LAB ASSESSMENT-2

SLOT: L49-L50

CSE 3502: INFORMATION SECURITY MANAGEMENT

Submitted By:

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19BCE2484

Submitted to:

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Experiment 1 Firewall Configuration:

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Lab Assessment 2

Experiment 1 : Firewall configuration

Aim:
The aim of the experiment is to configure a firewall in a network to allow only specific packets to pass through.

Procedure :

i) Configure the Server IP address as: 20.0.0.1

ii) Turn DHCP and HTTP 'on' from the services tab.

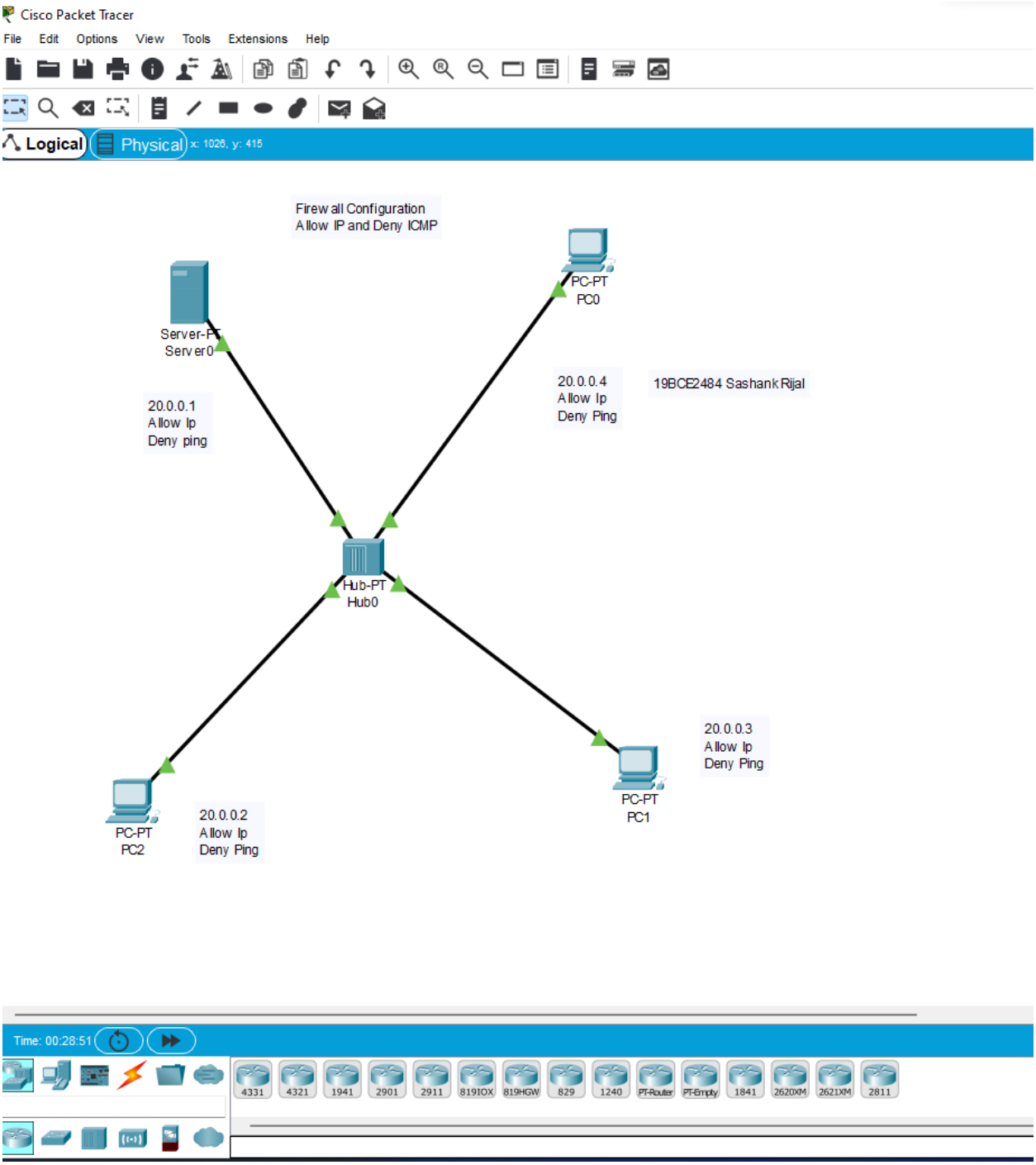
iii) Open ~~any~~ every PC and open IP Configuration. Select 'DHCP'. Each PC will be assigned an IP address dynamically

iv) Under 'Desktop' tab in Server, select 'IPv4 firewall', and turn service 'on'

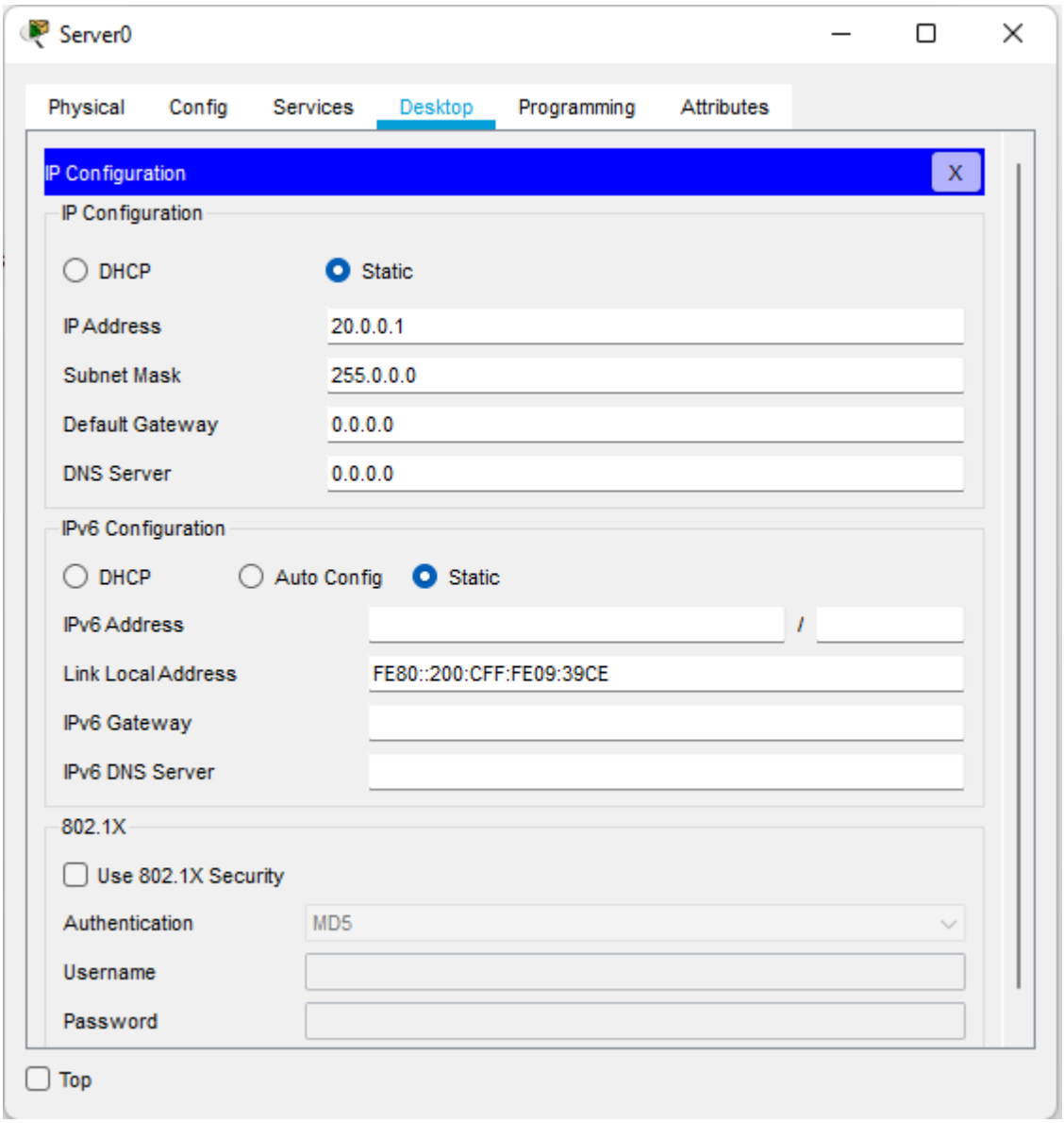
v) For allowing IP and denying ICMP, under 'action' select 'Allow' and under protocol, select 'IP'. Give remote IP as 0.0.0.0 & remote mask (wild card) as 255.255.255.255. Then click on 'Save' and 'add'. Similarly select 'Deny' under action and 'ICMP' under protocol then click 'Save' and 'add'.

vi) For allowing ICMP and denying IP, follow similar step as (v). Under action select 'Allow' and protocol 'ICMP'. Then click 'Save' & 'add'. Similarly select 'Deny' under action an 'IP' under protocol and click Save & add.

