



LINUXDIARY 4.0

Explore the Linux Realm

LIMITED SEATS

19

August

COMPETITIVE WARGAMES

20

EXCITING PRIZES

REGISTER AT



- ▶ Session 01:
Open Source 101
- ▶ Session 02:
Echo Linux

- ▶ Session 03:
The File Maze
- ▶ Session 04:
NetVerse

• CONNECT WITH US •



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Rs 199/-

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LinuxDiary 4.0

2023



Summarizing

Introduction to Linux

What is software and its types

Working of Linux kernel

Applications of Linux

Linux Distributions



Day 1 | Session 2

Echo Linux



Basic Linux Commands

Booting Processes

Text Editors

Process Management

Pipelining in Linux

What is Command? ? ?



CLI & GUI

```
[root@localhost ~]# ping -q fa.wikipedia.org
PING text.pmtpa.wikimedia.org (208.80.152.2) 56(84) bytes of data.
^C
--- text.pmtpa.wikimedia.org ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 540.528/540.528/540.528/0.000 ms
[root@localhost ~]# pwd
/root
[root@localhost ~]# cd /var
[root@localhost var]# ls -la
total 72
drwxr-xr-x. 18 root root 4096 Jul 30 22:43 .
drwxr-xr-x. 23 root root 4096 Sep 14 20:42 ..
drwxr-xr-x. 2 root root 4096 May 14 00:15 account
drwxr-xr-x. 11 root root 4096 Jul 31 22:26 cache
drwxr-xr-x. 3 root root 4096 May 18 16:03 db
drwxr-xr-x. 3 root root 4096 May 18 16:03 empty
drwxr-xr-x. 2 root root 4096 May 18 16:03 games
drwxrwx-T. 2 root gdm 4096 Jun 2 18:39 gdm
drwxr-xr-x. 38 root root 4096 May 18 16:03 lib
drwxr-xr-x. 2 root root 4096 May 18 16:03 local
lrwxrwxrwx. 1 root root 11 May 14 00:12 lock -> ../run/lock
drwxr-xr-x. 14 root root 4096 Sep 14 20:42 log
lrwxrwxrwx. 1 root root 10 Jul 30 22:43 mail -> spool/mail
drwxr-xr-x. 2 root root 4096 May 18 16:03 nis
drwxr-xr-x. 2 root root 4096 May 18 16:03 opt
drwxr-xr-x. 2 root root 4096 May 18 16:03 preserve
drwxr-xr-x. 2 root root 4096 Jul 1 22:11 report
lrwxrwxrwx. 1 root root 6 May 14 00:12 run -> ../run
drwxr-xr-x. 14 root root 4096 May 18 16:03 spool
drwxrwxrwt. 4 root root 4096 Sep 12 23:50 tmp
drwxr-xr-x. 2 root root 4096 May 18 16:03 yp
[root@localhost var]# yum search wiki
Loaded plugins: langpacks, presto, refresh-packagekit, remove-with-leaves
rpmpfusion-free-updates | 2.7 kB 00:00
rpmpfusion-free-updates/primary_db | 206 kB 00:04
rpmpfusion-nonfree-updates | 2.7 kB 00:00
updates/metalink | 5.9 kB 00:00
updates | 4.7 kB 00:00
updates/primary_db 73% [=====] 62 kB/s | 2.6 MB 00:15 ETA
```



Which is Better?



Terminal



Basic Commands In Linux



Commands	Description	Flags
pwd	print working directory	--
ls	list the contents of a current directory	-l, -a
cd	change directory	--

Commands	Description	Flags
mkdir	to make a directory	--
rmdir	to delete an empty directory	-v
mv	to move a directory, file	--help

Commands	Description	Flags
touch	to create, change and modify timestamps of a file	-m
cat	to create, display, concatenate files	-e, -n

Commands	Description	Flags
tar	creates tar files	-cf, -xvf
gzip	compress file	-v
gunzip	replace the compressed file with the original file (extract)	--

Commands	Description	Flags
history	view previously used commands	--
man	display the user manual of any command	--

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What is booting?

× × × ×

BOOTING

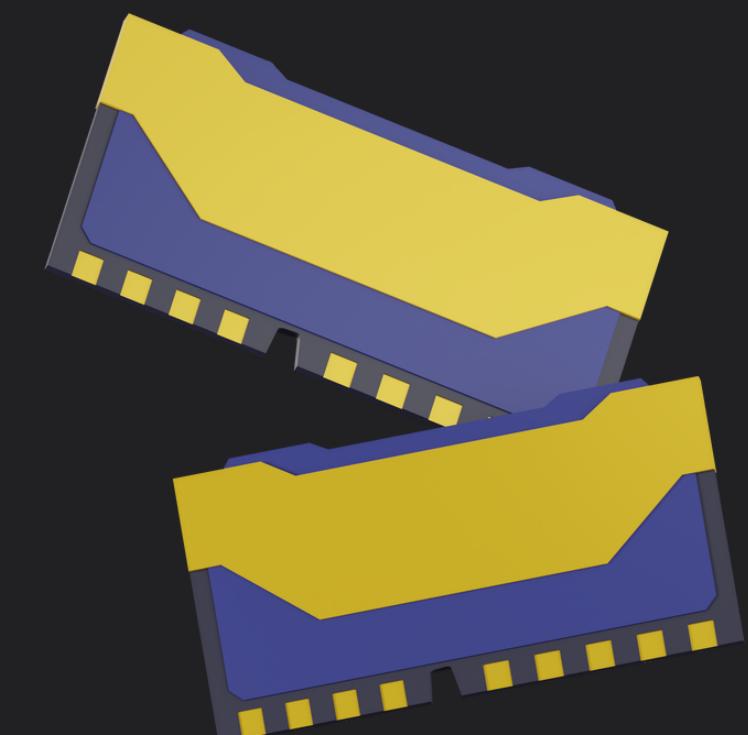
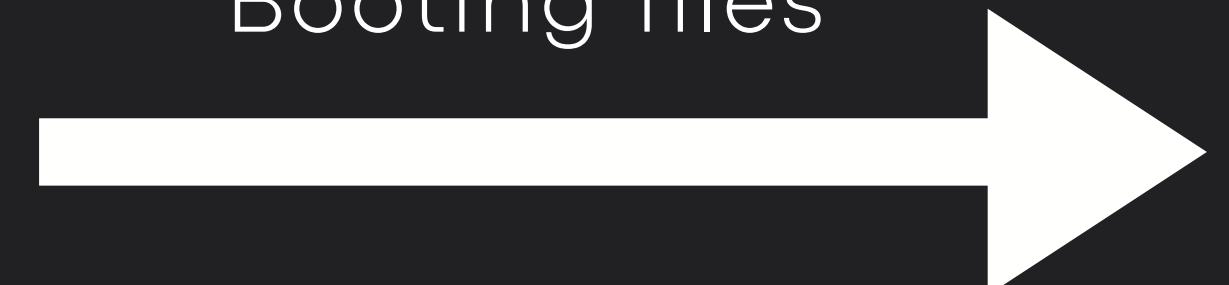


