

EAST WEST UNIVERSITY

Course Name: Data Communications
Course Code: CSE350

Instructor: Md. Khalid Mahbub Khan
Lecturer
Department of CSE

Lab Topic: Routing Configurations & Protocols with DHCP Server

Mim Bin Hossain (UTA)

1 Design Implementation

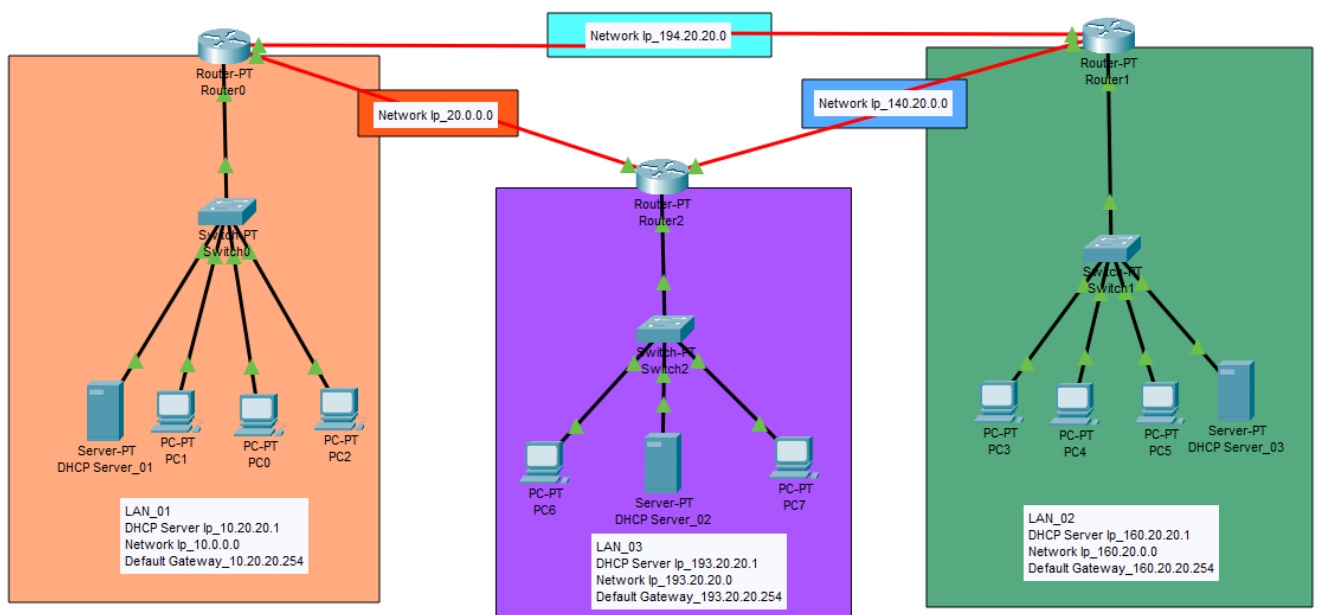


Figure 1: LAN Topology

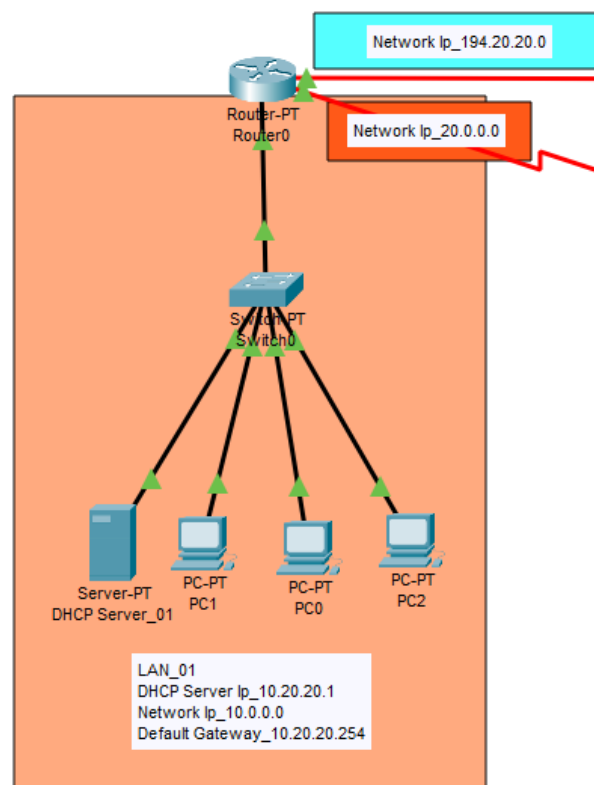
2 IP Address Allocation

The following table outlines the network topology used, including three networks and six host IP addresses, as shown below:

Network IP	DHCP Server IP
10.0.0.0	10.20.20.1
20.0.0.0	160.20.20.1
140.20.0.0	193.20.20.1
140.20.0.0	-
160.20.0.0	-
194.20.20.0	-

3 Consider Configuration of Networks and Protocols

3.1 Design of LAN 01



3.2 Configuration of the LAN 01 with FastEthernet (Fa)

```
interface fa0/0
ip address 10.20.20.254 255.0.0.0
no shut
do wr
exit
```

