

## 1. Demonstrate different types of topologies and transmission media (Packet Tracer)

ChatGPT said:

Here are the short and simple answers 🙋

1. **What is network topology?**  
Network topology is the way computers and devices are connected and arranged in a network.
2. **Name different types of network topologies.**  
Bus, Star, Ring, Mesh, Tree, and Hybrid topologies.
3. **Difference between Bus, Star, and Ring topology:**
  - **Bus:** All devices share one main cable.
  - **Star:** All devices connect to a central hub/switch.
  - **Ring:** Devices are connected in a circular path.
4. **What are transmission media?**  
It's the physical path through which data travels in a network.
5. **Difference between guided and unguided media:**
  - **Guided:** Uses cables (like copper wire, fiber).
  - **Unguided:** Uses air for wireless signals (like Wi-Fi, Bluetooth).
6. **Which transmission medium is used in wired LAN?**  
Twisted pair cable or fiber optic cable.
7. **What tool is used to simulate networks?**  
Cisco Packet Tracer.
8. **What are the uses of Packet Tracer?**  
It helps design, build, and test computer networks virtually without real hardware.
9. **How can you check connectivity between nodes?**  
By using the **ping** command or simulation mode in Packet Tracer.
10. **What happens when you change the topology type?**  
The network structure and data flow pattern change, affecting performance and connectivity.

You said:

## 2. Setup a wired LAN using Layer 2 switch

ChatGPT said:

Here are the short and simple answers 🙋

1. **What is a LAN?**  
LAN (Local Area Network) connects computers within a small area like a home, school, or office.

2. **What is the function of a Layer 2 switch?**  
It connects devices in the same LAN and forwards data using MAC addresses.
3. **What type of cable is used for LAN connection?**  
Ethernet cable (Twisted Pair cable – Cat5e or Cat6).
4. **What tool is used for testing cable connectivity?**  
LAN tester or cable tester.
5. **What is IP address configuration?**  
It's the process of assigning a unique IP address to each device in a network.
6. **How do you assign an IP address to a PC?**  
Go to network settings → select the adapter → enter the IP address, subnet mask, and gateway manually.
7. **What is the purpose of the PING command?**  
To check if one device can communicate with another on a network.
8. **What does a successful PING indicate?**  
It means the connection between the two devices is working properly.
9. **What is Wireshark used for?**  
Wireshark is used to capture and analyze network packets.
10. **What is shown in Wireshark when you capture PING packets?**  
It shows **ICMP request and reply messages** between devices.

You said:

## **Setup a WAN which contains wired as well as wireless LAN (Packet Tracer)**

ChatGPT said:

Here are the short and simple answers 🙋

1. **What is a WAN?**  
WAN (Wide Area Network) connects multiple LANs over large distances, like cities or countries.
2. **How is WAN different from LAN?**  
LAN covers a small area; WAN covers a large area and connects multiple LANs.
3. **What devices are used to connect two LANs?**  
Routers are used to connect different LANs.
4. **What is the purpose of a router in WAN?**  
A router forwards data between different networks and decides the best path for data.
5. **What is SSID?**  
SSID (Service Set Identifier) is the name of a wireless network.
6. **How do you configure a wireless LAN in Packet Tracer?**  
Add a wireless router → connect wireless PCs → set SSID and password → assign IPs.

7. **What protocol is used for wireless communication?**  
Wi-Fi uses the **IEEE 802.11** protocol.
8. **How can you check connectivity between two LANs?**  
By using the **ping** command between devices in different LANs.
9. **What is a packet in networking?**  
A packet is a small unit of data sent over a network.
10. **What does the Packet Tracer simulation show during transfer?**  
It shows how packets travel from the sender to the receiver through the network devices.

You said:

#### 4. Write a Program to Demonstrate Sub-netting and Find Subnet

ChatGPT said:

Here are the short and simple answers 👉

1. **What is subnetting?**  
Subnetting means dividing a large network into smaller parts called subnets.
2. **Why do we need subnetting?**  
It helps use IP addresses efficiently and improves network security and performance.
3. **What is a subnet mask?**  
A subnet mask separates the network part and host part of an IP address.
4. **How is subnet mask calculated?**  
It's calculated based on how many bits are borrowed from the host part for subnetting.
5. **How many hosts are available per subnet for a given mask?**  
Formula:  $2^n - 2$ , where  $n$  = number of host bits.
6. **What is CIDR notation?**  
CIDR (Classless Inter-Domain Routing) shows the number of network bits, e.g., **192.168.1.0/24**.
7. **Example of subnet mask for Class C network:**  
255.255.255.0 (/24).
8. **What is the range of private IP addresses?**
  - 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
9. **Difference between network ID and host ID:**
  - **Network ID:** Identifies the network.
  - **Host ID:** Identifies a device within that network.

10. **What command or program do you use to find the subnet mask?**

Use **ipconfig** (Windows) or **ifconfig** (Linux) command.