Boot process

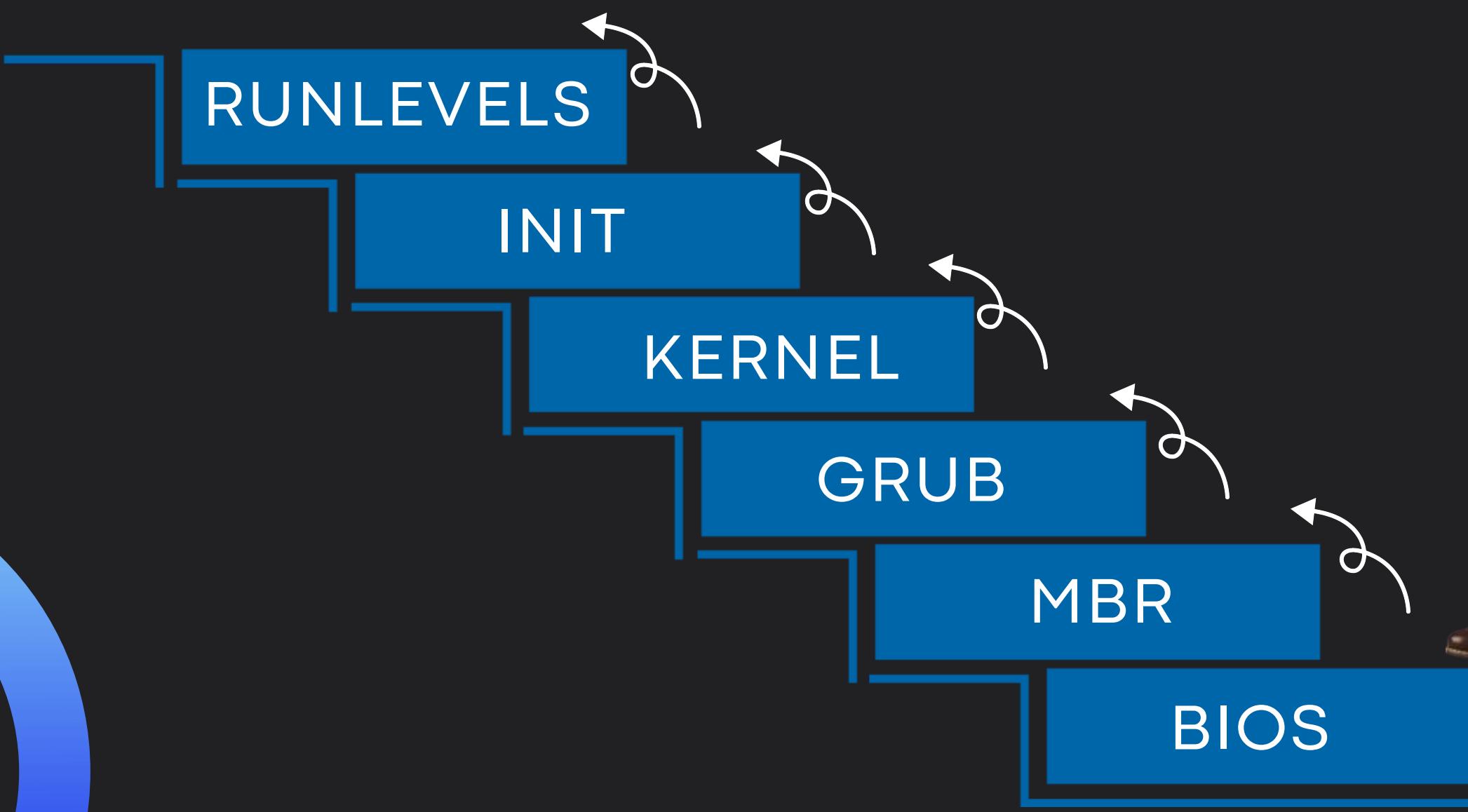
Loading the operating system from a bootable device
(HDD/SSD/Pendrives) into the main memory (RAM)



Booting files

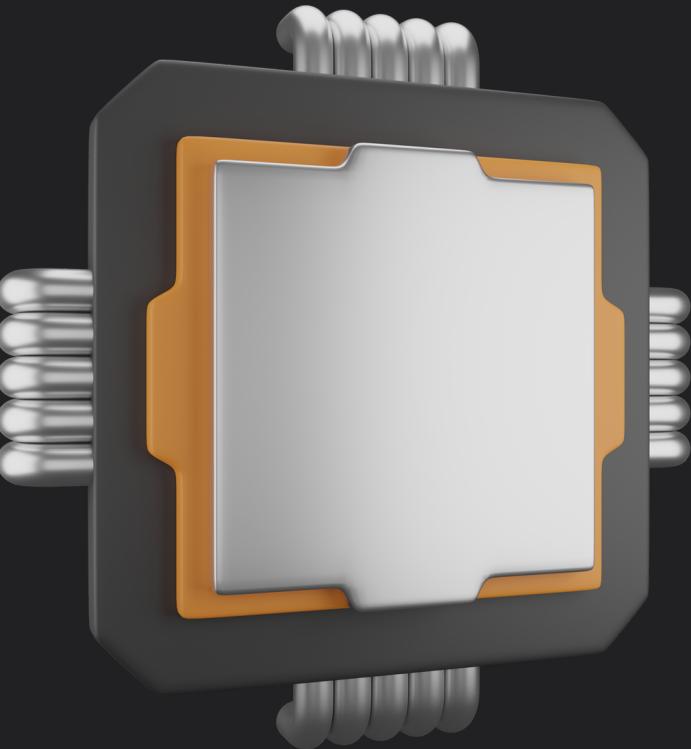


6 stages of booting



01. BIOS

- Basic Input Output System
- Performs the POST(Power-on-self-Test)
- Checks for a bootable device
- Searches for a bootloader and passes control to it



