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Tops Technology

Assignment: Network Fundamentals and Building Networks

Section 1: Multiple Choice

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

Ans: c) Forwarding data packets between networks

2) What is the purpose of DHCP (Dynamic Host Configuration Protocol) in a computer network?

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?

Ans: b) Switch

4) Which network topology connects all devices in a linear fashion, with each device connected to a central cable or backbone?

Ans: b) Bus

Section 2: True or False

5) 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 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

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:

A Small Office Home Office (SOHO)
Network refers to a type of local area or LAN network connection designed for small businesses.

- **Launch Cisco Packet Tracer**:
  Open Cisco Packet Tracer on your computer.
- **Connect Devices**:
  Use the appropriate cables to connect devices. In a wireless network, devices connect wirelessly to the router and configure wireless settings.
- **Configure Wireless Router**:
  Double-click on the wireless router to open its configuration.
- **Configure DHCP**:
  Enable DHCP on the wireless router to automatically assign IP addresses to wireless devices.
  Specify the range of IP addresses to be assigned by the DHCP server.
- **For mac filtering setting:**
  In this section, they can specify a list of allowed or denied MAC addresses
  allow list configuration, only devices with MAC addresses listed in the filter will be allowed to connect to the network
  deny list configuration, devices with MAC addresses listed in the filter will be blocked from connecting to the network
- **For Firmware updates**
  Firmware updates are essential for maintaining the security, stability, and performance of network devices.
- **Save Project**:
  Once you've configured and tested the wireless network, save your Packet Tracer project for future reference.

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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:

Get the Router Address

Step 1: Get the Router Address

Make sure your computer is connected to the Internet. If your computer isn't connected to the Internet, you won't be able to view your router's address.
If your wireless connection won't work, you can connect your computer to the router.

Step 2: Open Start Windows Start
Click the Windows logo in the bottom-left corner of the screen.

Step 3: Click Settings Windows Settings
You'll find this in the bottom-left side of the Start window

Step 4 : Click Windows Network & Internet
This globe-shaped icon is on the Settings page

Step 5: Click View your network properties
It's near the bottom of the page. You may have to scroll down in order to see this option.

Step 6: Find the "Default gateway" number
This is the router's address; you'll use it to access the router's page, from which point you'll be able to change your DHCP settings.

Enable DHCP

Step 1: Open a web browser and enter your router's address
Doing so will take you to your router's page

Step 2: Log into your router's page if prompted.
Some routers are protected by a username and password. If you didn't set the password, you can usually find it in your router's manual.
You can also look up your router's model number and name online to see if you can find the default username and password.
If you set a password but no longer remember it, reset your router to restore the factory settings.

Step 3: Open your router's settings.

Each router's page will differ slightly from other routers; you'll likely find the router's settings.

Step 4: Find the DHCP section.

This will usually be in the "Network Settings" section (or your router page's equivalent). If you can't find DHCP there, look for it in the "Advanced" settings, "Setup" settings, or "Local Network" settings.

Step 5: Enable DHCP. Click the Enable switch, checkbox, or button.

In some cases, you may first have to click a Disabled drop-down box and then select Enabled from the drop-down menu.

You may also have the option to change the number of devices that can use your router. Be careful if you do this, since allowing for too few devices will result in connection errors for one or more devices.

Step 6: Save your settings

Click the Save or Apply button to save your settings. Depending on your router, you may also be prompted to restart your router in order for the changes to take place.

Configuring a DHCP Server Router(config)

Step 1: Router#configure terminal

Go into the config mode.

Step 2: Router(config)#ip dhcp pool [pool name]

Enables a DHCP pool for use by hosts

Step 3: Router(config-dhcp)#default-router [host address]

Specifies the default router for the pool to use

Step 4: Router(config-dhcp)#network [network_address][subnet mask]

Specifies the network and subnet mask of the pool

Step 5: Router(config-dhcp)#dns-server [server IP address]

Specifies the IP address of a Domain Name System (DNS)

server that is available to a DHCP client. One is required, but up to eight can be specified

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Section 5: Essay

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

Ans:

Documentation provides a clear understanding of the network's layout, including physical and logical connections between devices. This knowledge helps in troubleshooting issues, planning expansions, and optimizing performance. Networks are dynamic environments that evolve over time due to upgrades, additions, and modifications. Documentation serves as a reference for tracking changes, ensuring that updates are implemented correctly and minimizing the risk of configuration errors.

Documentation provides essential information for engaging with vendors and third-party service providers. It ensures accurate communication regarding network requirements, configurations, and support agreements, fostering productive vendor relationships.

Network documentation is indispensable for building, maintaining, and securing networks effectively. It enhances efficiency, reduces risks, and enables organizations to adapt to changing requirements with confidence.