ROLL NUMBER-220701049

PRACTICAL-9

AIM:- Implementation of SUBNETTING in CISCO PACKET TRACER simulator.

PROCEDURE:-

Step 1: Creating a Network Topology

1. Open Cisco Packet Tracer and create a new project by clicking File > New.
2. Click on Network Devices at the bottom left, then Generic to start a blank topology.

Step 2: Adding Devices

1. Add Routers: Drag two routers (e.g., Router-PT) onto the workspace.
2. Add Switches: Drag two switches (e.g., Switch-PT) onto the workspace.
3. Add PCs: Drag five PCs per subnet onto the workspace, creating two groups (one for each subnet).
4. Connect Devices: Use cables to connect devices:
    - Use copper straight-through cables to connect PCs to switches.
    - Use a crossover cable to connect routers if needed.
    - Connect switches to routers using straight-through cables.

Step 3: Subnetting the Network

To create smaller subnets from 192.168.1.0/24:

1. Use a /27 subnet mask (255.255.255.224) to create subnets with 30 host addresses each.
2. Subnets:
    - 192.168.1.0/27: IP range for the first group (e.g., PCs and switch 1).
    - 192.168.2.0/27: IP range for the second group (e.g., PCs and switch 2).
3. Assign IPs:
    - Router R1:
        - GigabitEthernet0/0: 192.168.1.1
        - GigabitEthernet0/1: 192.168.2.1
    - Router R2:

        - FastEthernet0/0: 192.168.3.1
        - FastEthernet0/1: 192.168.4.1
    - Switch S1: 192.168.1.0/27
        - PC1: 192.168.1.11
        - PC2: 192.168.1.12
        - PC3: 192.168.1.13
        - PC4: 192.168.1.14
        - PC5: 192.168.1.15
    - Switch S2: 192.168.3.0/27
        - PC1: 192.168.3.11
        - PC2: 192.168.3.12
        - PC3: 192.168.3.13
        - PC4: 192.168.3.14
        - PC5: 192.168.3.15

Step 4: Configuring Routers

1. Right-click on each router and select CLI to open the command-line interface.
2. Enter configuration commands for each router:

For Router R1:

- enable
- configure terminal
- interface GigabitEthernet0/0
- ip address 192.168.1.1 255.255.255.224
- no shutdown
- exit
- interface GigabitEthernet0/1
- ip address 192.168.2.1 255.255.255.224
- no shutdown
- exit

For Router R2:

- enable
- configure terminal
- interface FastEthernet0/0
- ip address 192.168.3.1 255.255.255.224
- no shutdown
- exit
- interface FastEthernet0/1
- ip address 192.168.4.1 255.255.255.224
- no shutdown
- exit

Step 5: Configuring Switches

1. Right-click on each switch and select CLI.
2. Enter configuration commands for each switch

- enable
- configure terminal
- interface FastEthernet0/1
- switchport mode access
- exit
- interface FastEthernet0/2
- switchport mode access
- exit

Step 6: Configuring PCs

1. Right-click on each PC and select Config.
2. Assign IP Addresses, Subnet Masks, and Gateways:
    - For PCs on 192.168.1.0/27, set:
        - IP Address: 192.168.1.11, 192.168.1.12, etc.
        - Subnet Mask: 255.255.255.224
        - Default Gateway: 192.168.1.1
    - For PCs on 192.168.3.0/27, set:
        - IP Address: 192.168.3.11, 192.168.3.12, etc.
        - Subnet Mask: 255.255.255.224
        - Default Gateway: 192.168.3.1

Step 7: Testing the Network

1. Open the command prompt on each PC.
2. Ping other devices to test connectivity:
    - From each PC, try pinging the other PCs within its subnet.
    - Ping between PCs connected to different routers if routing is set up between routers.

OUTPUT:-