

# Institute of Computer Technology

## B. Tech Computer Science and Engineering

### Sub: Computer Network

Name: Sujal Suthar

Enrollment Number: 23162581026

Batch: 53

### Practical-5

Aim:

To configure and utilize Telnet (teletype network), SSH (Secure Socket Shell) and FTP (File Transfer Protocol) in a network

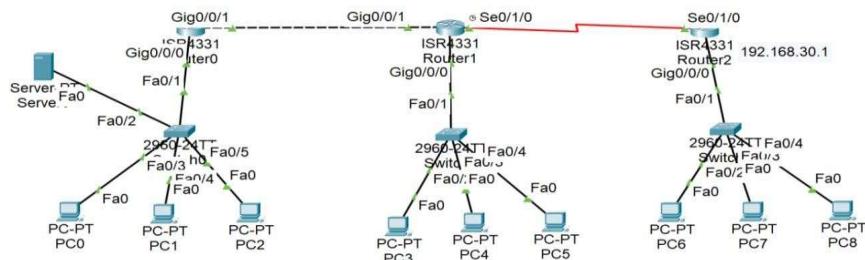
Scenario:

Design the network of an organization having 3 different departments. Make sure the below mentioned requirements must be fulfilled.

- 1) Create 3 users which will be able to get access to the router using Telnet.
- 2) Create a single password to get access to the router using Telnet. Configure in such a way that 2 users can access the router at a time.
- 3) Create 3 users which will be able to get access to the router using SSH. Configure in such a way that 2 users can access the router at a time.
- 4) Create an FTP server and perform the operation to upload and download a file from one department to another department.

Procedure:

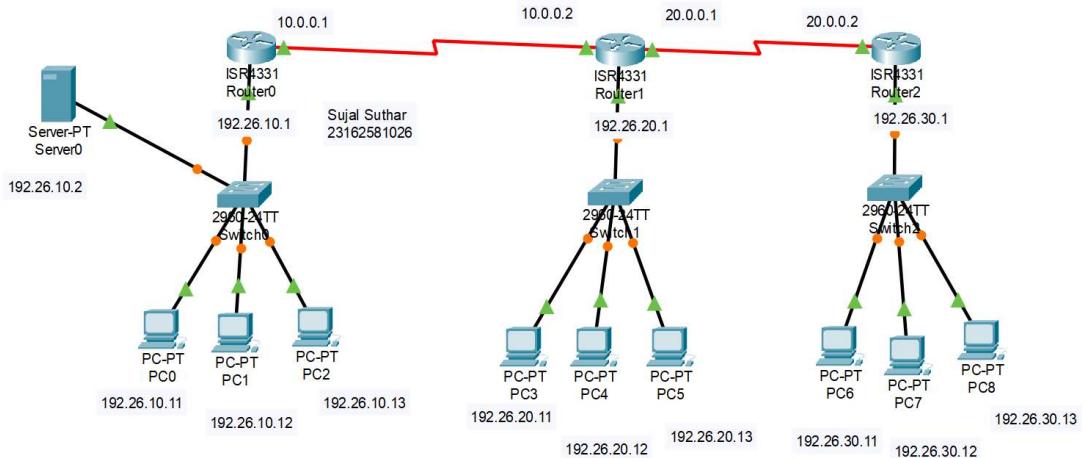
- 1) Create network as given below



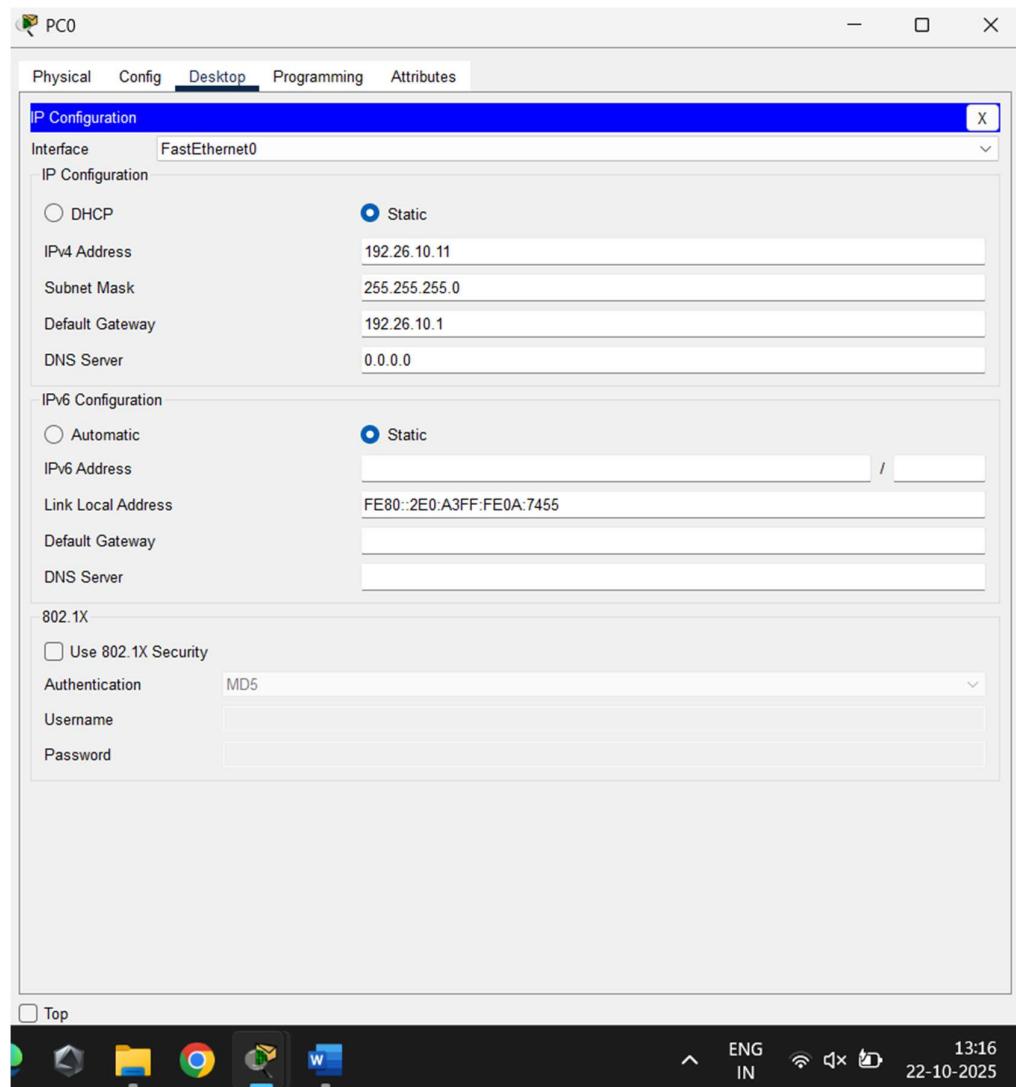
**Table 1: IP Address of devices**

<b>Department</b>	<b>Device</b>	<b>IP Address</b>	<b>Subnet Mask</b>	<b>Default Gateway</b>
Dept. 1	Server	192.26.10.2	255.255.255.0	192.26.10.1
	PC0	192.26.10.11	255.255.255.0	192.26.10.1
	PC1	192.26.10.12	255.255.255.0	192.26.10.1
	PC2	192.26.10.13	255.255.255.0	192.26.10.1
Dept. 2	PC3	192.26.20.11	255.255.255.0	192.26.20.1
	PC4	192.26.20.12	255.255.255.0	192.26.20.1
	PC5	192.26.20.13	255.255.255.0	192.26.20.1
Dept. 3	PC6	192.26.30.11	255.255.255.0	192.26.30.1
	PC7	192.26.30.12	255.255.255.0	192.26.30.1
	PC8	192.26.30.13	255.255.255.0	192.26.30.1

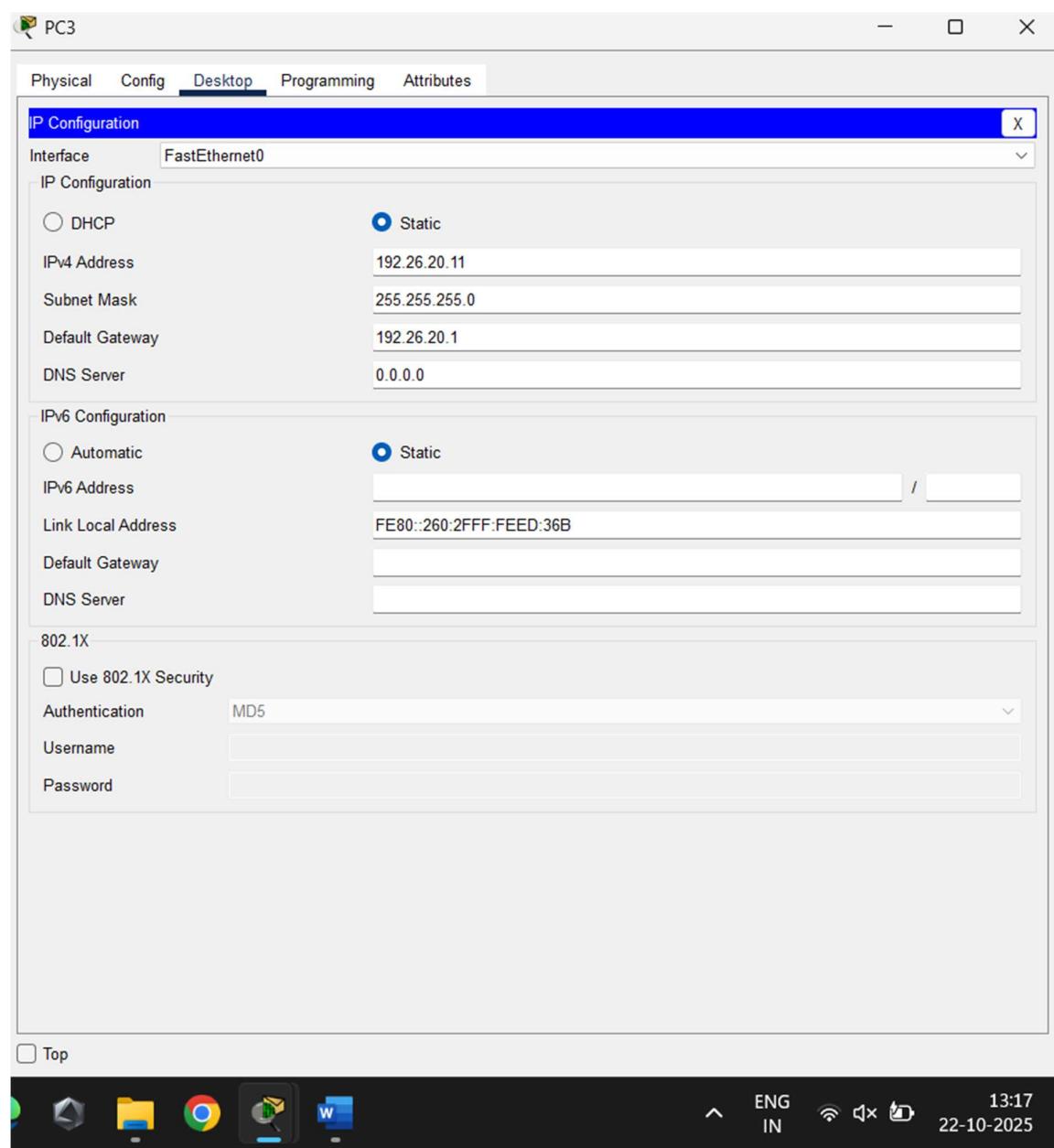
## 1) Network Design:

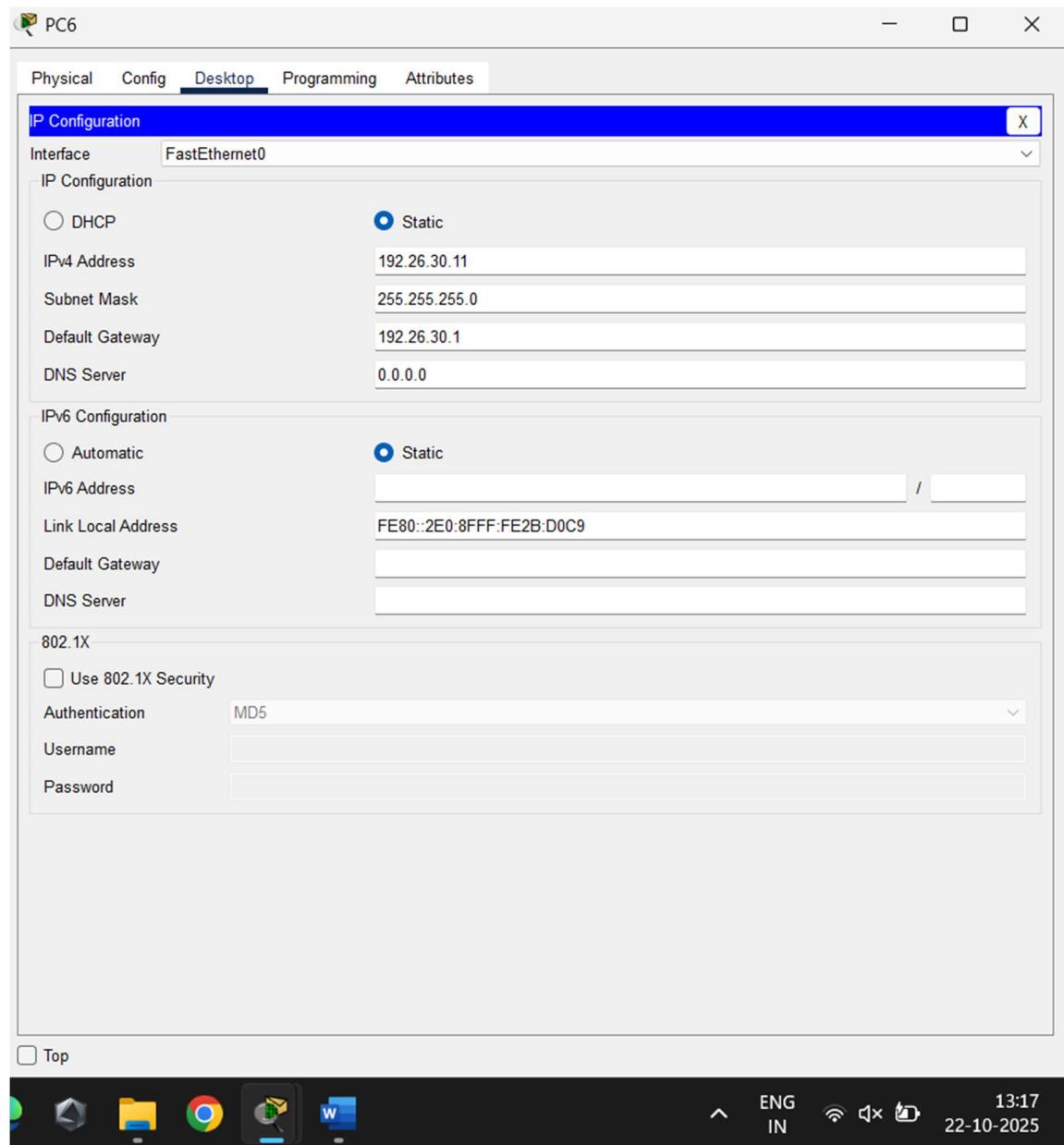


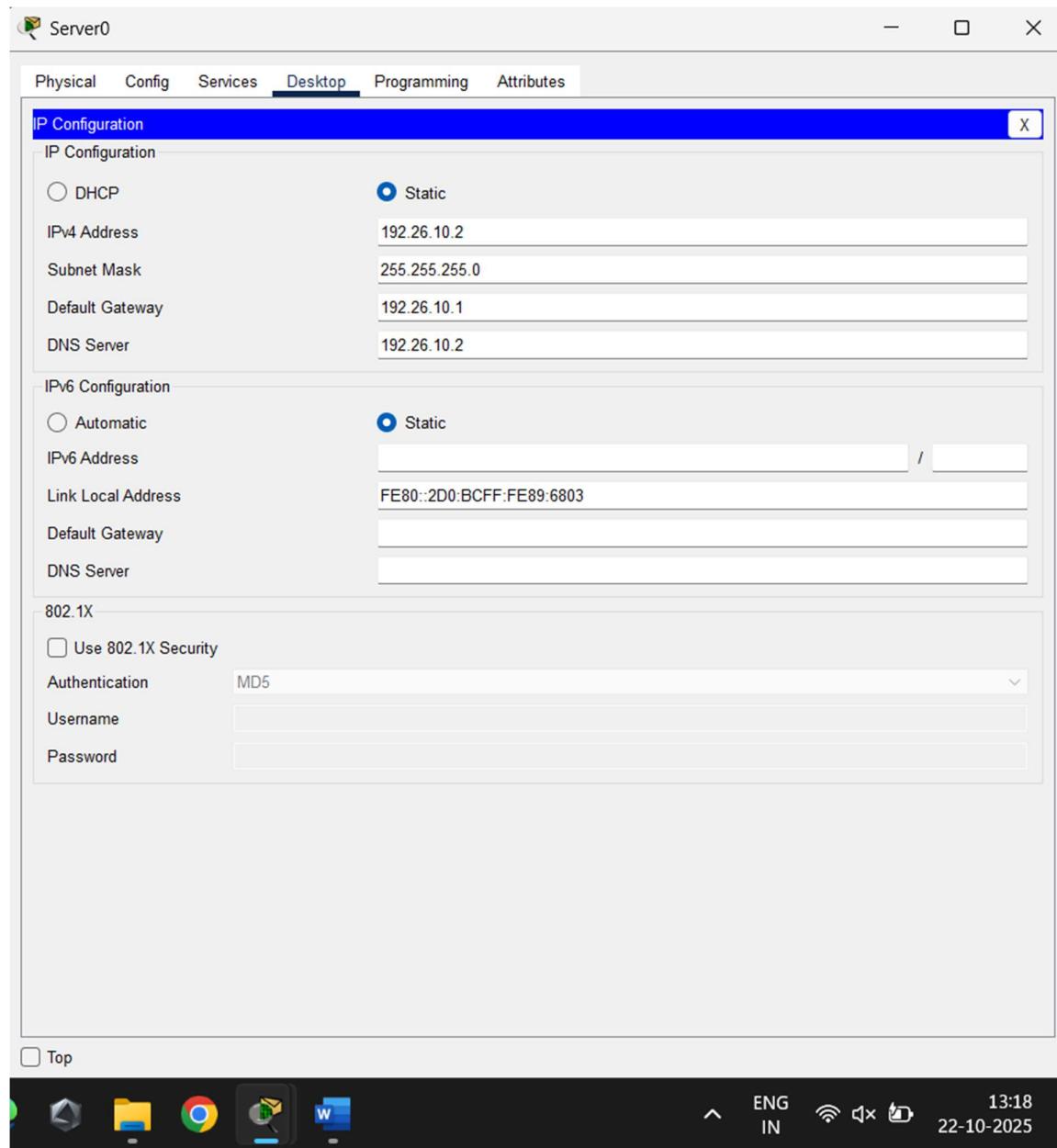
### 1) Configure IP address (All Devices, Routers):



2) Configure IP address (All Devices, Routers):







Router0

Physical Config CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**ROUTING**

- Static
- RIP

**SWITCHING**

- VLAN Database

**INTERFACE**

- GigabitEthernet0/0/0
- GigabitEthernet0/0/1
- GigabitEthernet0/0/2
- Serial0/1/0
- Serial0/1/1

