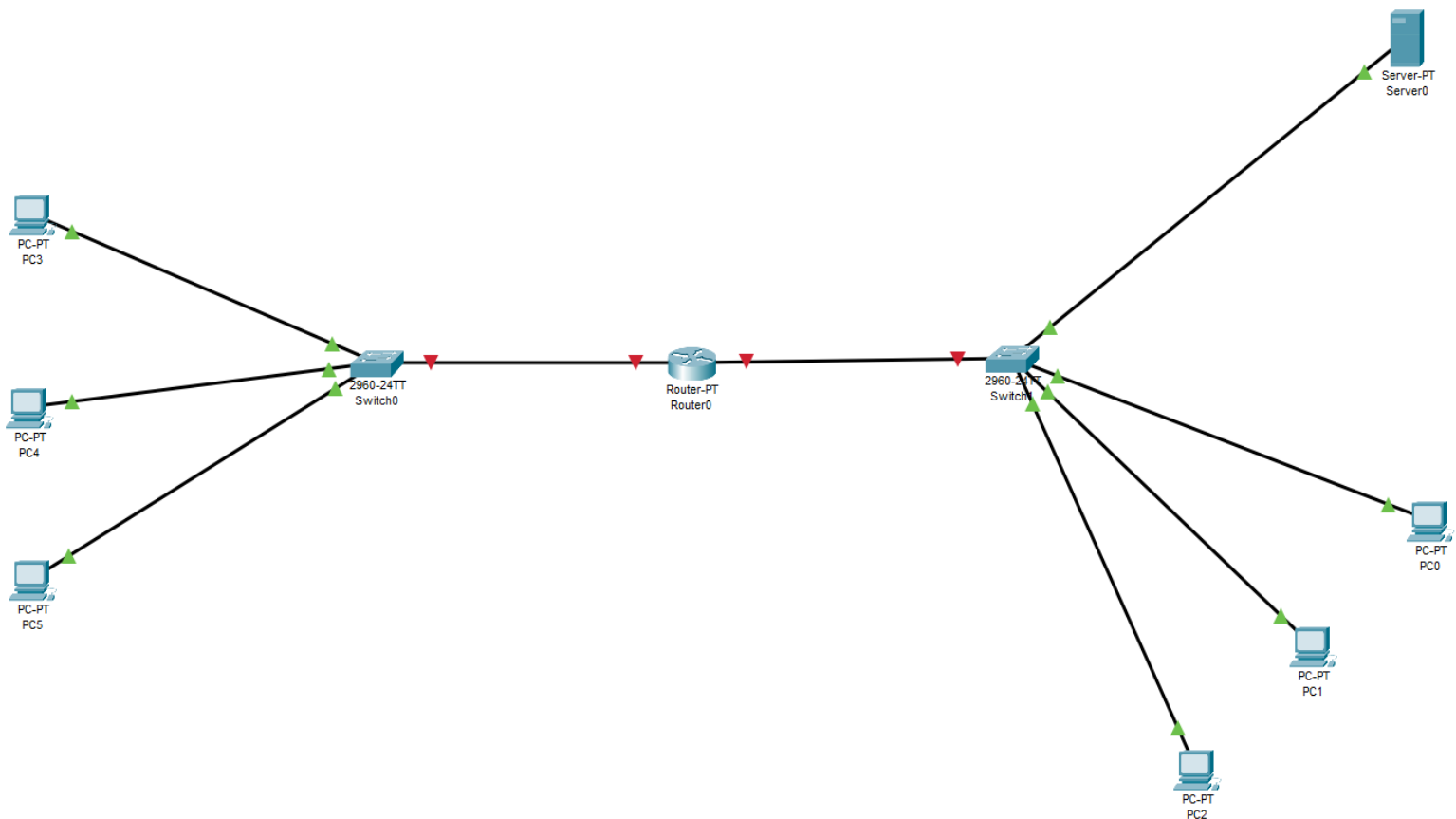# Assignment 2

Name: Muhammad Maaz Khan

Class: Se-5B

Roll: Se-221053

