INTRODUCTION TO LINUX

Advanced Programming

OUTLINE

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WHAT IS LINUX?

Just like Windows, iOS, and Mac OS, Linux is an operating system. In fact, one of the most popular platforms on the planet, Android, is powered by the Linux operating system. An operating system is software that manages all of the hardware resources associated with your desktop or laptop. To put it simply, the operating system manages the communication between your software and your hardware.

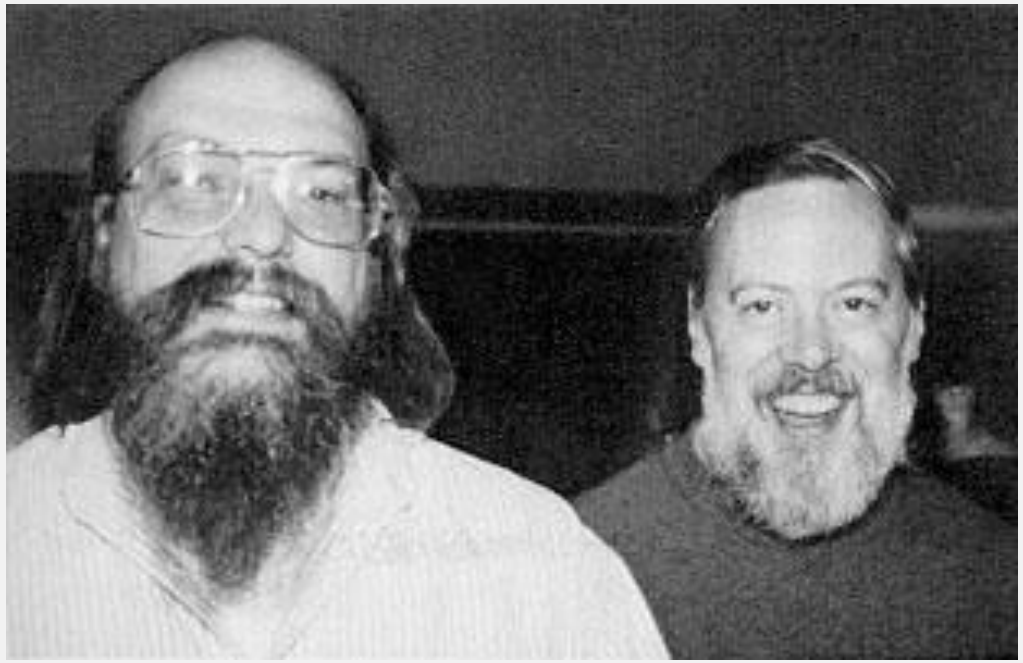
HISTORY

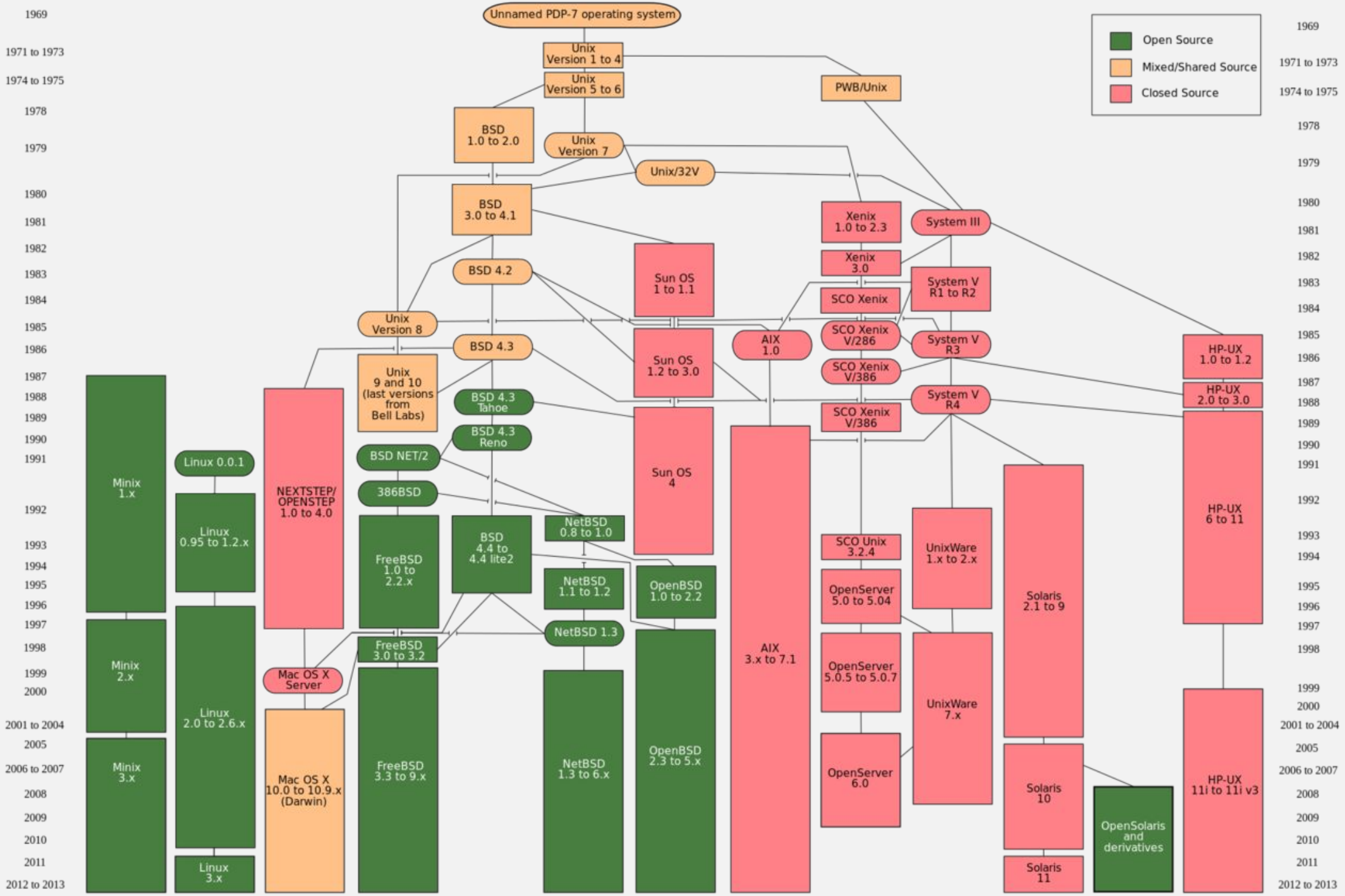
- Finnish-American software engineer who is the creator and, historically, the main developer of the Linux **kernel**, used by Linux distributions and other operating systems such as Android. He also created the distributed version control system Git.

