LINUX

🐧 Linux

Definition

Linux is an operating system (like Windows) that manages computer hardware and lets you run programs.

Why do we use Linux instead of Windows?

Because Linux is:

- **Free** → No license cost
- **Open source** → Anyone can see & modify the code
- **Fast & lightweight** → Works well even on low-end systems
- **Very secure** → Less viruses and strong permission system
- **Best for servers** → Most websites run on Linux
- **Developer-friendly** → Used in cloud, DevOps, hacking, servers

👉 **Windows** is mostly for personal use (games, MS Office)
👉 **Linux** is mostly for **servers, cloud, IT, developers**

Example:
Google, Facebook, Amazon servers → **Linux**, not Windows.

🌐 ICANN

Definition

ICANN is the organization that manages **domain names and IP addresses** for the whole internet.

In simple words

ICANN makes sure:

- Your website name is **unique**
- Internet works **without name conflicts**

Example:
Because of ICANN, only **one** person can own
👉 google.com

📘 DNS (Domain Name System)

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Definition

DNS converts website names into IP addresses.

In simple words

DNS is like the **phone contact list of the internet**.

- Humans remember → google.com
- Computers understand → 142.250.195.46

DNS connects both.

Example:
You type 👉 youtube.com
DNS finds 👉 its IP address
Website opens ✅

💻 **Instance**

Definition

An **instance** is a **virtual computer** running in the cloud.

In simple words

An instance = **online computer**

You can:

- Start it
- Stop it
- Install Linux/Windows
- Run apps

Example:
EC2 in AWS = one **instance**

🧠 **Hypervisor**

Definition

A **hypervisor** is software that creates and manages **virtual machines**.

In simple words

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Hypervisor lets **one physical computer run many virtual computers**.

Example:
One server →

- Linux VM
- Windows VM
- Ubuntu VM

All running together using a hypervisor.

🏢 On-Prem (On-Premises)

Definition

On-prem means servers are kept **inside your company building**.

In simple words

- You buy the server
- You manage power, cooling, security
- Everything is **your responsibility**

Example:
A bank keeping its own servers in its office.

☁️ Cloud

Definition

Cloud means using servers **over the internet** instead of owning them.

In simple words

- No need to buy servers
- Pay only for what you use
- Access from anywhere

Examples:

- AWS
- Azure

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- Google Cloud

🔄 **On-Prem vs Cloud (Easy Comparison)**

🧠 **One-Line Memory Tricks**

- **Linux** → Free & powerful OS for servers
- **ICANN** → Boss of internet names
- **DNS** → Name → IP converter
- **Instance** → Virtual computer
- **Hypervisor** → Creates virtual machines
- **On-Prem** → Servers in office
- **Cloud** → Servers on internet

QUESTIONS:

1) How end users request access to an application

1. User enters a URL or opens an app
2. Browser sends request using HTTP/HTTPS
3. DNS resolves domain to server IP
4. Server processes request and sends response

How to explain to interviewer

"When an end user wants to access an application, they usually enter a URL in the browser. The browser sends an HTTP or HTTPS request. DNS converts the domain name into an IP address. That request reaches the server, the application processes it, and the response is sent back to the user."

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2) What ICANN is

1. ICANN manages domain names globally
2. It controls DNS root servers
3. It ensures unique domain names
4. It coordinates IP address allocation

How to explain

“ICANN is an international organization responsible for managing domain names and IP addresses. It ensures that every domain name is unique and that DNS works smoothly across the internet.”

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3) Domain registrars and domain names

1. Domain name is a human-readable website name
2. Registrar is a company that sells domains
3. Registrars work under ICANN
4. Domains map to IP addresses

How to explain

“A domain name is the website name users remember, like google.com. A domain registrar is a company like GoDaddy or Namecheap that allows us to register these names. Registrars operate under ICANN and link domain names to server IP addresses.”

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4) Server || Instance || VM

1. Server is a physical machine
2. VM is a virtual computer on a server
3. Instance is a running VM in cloud
4. Multiple instances can run on one server

How to explain

“A server is a physical system. A virtual machine is a software-based computer running on that server. In cloud platforms, a running virtual machine is called an instance. One physical server can host multiple instances.”

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5) Linux vs Windows

1. Linux is open-source, Windows is licensed
2. Linux is lightweight and secure
3. Windows is user-friendly with GUI
4. Linux is preferred for servers

How to explain

"Linux is open-source and widely used in servers because it is stable, secure, and lightweight. Windows is more GUI-based and user-friendly, mainly used on desktops. In production environments, Linux is preferred."

