Chapter 15

Working with the Command-Line Interface

Episode 15.09

Episode title: **Advanced Linux commands**

Objective:

objectives

- File management
  - ls
  - pwd
  - mv
  - cp
  - rm
  - chmod
  - chown
  - grep
  - find
- · Filesystem management
  - fsck
  - mount
- · Administrative
  - su
  - sudo

Lower 3rds

OBJ - File management

OBJ - ls

OBJ - pwd

OBJ - mv

OBJ - cp

OBJ - rm

OBJ - chmod

OBJ - chown

OBJ - grep

OBJ - Find

OBJ - Filesystem management

OBJ - fsck

OBJ - Mount

OBJ - Administrative

OBJ - su

OBJ - sudo

Lower 3rds

Linux is based on the UNIX and POSIX operating systems

Linux is an open-source operating system

The su and sudo commands raise the user's authority by switching to the super user or root administrator

You'll find that Linux commands are often abbreviations or acronyms of their functions

sudo – su do

Lower 3rds

Switch user (su)
Change directory (cd)
Print working directory command (p w d)
copy command (c p)
move command (m v)
remove command (r m)
list command (l s)
file permissions
change mode command (c h m o d)
chown command - change the owner of a file or directory

Lower 3rds

grep and find – commands to locate troublesome file

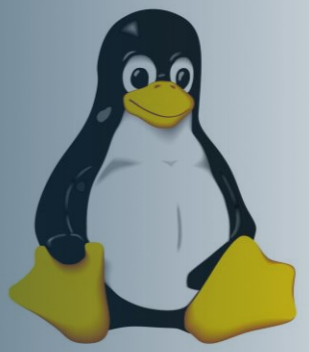
umount <mount point>

sudo umount /dev/sda

sudo mount /dev/sdb1 /mnt/media

Linux OS Commands

Linux is open-source - viewing, altering, enhancing, and distributing is allowed



su - Acronym

- Switch user
- Substitute user
- Super user

This command is used to switch to different user account and stay in the same shell session

Grep Command

```
└─# grep totsem /etc/passwd
totsem:x:1003:1003::/home/userA:/bin/sh
```

Find Command

```
└─# sudo find ../ -name "fileA"
../john/fileA
../totsem/fileA
```

Find Command

```
└─# find /usr -type f -name "mike*"
/usr/lib/x86_64-linux-gnu/espeak-ng-data/voices/!v/mike2
```

Episode 15.10

Episode title: **Advanced Linux commands pt. II**

Objective:

Lower 3rds

- OBJ - Package management
  - OBJ - apt
  - OBJ - dnf
  - OBJ - Network
  - OBJ - ip
  - OBJ - ping
  - OBJ - curl
  - OBJ - dig
  - OBJ - traceroute
- OBJ - Informational
  - OBJ - man
  - OBJ - Cat
  - OBJ - top
  - OBJ - ps
  - OBJ - du
  - OBJ - df

Lower 3rds

Package management is the process of installing, updating, and removing software packages

Packages are a collection of related commands, configuration files, and information about any dependencies needed to use its contents

When software requires other software to be available, it is a dependency

The package managers are apt and dnf

Linux provides network investigation tools

Informational commands display details and information about a Linux system's hardware, software, and performance

Operating system components include system, the kernel, the bootloader, and the administrator's root account

Lower 3rds

apt update – update the package index; a must before any upgrade or install

apt upgrade – apply any upgrades to the installed packages

apt install <package> - this command will find a package repository, download the package and install it

apt remove <package> - this is the uninstall command that will remove a package, but some package-related configuration files will remain

apt list – this command lists all of the available, installed, and upgradeable packages on the system

apt show – lists the information about package dependencies, size, source, and more

dnf update – installs any updates available

dnf install <package> - installs the package named

dnf remove – removes unused or unnecessary packages

dnf list – list all packages installed and the packages available

Lower 3rds

/etc/passwd

/etc/shadow

/etc/hosts

/etc/fstab

/etc/resolv.conf

Lower 3rds

systemd
journald
logind – manages user logins
networkd – manages network capabilities
timedatectl – manages the system data and time functions
hostnamectl – controls the system hostname
localed – manages the system's locale settings
machined – tracks containers and virtual machines
container - operating system-level virtualization

Lower 3rds

The Linux kernel itself consists of five subsystems: the process scheduler, the memory management unit, the virtual file system, the networking unit, and the inter-process communication unit

