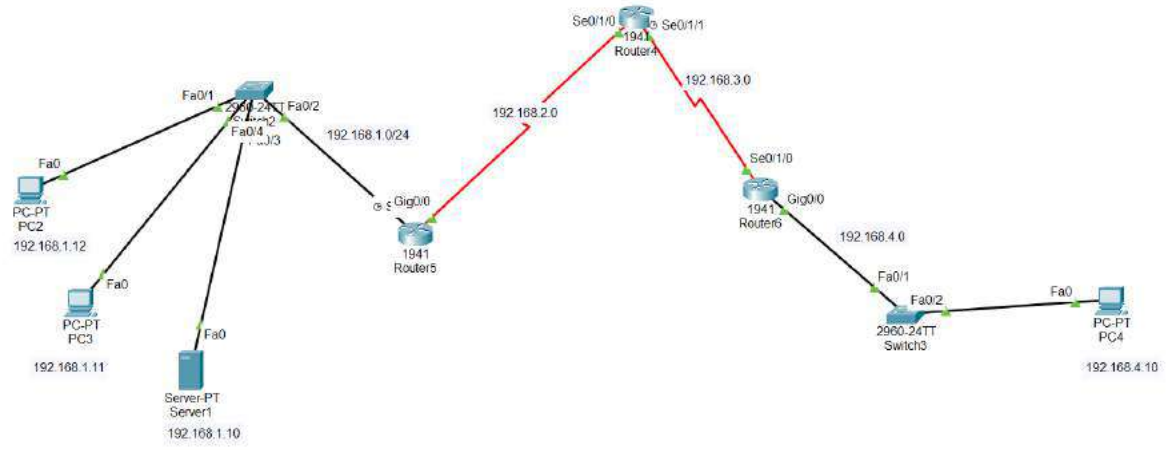
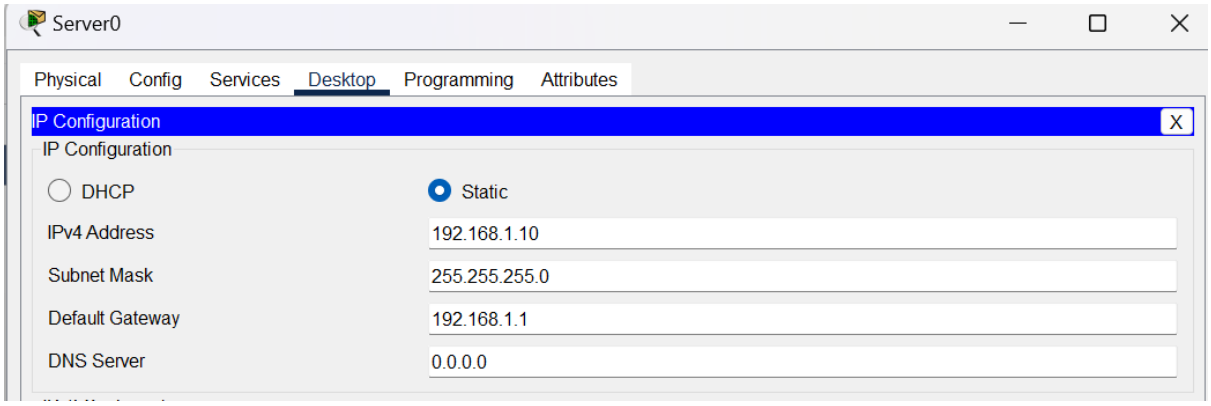
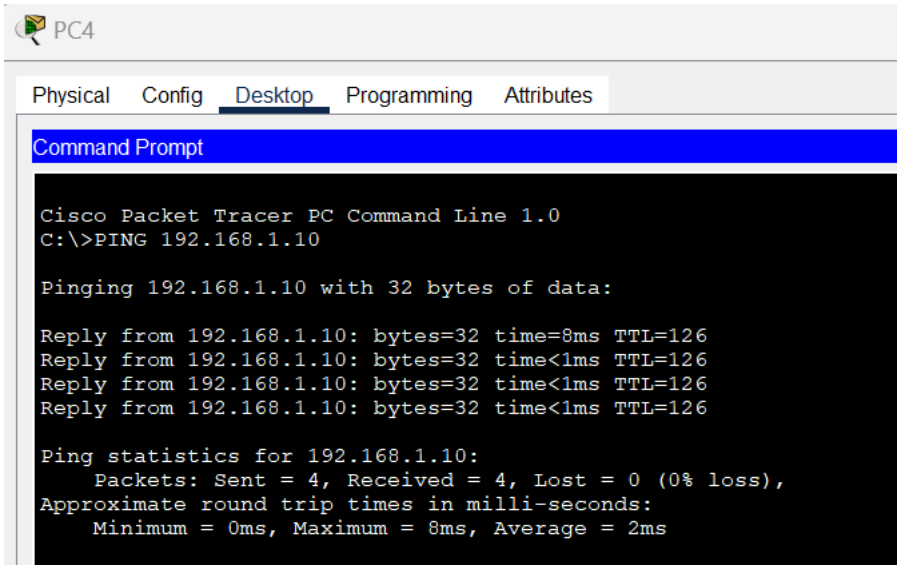
CONFIGURATION OF IPS

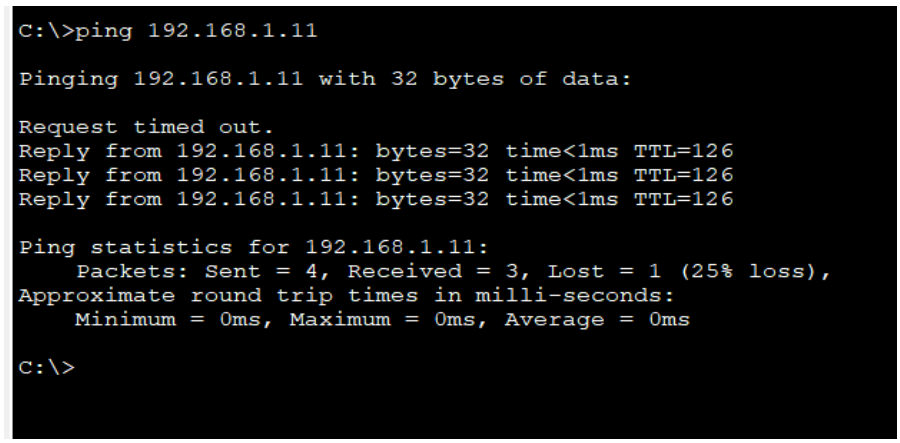


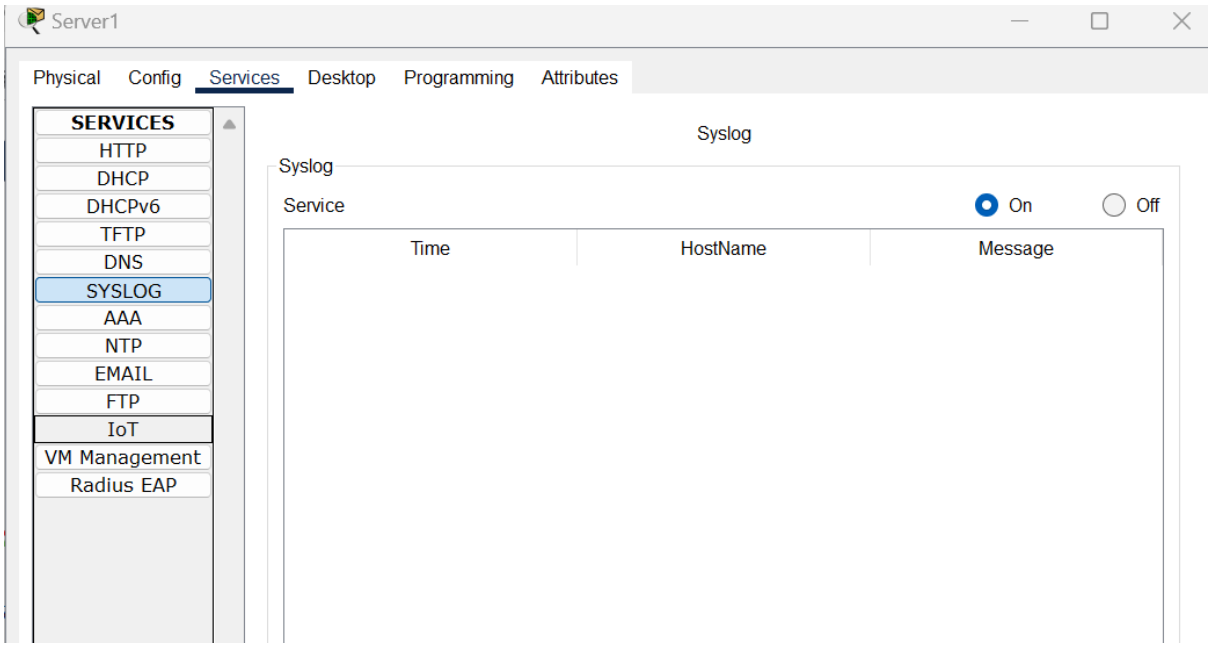
BEFORE IPS CONFIGURATION

ALL THE ROUTERS ARE CONFIGURED AS STATIC WITH THE IP GIVEN AND RIP PROTOCOL IS ENABLED









AFTER IPS CONFIGURATION

Router # show version

License Info:

License UDI:

Device# PID SN
---
*0 CISCO1941/K9 FTX1524TNA6-

Technology Package License Information for Module:'c1900'

Technology Technology-package Technology-package
Current Type Next reboot
---
ipbase ipbasek9 Permanent ipbasek9
security None None None
data None None None

Configuration register is 0x2102

Router (config)# license boot module c1900 technology-package security k9

It ill ask for yes to confirm (give yes)

Then give the command as do reload to reload your router

http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to
export@cisco.com.
Cisco CISCO1941/K9 (revision 1.0) with 491520K/32768K bytes of memory.
Processor board ID FTX152400KS
2 Gigabit Ethernet interfaces
2 Low-speed serial(sync/async) network interface(s)
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)

License Info:

License UDI:

Device# PID SN
---
*0 CISCO1941/K9 FTX15248ZB8-

Technology Package License Information for Module:'c1900'

Technology Technology-package Technology-package
Current Type Next reboot
---
ipbase ipbasek9 Permanent ipbasek9
security securityk9 Evaluation securityk9
data disable None None

Configuration register is 0x2102

Router#
Router#mkdir ipsdir
Create directory filename [ipsdir]?
Created dir flash:ipsdir

Router#
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip ips config location ipsdir
Router(config)#ip ips name iosips
Router(config)#ip ips signature-category
Router(config-ips-category)#category all
Router(config-ips-category-action)#retired true
Router(config-ips-category-action)#
Router(config-ips-category-action)#exit
Router(config-ips-category)#category ios_ips basic
Router(config-ips-category-action)#
Router(config-ips-category-action)#retired false
Router(config-ips-category-action)#exit
Router(config-ips-category)#exit
Do you want to accept these changes? [confirm]
Applying Category configuration to signatures ...
%IPS-6-ENGINE_BUILDING: atomic-ip - 288 signatures - 6 of 13 engines
%IPS-6-ENGINE_READY: atomic-ip - build time 30 ms - packets for this engine will be scanned

Router(config)#
Router(config)#in gigabitEthernet 0/0
Router(config-if)#ip ips iosips?
WORD
Router(config-if)#ip ips iosips out
Router(config-if)#
%IPS-6-ENGINE_BUILDS_STARTED: 00:04:40 UTC Mar 01 1993

%IPS-6-ENGINE_BUILDING: atomic-ip - 3 signatures - 1 of 13 engines

%IPS-6-ENGINE_READY: atomic-ip - build time 8 ms - packets for this engine will be scanned

%IPS-6-ALL_ENGINE_BUILDS_COMPLETE: elapsed time 8 ms

Router(config-if)#
Router(config-if)#
Router(config-if)#
Router(config-if)#exit
Router(config)#logging host 192.168.1.10
Router(config)#
Router(config)#service timestamps log datetime msec
Router(config)#ip ips signature-definition
Router(config-sigdef)#signature ?

<1-65535> signature id value

Router(config-sigdef)#signature 2004?
<0-65535> signature subid value
<cr>
Router(config-sigdef)#signature 2004 0
Router(config-sigdef-sig)#status
Router(config-sigdef-sig-status)#retired false
Router(config-sigdef-sig-status)#enabled true
Router(config-sigdef-sig-status)#exit
Router(config-sigdef-sig)#
Router(config-sigdef-sig)#engine
Router(config-sigdef-sig-engine)#event-action produce-alert
Router(config-sigdef-sig-engine)#event-action deny-packet-inline //it acts as ips not ids
Router(config-sigdef-sig-engine)#exit
Router(config-sigdef-sig)#exit
Router(config-sigdef)#exit
Do you want to accept these changes? [confirm]
%IPS-6-ENGINE_BUILDS_STARTED:
%IPS-6-ENGINE_BUILDING: atomic-ip - 303 signatures - 3 of 13 engines
%IPS-6-ENGINE_READY: atomic-ip - build time 480 ms - packets for this engine will be scanned
%IPS-6-ALL_ENGINE_BUILDS_COMPLETE: elapsed time 648 ms

Router(config)#
Router(config)#
Router(config)#do show ip ips all
IPS Signature File Configuration Status
Configured Config Locations: ipsdir
Last signature default load time:
Last signature delta load time:
Last event action (SEAP) load time: -none-

General SEAP Config:
Global Deny Timeout: 3600 seconds

Global Overrides Status: Enabled
Global Filters Status: Enabled

IPS Auto Update is not currently configured

IPS Syslog and SDEE Notification Status
Event notification through syslog is enabled
Event notification through SDEE is enabled

IPS Signature Status
Total Active Signatures: 1
Total Inactive Signatures: 0

IPS Packet Scanning and Interface Status
IPS Rule Configuration
IPS name iosips
IPS fail closed is disabled
IPS deny-action ips-interface is false
Fastpath ips is enabled
Quick run mode is enabled
Interface Configuration
Interface GigabitEthernet0/0
Inbound IPS rule is not set
Outgoing IPS rule is iosips

IPS Category CLI Configuration:
Category all
Retire: True
Category ios_ips basic
Retire: False
Router(config)#
*Mar 01, 00:12:29.1212: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.12:0] RiskRating:25
*Mar 01, 00:12:35.1212: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.12:0] RiskRating:25
*Mar 01, 00:12:41.1212: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.12:0] RiskRating:25
*Mar 01, 00:12:47.1212: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.12:0] RiskRating:25
*Mar 01, 00:14:42.1414: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.10:0] RiskRating:25
*Mar 01, 00:14:48.1414: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.10:0] RiskRating:25
*Mar 01, 00:14:54.1414: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.10:0] RiskRating:25
*Mar 01, 00:15:00.1515: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.10:0] RiskRating:25

PC2

Physical Config Desktop Programming Attributes

Command Prompt

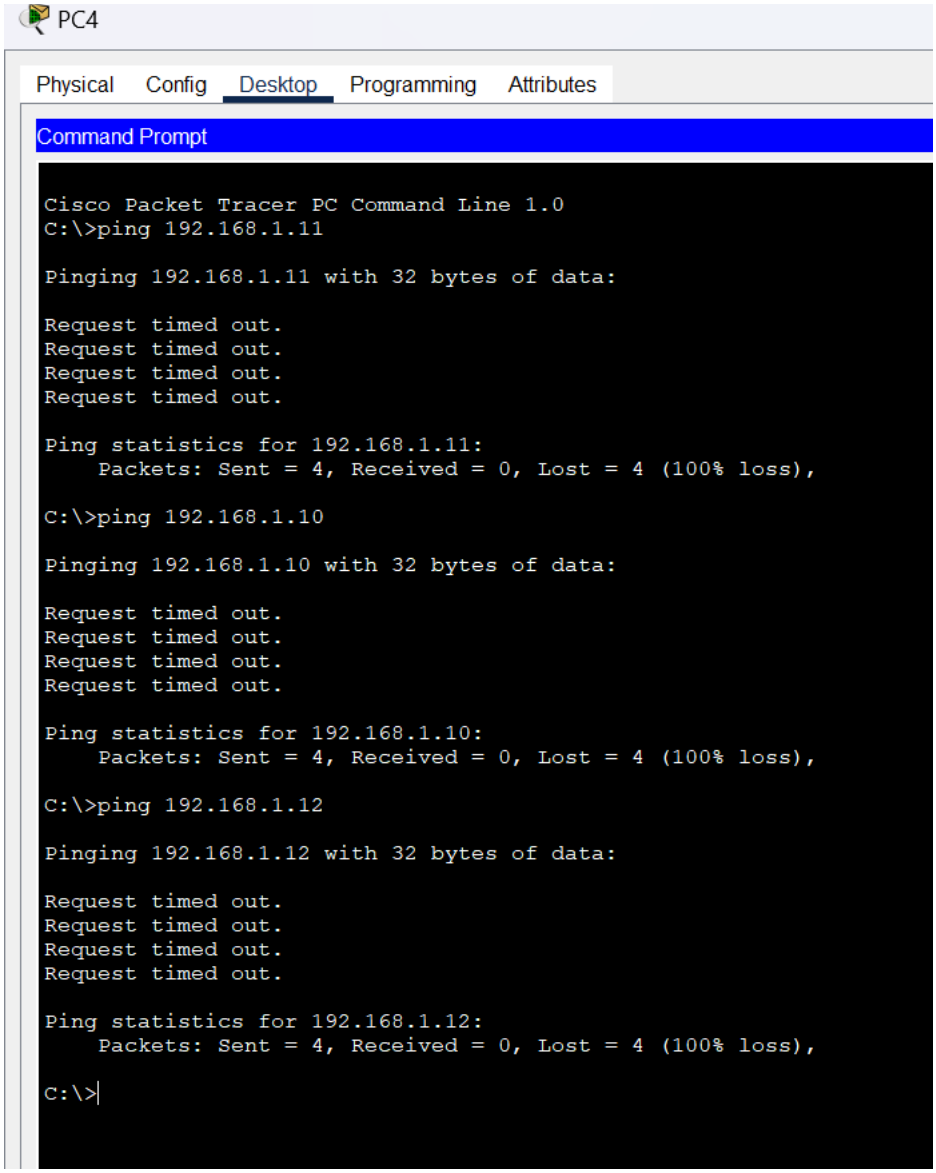
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.4.10

Pinging 192.168.4.10 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Reply from 192.168.4.10: bytes=32 time=16ms TTL=125

Ping statistics for 192.168.4.10:
    Packets: Sent = 4, Received = 1, Lost = 3 (75% loss),
Approximate round trip times in milli-seconds:
    Minimum = 16ms, Maximum = 16ms, Average = 16ms

C:\>ping 192.168.4.10

Pinging 192.168.4.10 with 32 bytes of data:

Reply from 192.168.4.10: bytes=32 time=26ms TTL=125
Reply from 192.168.4.10: bytes=32 time=2ms TTL=125
Reply from 192.168.4.10: bytes=32 time=2ms TTL=125
Reply from 192.168.4.10: bytes=32 time=2ms TTL=125

Ping statistics for 192.168.4.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 26ms, Average = 8ms

C:\>
```

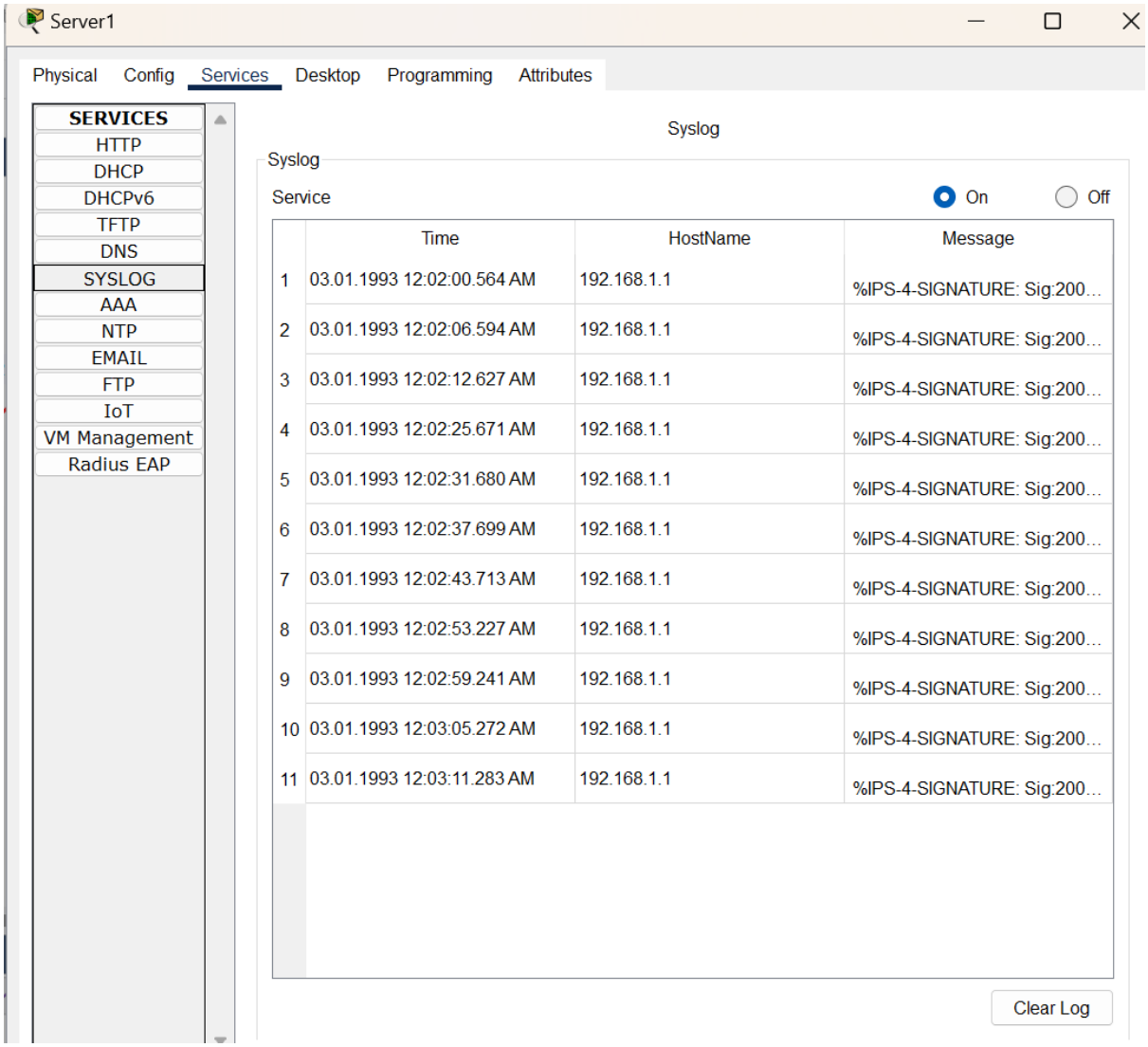
PC3

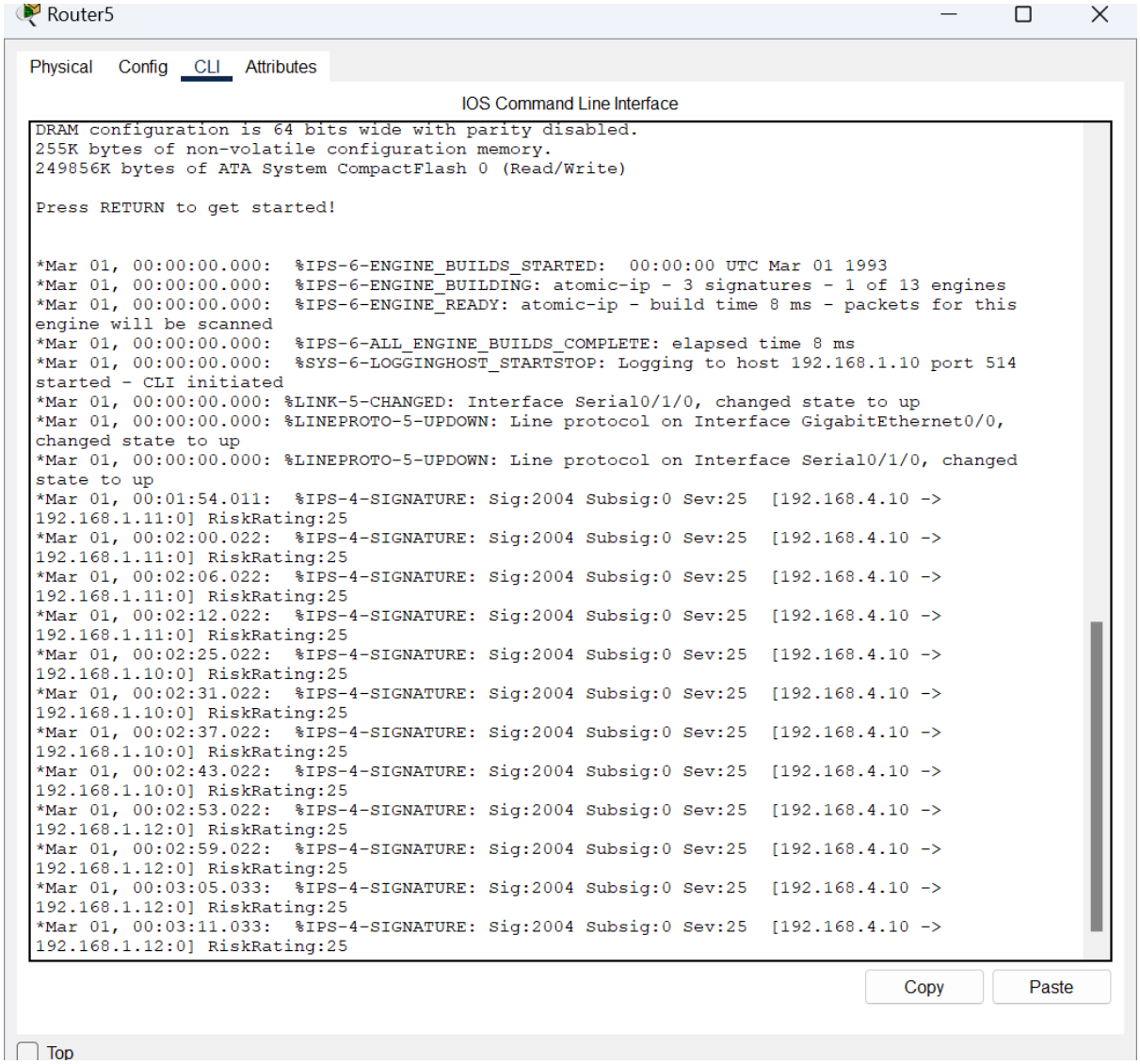
Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.4.10

Pinging 192.168.4.10 with 32 bytes of data:

Reply from 192.168.4.10: bytes=32 time=2ms TTL=125
Reply from 192.168.4.10: bytes=32 time=2ms TTL=125
Reply from 192.168.4.10: bytes=32 time=25ms TTL=125
Reply from 192.168.4.10: bytes=32 time=20ms TTL=125

Ping statistics for 192.168.4.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 25ms, Average = 12ms

C:\>
```


PC4
Physical
Config
Desktop
Programming
Attributes
Command Prompt
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.11
Pinging 192.168.1.11 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 192.168.1.11:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>ping 192.168.1.10
Pinging 192.168.1.10 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 192.168.1.10:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>ping 192.168.1.12
Pinging 192.168.1.12 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 192.168.1.12:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>