- He created Linux because he didn't have money for UNIX. In early 1991, unhappy with MS-DOS and MINIX, Torvalds wanted to buy a UNIX system. Luckily for us, he didn't have enough money. So he decided to make his own clone of UNIX, from scratch.

UNIX

Unix is a family of multitasking, multi-user computer operating systems that derive from the original AT&T Unix, whose development started in 1969 at the Bell Labs research center by Ken Thompson, Dennis Ritchie, and others.

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1971 to 1973
1974 to 1975
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2001 to 2004
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2006 to 2007
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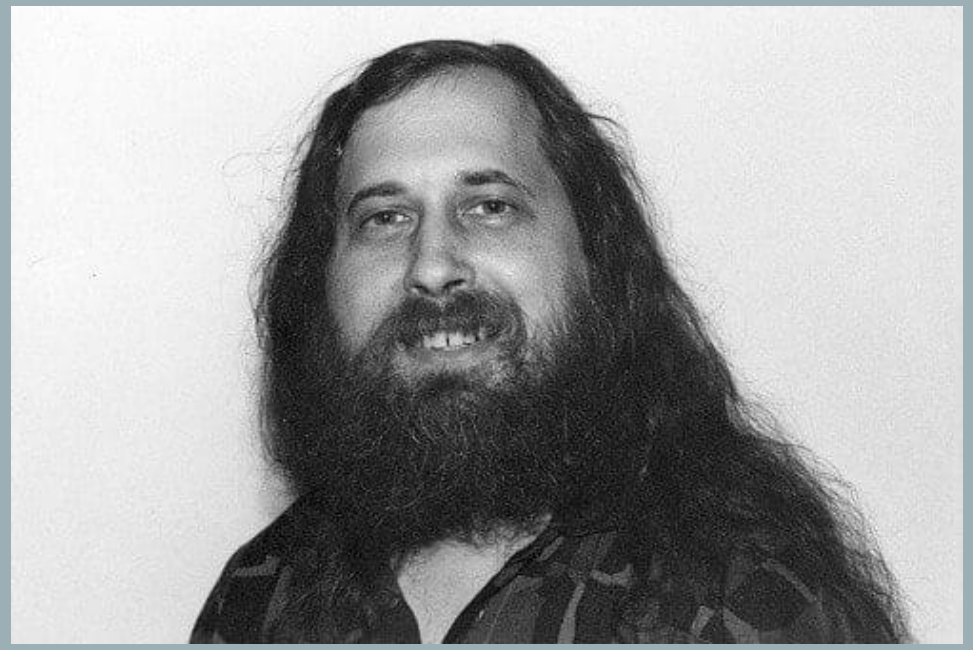
2011
2012 to 2013
Open Source
Mixed/Shared Source
Closed Source
Unnamed PDP-7 operating system
Unix Version 1 to 4
Unix Version 5 to 6
Unix Version 7
PWB/Unix
BSD 1.0 to 2.0
Unix/32V
BSD 3.0 to 4.1
BSD 4.2
BSD 4.3
Unix Version 8
Unix 9 and 10 (last versions from Bell Labs)
BSD 4.3 Tahoe
BSD 4.3 Reno
BSD NET/2
386BSD
FreeBSD 1.0 to 2.2.x
FreeBSD 3.0 to 3.2
FreeBSD 3.3 to 9.x
BSD 4.4 to 4.4 lite2
NetBSD 0.8 to 1.0
NetBSD 1.1 to 1.2
NetBSD 1.3
NetBSD 1.3 to 6.x
OpenBSD 1.0 to 2.2
OpenBSD 2.3 to 5.x
Sun OS 1 to 1.1
Sun OS 1.2 to 3.0
Sun OS 4
AIX 1.0
AIX 3.x to 7.1
Xenix 1.0 to 2.3
Xenix 3.0
SCO Xenix
SCO Xenix V/286
SCO Xenix V/386
SCO Xenix V/386
SCO Unix 3.2.4
OpenServer 5.0 to 5.04
OpenServer 5.0.5 to 5.0.7
OpenServer 6.0
System III
System V R1 to R2
System V R3
System V R4
UnixWare 1.x to 2.x
UnixWare 7.x
Solaris 2.1 to 9
Solaris 10
Solaris 11
OpenSolaris and derivatives
HP-UX 1.0 to 1.2
HP-UX 2.0 to 3.0
HP-UX 6 to 11
HP-UX 11i to 11i v3
Minix 1.x
Minix 2.x
Minix 3.x
Linux 0.0.1
Linux 0.95 to 1.2.x
Linux 2.0 to 2.6.x
Linux 3.x
NEXTSTEP/ OPENSTEP 1.0 to 4.0
Mac OS X Server
Mac OS X 10.0 to 10.9.x (Darwin)

