Unix and Linux

What is an operating system?

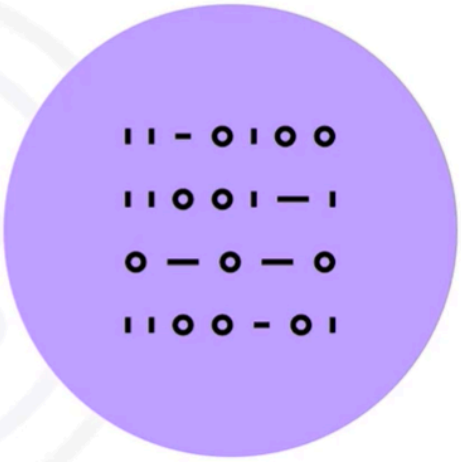
An operating system, or OS, is software that:

- Manages hardware and resources
- Allows interaction with hardware

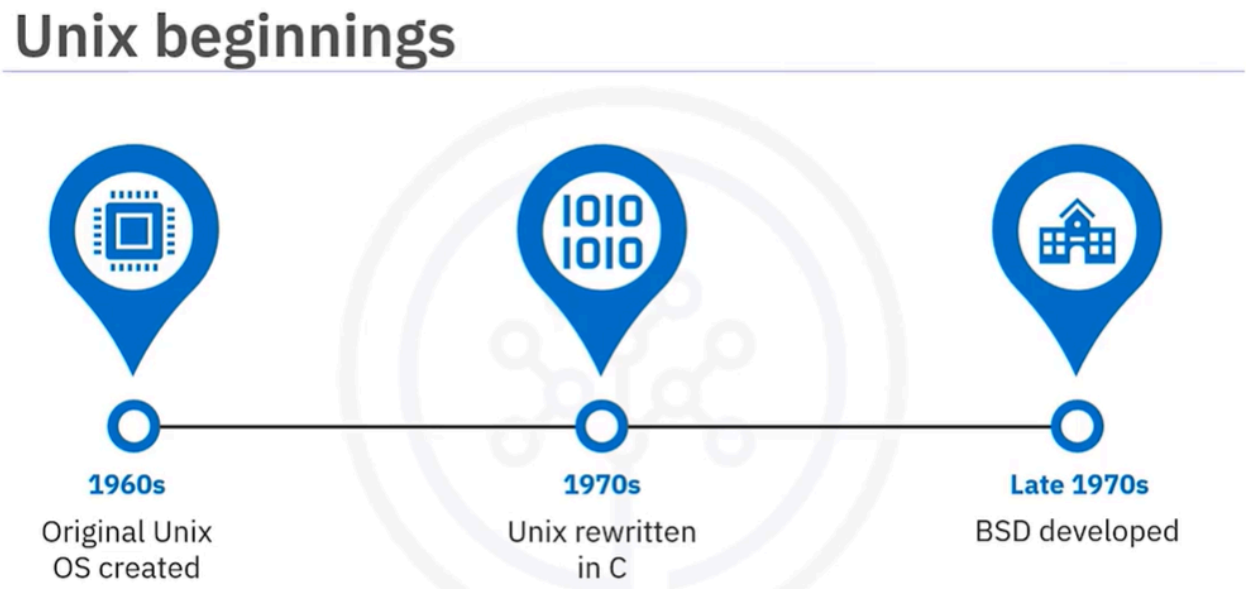
- What is an operating system? Well, it's software that manages computer hardware and resources And allows interaction with hardware to perform useful tasks.

What is Unix?

- Unix is a family of operating systems
- Popular Unix-based OSs include:
  - Oracle Solaris (and Open Solaris)
  - FreeBSD
  - HP-UX
  - IBM AIX
  - Apple macOS



- what is Unix? It's actually a family of operating systems Some popular Unix-based operating systems include Oracle Solaris and OpenSolaris FreeBSD, HPUX, IBM AIX, and Apple MacOS Which is one of the most popular desktop operating systems today.



- In the 1960s, the original Unix OS was created at AT&T Bell Labs However, like many operating systems at the time It was made for a specific hardware system In this case, the PDP-7 computer In the 1970s, the Unix OS was rewritten in C Distinguishing itself from other systems And making it portable to many hardware architectures And then, in the late 1970s UC Berkeley developed Berkeley Software Distribution, or BSD An add-on to Unix providing additional software and capabilities The famous Mac OS was later derived from BSD.

What is Linux?