Server1
Physical
Config
Services
Desktop
Programming
Attributes
SERVICES
HTTP
DHCP
DHCPv6
TFTP
DNS
SYSLOG
AAA
NTP
EMAIL
FTP
IoT
VM Management
Radius EAP
Syslog
Syslog
Service
On
Off
Time
HostName
Message
1 03.01.1993 12:02:00.564 AM 192.168.1.1 %IPS-4-SIGNATURE: Sig:200...
2 03.01.1993 12:02:06.594 AM 192.168.1.1 %IPS-4-SIGNATURE: Sig:200...
3 03.01.1993 12:02:12.627 AM 192.168.1.1 %IPS-4-SIGNATURE: Sig:200...
4 03.01.1993 12:02:25.671 AM 192.168.1.1 %IPS-4-SIGNATURE: Sig:200...
5 03.01.1993 12:02:31.680 AM 192.168.1.1 %IPS-4-SIGNATURE: Sig:200...
6 03.01.1993 12:02:37.699 AM 192.168.1.1 %IPS-4-SIGNATURE: Sig:200...
7 03.01.1993 12:02:43.713 AM 192.168.1.1 %IPS-4-SIGNATURE: Sig:200...
8 03.01.1993 12:02:53.227 AM 192.168.1.1 %IPS-4-SIGNATURE: Sig:200...
9 03.01.1993 12:02:59.241 AM 192.168.1.1 %IPS-4-SIGNATURE: Sig:200...
10 03.01.1993 12:03:05.272 AM 192.168.1.1 %IPS-4-SIGNATURE: Sig:200...
11 03.01.1993 12:03:11.283 AM 192.168.1.1 %IPS-4-SIGNATURE: Sig:200...
Clear Log


Router5
Physical
Config
CLI
Attributes
IOS Command Line Interface
DRAM configuration is 64 bits wide with parity disabled.
255K bytes of non-volatile configuration memory.
249856K bytes of ATA System CompactFlash 0 (Read/Write)
Press RETURN to get started!
*Mar 01, 00:00:00.000: %IPS-6-ENGINE_BUILDS_STARTED: 00:00:00 UTC Mar 01 1993
*Mar 01, 00:00:00.000: %IPS-6-ENGINE_BUILDING: atomic-ip - 3 signatures - 1 of 13 engines
*Mar 01, 00:00:00.000: %IPS-6-ENGINE_READY: atomic-ip - build time 8 ms - packets for this engine will be scanned
*Mar 01, 00:00:00.000: %IPS-6-ALL_ENGINE_BUILDS_COMPLETE: elapsed time 8 ms
*Mar 01, 00:00:00.000: %SYS-6-LOGGINGHOST_STARTSTOP: Logging to host 192.168.1.10 port 514 started - CLI initiated
*Mar 01, 00:00:00.000: %LINK-5-CHANGED: Interface Serial0/1/0, changed state to up
*Mar 01, 00:00:00.000: %LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
*Mar 01, 00:00:00.000: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed state to up
*Mar 01, 00:01:54.011: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.11:0] RiskRating:25
*Mar 01, 00:02:00.022: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.11:0] RiskRating:25
*Mar 01, 00:02:06.022: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.11:0] RiskRating:25
*Mar 01, 00:02:12.022: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.11:0] RiskRating:25
*Mar 01, 00:02:25.022: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.10:0] RiskRating:25
*Mar 01, 00:02:31.022: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.10:0] RiskRating:25
*Mar 01, 00:02:37.022: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.10:0] RiskRating:25
*Mar 01, 00:02:43.022: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.10:0] RiskRating:25
*Mar 01, 00:02:53.022: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.12:0] RiskRating:25
*Mar 01, 00:02:59.022: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.12:0] RiskRating:25
*Mar 01, 00:03:05.033: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.12:0] RiskRating:25
*Mar 01, 00:03:11.033: %IPS-4-SIGNATURE: Sig:2004 Subsig:0 Sev:25 [192.168.4.10 -> 192.168.1.12:0] RiskRating:25
Copy
Paste
Top

Basic Firewall Configuration in Cisco Packet Tracer

Steps to Configure and Verify Firewall in Cisco Packet Tracer:

Step 1: First, open the Cisco packet tracer desktop and select the devices given below:

S.NO	Device	Model Name	Quantity
1.	PC	PC	3
2.	server	PT-Server	1
3.	switch	PT-Switch	1

IP Addressing Table:

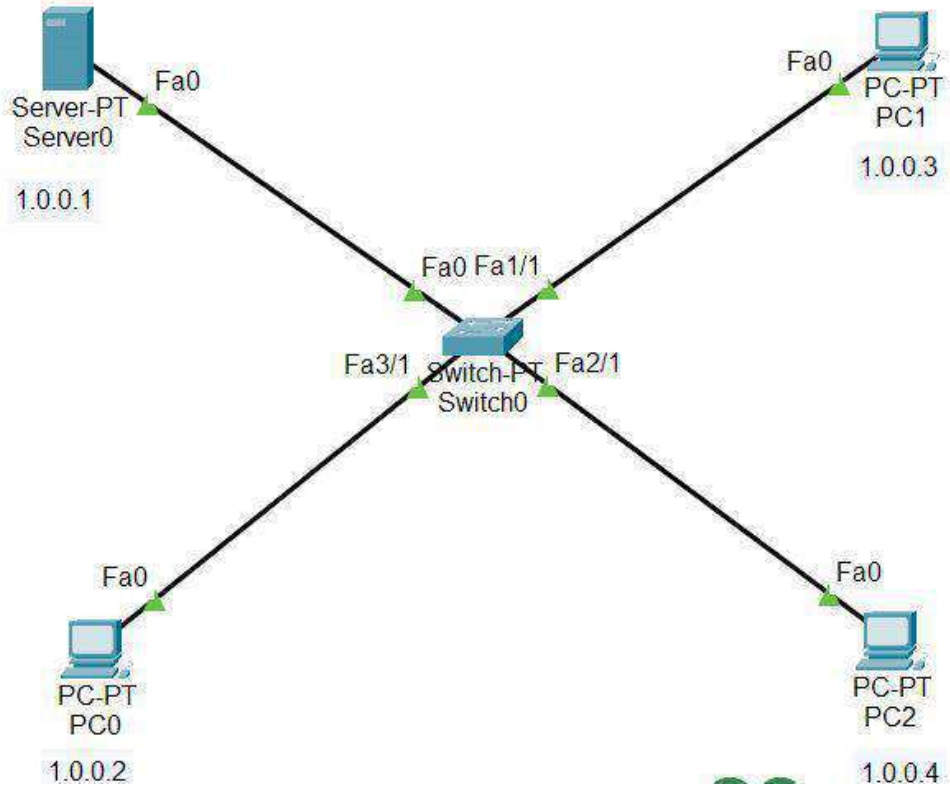
S.NO	Device	IPv4 Address	Subnet Mask
1.	Server	1.0.0.1	255.0.0.0
2.	PC0	1.0.0.2	255.0.0.0
3.	PC1	1.0.0.3	255.0.0.0
4.	PC2	1.0.0.4	255.0.0.0

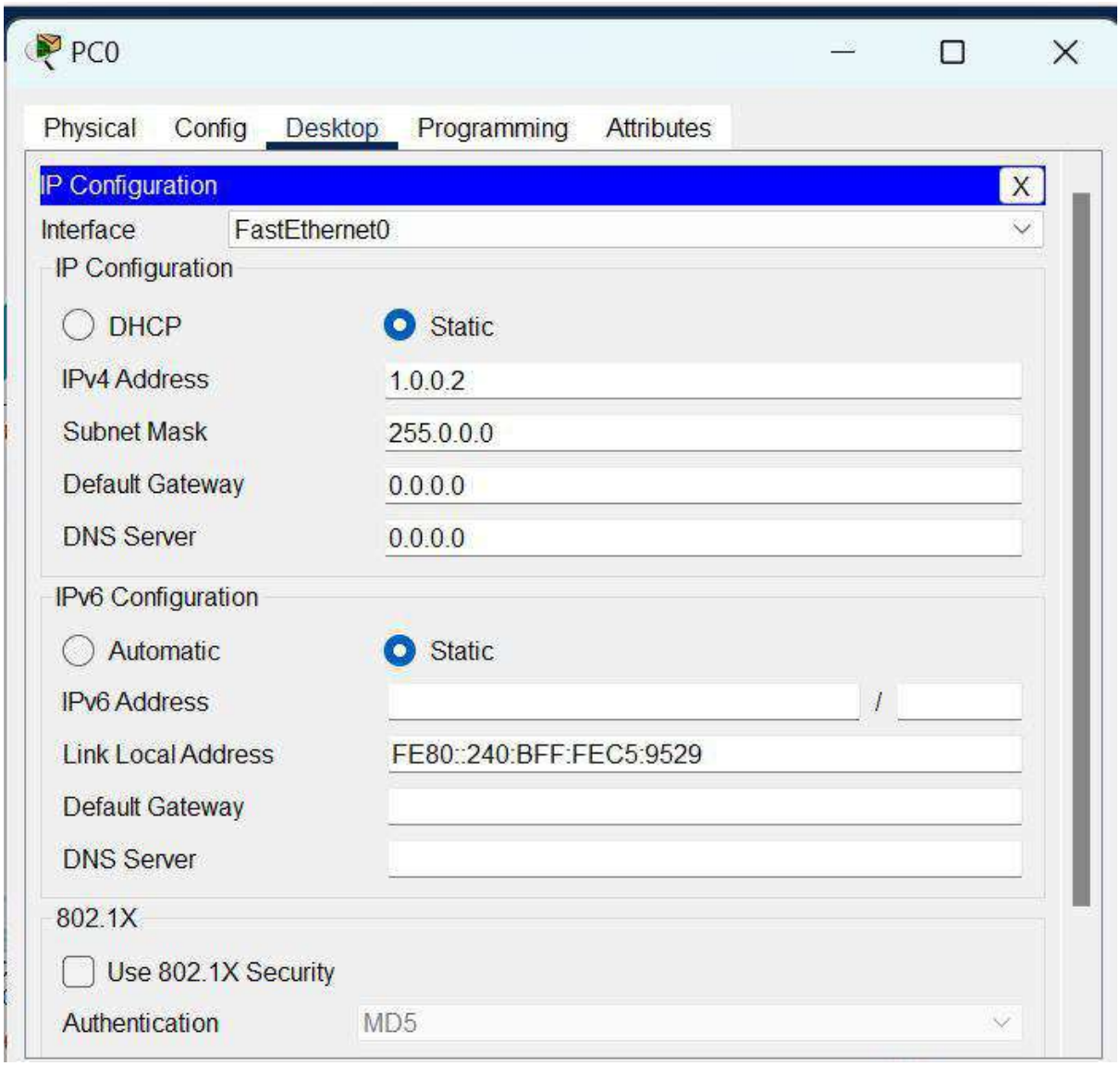
- Then, create a network topology as shown below the image.
- Use an Automatic connecting cable to connect the devices with others.

Step 2: Configure the PCs (hosts) and server with IPv4 address and Subnet Mask according to the IP addressing table given above.

- To assign an IP address in PC0, click on PC0.
- Then, go to desktop and then IP configuration and there you will IPv4 configuration.
- Fill IPv4 address and subnet mask.

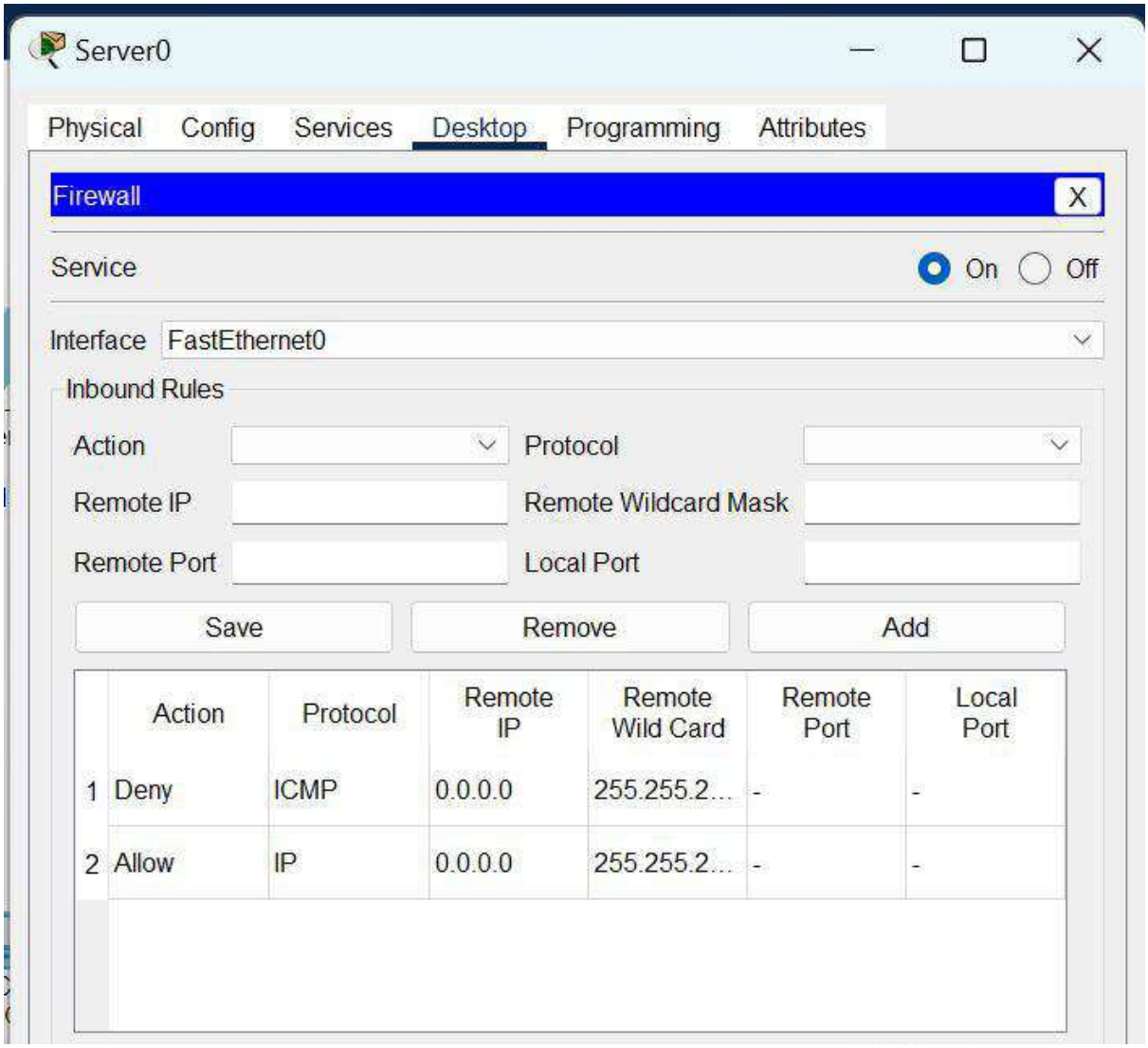
- Repeat the same procedure with the server
-





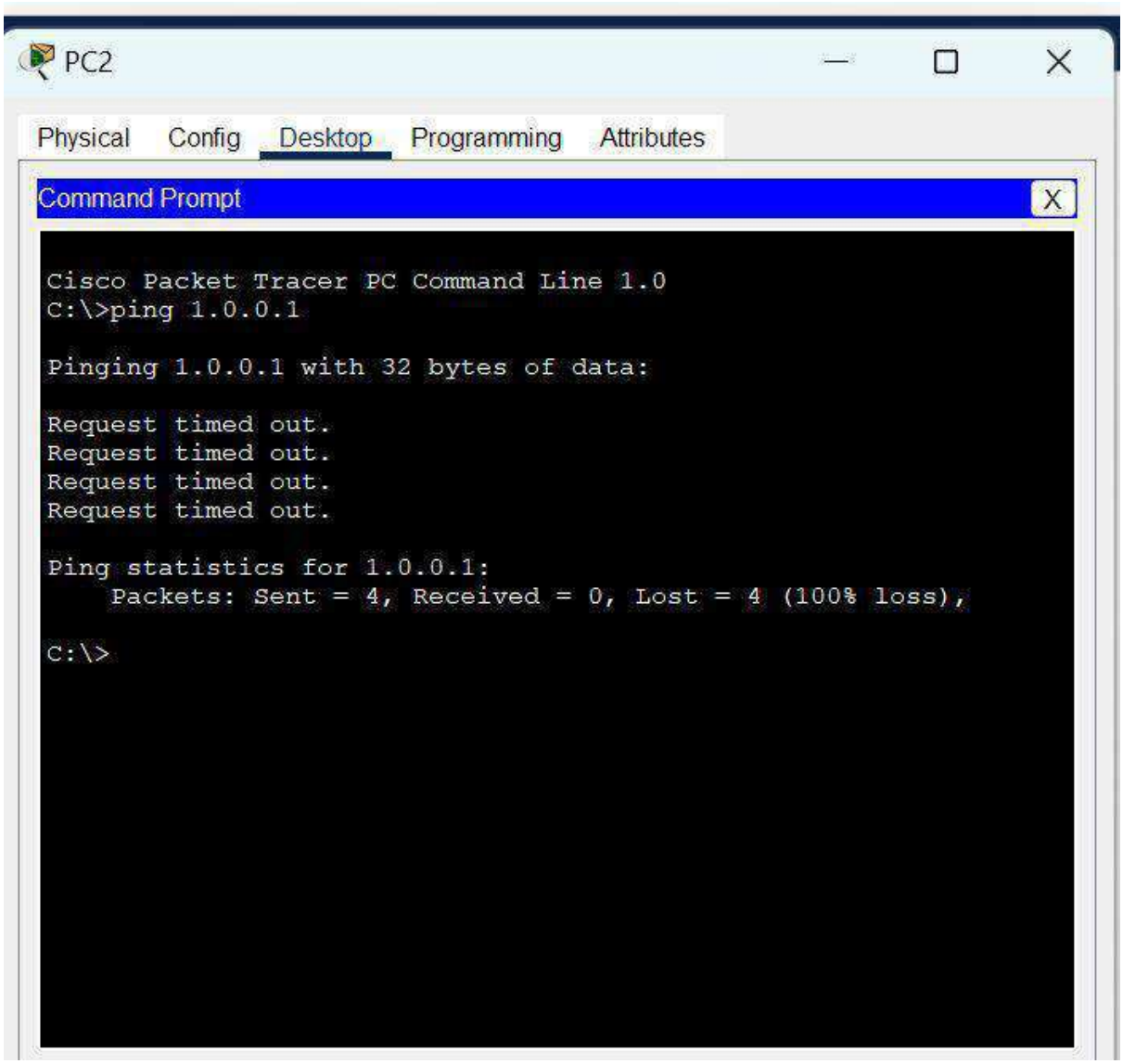
Step 3: Configuring the firewall in a server and blocking packets and allowing web browser.

- Click on server0 then go to the desktop.
- Then click on firewall IPv4.
- Turn on the services.
- First, Deny the ICMP protocol and set remote IP to 0.0.0.0 and Remote wildcard mask to 255.255.255.255.
- Then, allow the IP protocol and set remote IP to 0.0.0.0 and Remote wildcard mask to 255.255.255.255.
- And add them.



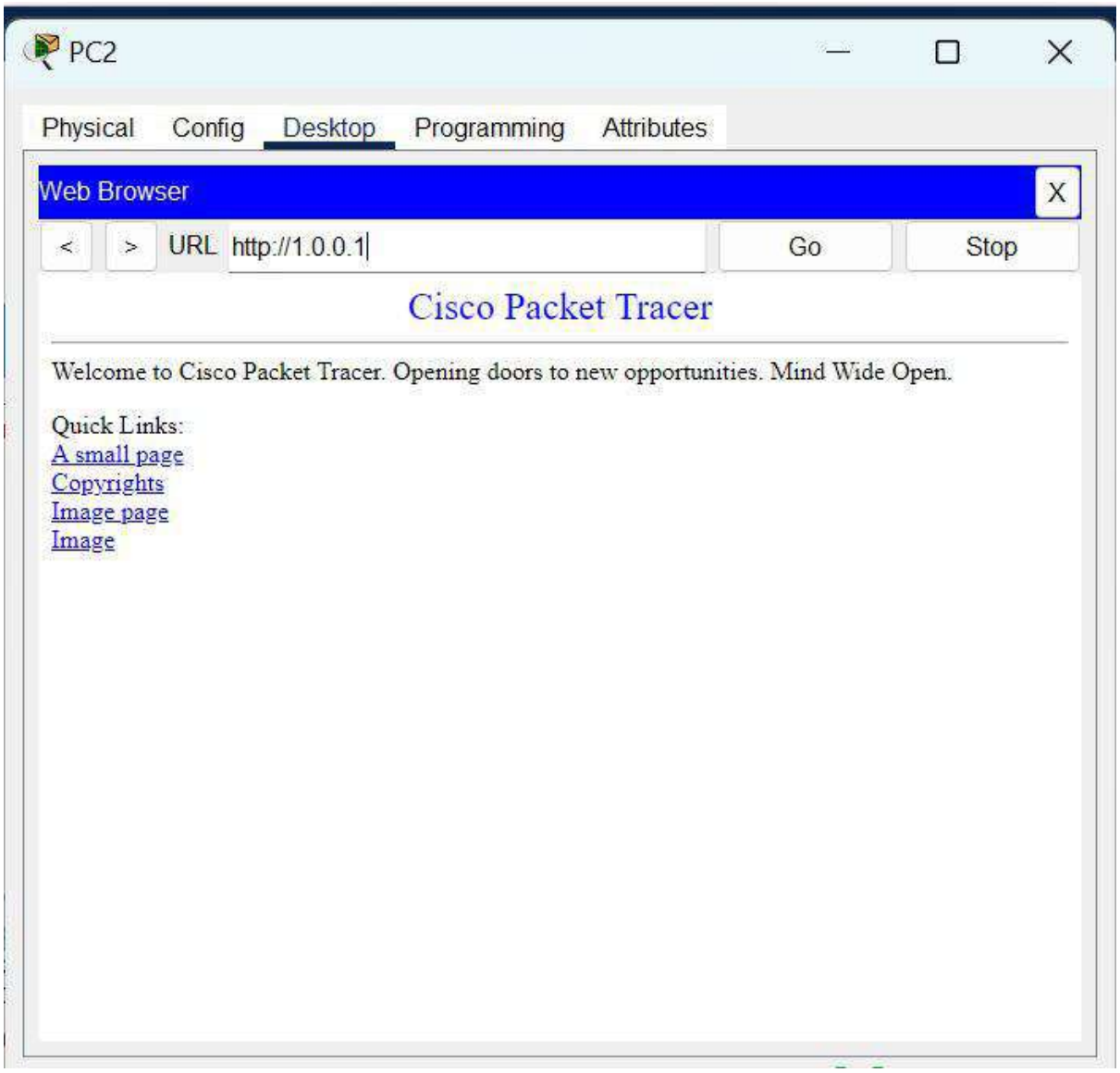
Step 4: Verifying the network by pinging the IP address of any PC.

- We will use the ping command to do so.
- First, click on PC2 then Go to the command prompt.
- Then type ping <IP address of targeted node>.
- We will ping the IP address of the server0.
- As we can see in the below image we are getting no replies which means the packets are blocked.

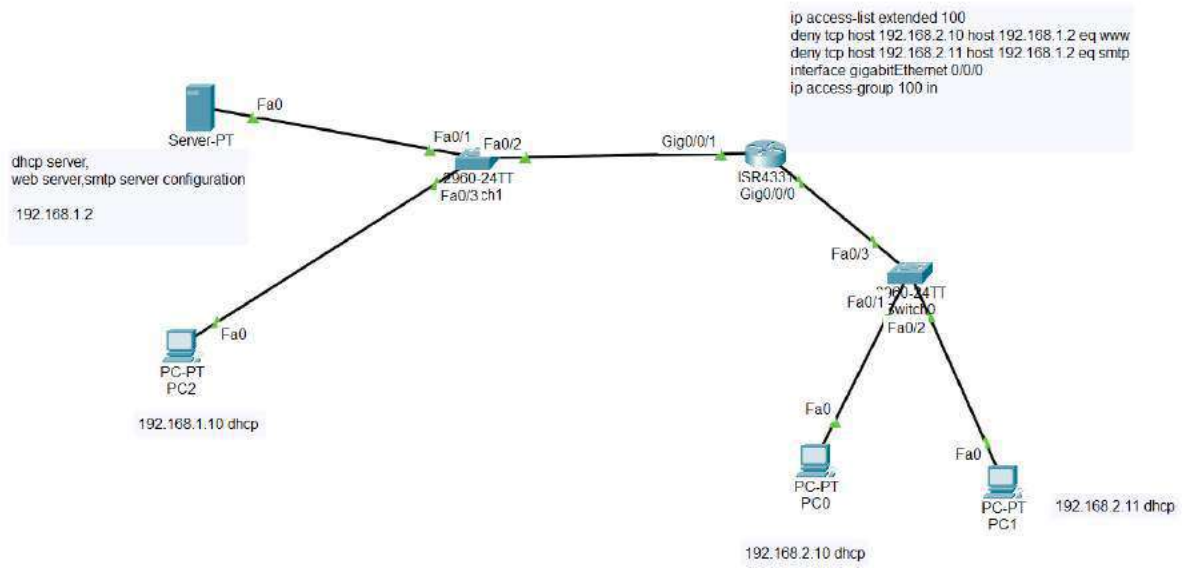


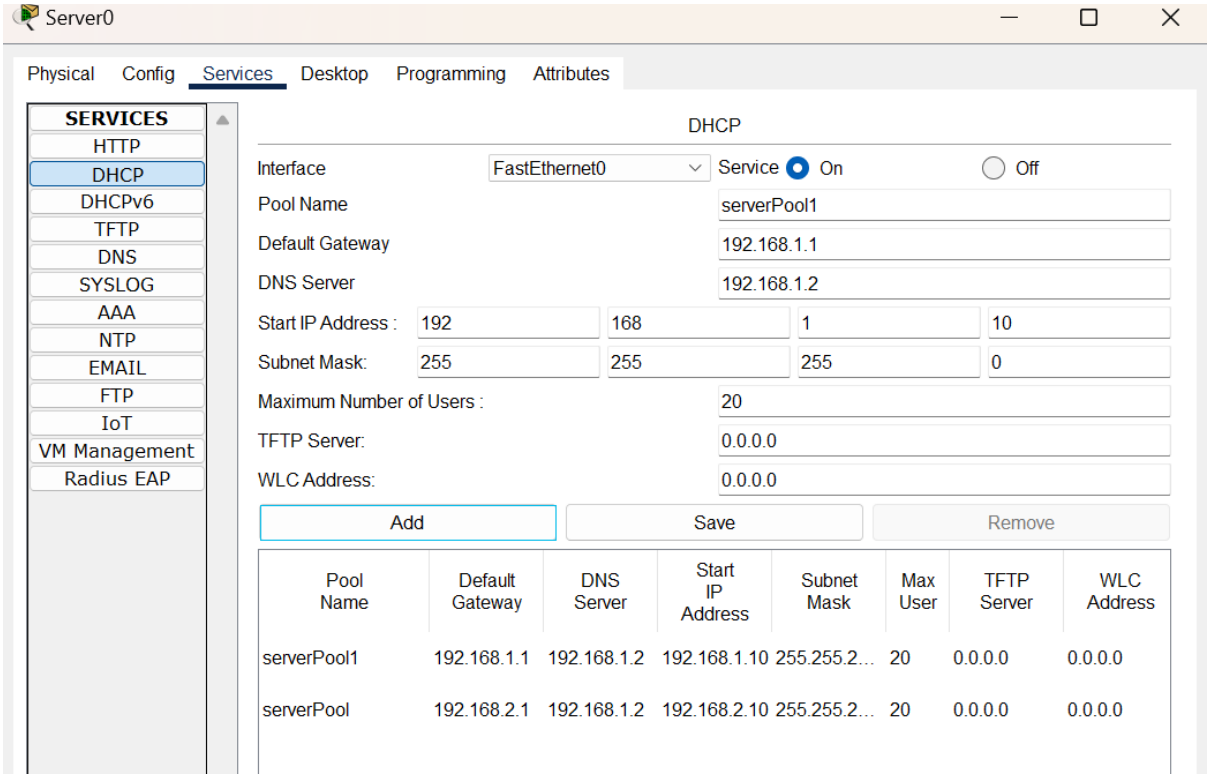
Check the web browser by entering the IP address in the URL.

