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LINUX BASICS

Internship

Spring 2025

Meet the speaker

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Agenda

01 Operating systems

02 Linux system architecture

03 Linux file system

04 Package managers

05 Processes in Linux

06 User management

07 Terminal/ssh/scp

08 Command for learning commands

09 Moving through file tree

10 Working with files

11 Working with file content

AGENDA

- OPERATING SYSTEMS
- LINUX SYSTEM ARCHITECTURE
- LINUX FILE SYSTEM
- PACKAGE MANAGERS

PROCESSES IN LINUX

USER MANAGEMENT

TERMINAL/SSH/SCP

COMMAND FOR LEARNING COMMANDS

MOVING THROUGH FILE TREE

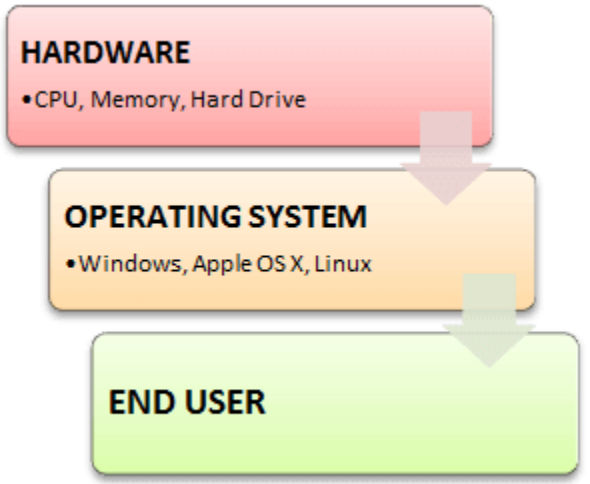
WORKING WITH FILES

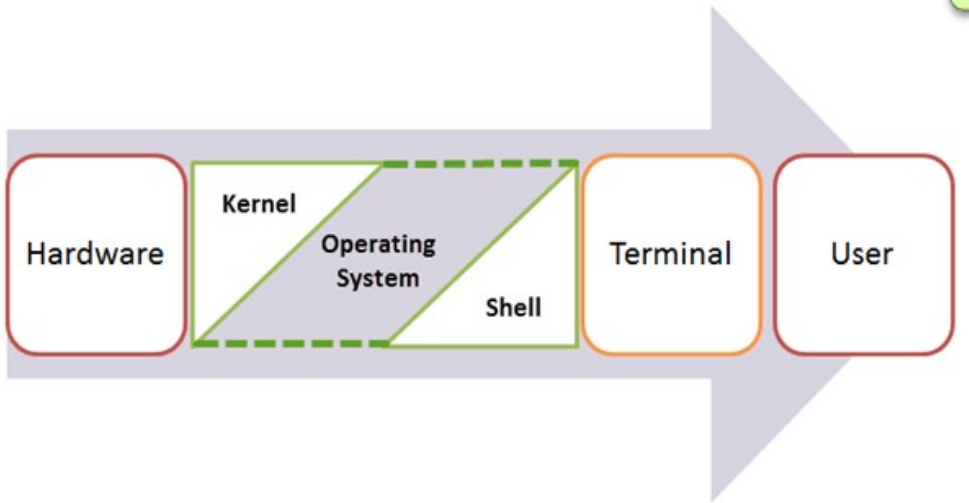
WORKING WITH FILE CONTENT

OPERATING SYSTEMS

FEATURES OF OPERATING SYSTEM

- PROTECTED AND SUPERVISOR MODE
- ALLOWS DISK ACCESS AND FILE SYSTEMS DEVICE DRIVERS NETWORKING SECURITY
- PROGRAM EXECUTION
- MEMORY MANAGEMENT VIRTUAL MEMORY MULTITASKING
- HANDLING I/O OPERATIONS
- MANIPULATION OF THE FILE SYSTEM
- ERROR DETECTION AND HANDLING
- RESOURCE ALLOCATION
- INFORMATION AND RESOURCE PROTECTION