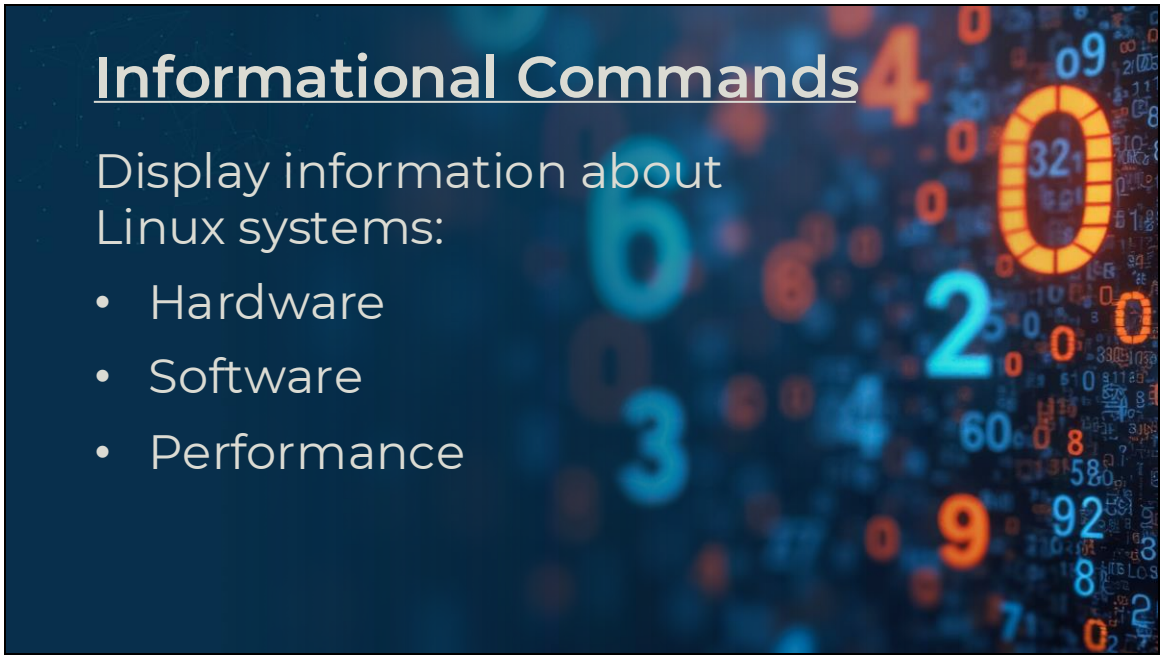
Bootloader - Key element of the Linux system

Root account - highest privilege of all users on the system

Packages and Package Management

Packages are a collection of related commands, configuration files, and information about any dependencies needed to use its contents

Package management is the process of installing, updating, and removing software packages


Informational Commands
Display information about Linux systems:
• Hardware
• Software
• Performance

Linux Kernel

Consists of five subsystems:

- Process scheduler
- Memory management unit
- Virtual file system
- Networking unit
- Inter-process communication unit

More Information

```
└# uname -a
Linux ACER-DESKTOP 5.15.167.4-microsoft-standard-WSL2 #1 SMP Tue Nov 5 00:21:55 UTC 2024 x86_64 GNU/Linux
```

Episode 15.12

Episode title: **Scripting and the terminal**

Objective:

Lower 3rds

scripting stores execution steps that are used repeatedly in a file

There are several types of scripting

Lower 3rds

OBJ - Gathering of information/data

OBJ - Initiating updates

OBJ - Script file types

OBJ - .bat (Batch files)

OBJ - .ps1 (PowerShell scripts)

OBJ - .vbs (VBScript)

OBJ - .sh (Bash shell scripts)

OBJ - .js (JavaScript)

OBJ - .py (Python script)

OBJ - Basic automation

OBJ - Restarting machines

Lower 3rds

OBJ - Remapping network drives

OBJ - Installation of applications

OBJ - Automated backups

OBJ - Gathering of information/data

OBJ - Initiating updates

Scripts have both upsides and downsides

Lower 3rds

OBJ - Unintentionally introducing malware

OBJ - Inadvertently changing system settings

OBJ - Browser/system crashes due to mishandling

Lower 3rds

Security risks

Limited portability

Complexity

Other Considerations

Unintended results:

- Unintentionally introducing malware
- Inadvertently changing system settings
- Browser/system crashes due to mishandling

Batch Files (.bat)

Text file with sequence of operating system CLI commands

```
cd /Users/user1/logs
del *.log
```

remove_logs.bat

PowerShell Scripts (.ps1)

Sequence of PowerShell scripting language statements

```
Remove-Item "C:\Users\user1\logs\*.log
```

remove_logs.ps1

VBScript (.vbs)

Automate and manage windows systems

```
Set fso = CreateObject("Scripting.FileSystemObject")
fso.DeleteFile("C:\Users\user1\logs\*.log")
```

remove_logs.vbs

Bash Shell Scripts (.sh)

Series of commands

```
cd /Users/user1/logs
del *.log
```

remove_logs.sh

JavaScript (.js)

Scripting language that is used to create features on webpages

```
const fs = require('fs');
const path = './folder_name/';
fs.readdirSync(path).forEach((file) =>
{fs.unlinkSync(path + file);});
```

remove_logs.js

Python Script (.py)

Scripting language that is used to create features on webpages

```
import os file_path = :\Users\user1\logs\*.log'
try: os.remove(file_path)
print(f"File '{file_path}' deleted successfully.")
except FileNotFoundError: print(f"File '{file_path}' not found.")
```

remove_logs.py