P01: Commands

Ping:

```
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

1.2) ifconfig

```
user@uv-goswami:~$ ifconfig
lo: flags=73<UP,LOOPBACK,RUNNING>  mtu 65536
        inet 127.0.0.1  netmask 255.0.0.0
        inet6 ::1  prefixlen 128  scopeid 0x10<host>
        loop  txqueuelen 1000  (Local Loopback)
        RX packets 748  bytes 89732 (89.7 KB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 748  bytes 89732 (89.7 KB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0

wlp1s0: flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
        inet 192.168.33.219  netmask 255.255.255.0  broadcast 192.168.33.255
        inet6 fe80::b9ba:c13a:724b:892e  prefixlen 64  scopeid 0x20<link>
        inet6 2402:3a80:41e3:35e3:e445:84a5:2082:aa68  prefixlen 64  scopeid 0x0
<global>
        inet6 2402:3a80:41e3:35e3:cce4:a66a:5b4f:3443  prefixlen 64  scopeid 0x0
<global>
        ether cc:47:40:b8:02:ce  txqueuelen 1000  (Ethernet)
        RX packets 49855  bytes 61917316 (61.9 MB)
        RX errors 0  dropped 0  overruns 0  frame 0
        TX packets 16280  bytes 2968661 (2.9 MB)
        TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
```

1.3) Nslookup :

```
user@uv-goswami:~$ nslookup google.com
Server:         127.0.0.53
Address:        127.0.0.53#53

Non-authoritative answer:
Name:   google.com
Address: 142.250.194.174
Name:   google.com
Address: 2404:6800:4002:823::200e
```

1.4) traceroute

```
user@uv-goswami:~$ traceroute www.google.com
traceroute to www.google.com (142.251.42.36), 64 hops max
  1   192.168.33.181  2.369ms  1.880ms  4.771ms
  2   *  *  *
  3   192.168.174.206  397.867ms  206.583ms  204.971ms
  4   192.168.204.1  204.121ms  205.659ms  196.950ms
```

1.5) netstat

```
user@uv-goswami:~$ netstat
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        40      0 uv-goswami:50806        172.65.10.226:https     CLOSE_WAIT
tcp         0      0 uv-goswami:47626        ubuntu-mirror-1.ps:http TIME_WAIT
tcp6        0      0 uv-goswami:55312        g2600-1417-0077-0:https ESTABLISHED
tcp6       40      0 uv-goswami:42400        2600:9000:256c:ae:https CLOSE_WAIT
tcp6       40      0 uv-goswami:42426        2600:9000:256c:ae:https CLOSE_WAIT
tcp6        0      0 uv-goswami:52758        64:ff9b::3419:1ec:https ESTABLISHED
tcp6        0      0 uv-goswami:35774        whatsapp-cd:xmpp-client ESTABLISHED
tcp6       40      0 uv-goswami:42386        2600:9000:256c:ae:https CLOSE_WAIT
tcp6        0      0 uv-goswami:52766        64:ff9b::3419:1ec:https ESTABLISHED
tcp6       40      0 uv-goswami:42374        2600:9000:256c:ae:https CLOSE_WAIT
tcp6       40      0 uv-goswami:42376        2600:9000:256c:ae:https CLOSE_WAIT
tcp6       40      0 uv-goswami:42412        2600:9000:256c:ae:https CLOSE_WAIT
tcp6        0      0 uv-goswami:50034        64:ff9b::36bd:94c:https ESTABLISHED
udp         0      0 uv-goswami:bootpc       _gateway:bootps         ESTABLISHED
udp6        0      0 uv-goswami:46694        2402:3a80:c006:13:https ESTABLISHED
Active UNIX domain sockets (w/o servers)
```

1.6) netstat