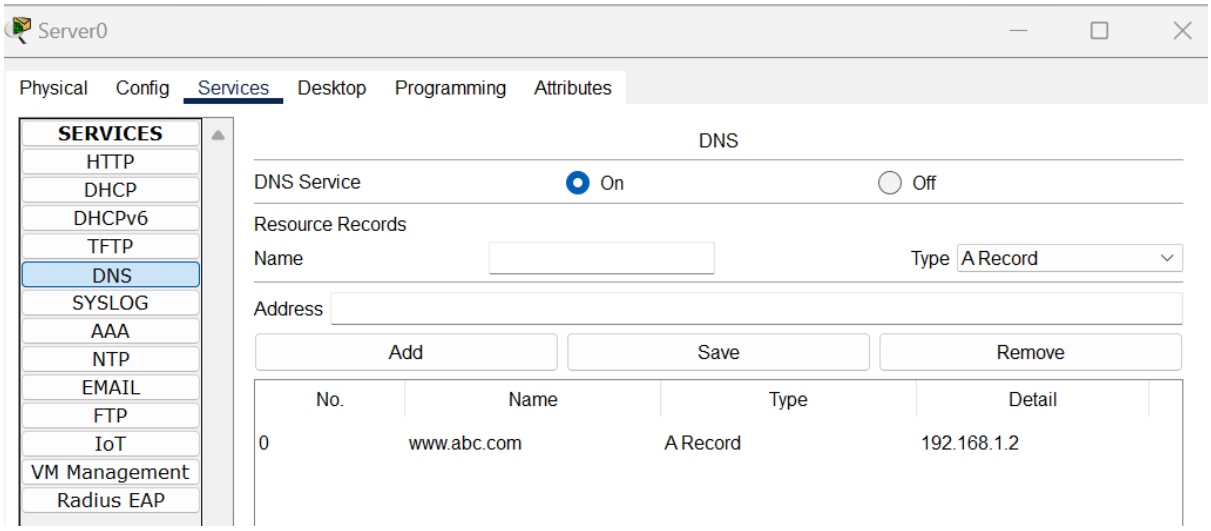
- Click on PC2 and go to desktop then web browser.

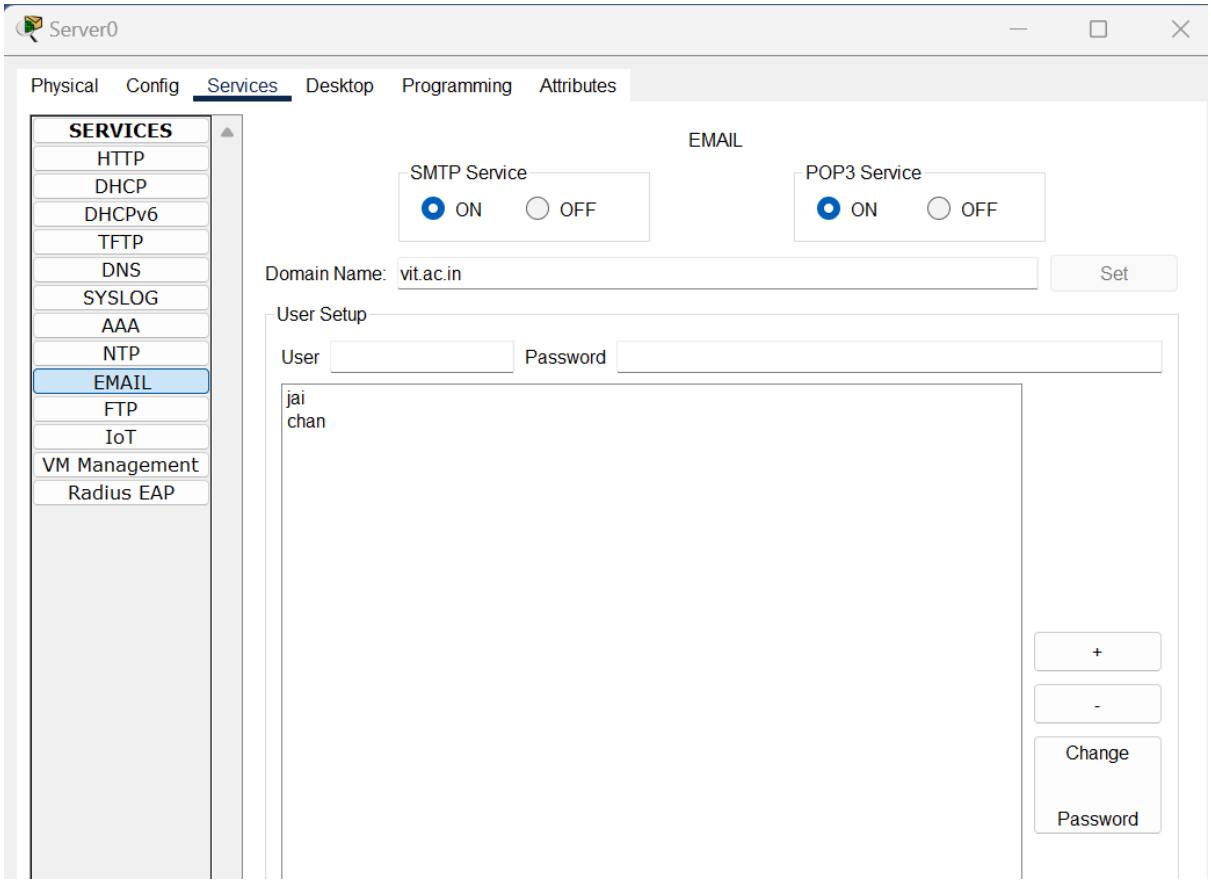

PC2
Physical
Config
Desktop
Programming
Attributes
Web Browser
X
<
>
URL
http://1.0.0.1
Go
Stop
Cisco Packet Tracer
Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.
Quick Links:
A small page
Copyrights
Image page
Image

EXTENDED ACL USING DHCP, SMTP, WEB SERVER









Before ACL configuration

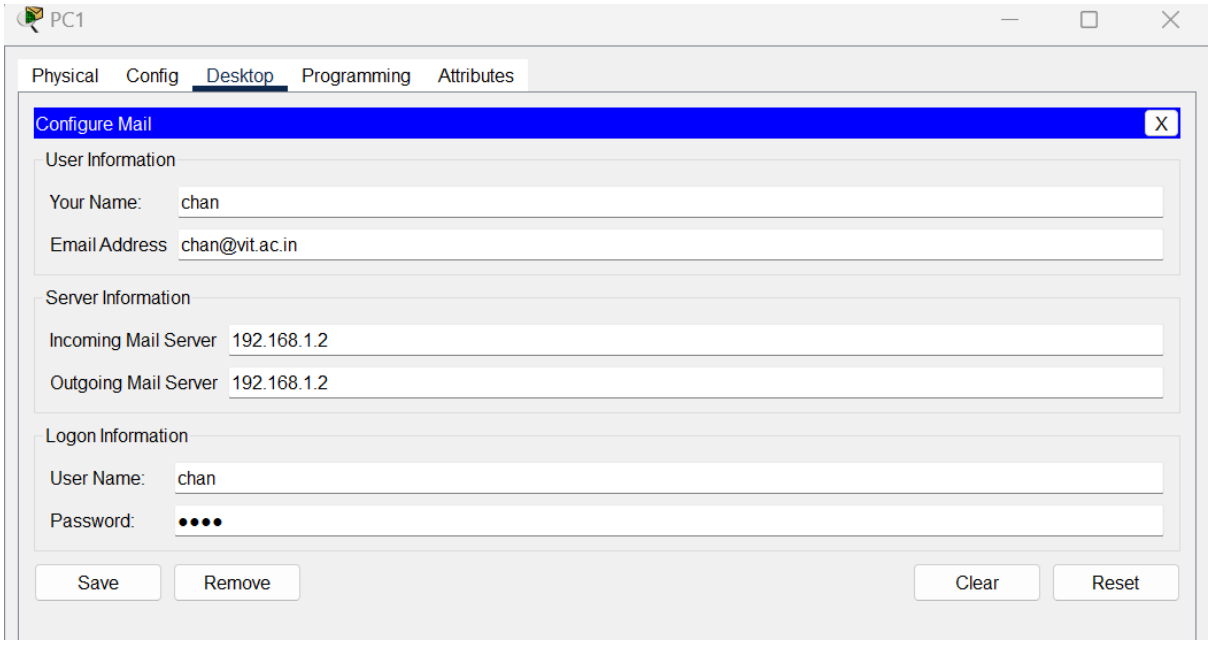
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0/1

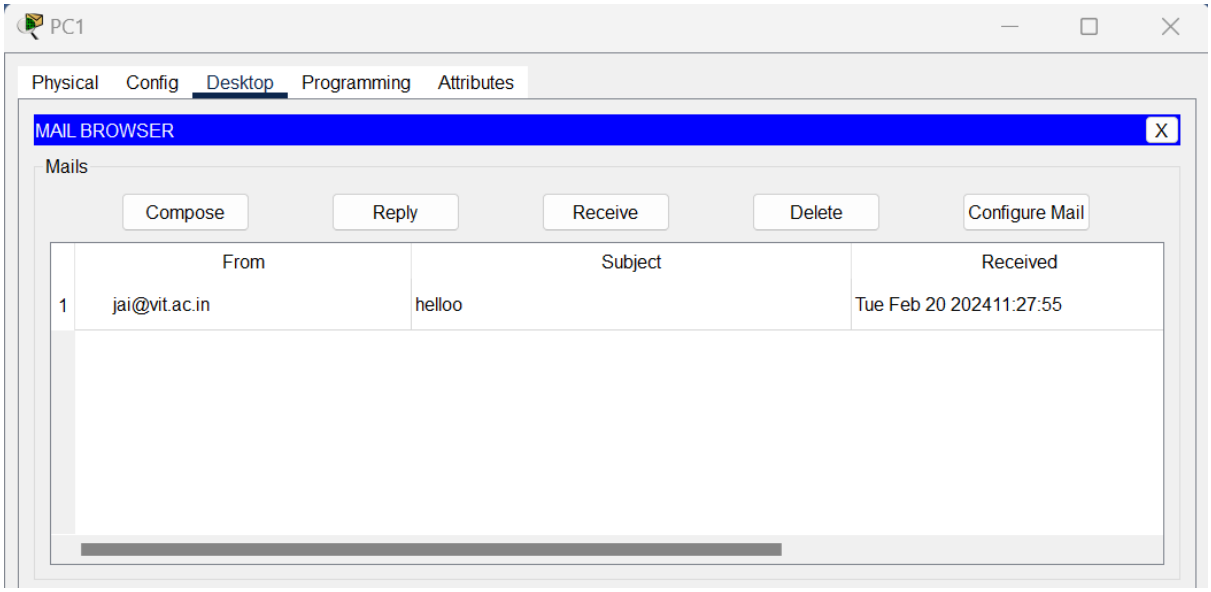
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/1, changed state to up

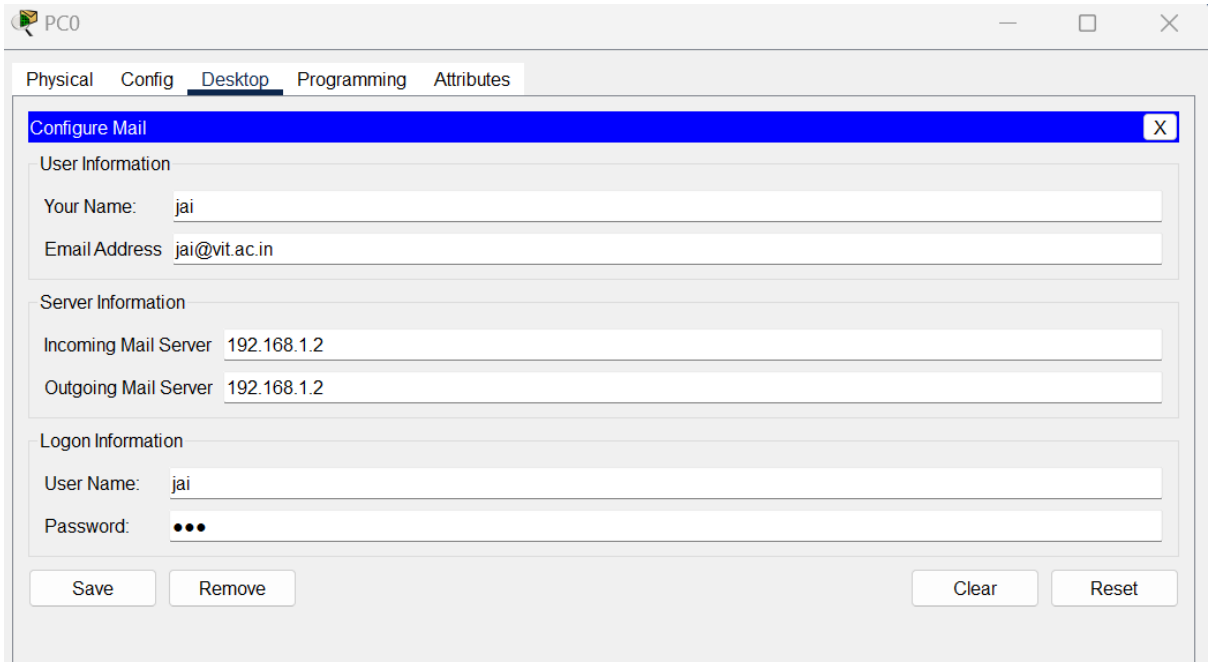
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up

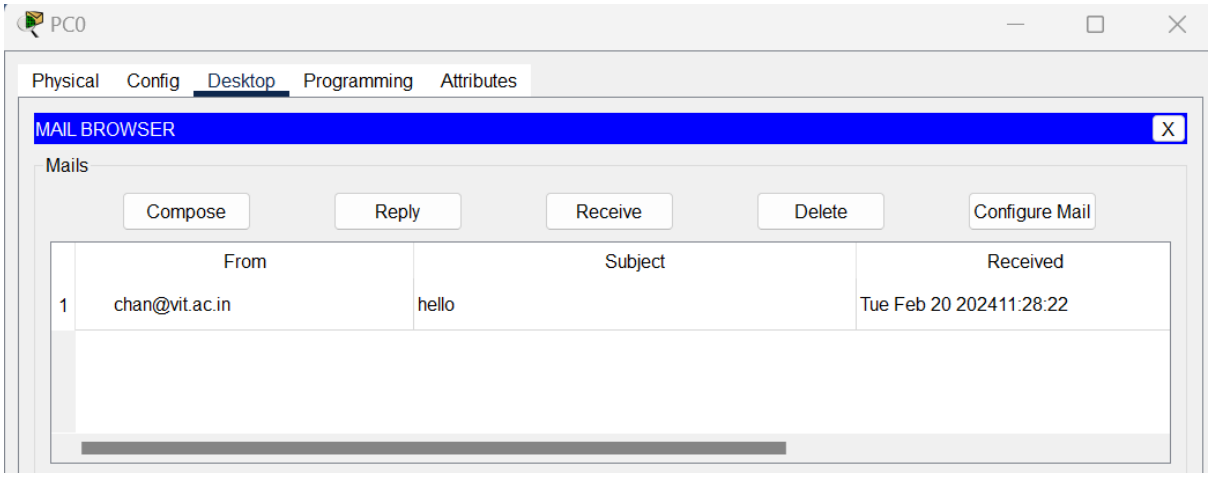
Router(config-if)#
Router(config-if)#ip helper-address 192.168.1.2
Router(config-if)#exit
Router(config)#interface GigabitEthernet0/0/0
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed state to up

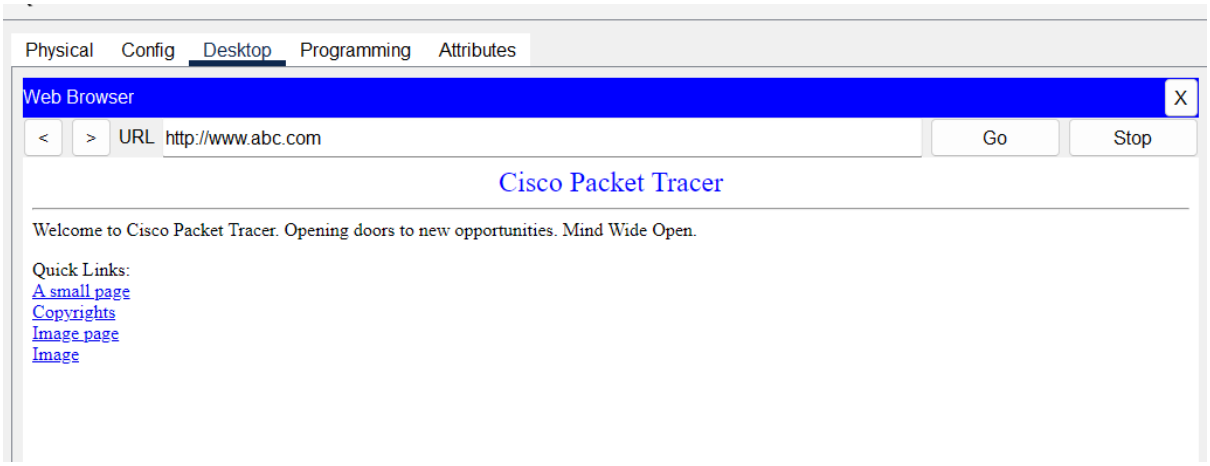
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
Router(config-if)#ip helper-address 192.168.1.2
Router(config-if)#exit




PC1
Physical
Config
Desktop
Programming
Attributes
MAIL BROWSER
X
Mails
Compose
Reply
Receive
Delete
Configure Mail
From
Subject
Received
1
jai@vit.ac.in
helloo
Tue Feb 20 202411:27:55


PC0
Physical
Config
Desktop
Programming
Attributes
Configure Mail
X
User Information
Your Name:
jai
Email Address
jai@vit.ac.in
Server Information
Incoming Mail Server
192.168.1.2
Outgoing Mail Server
192.168.1.2
Logon Information
User Name:
jai
Password:
●●●
Save
Remove
Clear
Reset

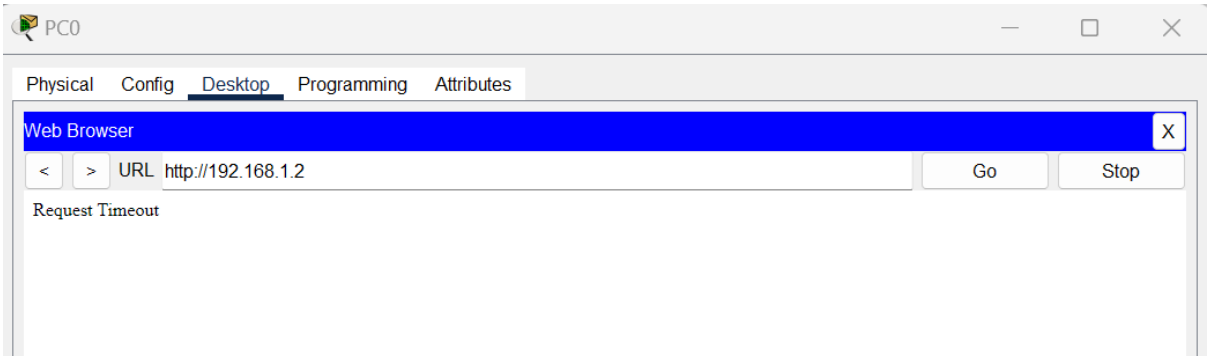

PC0
Physical
Config
Desktop
Programming
Attributes
MAIL BROWSER
X
Mails
Compose
Reply
Receive
Delete
Configure Mail
From
Subject
Received
1
chan@vit.ac.in
hello
Tue Feb 20 202411:28:22

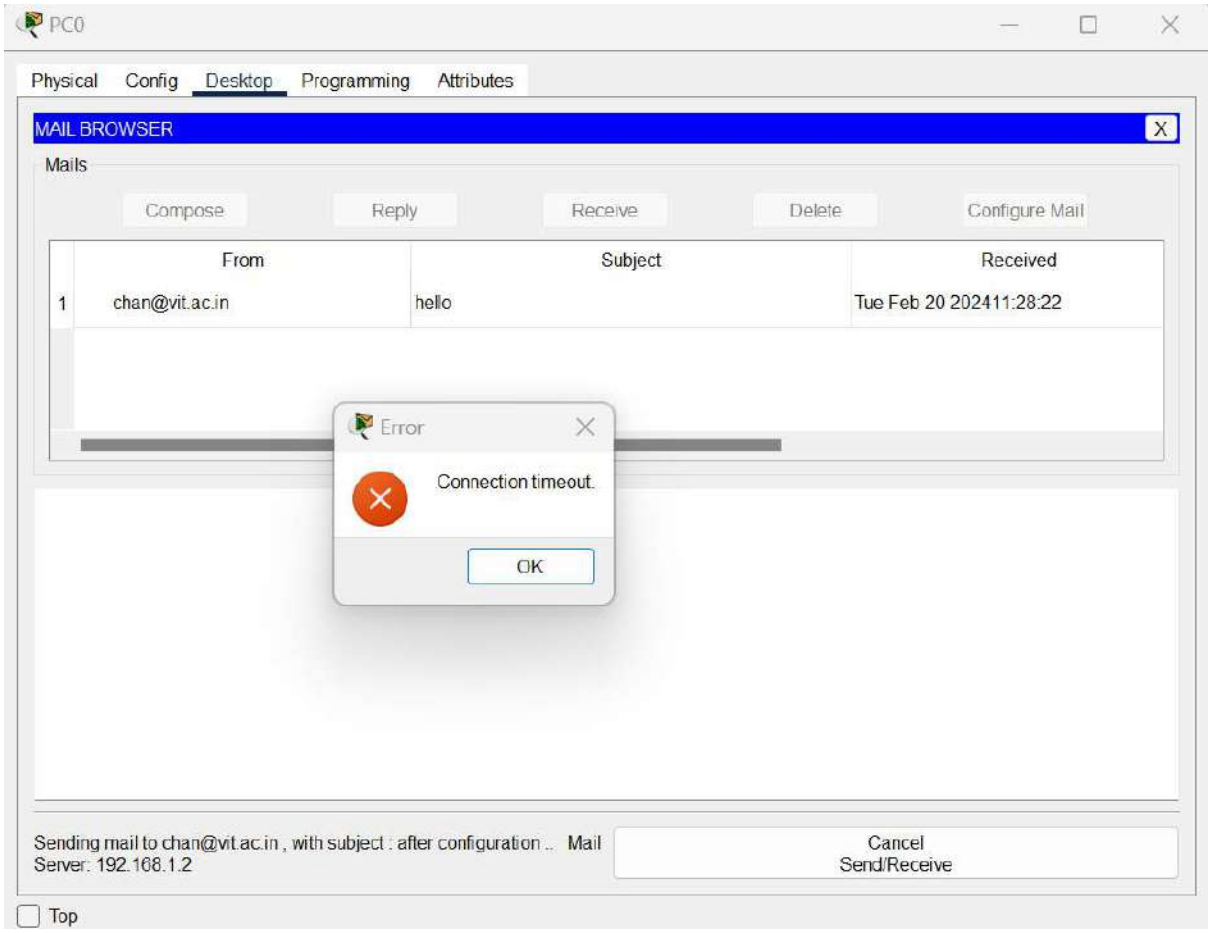


After ACL configuration

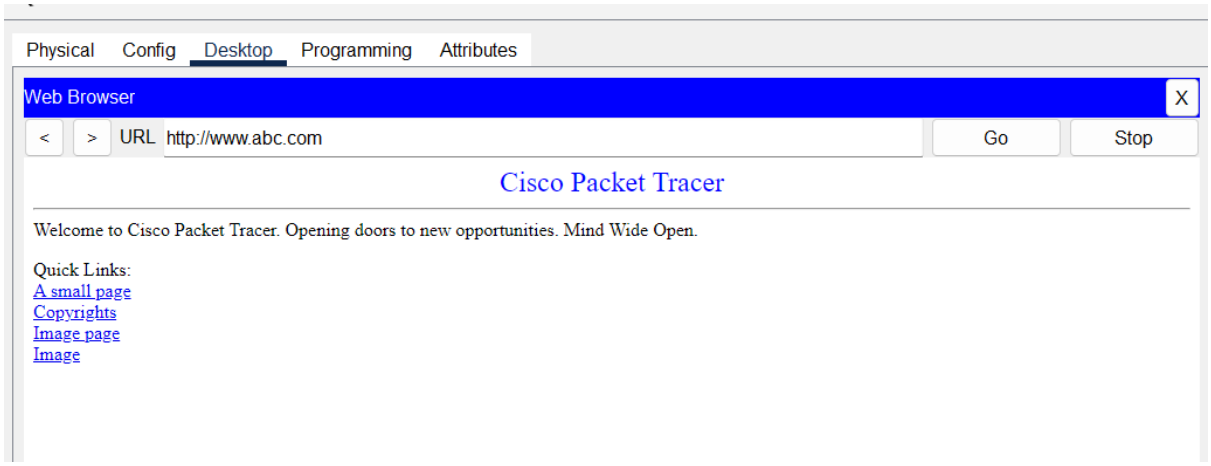
Router(config)#ip access-list ?
extended Extended Access List
standard Standard Access List
Router(config)#ip access-list standard ?
<1-99> standard IP access-list number
WORD name
Router(config)#ip access-list extended ?
<100-199> standard IP access-list number
WORD name
Router(config)#ip access-list extended 100
Router(config-ext-nacl)#?
<1-2147483647> Sequence Number
default Set a command to its defaults
deny Specify packets to reject
exit Exit from access-list configuration mode
no Negate a command or set its defaults
permit Specify packets to forward
remark Access list entry comment
Router(config-ext-nacl)#deny ?
ahp Authentication Header Protocol
eigrp Cisco's EIGRP routing protocol
esp Encapsulation Security Payload
gre Cisco's GRE tunneling
icmp Internet Control Message Protocol
ip Any Internet Protocol
ospf OSPF routing protocol

tcp Transmission Control Protocol
udp User Datagram Protocol
Router(config-ext-nacl)#deny tcp host 192.168.2.10 eq ?
<0-65535> Port number
domain Domain Name Service (DNS, 53)
ftp File Transfer Protocol (21)
pop3 Post Office Protocol v3 (110)
smtp Simple Mail Transport Protocol (25)
telnet Telnet (23)
www World Wide Web (HTTP, 80)
Router(config-ext-nacl)#deny tcp host 192.168.2.10 host 192.168.1.2 eq www or 80
Router(config-ext-nacl)#deny tcp host 192.168.2.11 host 192.168.1.2 eq smtp or 25
Router(config-ext-nacl)#exit
Router(config)#interface gigabitEthernet 0/0/0
Router(config-if)#ip access-group 100 in
Router(config-if)#exit
Router(config)#




