

# BASIC NETWORKING

## -CODEVIRUS ACADEMY

Free Learning Material



# Course Introduction

Basic Networking is the foundation of Cyber Security, Ethical Hacking, Cloud Computing, and IT Infrastructure. This course explains how computers communicate with each other, how data travels over networks, and how networks are designed and secured.

## COURSE OBJECTIVES

**After completing this course, learners will:**

- Understand networking fundamentals
- Learn how data travels across networks
- Understand IP addressing and protocols
- Learn basic troubleshooting concepts
- Build a strong base for CCNA, Ethical Hacking, Cloud, and Security courses



# Who should learn this course ?

- Beginners in IT and Networking
- BCA / BTech / Diploma students
- Cyber Security aspirants
- Ethical Hacking learners
- Cloud & DevOps beginners



# Types of Networks



**LAN**  
(Local Area Network)  
Covers small areas like home,  
office, or school.



**WAN**  
(Wide Area Network)  
Covers large geographical  
areas. Example: Internet



**MAN**  
(Metropolitan Area  
Network)  
Covers a city.



**PAN**  
(Personal Area Network)  
Very small network  
(Bluetooth, mobile hotspot)

# Network Topologies

## What is Network Topology?

Topology defines how devices are arranged in a network.

## Types of Topologies:

- Bus Topology
- Star Topology
- Ring Topology
- Mesh Topology
- Hybrid Topology



# Network Devices

- **Hub:** Broadcasts data to all devices
- **Switch:** Sends data to specific devices  
More secure than hub
- **Router:** Connects different networks
- **Modem:** Converts digital signal to analog and vice versa
- **Firewall:** Protects network from unauthorized access



# OSI Model

## What is OSI Model?

OSI (Open System Interconnection) model explains how data flows in a network using 7 layers.

