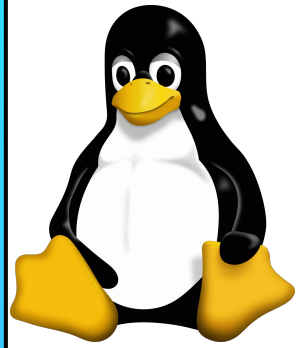


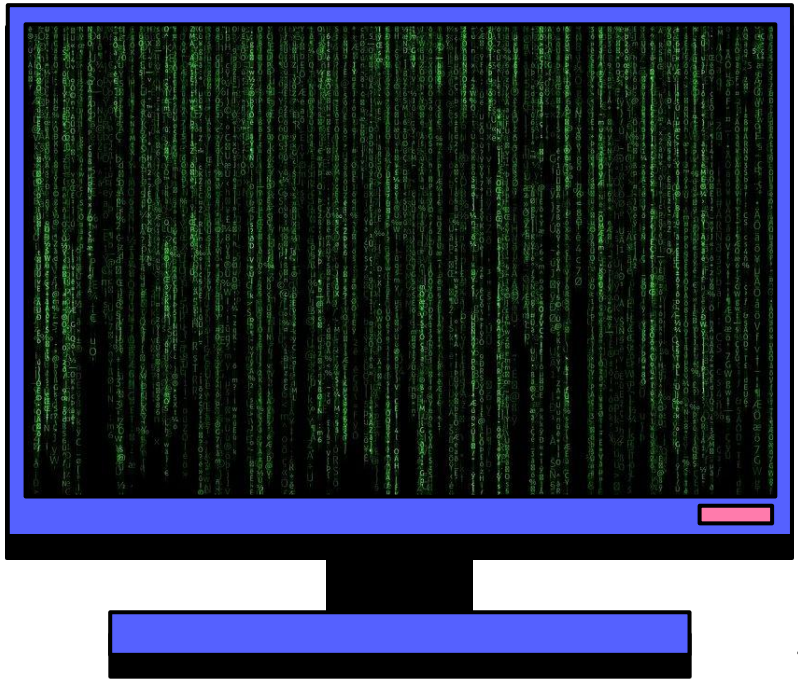
The Linux Week

Introduction to Linux

Welcome to Day 6

Day 6

- Introduction
- Tasks For System Admin
  - User and Group Management
  - File System Management
  - Process Management
  - Network Configuration and Management
  - Package Management
  - Backup and Restore
  - System Monitoring and Performance Tuning
  - Security Management
  - System Updates and Patching
  - Automating Tasks



System Admins

Involves managing and maintaining Linux-based systems.

Importance: Ensures systems are secure, efficient, and reliable.


01
Task (1)
User and Group Management

Tasks of User and Group Management

Task `1`

Creating, modifying, and deleting users and groups.

Task `2`

Managing permissions and ensuring security.

Key Commands

01

Chmod, chown

Manage file permissions and ownership

02

passwd

Changes User Password

03

Groupadd, groupmod, groupdel

Manages Groups

04

Useradd, usermod, userdel

Manages Users


02
Task (2)
File System Management

Understanding File System

Linux supports various file systems, including ext4, XFS, Btrfs, and more.

The hierarchy follows the Filesystem Hierarchy Standard (FHS), which defines the directory structure and its contents

Tasks of File System Management

Task `1`

Creating, mounting, unmounting file systems

Task `2`

Managing disk space and file system integrity

Key Commands

01

mkfs

Creates file system

02

Df, du

Check disk space usage.

03

fsck

File system consistency check.

04

Mount, unmount

Mount and unmount file systems.