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6) Linux distributions: Amazon Linux, Ubuntu, Kali, SUSE

1. Amazon Linux – optimized for AWS
2. Ubuntu – beginner-friendly and popular
3. Kali – used for security testing
4. SUSE – enterprise-focused Linux

How to explain

"Linux has different distributions for different purposes. Amazon Linux is optimized for AWS. Ubuntu is widely used and beginner-friendly. Kali Linux is used for penetration testing. SUSE is commonly used in enterprise environments."

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7) Linux commands (30 commands – mention category-wise)

1. File commands: ls, cp, mv, rm
2. Directory commands: pwd, cd, mkdir
3. System commands: top, ps, df, free
4. Network & permissions: chmod, chown, ping

How to explain

"Linux commands are used to manage files, directories, system performance, and networking. For example, ls lists files, chmod manages permissions, and top shows system usage. These commands help us control and troubleshoot servers."

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8) Puzzle-based questions derived from real issues

1. Based on logical thinking
2. Test problem-solving ability
3. Often scenario-based
4. No fixed formula, focus on approach

How to explain

"Puzzle-based questions are designed to test logical thinking and real-world problem-solving. Interviewers mainly observe how we approach the problem rather than the final answer."

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9) Hands-on practice with Linux

1. Creating files and directories
2. Managing users and permissions
3. Monitoring system performance
4. Running services and processes

How to explain

"Hands-on Linux practice involves working directly on the terminal—creating files, managing users, checking system performance, and handling running services. This practical experience is crucial for real production environments."

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10) Hosting a cryptocurrency application on Linux

1. Linux server hosts the application
2. Blockchain node runs on server
3. Application exposed via web server
4. End users access through browser or API

How to explain

"A cryptocurrency application can be hosted on a Linux server where the blockchain node and backend services run. A web server exposes the application, and end users access it through a browser or APIs securely."

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LINUX COMMANDS:

1. **sudo -i**

   Switches to the root user and provides administrator privileges.

2. **cd /dir**

   Changes the directory to the specified path.

3**. cd ..**

   Moves back to the parent directory and go inside a directory.

4. **mkdir directory-name**

   Creates a new directory.

5. **vi filename**

   Creates or opens a file using the vi editor.

   To save and exit: press Esc, then type :wq!

6. **ls/ll**

   Lists files and directories in the current directory.

7. **netstat -tulpn**

   Displays network connections, listening ports, and associated processes.

8. **pwd**

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Shows the present working directory.

9. **yum install package-name -y**

Installs a package using YUM and **-y** automatically confirms with yes.

apt-get package

this is used to install in ubuntu

10. **program-name --version**

Displays the version of the installed program.

11. **df -h**

Shows disk space usage in human-readable format.

12. **ps -ef**

Displays all running processes in full format.

13. **kill -9 PID**

Forcefully terminates a running process.

14. **top**

Displays real-time system performance and resource usage.

15. **rm -rf file-name**

Deletes a file forcefully (use with caution).

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16. **rmdir directory-name**

Deletes an empty directory.

17. **vi file-name (set line numbers)**

Press Esc, then type :set nu

To save and Esc :wq!

18. **cat file-name**

Displays the contents of a file.

19. **ping domain-name**

Checks network connectivity to a domain or IP address.check if our system is in communication with other systems

20. **cd ~**

Navigates to the home directory.

21. **cd /directory-name**

Navigates to the specified directory.

22. **cp source destination**

Copies a file from one location to another.

cp -r source-dir destination-dir

23. **uptime**

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Shows how long the system has been running.

24. **history**

Displays the list of previously executed commands.

25. **curl URL**

Fetches and displays content from a URL.

26. **head -n 100 file-name**

Displays the first 100 lines of a file.

27. **tail -n 100 file-name**

Displays the last 100 lines of a file.

28. **> (overwrite)**

Overwrites existing content in a file.

29**. >> (append)**

Appends content to the end of a file.

30**.insert or i**

It lets us enter text inside the file

31. **service <application _name> start**

service <application _name> stop

service <application _name> status

service <application _name> restart

to check the application is in start,stop,restart,status.

32.**date**

To chek the date and it will show the lauch time in UTC always shows in UTC.

33**. host name**

It shows that who uses the system.