PC0
Physical
Config
Desktop
Programming
Attributes
MAIL BROWSER
X
Mails
Compose
Reply
Receive
Delete
Configure Mail
From
Subject
Received
1
chan@vit.ac.in
hello
Tue Feb 20 202411:28:22
Error
Connection timeout.
OK
Sending mail to chan@vit.ac.in , with subject : after configuration ..
Server: 192.168.1.2
Mail
Cancel
Send/Receive
Top

Pc1


Physical
Config
Desktop
Programming
Attributes
Web Browser
X
<
>
URL
http://www.abc.com
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

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Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

Information Security Management

BCSE454E

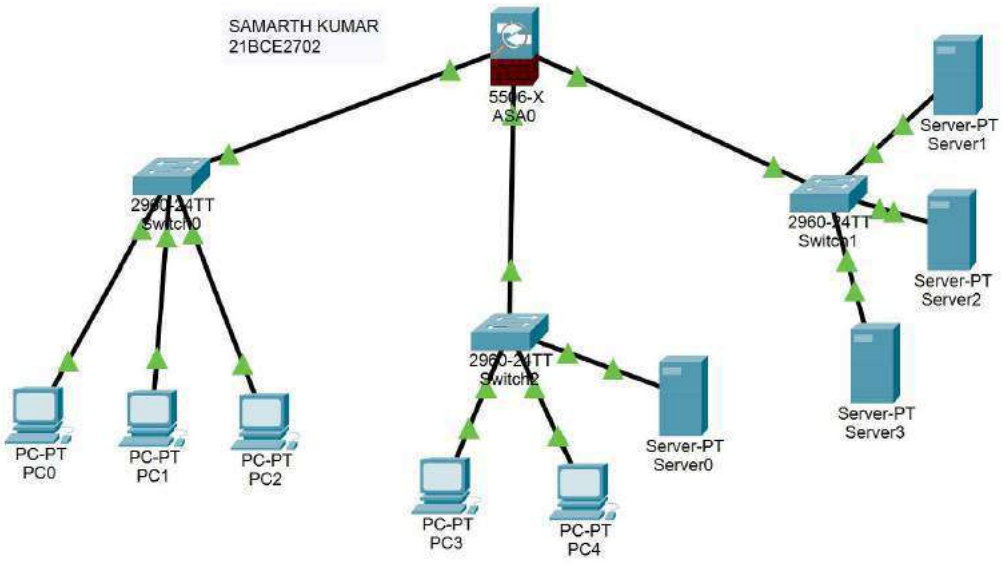
DA-4

NAME: SAMARTH KUMAR
REGISTRATION NO : 21BCE2702
COURSE CODE: BCSE354E
FACULTY : VIMALA DEVI K

SAMARTH KUMAR 21BCE2702

ASA FIREWALL

TOPOLOGY:



1.**Open a the asa firewall, by default the name seems to be ciscoasa and by default password ill be empty**

ciscoasa>en Password:

ciscoasa#conf t

ciscoasa(config)#

2.**Change the name of the firewall to identify it easily here I name the firewall as basefirewall**

ciscoasa(config)# host name basefirewall

basefirewall(config)#

3.**Enable the password for security purpose as I had given the password as hello123**

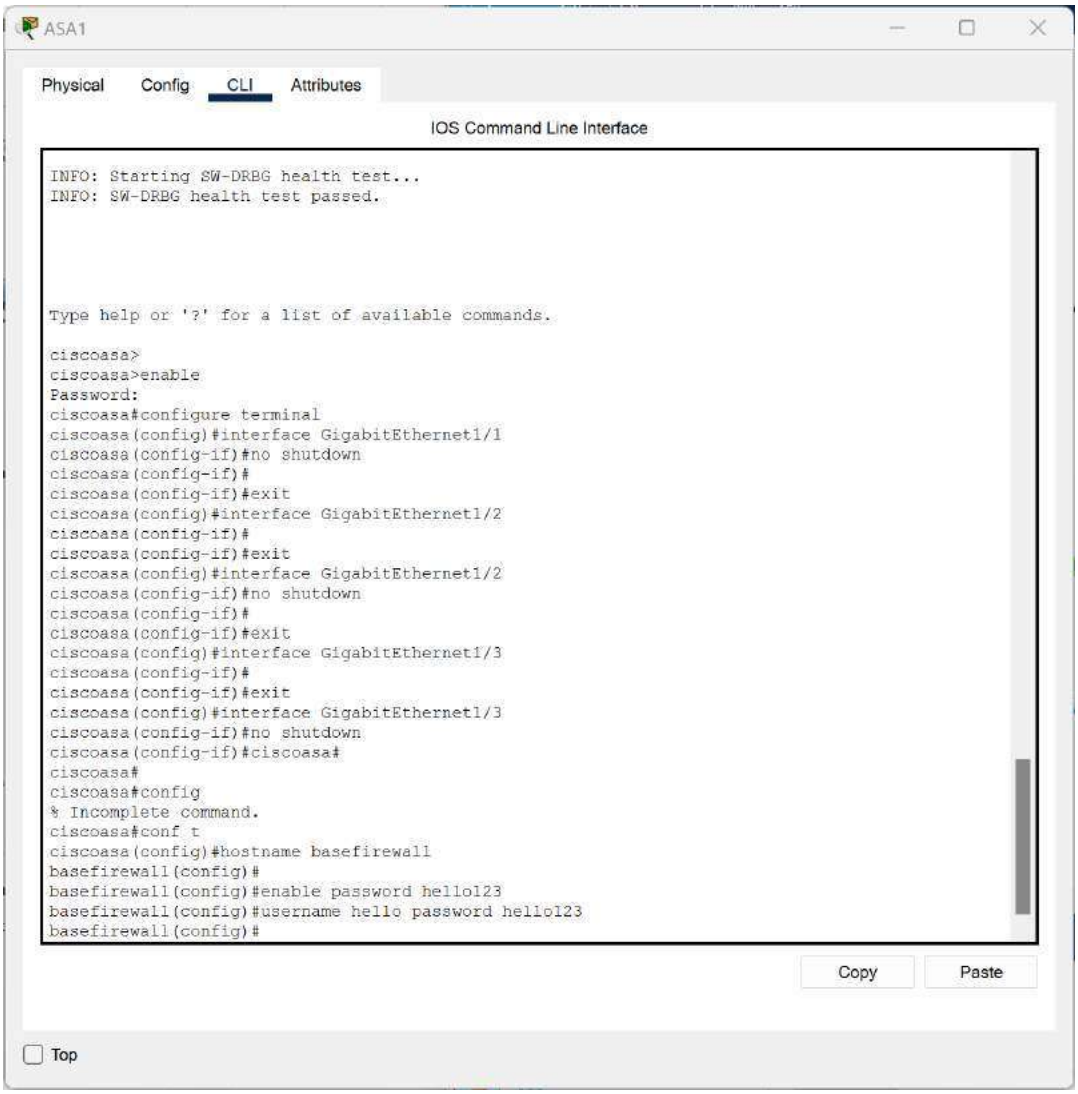
basefirewall(config)#

basefirewall(config)# enable password hello123

4. **Need to configure the host name for connecting to the ssh (remote desktop)**

basefirewall(config)#username hello password hello123

STEPS 1-4



5. **Need to set the clock and date for the present firewall**

   basefirewall(config)# clock set hh:mm:ss date month in words year

6. **Configure the interface port 1/1 with an ip address**

   basefirewall (config)#int g1/1

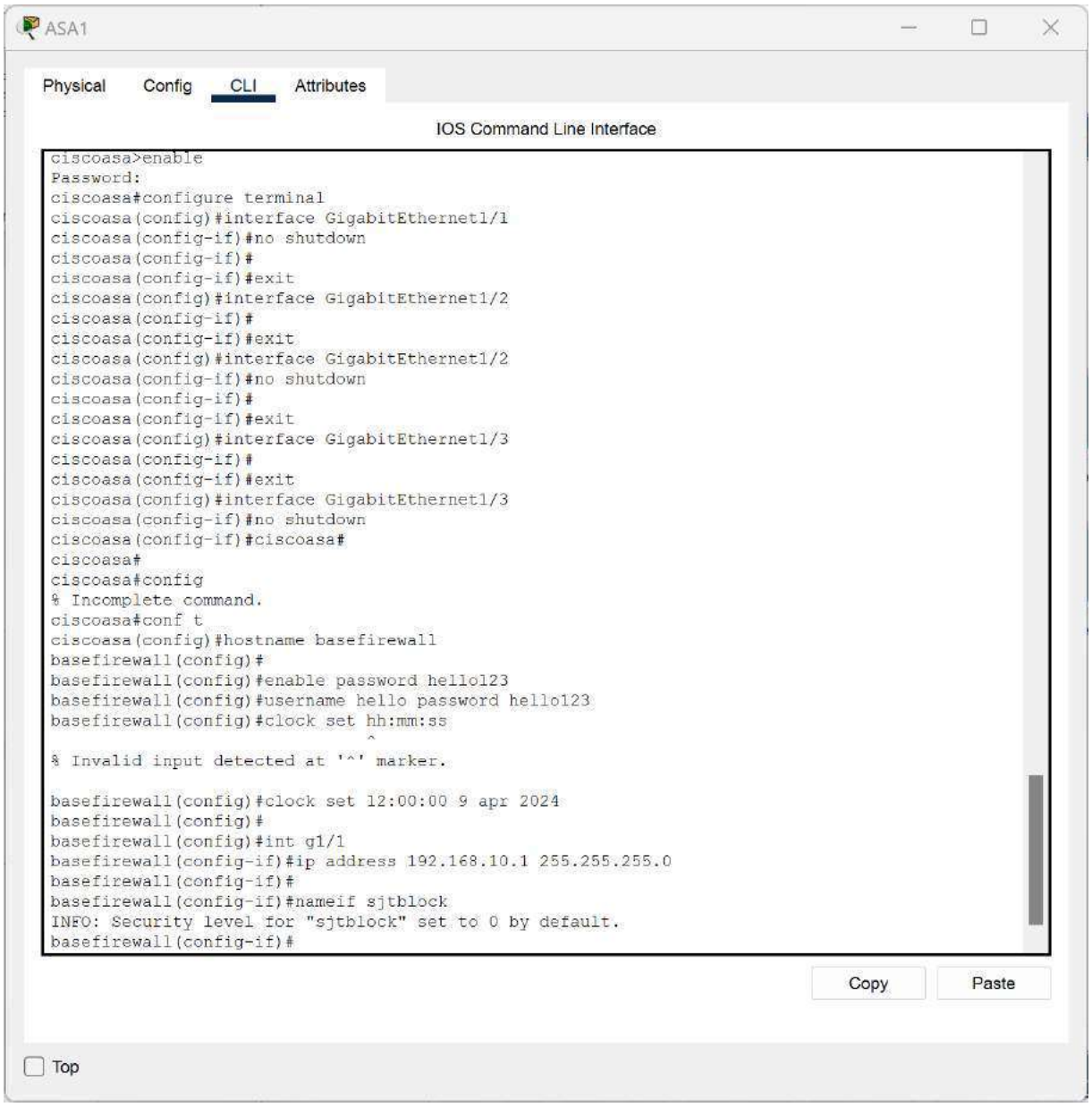
   basefirewall (config-if)#ip address 192.168.10.1 255.255.255.0

7. **We need to name the interface port for our easy identification let I name that port as sjtblock**

basefirewall (config-if)#nameif sjtblock

INFO: Security level for "sjtblock" set to 0 by default.

STEPS 5-7



8.Next we need to set the security level of each and every port which has connected to that particular firewall it varies from 0 to 100

Here 0 means no security all are allowed, 100 means it is more trusted port, other numbers are like how much trust u have on that particular port

basefirewall (config-if)#security-level 100

basefirewall (config-if)#exit

basefirewall (config)#

```
basefirewall(config-if)#
basefirewall(config-if)#nameif sjtblock
INFO: Security level for "sjtblock" set to 0 by default.
basefirewall(config-if)#
basefirewall(config-if)#security-level 100
basefirewall(config-if)#exit
basefirewall(config)#
```

9.Next we need to configure the asa firewall as a dhcp server

basefirewall (config)#dhcp ?

basefirewall (config)#dhcp add

basefirewall (config)#dhcpd address

basefirewall (config)#dhcp address 192.168.1.10-192.168.1.15 sjtblock

basefirewall (config)#dhcp dns 192.168.1.1

basefirewall (config)#dhcp en

basefirewall (config)#dhcp enable sjtblock

basefirewall (config)#int gig1/1

basefirewall (config-if)#no shut

basefirewall (config-if)#

basefirewall (config-if)#exit

```
basefirewall(config)#dhcp?

configure mode commands/options:
dhcpd
basefirewall(config)#dhcp address 192.168.1.10-192.168.1.15  sjtblock
Address range subnet 192.168.1.10 or 192.168.1.15 is not the same as inside interface subnet
192.168.10.1
basefirewall(config)#dhcp address 192.168.10.1-192.168.10.15  sjtblock
basefirewall(config)#dhcp dns 192.168.1.1
basefirewall(config)#
basefirewall(config)#dhcp enable sjtblock
basefirewall(config)#int gig1/1
basefirewall(config-if)#no shut
basefirewall(config-if)#
basefirewall(config-if)#exit
basefirewall(config)#
```

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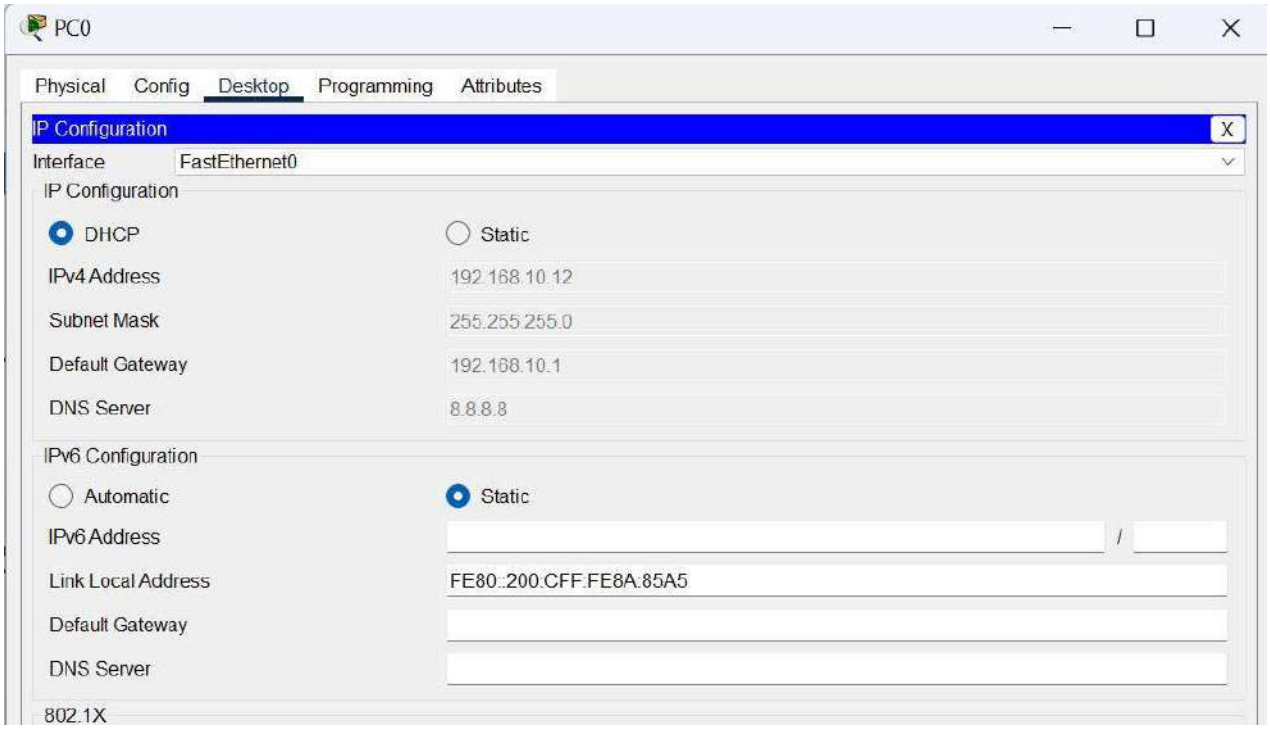
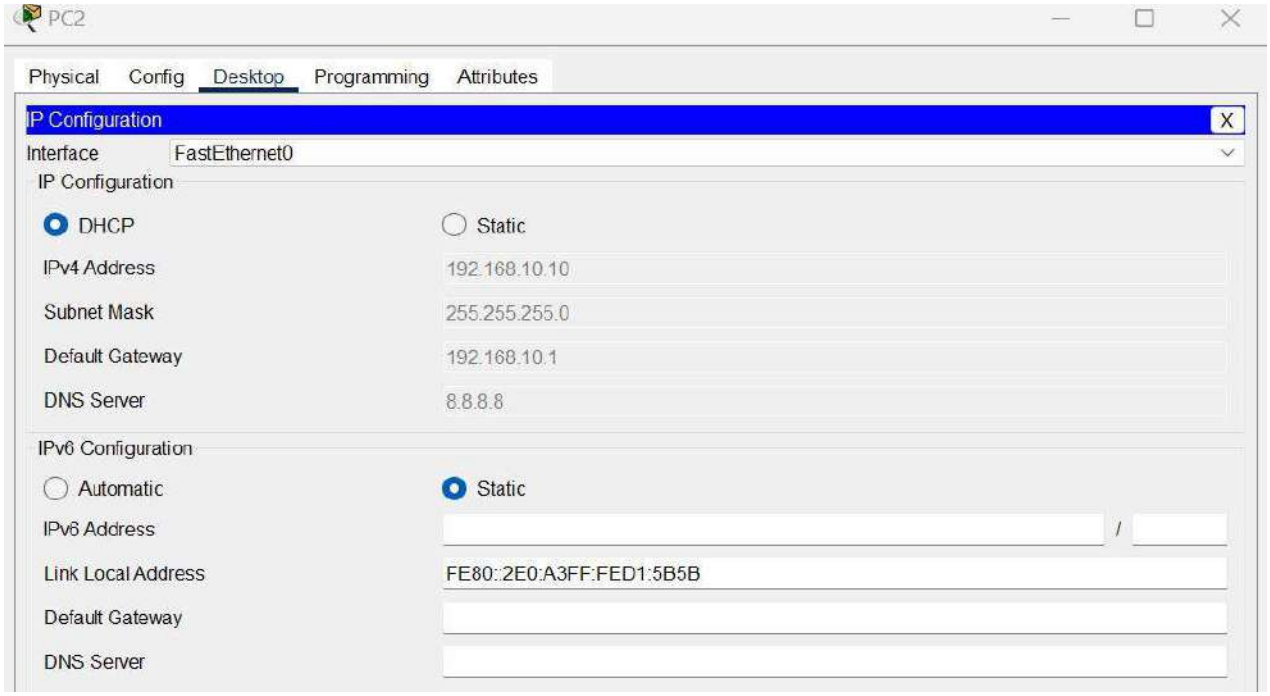
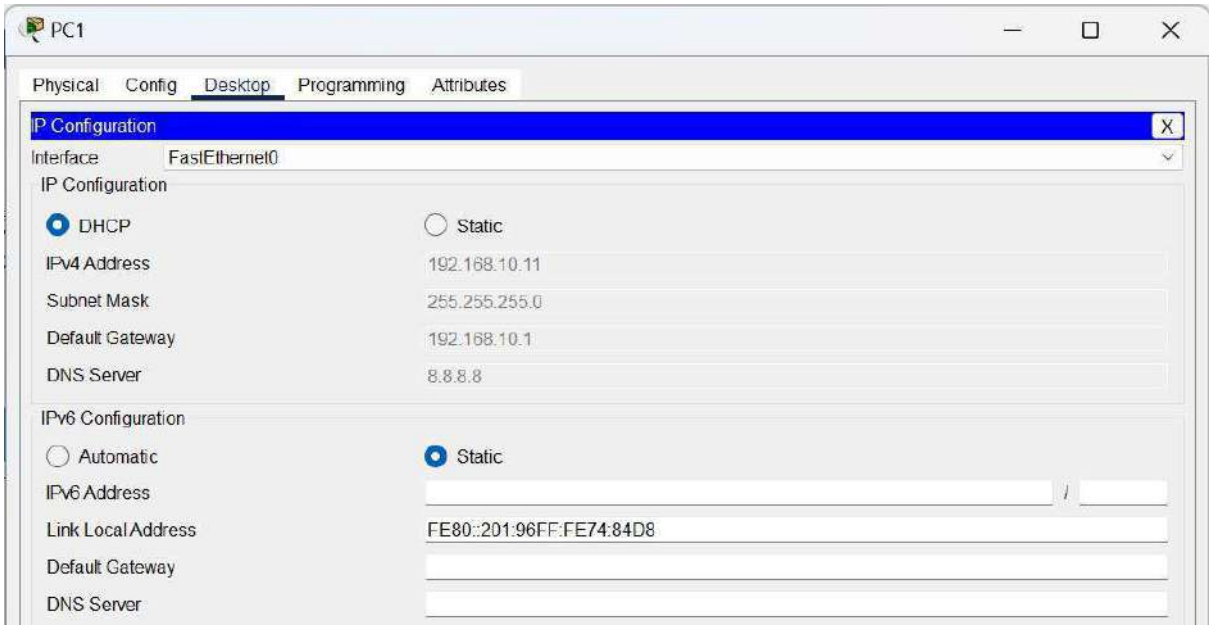
DHCP OUTPUT:







10. **For enabling the ssh (remote desktop) we need to configure the local authentication (AAA services)**

basefirewall (config)#aaa authentication ?

basefirewall (config)#aaa authentication ssh console ?

basefirewall (config)#aaa authentication ssh console local

11. **For providing the encryption security we need to give the type of encryption and their module and the number**

basefirewall (config)#crypto key generate rsa module 1024

Do you really want to replace them? [yes/no]: y Keypair

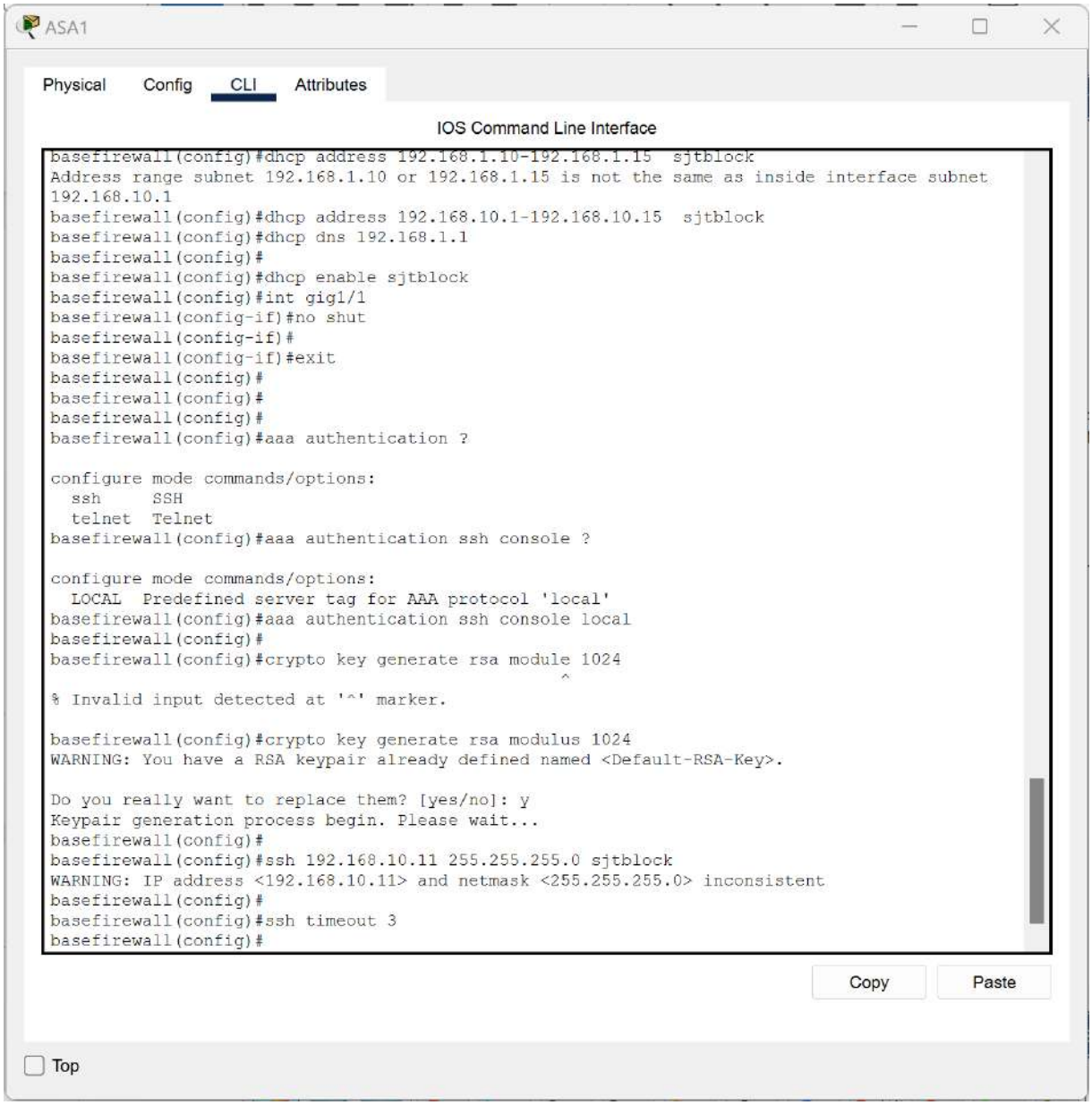
12. **Next step to create a blocking process: ssh ip range /single ip wat ever u need u can give to block using for ssh services with their subnet mask and also followed by interface port name**

basefirewall (config)#ssh 192.168.10.11 255.255.255.0 sjtblock

13. **Next step is to provide the ssh timeout how many minutes u have to specify**

basefirewall (config)#ssh timeout 3

STEPS 10-13:



14. **Once u had configured all the things write all the things in the memory for asa firewall the command is write memory**

basefirewall (config)#wr mem Building configuration...