**GigabitEthernet0/0/0**

Port Status  
Bandwidth  
Duplex  
MAC Address

On: 1000 Mbps (radio button selected)  
100 Mbps  
10 Mbps  
Half Duplex  
Full Duplex

Auto (checkbox checked)

0030.F219.8301

IP Configuration  
IPv4 Address: 192.26.10.1  
Subnet Mask: 255.255.255.0

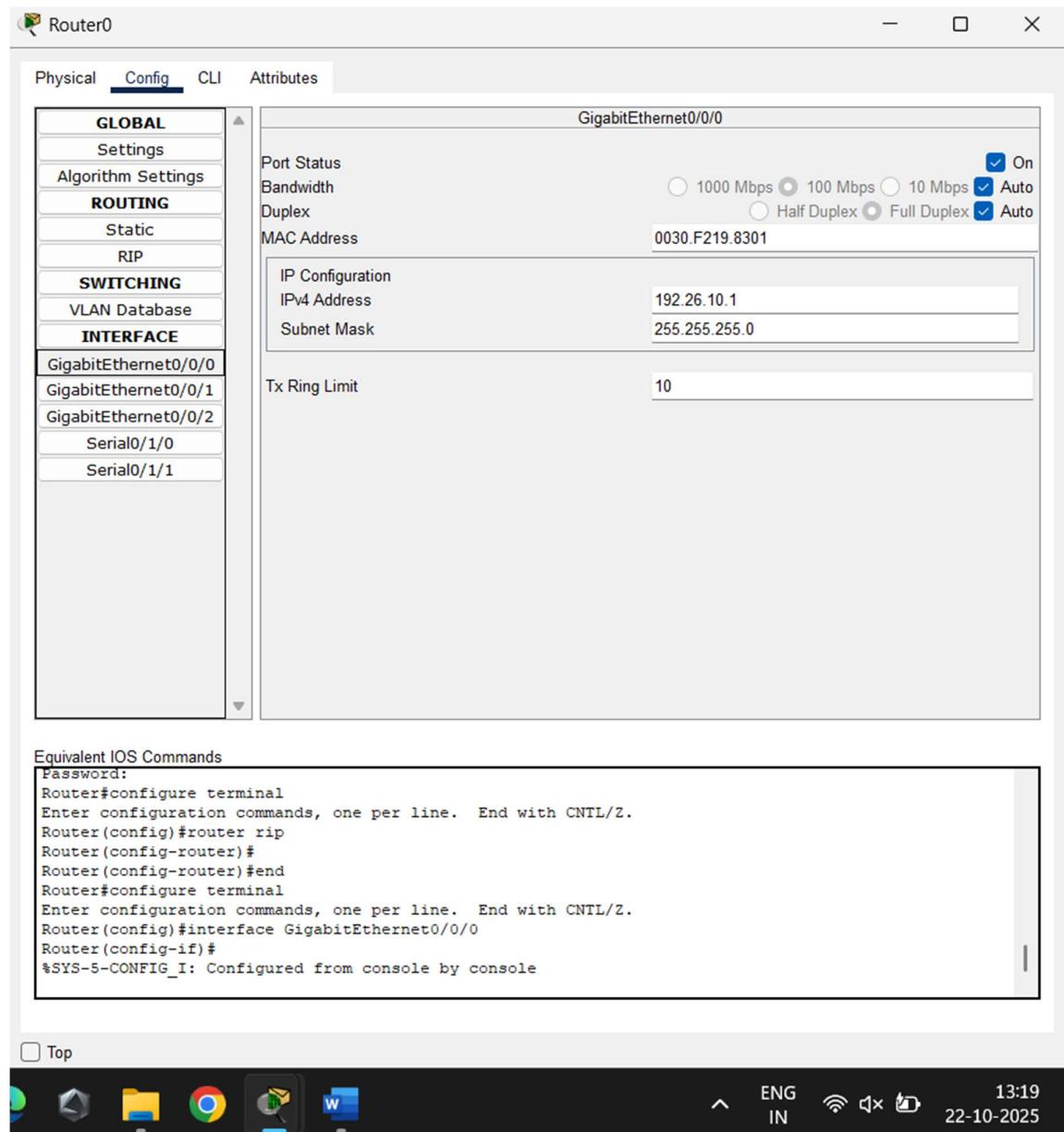
Tx Ring Limit: 10

Equivalent IOS Commands

```
Password:  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#router rip  
Router(config-router)#  
Router(config-router)#end  
Router#configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#interface GigabitEthernet0/0/0  
Router(config-if)#  
%SYS-5-CONFIG_I: Configured from console by console
```

Top

ENG IN 13:19 22-10-2025



Router0

Physical Config CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**ROUTING**

- Static
- RIP

**SWITCHING**

- VLAN Database

**INTERFACE**

- GigabitEthernet0/0/0
- GigabitEthernet0/0/1
- GigabitEthernet0/0/2
- Serial0/1/0**
- Serial0/1/1

Serial0/1/0

Port Status

Duplex  Full Duplex  On

Clock Rate 2000000

IP Configuration

IPv4 Address 10.0.0.1

Subnet Mask 255.0.0.0

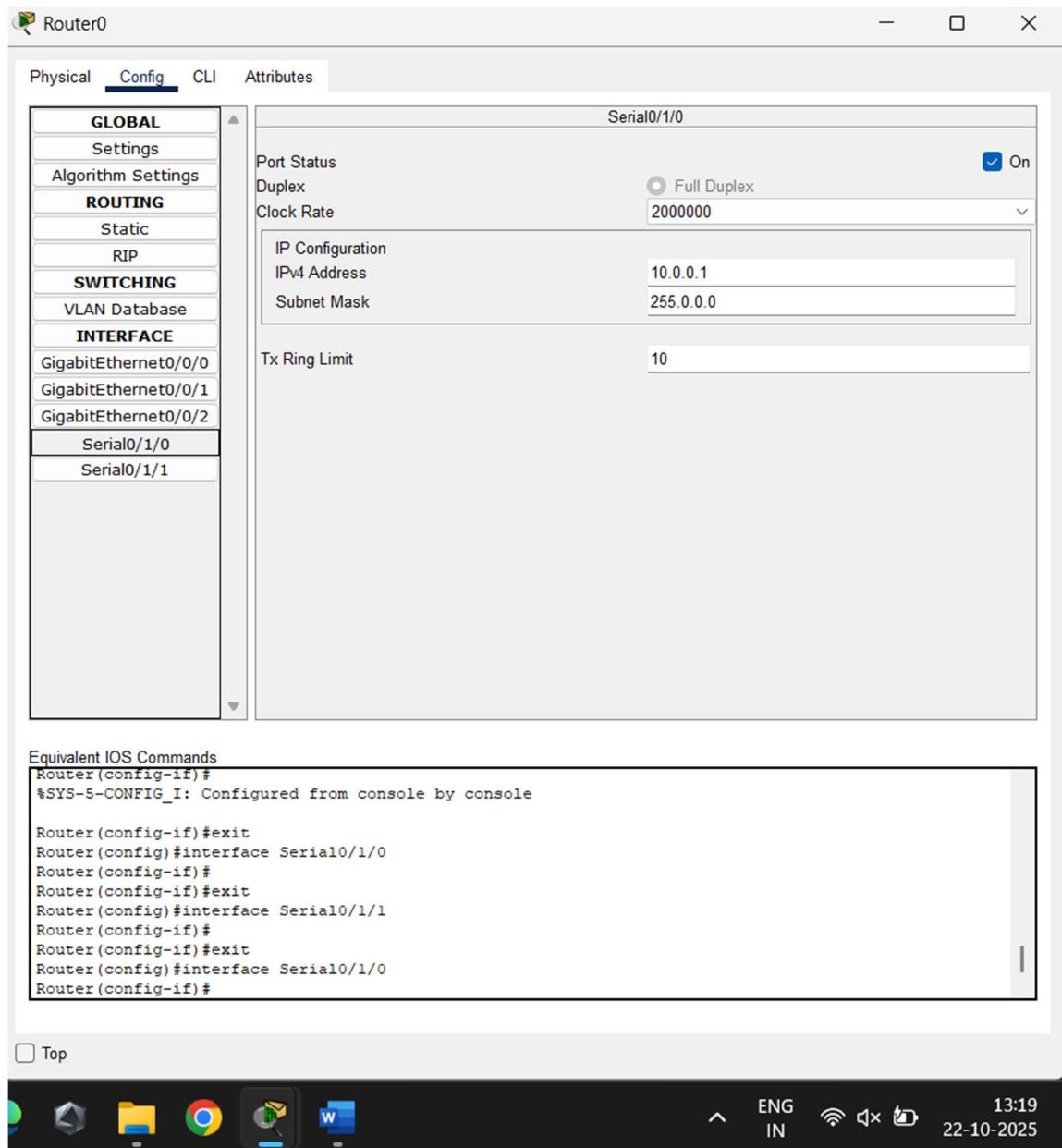
Tx Ring Limit 10

Equivalent IOS Commands

```
Router(config-if)#  
%SYS-5-CONFIG_I: Configured from console by console  
  
Router(config-if)#exit  
Router(config)#interface Serial0/1/0  
Router(config-if)#  
Router(config-if)#exit  
Router(config)#interface Serial0/1/1  
Router(config-if)#  
Router(config-if)#exit  
Router(config)#interface Serial0/1/0  
Router(config-if)#+
```

Top

ENG IN 13:19 22-10-2025



Router1

Physical Config CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**ROUTING**

- Static
- RIP

**SWITCHING**

VLAN Database

**INTERFACE**

- GigabitEthernet0/0/0
- GigabitEthernet0/0/1
- GigabitEthernet0/0/2
- Serial0/1/0
- Serial0/1/1

**GigabitEthernet0/0/0**

Port Status: On (checked)

Bandwidth: 1000 Mbps (radio button)

Duplex: Half Duplex (radio button)

MAC Address: 0030.A3DC.AE01

IP Configuration:

- IPv4 Address: 192.26.20.1
- Subnet Mask: 255.255.255.0

Tx Ring Limit: 10

Equivalent IOS Commands

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up

Router1>enable
Router1#
Router1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router1(config)#interface GigabitEthernet0/0/0
Router1(config-if)#
```

Top

ENG IN 13:19  
22-10-2025

Router1

Physical Config CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**ROUTING**

- Static
- RIP

**SWITCHING**

- VLAN Database

**INTERFACE**

- GigabitEthernet0/0/0
- GigabitEthernet0/0/1
- GigabitEthernet0/0/2
- Serial0/1/0**
- Serial0/1/1

Serial0/1/0

Port Status

Duplex  Full Duplex  On

Clock Rate 2000000

IP Configuration

IPv4 Address 10.0.0.2

Subnet Mask 255.0.0.0

Tx Ring Limit 10

Equivalent IOS Commands

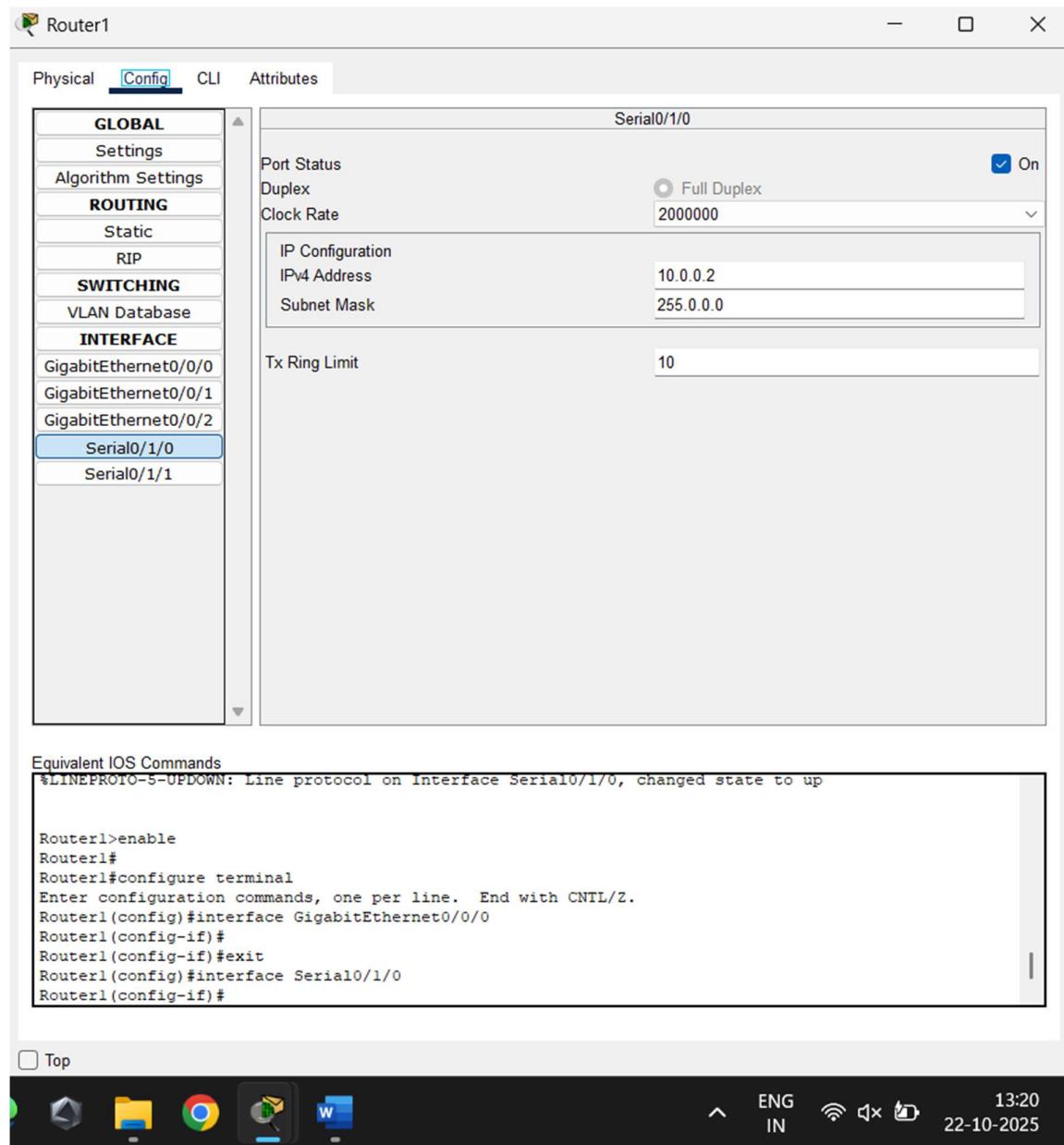
```
%LINEPROTO-5-UPDOWN: Line protocol on interface Serial0/1/0, changed state to up

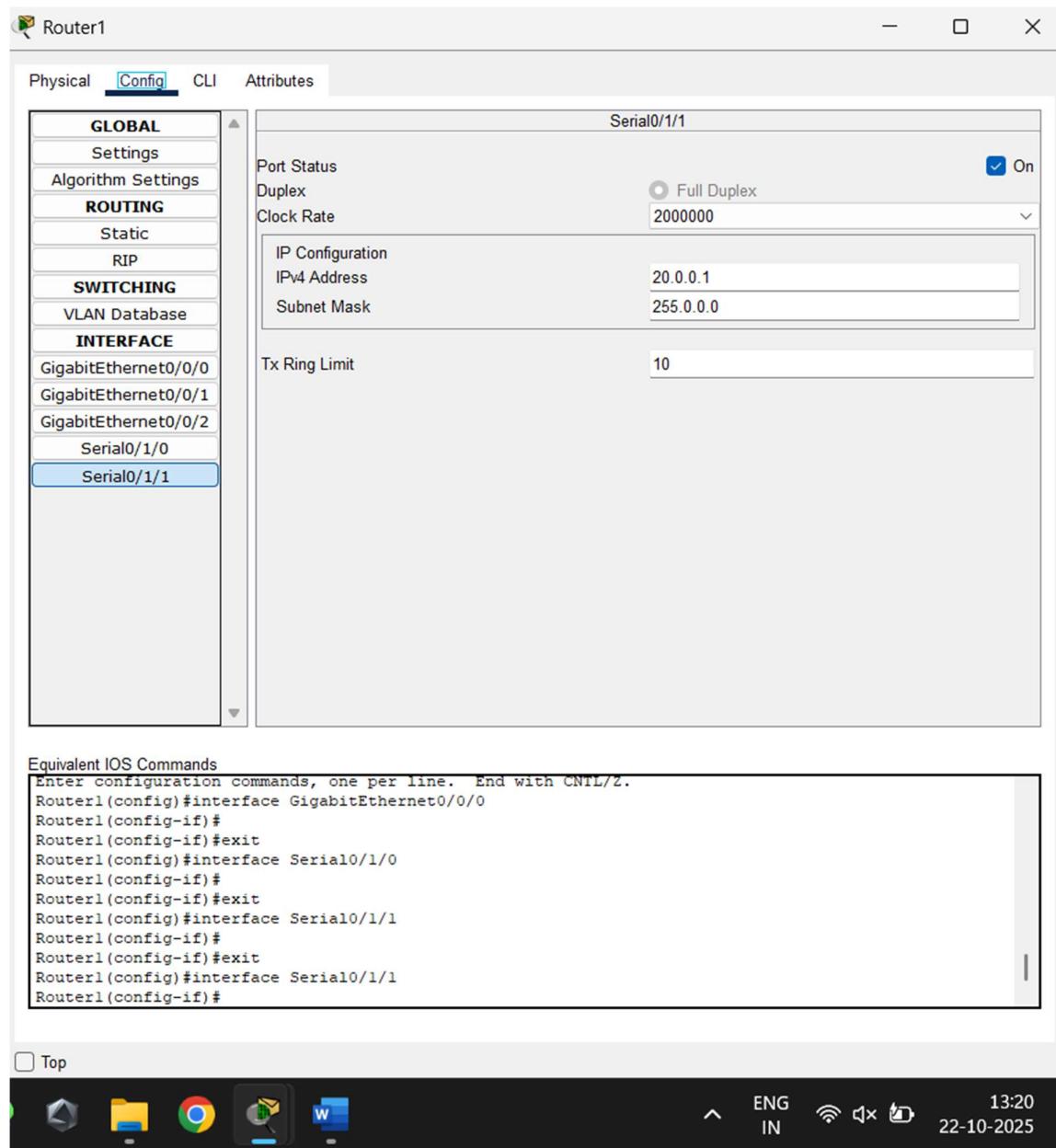
Router1>enable
Router1#
Router1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router1(config)#interface GigabitEthernet0/0/0
Router1(config-if)#
Router1(config-if)#exit
Router1(config)#interface Serial0/1/0
Router1(config-if)#

```

Top

ENG IN 13:20  
22-10-2025





Router2

Physical Config CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings
- ROUTING**
- Static
- RIP
- SWITCHING**
- VLAN Database
- INTERFACE**
- GigabitEthernet0/0/0
- GigabitEthernet0/0/1
- GigabitEthernet0/0/2
- Serial0/1/0
- Serial0/1/1

**GigabitEthernet0/0/0**

Port Status: On (checked)

Bandwidth: 1000 Mbps (radio button)

Duplex: Half Duplex (radio button)

MAC Address: 0002.1792.7001

IP Configuration:

- IPv4 Address: 192.26.30.1
- Subnet Mask: 255.255.255.0

Tx Ring Limit: 10

Equivalent IOS Commands:

```
%LINEPROTO-5-UPDOWN: Line protocol on interface Serial0/1/0, changed state to up.
```

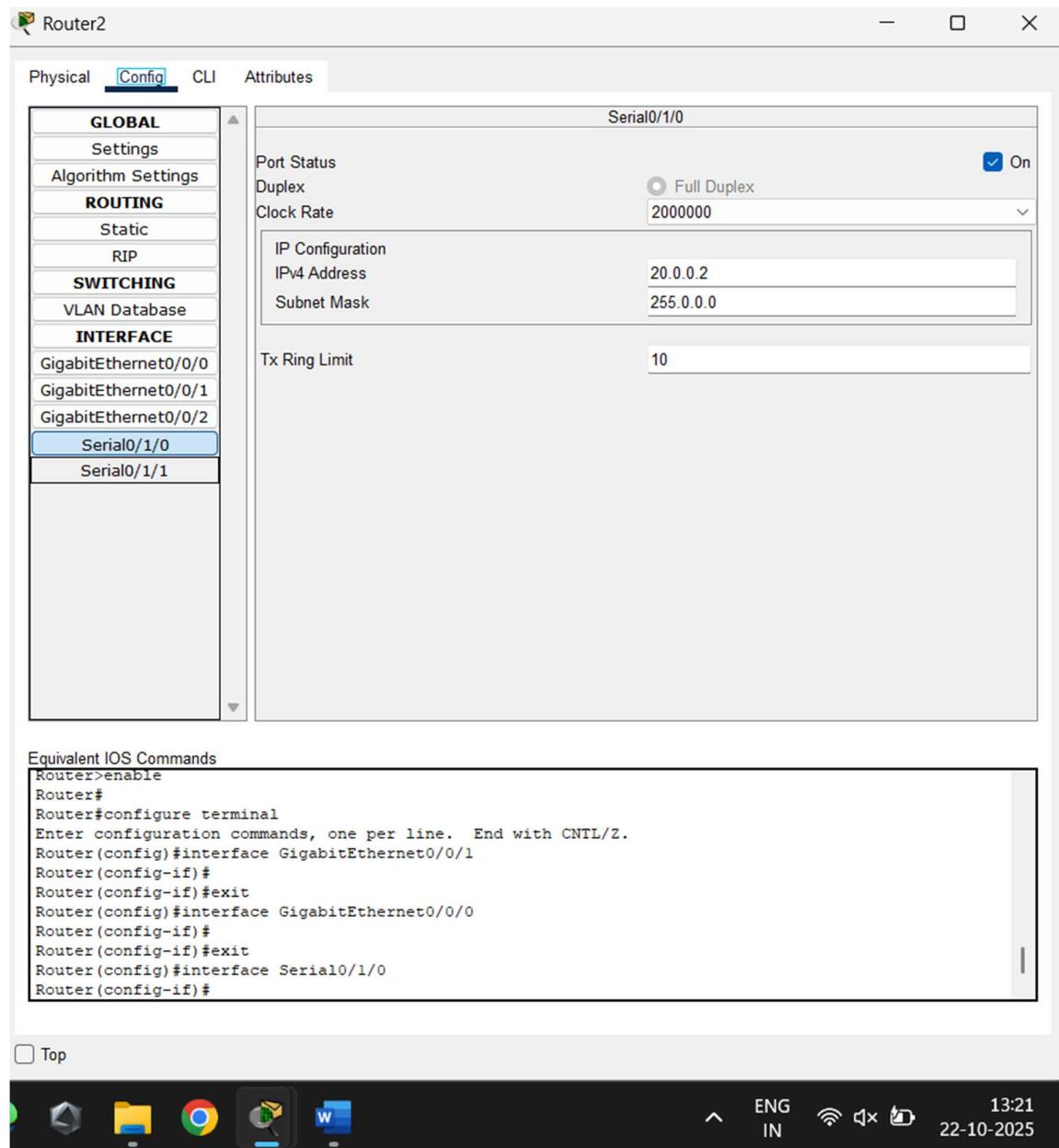
```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#

```

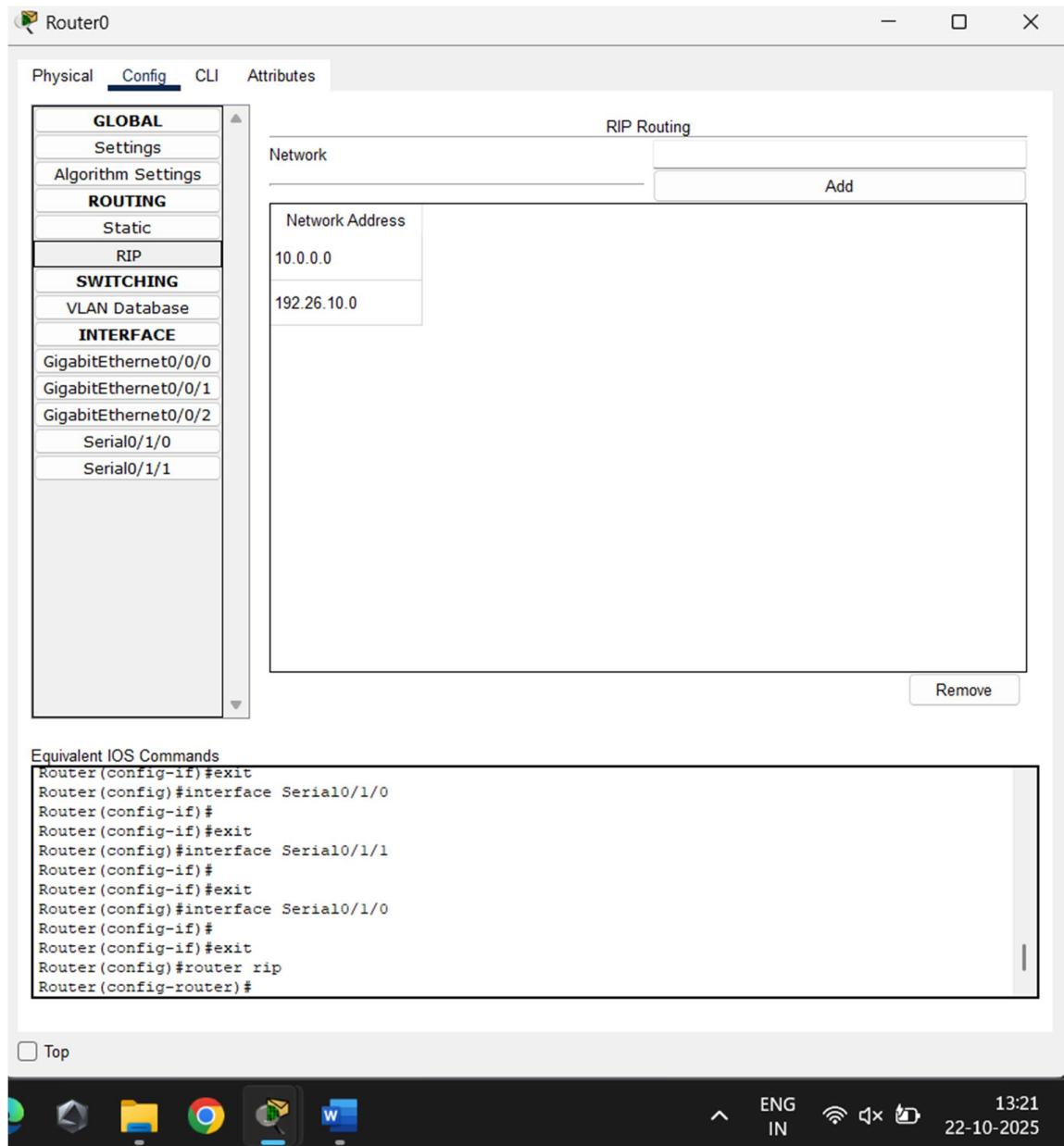
Top

Top bar icons: File, Home, Google Chrome, Network, Word, and a blank space.

System status: ENG IN, Wi-Fi, Battery, 13:21, 22-10-2025



3) Configure dynamic routing table (RIP in routers):



Router1

Physical Config CLI Attributes

**GLOBAL**

- Settings
- Algorithm Settings

**ROUTING**

- Static
- RIP

**SWITCHING**

- VLAN Database

**INTERFACE**

- GigabitEthernet0/0/0
- GigabitEthernet0/0/1
- GigabitEthernet0/0/2
- Serial0/1/0
- Serial0/1/1

RIP Routing

Network

Add

Network Address

- 10.0.0.0
- 20.0.0.0
- 192.26.20.0

Remove

Equivalent IOS Commands