```
user@uv-goswami:~$ netstat -a
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
tcp        0      0 _localdnsproxy:domain   0.0.0.0:*               LISTEN
tcp        0      0 localhost:redis         0.0.0.0:*               LISTEN
tcp        0      0 _localdnsstub:domain    0.0.0.0:*               LISTEN
tcp        0      0 localhost:ipp           0.0.0.0:*               LISTEN
tcp        0      0 localhost:11434         0.0.0.0:*               LISTEN
tcp       40      0 uv-goswami:50806        172.65.10.226:https     CLOSE_WAIT
tcp6       0      0 ip6-localhost:ipp       [::]:*                  LISTEN
tcp6       0      0 ip6-localhost:redis     [::]:*                  LISTEN
tcp6       0      0 uv-goswami:55312        g2600-1417-0077-0:https ESTABLISHED
tcp6      40      0 uv-goswami:42400        2600:9000:256c:ae:https CLOSE_WAIT
tcp6      40      0 uv-goswami:42426        2600:9000:256c:ae:https CLOSE_WAIT
tcp6       0      0 uv-goswami:52758        64:ff9b::3419:1ec:https ESTABLISHED
tcp6       0      0 uv-goswami:35774        whatsapp-cd:xmpp-client ESTABLISHED
tcp6      40      0 uv-goswami:42386        2600:9000:256c:ae:https CLOSE_WAIT
tcp6       0      0 uv-goswami:52766        64:ff9b::3419:1ec:https ESTABLISHED
tcp6      40      0 uv-goswami:42374        2600:9000:256c:ae:https CLOSE_WAIT
tcp6      40      0 uv-goswami:42376        2600:9000:256c:ae:https CLOSE_WAIT
tcp6      40      0 uv-goswami:42412        2600:9000:256c:ae:https CLOSE_WAIT
udp        0      0 0.0.0.0:mdns            0.0.0.0:*
udp        0      0 0.0.0.0:40084           0.0.0.0:*
udp        0      0 _localdnsproxy:domain   0.0.0.0:*
udp        0      0 _localdnsstub:domain    0.0.0.0:*
udp        0      0 uv-goswami:bootpc       _gateway:bootps         ESTABLISHED
udp6       0      0 [::]:mdns               [::]:*
udp6       0      0 uv-goswami:46694        2402:3a80:c006:13:https ESTABLISHED
udp6       0      0 [::]:54964              [::]:*
raw6       0      0 [::]:ipv6-icmp          [::]:*                  7
```

1.7) netstat -u

```
user@uv-goswami:~$ netstat -u
Active Internet connections (w/o servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State
udp        0      0 uv-goswami:bootpc       _gateway:bootps         ESTABLISHED
udp6       0      0 uv-goswami:41784        2402:3a80:c006:13:https ESTABLISHED
```

1.8) hostname

```
user@uv-goswami:~$ hostname
uv-goswami
```

## 1.9) traceroute

```
user@uv-goswami:~$ tracepath google.com
 1?: [LOCALHOST]                      0.014ms pmtu 1500
 1:  2402:3a80:41e3:35e3::f6                              2.584ms
 1:  2402:3a80:41e3:35e3::f6                              3.389ms
 2:  fd00:192:168:173::205                              197.744ms asymm  4
 3:  fd00:192:168:174::206                              204.104ms asymm  4
 4:  fd00:192:168:204::1                                187.874ms asymm  5
 5:  fd00:192:168:204::2                                156.814ms
 6:  2400:5200:c00:60::2                                204.164ms
```

1.10) host)