Cryptochecksum: 7ff79915 ffffffffedcb2eee 5cbc628d 5cfc17b5

1213 bytes copied in 1.12 secs (1083 bytes/sec)

[OK

15. Once u had done all the configurations and saved it in memory if u want to see the configuration wat u had done earlier the command is show start

```
basefw(config)#show start
: Saved
: Written by enable_15 at 13:01:41 UTC Mar 26 2024
: Call-home enabled from prompt by enable_15 at 13:01:41 UTC Mar 26 2024
:
ASA Version 9.6(1)
!
hostname basefw domain-name
wr
enable password MTLnZm8RrCMIuTSX encrypted names
!
interface GigabitEthernet1/1 nameif
sjtblock security-level 100 ip address
192.168.10.1 255.255.255.0
!
interface GigabitEthernet1/2
nameif ttblock security-level
50 ip address 10.10.10.1
255.0.0.0
!
interface GigabitEthernet1/3
nameif prpblock security-level
0
ip address 20.20.20.1 255.0.0.0
!
interface GigabitEthernet1/4
no nameif no security-level
no ip address shutdown
!
interface GigabitEthernet1/5
no nameif no security-level
no ip address shutdown
!
interface GigabitEthernet1/6
no nameif no security-level
no ip address shutdown
!
interface GigabitEthernet1/7
no nameif no security-level
no ip address shutdown
!
```

```
interface GigabitEthernet1/8
no nameif no security-level
no ip address shutdown
!
interface Management1/1
management-only no
nameif no security-level
no ip address shutdown
!
!
!
!
!
aaa authentication ssh console LOCAL
!
username hello password MTLnZm8RrCMIuTSX encrypted
!
class-map inspection_default match
default-inspection-traffic
!
policy-map type inspect dns preset_dns_map
parameters message-length
maximum 512 policy-map
global_policy class
inspection_default inspect dns
preset_dns_map
inspect ftp
inspect tftp  !
service-policy global_policy global
!
telnet timeout 5
ssh 192.168.10.11 255.255.255.0 sjtblock ssh
timeout 3
!
dhcpd dns 8.8.8.8
!
dhcpd address 192.168.10.10-192.168.10.20 sjtblock dhcpd
enable sjtblock
!
!
!
!
basefw(config)# basefw(config)#
```

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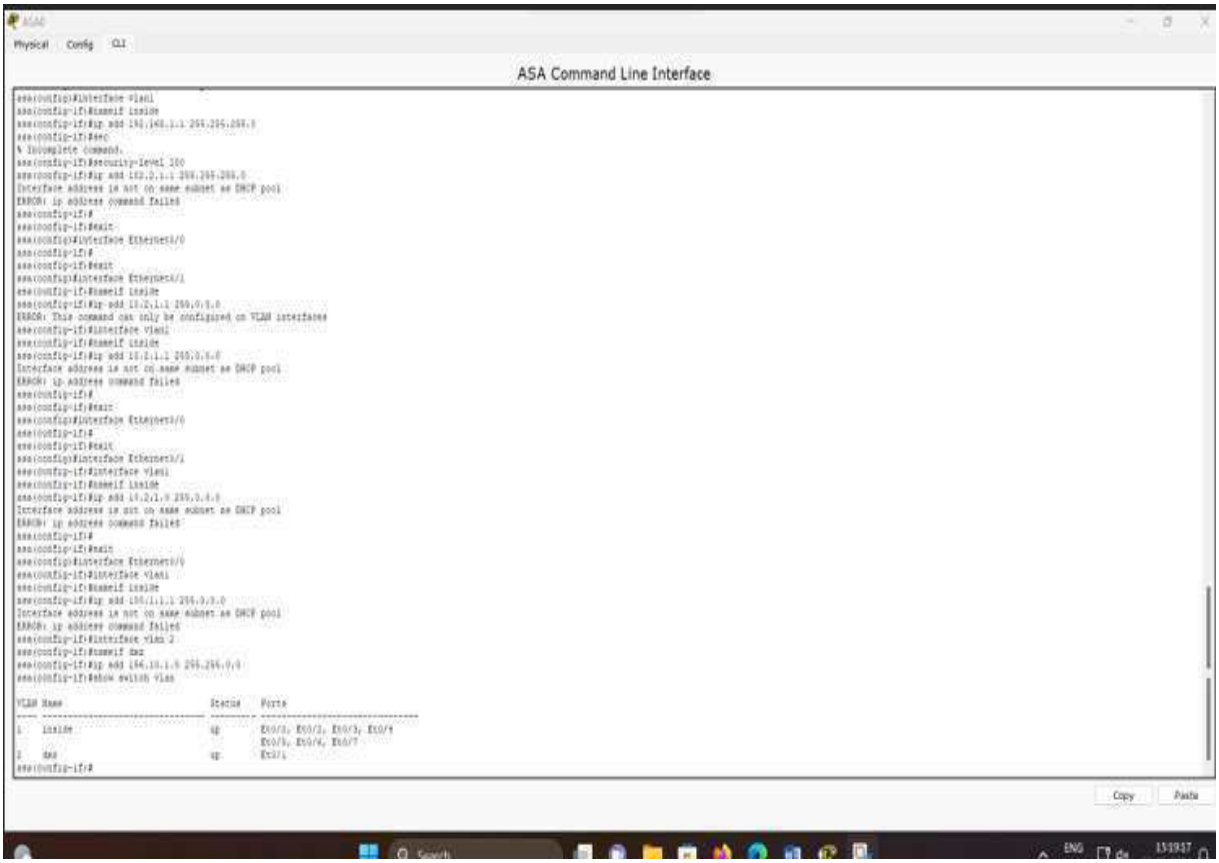
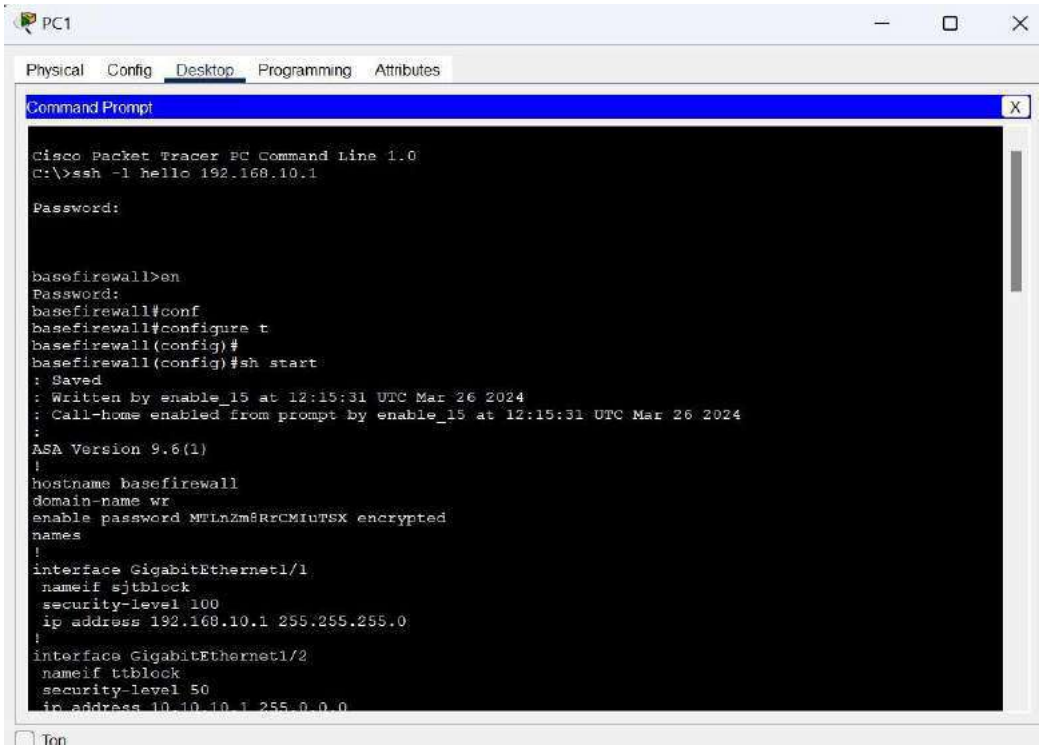


Ssh output:



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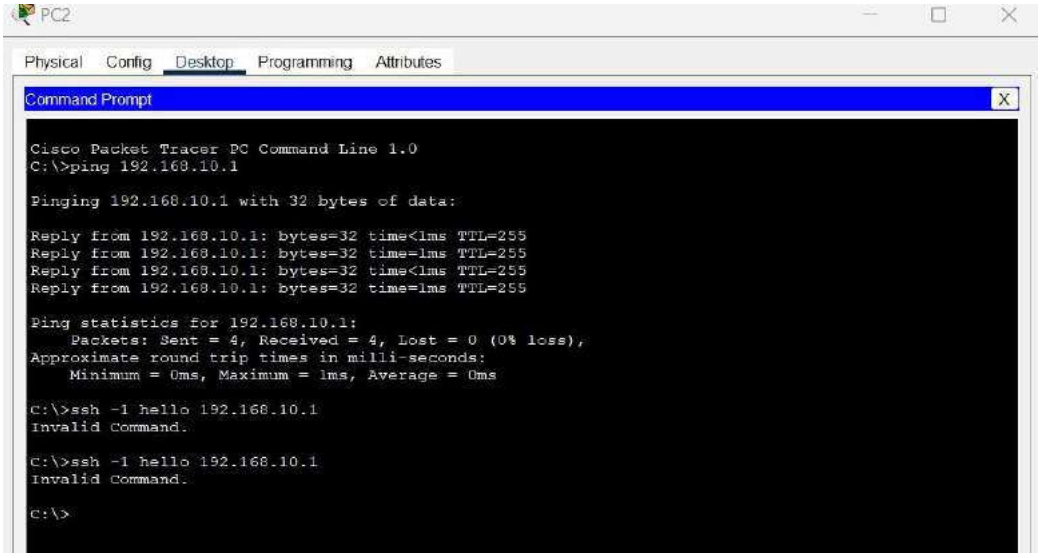

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(Deemed to be University under section 3 of UGC Act, 1956)

NAME: SAMARTH KUMAR

REG NO : 21BCE2702

COURSE NAME: Information Security Management

FACULTY : VIMALA DEVI K

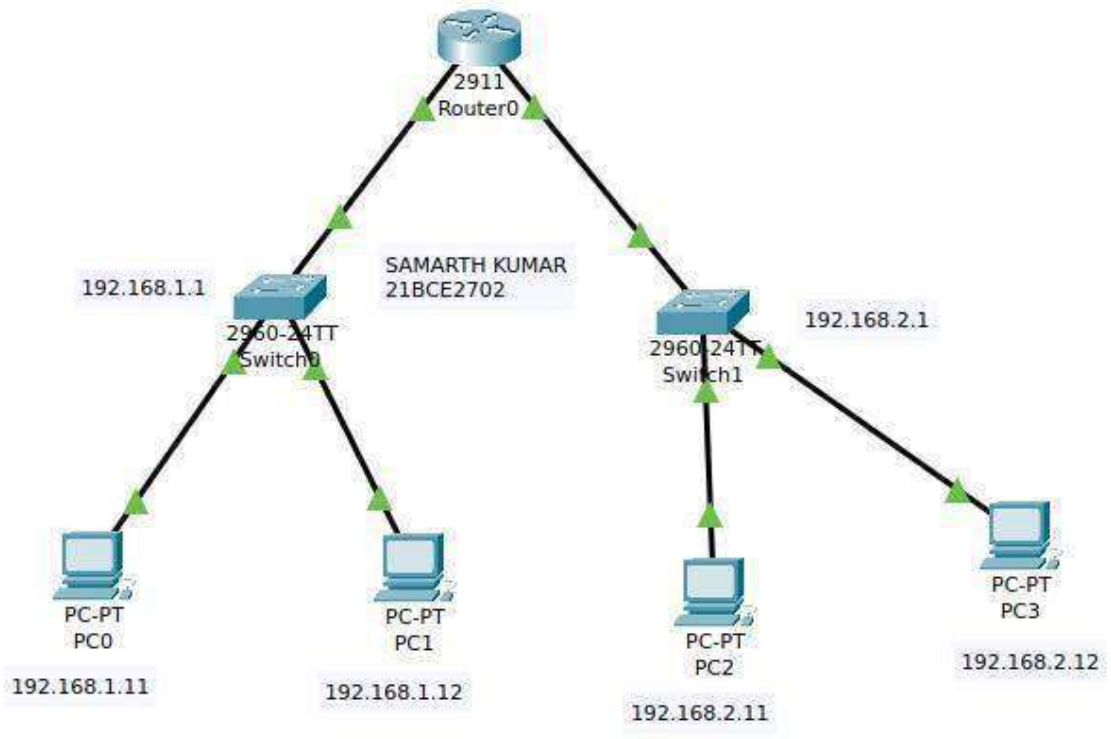
ISM LAB

EXPERIMENT 1

AIM: CONNECTING TWO NETWORKS USING A ROUTER

PROCEDURE:

1. Select a 2911 router
2. Select 2960 2 switches
3. Select 3 PC's



4. From router select gigabitethernet 0/0 to switch0 gigabitethernet 0/1
   From router select gigabitethernet 0/1 to switch1 gigabitethernet 0/1

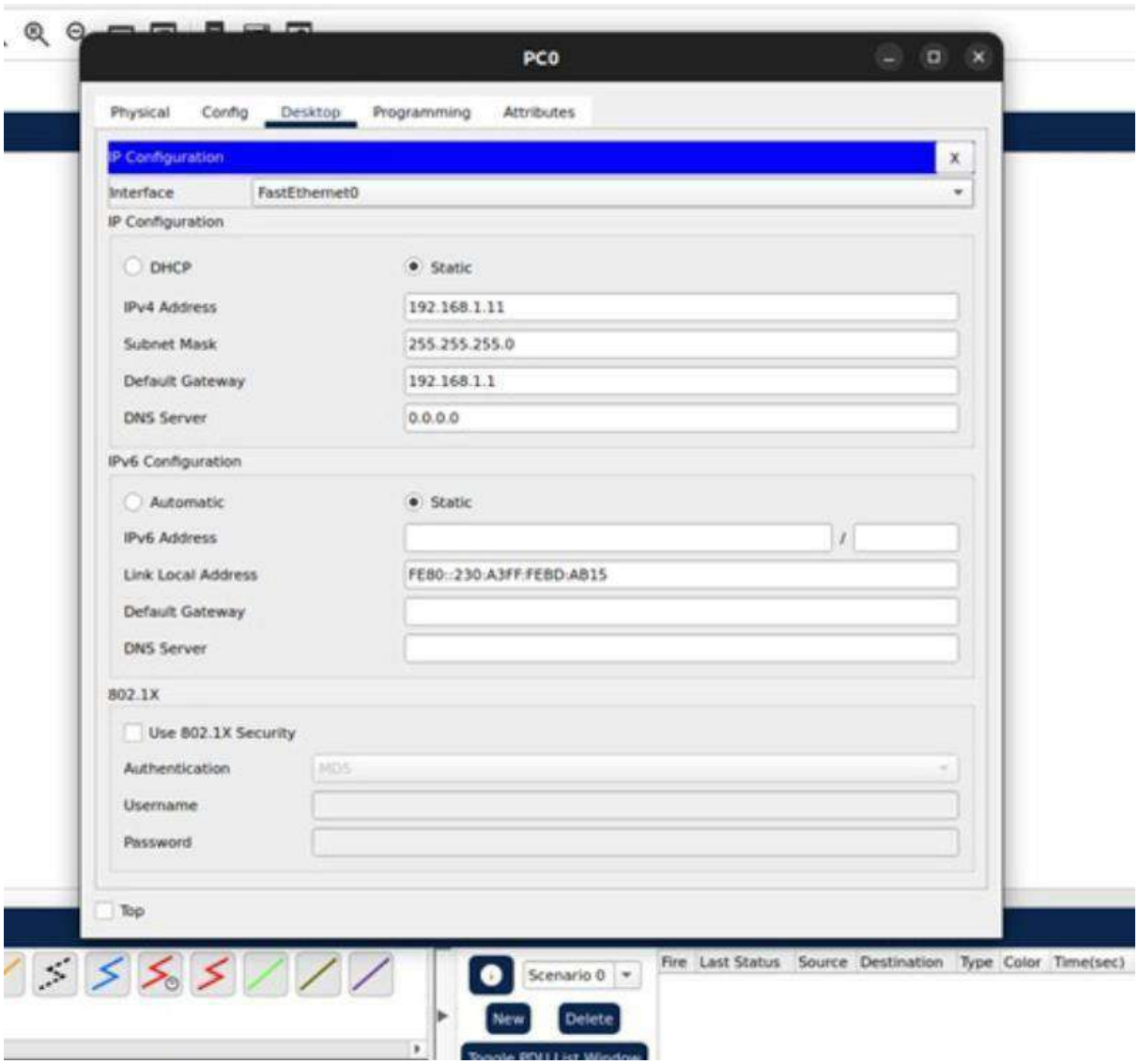
5. PC Configuration:

Give addrsses for Pcs in Network1 as : 192.168.1.11 to 192.168.1.13

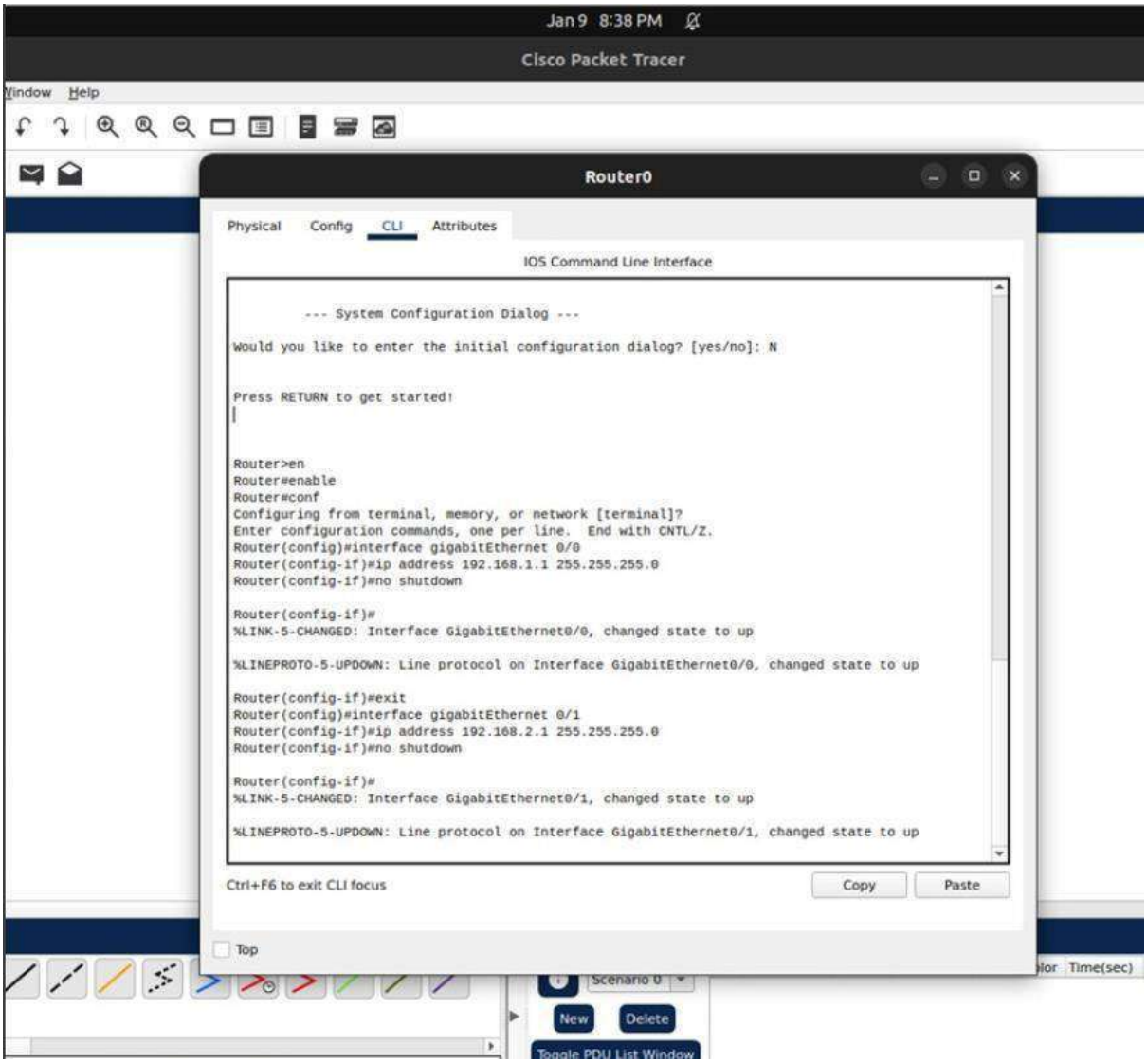
Give addrsses for Pcs in Network2 as : 192.168.2.11 to 192.168.2.13

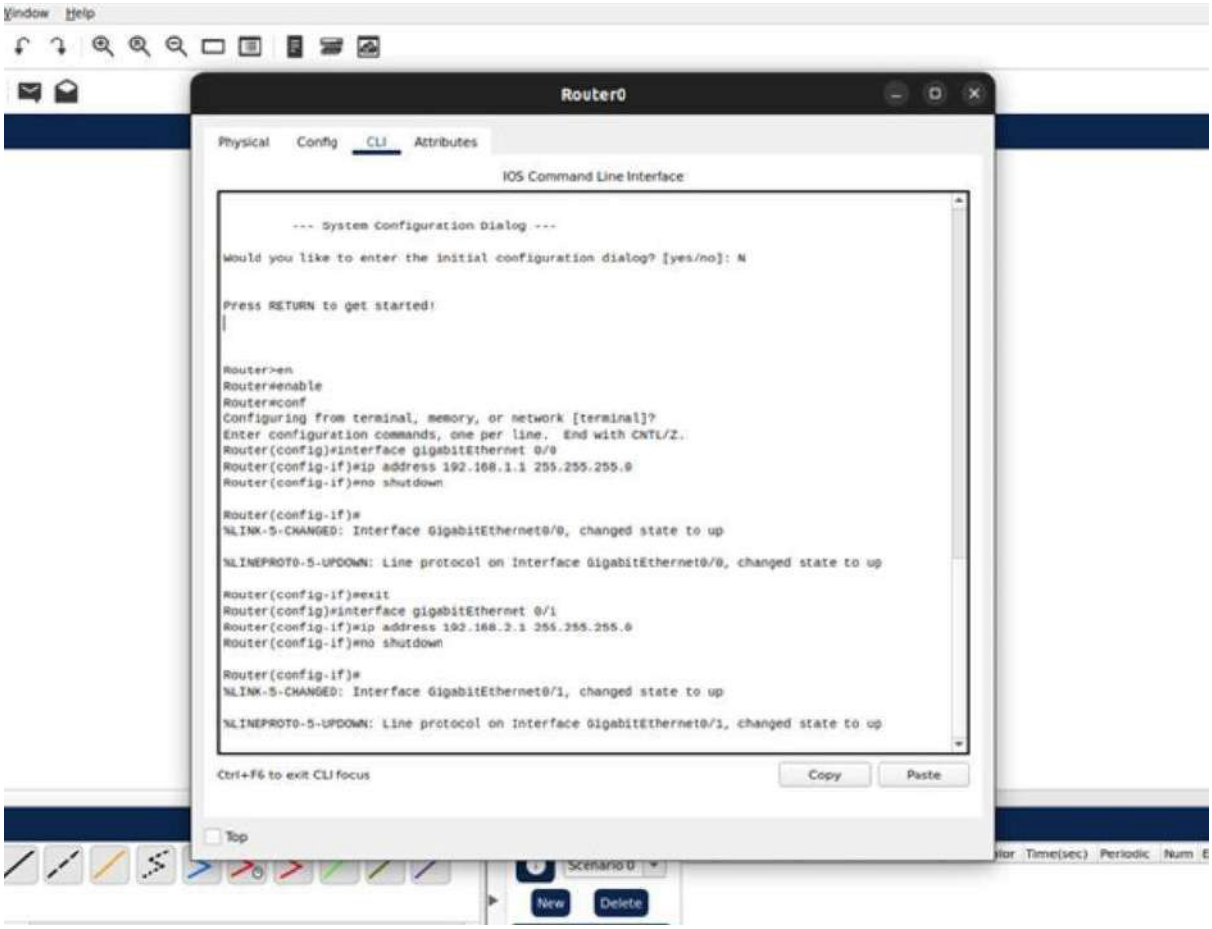
Set default gateway for the leftside network as 192.168.1.1 (as Similar to router gigabitEhternet 0/0)

Set default gateway for the leftside network as 192.168.2.1 (as Similar to router gigabitEhternet 0/1)



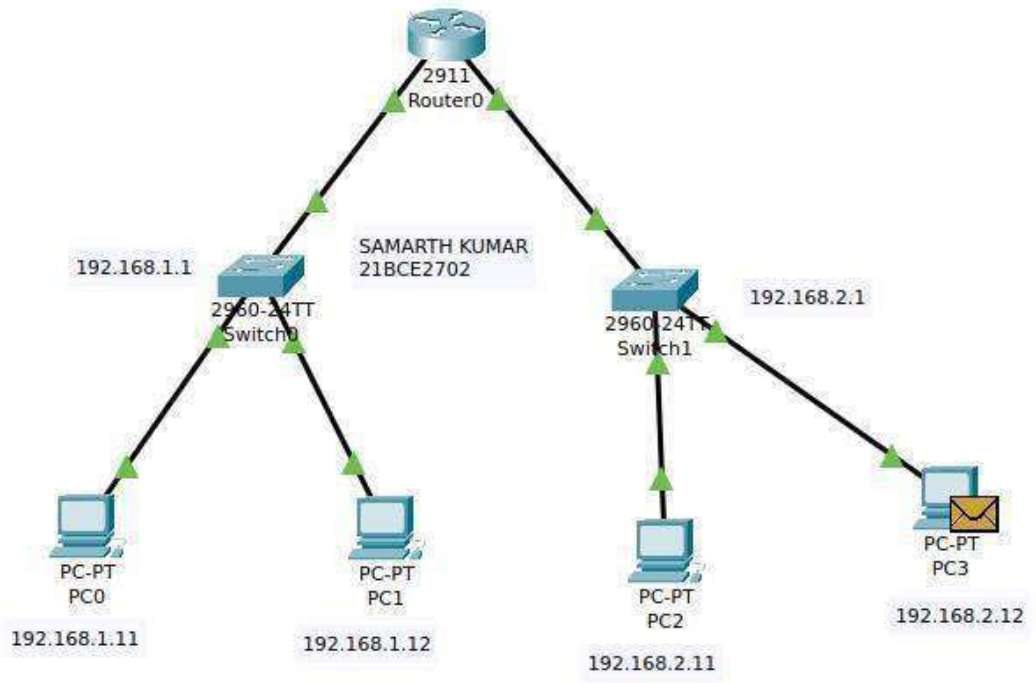
6. Router Configuration: Go to Router and CLI WRITE THE FOLLOWING COMMANDS:


Jan 9 8:38 PM
Cisco Packet Tracer
Window Help
Router0
Physical Config CLI Attributes
IOS Command Line Interface
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]: N
Press RETURN to get started!
Router>en
Router#enable
Router#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
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 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown
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
Ctrl+F6 to exit CLI focus
Copy
Paste
Top
Scenario 0
New
Delete
Toggle PDU List Window
Time(sec)



RESULT

- The two networks are successfully connected via the router, allowing communication between devices in different networks.
- PCs within each network can communicate with each other and access resources within their respective networks.
- PCs from Network1 can communicate with PCs from Network2 through the router.



CONCLUSION

The configuration demonstrates the basic setup of interconnecting multiple networks using a router in Cisco Packet Tracer.

It highlights the importance of proper IP addressing and default gateway configuration for devices to communicate across different networks.

This setup serves as a fundamental building block for more complex network configurations and scenarios.