GNU/LINUX



The distinction between the term "Linux" and "GNU/Linux" arises from the role of GNU in creating many of the system's components.

GNU provides several essential components that are widely used in Linux systems. These include:

- GNU Compiler Collection (GCC)
- GNU C Library (glibc)
- GNU Core Utilities (coreutils)
- Bash Shell

TERMINOLOGY

- **Distribution**: A Linux distribution, often shortened to "Linux distro," is a complete operating system that includes the Linux kernel along with various software components, such as system libraries, utilities, application software, and a package management system.
- **Shell**: A shell is a software program that acts as an interface between the user and the operating system (OS).
- **Desktop Environment:** A desktop environment (DE) is a collection of software that provides a graphical user interface (GUI) for interacting with an operating system.

WHY LEARN LINUX?

- Almost 55% of servers on the internet running Linux
- Learn to learn. Search your problems
- Understanding operating systems at a lower level
- Your career as a software engineer.

DUAL BOOT

- **What Is Dual Booting?** In general, one PC has only one OS. However, through the dual-boot method, you can install more than one operating systems on the PC.
- **How does dual boot work?** When dual systems are installed, the two systems are installed in different partitions, and the system installed later will not overwrite the previous system. Each individual system has its own partition format, which will not cause conflicts.

VIRTUAL MACHINE

- **What Is a Virtual Machine?** A virtual machine (VM) is the virtualization/emulation of a computer system. Most people will use VM software to create and manage multiple VMs on their local PCs
- **How do virtual machines work?** When you create VMs, you should install the VM software first. And then, you can use the VM software to create VMs. The VM you created will be stored as files. You don't need to create a new partition for the VM. You install operating systems on the VMs and run these systems via the VM software. In general, the VM software allows you to run multiple systems at the same time. And the OS switch is very easy
- **Famous VM softwares**: VirtualBox, VMWare

WSL

- **What is WSL**? Windows Subsystem for Linux (WSL) is a feature of the Windows operating system that allows users to run a Linux environment directly on Windows without needing a separate virtual machine or dual booting. It enables the execution of native Linux binaries, including command-line tools and GUI applications, alongside traditional Windows desktop apps.
- **How Does WSL Work?** WSL operates by integrating a compatibility layer into the Windows kernel that supports running ELF64 binaries—Linux executables. This integration allows Linux commands and tools to be executed natively within Windows.

COMMANDS

- man
- ls
- cd
- pwd
- cp
- mv
- rm
- sudo
- cat
- echo
- grep
- pipe (|)
- chmod
- apt
- alias

RESOURCES

- https://t.me/LinuxTerminalCommands
- https://ap-ece-ut.github.io/docs/tutorials/linux/intro
- https://askubuntu.com/
- Google it!

Q/A