BIOS:

PhoenixBIOS Setup Utility

Main Advanced Security Boot Exit

CD-ROM Drive +Removable Devices +Hard Drive Network boot from Intel E1000e	Item Specific Help Keys used to view or configure devices: <Enter> expands or collapses devices with a + or - <Ctrl+Enter> expands all <+> and <-> moves the device up or down. <n> May move removable device between Hard Disk or Removable Disk <d> Remove a device that is not installed.
---	--

F1 Help $\uparrow\downarrow$ Select Item $-/+$ Change Values F9 Setup Defaults
Esc Exit \leftrightarrow Select Menu Enter Select ► Sub-Menu F10 Save and Exit

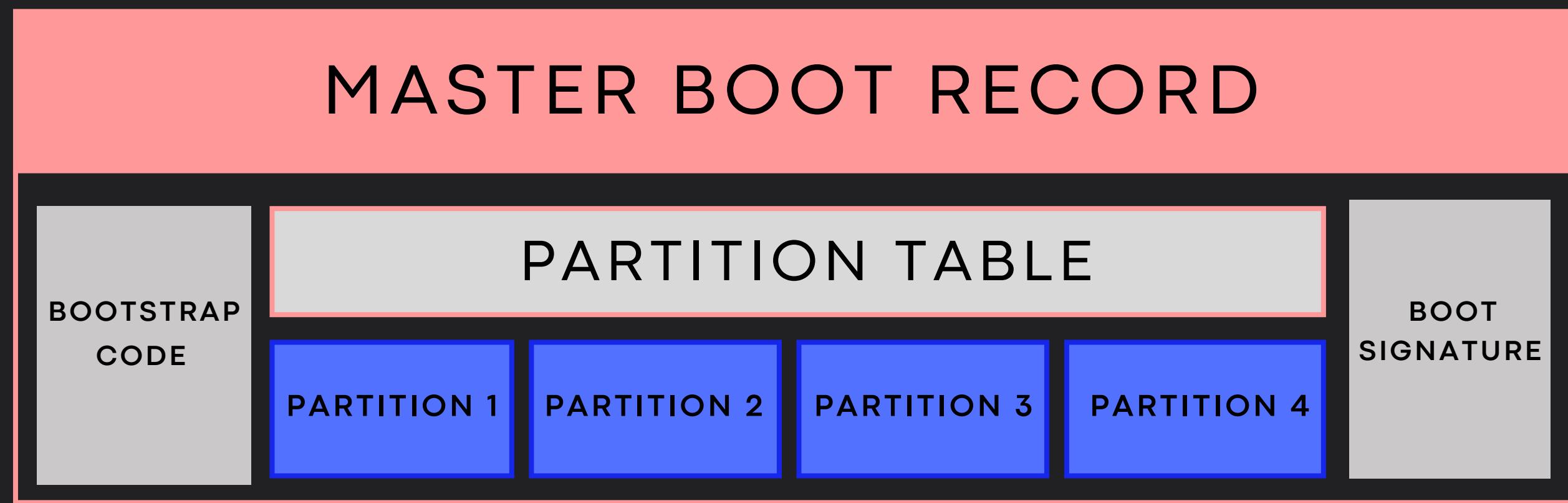


02. MBR

- Stands for Master Boot Record
- First sector of the bootable device with size of 512 bytes
- Main function: Load the bootloader into memory and pass control to it

MBR





03. GRUB

- Grand Unified Bootloader
- Displays available kernel images to choose from
- The grub configuration file is present at
`/boot/grub/grub.cfg`
- Function: load and execute the operating system's
kernel and initrd/intiramfs images



GRUB:

GNU GRUB version 2.02

```
Ubuntu
Advanced options for Ubuntu
Memory test (memtest86+)
Memory test (memtest86+, serial console 115200)
*elementary OS 5.0 Juno (5.0) (on /dev/sdb1)
Advanced options for elementary OS 5.0 Juno (5.0) (on /dev/sdb1)
```

Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the commands
before booting or 'c' for a command-line.

04. KERNEL

- Initrd/initramfs images load a temporary file system in the memory
- Kernel uses temporary file system to load the root file system
- Kernel loads the operating system components
- Initialization of the first process called 'init'



KERNEL



05. INIT

- Stands for Initialization
- The first process to start when the computer boots up
- Only process directly launched by Kernel
- The init configuration file is located at /etc/inittab



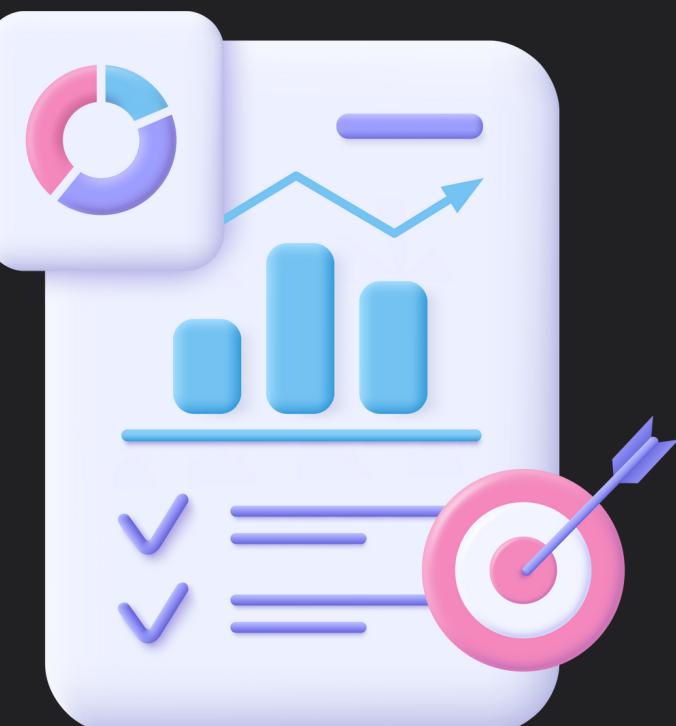
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— 06. RUNLEVELS —