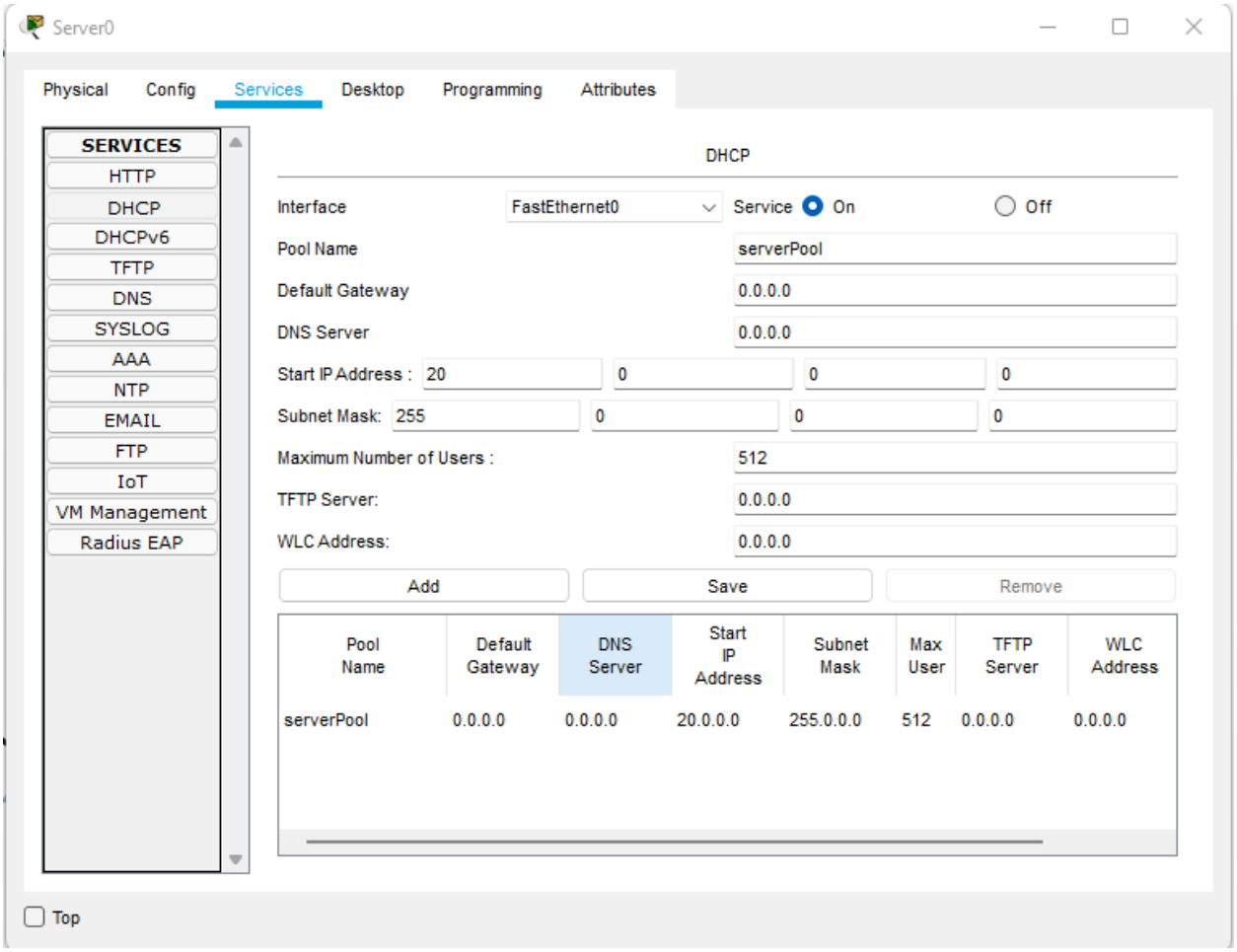
Network Design:

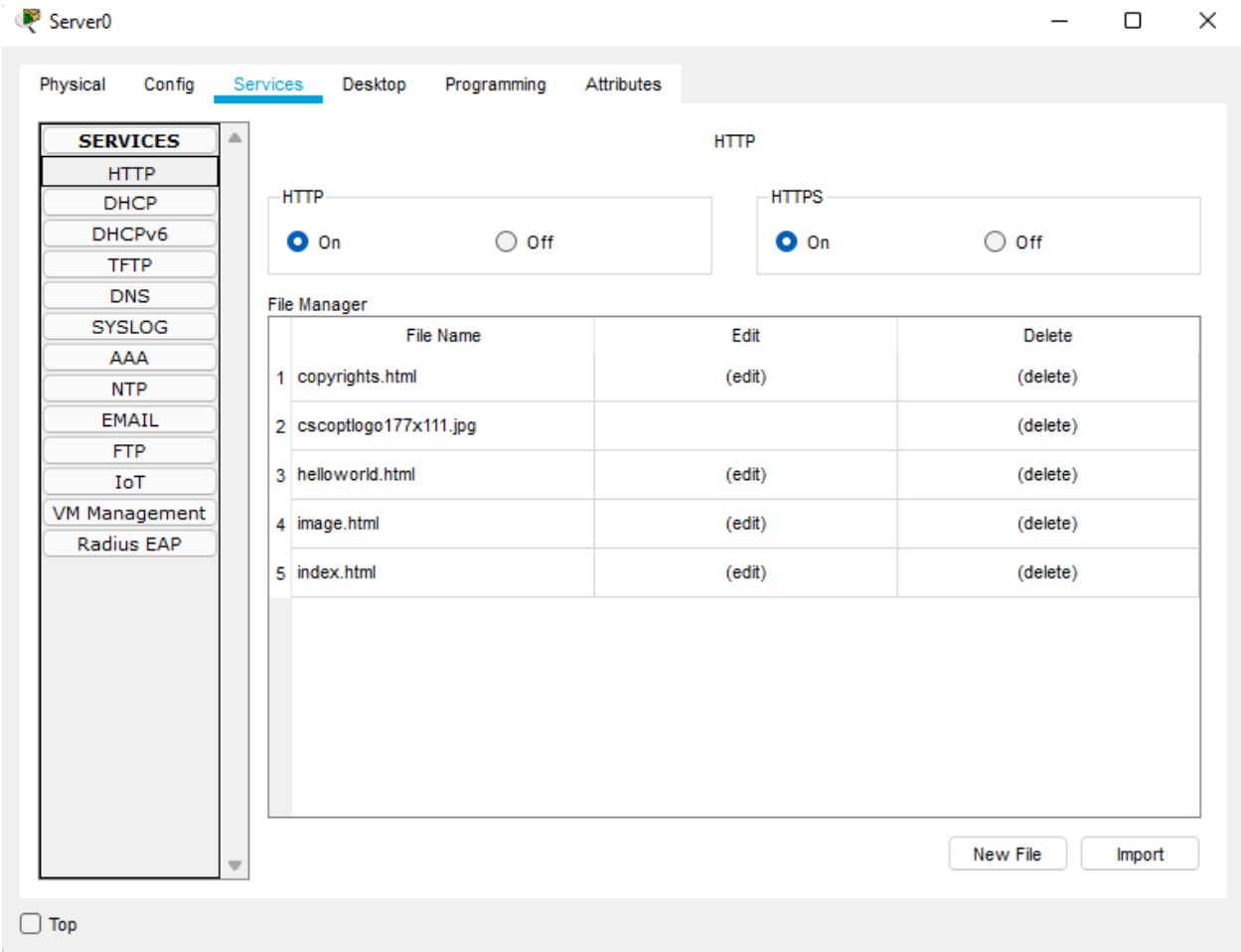


Configuring Server:

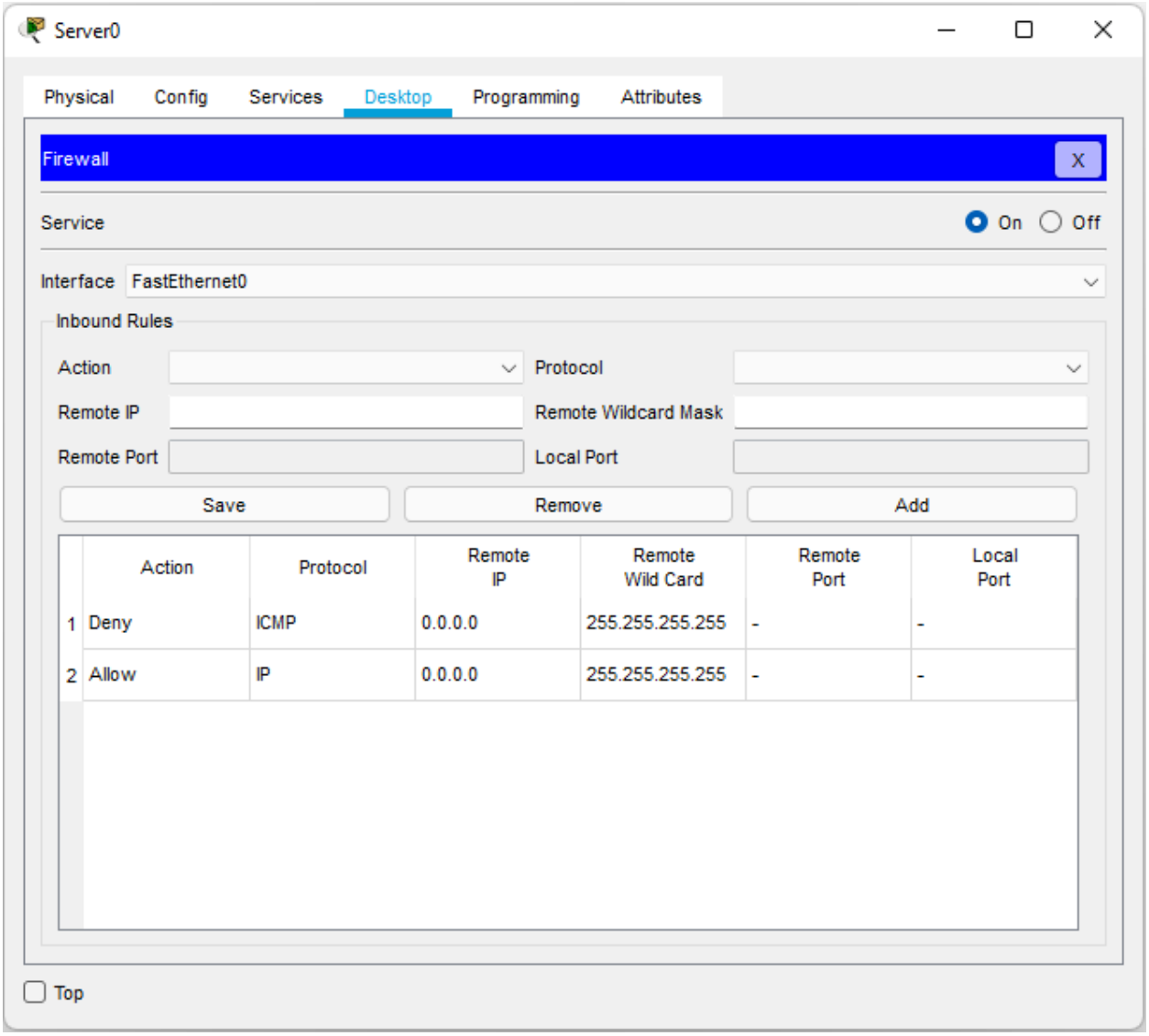


Enabling DHCP and HTTP:

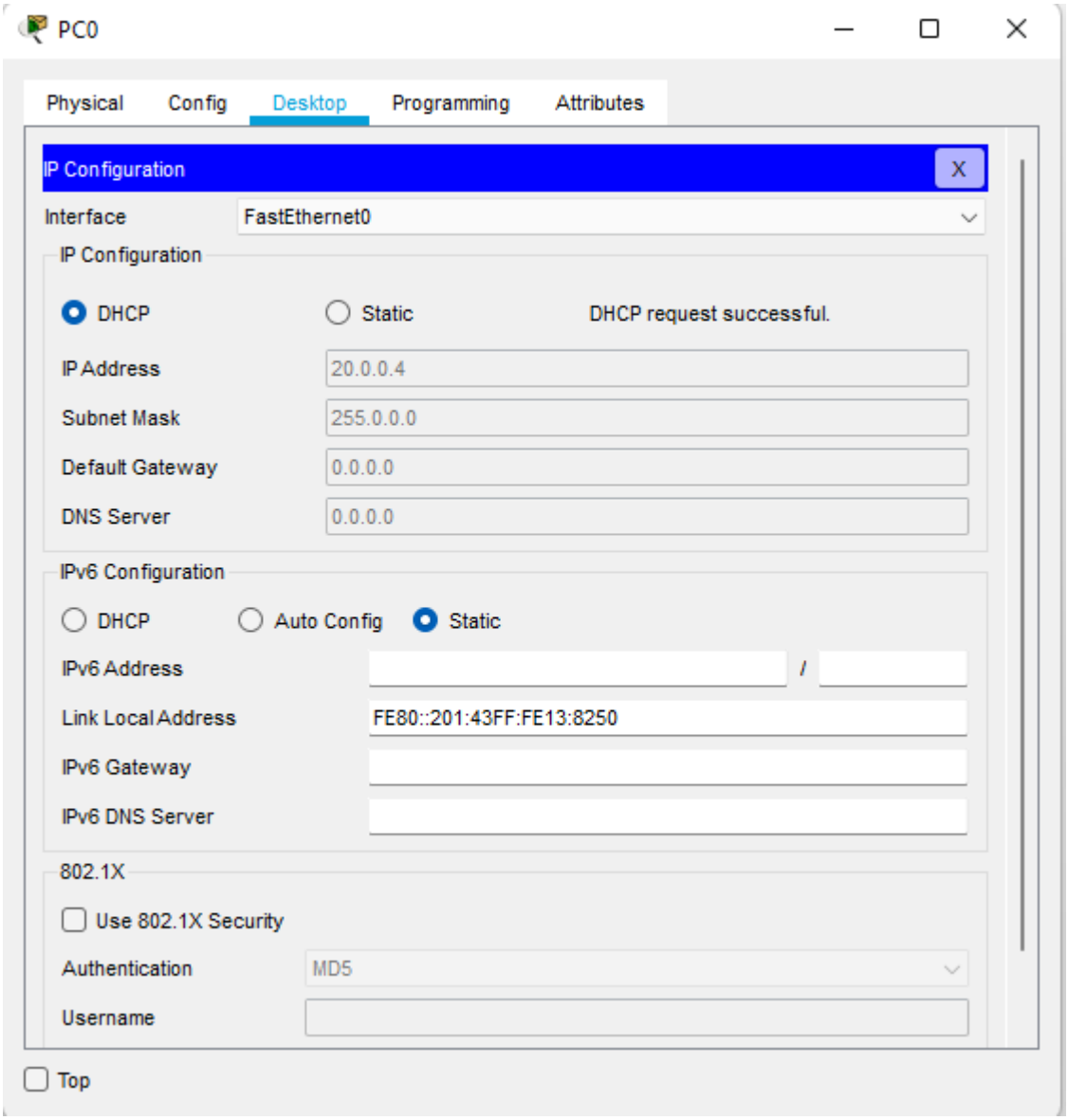

Server0
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
DHCP
Interface
FastEthernet0
Service
On
Off
Pool Name
serverPool
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
Start IP Address :
20
0
0
0
Subnet Mask:
255
0
0
0
Maximum Number of Users :
512
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
serverPool
0.0.0.0
0.0.0.0
20.0.0.0
255.0.0.0
512
0.0.0.0
0.0.0.0
Top

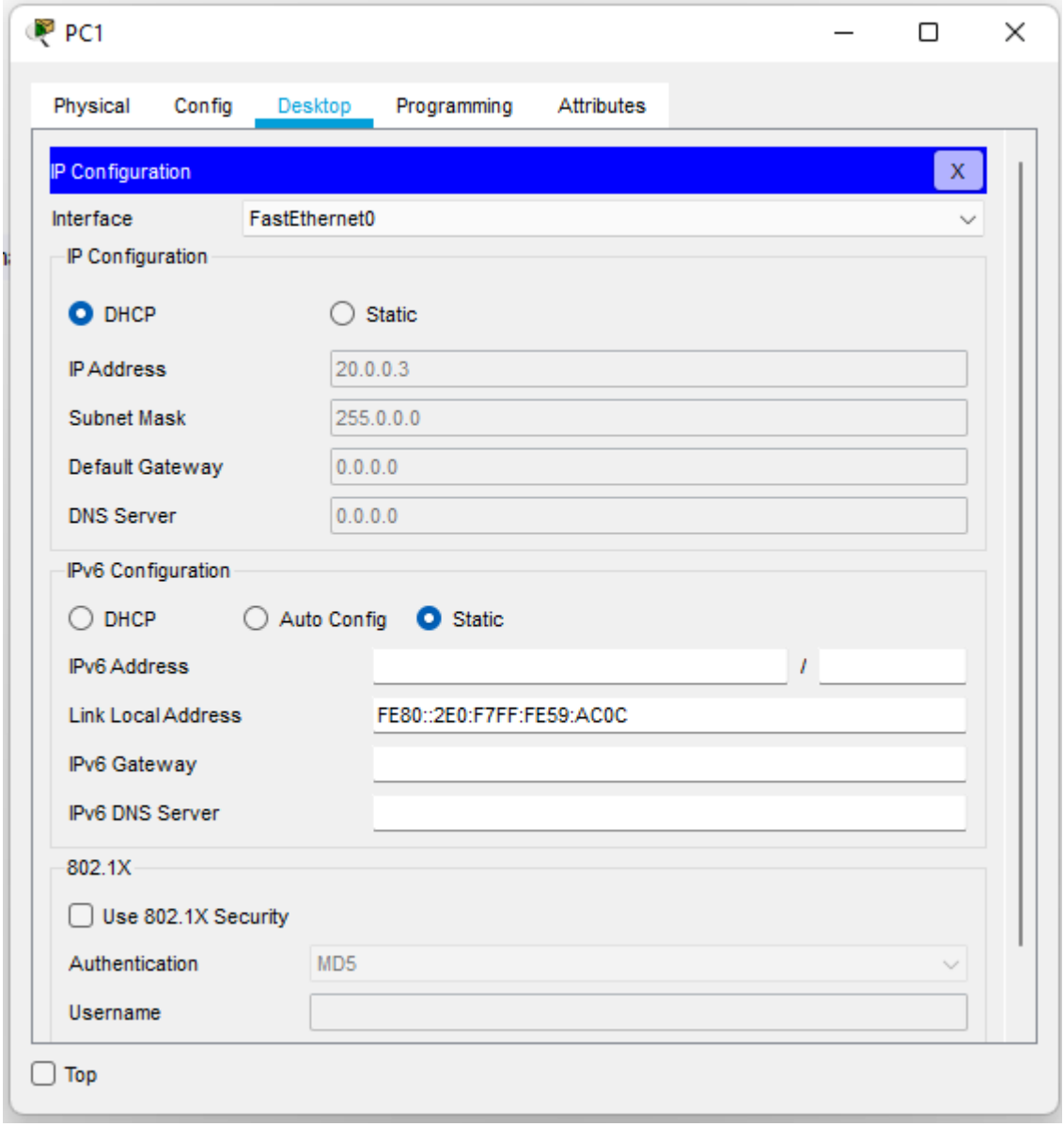

Server0
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
HTTP
HTTP
On
Off
HTTPS
On
Off
File Manager
File Name
Edit
Delete
1 copyrights.html (edit) (delete)
2 cscoptlogo177x111.jpg (delete)
3 helloworld.html (edit) (delete)
4 image.html (edit) (delete)
5 index.html (edit) (delete)
New File
Import
Top

