Republic of the Philippines
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SA1 – System Administration and Maintenance

Introduction to System Administration and Linux OS

Understanding Core Functions, Linux Basics, and Ubuntu Desktop Operations

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Objectives

- Identify core functions and administrative domains in system administration
- Recognize the purpose of an operating system and distinguish desktop vs server Linux
- Use Ubuntu Desktop GUI to manage files, settings, and tools

System Administration

System Administration

It is the practice of managing and maintaining computer systems and network.

Why System Administration Matters

1. Ensures reliability – keeps systems running smoothly.
2. Maintains security – protects data and users.
3. Supports productivity – enables users to work without interruptions.

- Example: IT admins in schools, offices, and cloud platforms.

System Administration – Core Functions

1. User account management
2. System monitoring
3. Security & updates
4. Backup & recovery
5. Hardware & software installation

Ex.: School IT admin managing lab computers

Administrative Domains in System Administration

1. Network Administration – Managing network connections, IP addresses, firewalls.
2. Security Administration – Implementing security measures, user access control.
3. Database Administration – Maintaining databases, backups.
4. Web Administration – Hosting and maintaining websites.

Operating System

Operating System

Software that manages hardware and software resources

- Windows
- macOS
- Linux

It acts as a bridge between user and hardware.

Linux

Overview of Linux

1. Free and open-source
2. Highly secure and stable

Popular Distros (Linux Distributions)
- Ubuntu
- Debian
- Fedora
- CentOS

Linux vs Windows in System Administration

Linux:

- Free & open-source
- Stable & secure
- Strong community support
- Preferred for servers

Windows:

- User-friendly GUI

Linux Desktop/Linux Server

	Linux Desktop	Linux Server
GUI	Yes (GNOME, KDE, EFCE)	Headless (no GUI)
Performance	Balanced (Normal resource usage)	Optimized (Low resource usage)
Hardware	Installed on laptops/PCs	Installed in servers or cloud instances
Purpose	Everyday personal use, alternative to Windows	Run services (web servers, databases, cloud hosting)
Summary	User-friendly, GUI, personal use	Headless remote service management

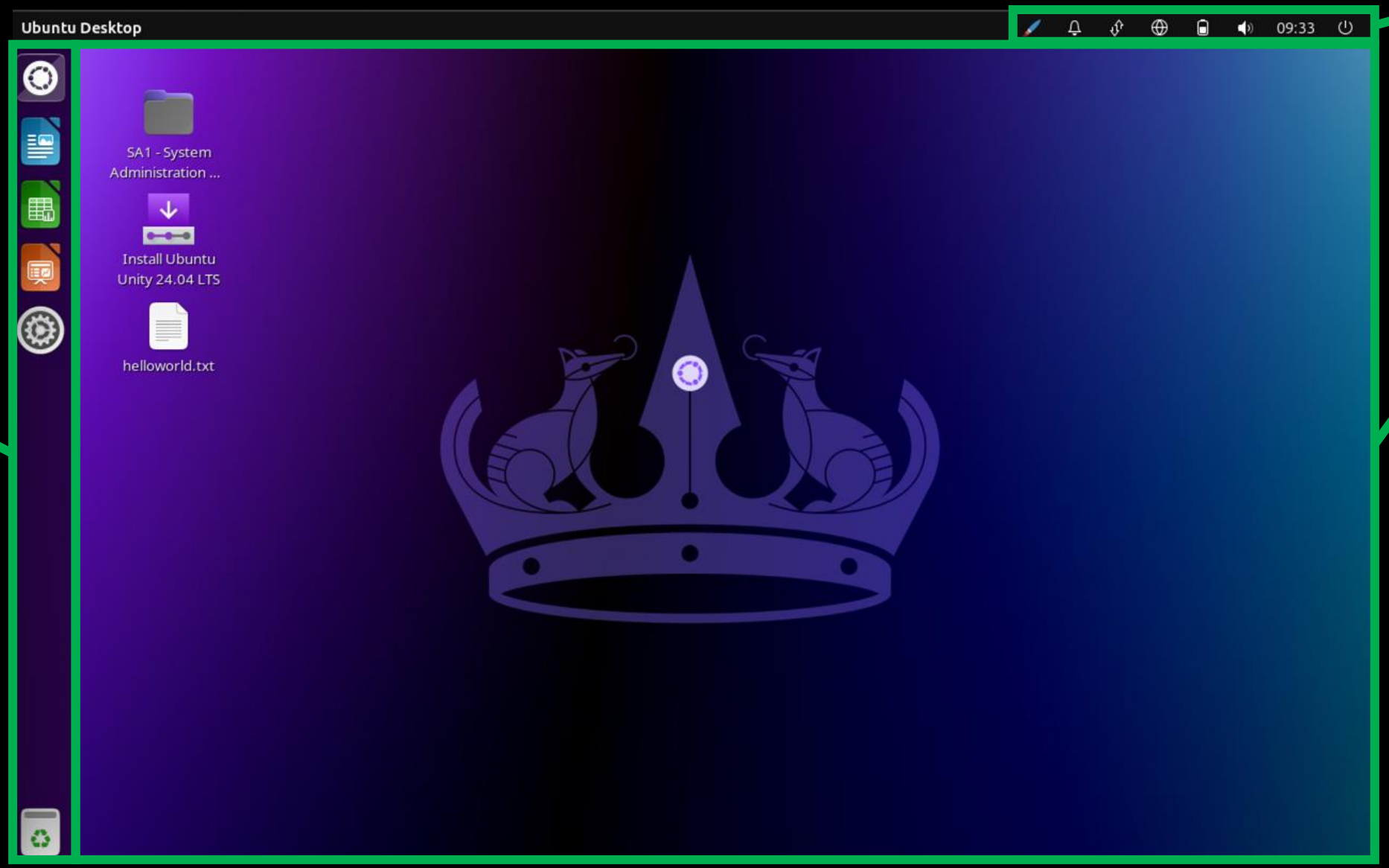
Power of the Linux Command Line

- Faster than GUI for admins
- Automation with scripts
- Remote management via SSH
- Precise control over the system

Example Commands: ls, cd, chmod, apt install

Linux - Ubuntu

Ubuntu GUI Components



Linux in System Administration

Linux in System Administration

File Permission & Ownership

- In Linux, every file has an **owner**, a **group**, and a set of **permissions.**
- This contributes to Linux security and stability, controlling who can **read**, **modify**, or **execute** files.

Sample Commands:

```
ls -l        # View permissions
chmod 755    # Change permissions
chown user:group file.txt  # Change owner
```

Linux in System Administration

Package Management **(APT)**

- Packages are like Apps
- **APT (Advanced Package Tool)** is Linux's App Store, installing, updating, and removing software via the **terminal.**

Sample Commands:

```
sudo apt update      # Refresh package list
sudo apt upgrade     # Update installed packages
sudo apt install nginx   # Install software
sudo apt remove nginx    # Remove software
```

Linux in System Administration

Remote Access (SHH)

- SHH (Secure Shell) allows secure connection to another computer via network.
- Manage other computers, like servers, remotely and encrypted

Sample Commands:

```
ssh user@server_ip    # Connect to server
scp file.txt user@server:/path  # Copy files securely
```

Linux in System Administration

Log Monitoring

- Logging (recording) everything happening in the system can help in identifying issues, detecting intrusions, or tracking misconfigurations (since Linux is configuration heavy)

Sample Commands:

```
cd /var/log          # Log directory
less /var/log/syslog    # View system log
tail -f /var/log/auth.log  # Monitor log in real time
```

References

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