Year/Sem/Batch: III/V/P

Introduction to Packet Tracer

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i) **Connect two PCs with a crossover cable and verify connectivity using the ping command.**

Steps:

1. Open Packet Tracer.
2. Drag and drop two PCs onto the workspace.
3. Connect them with a crossover cable.
4. Assign IP addresses:
5. PC1: 192.168.1.1 / 255.255.255.0
6. PC2: 192.168.1.2 / 255.255.255.0
7. Use the Command Prompt on PC1 and run:
8. ping 192.168.1.2
9. You should get successful replies.

ii) **Connect multiple PCs to a switch and ensure they can communicate. Steps:**

1. Place 1 switch and 3 PCs on the workspace.
2. Connect each PC to the switch using copper straight-through cables.
3. Assign IPs:
   - PC1: 192.168.10.1
   - PC2: 192.168.10.2
   - PC3: 192.168.10.3
4. Ping each PC from the others.

iii) **Use a router to connect two different networks and allow communication between them.**

Steps:

1. Place 1 router and 2 PCs.
2. Connect:
   - PC1 to Router's FastEthernet0/0
   - PC2 to Router's FastEthernet0/1
3. Assign IPs:
   - Router fa0/0: 192.168.1.1
   - Router fa0/1: 192.168.2.1
   - PC1: 192.168.1.2 (Gateway: 192.168.1.1)
   - PC2: 192.168.2.2 (Gateway: 192.168.2.1)

4. Use the CLI to enable router interfaces:

```
enable
configure terminal
interface fa0/0
ip address 192.168.1.1 255.255.255.0
no shutdown
exit
interface fa0/1
ip address 192.168.2.1 255.255.255.0
no shutdown
```

5. Test connectivity using ping.

iv) Use a DHCP server to automatically assign IP addresses to clients.

Steps:

1. Place 1 DHCP server, 1 switch, and 2 PCs.
2. Connect all devices to the switch.
3. Configure the DHCP server with:
   - IP: 192.168.100.1
   - Subnet: 255.255.255.0
   - Pool Range: 192.168.100.10 - 192.168.100.50
   - Default Gateway: 192.168.100.1
4. Set the PCs to get IP via DHCP (automatic).
5. Verify the PCs receive IPs and can ping each other.

v) Access a web page hosted on a local web server.

Steps:

1. Place 1 web server, 1 switch, and 1 PC.
2. Connect them via the switch.
3. Assign:
   - Web Server: 192.168.0.10
   - PC: 192.168.0.2 (Gateway not needed in this LAN)
4. On the web server, configure the HTTP service (default is ON).
5. On the PC, open the Web Browser and enter:
6. http://192.168.0.10
7. You should see a test page.

vi) Connect two LANs (representing two branch offices) using a WAN link (serial connection) between routers, and enable full communication between PCs in each LAN.

Devices Required:

- 2 Routers
- 2 Switches
- 4 PCs (2 at each site)

- Serial cable
- Ethernet cables

Device	Interface	IP Address	Subnet Mask
PC1	NIC	192.168.1.2	255.255.255.0
PC2	NIC	192.168.1.3	255.255.255.0
Router1	G0/0	192.168.1.1	255.255.255.0
Router1	Serial0/0/0	10.0.0.1	255.0.0.0
Router2	Serial0/0/0	10.0.0.2	255.0.0.0
Router2	G0/0	192.168.2.1	255.255.255.0
PC3	NIC	192.168.2.2	255.255.255.0
PC4	NIC	192.168.2.3	255.255.255.0

1. Setup the Devices

- Place 2 routers, 2 switches, and 4 PCs in Packet Tracer.
- Connect:
  - PC1 and PC2 to Switch1
  - PC3 and PC4 to Switch2
  - Switch1 to Router1's GigabitEthernet0/0
  - Switch2 to Router2's GigabitEthernet0/0
  - Connect Router1 Serial0/0/0 to Router2 Serial0/0/0 with a Serial DCE cable

2. Assign IP Addresses

- Configure IPs on PCs via the desktop > IP Configuration.
- Configure router interfaces using the CLI:

Router1 CLI:

```
enable
configure terminal
interface gig0/0
ip address 192.168.1.1 255.255.255.0
no shutdown
exit
interface serial0/0/0
ip address 10.0.0.1 255.0.0.0
clock rate 64000
no shutdown
exit
```

Router2 CLI:

```
enable
configure terminal
interface gig0/0
ip address 192.168.2.1 255.255.255.0
```

no shutdown
exit
interface serial0/0/0
ip address 10.0.0.2 255.0.0.0
no shutdown
exit

3. Configure Static Routing (So the routers know about each other's LANs)

On Router1:

ip route 192.168.2.0 255.255.255.0 10.0.0.2

On Router2:

ip route 192.168.1.0 255.255.255.0 10.0.0.1

4. Set Default Gateway on PCs

PC1 and PC2:

- **Default Gateway: 192.168.1.1**

PC3 and PC4:

- **Default Gateway: 192.168.2.1**

5. Test Connectivity

- **Open PC1 or PC2 and run:**
- **ping 192.168.2.2**
  ping 192.168.2.3

vii) **Configure a Router-Based Network with DHCP and Inter-Network Communication**
Using Cisco Packet Tracer, design and configure a network with two LANs connected through a router.
Requirements:

1. **Create two LANs, each containing:**
   1 Router
   2 Switches or 1 Switch
   3–4 PCs
2. **Assign suitable IP addresses and subnet masks to both LANs.**
3. **Configure the router interfaces with appropriate IP addresses.**
4. **Configure DHCP on the router so that PCs automatically receive IP addresses.**
5. **Configure routing between the two LANs.**
6. **Verify communication between PCs in different networks using ping.**
7. **Use commands such as ipconfig, ping, and show ip interface brief to verify and troubleshoot the configuration.**

Task:

a. **Configure the complete network and demonstrate successful communication between the two LANs. If communication fails, identify the cause and troubleshoot the configuration.**
   Suggested addressing:
   LAN 1: 192.168.10.0/24
   LAN 2: 192.168.20.0/24