Course: **Computer Networks**
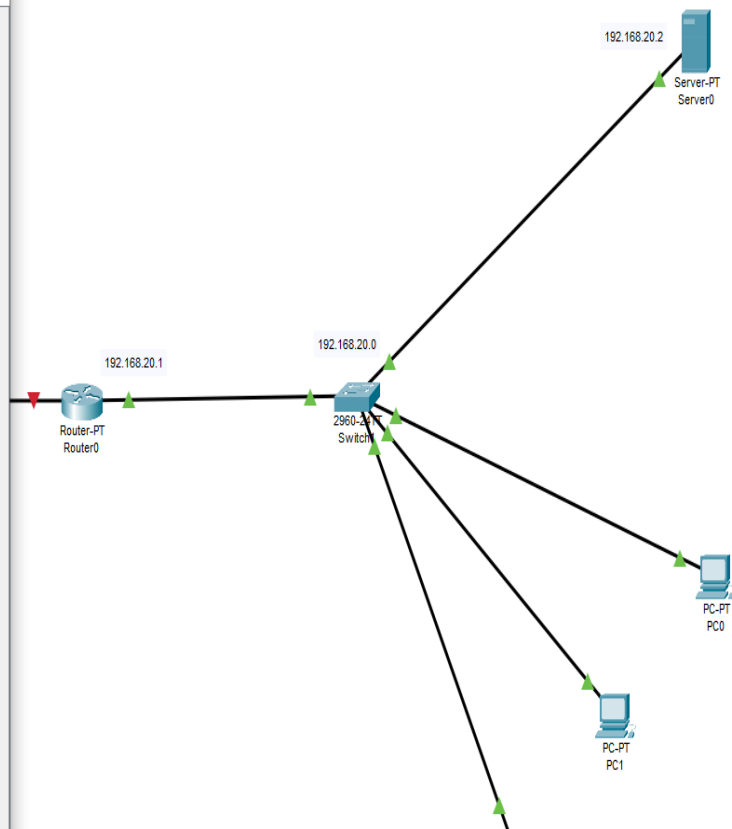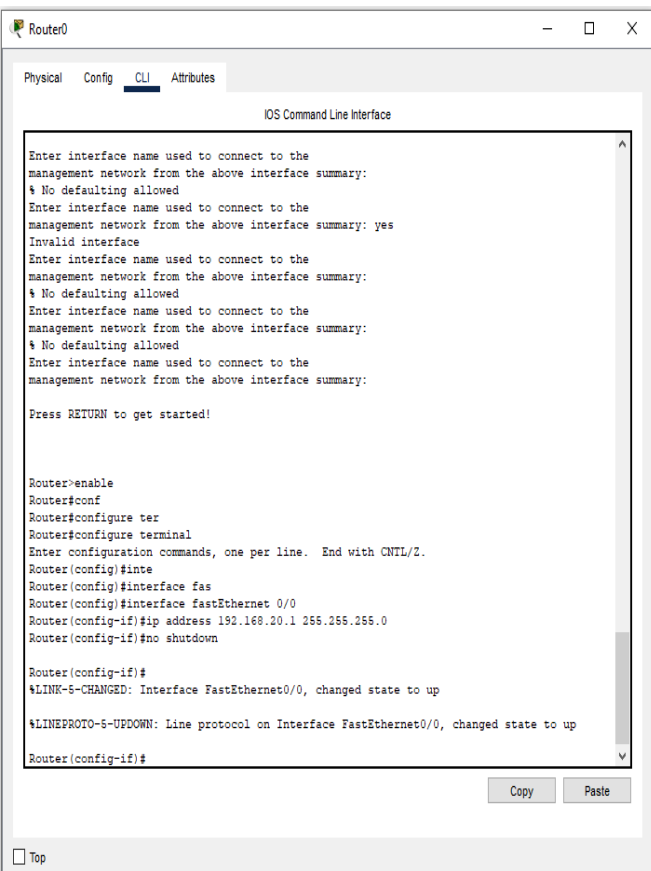*By* **Sir Wilayat**

