CSE3052 - INFORMATION SECURITY MANAGEMENT

DIGITAL ASSIGNMENT-2

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19BCE2555

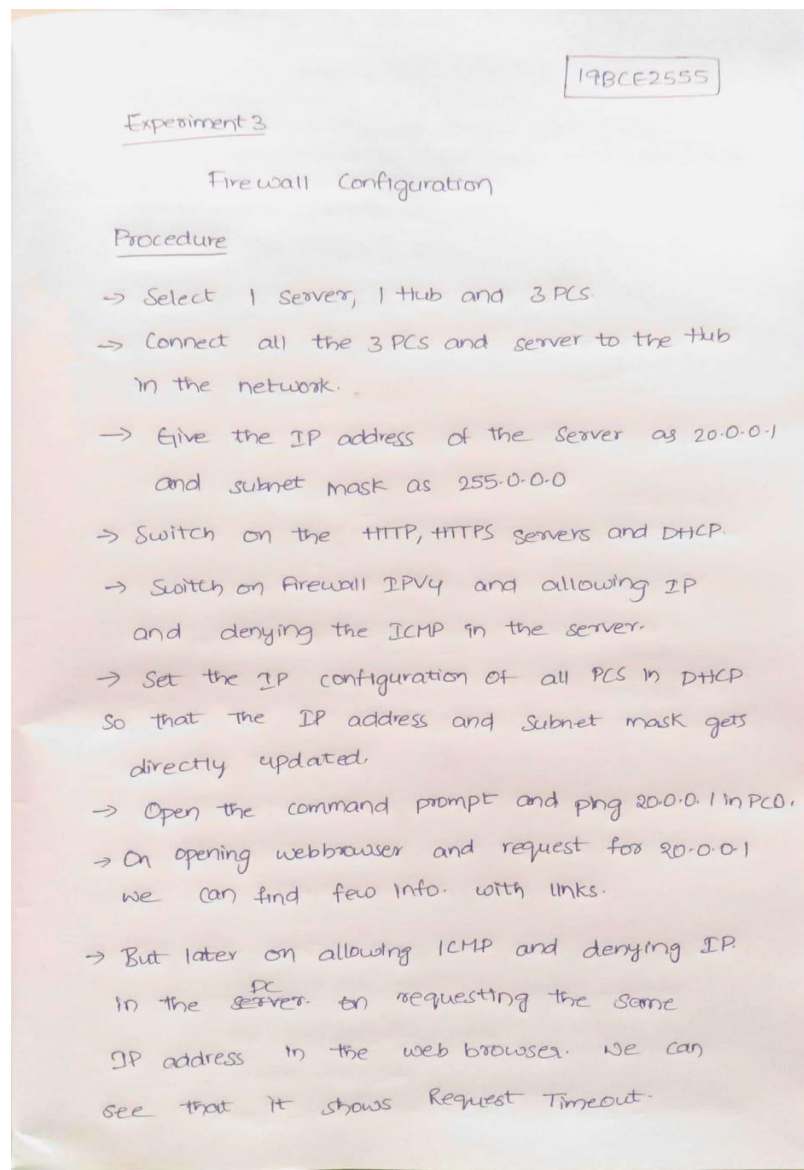# Experiment-3

TITLE:

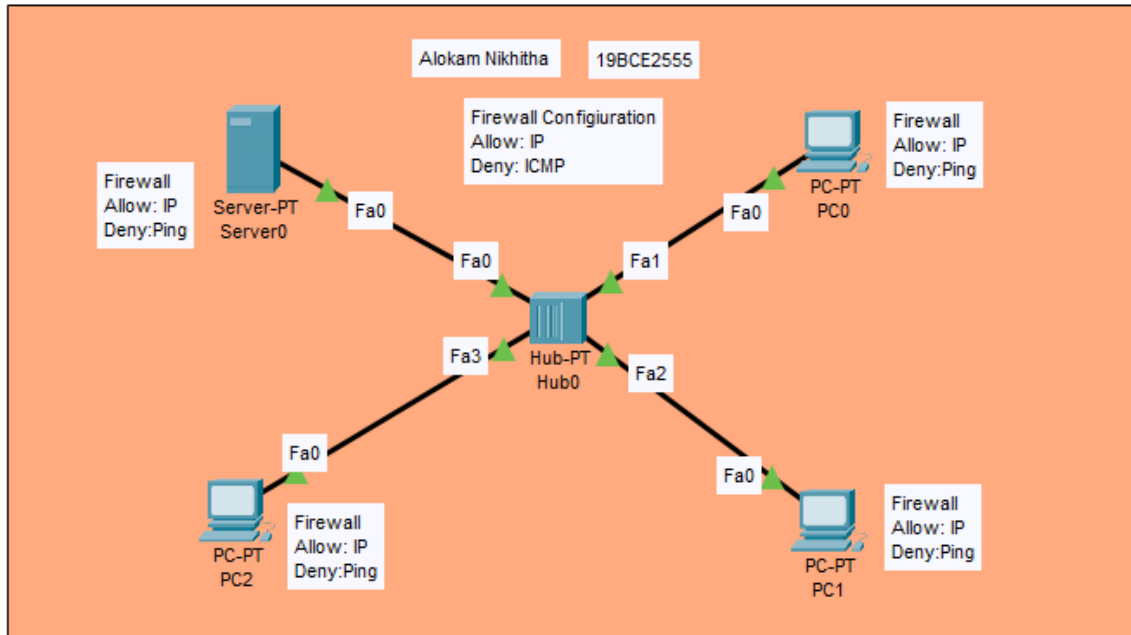**Firewall Configuration.**

AIM:

To configure Firewall by allowing IP and denying ICMP.

PROCEDURE:

19BCE2555

Experiment 3

Firewall Configuration

Procedure

→ Select 1 server, 1 Hub and 3 PCs.

→ Connect all the 3 PCs and server to the Hub in the network.

→ Give the IP address of the server as 20.0.0.1 and subnet mask as 255.0.0.0

→ Switch on the HTTP, HTTPS servers and DHCP.

→ Switch on firewall IPV4 and allowing IP and denying the ICMP in the server.

→ Set the IP configuration of all PCS in DHCP So that the IP address and subnet mask gets directly updated.

→ Open the command prompt and ping 20.0.0.1 in PC0.

→ On opening webbrowser and request for 20.0.0.1 we can find few info. with links.

→ But later on allowing ICMP and denying IP in the server. On requesting the same IP address in the web browser. We can see that it shows Request Timeout.

Scanned with CamScanner

TOPOLOGY

Server IP Configuration:

Server Services:

Switching on HTTP, HTTPS and DHCP

Firewall Configuration :

Switching on Firewall IPv4 and denying the ICMP and allowing the IP
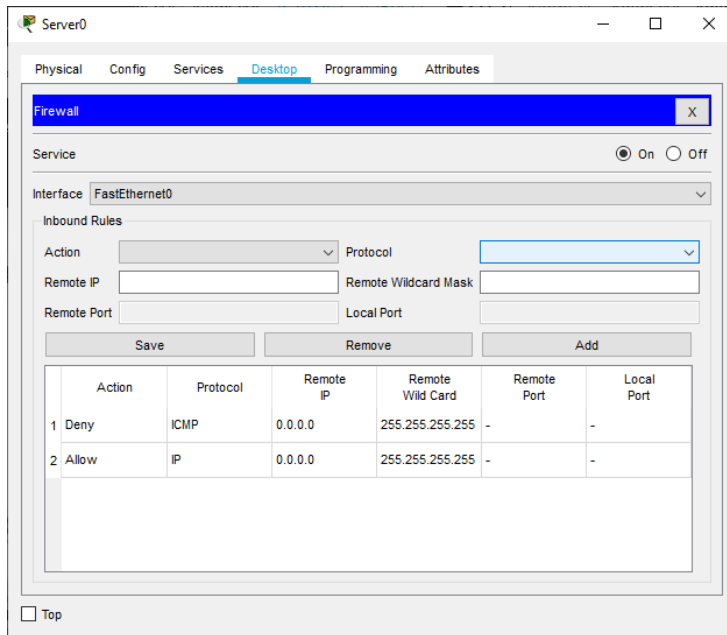
PC/ Computer Configuration:

Ip Confiuration in DHCP .

PC1

Physical Config Desktop Programming Attributes
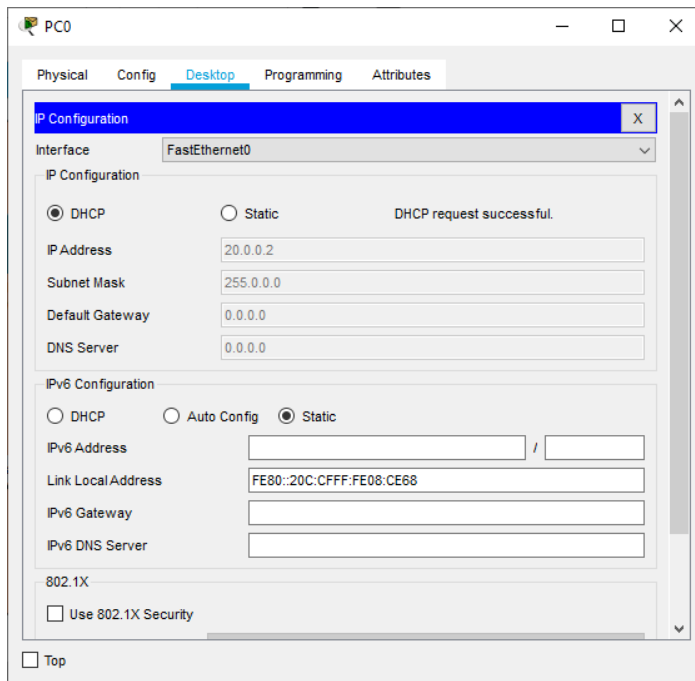
IP Configuration   X

Interface   FastEthernet0

IP Configuration

(•) DHCP   ( ) Static   DHCP request successful.