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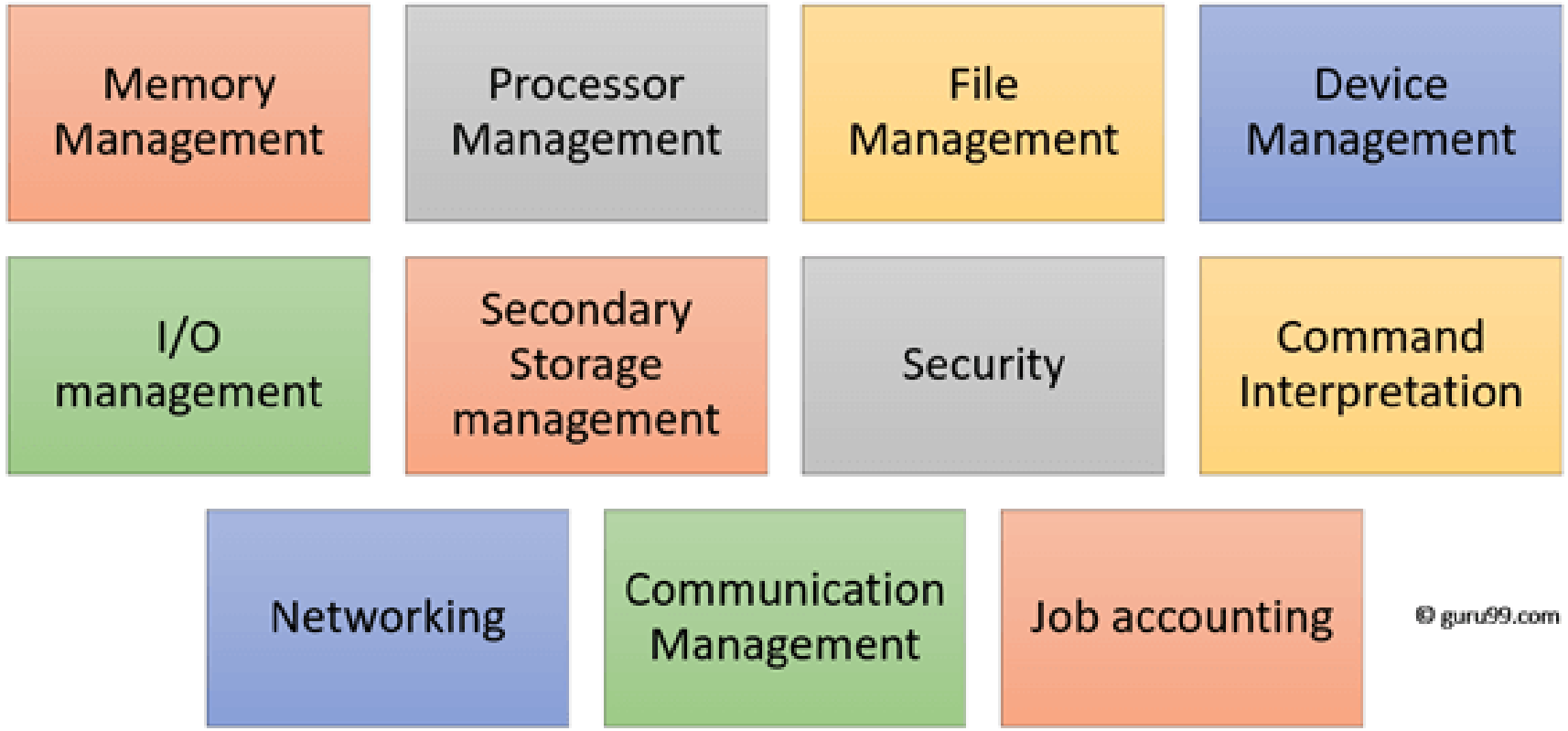
FUNCTIONS OF AN OPERATING SYSTEM