Adjusting the Topology

I connected two switches, one router, one server, and three PCs. The PCs are connected to the switch using copper straight-through cables.
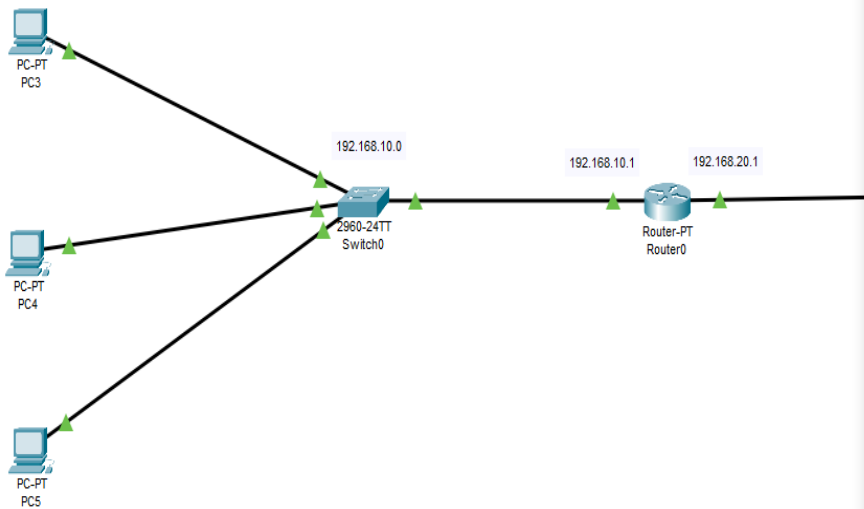
Their Link is Down (RED).

Configure the Router

Configure the Interface Connected to Switch1 (FastEthernet 0/0):

Configure the Interface Connected to Switch0 (FastEthernet 0/1):

Set the Router as a DHCP Relay:


```
Router(config)#interface fastEthernet 1/
                                       ^
% Invalid input detected at '^' marker.

Router(config)#interface fastEthernet 1/0
Router(config-if)#ip address 192.168.10.1 255.255.255.0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet1/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up

Router(config-if)#exit
Router(config)#inte
Router(config)#interface fast
Router(config)#interface fastEthernet 0
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip hel
Router(config-if)#ip help
Router(config-if)#ip helper-address 192.168.20.2
Router(config-if)#exit
Router(config)#inte
Router(config)#interface fa
Router(config)#interface fastEthernet 0/0
Router(config-if)#no ip hel
Router(config-if)#no ip helper
Router(config-if)#no ip helper-address 192.168.20.2
Router(config-if)#exit
Router(config)#inte
Router(config)#interface fas
Router(config)#interface fastEthernet 0/1
%Invalid interface type and number
Router(config)#interface fastEthernet 1/0
Router(config-if)#ip helper-address 192.168.20.2
Router(config-if)#exit
Router(config)#
```
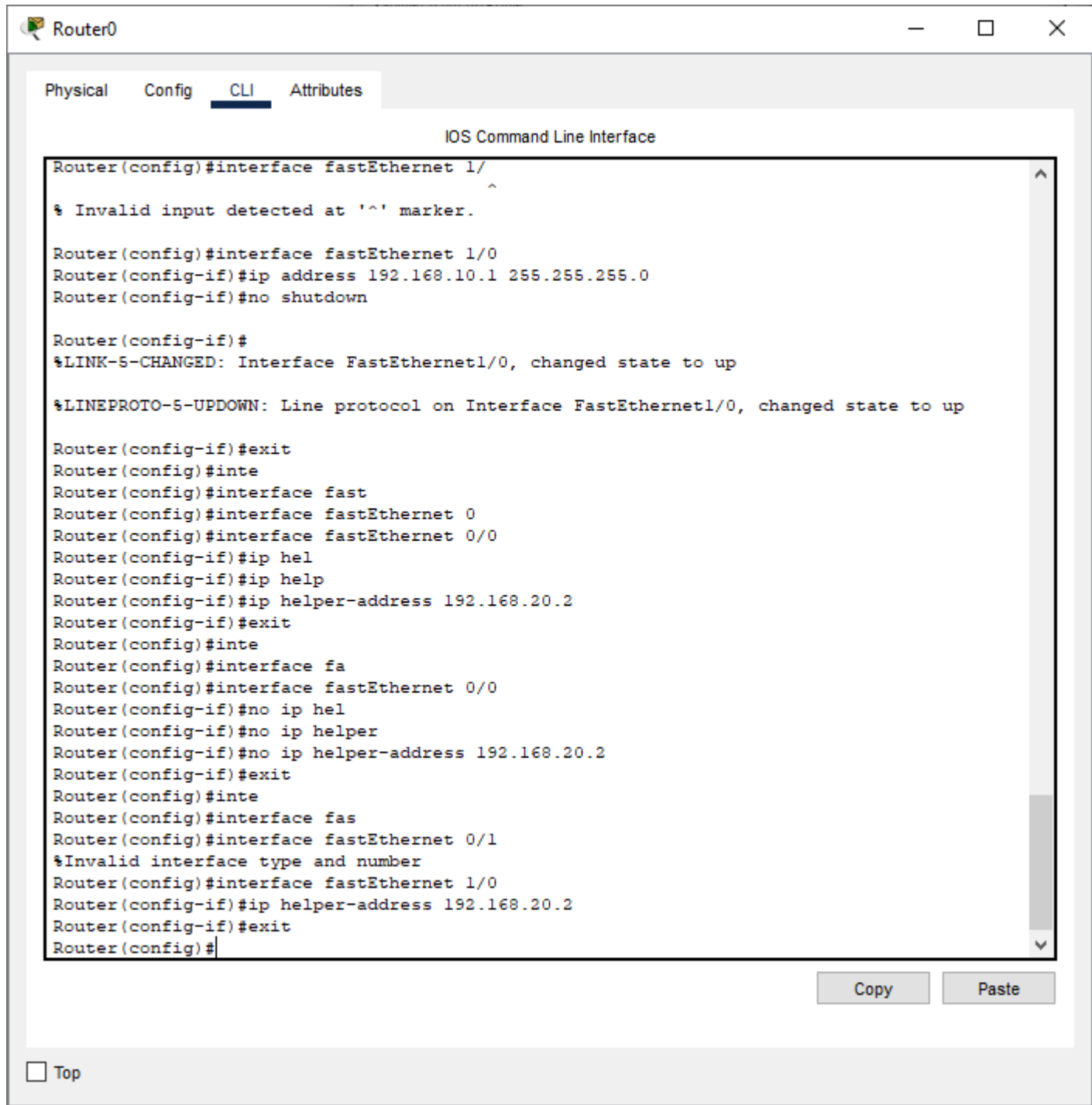
192.168.20.2 is the static IP address of the DHCP server.