- Family of Unix-like OSs
  - Usually specific distribution
- Originally developed as an effort to create a free, open-source Unix OS

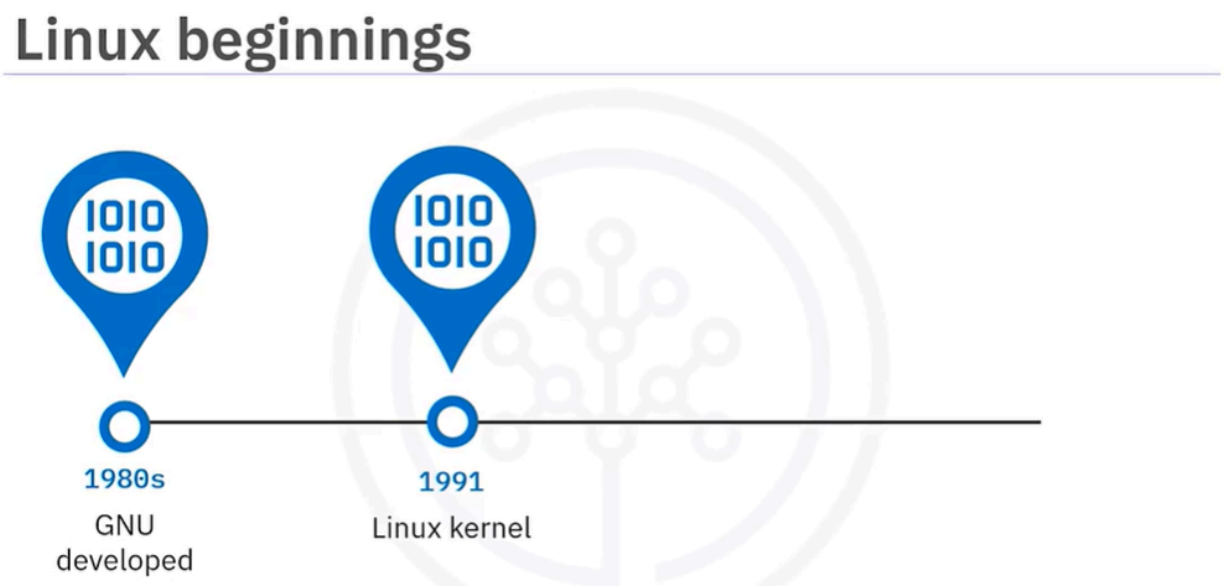
- what is Linux? Linux is a family of Unix-like operating systems However, when referring to Linux People are usually talking about a specific distribution or flavor Linux was developed as an effort to create a free, open-source version of the Unix OS.

Linux features

- Free and open source
- Secure
- Multi-user
- Multitasking
- Portability

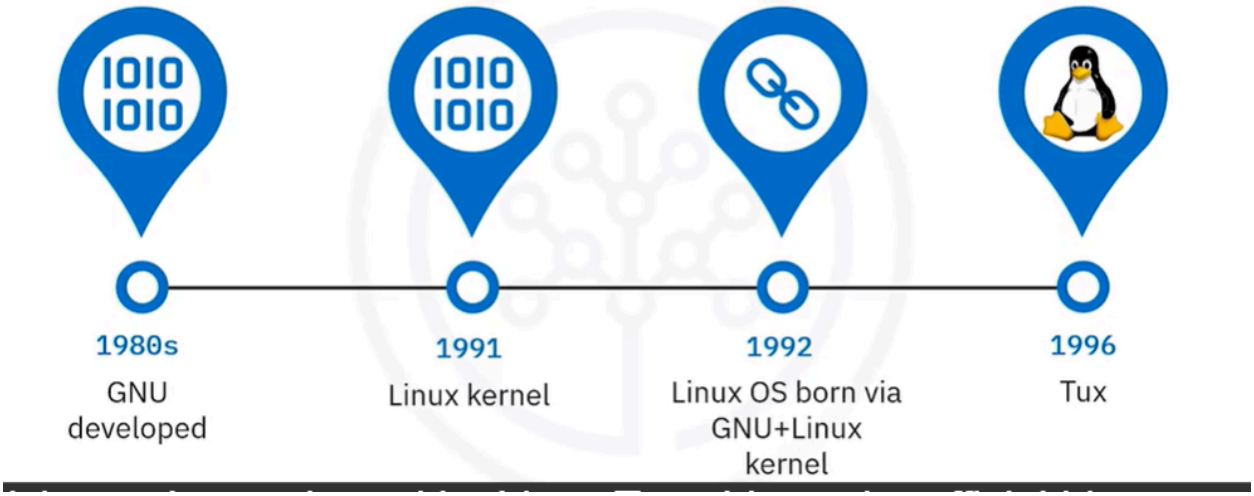
From desktops, to servers, to appliances

- Key Linux features include the following Linux is free and open-source Which means anyone can view the source code And with so many eyes on the source code Linux has become the most secure OS over the years It's multi-user Linux is designed to support multiple users accessing the system simultaneously It also supports multitasking Running multiple jobs and applications at the same time And, it's portable Linux has been ported to run on many different types of devices and hardware platforms From desktops, to servers, to appliances.