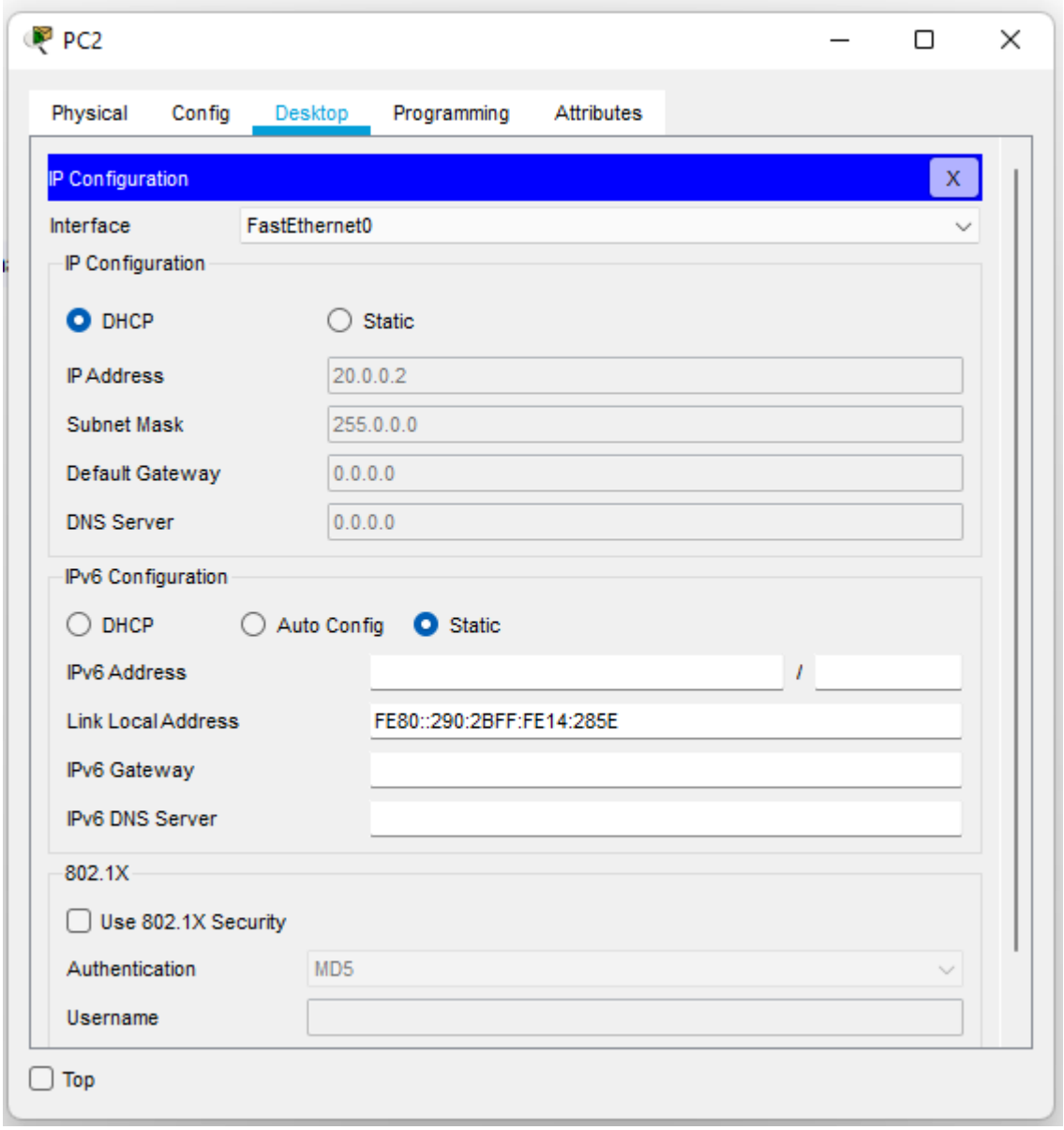
Allowing IP and Denying ICMP:



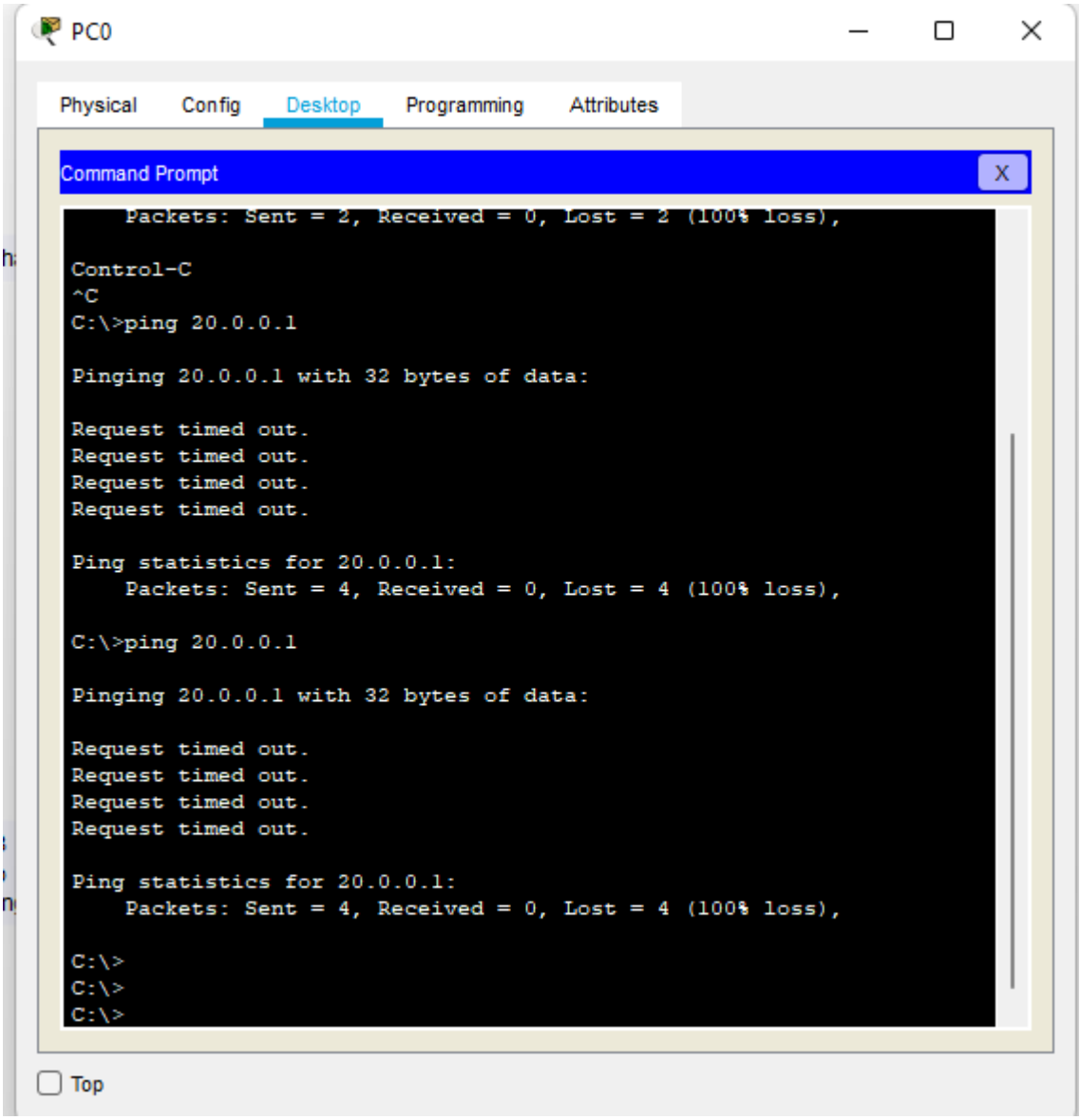
Ip configuration using DHCP:



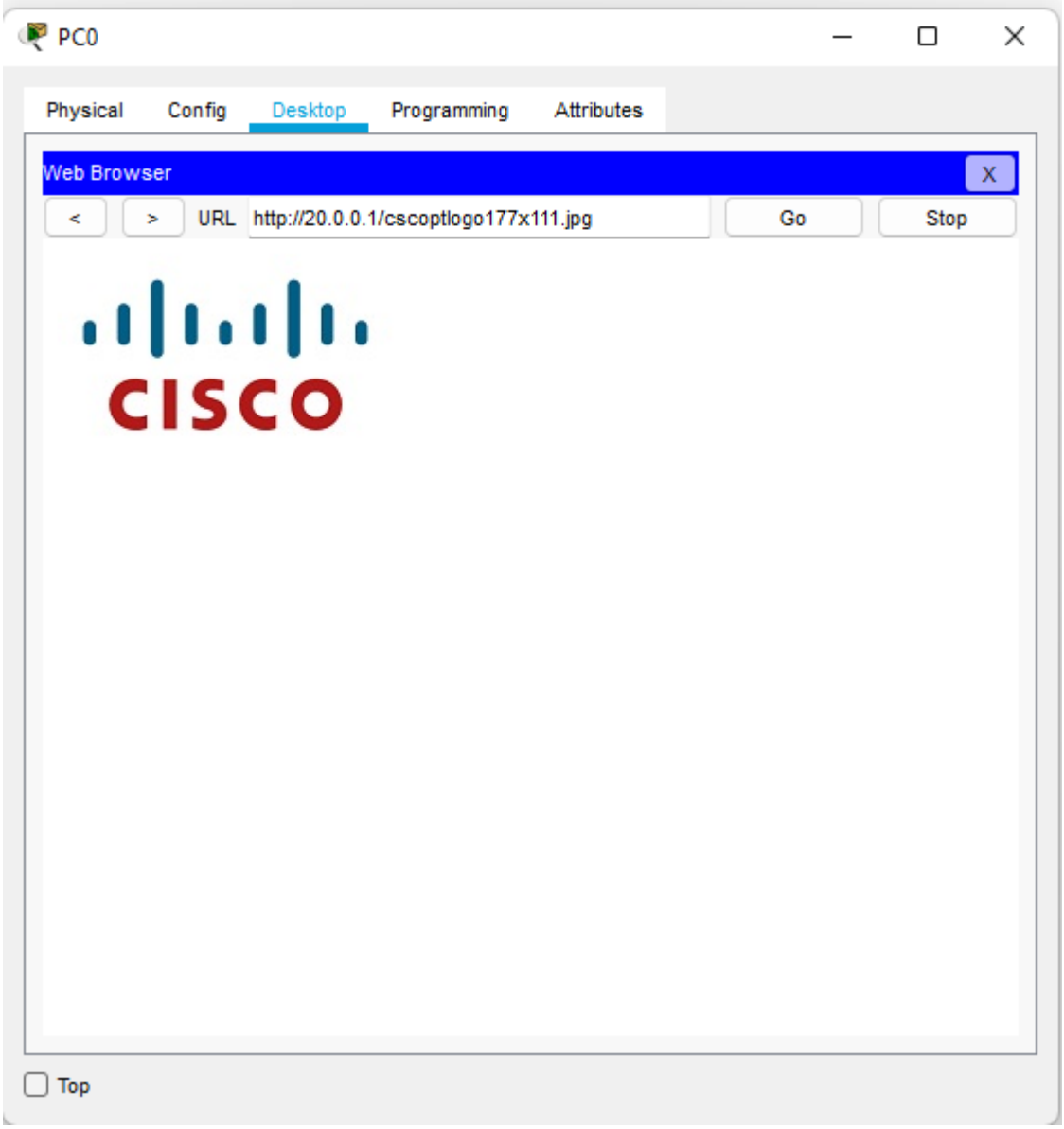

PC1
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IP Address
20.0.0.3
Subnet Mask
255.0.0.0
Default Gateway
0.0.0.0
DNS Server
0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
/
Link Local Address
FE80::2E0:F7FF:FE59:AC0C
IPv6 Gateway
IPv6 DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Top


PC2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IP Address
20.0.0.2
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::290:2BFF:FE14:285E
IPv6 Gateway
IPv6 DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Top

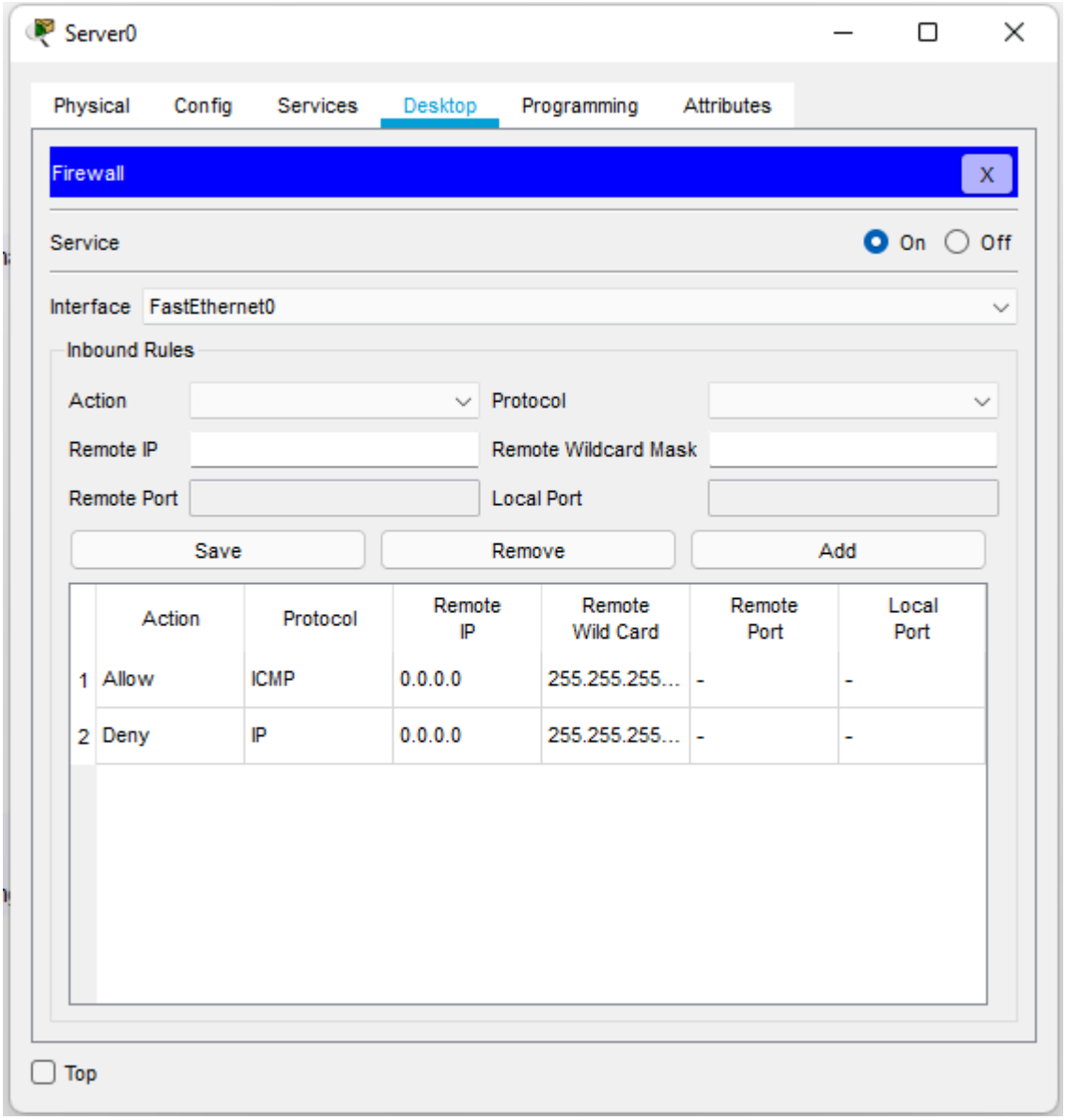
Denying ICMP:



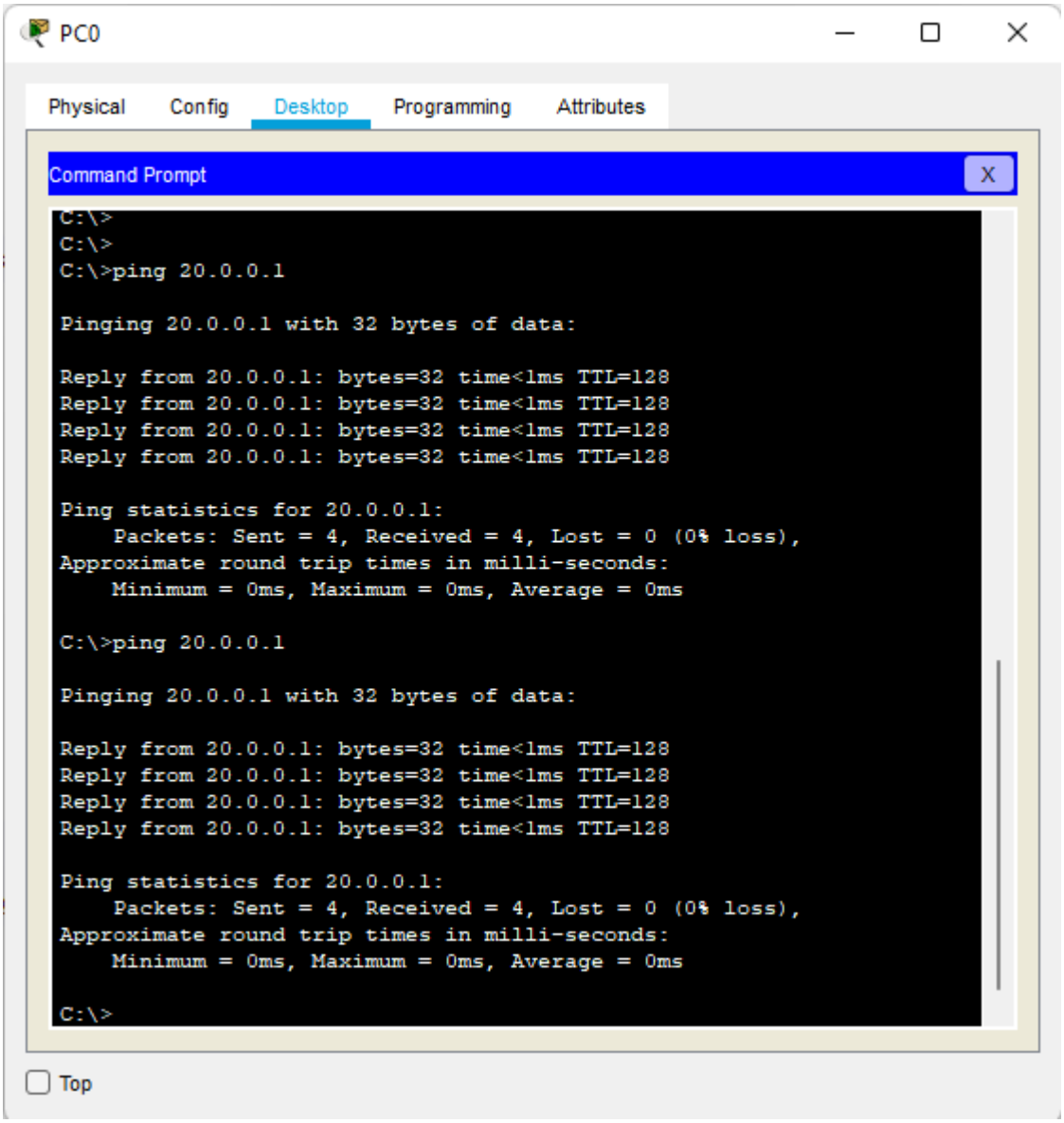
Allowing IP:


PC0
Physical
Config
Desktop
Programming
Attributes
Web Browser
X
<
>
URL
http://20.0.0.1/cscoptlogo177x111.jpg
Go
Stop
CISCO
Top

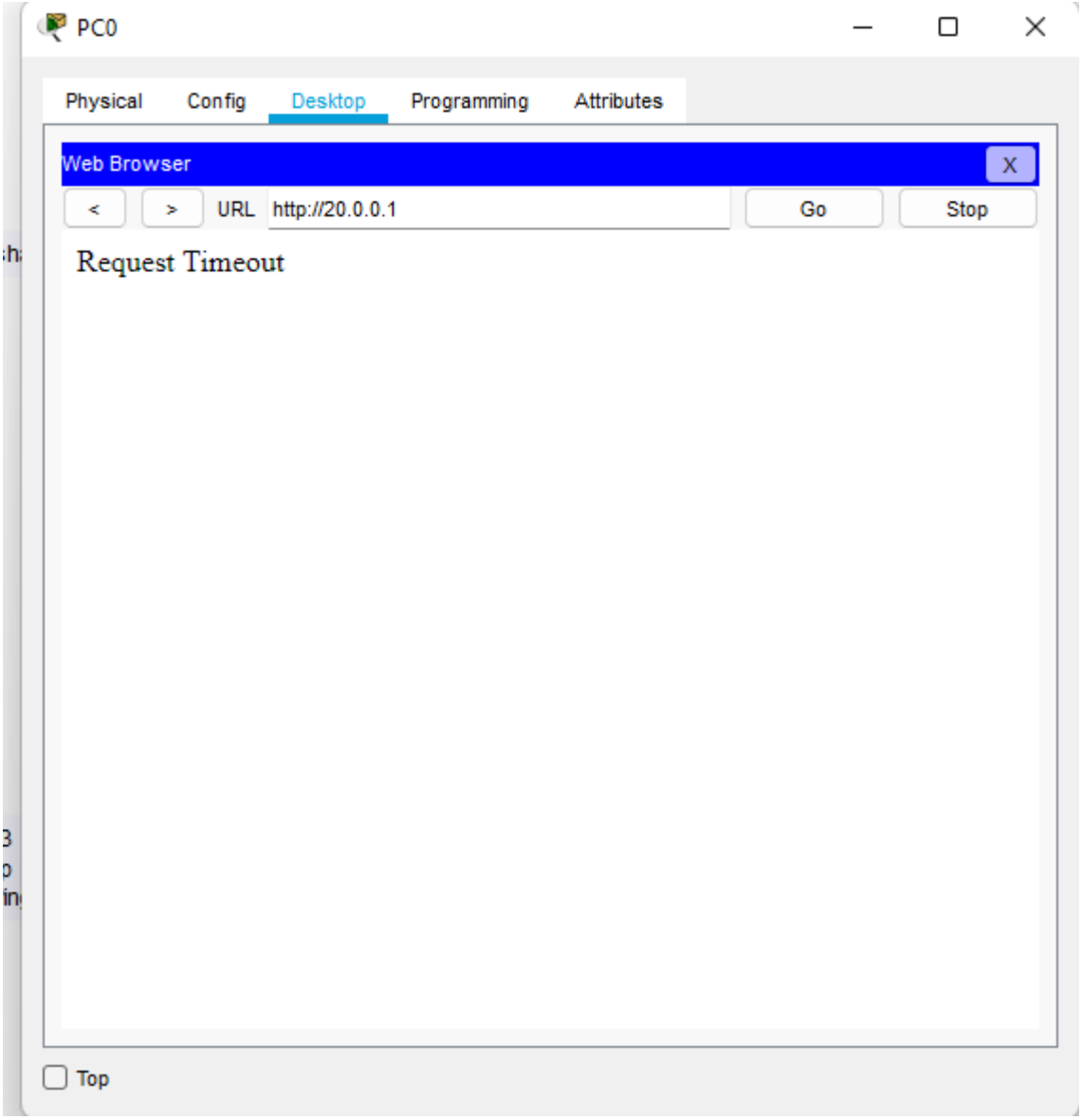
Allowing ICMP and Denying IP:



Allowing ICMP:



Denying IP:


PC0
Physical
Config
Desktop
Programming
Attributes
Web Browser
X
<
>
URL
http://20.0.0.1
Go
Stop
Request Timeout
Top

Experiment 2 Implementing Access Control lists:

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Experiment 2: Implementing Access Control lists.

Aim:

The aim of the experiment is to implement access control lists to allow and deny certain devices to access data packets.

Procedure:

i) PC Configuration:

PC0 : 192.168.10.1
PC1 : 192.168.10.2
PC3 : 192.168.10.3

Here we give default gateway as '192.168.10.10' for all three PCs. The gateway is configured in the next step.

ii) Router configuration:

```
Router>enable
Router# config t
Router(Config)# interface Gig 0/0
Router (Config-if)# ip address 192.168.10.10 255.255.255.0
Router (Config-if)# no shut
Router (Config-if)# exit
Router (Config)# interface Gig 0/1
Router (Config if)# ip address 10.10.10.10 255.0.0.0
Router (Config if)# no shut
Router (Config-if)# exit
```

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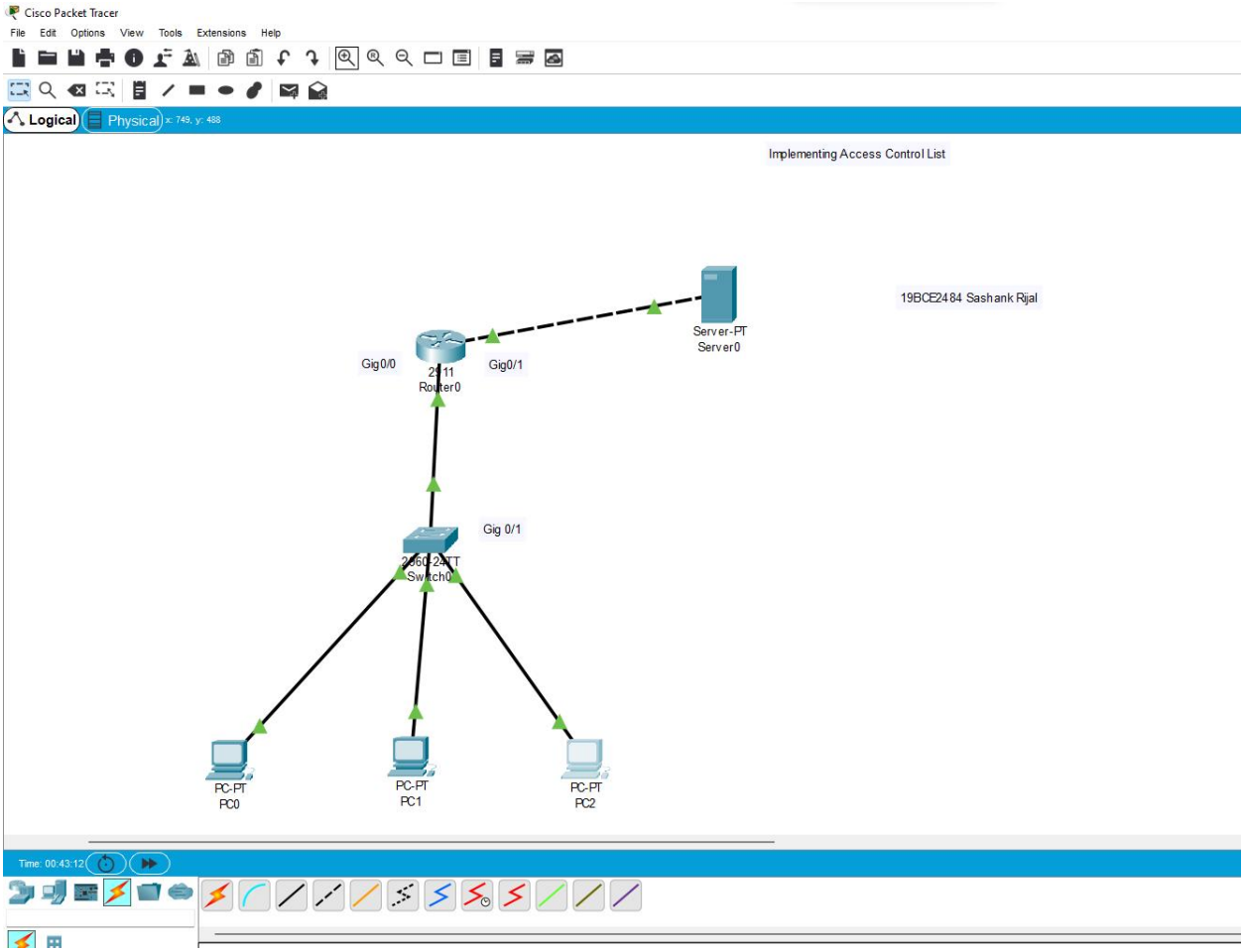
iii) Configure Access control list:

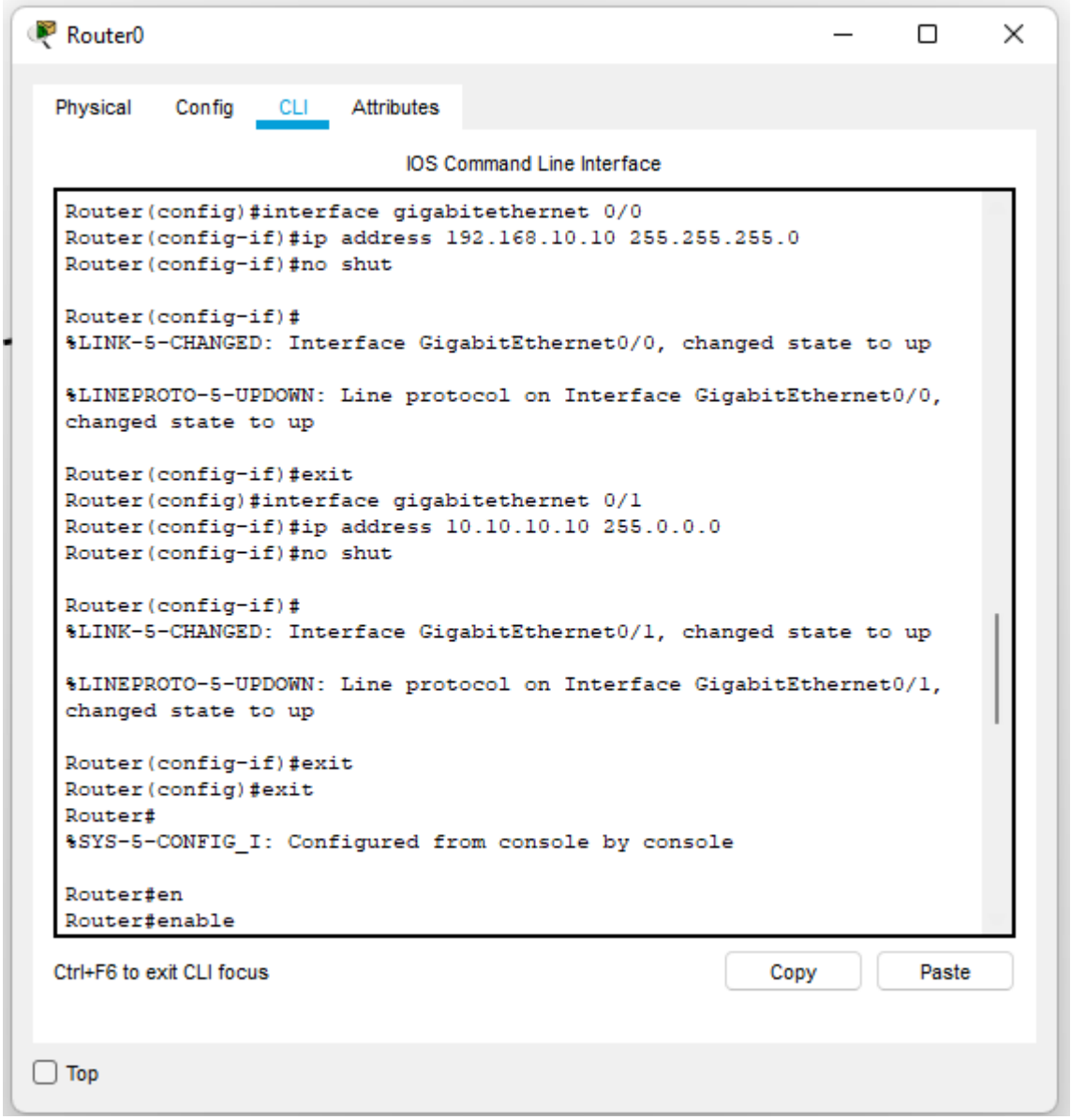
Router (config) # ip access-list standard 11
Router (config-std-nacl) # deny host 192.168.10.2
Router (config-std-nacl) # permit any
Router (config-std-nacl) # exit
Router (config) # interface vlg 0/0
Router (config-if) # ip access-group 11 in
Router (config-if) # exit
Router (config) # exit

iv) We can now check the configured access list via # show access-lists in the router CLI.

Network Design:



Configuring the Router:



Pinging PC0 PC1 AND PC2:

PC0

Physical | Config | Desktop | Programming | Attributes

Command Prompt

```
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

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=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 = 1ms, Average = 0ms

C:\>ping 10.10.10.11

Pinging 10.10.10.11 with 32 bytes of data:

Reply from 10.10.10.11: bytes=32 time<1ms TTL=127
Reply from 10.10.10.11: bytes=32 time<1ms TTL=127
Reply from 10.10.10.11: bytes=32 time<1ms TTL=127
Reply from 10.10.10.11: bytes=32 time=1ms TTL=127

Ping statistics for 10.10.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

Top

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: 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 10.10.10.11

Pinging 10.10.10.11 with 32 bytes of data:

Request timed out.
Reply from 10.10.10.11: bytes=32 time<1ms TTL=127
Reply from 10.10.10.11: bytes=32 time<1ms TTL=127
Reply from 10.10.10.11: bytes=32 time<1ms TTL=127

Ping statistics for 10.10.10.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Top

PC2

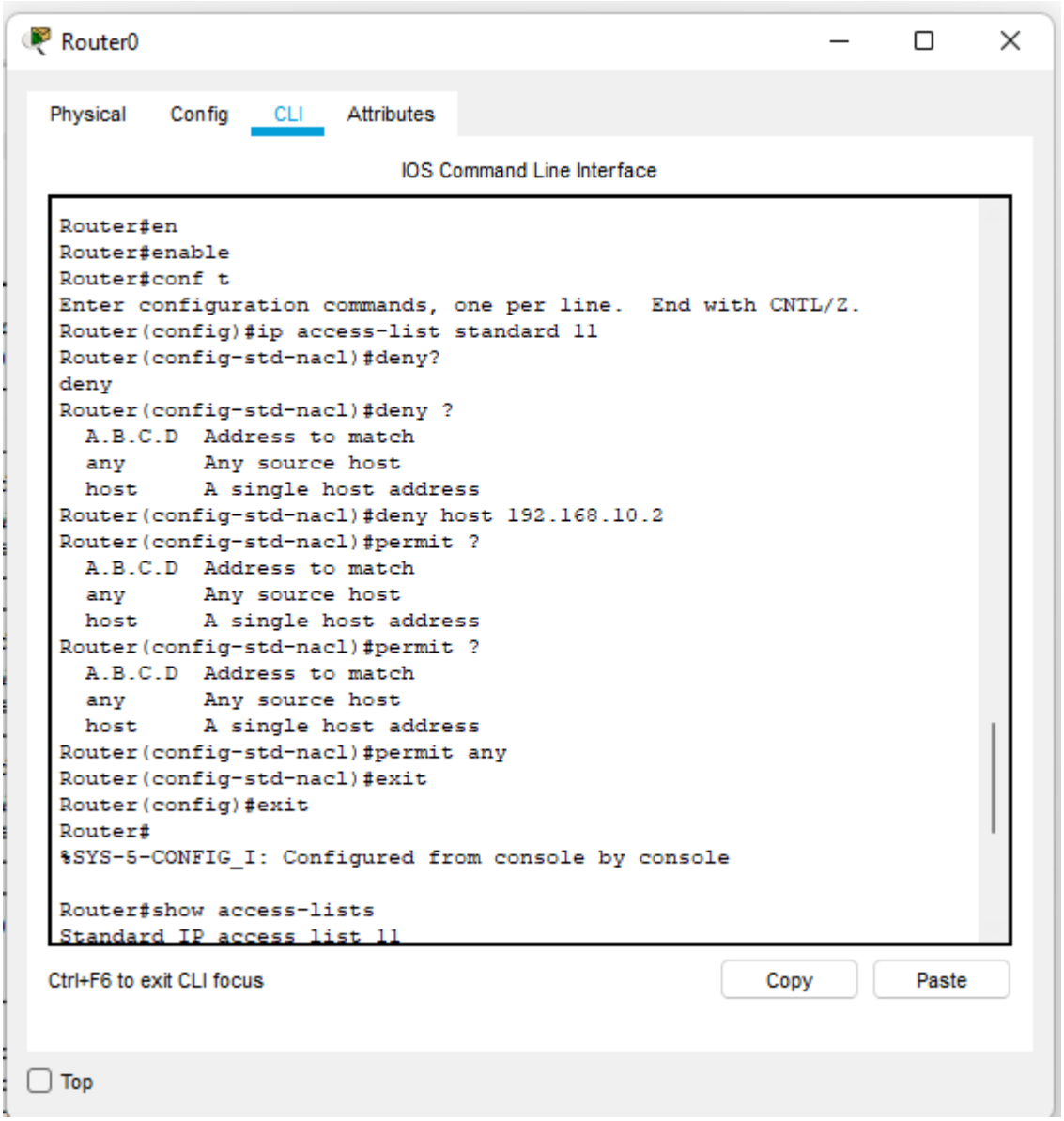
Physical | Config | Desktop | Programming | Attributes

Command Prompt

