

**Assignment module 3: Understanding and Maintenance of**

**Section 1: Multiple Choice**

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

**Ans.** Forwarding data packets between networks

1. What is the purpose of DNS (Domain Name System) in a computer network?
   1. Encrypting data transmissions for security
   2. Assigning IP addresses to devices dynamically
   3. Converting domain names to IP addresses
   4. Routing data packets between network segments

**Ans.** Converting domain names to IP addresses

1. What type of network topology uses a centralized hub or switch to connect all devices?
   1. Star
   2. Bus
   3. Ring
   4. Mesh

**Ans.** Star

1. Which network protocol is commonly used for securely accessing and transferring files over a network?
   1. HTTP
   2. FTP
   3. SMTP
   4. POP3

**Ans.** FTP

**Section 2: True or False**

1. 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



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

**Ans.** True

1. 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**

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

**Ans.**

|  |  |  |
| --- | --- | --- |
| **Feature** | **Hub** | **Switch** |
| **Layer** | Physical layer (1) | Data link layer (2) |
| **Data Transmission** | Broadcasts data to all ports | Sends data only to the specific port of the intended recipient |
| **Traffic Management** | No traffic management | Uses MAC addresses for efficient traffic management |
| **Intelligence** | Dumb device, no filtering | Smart device, learns MAC addresses and maintains a MAC address table |
| **Network Efficiency** | Higher collisions and network traffic | Lower collisions and improved efficiency |
| **Full Duplex Support** | Typically supports half duplex | Supports full duplex communication |
| **Use Case** | Simple networks with low traffic | Complex networks with multiple devices and higher traffic |

**Note:** MAC Address means Media Access Control Address.

1. Describe the process of troubleshooting network connectivity issues.

**Ans.** Troubleshooting network connectivity issues typically follows these steps:

1. **Identify the Problem:** Gather details about the issue, including error messages and affected devices.

2. **Check Physical Connections:** Ensure all cables, routers, and switches are properly connected and powered on.

3. **Verify Device Settings:** Check network settings like IP address, subnet mask, and gateway.

4. **Restart Devices:** Reboot affected devices to refresh connections.

5. **Check for IP Conflicts:** Ensure no duplicate IP addresses exist on the network.

6. **Inspect Firewall and Security Settings**: Review settings that may block connections.

7. **Update Network Drivers:** Make sure network adapter drivers are current.

8. **Use Diagnostic Tools:** Utilize built-in troubleshooting tools to identify common issues.

9. **Contact ISP:** If problems persist, check with the Internet Service Provider for outages or issues.

**Section 4: Practical Application**

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

**Ans.** Hereis theprocess of wireless router security setting;

1. In this we have to first access the router setting and connect it with web browser and enter the router IP Address. Log in with user name and password.
2. Then we have to change some setting of and set the Strong password with all 12 digits and letters, numbers, and symbols.
3. Then we have to enable the MAC Address filtering and also update router Firmware and install the latest version.
4. And turn off the remote management to access the router from outside also.
5. Then we have to add a guest network for the visitors and to keep our main network secure too.
6. Then we have to check the connection of the devices in the router and also check the that network is working properly or not.
7. Then save the changes and restart the router and it’s Done.

**Section 5: Essay**

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

**Ans.** Network documentation is crucial for effective network management and troubleshooting. It helps ensure that information is readily available for maintenance, security, and scalability. Here are some key reasons why network documentation is important:

**Information to Document:-**

1. **Network Diagrams**: Visual representations of the network layout, including devices, connections, and data flows.
2. **Device Inventory**: A list of all network devices (routers, switches, firewalls, servers) including model numbers, serial numbers, and locations.
3. **IP Address Management**: Records of assigned IP addresses, subnets, and any static vs. dynamic assignments.
4. **Configuration Settings**: Documentation of device configurations, including firewall rules, VPN settings, and security protocols.
5. **User Access Controls**: Lists of users, their access levels, and permissions for different network resources.
6. **Change Logs**: Records of any changes made to the network, including who made the change, when, and what the change entailed.
7. **Network Policies and Procedures**: Guidelines for network usage, security protocols, and incident response procedures.
8. **Backup and Recovery Procedures**: Information on how to back up configurations and data, as well as recovery processes in case of a failure.
9. **Vendor Information**: Contact details for vendors and support services related to network hardware and software.
10. **Performance Metrics**: Documentation of network performance over time, including bandwidth usage and latency measurements.

By maintaining comprehensive network documentation, organizations can improve their operational efficiency, enhance security, and prepare for future growth or changes.

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