The router is configured with two interfaces, each assigned to different subnets: 192.168.10.0/24 for clients connected to Switch0, and 192.168.20.0/24 for the DHCP server and clients connected to Switch1. The ip helper-address command on FastEthernet 1/0 is used to forward DHCP requests from clients in the 192.168.10.0/24 subnet to the DHCP server at 192.168.20.2. This setup enables dynamic IP assignment across both subnets.

Configure the DHCP Server:

Once the router configuration is complete, proceed to the DHCP server setup.

Assign a static IP address to the DHCP server within the **192.168.20.0/24** subnet.

Example: **192.168.20.2/24**

Server0 — □ ✕

Physical   Config   Services   **Desktop**   Programming   Attributes

IP Configuration   X

IP Configuration

○ DHCP   ● Static

IPv4 Address   192.168.20.2

Subnet Mask   255.255.255.0

Default Gateway   192.168.20.1

DNS Server   0.0.0.0

IPv6 Configuration

○ Automatic   ● Static

IPv6 Address   [   ] / [   ]

Link Local Address   FE80::207:ECFF:FE1A:5638

Default Gateway   [   ]

DNS Server   [   ]

802.1X

☐ Use 802.1X Security

Authentication   MD5   ⌄

Username   [   ]

Password   [   ]

☐ Top

For 192.168.10.0 Network

Server0 — ☐ ✕

| Physical | Config | Services | Desktop | Programming | Attributes |

SERVICES

| HTTP |
| DHCP |
| DHCPv6 |
| TFTP |
| DNS |
| SYSLOG |
| AAA |
| NTP |
| EMAIL |
| FTP |
| IoT |
| VM Management |
| Radius EAP |

