people started to call the GNU OS "Linux

Linux trivia

Why Linux?

- Linux runs on >75.3% of public web servers

It is used on:

- Servers (DNS, Web, File server, etc)
- Workstations (As a free alternative to Windows / Mac OS)
- Supercomputers (Used on 100% supercomputers as of 2021)
- Smartphones (Android, Sailfish, Pine OS)
- Network equipment (Firewalls, switches, routers)
- Gaming consoles (Valve SteamBox)
- Televisions
- … and many more devices

Unix and Unix philosophy

UNIX is the predecessor of Linux, from which it borrows heavily.

- Unix systems are characterized by a modular design that is sometimes called the "Unix philosophy". According to this philosophy, the operating system should provide a set of simple tools, each of which performs a limited, well-defined function – "Make each program do one thing well"

Unix philosophy: documented by Douglas McIlroy in 1978:

- Write programs that do one thing and do it well.
- Write programs to work together.
- Write programs to handle text streams, because that is a universal interface.

These principles are still valid today. Most shells – and shell utilities – follow them.

Every time you'll work with the Linux shell, you'll use programs built on these principles.

What comprises a Linux distribution?

Bootloader	Kernel	Init system

Package manager

Graphics system

Applications

Linux distributions

Linux OS has multiple distributions (AKA distros)

Most of them are free and open-source

Examples:

- ArchLinux
- Debian
- Ubuntu
- CentOS
- Mint
- Gentoo
- OpenSUSE

Linux distributions (II)

There are also non-free distributions available, such as:

- Red Hat Enterprise Linux
- Oracle Linux
- SUSE Linux Enterprise Server
- Scientific Linux
- Astra Linux Special Edition

The main difference between free and paid distributions is paid support – and some paid repositories.

Linux distributions (III)

The most popular families are RedHat or Debian derived

Most popular RedHat-like distributions are:

- RHEL
- CentOS
- Oracle Linux
- Fedora

Most popular Debian-like distributions:

- Debian
- Ubuntu
- MX Linux
- Linux Mint

Homework

- Install any Linux distribution mentioned in this presentation on either a virtual machine or a physical one.

- Tip: oracle cloud (Cloud Infrastructure | Oracle) provides 2 always-free VMs.

- For a local, virtualbox installation see official documentation and Ubuntu guide (applicable to most other distros as well)

THANK YOU