Mounting and Unmounting File System

1)

Mount

mount <device> <mount_point>

EX: mount /dev/sda1 /mnt

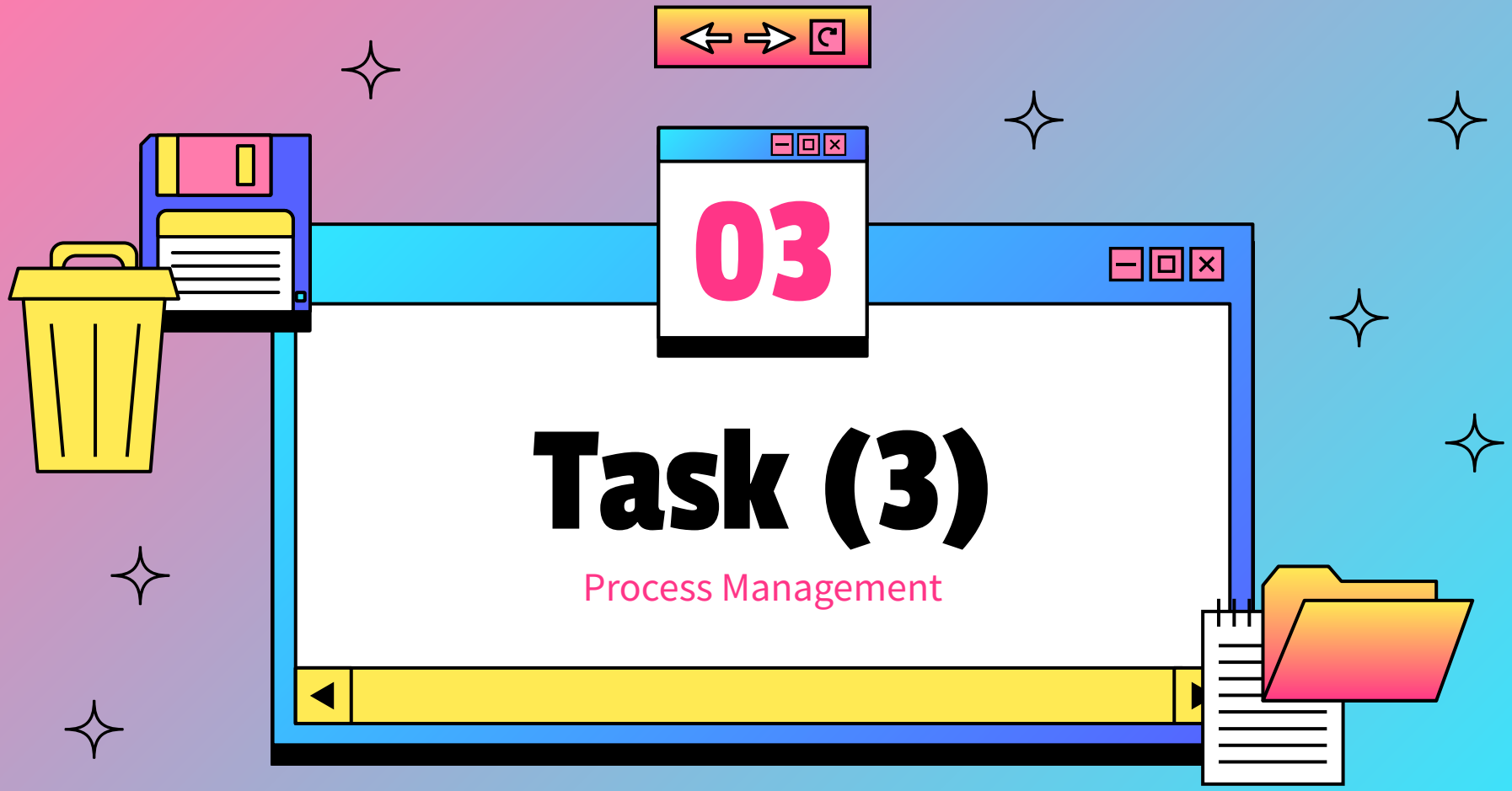
2)

Unmount

umount <mount_point_or_device>

EX: umount /mnt or umount /dev/sda1

Mounting and unmounting file systems are essential tasks for accessing and managing storage devices in Linux.


03
Task (3)
Process Management

Tasks of Process Management

Task `1`

Monitoring and controlling system processes.

Task `2`

Ensuring optimal system performance.

Key Commands

01

ps

Display active processes

02

Top, htop

Real-time system monitoring

03

Kill, pkill

Terminate processes.

04

Nice, renice

Adjust process priorities.