EXPERIMENT 2

AIM: TO CONFIGURE STANDARD ACESS CONTROL LIST

PROCEDURE :

- Open Cisco Packet tracer • connect 3PC to switch • switch connected to router
- router again to a Server.
- Router has Access control List (ACL) on his outbound direction.
- deny PC 2 for accessing server

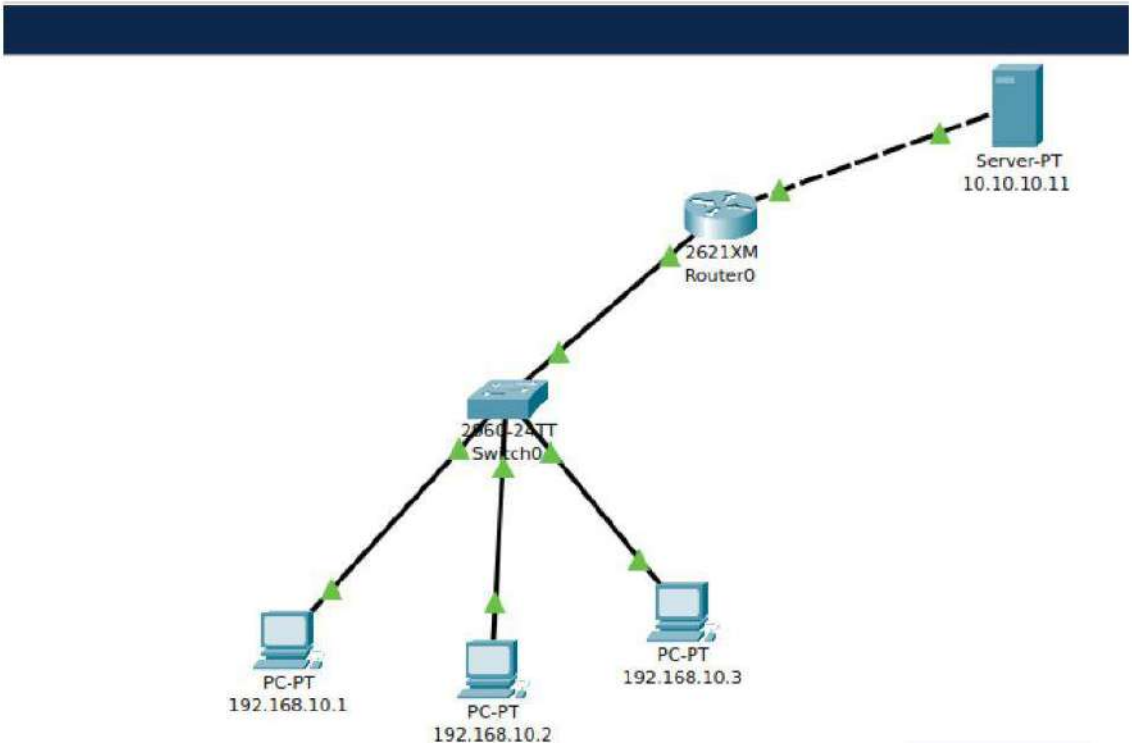
SERVER – 10.10.10.11 255.0.0.0
GATEWAY – INT FA 0/1
10.10.10.10

PC 01- 192.168.10.1
PC 02- 192.168.10.2
PC 03- 192.168.10.3 **GATEWAY** **–** INT FA 0/0

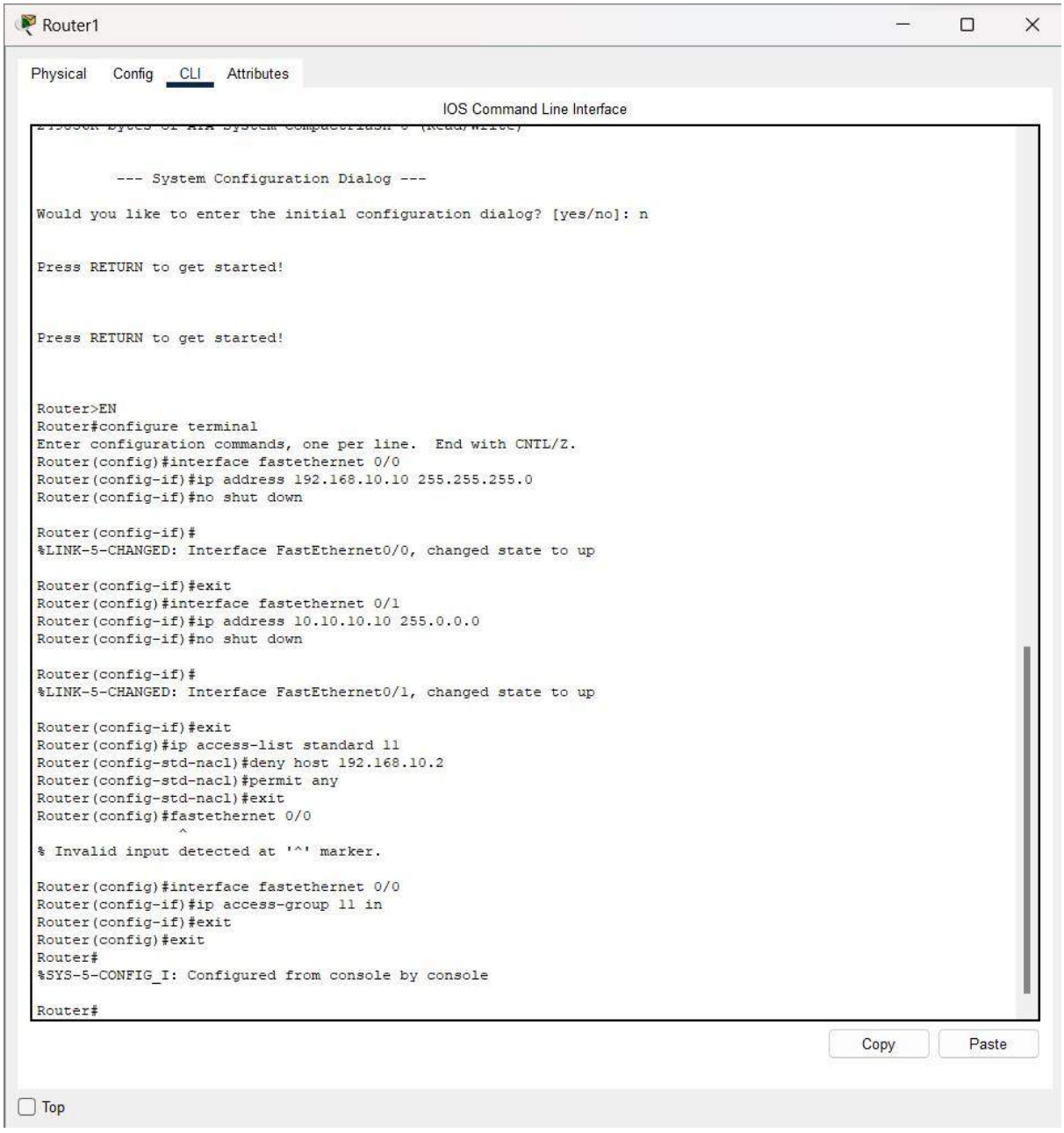
192.168.10.10

SCREENSHOTS:

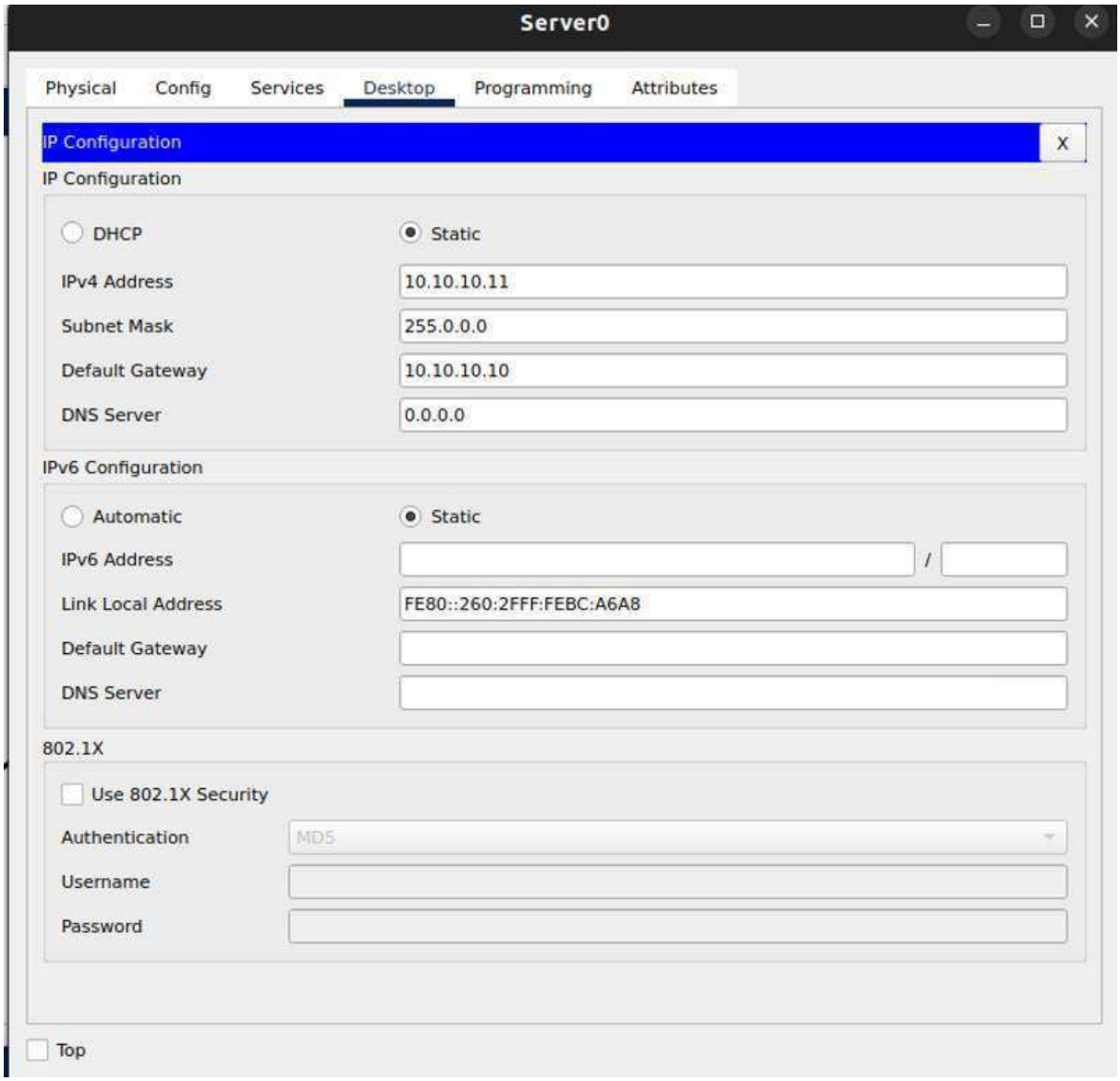
TOPOLOGY


Server-PT
10.10.10.11
2621XM
Router0
2960-24TT
Switch0
PC-PT
192.168.10.1
PC-PT
192.168.10.2
PC-PT
192.168.10.3

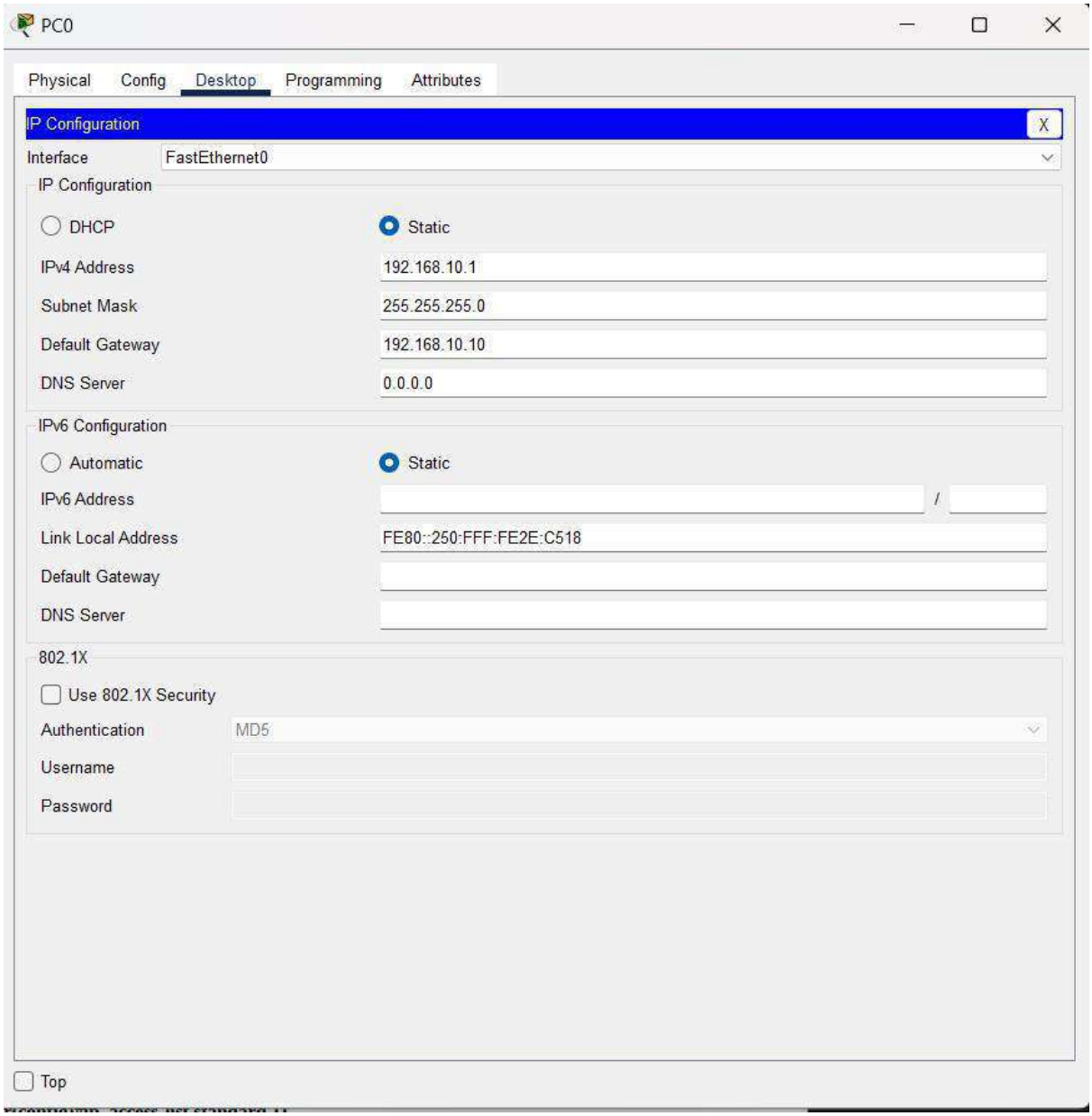
ROUTER CONFIGURATION



SERVER CONFIGURATION



PC CONFIGURATION

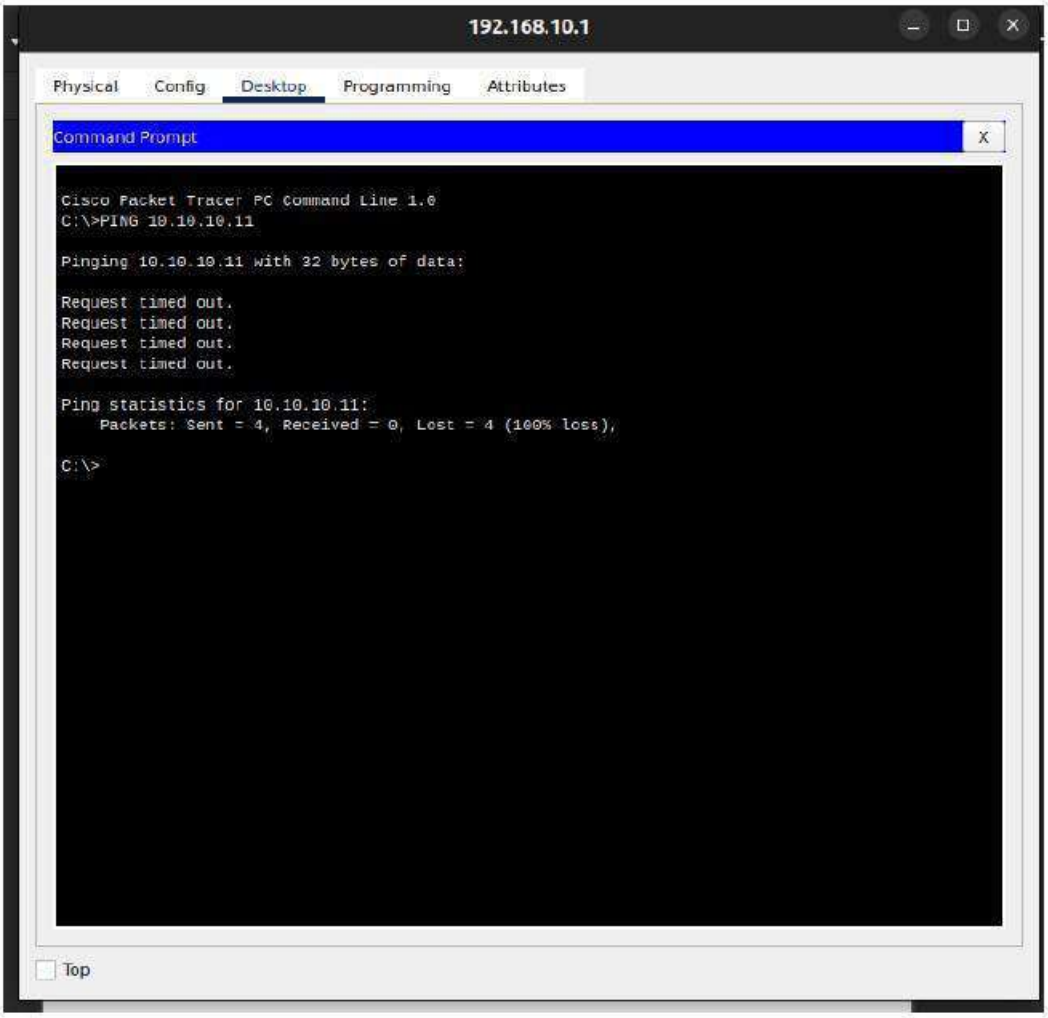


RESULT:

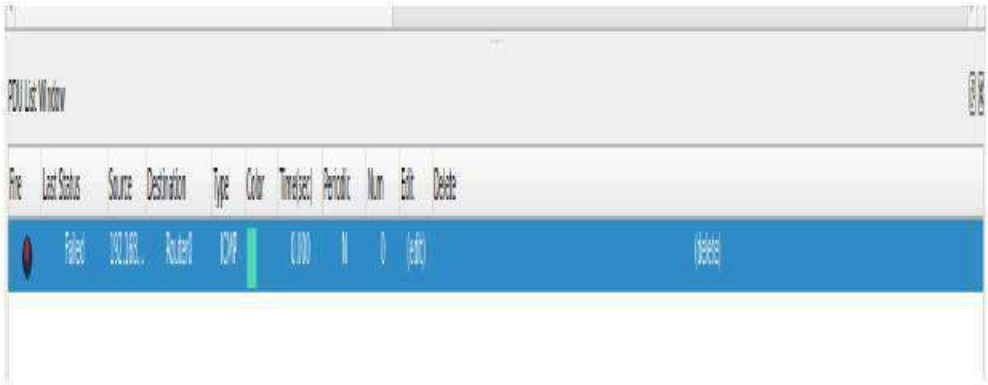
ACL VERIFICATION

```
Router#SHOW ACCESS-LISTS
Standard IP access list 11
    10 deny host 192.168.10.2
    20 permit any
```

- DENY ACCESS TO PC2



- EVENT LIST FAILED



CONCLUSION:

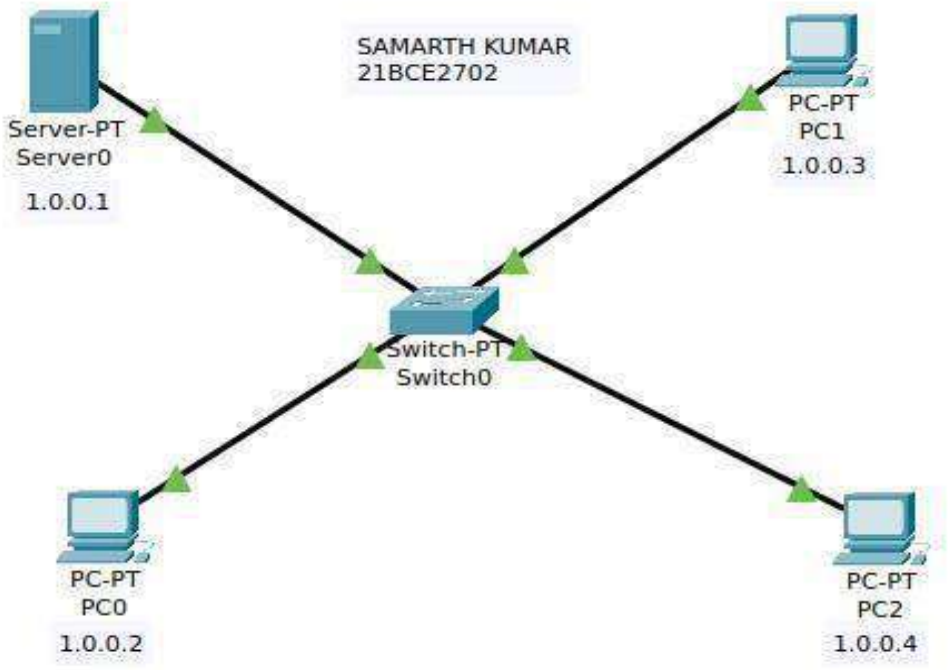
- PC 2 will be unable to access the server due to the Access Control List (ACL) on the router's outbound direction.

- The ACL specifically denies traffic originating from PC 2 from reaching the server. When PC 2 sends packets towards the server:
- The packets will reach the switch and be forwarded to the router.
- The router will analyze the source IP address of the packets, identifying them as originating from PC 2.
- The router will compare the source IP address with the ACL entries.
- Since the ACL contains a "deny" rule for traffic from PC 2, the packets will be dropped, not forwarded to the server.
- PC 2 will receive no response from the server, effectively blocked from accessing it.

EXPERIMENT 3

AIM: Configure and Verify Firewall in Cisco Packet Tracer **PROCEDURE:**

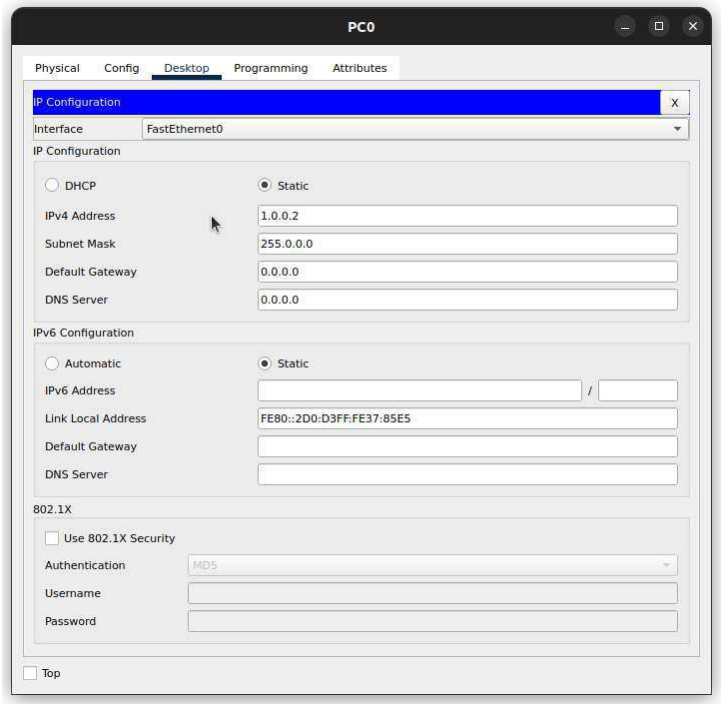
1. First, open the Cisco packet tracer desktop and select the devices 3 PC's, 1 server and 1 Switch and assign the following IP Address



2. Configure the PCs (hosts) and server with IPv4 address and Subnet Mask according to the IP addressing table given above.

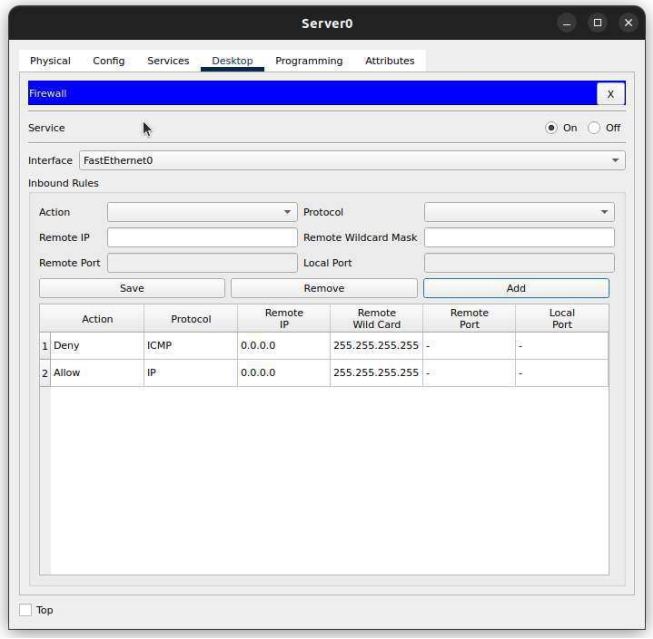
- To assign an IP address in PC0, click on PC0.
- Then, go to desktop and then IP configuration and there you will IPv4 configuration.
- Fill IPv4 address and subnet mask.

- Repeat the same procedure with the server



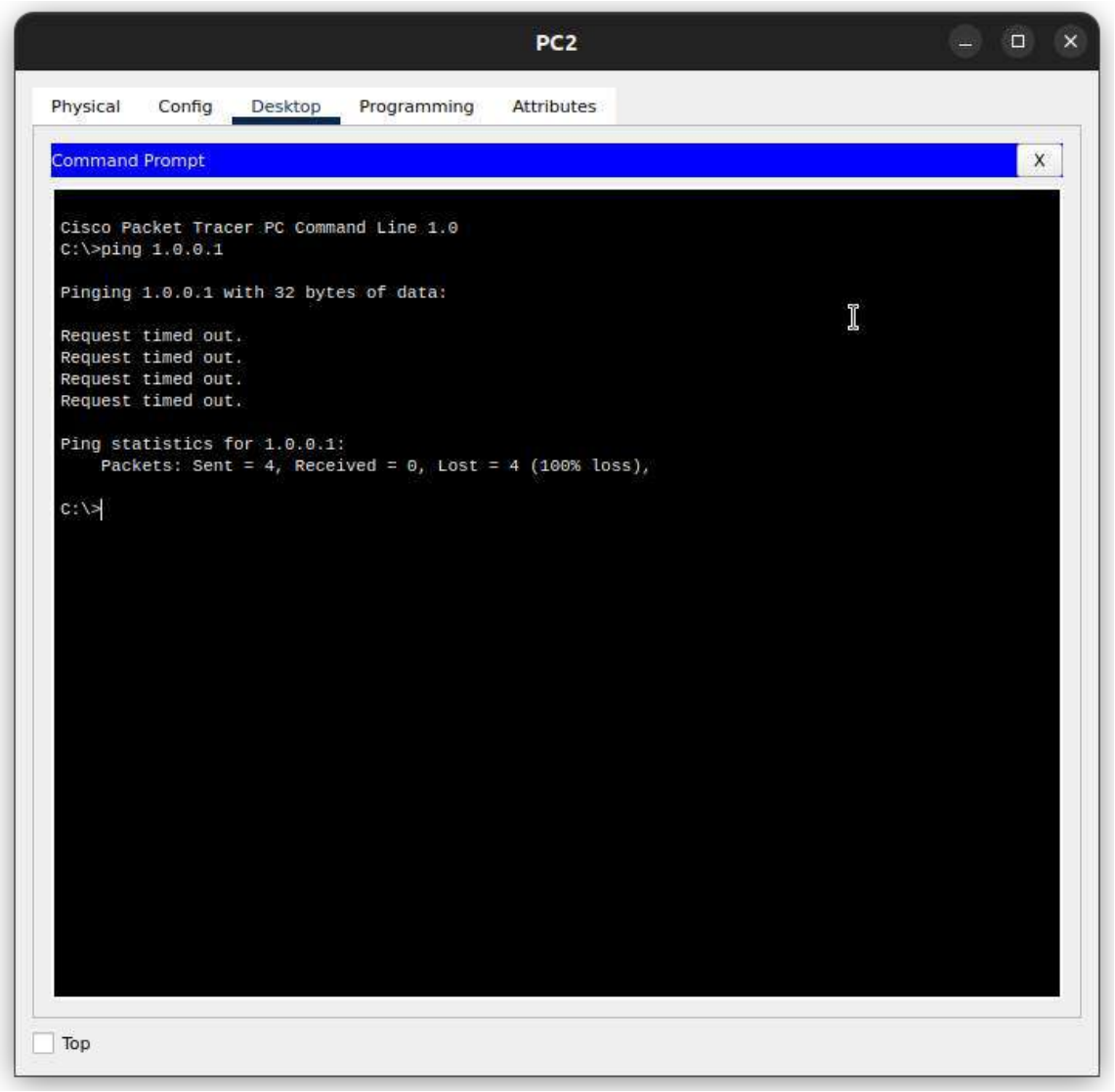
3. Configuring the firewall in a server and blocking packets and allowing web browser.