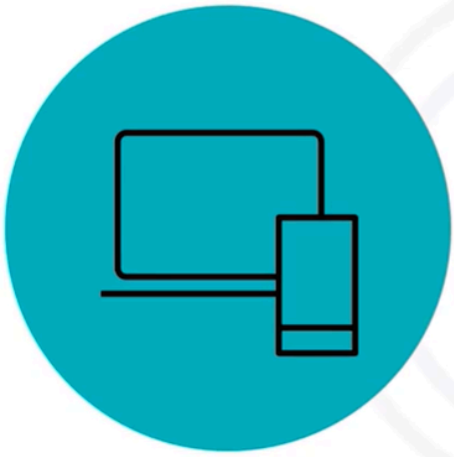
- How did Linux start? In the 1980s, GNU was developed at MIT GNU stands for GNU's Not Unix And was made as a free, open-source set of the existing Unix system tools And in 1991, Linus Torvalds developed a free, open-source version of the Unix kernel called Linux The kernel is the core component of an OS That enables components to communicate with the machine's hardware.

Linux beginnings



- Soon after, in 1992, the potential of unifying GNU and the Linux kernel was realized As popular Linux operating systems began to appear And in 1996, a computer scientist named Larry Ewing created Tux, the penguin Which was later adopted by Linus Torvalds as the official Linux mascot.

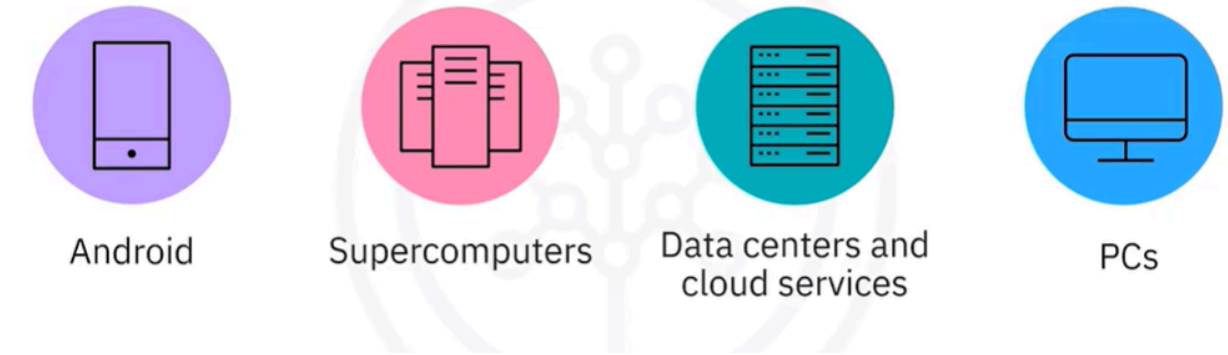
Today



- BSD-based macOS runs on millions of devices
- Billions of Linux instances run on servers, serving the modern web
- Modern Linux OSs are gaining popularity for PCs

- Today, the BSD-based Mac OS runs on millions of devices across the world Billions of Linux instances run on servers, serving us the modern web And especially among developers, modern Linux operating systems, such as Ubuntu Are beginning to gain popularity in the PC space.

Linux use cases today



- Okay, well what are the most common use cases for Linux today? First, it's used in billions of smartphones around the world Via the Android operating system, which uses a Linux-based kernel Linux is also widely used in supercomputers Where many Linux-powered servers are clustered together For high-performance computing applications Enterprise and cloud data centers also use Linux over millions of servers Running all kinds of applications, web servers, databases, and so on And finally, versions of Linux can easily be used as your PC's operating system Many people install Linux today as a learning experience or as their daily driver.

Recap

In this video, you learned that:

- Unix is a family of operating systems dating from the 1960s
- Linux was originally developed in the 1991 as a free, open source alternative to Unix
- Linux is multi-user, portable, and supports multitasking
- Linux is widely used today in mobile devices, supercomputers, data centers, and cloud servers

What is kernel?

The **kernel** is a crucial part of an operating system (OS). Here's a simple breakdown:

- **Core Component**: The kernel is the core part of the OS that manages communication between the hardware (like the CPU, memory, and devices) and the software (like applications).
- **Resource Management**: It controls how resources are allocated, ensuring that different programs can run smoothly without interfering with each other.
- **Communication**: The kernel allows software applications to communicate with the hardware. For example, when you open a file or print a document, the kernel helps the software talk to the printer or hard drive.

In summary, the kernel acts like a bridge between the hardware and software, making sure everything works together efficiently.