IP Address   20.0.0.3

Subnet Mask   255.0.0.0

Default Gateway   0.0.0.0

DNS Server   0.0.0.0

IPv6 Configuration

( ) DHCP   ( ) Auto Config   (•) Static

IPv6 Address   /

Link Local Address   FE80::201:C7FF:FE5D:8B0C

IPv6 Gateway

IPv6 DNS Server

802.1X

[ ] Use 802.1X Security

[ ] Top

PC2

Physical Config Desktop Programming Attributes

IP Configuration   X

Interface   FastEthernet0

IP Configuration

(•) DHCP   ( ) Static   DHCP request successful.

IP Address   20.0.0.4

Subnet Mask   255.0.0.0

Default Gateway   0.0.0.0

DNS Server   0.0.0.0

IPv6 Configuration

( ) DHCP   ( ) Auto Config   (•) Static

IPv6 Address   /

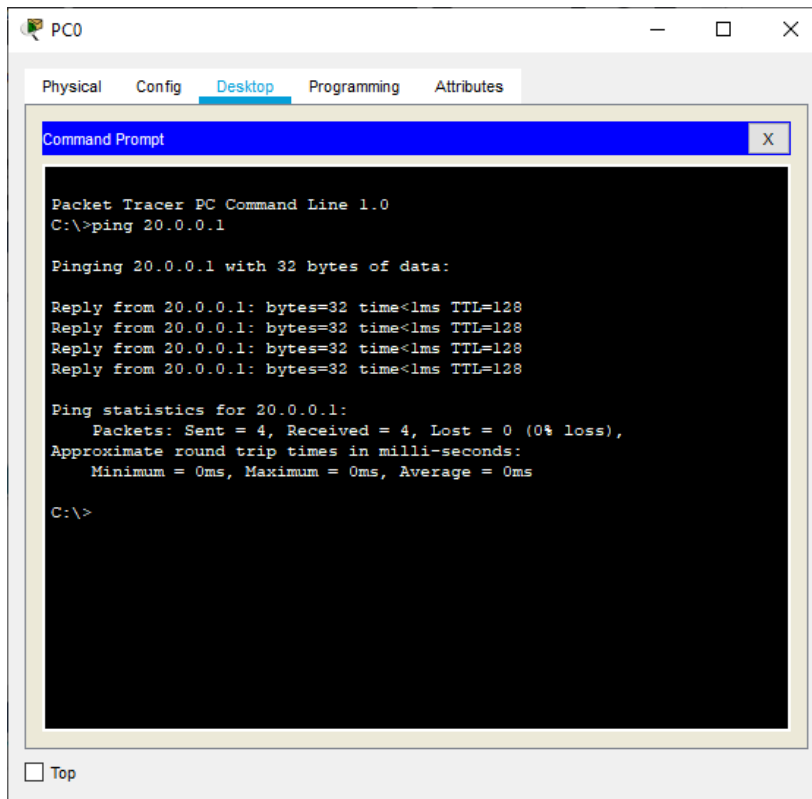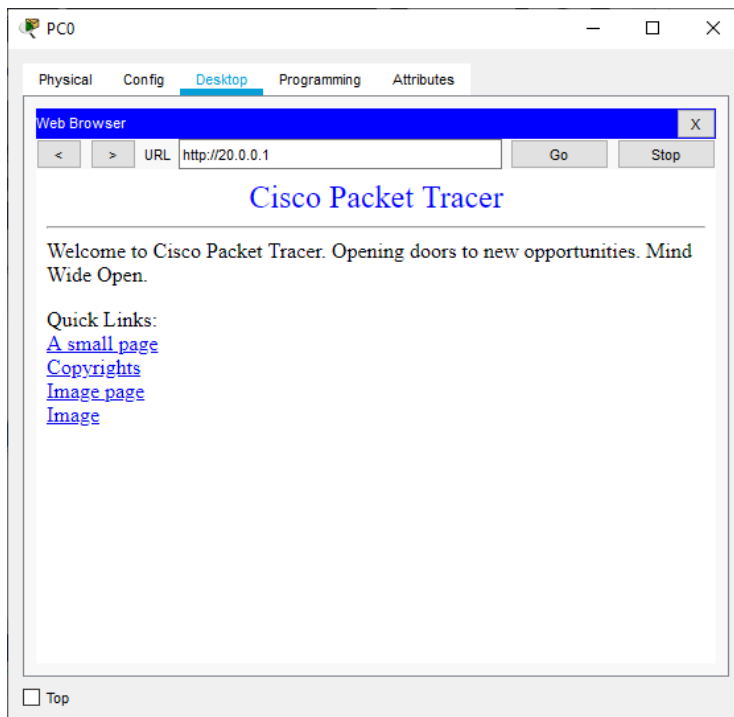Link Local Address   FE80::201:96FF:FE20:5EC6

IPv6 Gateway

IPv6 DNS Server

802.1X

[ ] Use 802.1X Security

[ ] Top

Command prompt (Pinging 20.0.0.1)

```
PC0                                              —   □   ×

  Physical    Config    Desktop    Programming    Attributes

  Command Prompt                                          X

    Packet Tracer PC Command Line 1.0
    C:\>ping 20.0.0.1

    Pinging 20.0.0.1 with 32 bytes of data:

    Reply from 20.0.0.1: bytes=32 time<1ms TTL=128
    Reply from 20.0.0.1: bytes=32 time<1ms TTL=128
    Reply from 20.0.0.1: bytes=32 time<1ms TTL=128
    Reply from 20.0.0.1: bytes=32 time<1ms TTL=128

    Ping statistics for 20.0.0.1:
        Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

    C:\>

  □ Top
```