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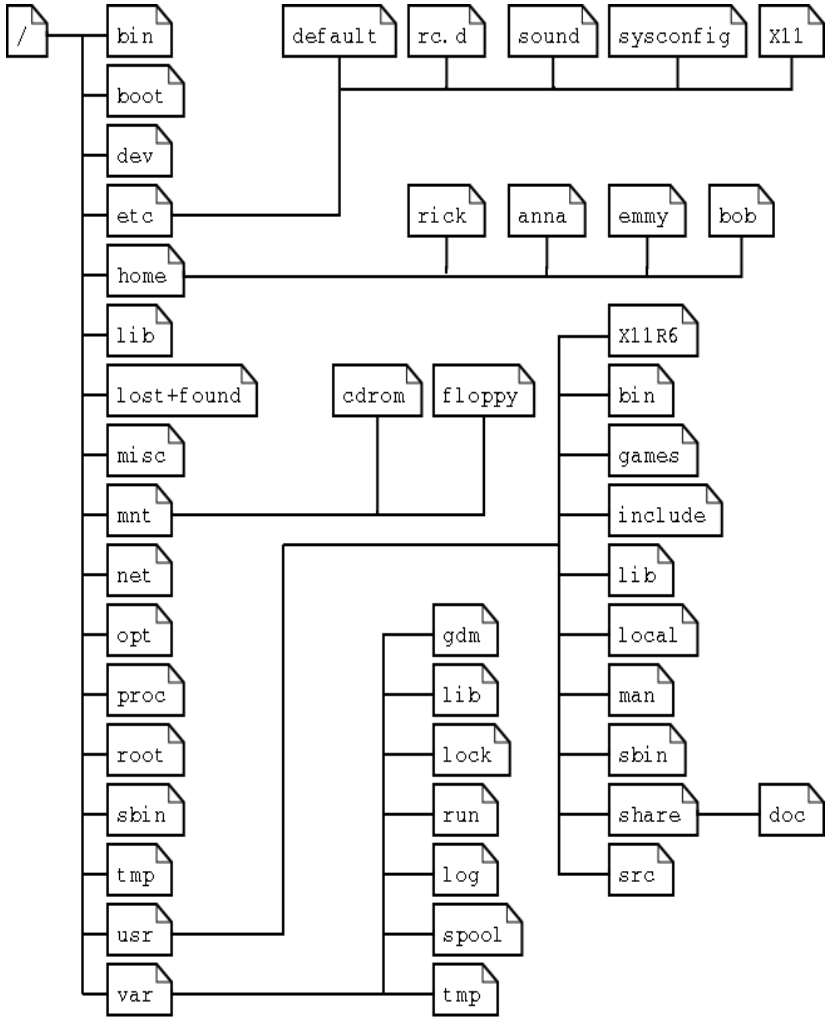
LINUX FILE SYSTEM

MAIN FOLDERS

/ - root folder for fs
/boot – bootable files
/bin – common programs
/dev – references to the devices
/etc - configs
/home – users home folders
/lib – kernel modules
/mnt – standard mount point
/proc – system resources info
/opt – 3rd party and extra software
/root – home folder for root user
/run - processes
/usr – user`s program
/var – variables and temporary data
/sys – system information
/sbin – system binaries



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PACKAGE MANAGERS

PACKAGE TYPES

Package tools:

rpm– Debian, Mint, Ubuntu
dpkg/deb – APT, Synaptic

Package managers:

