

## 1. Difference between Hardware and Software

### Hardware

Physical components of a computer

Can be touched

Examples: CPU, Keyboard, Mouse

Wears out over time

### Software

Programs and applications

Cannot be touched

Examples: Windows, Linux, MS Word

Does not wear out

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## 2. Define IP Address Range and Private Address Range

### IP Address Range

An **IP address** is a unique number used to identify a device on a network.

In IPv4, the address range is:

- **0.0.0.0 to 255.255.255.255**

### Private IP Address Range

Private IP addresses are used **inside local networks** and are not routable on the internet.

#### Class Private Range

Class A 10.0.0.0 – 10.255.255.255

Class B 172.16.0.0 – 172.31.255.255

Class C 192.168.0.0 – 192.168.255.255

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## 3. Explain Network Protocol and Port Number

### Network Protocol

A **network protocol** is a set of rules that allows devices to communicate over a network.

#### Examples:

- TCP/IP
  - HTTP
  - FTP
  - SMTP
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### Port Number

A **port number** identifies a specific service or application on a device.

### **Service Port Number**

HTTP 80

HTTPS 443

FTP 21

SSH 22

SMTP 25

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## **4. Explain Types of Network Devices**

### **1. Router**

- Connects different networks
- Routes data packets

### **2. Switch**

- Connects devices within a network
- Works using MAC addresses

### **3. Hub**

- Broadcasts data to all devices
- Less secure

### **4. Modem**

- Connects network to the internet

### **5. Firewall**

- Protects network from unauthorized access

### **6. Access Point**

- Provides wireless connectivity

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## **5. Which Tools Are Used for Data Backup and Recovery**

### **Backup Tools**

- Acronis
- Veeam
- Windows Backup

- Google Drive / OneDrive

### **Recovery Tools**

- EaseUS Data Recovery
  - Recuva
  - TestDisk
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## **6. Explain HTTP and HTTPS Protocols**

### **HTTP (HyperText Transfer Protocol)**

- Transfers data between browser and server
- **Not secure**
- Uses port **80**

### **HTTPS (HyperText Transfer Protocol Secure)**

- Secure version of HTTP
  - Uses encryption
  - Uses port **443**
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## **7. What is SSL and TLS Security?**

### **SSL (Secure Sockets Layer)**

- Encryption technology
- Secures data during transmission
- Now mostly replaced

### **TLS (Transport Layer Security)**

- Updated and more secure version of SSL
- Used in HTTPS connections

### **Purpose:**

- Prevents data theft
  - Ensures privacy and integrity
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## **8. Explain the MAC Address**

A **MAC (Media Access Control) Address** is a **unique physical address** assigned to a network device.

**Features:**

- 48-bit address
- Written in hexadecimal format  
Example: 00:1A:2B:3C:4D:5E
- Used by switches to identify devices
- Cannot be changed easily