Process States

Running - R

Actively running or waiting to run.

Sleeping - S

Waiting for an event or resource.

Stopped - T

Stopped, usually by receiving a stop signal

Zombie - Z

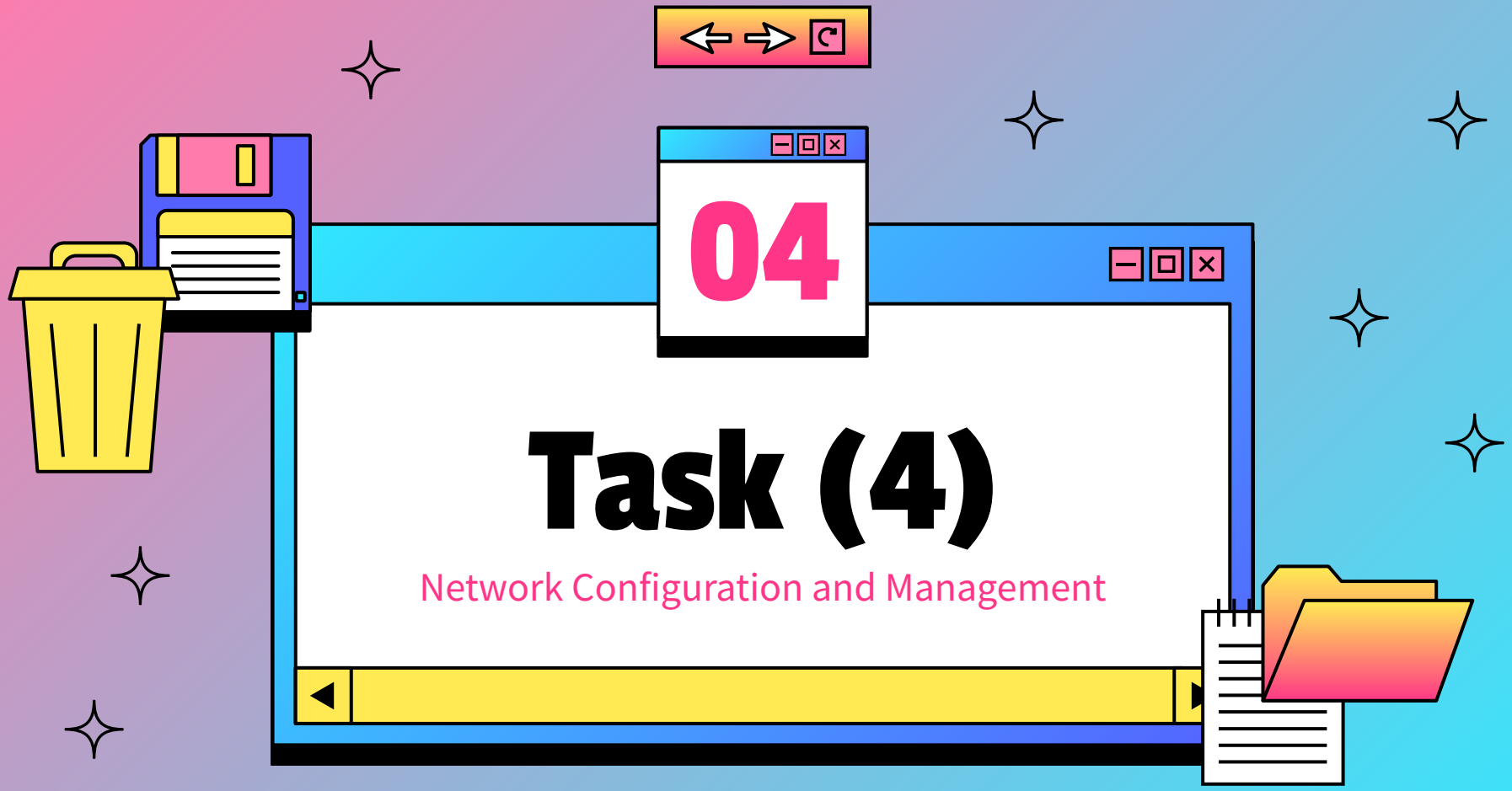
Completed execution but still has an entry in the process table.

