LAB ASSIGNMENT-4

Lab 4: IP Addressing and Subnetting (VLSM) with Cisco Packet Tracer

Experiment Overview:

In this experiment, you will configure IP addressing using Variable Length Subnet Masking (VLSM) for a network. You will create subnets of different sizes to optimize IP address utilization, and configure routers and PCs to use these subnets. This will demonstrate efficient IP address allocation using VLSM.

Procedure:

Network Design and Subnetting:

1. Design the network topology:

○ Determine the IP address requirements for each subnet.

○ Calculate the subnet addresses using VLSM.

Step 1: Subnetting the Network

1. Identify the major network address:

○ Example: 192.168.0.0/24

2. Determine the number of subnets and their sizes:

○ Subnet 1 (e.g., 50 hosts): Network Address: 192.168.0.0/26 (Subnet Mask: 255.255.255.192)

○ Subnet 2 (e.g., 30 hosts): Network Address: 192.168.0.64/27 (Subnet Mask: 255.255.255.224)

○ Subnet 3 (e.g., 10 hosts): Network Address: 192.168.0.96/28 (Subnet Mask: 255.255.255.240)

○ Subnet 4 (e.g., 5 hosts): Network Address: 192.168.0.112/29 (Subnet Mask: 255.255.255.248)

Step 2: Configuring Router1

1. Select the router and open CLI.

2. Press ENTER to start configuring Router1.

3. Activate privileged mode:

○ Type enable

4. Access the configuration menu:

○ Type config t (configure terminal)

5. Configure interfaces of Router1:

○ FastEthernet0/0:

■ Type interface FastEthernet0/0

■ Configure with the IP address 192.168.0.1 and Subnet mask

255.255.255.192

○ FastEthernet0/1:

■ Type interface FastEthernet0/1

■ Configure with the IP address 192.168.0.65 and Subnet mask

255.255.255.224

6. Finish configuration:

○ Type no shutdown to activate the interfaces

Step 3: Configuring PCs

1. Assign IP addresses to each PC:

○ PC0:

■ Go to the desktop, select IP Configuration, and assign the following:

■ IP address: 192.168.0.2

■ Subnet Mask: 255.255.255.192

■ Default Gateway: 192.168.0.1

○ PC1:

■ Go to the desktop, select IP Configuration, and assign the following:

■ IP address: 192.168.0.66

■ Subnet Mask: 255.255.255.224

■ Default Gateway: 192.168.0.65

Step 4: Connecting PCs with Router

1. Connect the devices using copper straight-through cables:

○ Connect FastEthernet0 port of PC0 to FastEthernet0/0 port of Router1

○ Connect FastEthernet0 port of PC1 to FastEthernet0/1 port of Router1

Configuration Tables

Simulation of Designed Network Topology

Sending a PDU from PC0 to PC1

1. Open the simulation mode in Packet Tracer.

2. Send a PDU from PC0 to PC1:

○ Observe the packet traveling from PC0 to the router and then to PC1.

Acknowledgment from PC1 to PC0

1. Observe the acknowledgment packet:

○ Ensure that the acknowledgment packet travels back from PC1 to PC0,

confirming successful communication.