- Click on server0 then go to the desktop.
- Then click on firewall IPv4.
- Turn on the services.
- First, Deny the ICMP protocol and set remote IP to 0.0.0.0 and Remote wildcard mask to 255.255.255.255.
- Then, allow the IP protocol and set remote IP to 0.0.0.0 and Remote wildcard mask to 255.255.255.255.
- And add them.



4. Verifying the network by pinging the IP address of any PC.

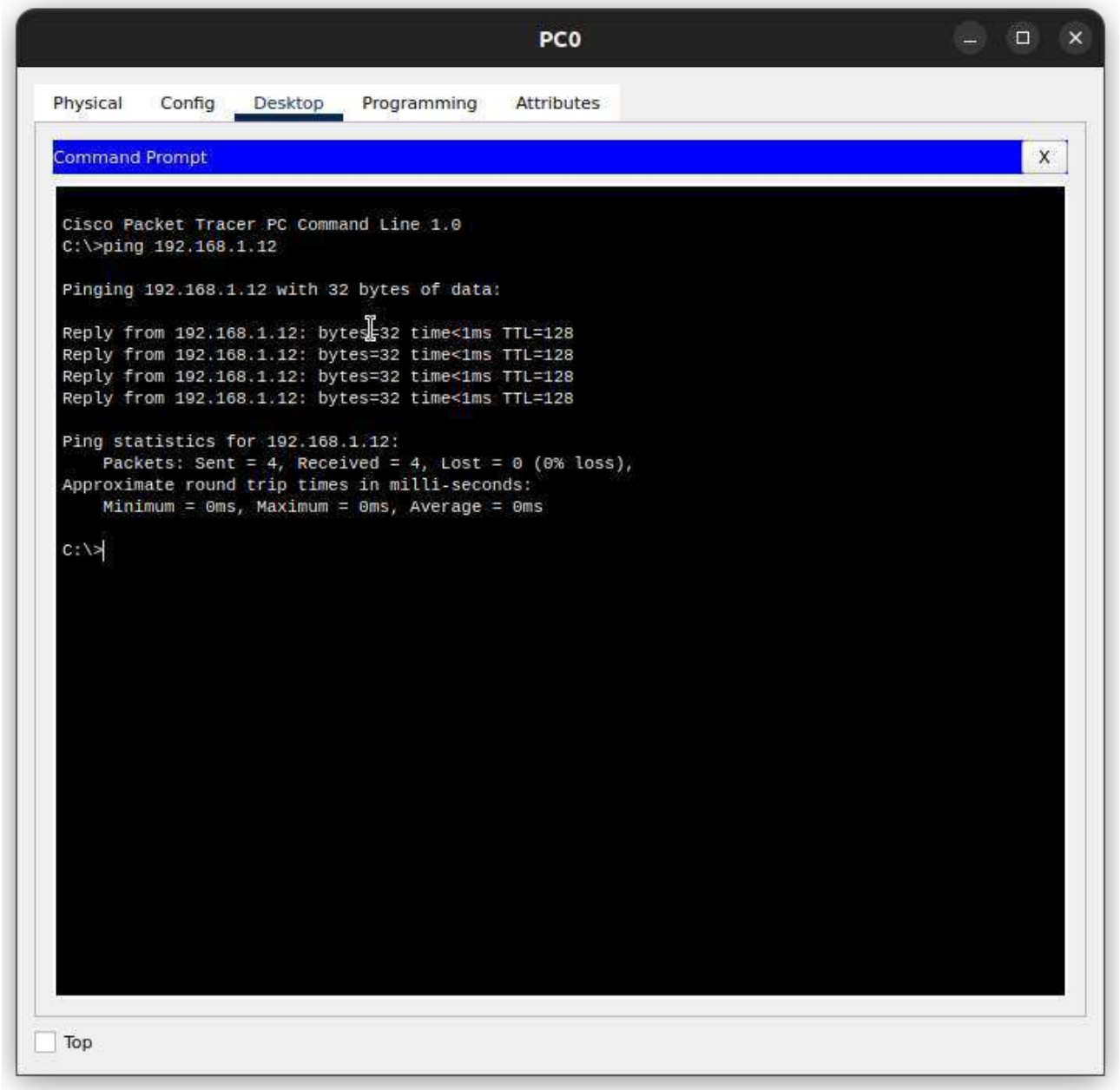
- We will use the ping command to do so.
- First, click on PC2 then Go to the command prompt.
- Then type ping <IP address of targeted node>.
- We will ping the IP address of the server0.
- As we can see in the below image we are getting no replies which means the packets are blocked.



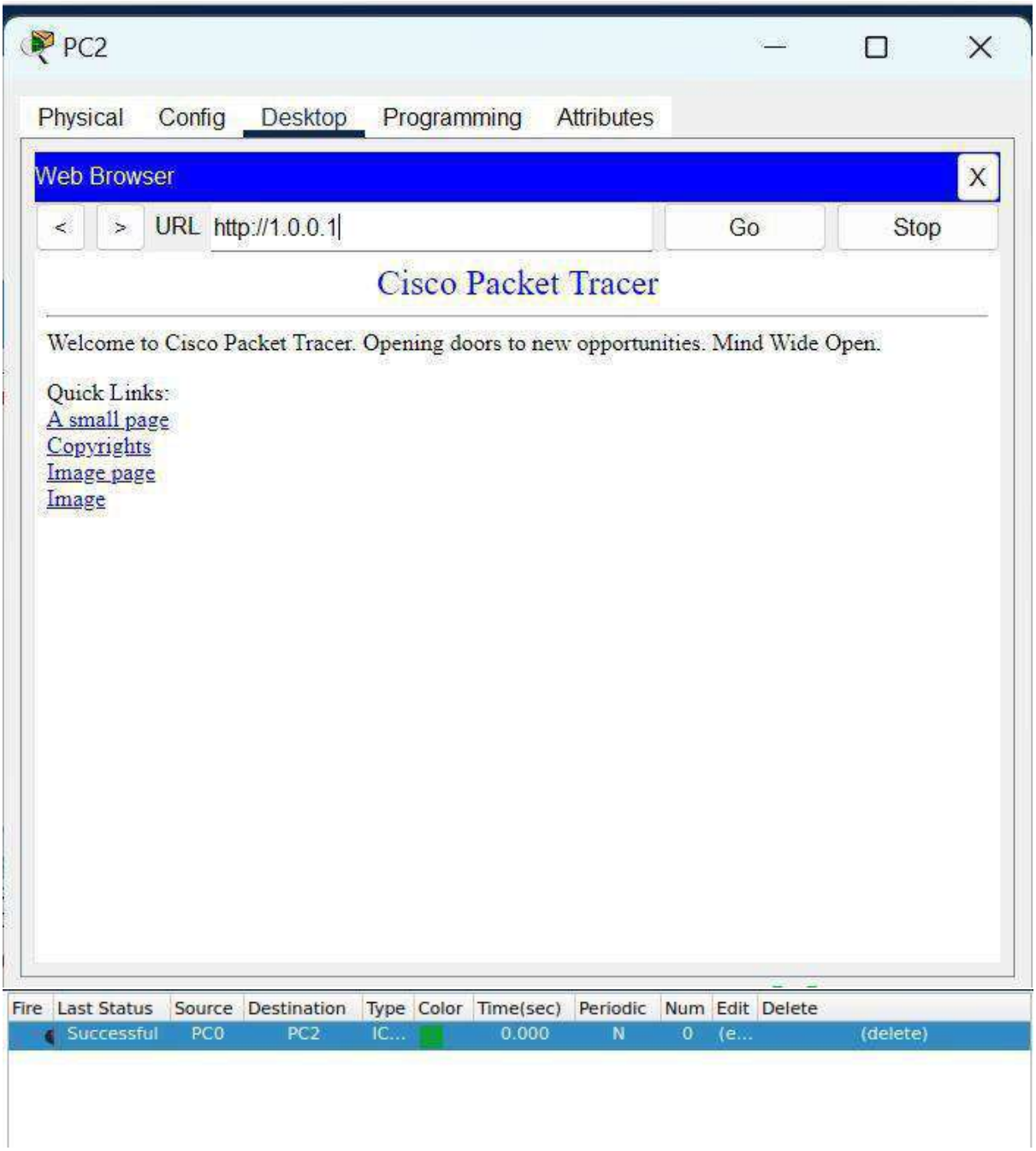
Check the web browser by entering the IP address in the URL.

Click on PC2 and go to desktop then web browser.

After unblocking all the packets


PC0
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.12
Pinging 192.168.1.12 with 32 bytes of data:
Reply from 192.168.1.12: bytes=32 time<1ms TTL=128
Reply from 192.168.1.12: bytes=32 time<1ms TTL=128
Reply from 192.168.1.12: bytes=32 time<1ms TTL=128
Reply from 192.168.1.12: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.1.12:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
Top

RESULT



The firewall was successfully configured and verified to restrict and control the traffic flow between different network segments. The firewall rules were implemented to allow or deny specific types of traffic based on the defined criteria, and the access control lists were applied to filter traffic based on source and destination IP addresses.

CONCLUSION

In conclusion, the experiment demonstrated the importance of implementing a firewall to enhance network security and protect against unauthorized access and malicious attacks. By configuring and verifying the firewall in

Cisco Packet Tracer, it was evident that network administrators can effectively manage and control the flow of traffic to ensure the confidentiality, integrity, and availability of the network resources. Overall, the experiment provided valuable insights into the practical application of firewall technology in a simulated network environment.

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Digital Assessment - 3

INFORMATION SECURITY AND MANAGEMENT

NAME: SAMARTH KUMAR

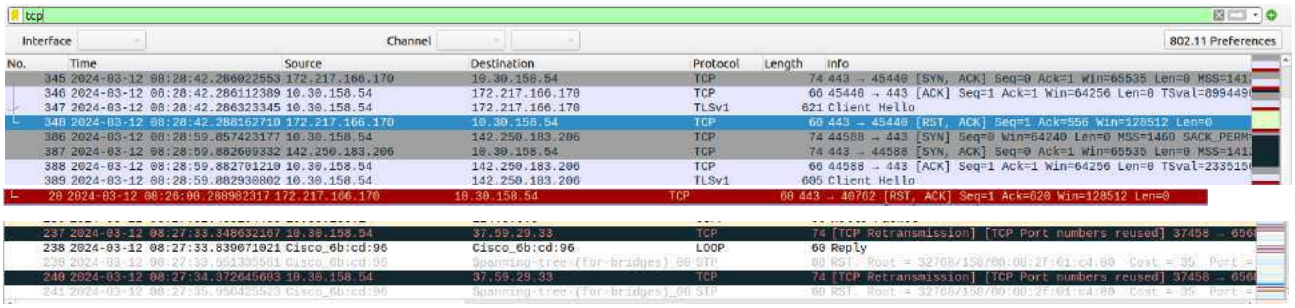
REG NO. 21BCE2702

Course Code : BCSE354E

Faculty: VIMALA DEVI K

Traffic and color Analysis for different protocols

1. **TCP**:



Analysis:

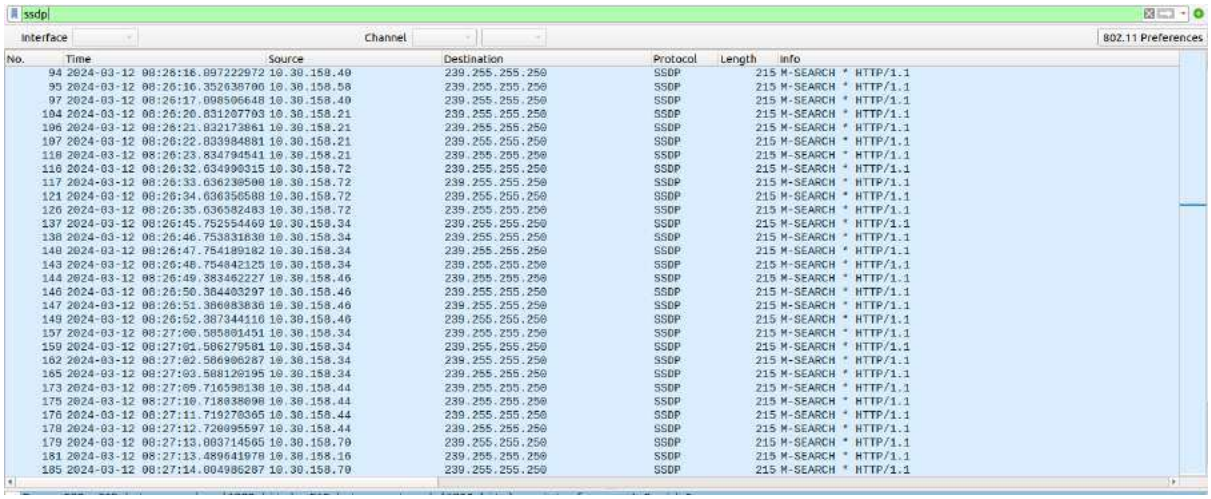
1. **Packet Information:**
    - Timestamp: 2024-03-12 08:26:00.287272076
    - Source IP: 10.30.158.54
    - Destination IP: 172.217.166.170
    - Protocol: TCP
    - Length: 66 bytes
    - Message: 40762 → 443 [ACK] Seq=1 Ack=1 Win=64256 Len=0 TSval=899287075 TSecr=1022103074
2. **Explanation:**
    - TCP (Transmission Control Protocol): TCP is a connection-oriented protocol used for reliable and ordered delivery of data between devices over an IP network.
    - Source Port (40762) and Destination Port (443): These are port numbers representing the source and destination endpoints of the TCP connection. Port 443 is commonly used for HTTPS traffic, which is secured with SSL/TLS.
    - [ACK]: This TCP flag indicates that the packet is acknowledging receipt of data from the other end of the connection.
    - Seq=1 Ack=1: These fields indicate the sequence and acknowledgment numbers of the TCP segments. In this case, it suggests that the next expected sequence number from the sender is 1, and the acknowledgment number indicates the sender has received data up to sequence number 1 from the receiver.

- Win=64256: This field represents the TCP window size, which is the amount of data (in bytes) that can be sent without receiving an acknowledgment. A larger window size indicates more available buffer space for receiving data.
- Len=0: Indicates the length of the TCP segment's payload in bytes. In this case, it's zero, indicating that there is no payload in this particular TCP segment.

3. **Traffic Analysis:**
    - This packet represents an acknowledgment (ACK) sent from the source (IP: 10.30.158.54) to the destination (IP: 172.217.166.170) in response to data received over a TCP connection.
    - The connection appears to be initiated from port 40762 on the source side and directed towards port 443 on the destination side, commonly associated with HTTPS traffic.
    - The acknowledgment confirms the receipt of data up to sequence number 1 and acknowledges the readiness to receive further data.

4. **Color:**
    - In Wireshark, TCP traffic is represented by a light purple colour. This colour coding simplifies the analysis process, making it easier for users to distinguish and focus on TCP-related packets within the network capture.
    - In Wireshark, yellow text on a red background typically indicates a packet with a checksum error. This color scheme helps highlight potential issues with data integrity, prompting further investigation by network analysts to ensure the reliability and accuracy of transmitted data.
    - Wireshark highlights potential issues by displaying them in red text on a black background. This distinctive colour scheme draws attention to critical problems, aiding network administrators in quickly identifying and resolving issues within network traffic.

2. SSDP



1. Packet Information:

- Timestamp: 2024-03-12 08:26:16.097222972
- Source IP: 10.30.158.40
- Destination IP: 239.255.255.250
- Protocol: SSDP
- Length: 215 bytes
- Message: M-SEARCH * HTTP/1.1

2. Explanation:

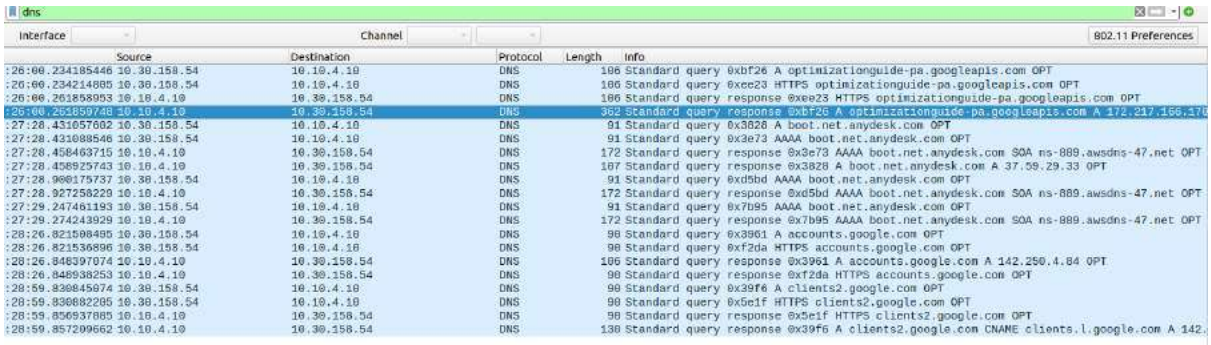
- SSDP (Simple Service Discovery Protocol): This is a network protocol primarily used for discovery of network services in Universal Plug and Play (UPnP) devices. It operates over UDP (User Datagram Protocol) and utilizes multicast for communication.
- M-SEARCH: This is an SSDP method used for discovering devices or services available on the network. It is akin to a multicast query sent by a client to discover services. In this case, the asterisk (*) denotes that the client is looking for all services available on the network.
- HTTP/1.1: SSDP uses a simple HTTP-like protocol for communication. This portion indicates that the message follows the format of HTTP version 1.1.

3. **Traffic Analysis:**

   - This packet represents a client's (source IP: 10.30.158.40) search for available services on the network. It sends an SSDP M-SEARCH request to the multicast address 239.255.255.250.
   - The M-SEARCH request is a broadcast-like message, seeking responses from any devices or services that support SSDP.
   - Typically, devices such as printers, media servers, or routers may respond to such requests if they support SSDP.
   - This type of traffic is common in network discovery processes, especially in home networks or environments where UPnP devices are prevalent.

4. **Color:**
   In Wireshark, SSDP (Simple Service Discovery Protocol) packets are displayed in light blue colour. This distinctive colour makes it easy for users to identify and focus on SSDP traffic within network captures, aiding in the analysis of devices and services discovery processes on the network.

3. DNS



Analysis for ->

15 2024-03-12 08:26:00.261859748 10.10.4.10 10.30.158.54 DNS 362 Standard query response 0xbf26 A optimizationguide-pa.googleapis.com A 172.217.166.170 A 172.217.174.234 A 216.58.203.10 A 142.250.71.106 A 142.250.183.42 A 142.250.183.74 A 142.250.183.106 A 142.250.192.10 A 142.250.192.42 A 142.250.192.74 A 142.250.192.106 A 142.250.192.138 A 142.251.42.10 A 142.251.42.42 A 142.251.42.74 A 172.217.166.74 OPT

1. **Packet Information:**

   - Timestamp: 2024-03-12 08:26:00.261859748
   - Source IP: 10.10.4.10
   - Destination IP: 10.30.158.54
   - Protocol: DNS
   - Length: 362 bytes
   - Message: Standard query response

2. **Explanation:**

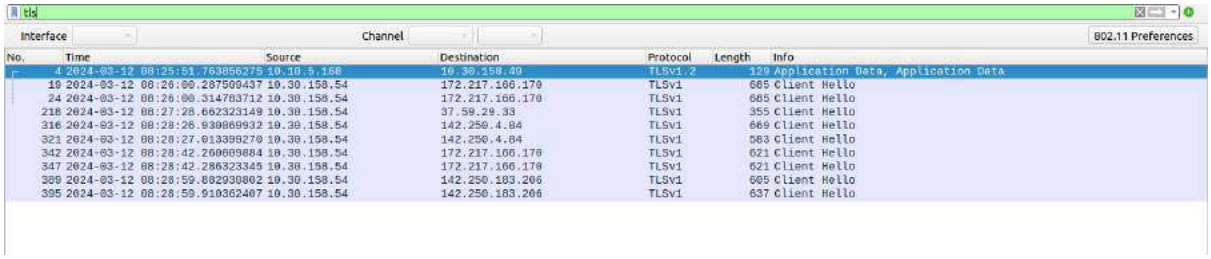
   - DNS (Domain Name System): This is a hierarchical decentralized naming system for computers, services, or other resources connected to the Internet or a private network. It translates domain names to IP addresses and vice versa.
   - Standard Query Response: This part of the DNS message indicates that the packet is a response to a DNS query. It contains the resolved IP addresses for the queried domain name.

3. **Traffic Analysis:**

   - This packet represents a DNS response from a DNS server (source IP: 10.10.4.10) to a client (destination IP: 10.30.158.54) that queried for the domain name "optimizationguide-pa.googleapis.com".
   - The DNS server has resolved the domain name to multiple IP addresses (A records). These IP addresses are provided in the response.
   - The IP addresses provided are for the domain "optimizationguide-pa.googleapis.com" and include a list of IPv4 addresses (A records) that can be used to reach the specified domain.
   - The DNS response also includes an OPT record, which is an extension mechanism in DNS for adding extra data to DNS messages.

4. **Color:**
   In Wireshark, DNS packets are displayed in light blue color. This distinctive colour makes it easy for users to identify and focus on SSDP traffic within network captures, aiding in the analysis of devices and services discovery processes on the network.

4. TLS



Analysis for->

4 2024-03-12 08:25:51.763856275 10.10.5.168 10.30.158.49 TLSv1.2 129 Application Data, Application Data

1. **Packet Information**:

   - Timestamp: 2024-03-12 08:25:51.763856275
   - Source IP: 10.10.5.168
   - Destination IP: 10.30.158.49
   - Protocol: TLSv1.2
   - Length: 129 bytes
   - Message: Application Data, Application Data

2. **Explanation:**

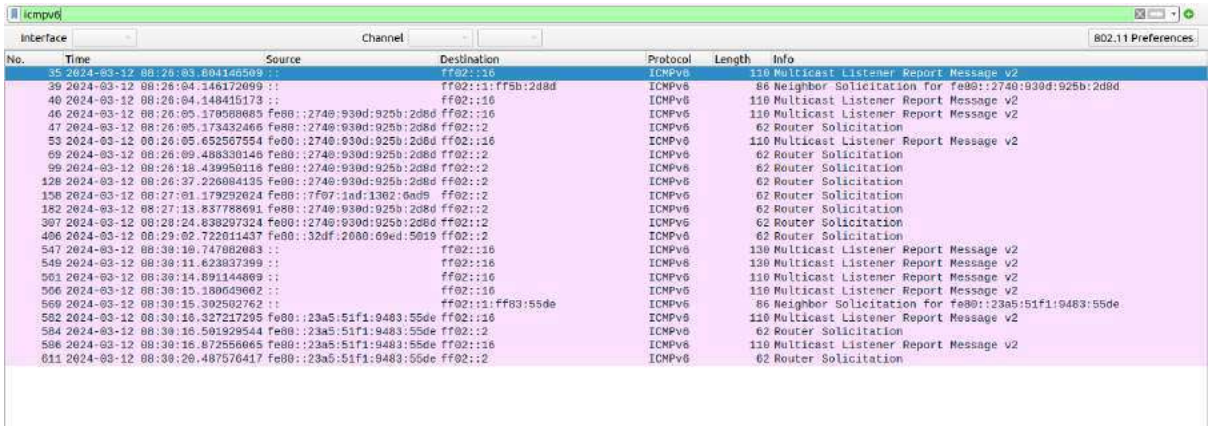
   - TLS (Transport Layer Security): TLS is a cryptographic protocol used to secure communication over a network. It ensures privacy, data integrity, and authentication between communicating applications.
   - TLSv1.2: This indicates the version of the TLS protocol being used for the communication. TLSv1.2 is one of the widely used versions, providing strong security features.
   - Application Data: This part of the TLS packet indicates that the payload contains application-layer data encrypted and secured by the TLS protocol.

3. **Traffic Analysis:**

   - This packet represents encrypted data being transmitted securely between a client (source IP: 10.10.5.168) and a server (destination IP: 10.30.158.49) over TLSv1.2.
   - The packet carries application data, suggesting that it contains information exchanged between the client and server at the application layer.
   - Since the data is encrypted under TLS, its contents are not visible in plaintext without proper decryption keys.
   - The exchange of application data over TLS ensures that the communication remains confidential and protected from eavesdropping or tampering.

4. **Color:**
   Light purple for TLS

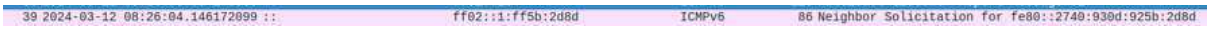
5. ICMPV6



Analysis for->

39 2024-03-12 08:26:04.146172099 :: ff02::1:ff5b:2d8d ICMPv6 86 Neighbor Solicitation for fe80::2740:930d:925b:2d8d

1.Packet Information:



- Timestamp: 2024-03-12 08:26:04.146172099
- Source IP: ::
- Destination IP: ff02::1:ff5b:2d8d
- Protocol: ICMPv6
- Length: 86 bytes
- Message: Neighbor Solicitation for fe80::2740:930d:925b:2d8d

2. **Explanation:**

- ICMPv6 (Internet Control Message Protocol version 6): ICMPv6 is a network layer protocol used in IPv6 networks for diagnostic and error reporting purposes, as well as for the management of network devices.
- Neighbor Solicitation: This ICMPv6 message type is used by IPv6 hosts to resolve the link-layer address of a neighbor (e.g., another host or router) on the same link when its IPv6 address is known.

3. **Traffic Analysis:**

- This packet represents a Neighbor Solicitation message sent by a node (::) to the IPv6 multicast address ff02::1:ff5b:2d8d.
- The Neighbor Solicitation is seeking the link-layer address (MAC address) of the IPv6 address fe80::2740:930d:925b:2d8d.
- IPv6 multicast addresses beginning with ff02::/16 are used for various purposes, including link-local multicast.
- Neighbor Solicitation messages are part of the Neighbor Discovery Protocol (NDP) in IPv6, which is essential for address resolution, neighbor unreachability detection, and other functions in IPv6 networks.