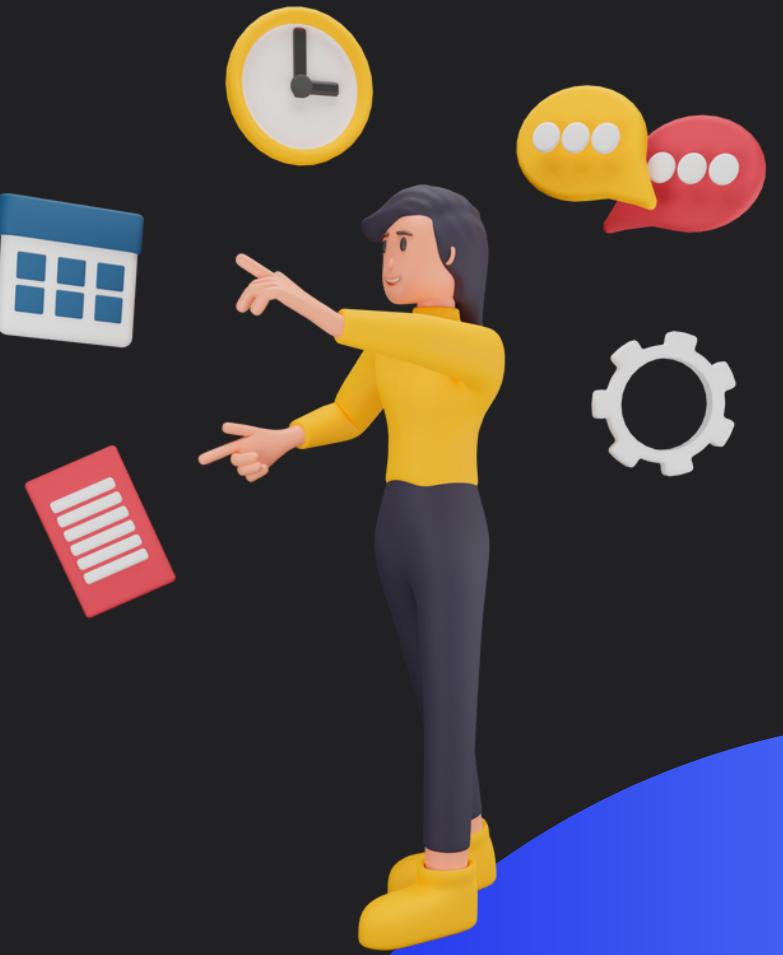
- Runlevel is a mode or state in which a Linux system operates
- Modes: single-user, multi-user, with and without network services
- Numbered from 0-6, default : 3 or 5

RUNLEVELS



Runlevel Programs

- Services starting after the computer boots up
- Runlevel programs start with letters 's' and 'k'
`s-start k-kill`
- Numbers next to s and k denote the start and kill sequence of a program
- e.g. S10Program1, S12Program2



Types of booting



Cold booting

- Starting a switched off computer
- Involves POST

Warm booting

- Restarting a computer
- Does not involves POST

Text editors

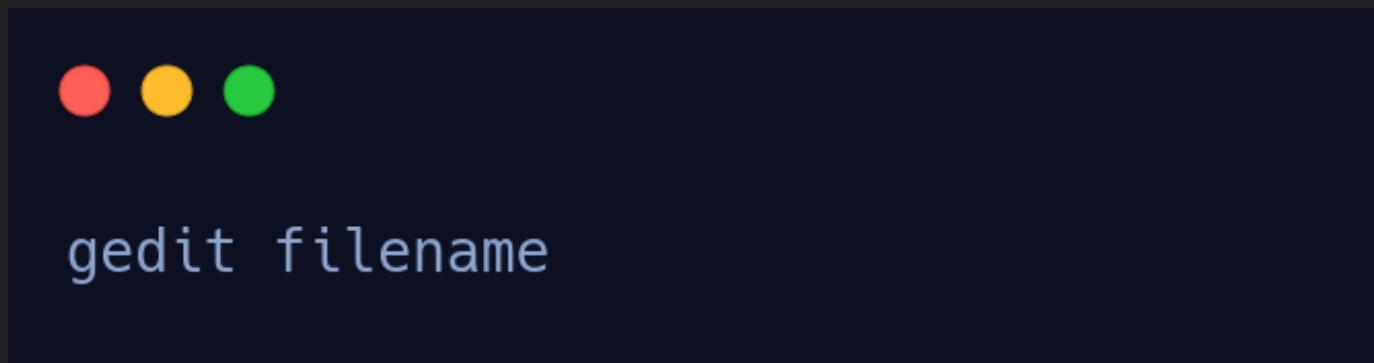
Command line:
Vi/vim, nano, pico,
and more

GUI:
gedit, Kwrite, and
more

Gedit



- Graphical text editor for GNOME desktop environment
- Clean and intuitive interface
- Supports tabbed editing and split view

