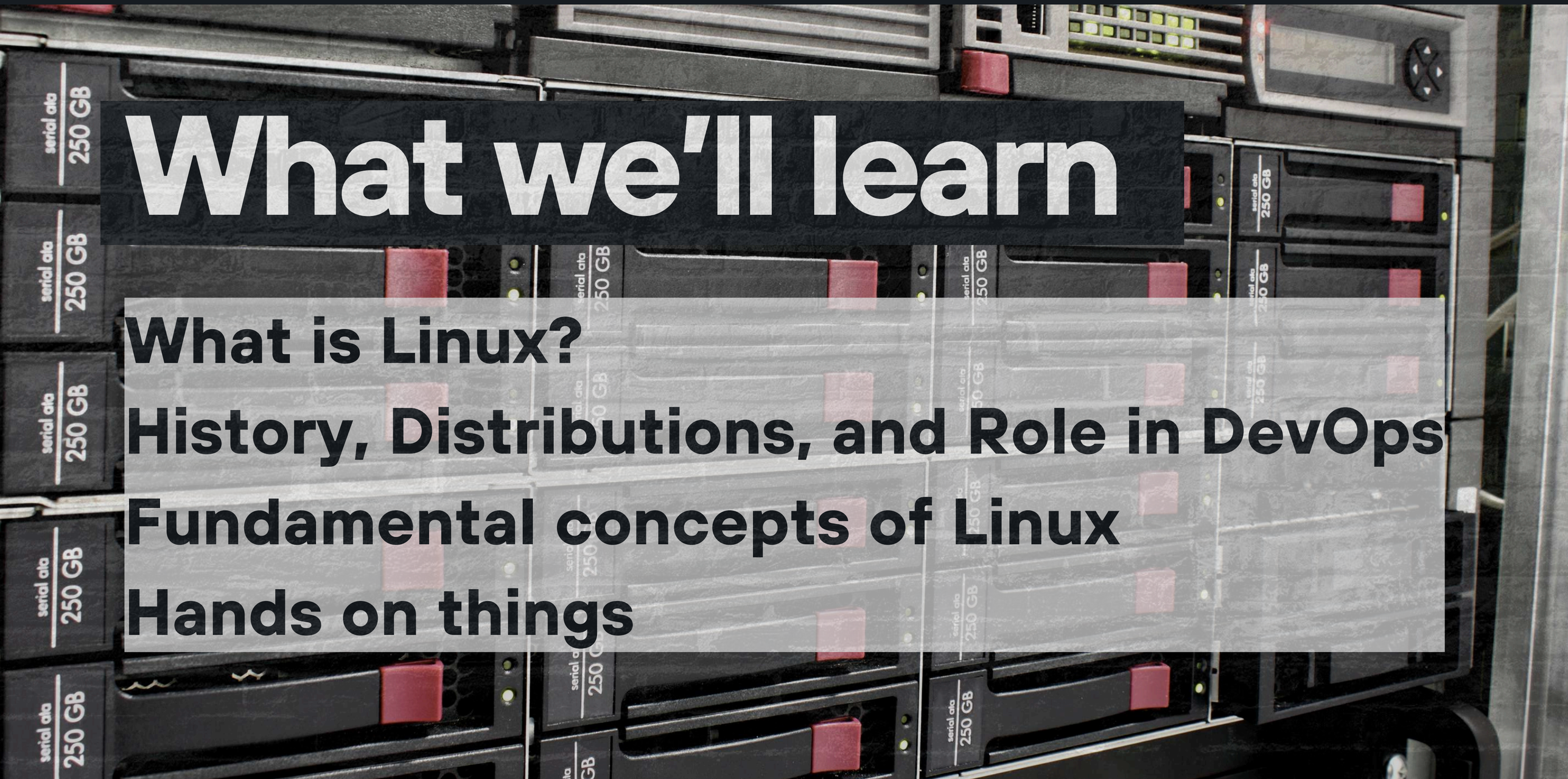
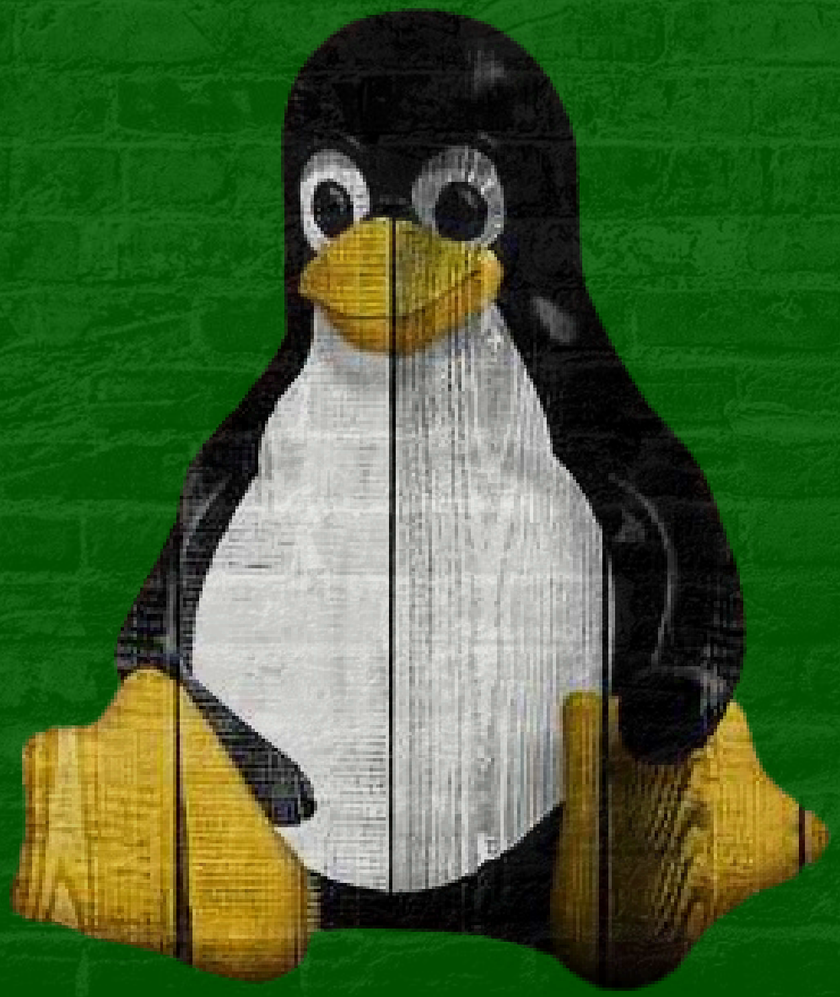
Club Informatique
& Télécom