Changing Process Priority

nice -n <priority> <command>

renice <priority> -p <PID>

Priority ranges from -20 (highest priority) to 19 (lowest priority).


04
Task (4)
Network Configuration and Management

Tasks of Network Configuration and Management

Task `1`

Configuring network interfaces and services.

Task `2`

Troubleshooting network issues.

Key Commands

01

Ifconfig, ip

Configure network interfaces

02

Netstat, ss

Network statistics

03

Ping, traceroute

Test network connectivity

04

Iptable, firewald

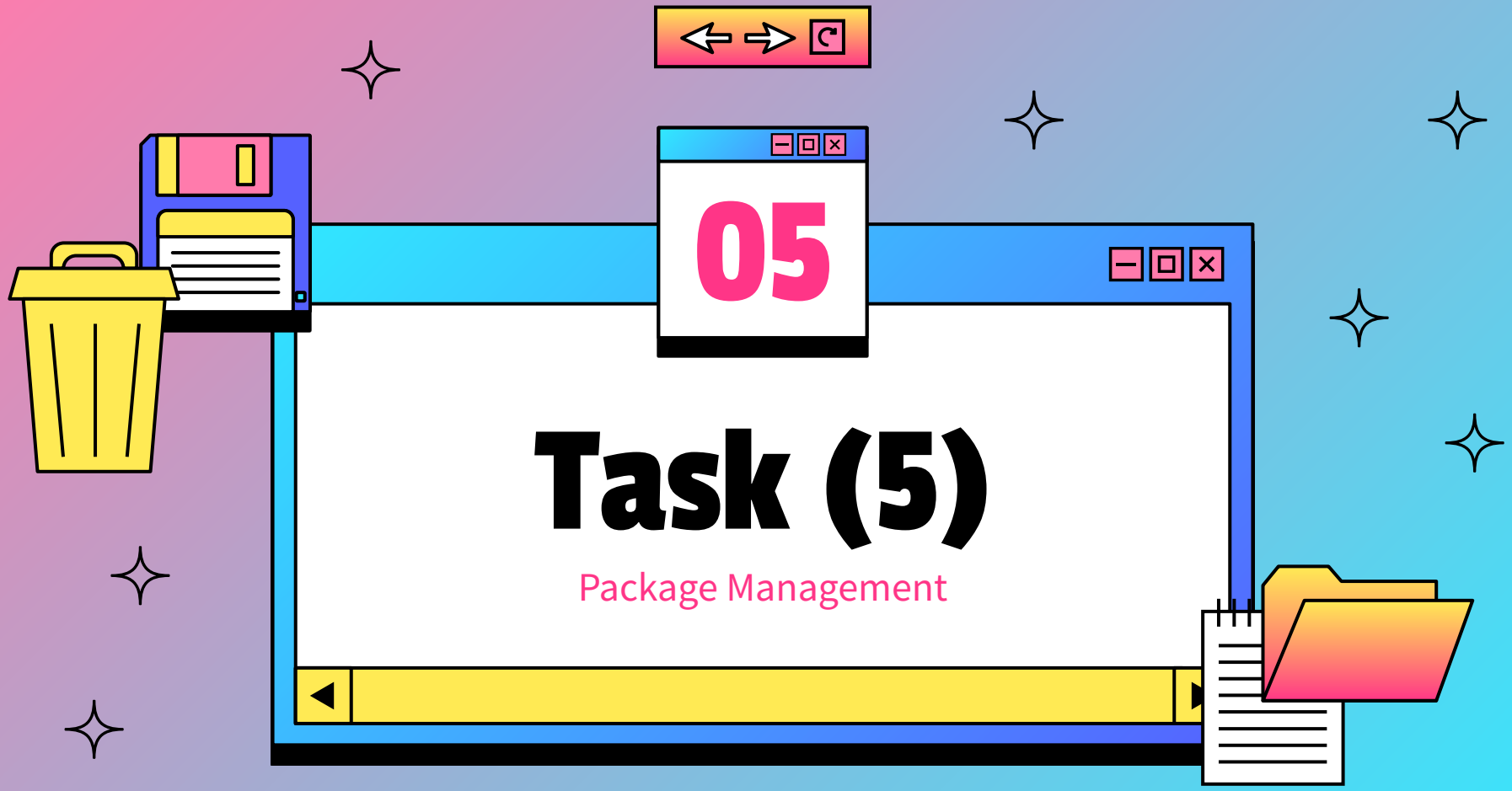
Manage firewall rules

Example (1)