## OSI Layers

➤ Application

➤ Presentation

➤ Session

➤ Transport

➤ Network

➤ Data Link

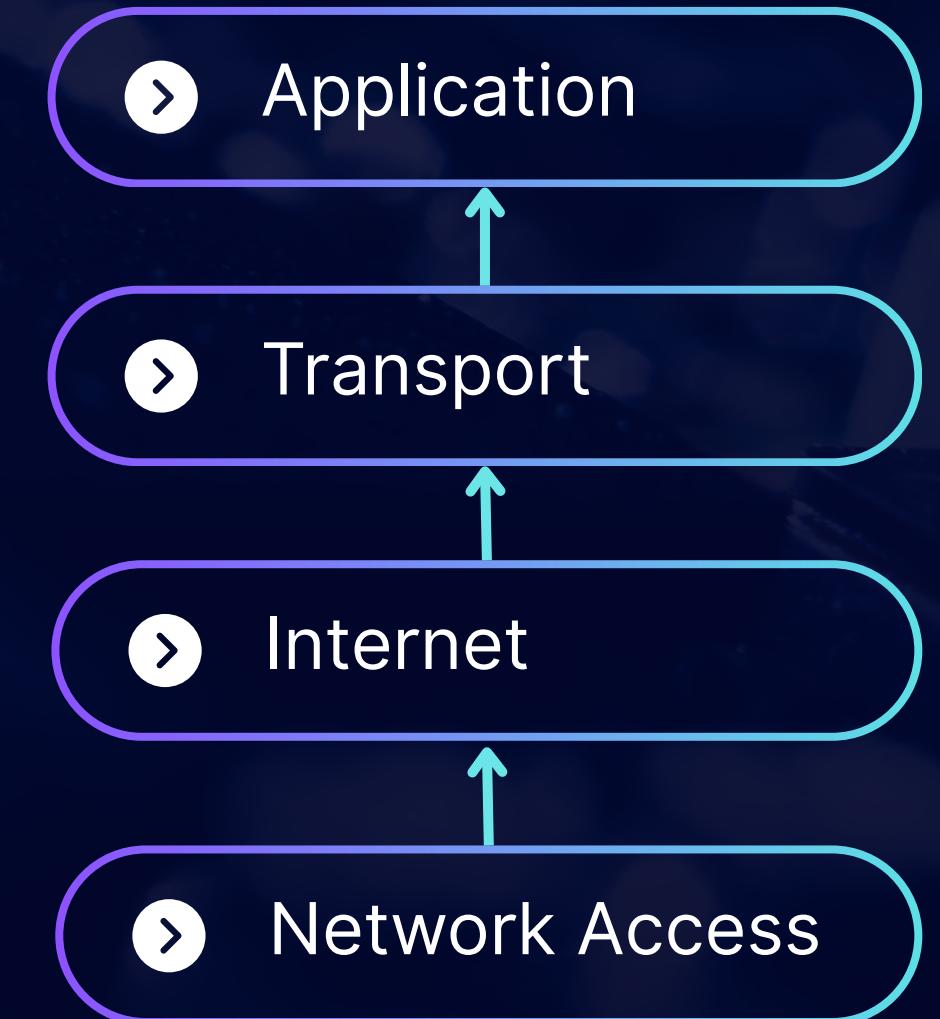
➤ Physical Layer

# TCP/IP Model

## Difference Between OSI and TCP/IP :

- OSI has 7 layers
- TCP/IP has 4 layers

## TCP/IP Model Layers



# IP Addressing

## What is a IP Address?

An IP address is a unique numerical identifier assigned to each device in a network.

- **IPv4:** 32-bit address . Example: 192.168.1.1
- **IPv6:** 128-bit address. Used due to IPv4 exhaustion

## Private IP Ranges :

- 10.0.0.0 – 10.255.255.255
- 172.16.0.0 – 172.31.255.255
- 192.168.0.0 – 192.168.255.255



# Ports & Protocols

## What is a Protocol?

A protocol defines rules for communication between devices.