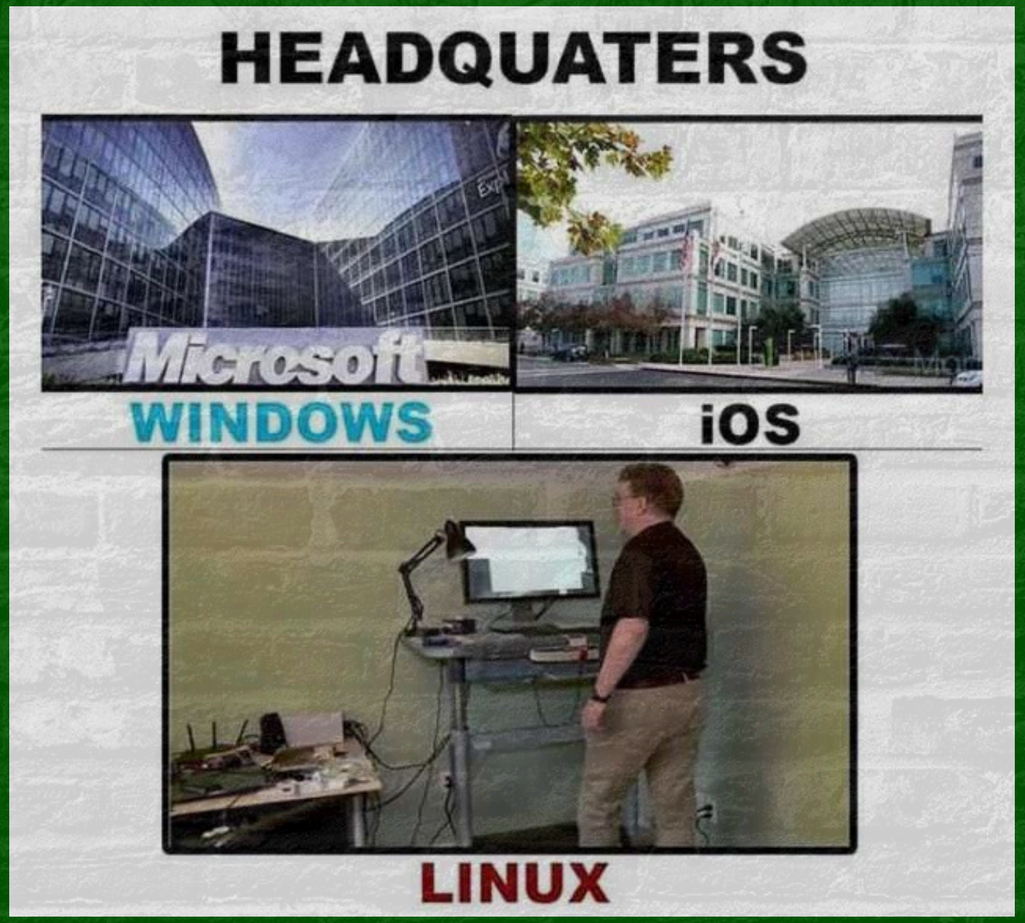
What we'll learn

- What is Linux?
- History, Distributions, and Role in DevOps
- Fundamental concepts of Linux
- Hands on things



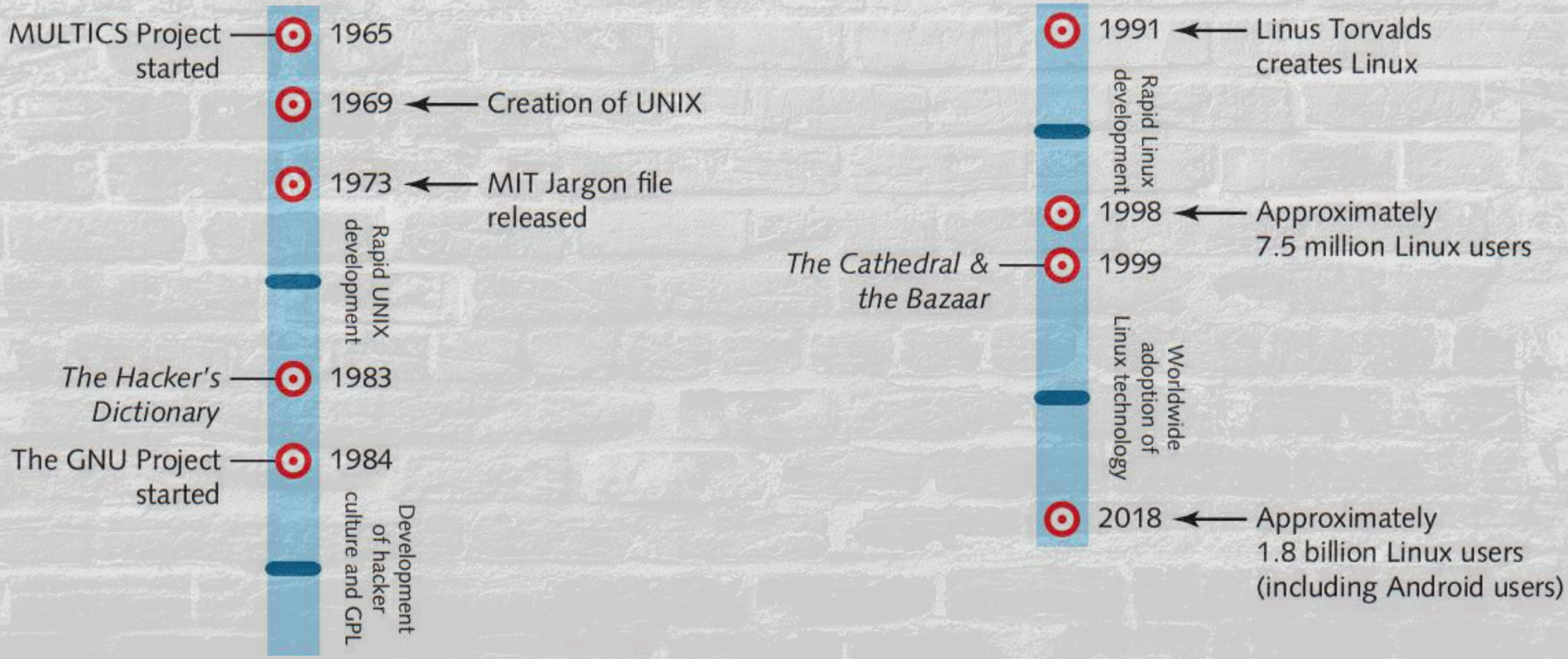
What is Linux ?

Linux is an open-source operating system modeled after UNIX, first released in 1991 by Linus Torvalds. It has since evolved through contributions from developers worldwide.