Ping Google.com

Example (2)

Traceroute google.com


05
Task (5)
Package Management

Tasks of Package Management

Task `1`

Installing, and removing software packages

Task `2`

Updating software packages

Key Commands

01

Apt, apt-get

Debian Based

02

Yum, dnf

Red Hat, Fedora, CentOS based

03

Zypper

OpenSUSE and SUSE Based

04

Pacman

Arch based Linux


06
Task (6)
Backup and Restore Management

Tasks of Backup and Restore Management

Task `1`

Performing regular backups

Task `2`

Restoring data as needed.

Key Commands

01

tar

Archive files

02

rsync

Synchronize files and directories.

03

dd

Bit-level file copying

04

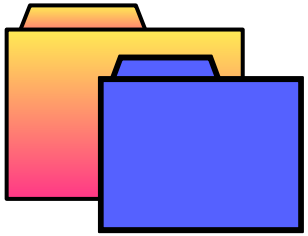
cron

Schedule backup tasks

Types of Backup

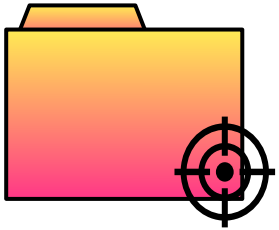
Full Backup

Copies all data every time a backup is performed.



Incremental

Only backs up data that has changed since the last backup.