## Common Protocols:

- HTTP – 80
- HTTPS – 443
- FTP – 21
- SSH – 22
- SMTP – 25
- DNS – 53



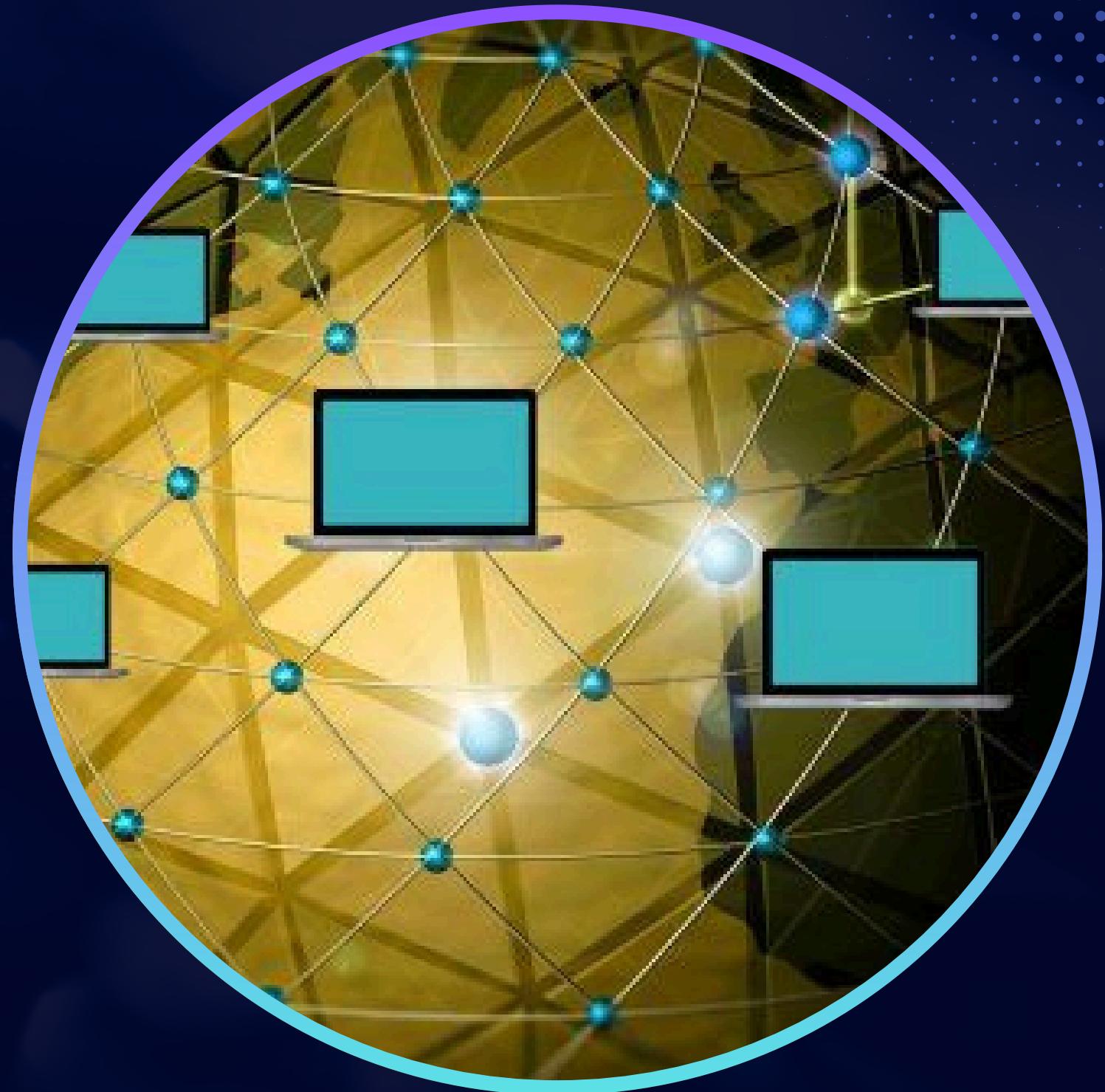
# MAC Address

## What is MAC Address?

MAC address is a unique hardware address assigned to a network interface card.

**48-bit address**

**Example:** 00:1A:2B:3C:4D:5E



# Basic Network Security

- Common Network Threats
- Malware
- Phishing
- Man-in-the-Middle attack
- Unauthorized access
- Basic Security Measures
- Strong passwords
- Firewalls
- Antivirus
- Regular updates



# Network Troubleshooting

## Common Commands

- ping – Check connectivity
- ipconfig / ifconfig – View IP configuration
- tracert / traceroute – Trace network path

## FINAL NOTE

Networking is the backbone of IT and Cyber Security.

Strong networking knowledge makes learning Ethical Hacking, CCNA, Cloud, and Security much easier.



# BASIC NETWORKING QUIZ QUESTIONS (MCQS)



## Q1. What is a computer network?

- A. A single computer
- B. A group of connected devices
- C. A software program
- D. A database

Answer: B

## Q2. Which network covers a small area like an office?

- A. WAN
- B. MAN
- C. LAN
- D. PAN

Answer: C

## Q3. Which device connects different networks?

- A. Hub
- B. Switch
- C. Router
- D. Repeater

Answer: C

## Q4. How many layers are there in the OSI model?

- A. 4
- B. 5
- C. 6
- D. 7

Answer: D

**Q5. Which layer of OSI handles routing?**

- A. Transport
- B. Network
- C. Session
- D. Application

Answer: B

**Q6. What is an IP address?**

- A. Device name
- B. Unique network identifier
- C. Password
- D. Protocol

Answer: B

**Q7. Which protocol uses port 443?**

- A. HTTP
- B. FTP
- C. HTTPS
- D. SSH

Answer: C

**Q8. Which command checks network connectivity?**

- A. netstat
- B. ping
- C. route
- D. arp

Answer: B

## Q9. MAC address is:

- A. Software-based
- B. Temporary
- C. Hardware-based
- D. Public

Answer: C



## Q10. Firewall is used to:

- A. Increase speed
- B. Store data
- C. Block unauthorized access
- D. Create IP addresses

Answer: C