**CA2 Network Set up using packet tracer.**

**35% of your overall CA marks**

Configure a network that includes the following devices:

5 end user devices (laptops, PCs, etc.)

1 web server

1 DHCP server

1 router

1 mail server

**Device Configuration:**

***Web Server Configuration***

IP Configuration: Static

Functionality: The web server should provide access to web pages.

Tip: You can access the web server’s web pages by selecting the server > services > HTTP.

IP Address: Configure the IP address statically within the network range you select (based on the last digit of your student number).

Example: ‘192.168.2.10’

***DHCP Server Configuration***

IP Configuration: Static

Functionality: The DHCP server will assign dynamic IP addresses to enduser devices (laptops/PCs).

IP Address: Assign a static IP within your chosen network’s range.

Example: ‘192.168.2.20’

End User Devices Configuration

Total Devices: 5 devices (laptops, PCs, etc.)

3 Devices: Should use DHCP to obtain their IP configurations.

2 Devices: Must have static IP addresses.

Example Configuration:

DHCP Devices:

Device 1: ‘192.168.2.21’ (Automatically assigned via DHCP)

Static IP Devices:

Device 4: ‘192.168.2.30’ (Static IP)

Ensure: Each device can ping each other and access the web server.

**Router Configuration**

Router IP Configuration: Static IP on at least two interfaces: one for the internal network and one for the external or "internet" side.

Example Configuration:

Internal (LAN side): ‘192.168.2.1’

External (WAN side): ‘192.168.100.1’ (Assuming a private network or configure as needed).

Functionality: The router should route traffic between the internal devices and external networks (e.g., simulate internet access or another subnet).

**Mail Server Configuration**

IP Configuration: Static

Functionality: The mail server should be set up to handle email traffic (using SMTP, IMAP, or POP3).

Example Configuration:

IP Address: ‘192.168.2.50’

Services to Enable: SMTP, IMAP (Configure via Packet Tracer’s Services tab for Mail server settings).

Network Selection:

Based on the last digit of your student number, choose one of the following network subnets for all your network devices:

|  |  |
| --- | --- |
| **Last Digit** | **Network Subnet** |
| 1 | 192.168.1.0/24 |
| 2 | 192.168.2.0/24 |
| 3 | 192.168.3.0/24 |
| 4 | 192.168.4.0/24 |
| 5 | 192.168.5.0/24 |
| 6 | 192.168.6.0/24 |
| 7 | 192.168.7.0/24 |
| 8 | 192.168.8.0/24 |
| 9 | 192.168.9.0/24 |
| 0 | 192.168.0.0/24 |
|  |  |

The subnet mask for each network should be ‘/24’ (255.255.255.0).

**Follow-up Questions:**

1. Why must the Web, DHCP, and Mail Server devices be configured with static IP configurations?

They are very important to a network, and if they were dynamic, it would take longer to find them. The servers' being static makes it quicker to find the IP.

1. What is the role of a default gateway in your network, and why must the router be configured with the default gateway IP address?

A default gateway guides the packets intended to leave the network, be they to the Internet or another external network. The router must be configured with this as it handles all the traffic.

1. What is the difference between a static route and a dynamic routing protocol and in what scenario would you use each on the router?

Network administrators configure static routes, to set a path for network traffic. They are best used in smaller, local scenarios.

Dynamic Routing Protocol automatically adjusts routes based on where traffic will flow most efficiently. They are best used in large or complex networks for scalability and adaptability.