yum - RedHat, Fedora, SUSE
apt - Debian, Ubuntu
pacman, yaourt - Arch

Source-based – Slackware, Gentoo

WORKING WITH PACKAGES

apt-get update -

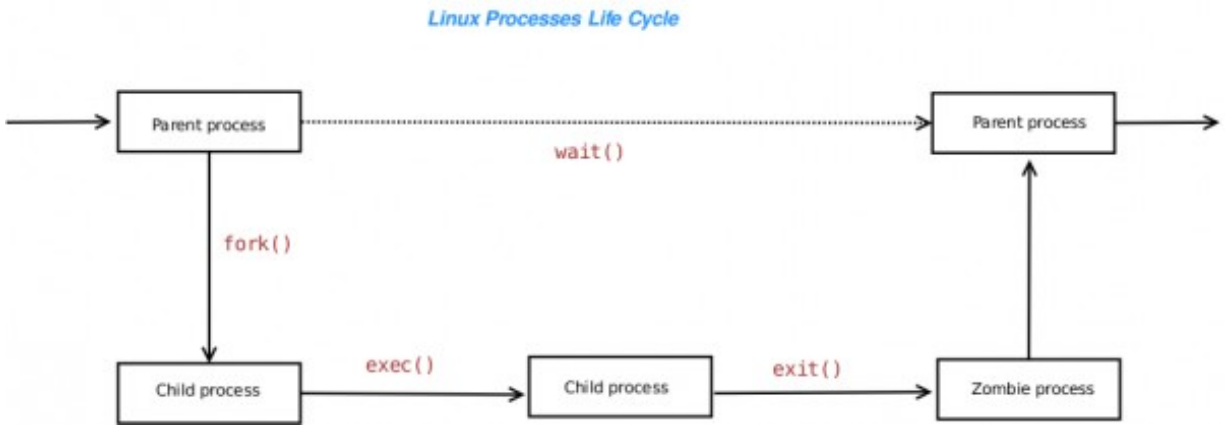
apt-get upgrade

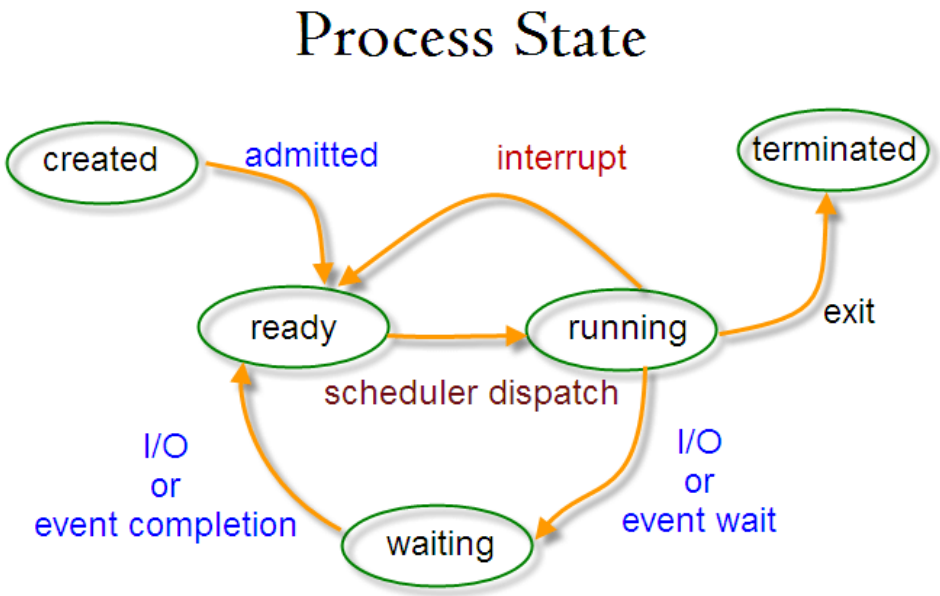
apt-get install <app name>

apt-cache search <package name>

apt-cache showpkg <package name>

PROCESSES





- **Running** –it is the current process in the system.
- **Waiting** – in this state, a process is waiting for an event to occur or for a system resource.
- **Stopped** – in this state, a process has been stopped, usually by receiving a signal.
- **Zombie** – here, a process is dead, it has been halted but it's still has an entry in the process table.

USER MANAGEMENT

READ =100

WRITE =010

EXECUTE=001

Command	Description
sudo adduser username	Adds a user
sudo passwd -l 'username'	Disable a user
sudo userdel -r 'username'	Delete a user
sudo usermod -a -G GROUPNAME USERNAME	Add user a to a usergroup
sudo deluser USER GROUPNAME	Remove user from a user group
whoami	prints your user name
chown <username>:<groupname>	Change file owner and group

COMMAND FOR LEARNING COMMANDS

- MAN, I DON`T KNOW A COMMAND <ABC>
- JUST ASK MAN, DUDE

man == manual pages

man <command> - manual about <command>

man <config.file> - manual about <config.file>

man <daemon> - manual about <daemon>

I DON`T WANNA READ TO MUCH

whatis – shows the first line of manual

whereis – the location of manual page

info – just like man but in the info format

MOVING THROUGH FILE TREE

LETS WALK

pwd – Print Working Directory

cd – Change Directory

ls - LiSt

mkdir – MaKe DIRectory

I`M JUST TO TIRED TO TYPE ALL OF THESE LETTERS

Use Tab key for autocomplete !!!!!

And remember **shortcuts**!!

. – current directory

.. – a parent directory

~ - home directory

And about absolute and relative paths

/…/…/…. - Absolute path

…/.../... – Relative path.

WORKING WITH FILES

REMEMBER NEXT RULES

Case sensitivity !

Everything is a file !

SO WHAT CAN WE DO WITH FILES?!

file – determines the file type

touch – create an empty file

rm – ReMove file

cp – CoPy file

mv – MoVe. Or Rename))

rename – Rename multiple files according to the regexp

WORKING WITH FILE CONTENT

OK. SO WHAT`S NEXT ?

head – show the first 10 lines of file

tail – show the last 10 lines of file

cat – an universal tool to work with files

tac – an opposite for cat command

more / less– prints file on screen

strings – prints readable strings from (binary) files

nano – simple text editor

emacs – powerful and customizable text editor

vi / vim – most powerful text editor you`ve ever seen ;)

PROCESSES IN LINUX

WHAT IS USING MY CPU ?!