DHCP

Interface   FastEthernet0 ▾   Service ⦿ On   ○ Off

Pool Name   PoolFor10

Default Gateway   192.168.10.1

DNS Server   8.8.8.8

Start IP Address : 192   168   10   2

Subnet Mask: 255   255   255   0

Maximum Number of Users :   4

TFTP Server: 0.0.0.0

WLC Address: 0.0.0.0

| Add | Save | Remove |

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
PoolFor10	192.168....	8.8.8.8	192.168....	255.255....	4	0.0.0.0	0.0.0.0
PoolFor20	192.168....	8.8.8.8	192.168....	255.255....	4	0.0.0.0	0.0.0.0
serverPool	0.0.0.0	0.0.0.0	192.168....	255.255....	512	0.0.0.0	0.0.0.0

☐ Top

PC's

PC4 — □ ×

Physical   Config   Desktop   Programming   Attributes

IP Configuration   X

Interface   FastEthernet0   ⌄

IP Configuration

◉ DHCP   ○ Static   DHCP request successful.

IPv4 Address   192.168.10.3

Subnet Mask   255.255.255.0

Default Gateway   192.168.10.1

DNS Server   8.8.8.8

IPv6 Configuration

○ Automatic   ◉ Static

IPv6 Address   /

Link Local Address   FE80::205:5EFF:FE3D:6CC4

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication   MD5   ⌄

Username

Password

☐ Top

PC5

Physical | Config | **Desktop** | Programming | Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

( ) DHCP   ( ) Static   DHCP request successful.

IPv4 Address   192.168.10.4

Subnet Mask   255.255.255.0

Default Gateway   192.168.10.1

DNS Server   8.8.8.8

IPv6 Configuration

( ) Automatic   (•) Static

IPv6 Address _____ / _____

Link Local Address FE80::201:63FF:FE08:9D2D

Default Gateway _____

DNS Server _____

802.1X

[ ] Use 802.1X Security

Authentication   MD5

Username

Password

[ ] Top

For 192.168.20.0 Network.