3.3 Configuration of the LAN 01 with Serial (Se)

```
interface se2/0
ip address 194.20.20.5 255.255.255.0
clock rate 6400
no shut
do wr
exit

interface se3/0
ip address 20.20.20.3 255.0.0.0
no shut
do wr
exit
```

3.4 Using Static Routing Protocol of the LAN 01

```
ip route 160.20.0.0 255.255.0.0 194.20.20.6
ip route 193.20.20.0 255.255.255.0 20.20.20.4
exit
```

3.5 Using RIP Protocol of the LAN 01

```
router rip
network 10.0.0.0
network 20.0.0.0
network 194.20.20.0
exit
```

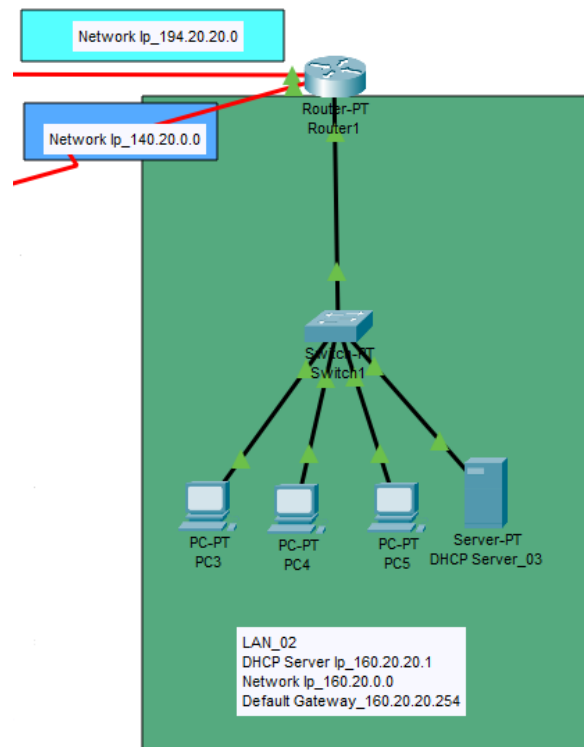
3.6 Using EIGRP Protocol of the LAN 01

```
router eigrp 1
network 10.0.0.0 0.255.255.255
network 20.0.0.0 0.255.255.255
network 194.20.20.0 0.0.0.255
exit
```

3.7 Using OSPF Protocol of the LAN 01

```
router ospf 1
network 10.0.0.0 0.255.255.255 area 1
network 20.0.0.0 0.255.255.255 area 1
network 194.20.20.0 0.0.0.255 area 1
exit
```

3.8 Design of LAN 02



3.9 Configuration of the LAN 02 with FastEthernet (Fa)

```
interface fa0/0
ip address 160.20.20.254 255.255.0.0
no shut
do wr
exit
```

3.10 Configuration of the LAN 02 with Serial (Se)

```
interface se2/0
ip address 140.20.20.6 255.255.0.0
no shut
do wr
exit
```

```
interface se3/0
ip address 194.20.20.6 255.255.255.0
no shut
do wr
exit
```

3.4 Using Static Routing Protocol of the LAN 02

```
ip route 10.0.0.0 255.0.0.0 194.20.20.5
ip route 193.20.20.0 255.255.255.0 140.20.20.5
exit
```

3.11 Using RIP Protocol of the LAN 02

```
router rip
network 140.20.0.0
network 160.20.0.0
network 194.20.20.0
exit
```

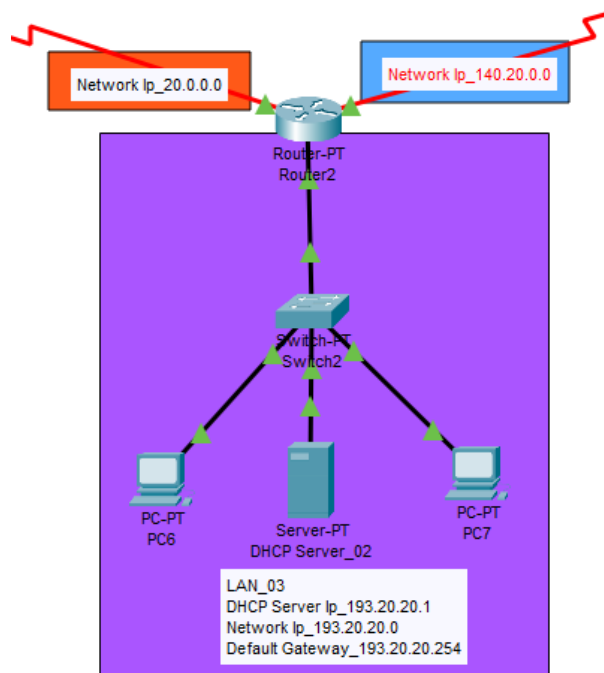
3.12 Using EIGRP Protocol of the LAN 02

```
router eigrp 1
network 140.20.0.0 0.0.255.255
network 160.20.0.0 0.0.255.255
network 194.20.20.0 0.0.0.255
exit
```