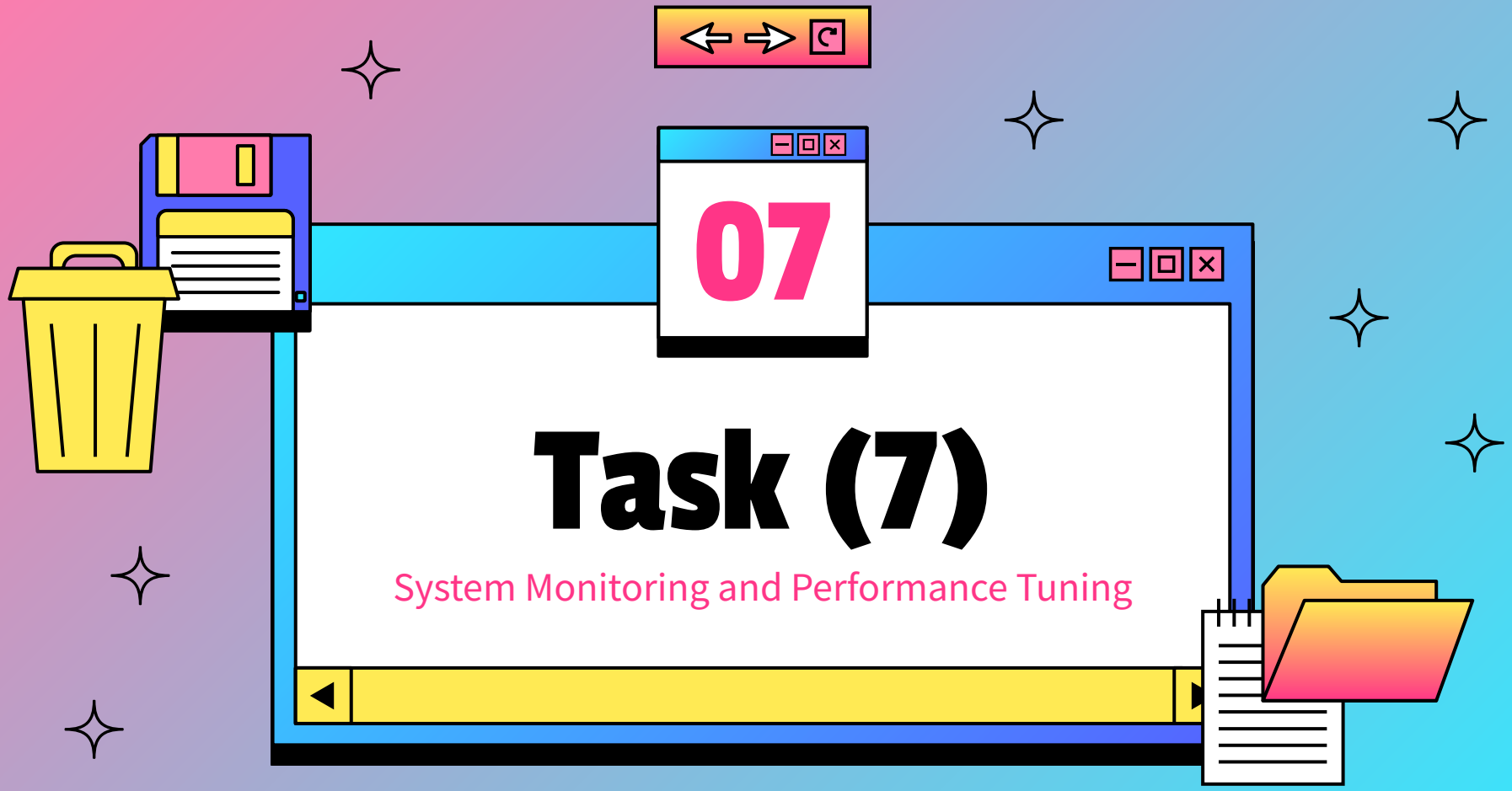
Differential

Backs up data that has changed since the last full backup.

Rsync

rsync is a powerful tool for syncing files and directories between locations.

rsync -av /source/ /destination/


07
Task (7)
System Monitoring and Performance Tuning

Tasks of System Monitoring and Performance Tuning

Task `1`

Monitoring system performance.

Task `2`

Making adjustments to optimize performance.

Key Commands

01

free

Display memory usage

02

uptime

Show system running time

03

sar

Collect and report system activity

04

Vmstat, iostat

Report system performance.

Netstat & free

Viewing network statistics
netstat -tuln

Free -h (human readable)


08
Task (8)
Security Management

Tasks of Security Management

Task `1`

Implementing system security measures.

Task `2`

maintaining system security measures.

Key Commands

01

fail2ban

Protect against brute-force attacks

02

auditd

Configure audit logs

03

Passwd -L

Passwd -U

Lock and unlock passwords

04

Usermod -L

Usermod -U

lock and unlock user accounts.