```
user@uv-goswami:~$ host google.com
google.com has address 142.251.42.14
google.com has IPv6 address 2404:6800:4009:82f::200e
google.com mail is handled by 10 smtp.google.com.
```

P02: PC to PC communication:
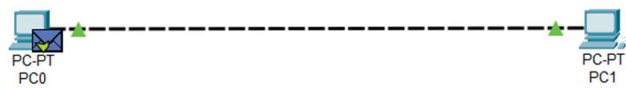
PC0

Physical   Config   **Desktop**   Programming   Attributes

IP Configuration   X

Interface   FastEthernet0

IP Configuration

○ DHCP   ● Static

IPv4 Address   192.168.1.1

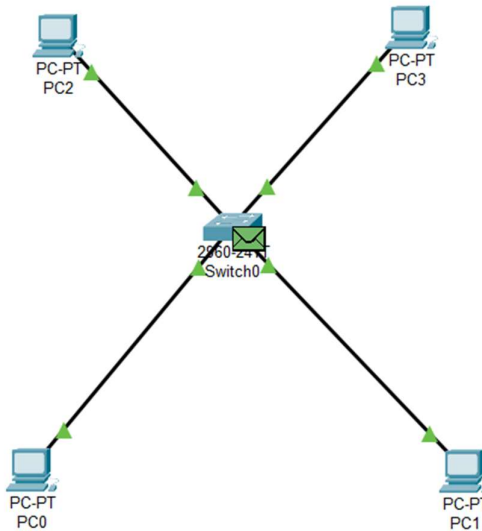Subnet Mask   255.255.255.0

Default Gateway   0.0.0.0

DNS Server   0.0.0.0