Request on Web browser

```
PC0                                              —   □   ×

  Physical    Config    Desktop    Programming    Attributes

  Web Browser                                             X
  [ < ] [ > ]  URL  http://20.0.0.1          [  Go  ] [  Stop  ]
                    Cisco Packet Tracer
  ─────────────────────────────────────────────────────────
  Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind
  Wide Open.

  Quick Links:
  A small page
  Copyrights
  Image page
  Image

  □ Top
```
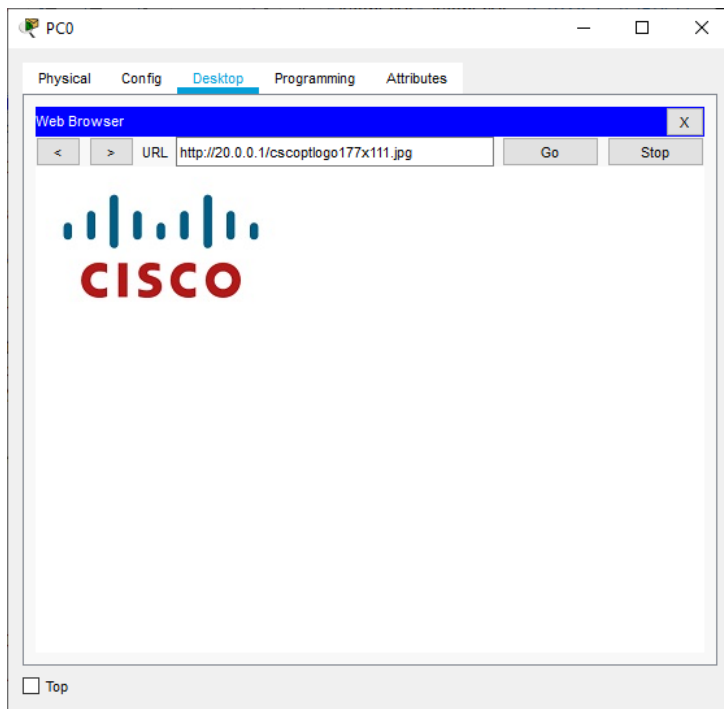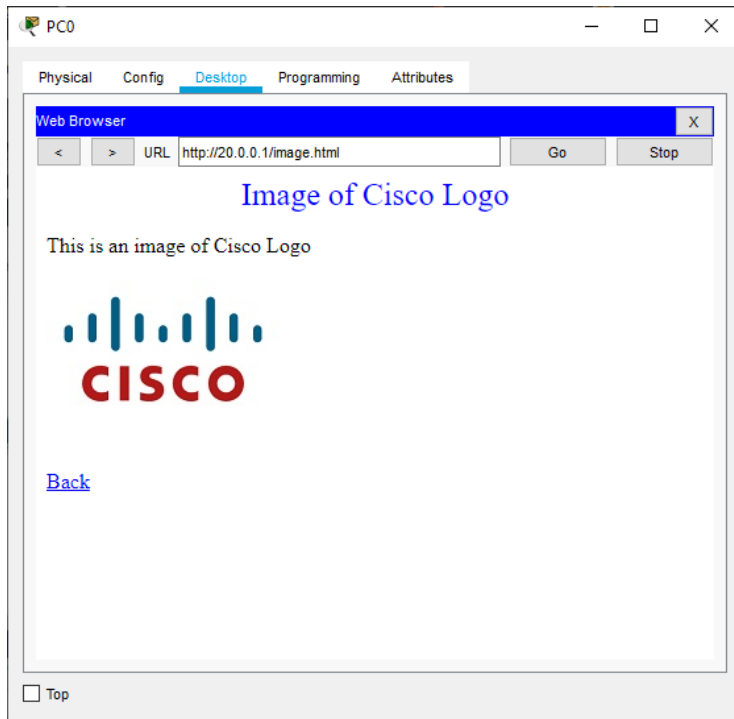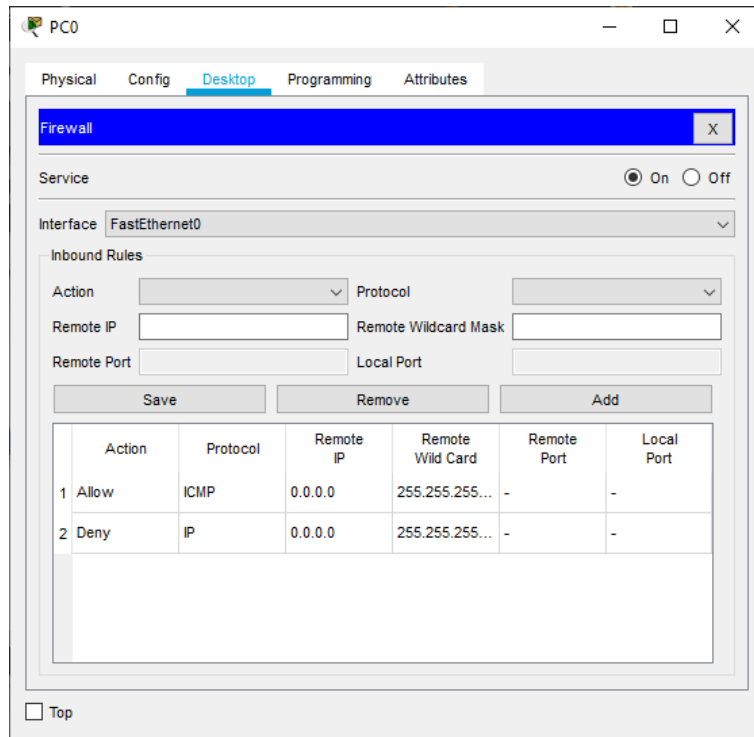
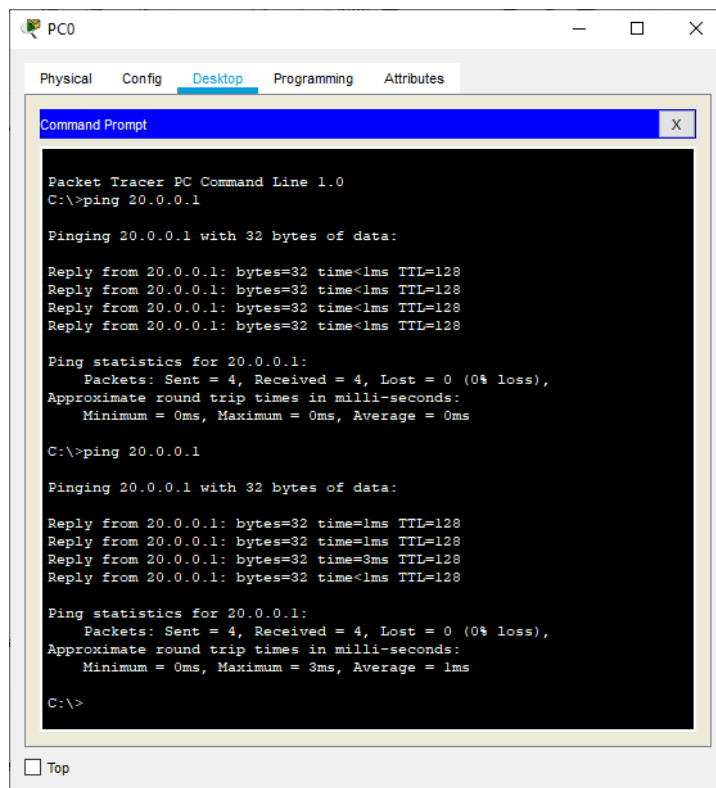## Changing the Firewall Configiuration (Allowing ICMP and denying IP)
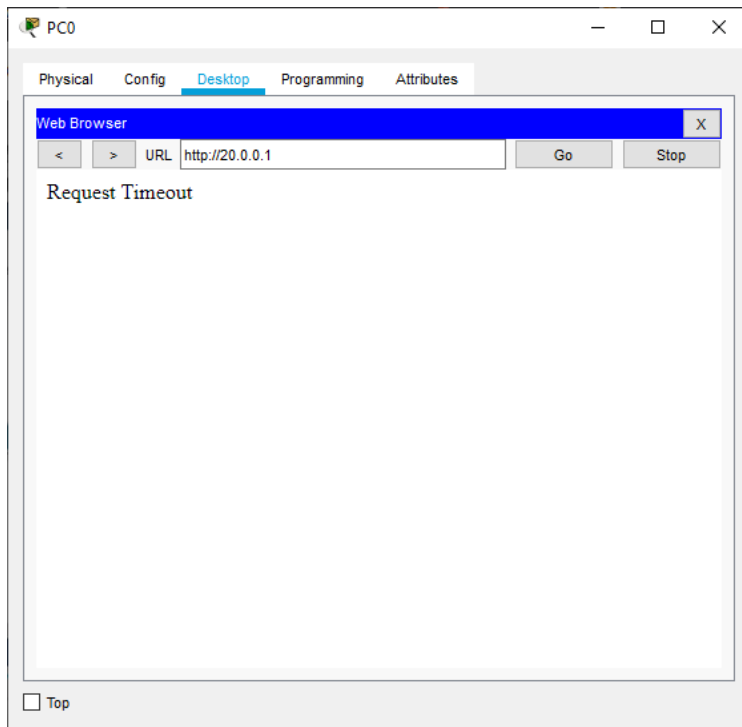

Command Prompt (pinging 20.0.0.1)

Request on Web browser

PC0

Physical   Config   Desktop   Programming   Attributes

Web Browser   X

< | > | URL | http://20.0.0.1 | Go | Stop

Request Timeout

☐ Top

Results

On Allowing IP and Denying ICMP
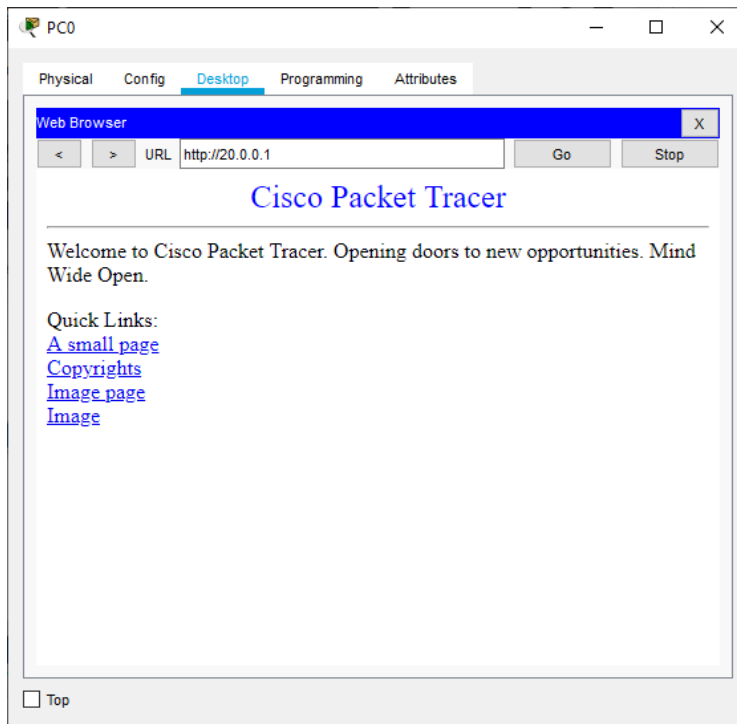
Image page:
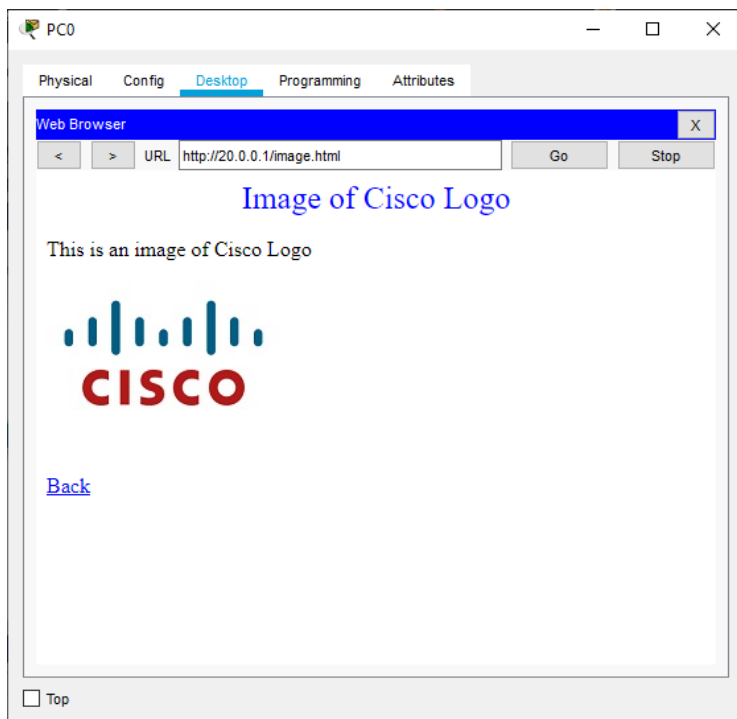
Image:

A small page
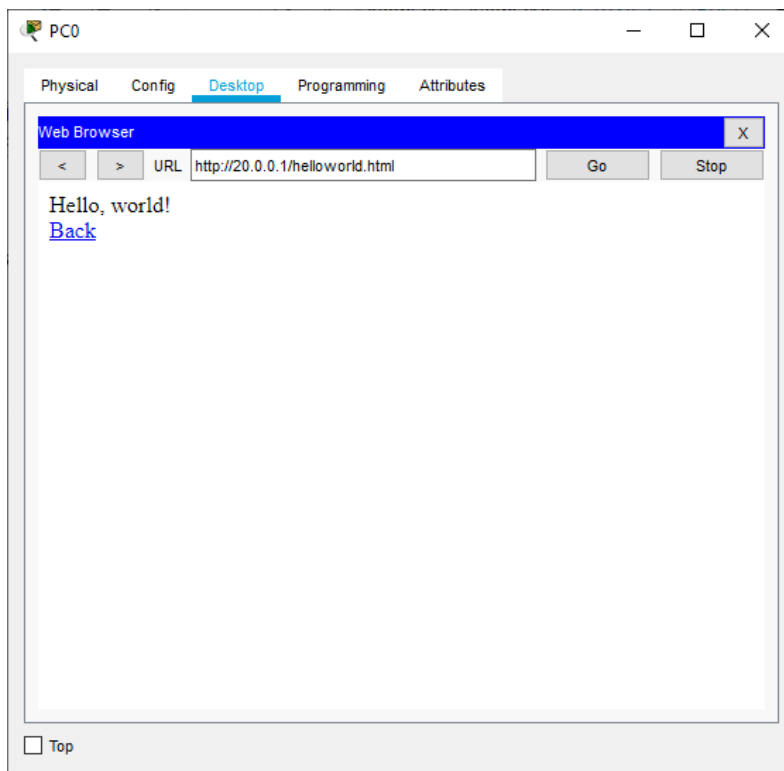
License Agreement
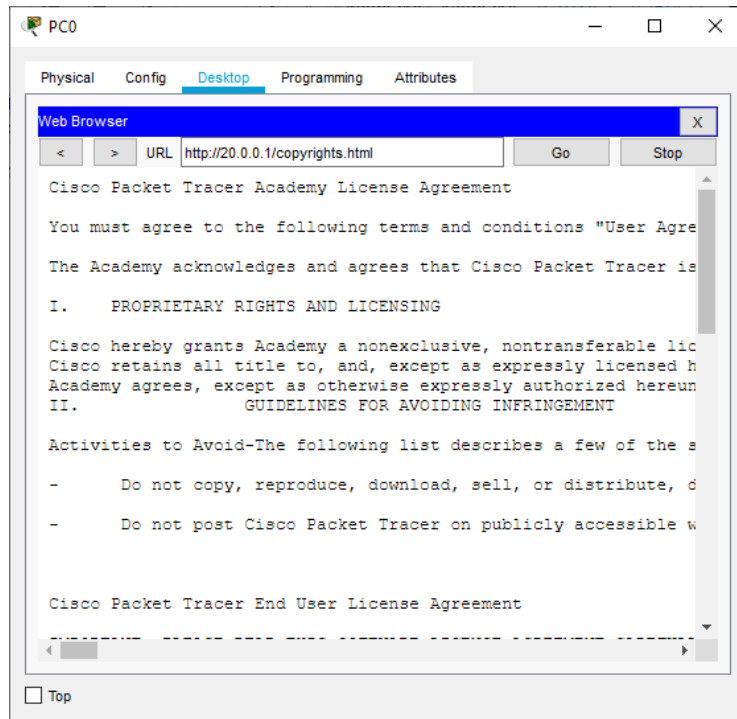
On Allowing ICMP and Denying IP
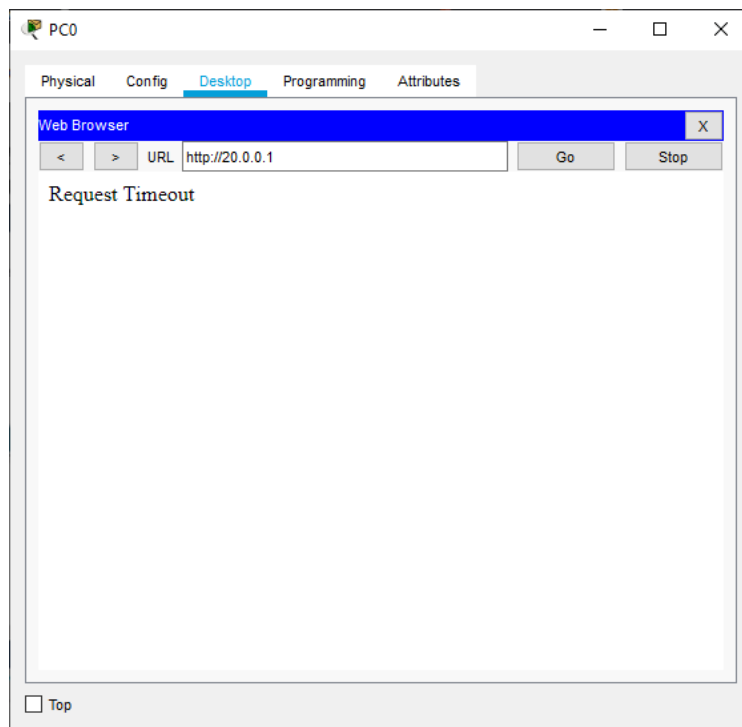
Conclusion

We can see that on allowing IP and Denying the ICMP .We can get the request for the given IP address on entering the IP address in Web browser of the PC. But on denying the IP address and allowing ICMP It shows that the Request time out on entering the IP address in web browser.
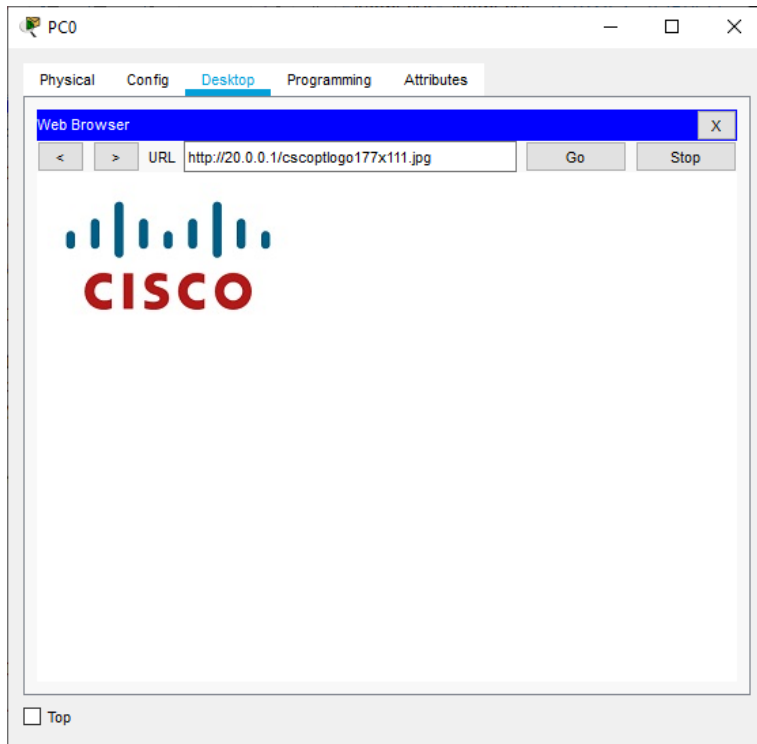
Experiment-4

TITLE:

Implementing Access Control Lists.

AIM:

To Implement Access Control Lists.