Pc's

PC0   —   □   ✕

Physical	Config	Desktop	Programming	Attributes

IP Configuration   X

Interface   FastEthernet0   ⌄

IP Configuration

◉ DHCP   ○ Static

IPv4 Address   192.168.20.3

Subnet Mask   255.255.255.0

Default Gateway   0.0.0.0

DNS Server   0.0.0.0

IPv6 Configuration

○ Automatic   ◉ Static

IPv6 Address   /

Link Local Address   FE80::260:2FFF:FE4C:9653

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication   MD5   ⌄

Username

Password

☐ Top

PC1

Physical   Config   Desktop   Programming   Attributes

IP Configuration   X

Interface   FastEthernet0   ⌄

IP Configuration

◉ DHCP   ○ Static

IPv4 Address   192.168.20.4

Subnet Mask   255.255.255.0

Default Gateway   0.0.0.0

DNS Server   0.0.0.0

IPv6 Configuration

○ Automatic   ◉ Static

IPv6 Address   /

Link Local Address   FE80::201:63FF:FE93:AB1E

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

Authentication   MD5   ⌄

Username

Password

☐ Top

PC2 — □ ✕

Physical   Config   **Desktop**   Programming   Attributes

IP Configuration   X

Interface   FastEthernet0   ⌄

IP Configuration

◉ DHCP   ○ Static

IPv4 Address   192.168.20.5

Subnet Mask   255.255.255.0

Default Gateway   0.0.0.0

DNS Server   0.0.0.0

IPv6 Configuration

○ Automatic   ◉ Static

IPv6 Address   /

Link Local Address   FE80::20D:BDFF:FE49:E215

Default Gateway

DNS Server

802.1X

☐ Use 802.1X Security

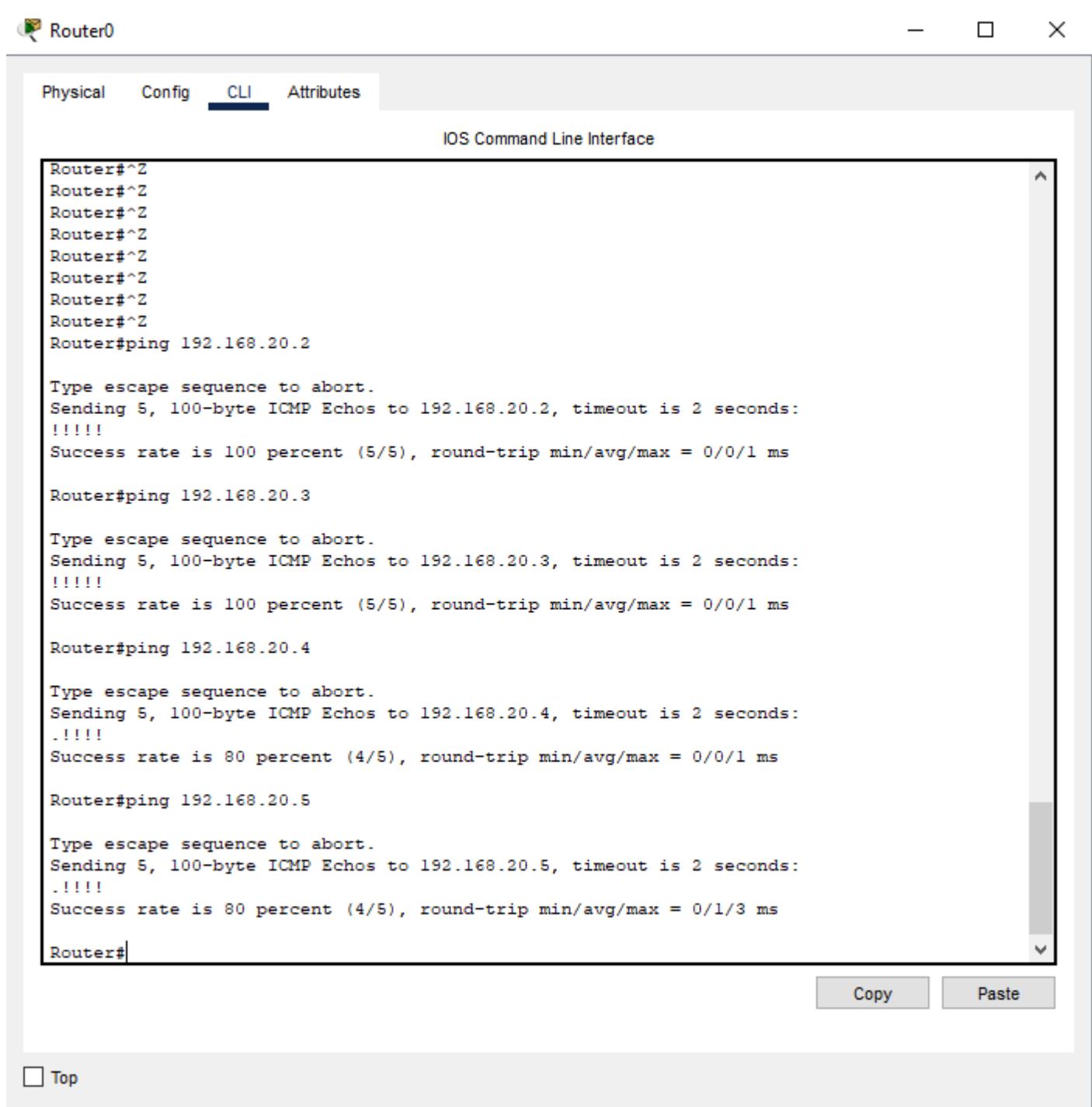Authentication   MD5   ⌄

Username

Password

☐ Top

The DHCP server successfully assigned IP addresses to PCs in two subnets:
192.168.10.0/24 and **192.168.20.0/24**. The router served as a DHCP relay for the
192.168.10.0/24 subnet, forwarding requests to the central DHCP server. Proper
configuration of DHCP pools on the server ensured correct IP allocation, though
minor adjustments to the gateway and DNS settings for PoolFor20 are needed for
complete configuration.

Router0   —   □   ✕

| Physical | Config | CLI | Attributes |

IOS Command Line Interface

```
Router#^Z
Router#^Z
Router#^Z
Router#^Z
Router#^Z
Router#^Z
Router#^Z
Router#^Z
Router#ping 192.168.20.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.20.2, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router#ping 192.168.20.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.20.3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router#ping 192.168.20.4

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.20.4, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/1 ms

Router#ping 192.168.20.5

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.20.5, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 0/1/3 ms

Router#
```

Copy   Paste

☐ Top

The successful **ping results** confirm that the **router's configuration is correct**