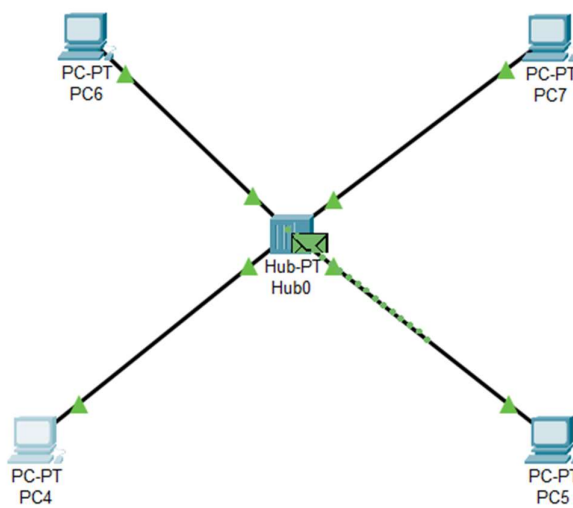
PC1

Physical   Config   **Desktop**   Programming   Attributes

IP Configuration   X

Interface   FastEthernet0

IP Configuration

○ DHCP   ● Static

IPv4 Address   192.168.1.2

Subnet Mask   255.255.255.0

Default Gateway   0.0.0.0

DNS Server   0.0.0.0

IPv6 Configuration

○ Automatic   ● Static
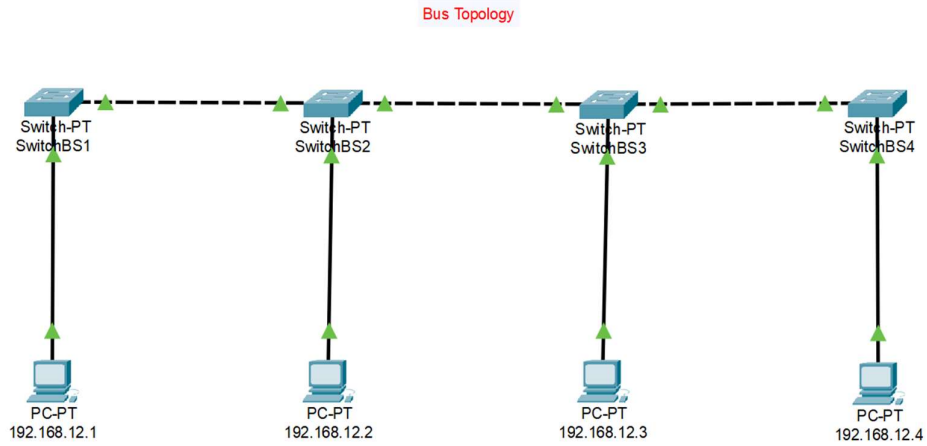
P03: Star Topology

3.1) Using Switch

3.2) Using Hub

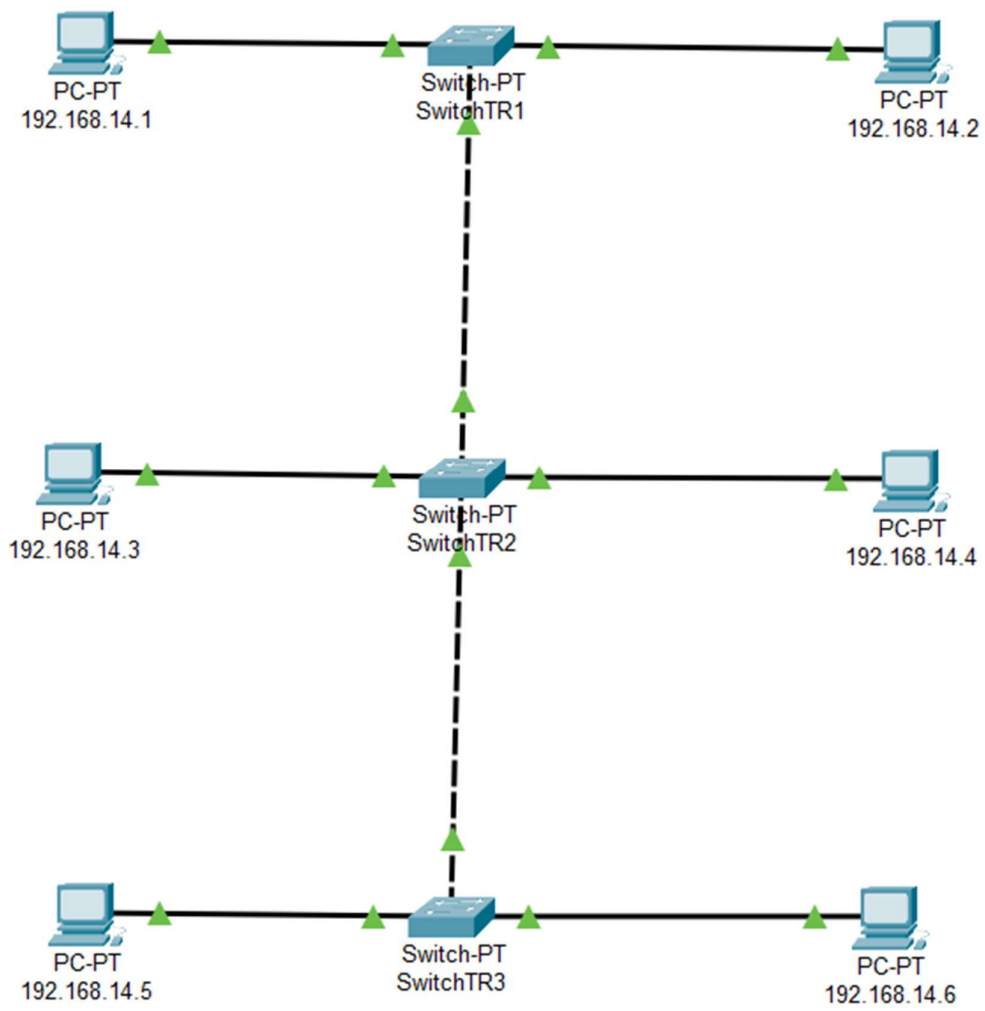# P04: Bus, Ring, Tree, Hybrid, Mesh, topology

4.1) Bus Topology:

Bus Topology

Switch-PT
SwitchBS1

