

Assignment module 3 : Understanding and Maintenance of network

Section 1: Multiple Choice

1. What is the primary function of a router in a computer network?

ANS:- Forwarding data packets between networks

2. What is the purpose of DNS (Domain Name System) in a computer network?

ANS:- Converting domain names to IP addresses

3. What type of network topology uses a centralized hub or switch to connect all devices?

ANS:- Star

4. Which network protocol is commonly used for securely accessing and transferring files over a network?

ANS:- FTP

Section 2: True or False

5. 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

6. True or False: DHCP (Dynamic Host Configuration Protocol) assigns static IP addresses to network devices automatically.

ANS:- FALSE

7. True or False: VLANs (Virtual Local Area Networks) enable network segmentation by dividing a single physical network into multiple logical networks.

ANS:- TRUE

Section 3: Short Answer

8. Explain the difference between a hub and a switch in a computer network.

	HUB	SWITCH
Function	A hub is a basic networking device that connects multiple computers in a network. It broadcasts data to all devices connected to it.	A switch is a more advanced device that connects multiple devices in a network and uses MAC addresses to forward data only to the intended recipient.
Data Transmission	When a hub receives data from one device, it sends that data to all other devices on the network, regardless of the intended recipient.	When a switch receives data, it checks the destination MAC address and sends the data only to the specific device, reducing unnecessary traffic.
Efficiency	Hubs can lead to network congestion and collisions because all devices share the same bandwidth.	Switches are more efficient than hubs because they reduce collisions and improve overall network performance
Layer	Operates at the physical layer (Layer 1) of the OSI model.	Operates at the data link layer (Layer 2) of the OSI model, and some switches can also operate at the network layer (Layer 3).

9. Describe the process of troubleshooting network connectivity issues.

1. Identify the Problem

- Gather information from users about the symptoms they are experiencing
- Determine if the issue is affecting one device, multiple devices, or the entire network.

2. Check Physical Connections

- Inspect cables, plugs, and ports to ensure they are securely connected and undamaged.
- Verify that devices are powered on.

3. Test the Device

- Restart the device experiencing issues.
- Check if the network adapter is enabled (for computers).
- Run the built-in network troubleshooter (if available).

4. Verify Network Configuration

- Check IP configuration settings
- Use commands like `ipconfig` (Windows) or `ifconfig` (Linux/Mac) to view settings.

5. Ping Tests

- Use the ping command to test connectivity to the router and external websites (e.g., `ping 8.8.8.8`).
- If ping to the router works but not to external sites, the issue may be with the ISP.

6. Check Network Devices

- Restart the router and modem.

- Check for any warning lights on networking devices (indicators for issues).
- Access the router's interface to check for connectivity status and settings.

7. Inspect Firewall and Security Settings

- Ensure that firewall settings are not blocking network access.
- Temporarily disable any security software to see if it resolves the issue.

8. Check for Network Outages

- Contact your ISP or check their website/social media for any reported outages in your area.

9. Advanced Diagnostics

- Use traceroute (tracert on Windows, traceroute on Linux/Mac) to identify where the connection is failing.
- Analyze logs from networking devices for errors or warnings.

10. Consider Environmental Factors

- Check for physical obstructions or electronic interference if using Wi-Fi.
- Ensure that the network isn't overloaded with too many devices.

11. Review Network Policies

- If applicable, ensure that network policies (such as MAC filtering) are not preventing access.

12. Document and Report

- Keep records of the steps taken and any changes made for future reference.
- If unable to resolve, escalate the issue to higher-level support or network professionals.

Section 4: Practical Application

10. Demonstrate how to configure a wireless router's security settings to enhance network security.

ANS:- DONE

Section 5: Essay

11. Discuss the importance of network documentation and provide examples of information that should be documented.

Importance of Network Documentation

1. **Troubleshooting:** Detailed documentation helps quickly identify and resolve issues by providing a reference for network configurations and setups.
2. **Maintenance:** Regular updates and maintenance are easier to manage with accurate records of the network's components and their configurations.
3. **Security:** Documentation helps ensure that security policies are consistently applied and can be reviewed and updated as needed.
4. **Compliance:** Many industries require compliance with specific standards and regulations, which often include maintaining detailed network documentation.
5. **Training:** New IT staff can get up to speed more quickly with comprehensive documentation, reducing the learning curve and minimizing errors.

Examples of Information to Document

1. **Network Topology:** Diagrams showing the layout of the network, including devices, connections, and their relationships.
2. **IP Addressing:** A list of all IP addresses in use, including static and dynamic addresses, and their associated devices.

3. **Device Inventory:** Details of all network devices (routers, switches, firewalls, etc.), including model numbers, serial numbers, and firmware versions.
4. **Configuration Settings:** Specific settings for each device, such as VLAN configurations, routing tables, and firewall rules.
5. **Network Policies:** Security policies, access control lists (ACLs), and other rules governing network usage.