> *Linux isn't about fancy headquarters or polished environments; it's about the freedom to build, customize, and make things work on your own terms—often in the most unconventional ways.*

Linux تاريخ


MULTICS Project started
1965
1969
Creation of UNIX
1973
MIT Jargon file released
Rapid UNIX development
The Hacker's Dictionary
1983
The GNU Project started
1984
Development of hacker culture and GPL
1991
Linus Torvalds creates Linux
Rapid Linux development
1998
Approximately 7.5 million Linux users
The Cathedral & the Bazaar
1999
Worldwide adoption of Linux technology
2018
Approximately 1.8 billion Linux users (including Android users)

What is a “distribution?”

Distribution = kernel + specific packages and software

علاش Linux مهم؟

By looking at the freshest 2024 Linux statistics, we find that 96.3% of the top 1,000,000 web servers use Linux. Linux is also the OS of all supercomputers. There are no Windows supercomputers.

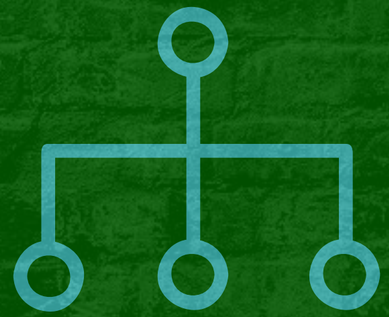
شنو علاقتو بال DevOps؟

- 90% of cloud servers run on Linux (AWS, Azure, Google Cloud).
- Containers and tools like Docker & Kubernetes are built for Linux first.
- Linux offers control, stability, and scalability for production environments.

Unix like systems' characteristics

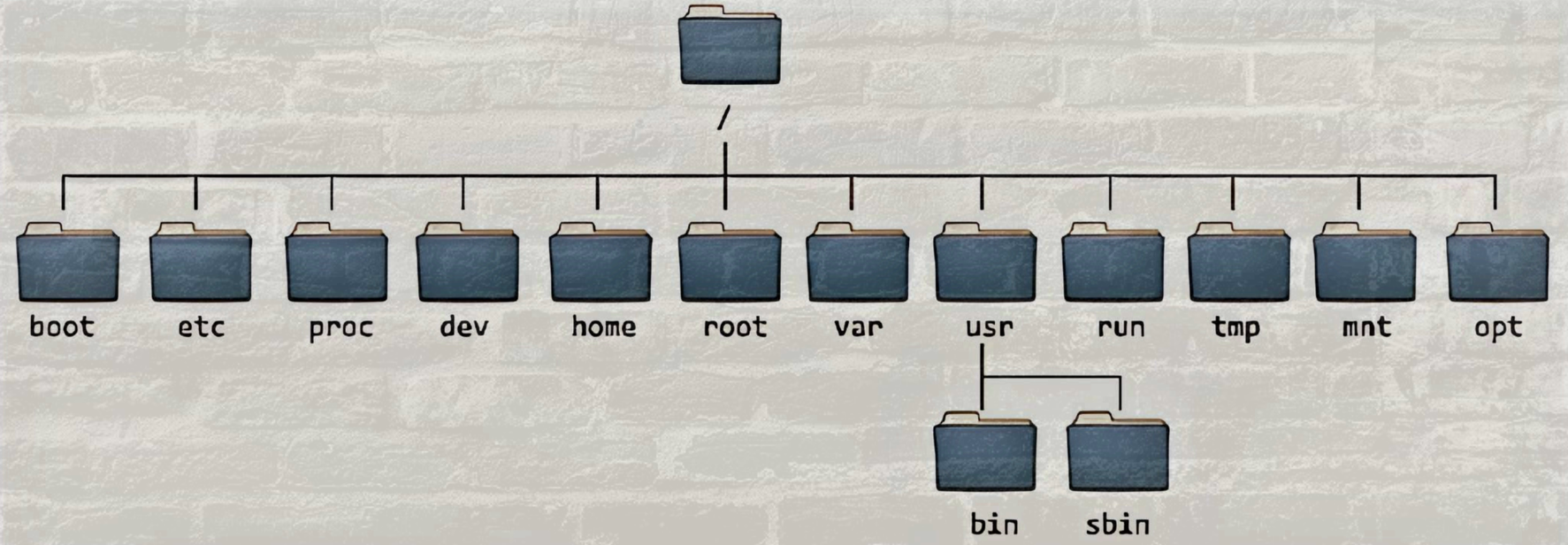
Multi-user support: Unix-like operating systems allow multiple users to operate simultaneously.

