
TOPS Tech Assignment-4

Module 4: Network Fundamentals and Building Networks

Section 1: Multiple Choice:-

1. What is the primary function of a router in a computer network?
 - a. Assigning IP addresses to devices
 - b. Providing wireless connectivity to devices
 - c. Forwarding data packets between networks
 - d. Managing user authentication and access control

Ans: c) Forwarding data packets between networks

2. What is the purpose of DHCP (Dynamic Host Configuration Protocol) in a computer network?
 - a. Assigning static IP addresses to devices
 - b. Resolving domain names to IP addresses
 - c. Managing network traffic and congestion
 - d. Dynamically assigning IP addresses to devices

Ans: d) Dynamically assigning IP addresses to devices

3. Which network device operates at Layer 2 (Data Link Layer) of the OSI model and forwards data packets based on MAC addresses?
 - a. Router
 - b. Switch
 - c. Hub
 - d. Repeater

Ans: b) Switch

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4. Which network topology connects all devices in a linear fashion, with each device connected to a central cable or backbone?
- a. Star
 - b. Bus
 - c. Ring
 - d. Mesh

Ans. b) Bus

Section 2: True or False:-

5. True or False: A VLAN (Virtual Local Area Network) allows network administrators to logically segment a single physical network into multiple virtual networks, each with its own broadcast domain.

Ans. True

6. True or False: TCP (Transmission Control Protocol) is a connectionless protocol that provides reliable, ordered, and error-checked delivery of data packets over a network.

Ans. False

7. True True or False: A firewall is a hardware or software-based security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules.

Ans: True

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Section 3: Short Answer:-

8. Describe the steps involved in setting up a wireless network for a small office or home office (SOHO) environment.

Ans:

1. Choose the Internet Service:

- ➔ First, get an Internet connection from a local Internet Service Provider (ISP).
- ➔ They will give you a modem to connect to the internet.

2. Get a Wireless Router

- ➔ Buy a Wi-Fi router.
- ➔ This device helps share the internet connection wirelessly to your laptops, phones, and other devices.

3. Connect the Modem and Router:

- ➔ Plug one end of a network cable (LAN cable) into the modem.
- ➔ Plug the other end into the WAN/Internet port of your router.
- ➔ Now your router can send the internet to other devices.

4. Power On the Devices:

- ➔ Turn on the modem, router, and your computer/laptop.

Wait for a few minutes until all lights on the router turn on.

5. Open Router Settings:

- ➔ On your laptop or phone, connect to the Wi-Fi name (SSID) shown on the router box.
- ➔ Open a web browser and type the address like 192.168.1.1 or 192.168.0.1.
- ➔ Log in using the default username and password (written on the router).

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6. Set Up Wi-Fi Name and Password

- ➔ Change the Wi-Fi name (SSID) to something unique, like MyOfficeWiFi.
- ➔ Create a strong password so only authorized people can connect

7. Secure the Network

- ➔ Turn on WPA2 or WPA3 security (it protects your Wi-Fi from hackers).
- ➔ Change the router's default admin password for safety.

8. Connect All Devices

- ➔ Now connect all your devices (laptops, phones, printers) using the new Wi-Fi name and password.

9. Test the Internet

- ➔ Open any website to make sure your internet is working.
- ➔ If it's slow, try restarting the modem and router.

10. Place the Router in a Good Location

- ➔ Keep the router in the center of your home or office for better Wi-Fi coverage.
- ➔ Avoid placing it near walls or metal objects.

⇒ Now your wireless network is ready!

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Section 4: Practical Application:-

9. Demonstrate how to configure a router for Internet access using DHCP (Dynamic Host Configuration Protocol).

Ans.

→ Steps to Configure a Router Using DHCP

1. Connect the Hardware:

- Plug the internet cable from the modem into the router's WAN/Internet port.
- Connect your computer to the router using a LAN cable or Wi-Fi.

2. Open Router Settings Page:

- On your computer, open any browser.
- Type 192.168.1.1 or 192.168.0.1 in the address bar.
- Enter the username and password (written on the router).

3. Set Internet Connection Type to DHCP:

- Go to Network or Internet Settings in the router menu.
- Find “WAN Connection Type” or “Internet Type.”
- Select “Automatic IP” or “DHCP Client.”
- This allows the router to automatically get an IP address from your ISP.

4. Save and Reboot the Router:

- Click Save/Apply to confirm the settings.
- Restart the router so the changes take effect.

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5. Check Internet Connection:

- ➔ After rebooting, open the Status page.
- ➔ If you see an IP address assigned in the WAN section, it means DHCP is working.
- ➔ Open a website to confirm internet access.

6. Set Up Wi-Fi(Optional):

- ➔ Create your own Wi-Fi name (SSID) and password for security.
- ➔ Save the settings again.

Result:

Your router is now configured to get an IP address automatically using DHCP, and all your connected devices can access the Internet.

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Section 5: Essay :-

10. Discuss the importance of network documentation in the context of building and managing networks.

Ans.

Importance of Network Documentation

- ➔ Network documentation means keeping written records of all the details about a network — like what devices are used, how they are connected, and who manages them.
- ➔ It is very important when building and managing a network because it helps in many ways.

1. Easy to Understand the Network:

- ➔ Network documentation helps you know how everything is connected.
- ➔ Anyone can easily understand the setup by looking at the records.

2. Helps to Solve Problems Quickly:

- ➔ If something stops working, the document helps to find the issue fast.
- ➔ It saves time and avoids mistakes while fixing.

3. Saves Time for New People:

- ➔ When new staff or team members join, they can easily learn how the network works by reading the documents.

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4. Helps in Planning and Future Changes:

➔ When you want to add new computers or upgrade the system, the document helps plan properly without confusion.

5. Keeps Information Safe:

➔ It keeps important details like device names, connections, and settings written safely in one place.

6. Improves Security and Control

➔ It helps you know who has access to what, so you can manage and protect the network better.

In short:

Network documentation makes it easier to build, manage, repair, and improve a network in a safe and organized way.