```
Router1(config-if)#exit
Router1(config)#interface Serial0/1/0
Router1(config-if)#exit
Router1(config-if)#exit
Router1(config)#interface Serial0/1/1
Router1(config-if)#
Router1(config-if)#exit
Router1(config)#interface Serial0/1/1
Router1(config-if)#
Router1(config-if)#exit
Router1(config)#router rip
Router1(config-router)#

```

Top

ENG IN 13:21  
22-10-2025

Router2

Physical Config CLI Attributes

**GLOBAL**

Settings

Algorithm Settings

**ROUTING**

Static

RIP

**SWITCHING**

VLAN Database

**INTERFACE**

GigabitEthernet0/0/0

GigabitEthernet0/0/1

GigabitEthernet0/0/2

Serial0/1/0

Serial0/1/1

RIP Routing

Network

Add

Network Address

20.0.0.0

192.26.30.0

Remove

Equivalent IOS Commands

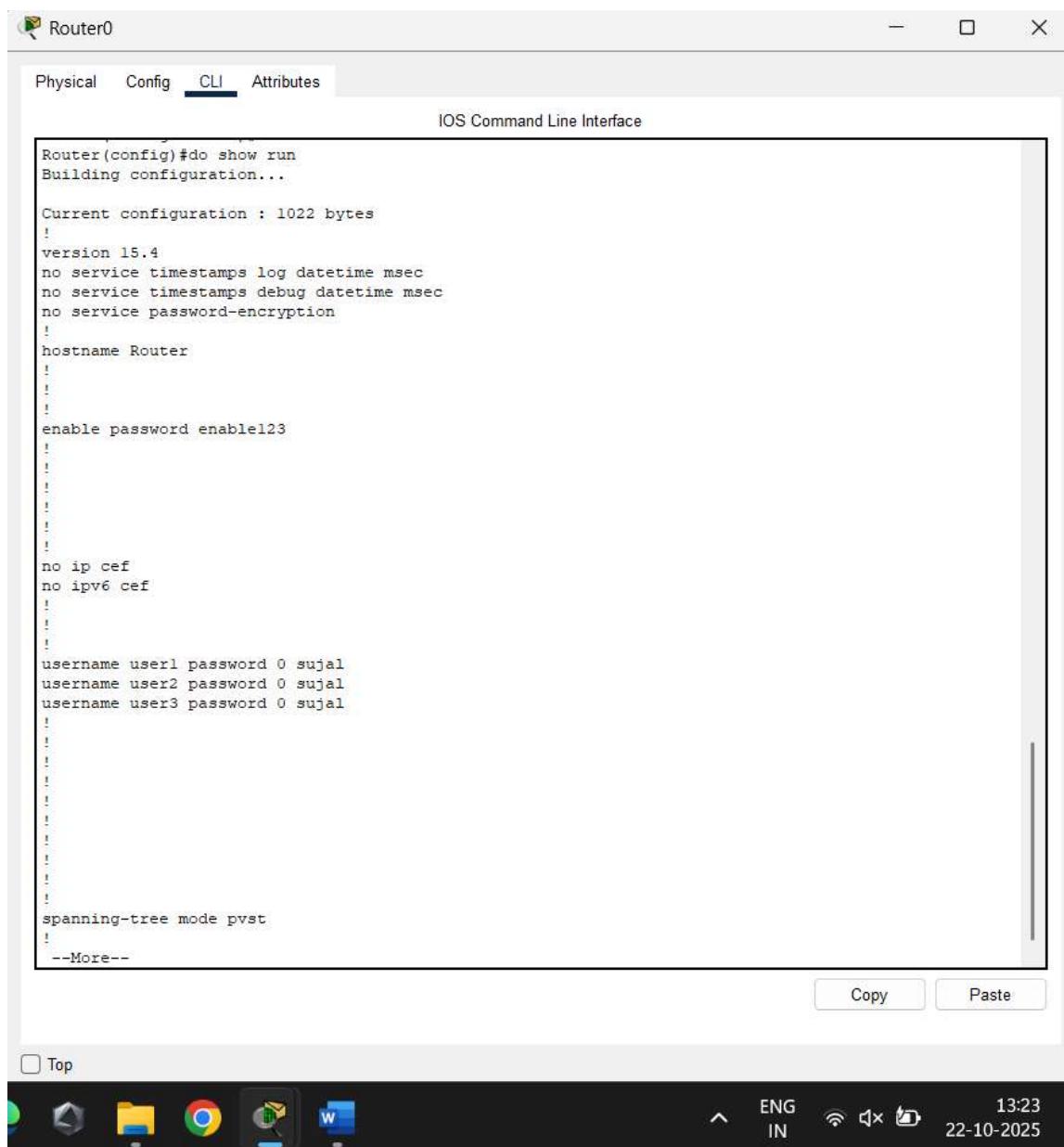
```
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#

```

Top

ENG IN 13:22  
22-10-2025

4) Configure TELNET on Router0:



The screenshot shows a Windows desktop environment. In the foreground, there is a window titled "Router0" which is an "IOS Command Line Interface". The window has tabs at the top: "Physical", "Config", "CLI" (which is selected), and "Attributes". The main area of the window displays the output of the command "show run". The configuration includes basic router settings like hostname "Router", enable password "enable123", and three user accounts ("user1", "user2", "user3") with password "sujal". It also shows the spanning-tree mode set to "pvst". At the bottom of the CLI window, it says "--More--". Below the window, there is a taskbar with icons for File Explorer, Google Chrome, and Microsoft Word. The system tray shows the date and time as "22-10-2025 13:23".

```
Router(config)#do show run
Building configuration...

Current configuration : 1022 bytes
!
version 15.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
enable password enable123
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
username user1 password 0 sujal
username user2 password 0 sujal
username user3 password 0 sujal
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
--More--
```

Copy Paste

Top

ENG IN 13:23 22-10-2025

Router0

Physical Config **CLI** Attributes

IOS Command Line Interface

```
!
!
!
interface GigabitEthernet0/0/0
ip address 192.26.10.1 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/0/1
no ip address
duplex auto
speed auto
shutdown
!
interface GigabitEthernet0/0/2
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/1/0
ip address 10.0.0.1 255.0.0.0
clock rate 2000000
!
interface Serial0/1/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router rip
network 10.0.0.0
network 192.26.10.0
!
ip classless
!
ip flow-export version 9
!
--More-- |
```

Top

▲ ENG IN ⌂ 13:23  
22-10-2025

Router0

Physical Config **CLI** Attributes

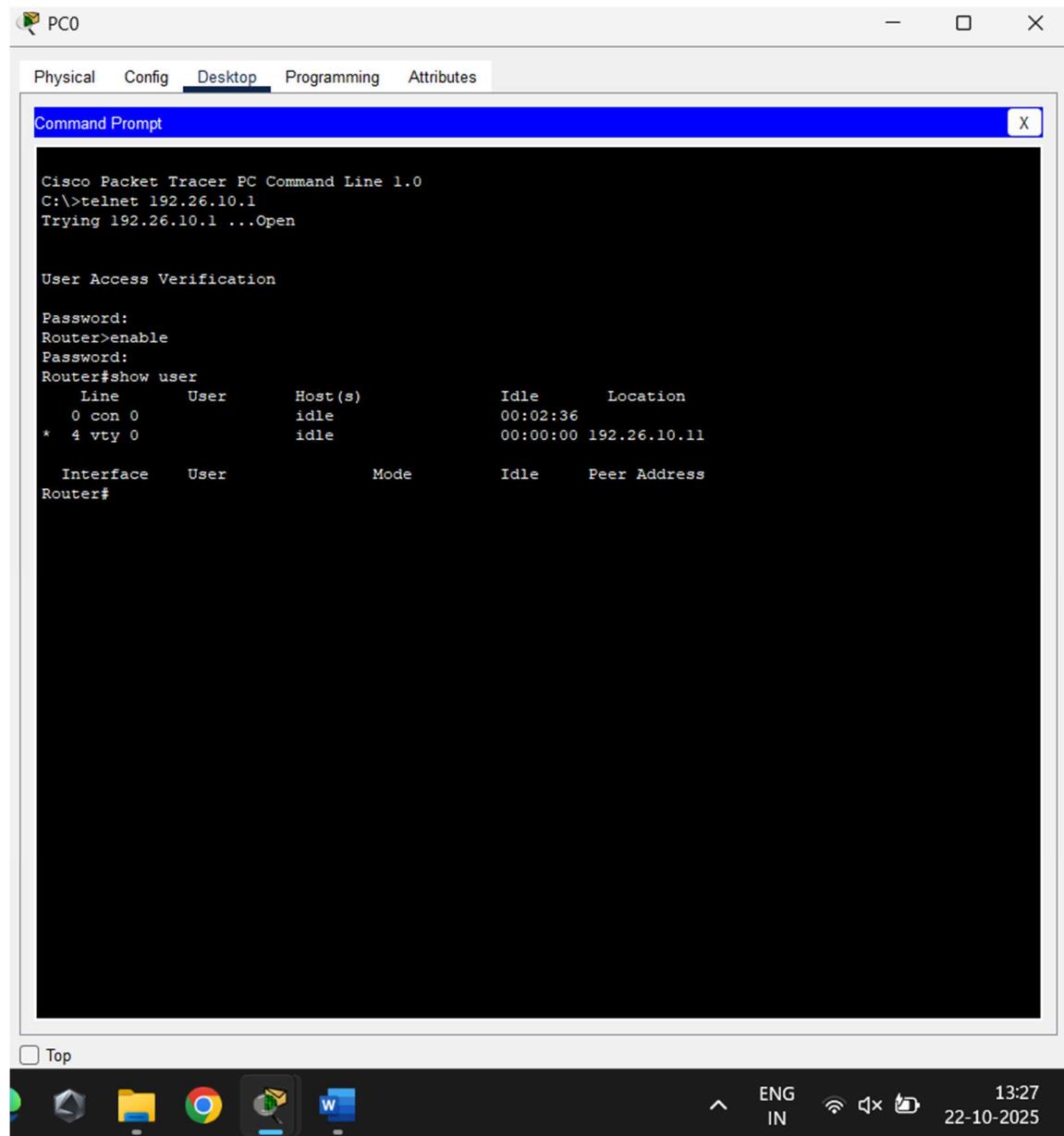
IOS Command Line Interface

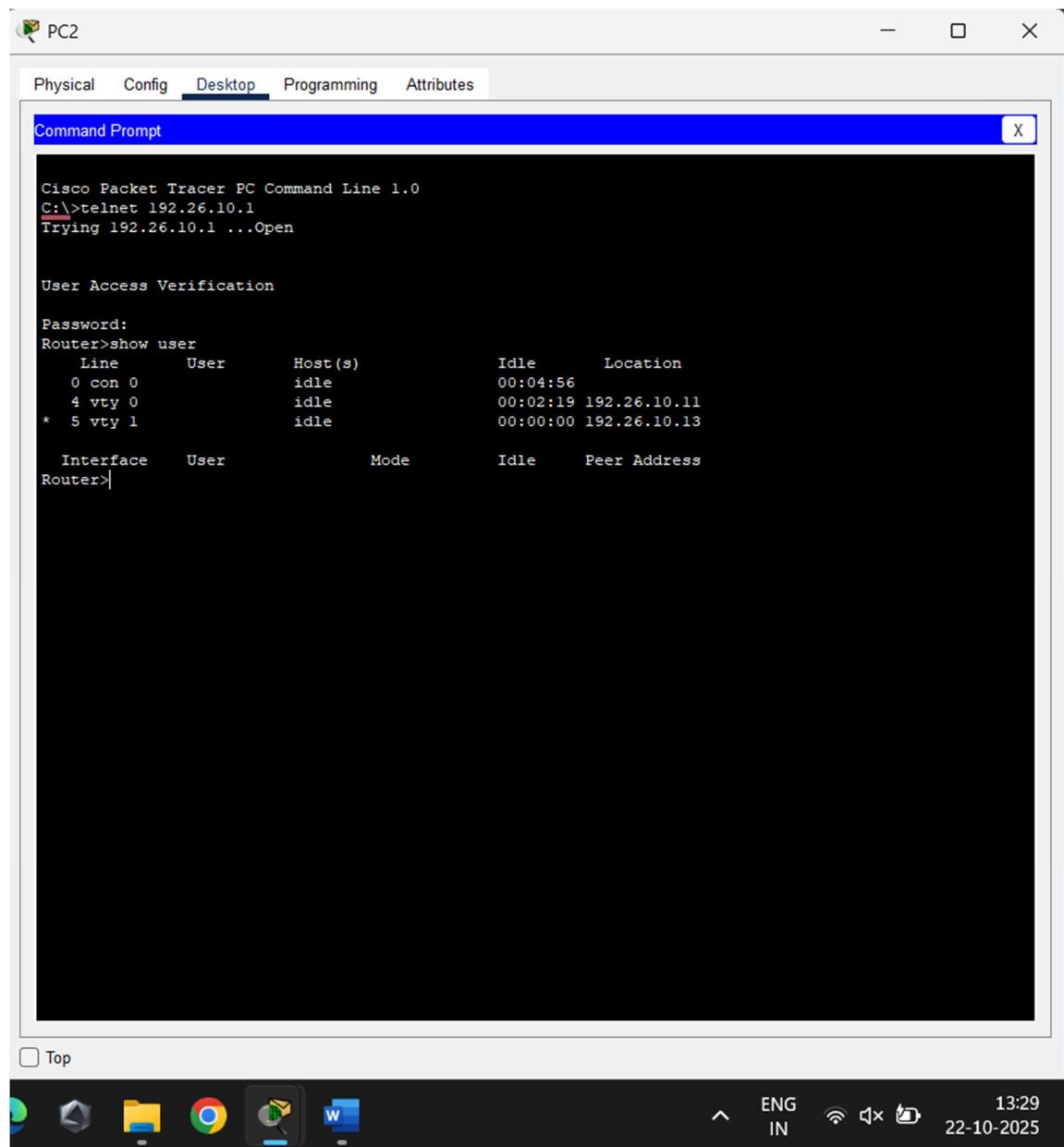
```
ip address 10.0.0.1 255.0.0.0
clock rate 2000000
!
interface Serial0/1/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router rip
network 10.0.0.0
network 192.26.10.0
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 1
password telnet123
login
line vty 2 4
login
!
!
!
end