PROCEDURE:

TOPOLOGY
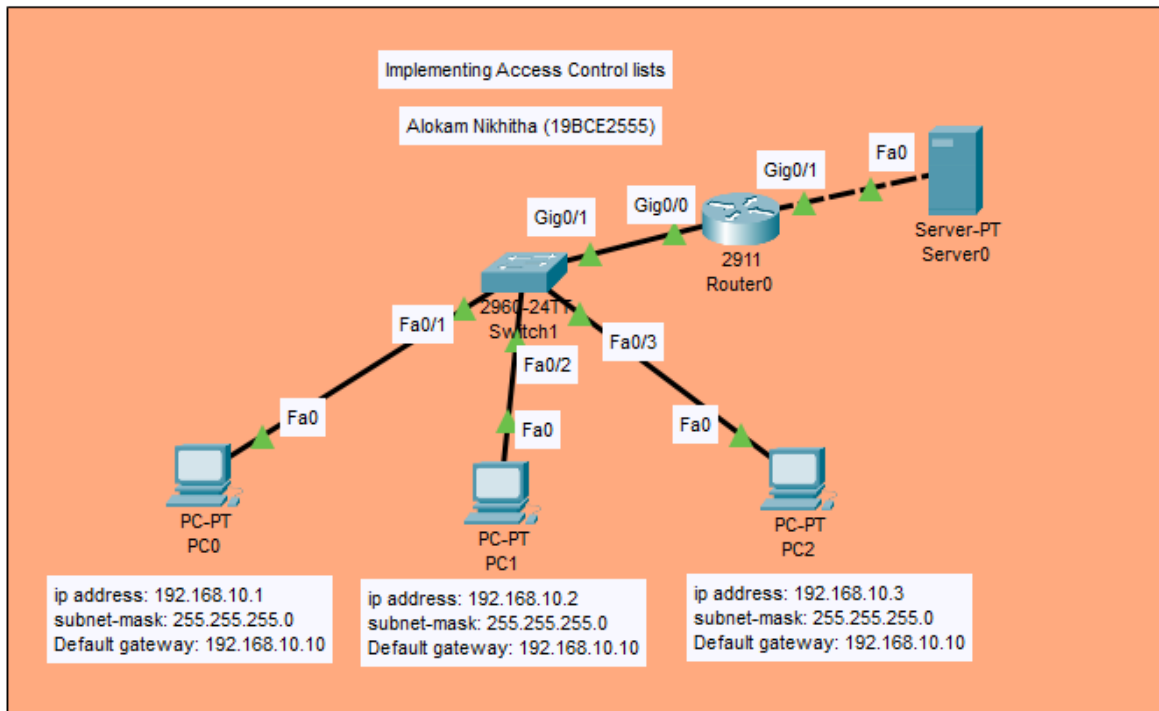
PCs Configuration:
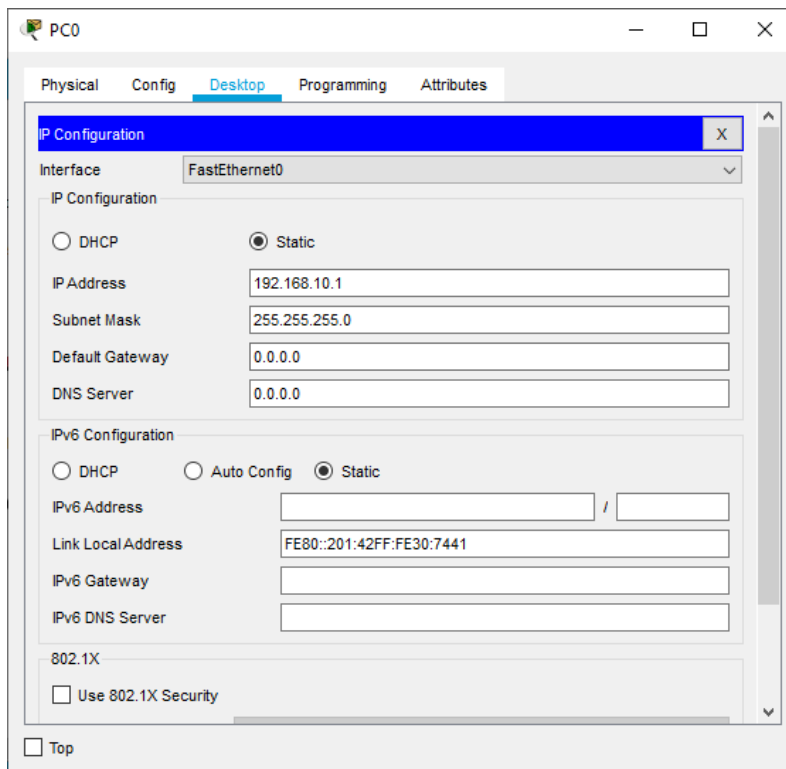
PC1

Physical | Config | Desktop | Programming | Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

○ DHCP ● Static

IP Address: 192.168.10.2
Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0
DNS Server: 0.0.0.0

IPv6 Configuration

○ DHCP ○ Auto Config ● Static

IPv6 Address: _____ / ____
Link Local Address: FE80::204:9AFF:FED4:C27C
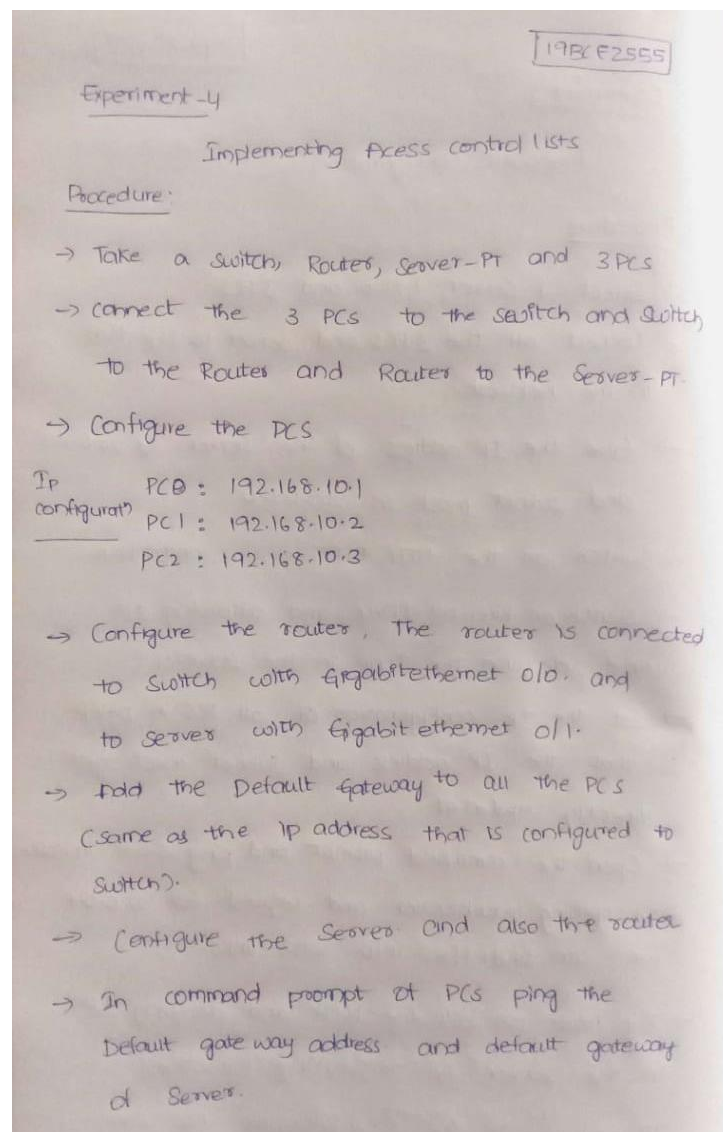IPv6 Gateway: _____
IPv6 DNS Server: _____

802.1X

☐ Use 802.1X Security

☐ Top

PC2

Physical | Config | Desktop | Programming | Attributes

IP Configuration [X]

Interface: FastEthernet0

IP Configuration

○ DHCP ● Static

IP Address: 192.168.10.3
Subnet Mask: 255.255.255.0
Default Gateway: 0.0.0.0
DNS Server: 0.0.0.0

IPv6 Configuration

○ DHCP ○ Auto Config ● Static

IPv6 Address: _____ / ____
Link Local Address: FE80::209:7CFF:FE02:8D37
IPv6 Gateway: _____
IPv6 DNS Server: _____
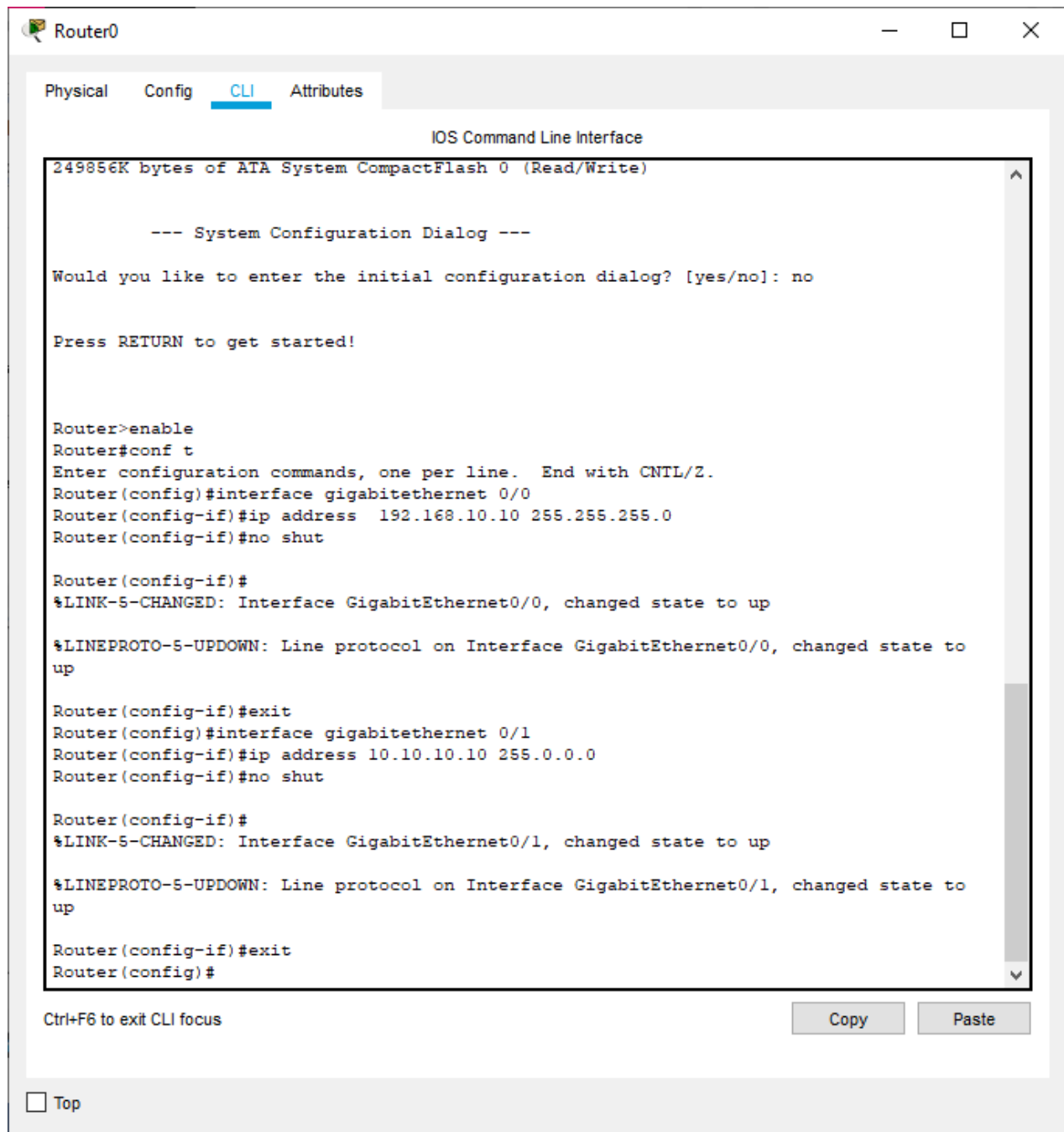
802.1X