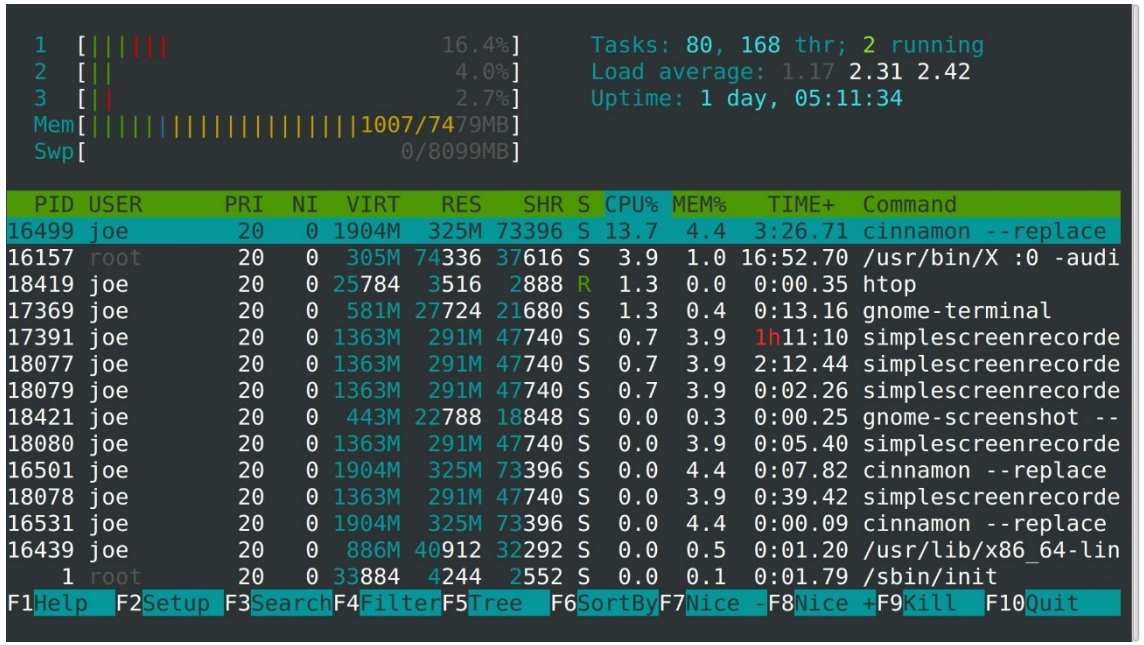
ps – Process Status

ps -ef / ps aux – see every process

ps axjf – build a process tree

ps o pid,user,command

top/htop/atop – list of all working processes



WELL... I NEED TO KILL SOMETHING

kill – kill the process

kill <pid> - try to kill a process

kill -9 <pid> - kill a process with SIGTERM

kill -<signal> <pid>

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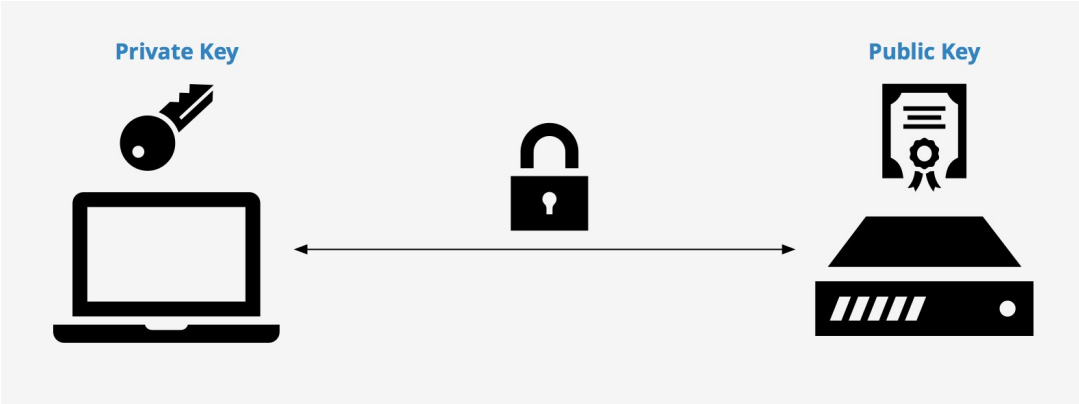
SSH/SCP

WHAT ABOUT REMOTES?

ssh = Secure SHell

ssh-keygen – generate a ssh key

ssh -p <port> <ip>



HOW CAN I SEND FILES WITHOUT GUI ?

scp = Secure CoPy

scp <remote_host>:<file> <local destination>

scp <local source> <remote host>:<remote destination>

scp <remote host1>:<remote dest1> <remote host 2>:<remote dest2>


Q&A

Linux

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