Switch-PT
SwitchBS2

Switch-PT
SwitchBS3

Switch-PT
SwitchBS4

PC-PT
192.168.12.1

PC-PT
192.168.12.2

PC-PT
192.168.12.3

PC-PT
192.168.12.4

4.2) Ring Topology:

Ring Topology

PC-PT
192.168.13.2

Switch-PT
SwitchRn2

PC-PT
192.168.13.1

Switch-PT
SwitchRn1

Switch-PT
SwitchRn3

PC-PT
192.168.13.4

Switch-PT
SwitchRn4

PC-PT
192.168.13.3
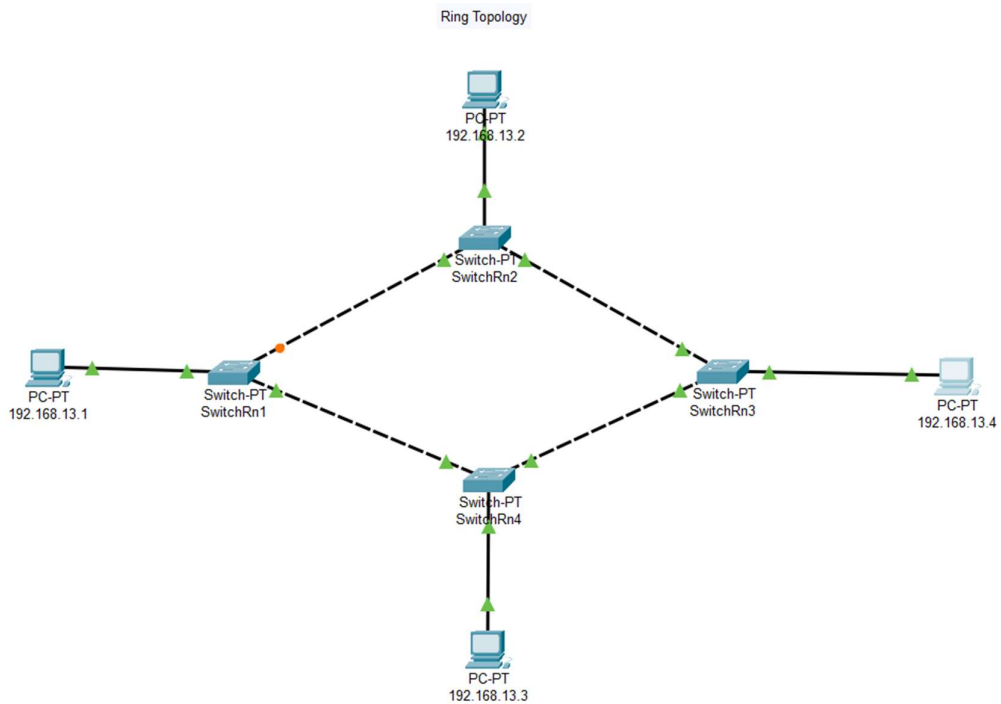
4.3) Tree Topology:

Tree Topology

4.4) Hybrid Topology:

Hybrid
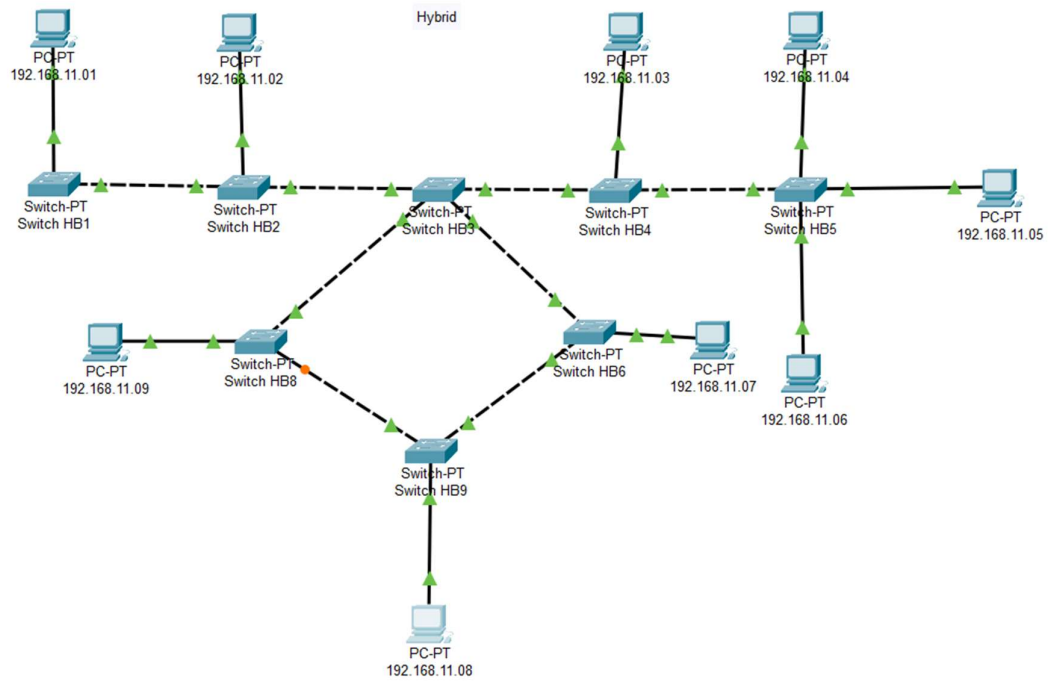
4.5) Mesh Topology:

Mesh Topology
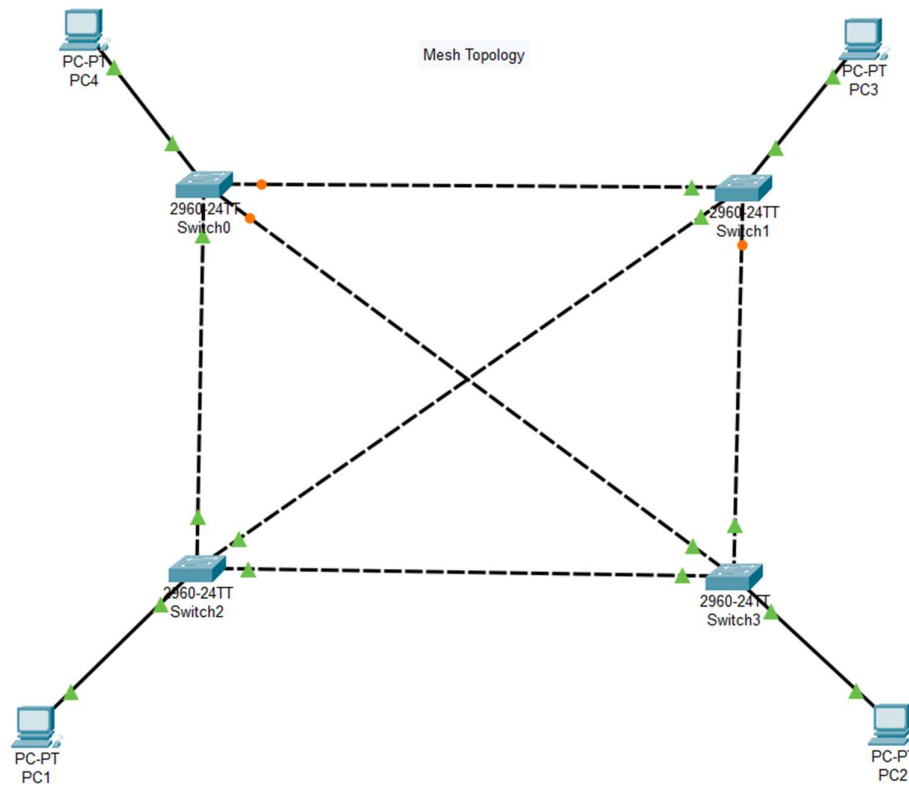
P05: Initial Switch Configuration:

Switch-PT
Switch3

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname SW1
SW1(config)#enable secret 1234
SW1(config)#service password-encryption
SW1(config)#
SW1(config)#line con 0
SW1(config-line)#password cisco123
SW1(config-line)#login
SW1(config-line)#exit
SW1(config)#
SW1(config)#banner motd
SW1(config)#
SW1(config)#banner motd $ ***Only authorized users allowed***$
SW1(config)#

Press RETURN to get started!

 ***Only authorized users allowed***

User Access Verification

Password:

SW1>enable
Password:
SW1#
```

