

### What is an Operating System (OS)?

An **Operating System** is **system software** that:

- Starts the computer
- Manages hardware like CPU, RAM, disk
- Allows users to run applications

 It acts as a **bridge between the user and computer hardware**.

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### Why do we need an OS?

We need an OS because it:

1. Helps users interact with the computer
2. Manages memory and CPU efficiently
3. Runs multiple applications at the same time
4. Controls files, folders, and devices
5. Provides security using users and permissions

 Without an OS, a computer **cannot work**.

### Different Types of Operating Systems

1. **Desktop OS** – Windows, Linux, macOS
  2. **Server OS** – Windows Server, Linux (Ubuntu, Red Hat)
  3. **Mobile OS** – Android, iOS
  4. **Embedded OS** – Used in ATM, washing machines, routers
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### Difference Between Windows and Linux

Windows	Linux
Paid OS	Mostly free & open-source
Easy to use (GUI)	CLI + GUI
Used in offices & personal PCs	Used in servers & cloud
Less customizable	Highly customizable
Proprietary	Open source

“Windows is mostly used by end users, while Linux is preferred in servers and cloud environments.”

**Q1:** Difference between Admin and Standard user?

👉 Admin can change system settings; Standard user cannot.

**Q2:** What are file permissions?

👉 Rules that control access to files and folders.

**Q3:** What will you do if a user needs software installation?

👉 Log in as Admin or give temporary admin access.

**Q1:** How do you handle a slow system?

👉 Check Task Manager → CPU/RAM → close heavy apps.

**Q2:** What is a Windows service?

👉 A background program that runs automatically.

**Q3:** What is Startup tab used for?

👉 To control apps that start during boot.

**Q1:** Difference between RAM and Hard Disk?

👉 RAM is temporary memory; Hard disk is permanent storage.

**Q2:** HDD vs SSD?

👉 SSD is faster and more reliable than HDD.

**Q3:** What is the role of CPU?

👉 CPU executes instructions and controls the system.

**Q1:** What is LAN?

👉 A network within a small area like an office.

**Q2:** Difference between LAN and WAN?

👉 LAN is local; WAN covers large areas.

**Q3:** Router vs Switch?

👉 Router connects networks; switch connects devices.

**Q1:** What is an IP address?

👉 A unique address that identifies a device.

**Q2:** What is DNS?

👉 Converts domain names to IP addresses.

**Q3:** What is DHCP?

👉 Automatically assigns IP configuration.

### **Hands-On Practice (IMPORTANT)**

Do this on your laptop ↴

**1** Check Windows version

Win + R → winver

**2** Open System Info

Win + Pause/Break

**3** Explore:

- Control Panel
  - Settings
  - File Explorer
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 **Hands-On Practice (DO THIS)**

◆ **Create a New User**

1. Control Panel → User Accounts
2. Manage another account → Add user  
*(Or Settings → Accounts → Family & other users)*

◆ **Check Folder Permissions**

1. Right-click any folder
  2. Properties → Security tab
  3. View permissions for users
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## 4. **Hands-On Practice (MUST DO)**

5. **1** Open Task Manager → Check CPU & RAM usage
  - 2** End a non-critical app (like Calculator)
  - 3** Disable one startup app (non-important)
  - 4** Open Services:  
6. Win + R → services.msc
  - 5** Restart **Print Spooler** service
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**1** Open Task Manager → Performance

- Check CPU model
- Check RAM size

**2** Open Device Manager

Win + X → Device Manager

- View Display adapter
- View Network adapter

**3** Check Disk Type

- Task Manager → Performance → Disk
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**1** Open Network settings

- Control Panel → Network & Sharing Center

**2 Check IP Address**

ipconfig

**3 Identify Network Adapter**

- Device Manager → Network adapters
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**1 Open Command Prompt**

ipconfig

**2 Test internet connectivity**

ping google.com

**3 Release & Renew IP**

ipconfig /release

ipconfig /renew

**4 Change DNS to Google**

- Preferred: 8.8.8.8
  - Alternate: 8.8.4.4
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 **Real-World IT Support Scenario**

- ◆ **Problem:** User cannot access a folder
- ◆ **Solution:**

- Check user account
  - Verify folder permissions
  - Give Read/Modify access if required
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- ◆ **Problem:** System is very slow
- ◆ **Steps:**

1. Open Task Manager
  2. Check CPU/RAM/Disk usage
  3. End unnecessary processes
  4. Disable unwanted startup apps
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- ◆ **PC is slow**

- Check RAM usage
- Check if HDD or SSD
- Suggest RAM upgrade or SSD

◆ **PC not powering ON**

- Check power cable
  - Check SMPS
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◆ **User says: “Internet is not working”**

1. Check LAN cable/Wi-Fi
  2. Check IP using ipconfig
  3. Restart router
  4. Ping gateway
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◆ **User: “Internet not working”**

- Check IP address
  - Ping gateway
  - Change DNS
  - Restart router
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