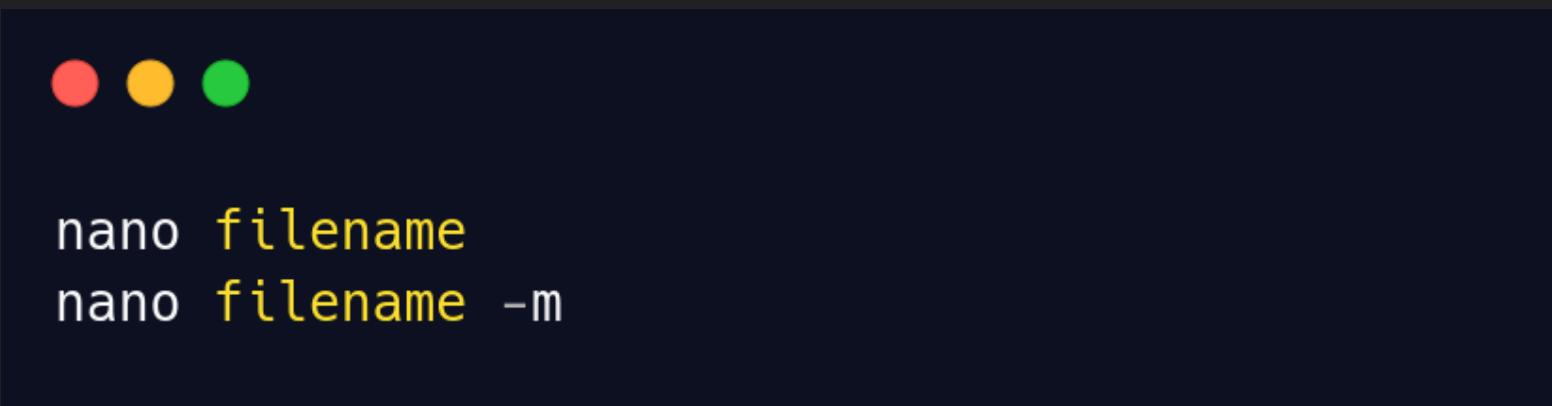


```
  :::  
.ILE88Dj. :jD88888Dj:  
.LGitE888D.f8GjjjL8888E;  
iE  :8888Et.   .G8888.  
D888,     :8888:  
D888,     :8888:  
D888,     :8888:  
D888,     :8888:  
888W,     :8888:  
W88W,     :8888:  
W88W:     :8888:  
DGGD:     :8888:  
:8888:  
:W888:  
:8888:  
E888I  
tW88D
```

ano



- Command line text editor
- Popular for its simplicity and ease of use



```
● ● ●  
nano filename  
nano filename -m
```

//////////

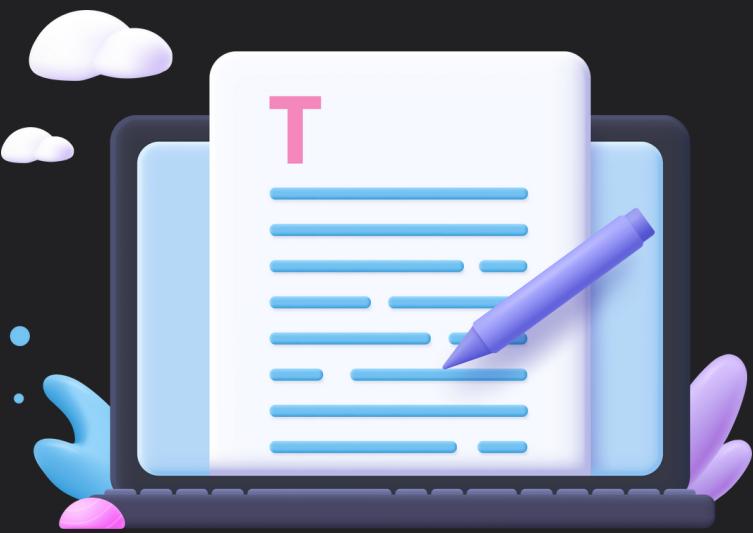
NANO

//////////

Vim

- Most powerful command line text editor
- Modes: COMMAND (default)
INSERT ('i' key)
- Some important commands:

```
● ● ●  
  
Exit without saving --> :q!  
Save and exit --> :wq
```



PROCESS MANAGEMENT IN LINUX

What is Process?



- On Linux, a process is any active (running) instance of a program.
- Processes exist in parent-child hierarchies.