You said:

## 5. Write a program using TCP socket for wired network

ChatGPT said:

Here are the short and simple answers 🙋

1. **What is a socket?**

A socket is an endpoint that allows two devices to communicate over a network.

2. **What is TCP?**

TCP (Transmission Control Protocol) is a connection-oriented protocol that ensures reliable data transfer.

3. **Difference between TCP and UDP:**

- **TCP:** Reliable, connection-based.
- **UDP:** Faster, but no guarantee of delivery.

4. **Which layer uses TCP?**

The **Transport Layer** in the OSI model.

5. **Functions of socket(), bind(), listen(), and accept():**

- **socket():** Creates a socket.
- **bind():** Assigns IP and port.
- **listen():** Waits for client connections.
- **accept():** Accepts the connection request.

6. **What is a client and a server in a socket program?**

- **Client:** Sends request.
- **Server:** Receives and responds to the request.

7. **How does TCP ensure reliable data transfer?**

By using acknowledgments, sequence numbers, and retransmissions.

8. **What is a port number?**

A unique number used to identify specific network services on a device.

9. **What is the output of the 'Say Hello' program?**

It displays "Hello" message from server to client.

10. **How is file transfer verified?**

By checking if the received file matches the original file (using size or content check).

You said:

## 7. Study and Analyze HTTP, HTTPS and FTP protocol using Packet Tracer

ChatGPT said:

Here are the short and simple answers 👉

1. **What is HTTP?**  
HTTP (HyperText Transfer Protocol) is used to transfer web pages on the internet.
2. **What is HTTPS?**  
HTTPS is the secure version of HTTP that encrypts data for safe communication.
3. **What is FTP used for?**  
FTP (File Transfer Protocol) is used to upload and download files between computers.
4. **What port numbers do HTTP, HTTPS, and FTP use?**
  - HTTP: **Port 80**
  - HTTPS: **Port 443**
  - FTP: **Port 20 and 21**
5. **Main difference between HTTP and HTTPS:**  
HTTPS uses encryption for security, while HTTP sends data in plain text.
6. **What protocol provides security to HTTPS?**  
**SSL/TLS** provides encryption and security to HTTPS.
7. **What is SSL/TLS?**  
Secure Socket Layer (SSL) and Transport Layer Security (TLS) are protocols that protect data by encryption.
8. **How do you simulate these protocols in Packet Tracer?**  
Add a web and FTP server, configure HTTP/HTTPS/FTP services, and connect clients to access them.
9. **How can you test file transfer using FTP?**  
By connecting a PC to the FTP server and using the **FTP command** to upload or download files.
10. **What information can be seen in the packet details?**  
It shows source and destination IPs, ports, protocol type, and data transfer details.

You said:

## 11. Installing and Configuring DHCP server DHCP server fails?

1. **What is DHCP?**  
DHCP (Dynamic Host Configuration Protocol) automatically provides IP addresses to devices in a network.
2. **What is the function of a DHCP server?**  
It assigns IP addresses, subnet masks, gateways, and DNS details to clients automatically.

3. **What are the advantages of DHCP?**  
It saves time, reduces manual errors, and manages IPs efficiently.
4. **Difference between static and dynamic IP assignment:**
  - **Static:** IP is set manually and stays fixed.
  - **Dynamic:** IP is given automatically by DHCP and can change.
5. **What is a DHCP lease?**  
It's the time period for which an IP address is assigned to a device.
6. **Main steps of DHCP process (DORA):**  
Discover → Offer → Request → Acknowledge.
7. **How do you configure a DHCP server in Packet Tracer?**  
Add a server → turn on DHCP → set IP range, subnet mask, and gateway → connect clients.
8. **How do clients obtain IP addresses automatically?**  
Clients send a DHCP request and receive an IP from the DHCP server.
9. **What command is used to check assigned IP?**  
Use `ipconfig` (Windows) or `ifconfig` (Linux).
10. **What happens when DHCP server fails?**  
Clients won't get IP addresses, and network communication may stop.

You said:

## 12. Write a Program for DNS lookup

1. **What is DNS?**  
DNS (Domain Name System) translates website names into IP addresses.
2. **What is the purpose of DNS?**  
It helps users access websites using names (like google.com) instead of numbers (IP addresses).
3. **What is the difference between URL and IP address?**
  - **URL:** Human-readable web address.
  - **IP address:** Numerical address of a server or device.
4. **What is forward lookup?**  
It converts a domain name into an IP address.
5. **What is reverse lookup?**  
It converts an IP address back into a domain name.
6. **Which function is used in programming for DNS resolution?**  
`gethostbyname()` or `socket.gethostbyname()` in Python.
7. **What command is used to check DNS in Windows/Linux?**  
Use `nslookup` or `dig` command.

8. **What is the structure of a DNS query?**

It contains a header, question, answer, authority, and additional sections.

9. **What are the DNS record types?**

- **A:** Maps domain to IP
- **MX:** Mail server
- **CNAME:** Alias name
- **NS:** Name server

10. **What happens if DNS server is not reachable?**

Websites won't open because domain names can't be converted to IP addresses.

**You said:**