sudo ufw enable
sudo ufw disable

sudo ufw allow ssh
sudo ufw deny http

sudo ufw status

Firewall

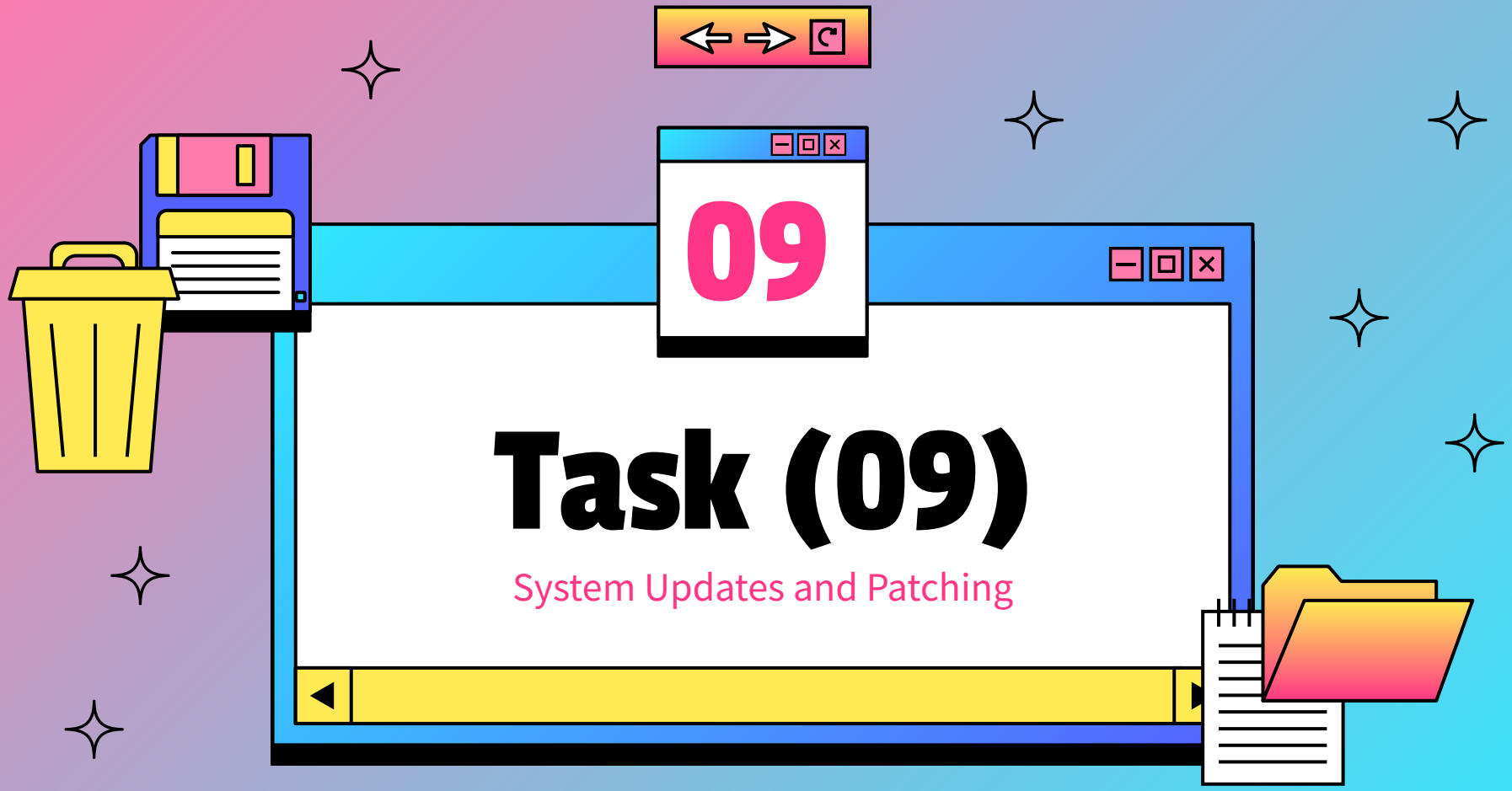
Installing Auditd

sudo apt-get install auditd

sudo systemctl start auditd

sudo systemctl enable auditd

auditd is a powerful tool for monitoring and logging system activity in Linux. By defining audit rules, you can track various actions and events on your system, which helps in enhancing security, ensuring compliance, and conducting forensic analysis


09
Task (09)
System Updates and Patching

Tasks of System Updates and patches

Task

Keeping the system up to date with the latest patches and updates.

Key Commands

01

Apt update

Debian-based): Update packages.

02

Yum, dnf update

(Red Hat-based): Update packages.


10
Task (10)
Automating Updates

Tasks of Automating Tasks

Task

Automating routine tasks to improve efficiency.

Key Commands

01

systemd

Manage system and service manager tasks.

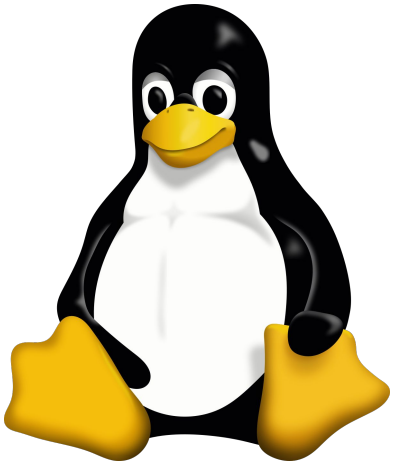
02

Cron, crontab

Schedule and automate tasks.

Q/A Session

Thank you !



End of Day 6!

By Maya Mnaizel