☐ Use 802.1X Security

☐ Top

Router Configuration:


```
Router0                                                    —    □    ✕

Physical    Config    CLI    Attributes

                        IOS Command Line Interface

249856K bytes of ATA System CompactFlash 0 (Read/Write)


        --- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no


Press RETURN to get started!



Router>enable
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface gigabitethernet 0/0
Router(config-if)#ip address  192.168.10.10 255.255.255.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to
up

Router(config-if)#exit
Router(config)#interface gigabitethernet 0/1
Router(config-if)#ip address 10.10.10.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to
up

Router(config-if)#exit
Router(config)#

Ctrl+F6 to exit CLI focus                          Copy      Paste

☐ Top
```

Setting Default Gateway of the PCs

PC0 — IP Configuration

Interface: FastEthernet0

IP Configuration
- DHCP
- ● Static

IP Address: 192.168.10.1
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.10.10
DNS Server: 0.0.0.0

IPv6 Configuration
- DHCP
- Auto Config
- ● Static

IPv6 Address: ___ / ___
Link Local Address: FE80::201:42FF:FE30:7441
IPv6 Gateway:
IPv6 DNS Server:

802.1X
- ☐ Use 802.1X Security

☐ Top

PC1 — IP Configuration

Interface: FastEthernet0

IP Configuration
- DHCP
- ● Static

IP Address: 192.168.10.2
Subnet Mask: 255.255.255.0
Default Gateway: 192.168.10.10
DNS Server: 0.0.0.0

IPv6 Configuration
- DHCP
- Auto Config
- ● Static

IPv6 Address: ___ / ___
Link Local Address: FE80::204:9AFF:FED4:C27C
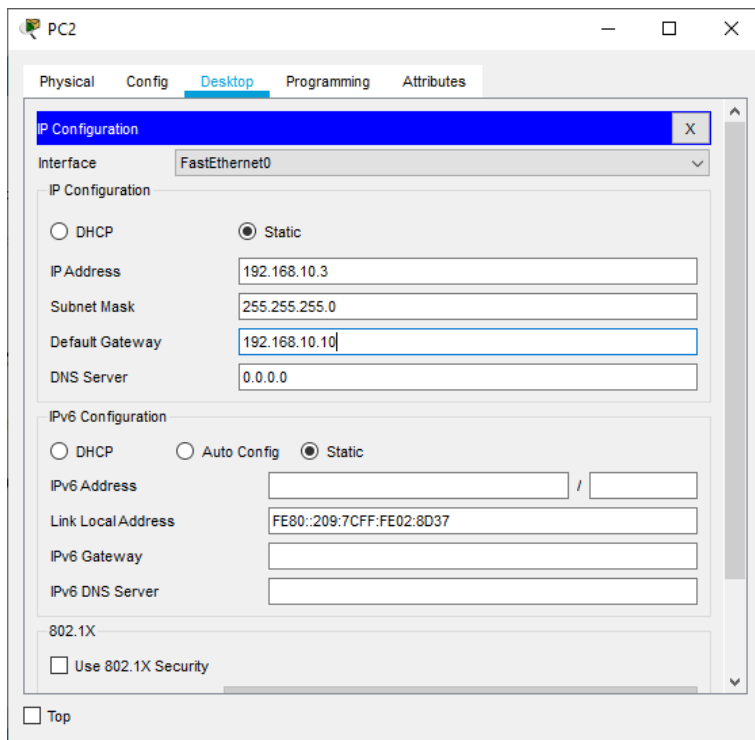IPv6 Gateway:
IPv6 DNS Server:

802.1X
- ☐ Use 802.1X Security

☐ Top

Server IP Configuration:
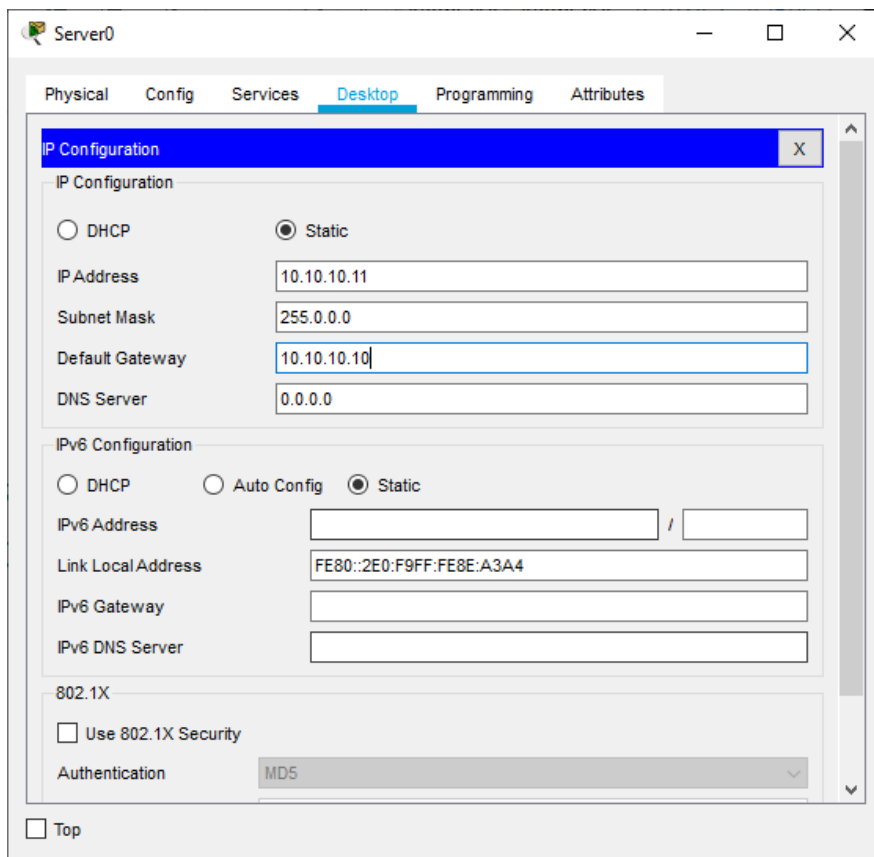
Router Configuration
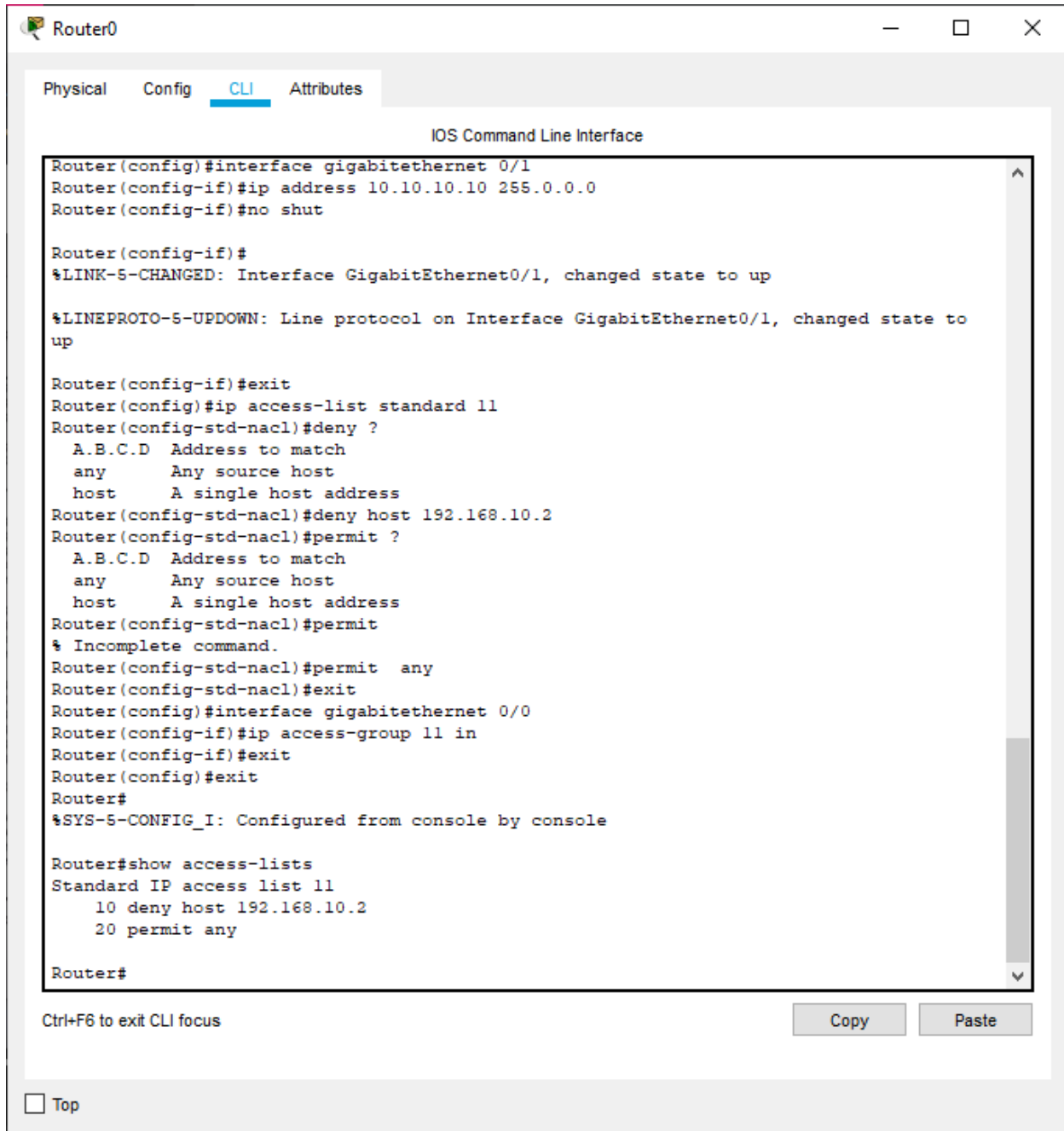
```
Router0                                                        —    □    ×

 Physical    Config    CLI    Attributes

                        IOS Command Line Interface

Router(config)#interface gigabitethernet 0/1
Router(config-if)#ip address 10.10.10.10 255.0.0.0
Router(config-if)#no shut

Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to
up

Router(config-if)#exit
Router(config)#ip access-list standard 11
Router(config-std-nacl)#deny ?
  A.B.C.D  Address to match
  any      Any source host
  host     A single host address
Router(config-std-nacl)#deny host 192.168.10.2
Router(config-std-nacl)#permit ?
  A.B.C.D  Address to match
  any      Any source host
  host     A single host address
Router(config-std-nacl)#permit
% Incomplete command.
Router(config-std-nacl)#permit  any
Router(config-std-nacl)#exit
Router(config)#interface gigabitethernet 0/0
Router(config-if)#ip access-group 11 in
Router(config-if)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#show access-lists
Standard IP access list 11
    10 deny host 192.168.10.2
    20 permit any

Router#

Ctrl+F6 to exit CLI focus                          Copy         Paste

□ Top
```
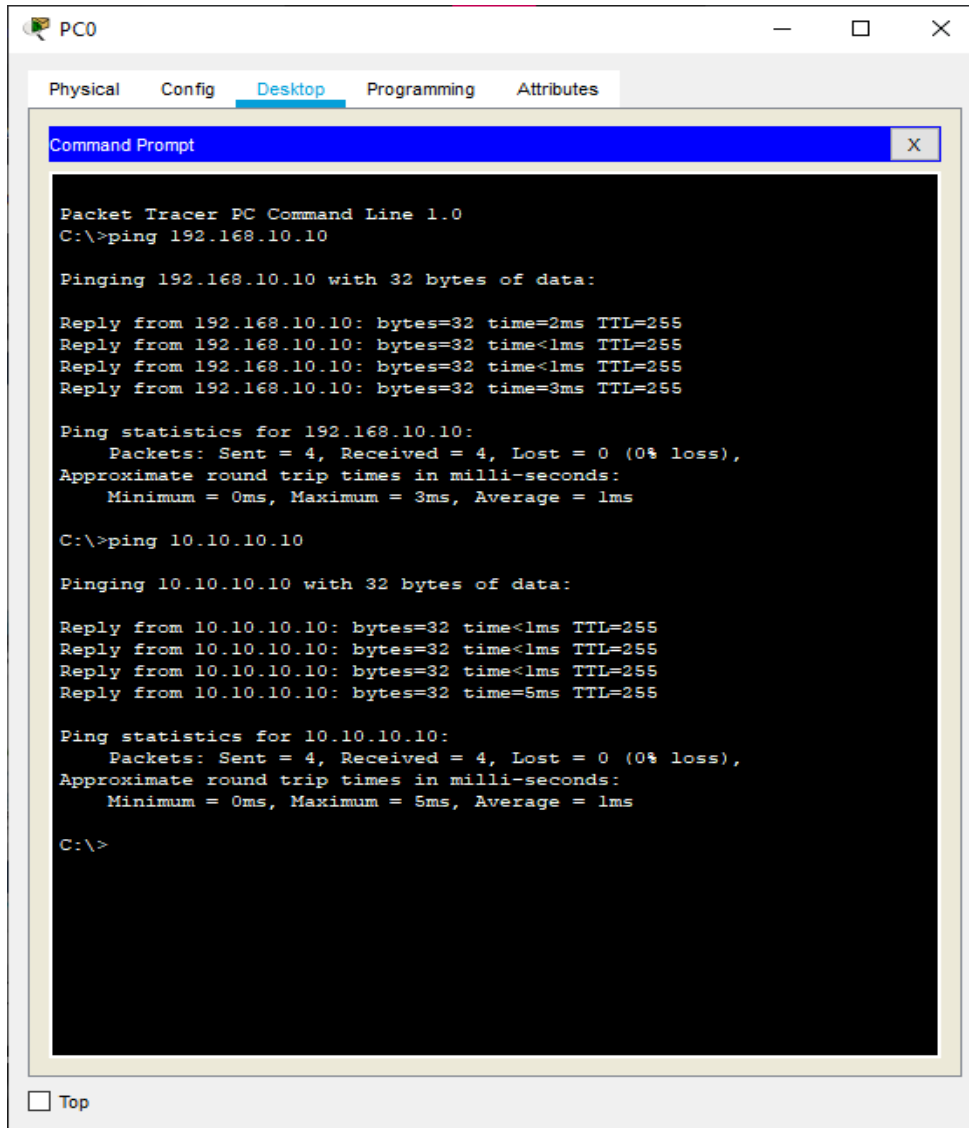
Command Prompt of PCs:


```
PC0                                                     —    □    ✕

Physical    Config    Desktop    Programming    Attributes

 Command Prompt                                                   X

  Packet Tracer PC Command Line 1.0
  C:\>ping 192.168.10.10

  Pinging 192.168.10.10 with 32 bytes of data:

  Reply from 192.168.10.10: bytes=32 time=2ms TTL=255
  Reply from 192.168.10.10: bytes=32 time<1ms TTL=255
  Reply from 192.168.10.10: bytes=32 time<1ms TTL=255
  Reply from 192.168.10.10: bytes=32 time=3ms TTL=255

  Ping statistics for 192.168.10.10:
      Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
      Minimum = 0ms, Maximum = 3ms, Average = 1ms

  C:\>ping 10.10.10.10

  Pinging 10.10.10.10 with 32 bytes of data:

  Reply from 10.10.10.10: bytes=32 time<1ms TTL=255
  Reply from 10.10.10.10: bytes=32 time<1ms TTL=255
  Reply from 10.10.10.10: bytes=32 time<1ms TTL=255
  Reply from 10.10.10.10: bytes=32 time=5ms TTL=255

  Ping statistics for 10.10.10.10:
      Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
      Minimum = 0ms, Maximum = 5ms, Average = 1ms

  C:\>

☐ Top
```

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PC1

Physical | Config | Desktop | Programming | Attributes

Command Prompt

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.10

Pinging 192.168.10.10 with 32 bytes of data:

Reply from 192.168.10.10: Destination host unreachable.
Reply from 192.168.10.10: Destination host unreachable.
Reply from 192.168.10.10: Destination host unreachable.
Reply from 192.168.10.10: Destination host unreachable.

Ping statistics for 192.168.10.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 10.10.10.10

Pinging 10.10.10.10 with 32 bytes of data:

Reply from 192.168.10.10: Destination host unreachable.
Reply from 192.168.10.10: Destination host unreachable.
Reply from 192.168.10.10: Destination host unreachable.
Reply from 192.168.10.10: Destination host unreachable.