"Everything is a file" principle: System devices and resources are treated as files.

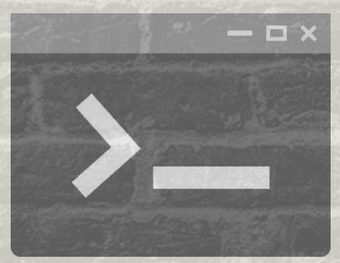


Hierarchical file system: A structured, tree-like organization of files and directories.

Important Directories



Interaction with Linux



Command line : provides greater control and efficiency but may be less user-friendly and accessible.

Graphical interface : is more intuitive and user-friendly but may be less efficient and have less control over the system.

Different commands

Navigating the File System

cd [directory]	Change directory
pwd	Print working directory
ls [options] [directory]	List directory contents
mkdir [directory]	Create a new directory
rmdir [directory]	Remove a directory
cp [source] [destination]	Copy files or directories
mv [source] [destination]	Move or rename files or directories
rm [options] [file]	Remove files or directories
touch [file]	Create an empty file

Process Management

ps [options]	Display information about active processes
kill [process_ID]	Terminate a process
top	Display and manage the top processes
bg [job_ID]	Move a job to the background
fg [job_ID]	Bring a background job to the foreground

Archiving and Compression

tar [options] [files/directories]	Create or extract tar archives
gzip [file]	Compress a file
gunzip [file.gz]	Decompress a gzipped file
zip [archive.zip] [files/directories]	Create a zip archive
unzip [archive.zip]	Extract files from a zip archive

File Manipulation

cat [file]	Output the contents of a file
head [options] [file]	Output the first lines of a file
tail [options] [file]	Output the last lines of a file
less [file]	View the contents of a file interactively
grep [pattern] [file]	Search for a pattern in a file
wc [options] [file]	Count the number of lines, words, or characters in a file

Permissions

chmod [permissions] [file]	Change the permissions of a file or directory
chown [user:group] [file]	Change the owner and group of a file or directory
chgrp [group] [file]	Change the group of a file or directory
umask [mask]	Set the default file permissions for newly created files

Processes in Linux

- Processes are essential in Linux for multitasking, resource management, and system stability.
- Every process is spawned by a parent, except for init (or systemd), which is the root of the process tree.
- Created using system calls like fork() (creates a child process) or exec() (replaces the current process with a new program).

System Processes

User Processes

Generated automatically by the kernel. They ensure the operating system run smoothly.
Example : systemd.

Created by a user. They handle tasks initiated by users.
Example : web browser.

Processes management

Process management in Linux refers to the system's ability to create, schedule, monitor, and terminate processes efficiently. It ensures that resources like CPU, memory, and I/O are allocated fairly among active processes while maintaining system stability.

Processes management

In cloud environments, where scalability and performance are paramount, effective process management enables resource optimization, high availability, and seamless scaling of applications.

Process management is essential in DevOps for automating tasks, managing containers, and optimizing resources. It ensures efficient application delivery, scalability, and reliability in cloud environments.

jgari@RazerBladeJGG: ~

```
37 packages can be updated.
17 updates are security updates.
jgari@RazerBladeJGG:~$ screenfetch
[[ ! ]] awk: fatal: cannot open file `/sys/devices/system/cpu/cpu0/cpufreq/scaling_max_freq' for reading (Permission den
ied)
                          ./+o+-       jgari@RazerBladeJGG
                  yyyyy- -yyyyyy+      OS: Ubuntu 16.04 xenial
               ://+//////-yyyyyyo      Kernel: x86_64 Linux 4.4.0-43-Microsoft
           .++ .:/++++++/-.+sss/`       Uptime: 0m
         .:++o:  /++++++++/:--:/-       Packages: 625
        o:+o+:++.`..```.-/oo+++++/      Shell: bash 4.3.48
       .:+o:+o/.          `+sssoo+/     CPU: Intel Core i7-6700HQ CPU
  .++/+:+oo+o:`             /sssooo.    RAM: 7922MiB / 16276MiB
 /+++//+:`oo+o               /::--:.
 \+/+o+++`o++o                ++////.
  .++.o+++oo+:`              /dddhhh.
       .+.o+oo:.            `oddhhhh+
        \+.++o+o``-````  .:ohdhhhhh+
         `:o+++ `ohhhhhhhhyo++os:
           .o:`.syhhhhhhh/.oo++o`
jgari@Razer
```

Hands on things