Router(config)#
```

Top

ENG IN 24 24  
22-10-2025





## 5) Configure SSH on Router1

The screenshot shows a Windows application window titled "Router1". The tab bar at the top has "Physical", "Config", "CLI" (which is selected), and "Attributes". Below the tabs is the title "IOS Command Line Interface". The main area contains the following CLI session output:

```
Router1(config-if)#  
Router1(config-if)#exit  
Router1(config)#interface Serial0/1/0  
Router1(config-if)#  
Router1(config-if)#exit  
Router1(config)#interface Serial0/1/1  
Router1(config-if)#  
Router1(config-if)#exit  
Router1(config)#interface Serial0/1/1  
Router1(config-if)#  
Router1(config-if)#exit  
Router1(config)#router rip  
Router1(config-router)#exit  
Router1(config)#hostname r1  
r1(config)#crypto key generate rsa  
% You already have RSA keys defined named Router1.sahara.local .  
% Do you really want to replace them? [yes/no]:  
% Please answer 'yes' or 'no'.  
% Do you really want to replace them? [yes/no]: no  
r1(config)#ip domain-name college26.com  
r1(config)#crypto key generate rsa  
% You already have RSA keys defined named Router1.sahara.local .  
% Do you really want to replace them? [yes/no]: yes  
The name for the keys will be: r1.college26.com  
Choose the size of the key modulus in the range of 360 to 4096 for your  
General Purpose Keys. Choosing a key modulus greater than 512 may take  
a few minutes.  
  
How many bits in the modulus [512]: 1024  
% Generating 1024 bit RSA keys, keys will be non-exportable...[OK]  
  
r1(config)#username ssh password pass1  
*Mar 1 0:17:41.966: %SSH-5-ENABLED: SSH 2 has been enabled  
r1(config)#username ssh password pass1  
r1(config)#username ssh1 password pass2  
r1(config)#username ssh2 password pass3  
r1(config)#ip ssh version 2  
r1(config)#line vty 0 1  
r1(config-line)#transport input ssh  
r1(config-line)#login local  
r1(config-line)#exit  
r1(config)#
```

At the bottom right of the CLI window, there are "Copy" and "Paste" buttons. The taskbar at the bottom of the screen shows various icons and the system tray with the date and time (22-10-2025, 13:34).

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
rl(config)#do show run
Building configuration...

Current configuration : 1091 bytes
!
version 15.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname rl
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
username admin privilege 15 secret 5 $1$mERr$qllyWWOYuCgoCiHZAY1vmV1
username ssh password 0 pass1
username ssh1 password 0 pass2
username ssh2 password 0 pass3
!
!
!
!
!
ip ssh version 2
ip domain-name college26.com
!
!
spanning-tree mode pvst
--More--
```

Top

13:36  
ENG IN 22-10-2025

Router1

Physical Config **CLI** Attributes

IOS Command Line Interface

```
!
interface Serial0/1/0
 ip address 10.0.0.2 255.0.0.0
!
interface Serial0/1/1
 ip address 20.0.0.1 255.0.0.0
!
interface Vlan1
 no ip address
 shutdown
!
router rip
 network 10.0.0.0
 network 20.0.0.0
 network 192.26.20.0
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 1
 login local
 transport input ssh
line vty 2 4
 login
!
!
!
end

rl(config)#
```

Top

Top Taskbar: File Explorer, Google Chrome, FileZilla, Microsoft Word

System tray: ENG IN, Wi-Fi, Battery, 13:37, 22-10-2025

C:\>ssh -l ssh 192.26.20.1

Password:

rl>show user

Line	User	Host(s)	Idle	Location
0 con 0		idle	00:02:51	
* 4 vty 0	ssh	idle	00:00:00	

rl>

rl>show interface

Interface	User	Mode	Idle	Peer Address

rl>

Top

Top Taskbar: File Explorer, Google Chrome, FileZilla, Microsoft Word

System tray: ENG IN, Wi-Fi, Battery, 13:40, 22-10-2025

PC4

Physical Config Desktop Programming Attributes

Command Prompt X

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ssh -l 192.26.20.1
Invalid Command.

C:\>ssh -l ssh1 192.26.20.1

Password:

rl>show user
   Line      User      Host(s)          Idle      Location
   0 con 0    idle          00:05:34
   4 vty 0   ssh1    idle          00:01:12
* 5 vty 1   ssh1    idle          00:00:00

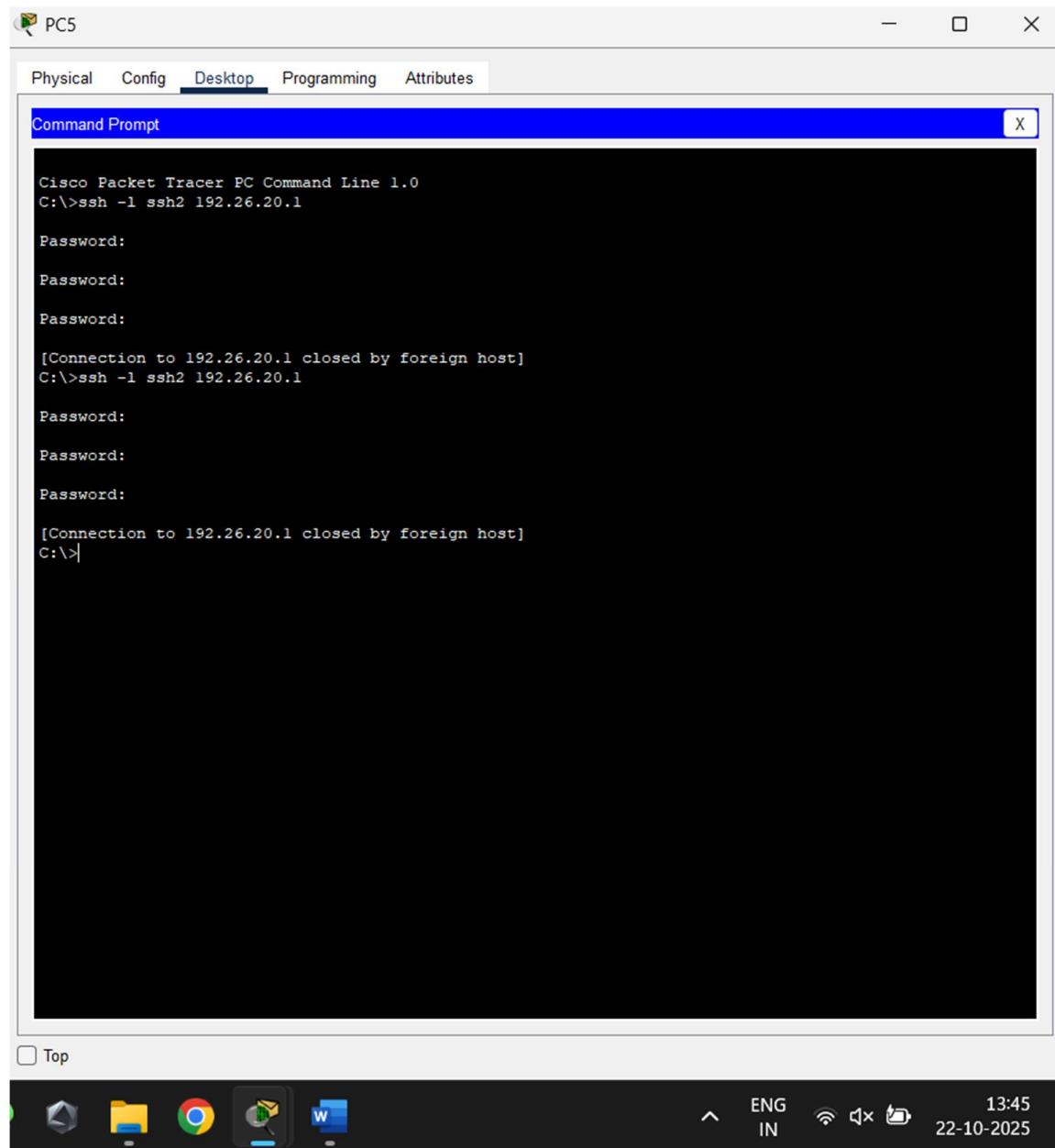
   Interface   User          Mode      Idle      Peer Address
rl>show user
   Line      User      Host(s)          Idle      Location
   0 con 0    idle          00:05:47
* 5 vty 1   ssh1    idle          00:00:00