/ / / / / / /

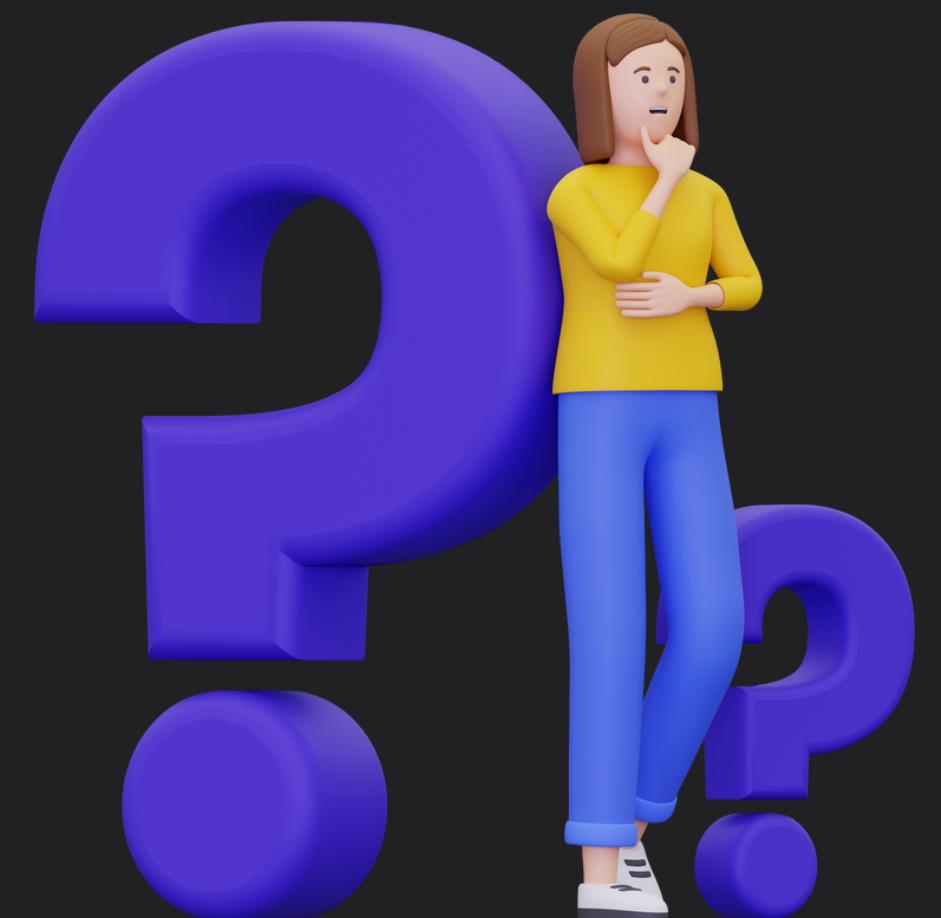
Process

PID

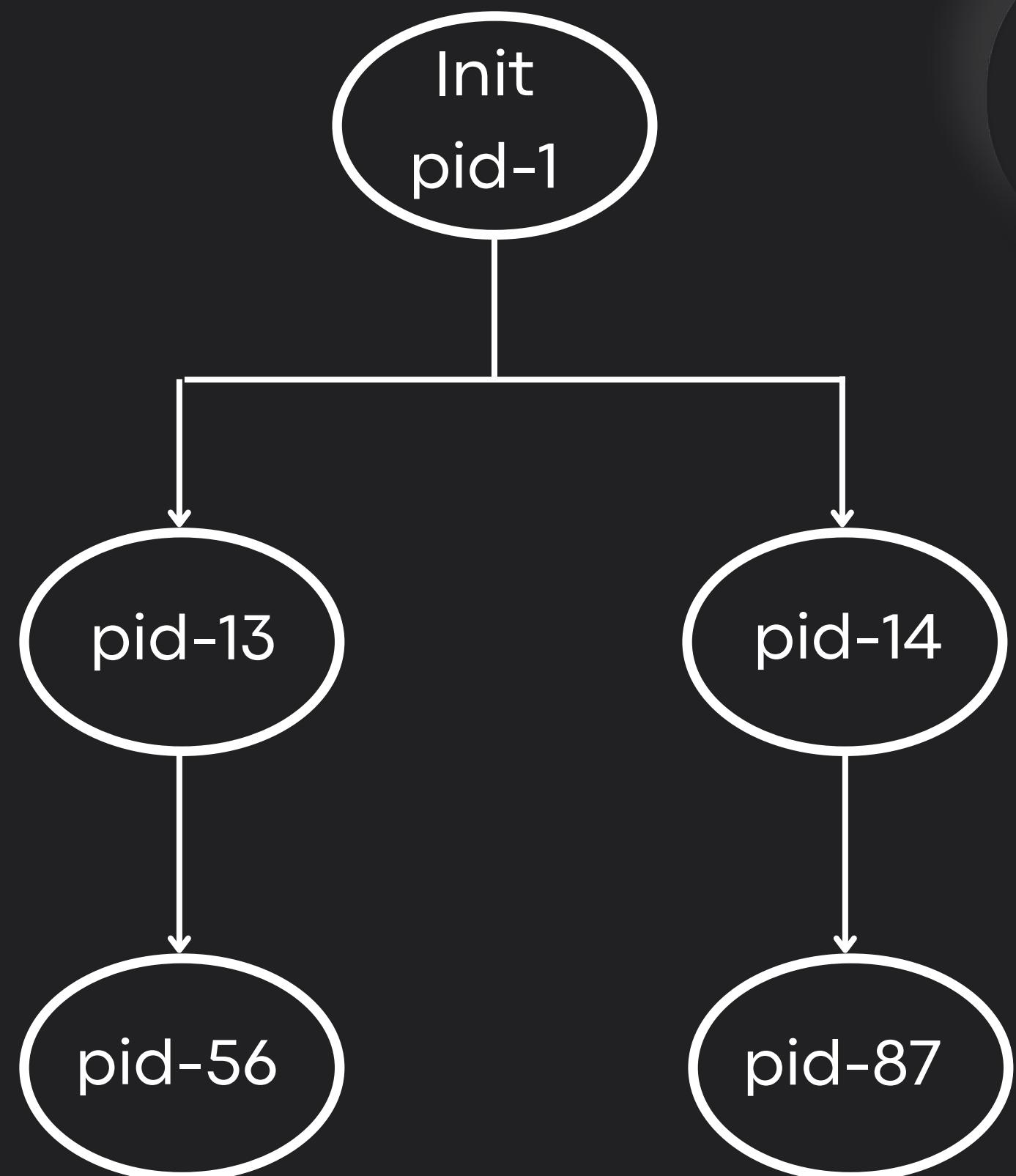
- Process ID
- Unique
- echo \$\$

PPIID

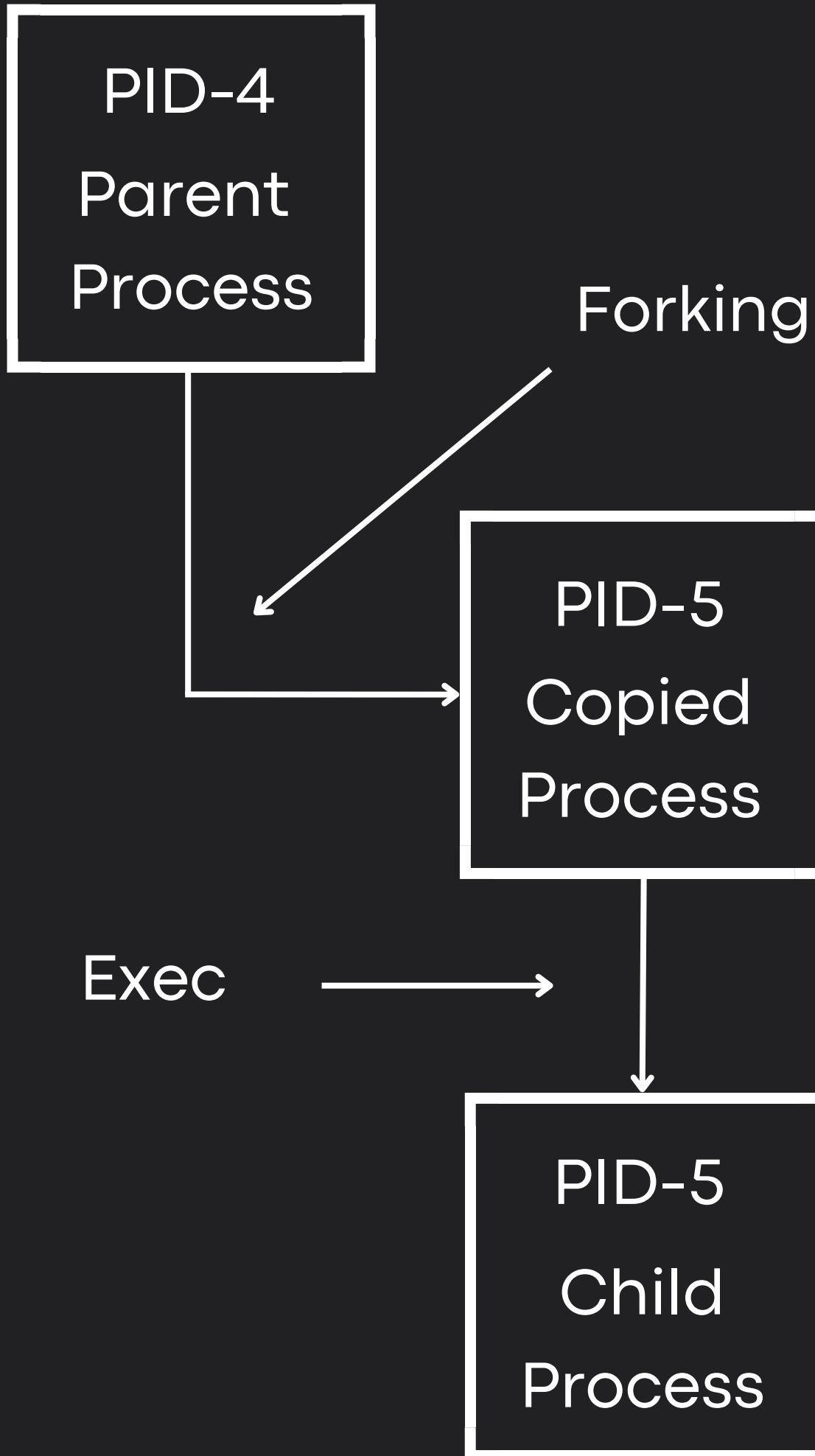
- Parent Process ID
- echo \$PPID



Process Tree



- Processes exist in parent-child hierarchies.
- Command for printing process tree- `pstree`.



Forking & Exec

- Forking creates a new process by duplicating the existing process.
- Exec replaces the current process with new process.
- Used for generating child process from a parent process.//////

Foreground Processes



- Processes that require a user to start them or to interact with them are called Foreground Processes.
- Example- ls , pstree, man, etc.

Background Processes



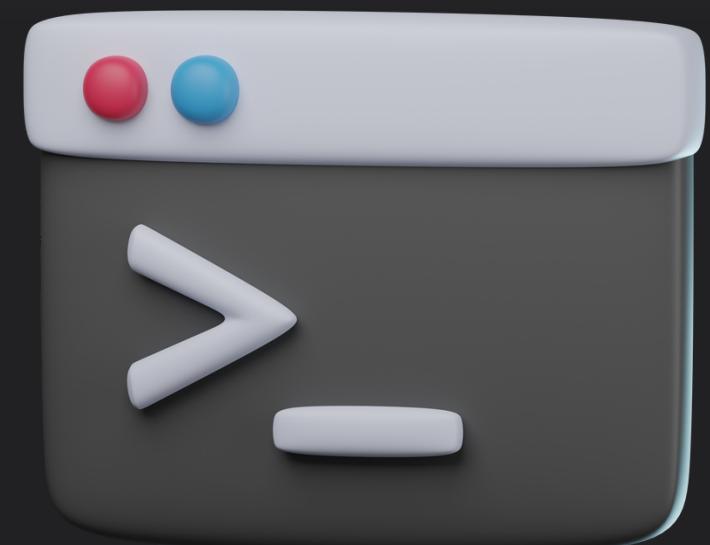
- Processes that are independent of user interaction are known as Background Processes.
- To start any process in background - command &

Process Management

- Process management in Linux is - kill/start/stop any process.
- In Linux, we can prioritise or manage the processes by using command-line tools.



LET'S MOVE TO COMMAND LINE TOOLS



top	It provides a dynamic real-time view of the running system	-
ps	The ps command is used to list the currently running processes and their PIDs along with some other information depending on different options	-ef, [PID]
jobs	Jobs command is used to list the jobs that you are running in foreground or background	-l

bg

It resumes suspended jobs in the
background

-

fg

Command that moves a background
process on your current Linux shell to the
foreground

-

Fun Commands

- oneko
- nyancat



pidof

pidof finds the process IDs (PIDs) of the named programs. It prints those IDs on the standard output