Ping statistics for 10.10.10.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>
```

☐ Top

PC2

Physical | Config | Desktop | Programming | Attributes

Command Prompt

```
Pinging 192.168.10.10 with 32 bytes of data:

Reply from 192.168.10.10: bytes=32 time<1ms TTL=255
Reply from 192.168.10.10: bytes=32 time<1ms TTL=255
Reply from 192.168.10.10: bytes=32 time<1ms TTL=255
Reply from 192.168.10.10: bytes=32 time<1ms TTL=255

Ping statistics for 192.168.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 10.10.10.10

Pinging 10.10.10.10 with 32 bytes of data:

Reply from 10.10.10.10: bytes=32 time<1ms TTL=255
Reply from 10.10.10.10: bytes=32 time<1ms TTL=255
Reply from 10.10.10.10: bytes=32 time=3ms TTL=255
Reply from 10.10.10.10: bytes=32 time<1ms TTL=255

Ping statistics for 10.10.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 0ms

C:\>
```
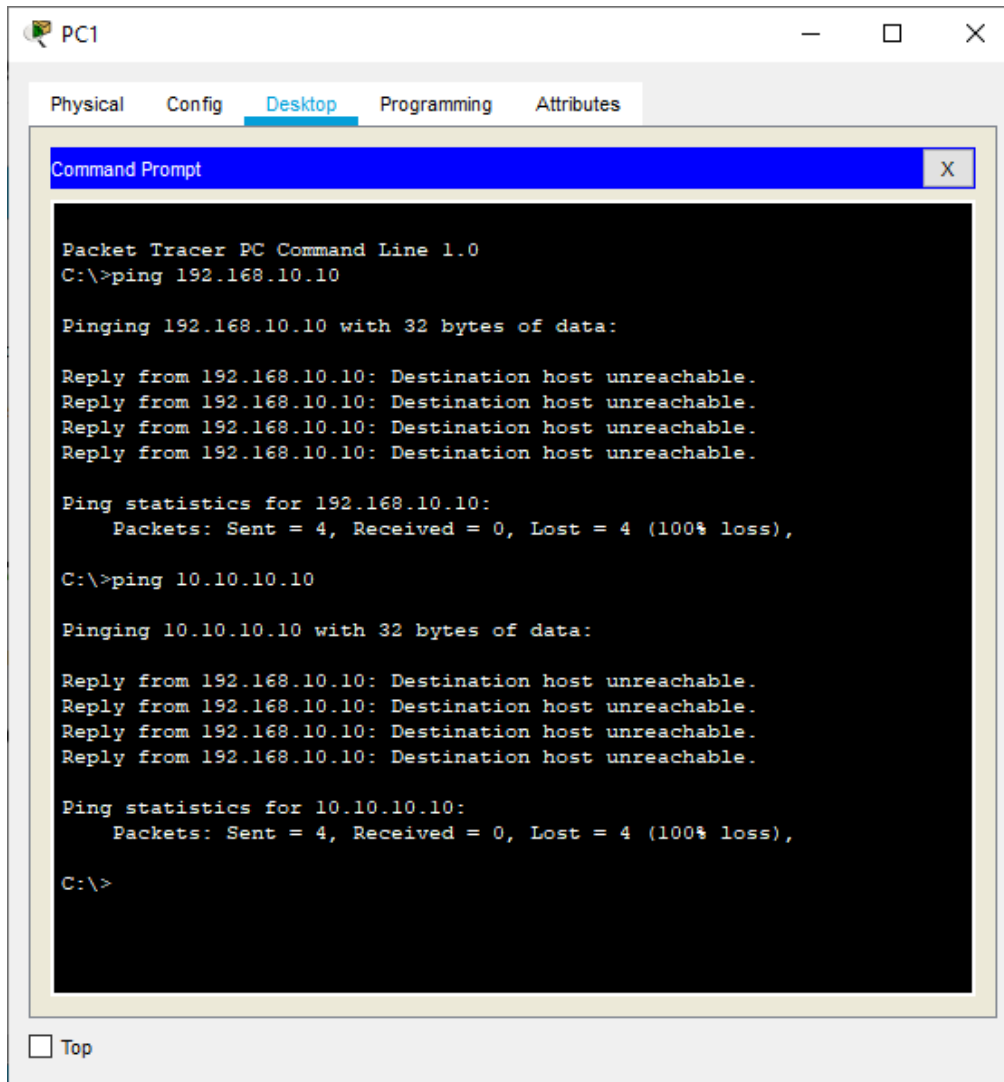
☐ Top

Results

Command prompt of PC0:

Packet Tracer PC Command Line 1.0
C:\>ping 192.168.10.10

Pinging 192.168.10.10 with 32 bytes of data:

Reply from 192.168.10.10: bytes=32 time=2ms TTL=255
Reply from 192.168.10.10: bytes=32 time<1ms TTL=255
Reply from 192.168.10.10: bytes=32 time<1ms TTL=255
Reply from 192.168.10.10: bytes=32 time=3ms TTL=255

Ping statistics for 192.168.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 1ms

C:\>ping 10.10.10.10

Pinging 10.10.10.10 with 32 bytes of data:

Reply from 10.10.10.10: bytes=32 time<1ms TTL=255
Reply from 10.10.10.10: bytes=32 time<1ms TTL=255
Reply from 10.10.10.10: bytes=32 time<1ms TTL=255
Reply from 10.10.10.10: bytes=32 time=5ms TTL=255

Ping statistics for 10.10.10.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 5ms, Average = 1ms

C:\>

Command prompt of PC1:

```
PC1                                                    —    □    ✕

 Physical    Config    Desktop    Programming    Attributes

  Command Prompt                                            X

   Packet Tracer PC Command Line 1.0
   C:\>ping 192.168.10.10

   Pinging 192.168.10.10 with 32 bytes of data:

   Reply from 192.168.10.10: Destination host unreachable.
   Reply from 192.168.10.10: Destination host unreachable.
   Reply from 192.168.10.10: Destination host unreachable.
   Reply from 192.168.10.10: Destination host unreachable.

   Ping statistics for 192.168.10.10:
       Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

   C:\>ping 10.10.10.10

   Pinging 10.10.10.10 with 32 bytes of data:

   Reply from 192.168.10.10: Destination host unreachable.
   Reply from 192.168.10.10: Destination host unreachable.
   Reply from 192.168.10.10: Destination host unreachable.
   Reply from 192.168.10.10: Destination host unreachable.

   Ping statistics for 10.10.10.10:
       Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

   C:\>

 □ Top
```
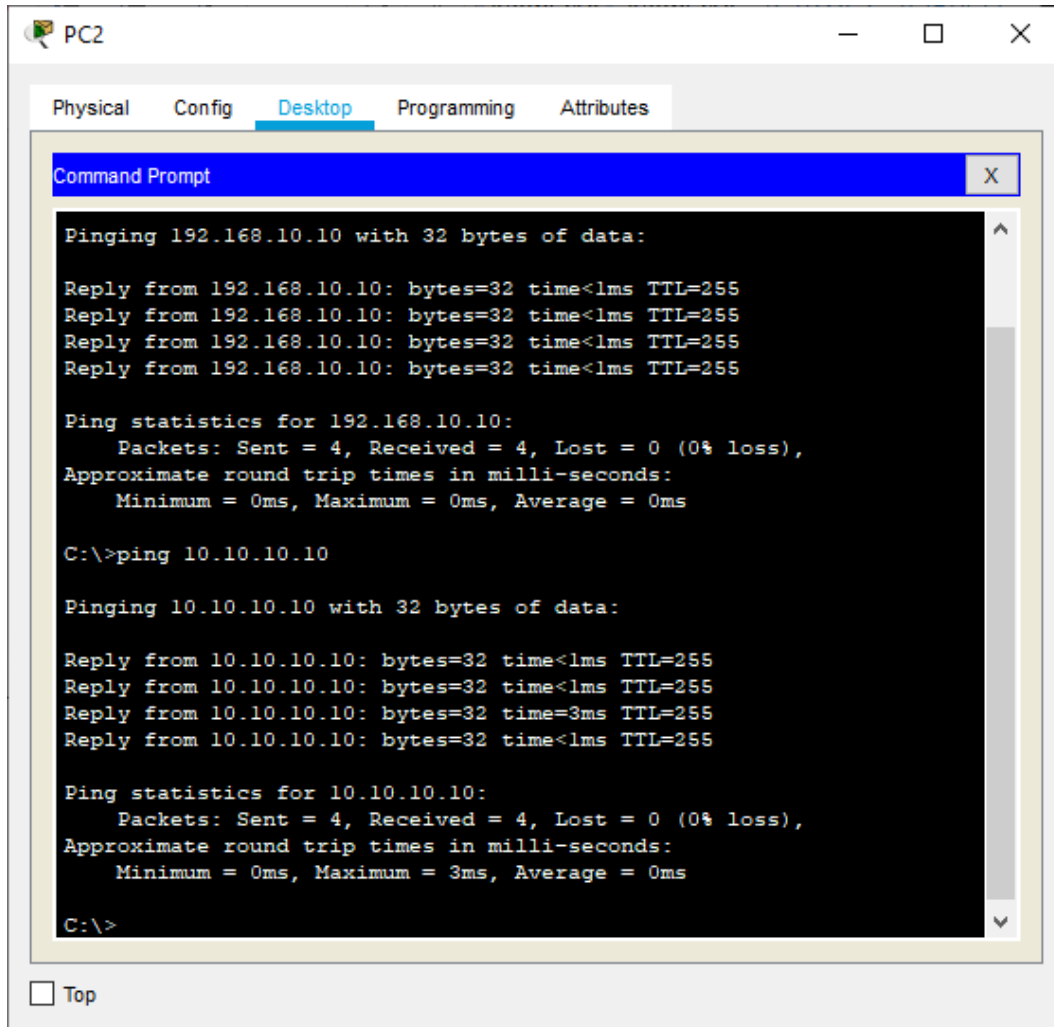
Command prompt of PC2:

Conclusion

Here we can see that on pinging the Default gateway address We can find that in the PC0, PC2 . They reply is received from the pinged address . But where as in the PC1 . The Destination host is unreachable