   Interface   User          Mode      Idle      Peer Address
rl>show user
   Line      User      Host(s)          Idle      Location
   0 con 0    idle          00:06:15
   4 vty 0   ssh1    idle          00:00:10
* 5 vty 1   ssh1    idle          00:00:00

   Interface   User          Mode      Idle      Peer Address
rl>
```

Top

ENG IN 13:44  
22-10-2025



6) Configure FTP on Server:

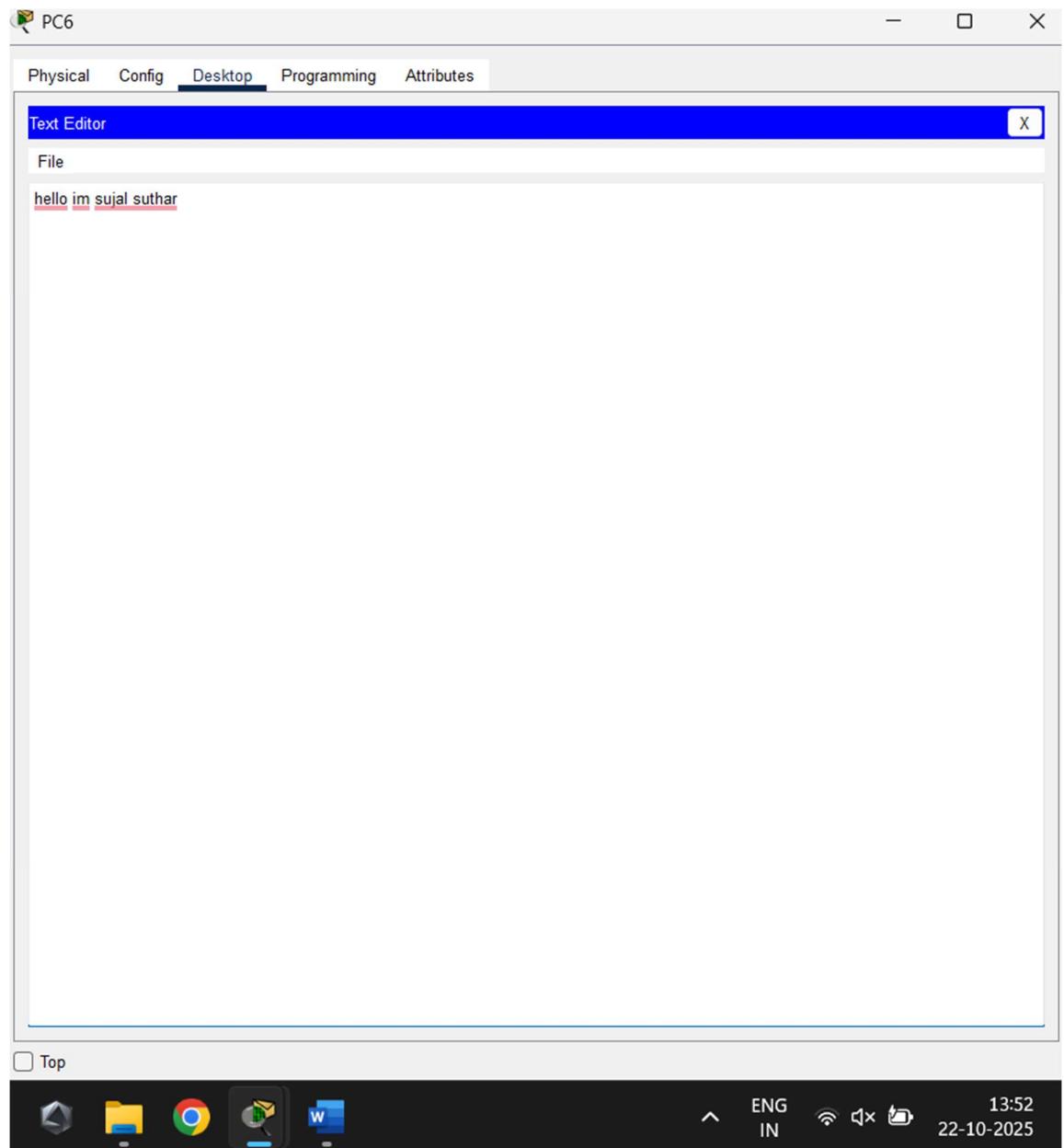
The screenshot shows the 'Server0' configuration interface with the 'Services' tab selected. On the left, a sidebar lists various services: HTTP, DHCP, DHCPv6, TFTP, DNS, SYSLOG, AAA, NTP, EMAIL, and FTP. The 'FTP' service is currently selected. The main panel displays the 'FTP' configuration settings. At the top, there is a 'Service' section with an 'On' radio button selected. Below it is a 'User Setup' section containing fields for 'Username' and 'Password', and checkboxes for 'Write', 'Read', 'Delete', 'Rename', and 'List'. A table lists four users with their details:

	Username	Password	Permission
1	cisco	cisco	RWDNL
2	user1	sujal26	RWDNL
3	user2	sujal26	RWDNL
4	user3	sujal26	RWDNL

Buttons for 'Add', 'Save', and 'Remove' are located to the right of the table. Below this is a 'File' section listing several files with their file numbers and names:

- 28 ir800-universalk9-mz.SPA.155-3.M
- 29 ir800-universalk9-mz.SPA.156-3.M
- 30 ir800\_yocto-1.7.2.tar
- 31 ir800\_yocto-1.7.2\_python-2.7.3.tar
- 32 pt1000-i-mz.122-28.bin
- 33 pt3000-i6q4l2-mz.121-22.EA4.bin
- 34 sujalsuthar.txt

A 'Remove' button is located at the bottom right of this list. The bottom of the screen features a toolbar with icons for Home, File, Google Chrome, and Windows Task View, along with system status indicators for ENG IN, battery level, signal strength, and the date and time (22-10-2025, 13:46).



PC6

Physical Config Desktop Programming Attributes

Command Prompt X

```
Cisco Packet Tracer PC Command Line 1.0
C:>ftp 192.26.10.2
Trying to connect...192.26.10.2
Connected to 192.26.10.2
220- Welcome to PT Ftp server
Username:user1
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>ls
Invalid or non supported command.
ftp>ls -la
Invalid or non supported command.
ftp>put sujal.txt
%Error opening c:sujal.txt (No such file or directory)
ftp>put

C:>ftp 192.26.10.2
Trying to connect...192.26.10.2
Connected to 192.26.10.2
220- Welcome to PT Ftp server
Username:user1
331- Username ok, need password
Password:
230- Logged in
(passive mode On)
ftp>put sujalsuthar.txt

Writing file sujalsuthar.txt to 192.26.10.2:
File transfer in progress...

[Transfer complete - 23 bytes]

23 bytes copied in 0.018 secs (1277 bytes/sec)
ftp>
```

Top

Top

13:53 22-10-2025

The screenshot shows a Cisco Packet Tracer interface titled "PC0". The top menu bar includes "Physical", "Config", "Desktop" (which is selected), "Programming", and "Attributes". Below the menu is a "Command Prompt" window with the following terminal session logs:

```
Cisco Packet Tracer PC Command Line 1.0
C:>telnet 192.26.10.1
Trying 192.26.10.1 ...Open

User Access Verification

Password:
Router#enable
Password:
Router#show user
  Line      User      Host(s)        Idle      Location
  0 con 0           idle          00:02:36
* 4 vty 0           idle          00:00:00 192.26.10.11

  Interface     User            Mode        Idle      Peer Address
Router# 

[Connection to 192.26.10.1 closed by foreign host]
C:>ftp 192.26.10.2
Trying to connect...192.26.10.2
Connected to 192.26.10.2
220- Welcome to PT Ftp server
Username:user1
331- Username ok, need password
Password:
230- Logged in
 (passive mode On)
ftp>get sujalsuthar.txt

Reading file sujalsuthar.txt from 192.26.10.2:
File transfer in progress...

[Transfer complete - 23 bytes]

23 bytes copied in 0 secs
ftp>
```

The taskbar at the bottom includes icons for Home, File, Google Chrome, and Microsoft Word, along with system status indicators like battery level and signal strength. The system tray shows the date and time as 22-10-2025 13:54.

**Conclusion:** We successfully implemented Telnet, SSH, and FTP services within the network. Telnet and SSH allowed secure remote management of the router, while FTP facilitated smooth file transfer between different departments. Therefore, the objective of the practical was effectively accomplished.

Note: Make sure the last two digits of your enrollment numbers appear in the network IP address that must be visible in the snapshot of the Cisco packet tracer. i.e. 192.26.10.1 (26 indicates last two digits of your enrollment no.)