```
Control-C
^C
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<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 10.10.10.11

Pinging 10.10.10.11 with 32 bytes of data:

Reply from 10.10.10.11: bytes=32 time<1ms TTL=127
Reply from 10.10.10.11: bytes=32 time<1ms TTL=127
Reply from 10.10.10.11: bytes=32 time<1ms TTL=127
Reply from 10.10.10.11: bytes=32 time<1ms TTL=127

Ping statistics for 10.10.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Top

Configuring Access control list (Standard 11)



Router0

Physical Config CLI Attributes

IOS Command Line Interface

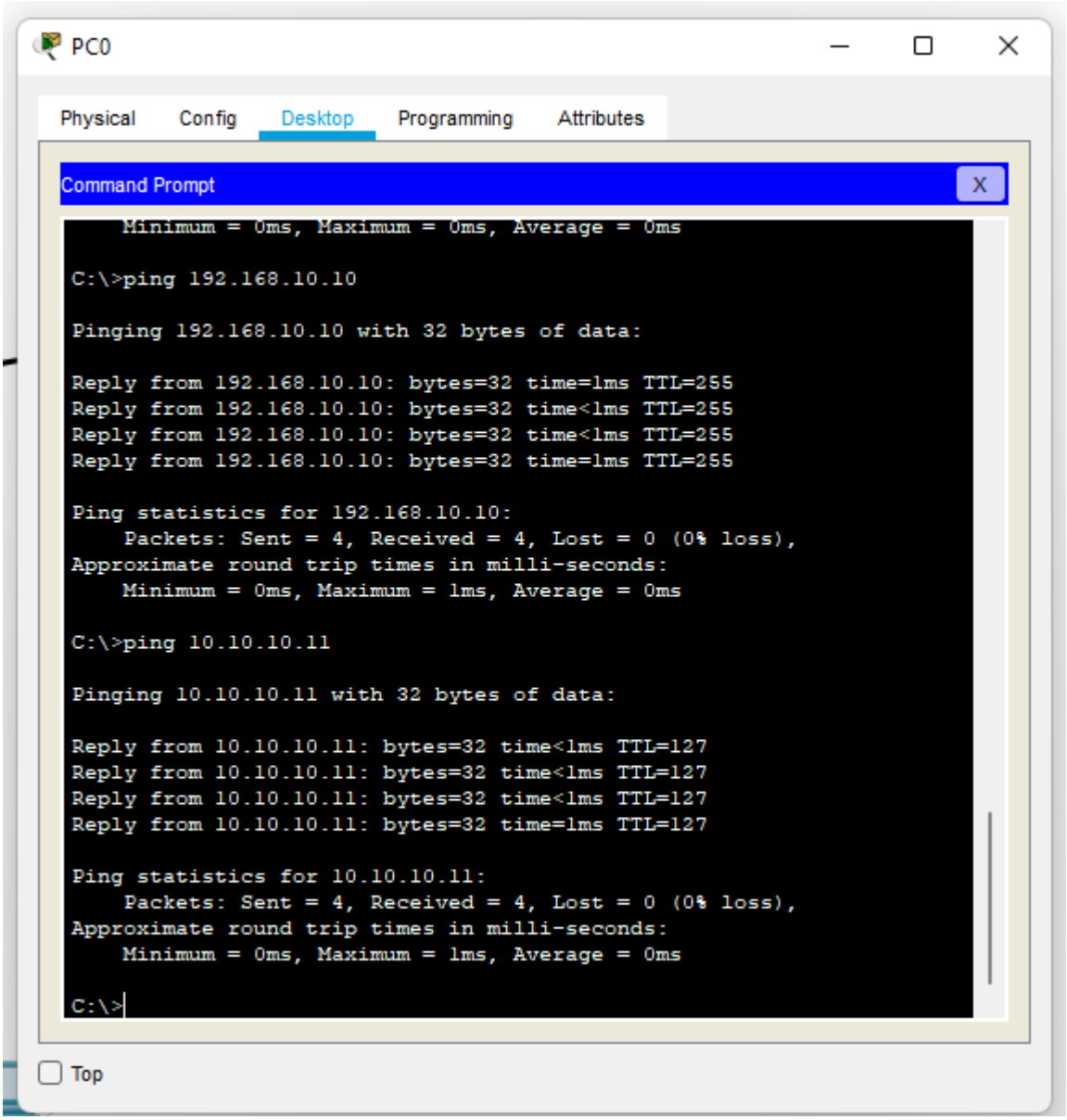
```
  host      A single host address
Router(config-std-nacl)#permit any
Router(config-std-nacl)#exit
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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

Router#enable
Router#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
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 (12 match(es))
    20 permit any (8 match(es))

Router#
```

Ctrl+F6 to exit CLI focus

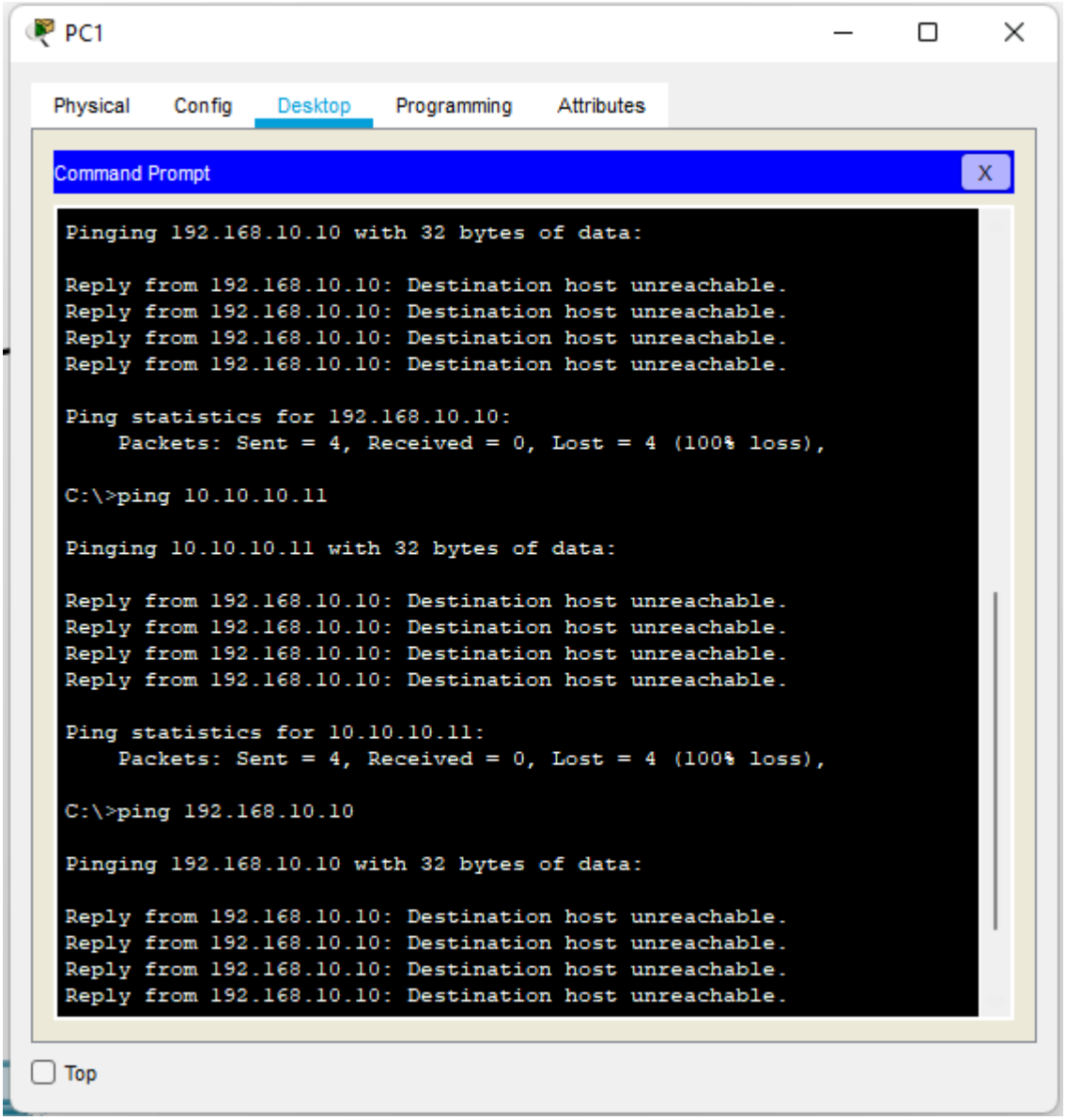
Copy Paste

Top

Pinging PC after setting access control list:



This PC (PC1) was denied therefore does not receive any reply:



PC2

Physical | Config | Desktop | Programming | Attributes

Command Prompt

```
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

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=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 = 1ms, Average = 0ms

C:\>ping 10.10.10.11

Pinging 10.10.10.11 with 32 bytes of data:

Reply from 10.10.10.11: bytes=32 time<1ms TTL=127
Reply from 10.10.10.11: bytes=32 time<1ms TTL=127
Reply from 10.10.10.11: bytes=32 time<1ms TTL=127
Reply from 10.10.10.11: bytes=32 time<1ms TTL=127

Ping statistics for 10.10.10.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

Top