3.13 Using OSPF Protocol of the LAN 02

```
router ospf 1
network 140.20.0.0 0.0.255.255 area 1
network 160.20.0.0 0.0.255.255 area 1
network 194.20.20.0 0.0.0.255 area 1
exit
```

3.8 Design of LAN 03



3.9 Configuration of the LAN 03 with FastEthernet (Fa)

```
interface fa0/0
ip address 193.20.20.254 255.255.255.0
no shut
do wr
exit
```

3.10 Configuration of the LAN 03 with Serial (Se)

```
interface se2/0
ip address 140.20.20.5 255.255.0.0
clock rate 6400
no shut
do wr
exit

interface se3/0
ip address 20.20.20.4 255.0.0.0
clock rate 6400
no shut
do wr
exit
```

3.4 Using Static Routing Protocol of the LAN 03

```
ip route 10.0.0.0 255.0.0.0 20.20.20.3
ip route 160.20.20.0 255.255.0.0 140.20.20.6
exit
```

3.11 Using RIP Protocol of the LAN 03

```
router rip
network 20.0.0.0
network 140.20.0.0
network 193.20.20.0
exit
```

3.12 Using EIGRP Protocol of the LAN 03

```
router eigrp 1
network 20.0.0.0 0.255.255.255
network 140.20.0.0 0.0.255.255
network 193.20.20.0 0.0.0.255
exit
```

3.13 Using OSPF Protocol of the LAN 03

```
router ospf 1
network 20.0.0.0 0.255.255.255 area 1
network 140.20.0.0 0.0.255.255 area 1
network 193.20.20.0 0.0.0.255 area 1
exit
```

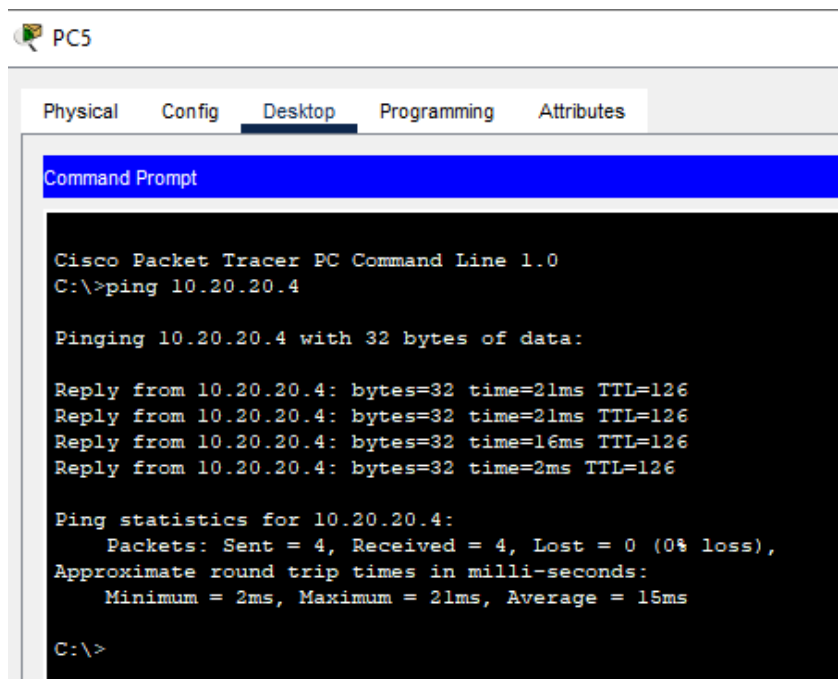
4 Ping Operation

Ping (Packet Internet Groper) is a network utility used to test the reachability of a host on an IP network and to measure the round-trip time for messages sent from the originating host to a destination computer. The basic function of the ping command is to send a series of Internet Control Message Protocol (ICMP) Echo Request messages to a target host and wait for ICMP Echo Reply messages. After configuring the network as described, the ping command is used to test connectivity. The primary test is to ping from PC5(160.20.20.2) Router1 router to PC1(10.10.10.4) Router0.

Steps:-

- Open the command prompt on PC5
- Execute the command: ping 10.10.10.4

- Observe the ping results
- The ping command should display successful replies from PC0, indicating that ICMP packets have traversed the network from PC5 to PC1 and back without issues.



The screenshot shows the 'PC5' window in Cisco Packet Tracer. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The command prompt shows the execution of the 'ping 10.20.20.4' command, resulting in four successful replies and a summary of ping statistics.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.20.20.4

Pinging 10.20.20.4 with 32 bytes of data:

Reply from 10.20.20.4: bytes=32 time=21ms TTL=126
Reply from 10.20.20.4: bytes=32 time=21ms TTL=126
Reply from 10.20.20.4: bytes=32 time=16ms TTL=126
Reply from 10.20.20.4: bytes=32 time=2ms TTL=126

Ping statistics for 10.20.20.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 21ms, Average = 15ms

C:\>
```

This output shows successful communication with the target host, indicating that the network is functioning correctly between the two points.