-

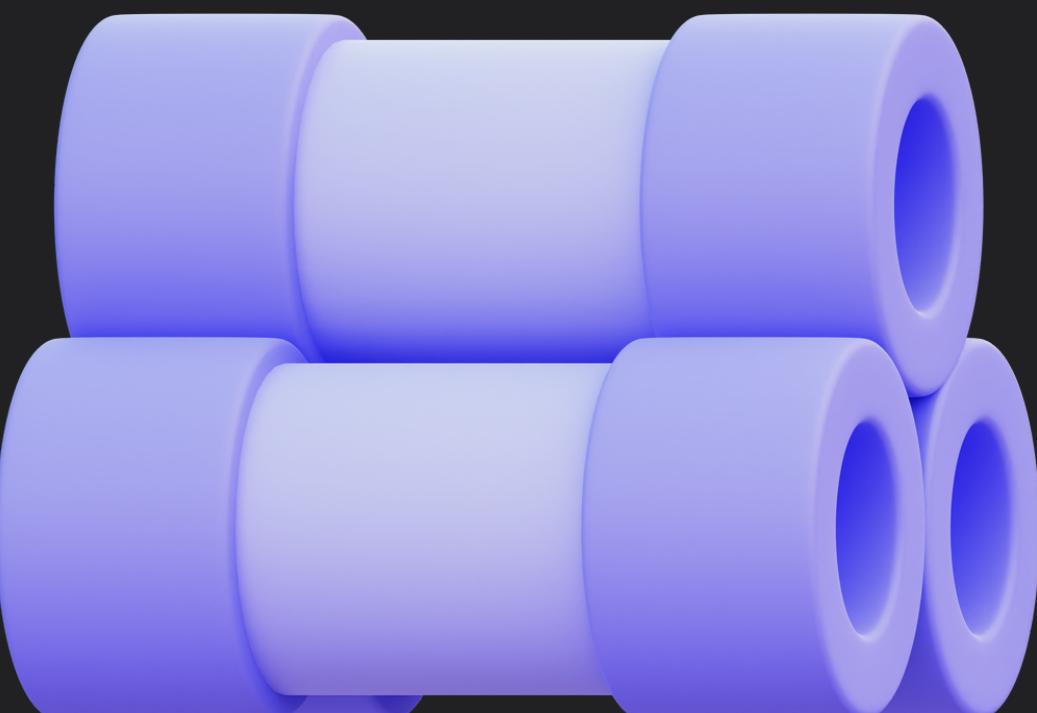
kill

List all killing signals for killing process on Linux

-l

PIPELINING IN LINUX

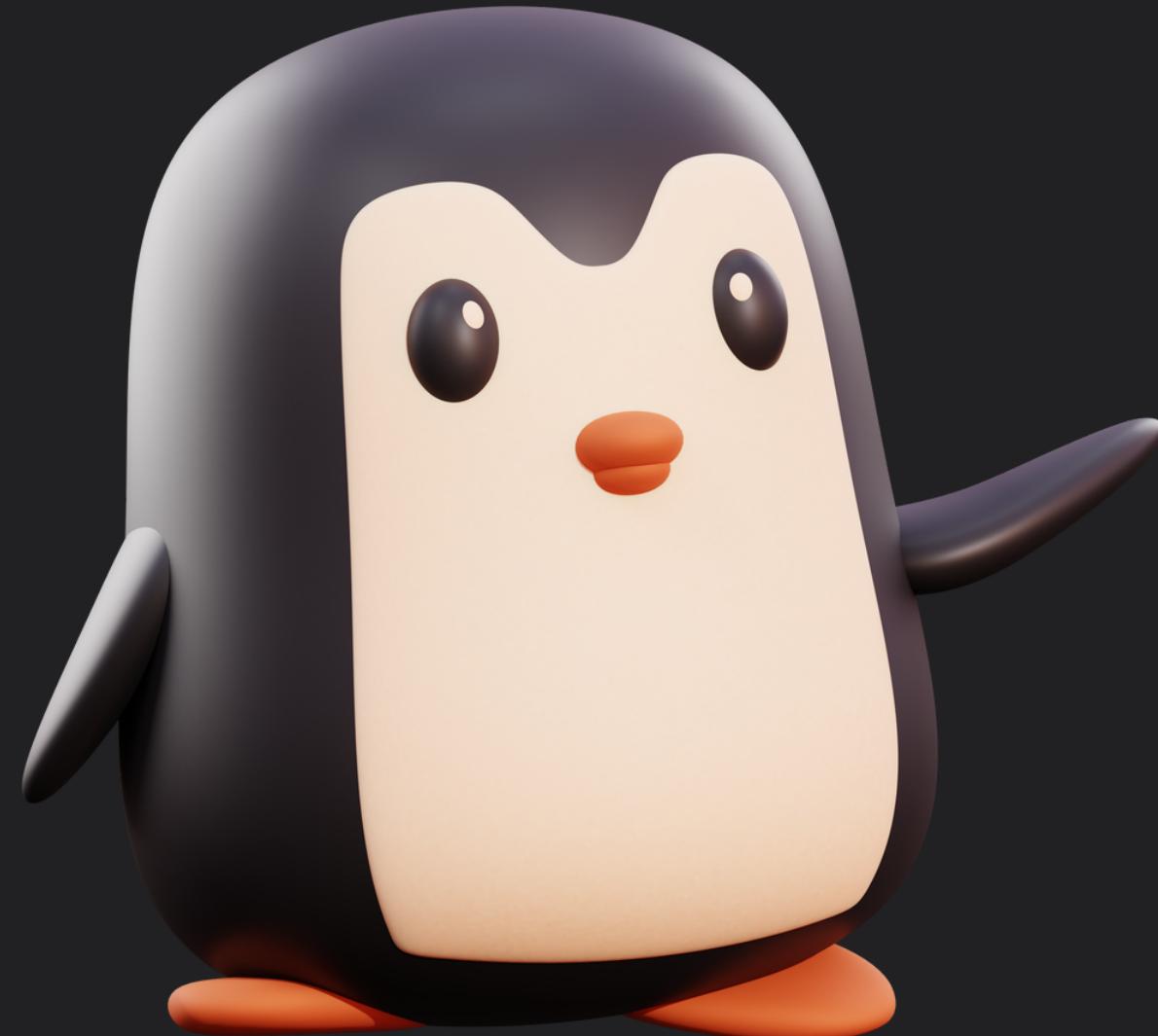
Pipelining in Linux

- Connecting data flow from one process to another. Output of one command is given to input for second command, this is done through pipe '|'.

SYNTAX:

```
COMMAND_1 | COMMAND_2 | COMMAND_3 | .... |  
COMMAND_N
```

Example



- `ps -ef | grep "Particular Name".`
- gives you process related information of name mentioned.

Packages to install

- sudo apt install lolcat
- sudo apt install sl -y
- sudo apt install cmatrix
- sudo apt install cowsay
- sudo apt install xcowsay



Example

- `sl | lolcat`
- `cmatrix | lolcat`
- `fortune | cowsay | lolcat`
- `fortune | xcowsay | cmatrix | lolcat`





Thank You

COMMUNITY | KNOWLEDGE | SHARE