COMPUTER NETWORKS LAB FIVE REPORT

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B. TECH COMPUTER SCIENCE AND ENGINEERING (SEC-C 3RD YEAR, 5TH SEMESTER)
(FROM SRM INSTITUTE OF SCIENCE AND TECHNOLOGY – TRICHY)

Objective

This lab focuses on the configuration of static and default routing to facilitate communication between different network segments. Utilizing Cisco Packet Tracer, we will create a network with two routers and two PCs connected to each router. Static and default routing will be configured on both routers to ensure successful data transfer between the PCs on different networks.

Procedure

Network Design:

- **Router1** is connected to **Router2**.

- **PC0** is connected to **Router1**.

- **PC1** is connected to **Router2**.

IP Addressing Scheme:

- **Router1 to Router2 Link**: 192.168.1.0/30

- **PC0 Network**: 192.168.10.0/24

- **PC1 Network**: 192.168.20.0/24

Step 1: Configure Network Addresses

1. **Router1 to Router2 Link**:

   - Network Address: 192.168.1.0/30

2. **PC0 Network**:

   - Network Address: 192.168.10.0/24

3. **PC1 Network**:

   - Network Address: 192.168.20.0/24

Step 2: Configuring Router1

1. **Access CLI of Router1**:

   - Press ENTER to start configuration.

2. **Activate Privileged Mode**:

   - Type enable.

3. **Access Configuration Mode**:

   - Type config t.

4. **Configure Interfaces**:

   o **FastEthernet0/0** (connected to PC0):

      ▪ Command: interface FastEthernet0/0

      ▪ IP: 192.168.10.1

      ▪ Subnet Mask: 255.255.255.0

   o **Serial0/0/0** (connected to Router2):

      ▪ Command: interface Serial0/0/0

      ▪ IP: 192.168.1.1

      ▪ Subnet Mask: 255.255.255.252

5. **Activate Interfaces**:

   - Command: no shutdown

Step 3: Configuring Router2

1. **Access CLI of Router2**:

   - Press ENTER to start configuration.

2. **Activate Privileged Mode**:

   - Type enable.

3. **Access Configuration Mode**:

   - Type config t.

4. **Configure Interfaces**:

- **FastEthernet0/0** (connected to PC1):
  - Command: interface FastEthernet0/0
  - IP: 192.168.20.1
  - Subnet Mask: 255.255.255.0

- **Serial0/0/0** (connected to Router1):
  - Command: interface Serial0/0/0
  - IP: 192.168.1.2
  - Subnet Mask: 255.255.255.252

5. **Activate Interfaces**:

- Command: no shutdown

Step 4: Configuring PCs

1. **PC0 Configuration**:

- Go to the desktop of PC0, select **IP Configuration**, and assign:
  - IP Address: 192.168.10.2
  - Subnet Mask: 255.255.255.0
  - Default Gateway: 192.168.10.1

2. **PC1 Configuration**:

- Go to the desktop of PC1, select **IP Configuration**, and assign:
  - IP Address: 192.168.20.2
  - Subnet Mask: 255.255.255.0
  - Default Gateway: 192.168.20.1

Step 5: Static Routing Configuration

1. **Configure Static Routes on Router1**:

   - Command: ip route 192.168.20.0 255.255.255.0 192.168.1.2

2. **Configure Static Routes on Router2**:

   - Command: ip route 192.168.10.0 255.255.255.0 192.168.1.1

Step 6: Default Routing Configuration

1. **Configure Default Route on Router1**:

   - Command: ip route 0.0.0.0 0.0.0.0 192.168.1.2

2. **Configure Default Route on Router2**:

   - Command: ip route 0.0.0.0 0.0.0.0 192.168.1.1

Step 7: Verify Connectivity

1. **Ping from PC0 to PC1**:

   - Open the command prompt on PC0 and type: ping 192.168.20.2
   - Observe the response.

2. **Ping from PC1 to PC0**:

   - Open the command prompt on PC1 and type: ping 192.168.10.2
   - Observe the response.

Simulation of Designed Network Topology

1. **Sending a PDU from PC0 to PC1**:

   - Open **Simulation Mode** in Packet Tracer.
   - Send a PDU from PC0 to PC1 and observe the packet travel from PC0 to Router1, Router2, and finally PC1.

2. **Acknowledgment Packet**:

   - Observe the acknowledgment packet traveling from PC1 back to PC0, confirming successful communication between the devices.

Screenshots

Router-PT
R0

Router-PT
R1

2960-24TT
Switch0

2960-24TT
Switch1

PC-PT
PC0

PC-PT
PC1

Router-PT
R0

Router-PT
R1

2960-24TT
Switch0

2960-24TT
Switch1

PC-PT
PC0

PC-PT
PC1

Top diagram:

Router-PT
R0

Router-PT
R1

2960-24TT
Switch0

2960-24TT
Switch1

PC-PT
PC0

PC-PT
PC1

Bottom diagram:

Router-PT
R0

Router-PT
R1

2960-24TT
Switch0

2960-24TT
Switch1

PC-PT
PC0

PC-PT
PC1

Router-PT
R0

Router-PT
R1

2960-24TT
Switch0

2960-24TT
Switch1

PC-PT
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Router-PT
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Router-PT
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2960-24TT
Switch1

PC-PT
PC0

PC-PT
PC1