P06: Initial Router Configuration:


```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R1
R1(config)#
R1(config)#enable password 1234
R1(config)#
R1(config)#line console 0
R1(config-line)#password 123
R1(config-line)#login
R1(config-line)#exit
R1(config)#
R1(config)#line vty 0 4
R1(config-line)#password v123
R1(config-line)#login
R1(config-line)#exit
R1(config)#
R1(config)#banner motd $Authorized Access$
R1(config)#
R1(config)#exit

User Access Verification

Password:

R1>enable
Password:
R1#
```
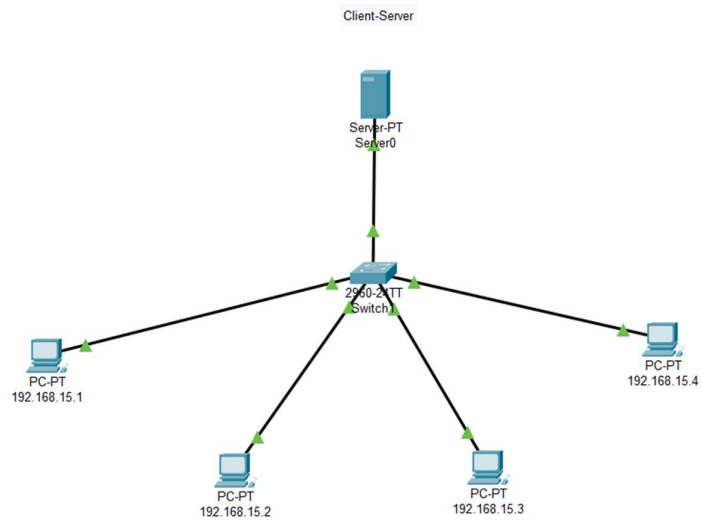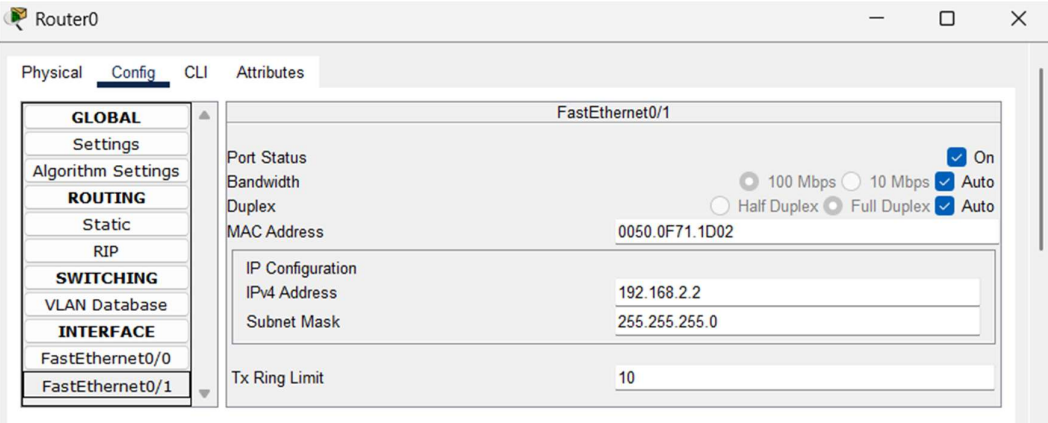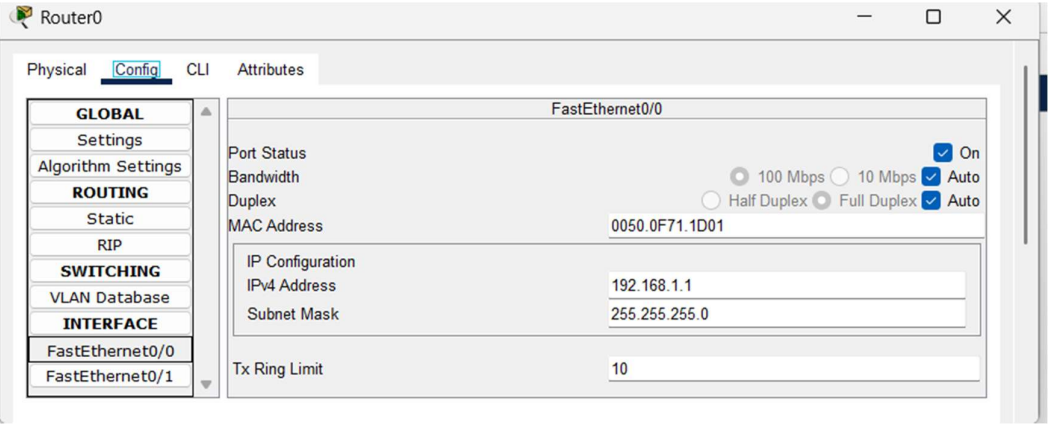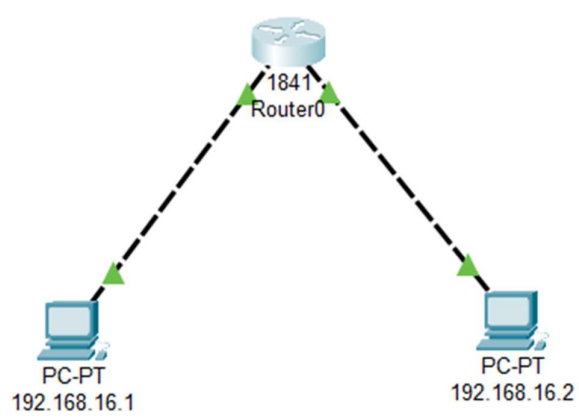
P7: Client Server Network:

Client-Server

Server-PT
Server0

2960-24TT
Switch

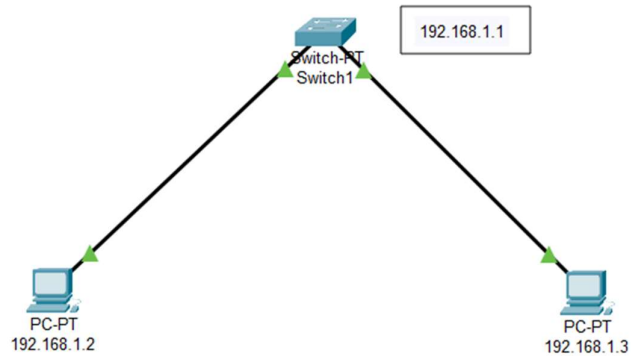PC-PT
192.168.15.1

PC-PT
192.168.15.4

PC-PT
192.168.15.2

PC-PT
192.168.15.3

P08: Connection between devices using router

P09: Remote desktop sharing within LAN connection.


```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface vlan 1
Switch(config-if)#ip address 192.168.1.1 255.255.255.0
Switch(config-if)#no shutdown

Switch(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

Switch(config)#line vty 0 4
Switch(config-line)#login local
Switch(config-line)#username cisco password cisco
Switch(config)#
Switch(config)#
Switch(config)#enable password ciscol
Switch(config)#
```

Physical   Config   Desktop   Programming   Attributes

Command Prompt   X

```
Cisco Packet Tracer PC Command Line 1.0
C:\>telnet 192.168.1.1
Trying 192.168.1.1 ...Open


User Access Verification

Username: cisco
Password:
Switch>enable
Password:
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#
```