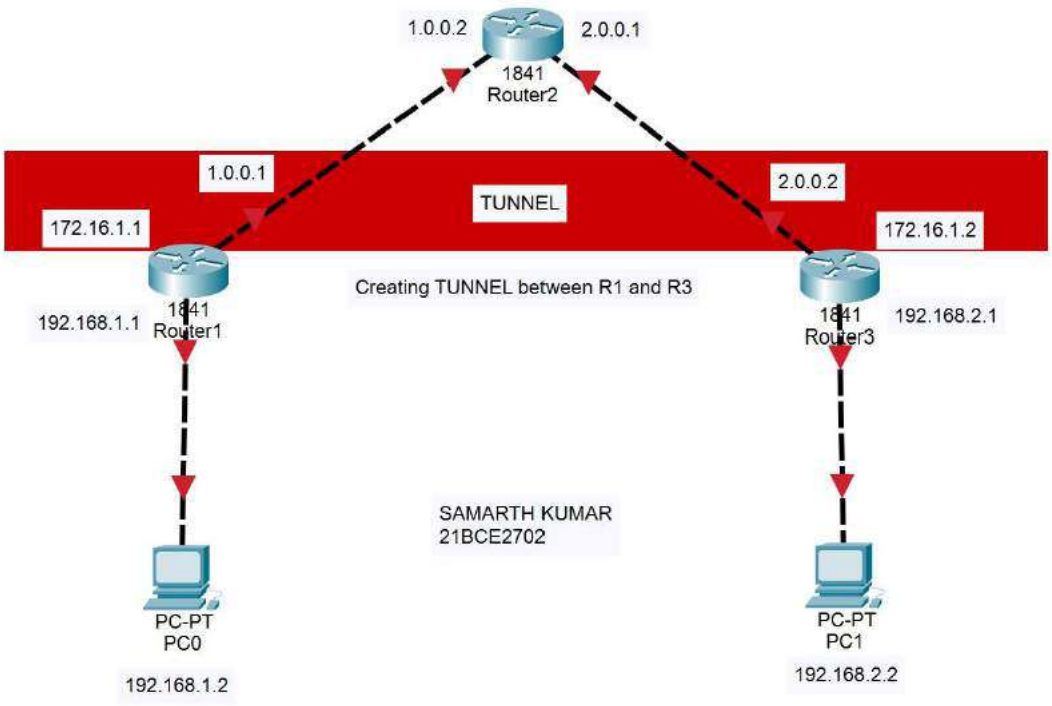
4. **Color:**

Pink

In Wireshark, ICMPv6 packets are displayed in pink colour. This distinct colour helps users identify and track ICMPv6 traffic within network captures, facilitating efficient analysis and troubleshooting of IPv6 network communications.

DA 3

VPN configuration Topology:



CONFIGURATION ON ROUTER R1:

Router>enable

Router#config t

Router(config)#host r1

r1(config)#int fa0/0

r1(config-if)#ip add 192.168.1.1 255.255.255.0

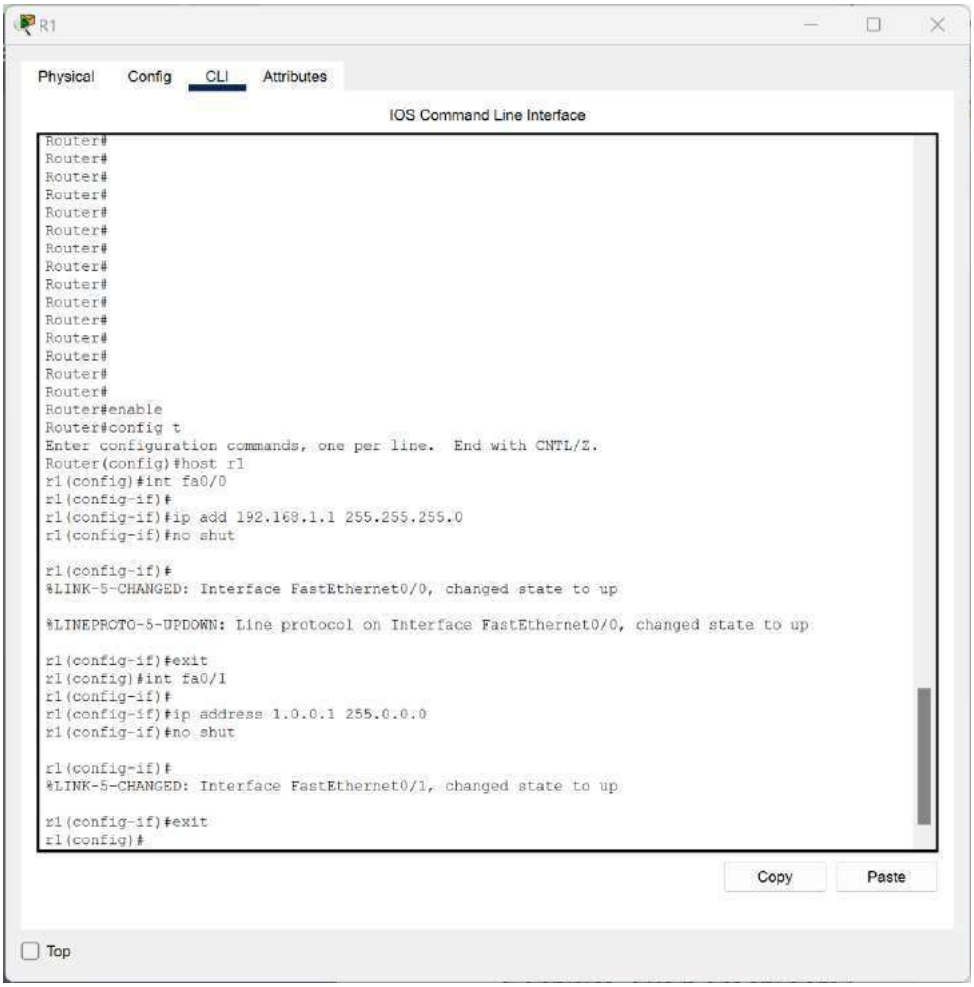
r1(config-if)#no shut

r1(config-if)#exit

r1(config)#int fa0/1

r1(config-if)#ip address 1.0.0.1 255.0.0.0

r1(config-if)#no shut



CONFIGURATION ON ROUTER R2:

Router>enable

Router#config t

Router(config)#host r2

r2(config)#int fa0/0

r2(config-if)#ip add 1.0.0.2 255.0.0.0

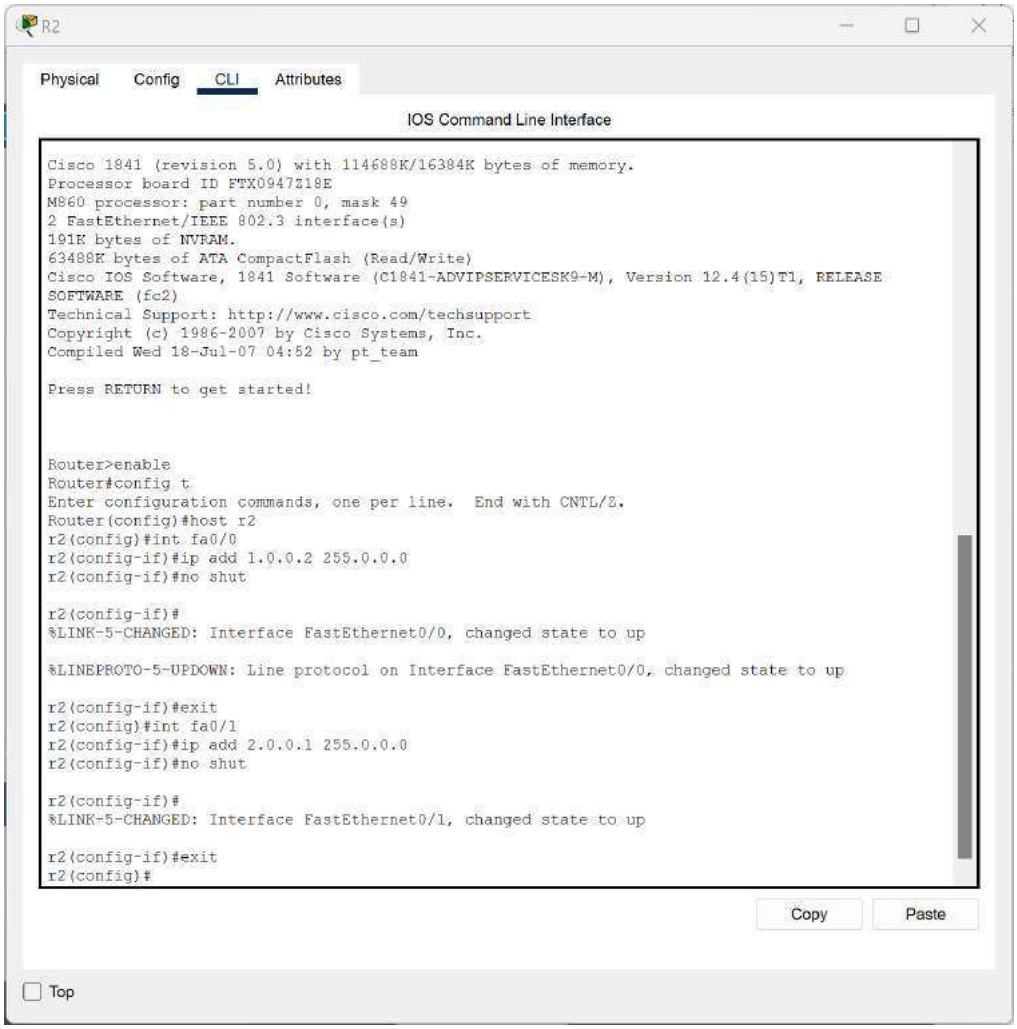
r2(config-if)#no shut

r2(config-if)#exit

r2(config)#int fa0/1

r2(config-if)#ip add 2.0.0.1 255.0.0.0

r2(config-if)#no shut



CONFIGURATION ON ROUTER R3:

Router>enable

Router#config t

Router(config)#host r3

r3(config)#int fa0/0

r3(config-if)#ip add 2.0.0.2 255.0.0.0

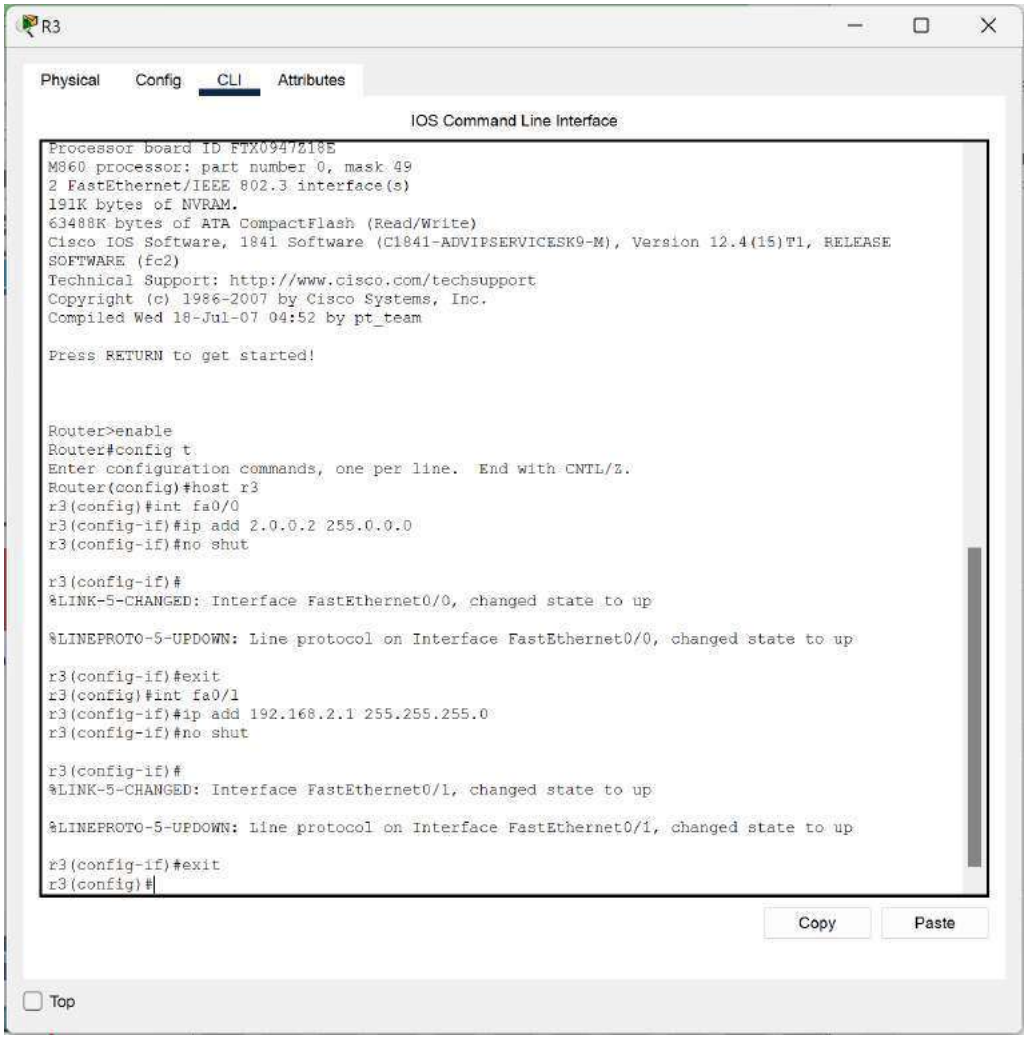
r3(config-if)#no shut

r3(config-if)#exit

r3(config)#int fa0/1

r3(config-if)#ip add 192.168.2.1 255.255.255.0

r3(config-if)#no shut



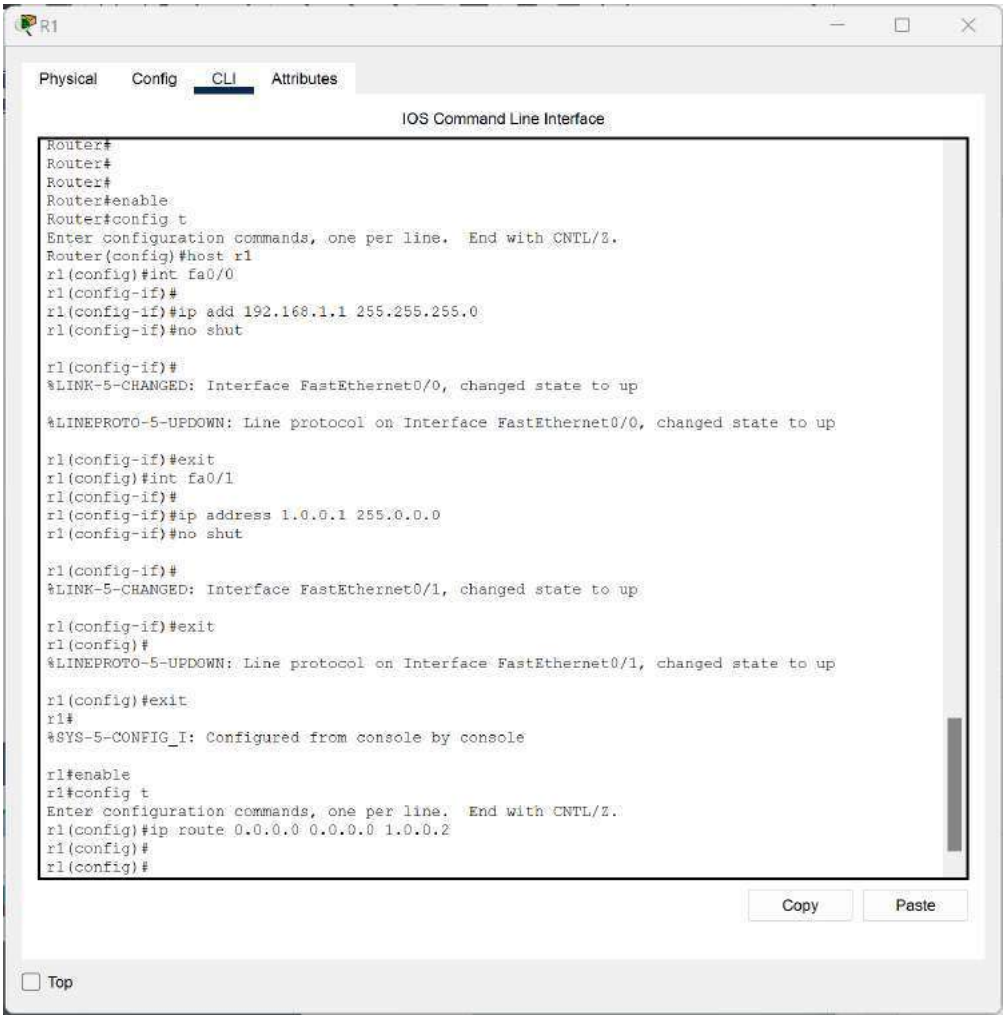
DEFAULT ROUTING CONFIGURATION ON ROUTER R1:

r1>enable r1#config t

Enter configuration commands, one per line. End with CNTL/Z.

r1(config)#ip route 0.0.0.0 0.0.0.0 1.0.0.2

r1(config)#



r3>enable r3#config t

Enter configuration commands, one per line. End with CNTL/Z.

r3(config)#ip route 0.0.0.0 0.0.0.0 2.0.0.1

r3(config)#

DEFAULT ROUTING CONFIGURATION ON

ROUTER r3:

Now check the connection by pinging each other.

First we go to router r1 and ping with router r3:

```
r1>ping 2.0.0.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2.0.0.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms
```

SUCCESSFUL PING

NOW CREATE VPN TUNNEL between R1 & R3

FIRST CREATE A VPN TUNNEL ON ROUTER R1:

r1#config t r1(config)#interface tunnel 10 r1(config-if)#ip address 172.16.1.1 255.255.0.0 r1(config-if)#tunnel source fa0/1 r1(config-if)#tunnel destination 2.0.0.2 r1(config-if)#no shut

```
r1(config)#interface tunnel 10

r1(config-if)#
%LINK-5-CHANGED: Interface Tunnel10, changed state to up

r1(config-if)#172.16.1.1 255.255.0.0
             ^
% Invalid input detected at '^' marker.

r1(config-if)#ip address 172.16.1.1 255.255.0.0
r1(config-if)#tunnel source fa0/1
r1(config-if)#tunnel destination 2.0.0.2
r1(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel10, changed state to up

r1(config-if)#no shut
r1(config-if)#
```

Copy Paste

NOW CREATE A VPN TUNNEL ON ROUTER R3:

r3#config t r3(config)#interface tunnel 100 r3(config-if)#ip address 172.16.1.2 255.255.0.0 r3(config-if)#tunnel source fa0/0 r3(config-if)#tunnel destination 1.0.0.1 r3(config-if)#no shut

```
r3#config t
Enter configuration commands, one per line.  End with CNTL/Z.
r3(config)#interface tunnel 100

r3(config-if)#
%LINK-5-CHANGED: Interface Tunnel100, changed state to up

r3(config-if)#ip address 172.16.1.2 255.255.0.0
r3(config-if)#tunnel source fa0/0
r3(config-if)#tunnel destination 1.0.0.1
r3(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Tunnel100, changed state to up

r3(config-if)#no shut
r3(config-if)#
```

Copy Paste

Now test communication between these two routers

again by pinging each other:

```
r1>ping 172.16.1.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.16.1.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/4/5 ms
```

SUCCESSFUL PING

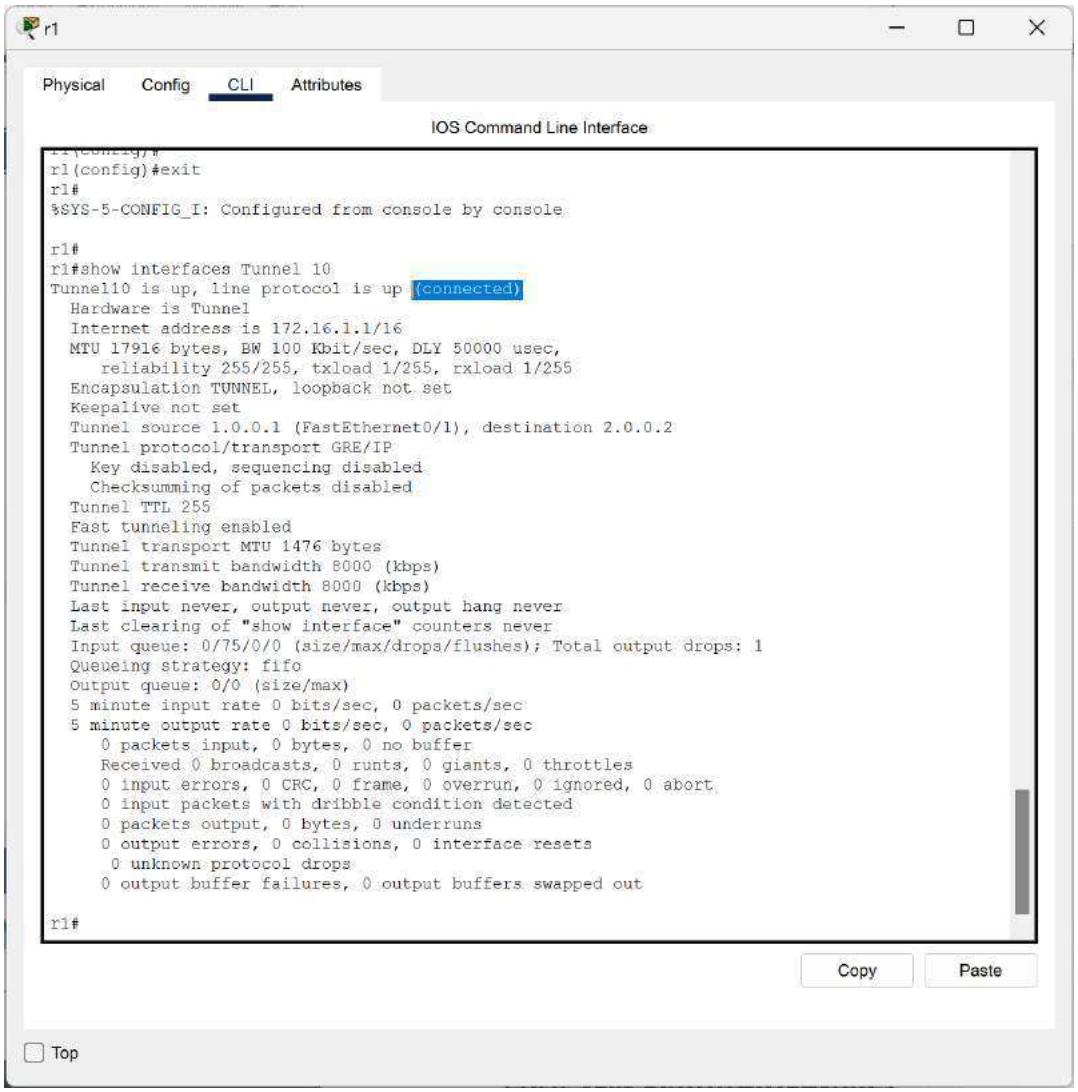
Now Do routing for created VPN Tunnel on Both R1&R3:

r1(config)#ip route 192.168.2.0 255.255.255.0 172.16.1.2

r3(config)#ip route 192.168.1.0 255.255.255.0 172.16.1.1

TEST VPN TUNNEL CONFIGURATION:

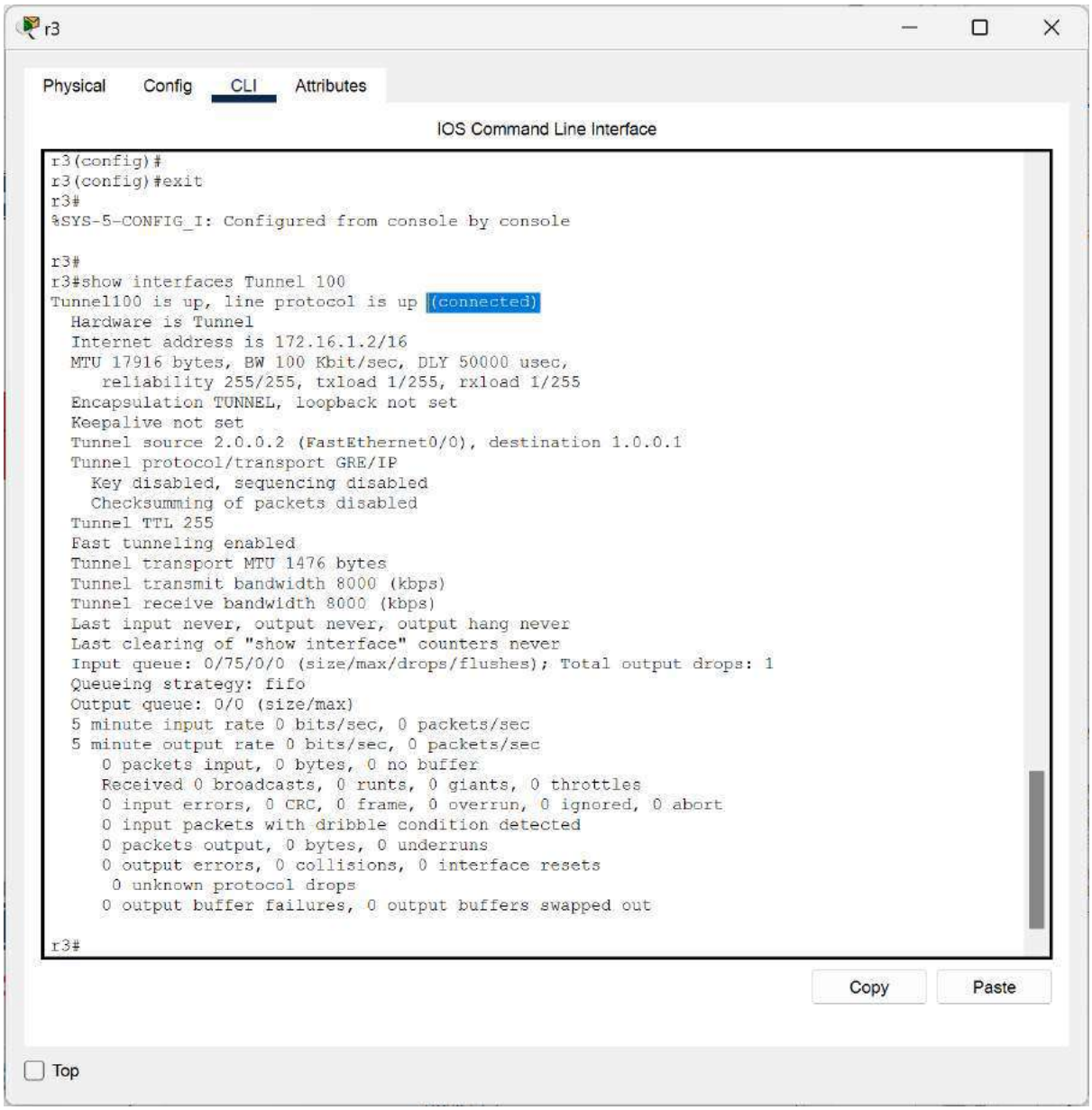
r1#show interfaces Tunnel 10



Now going to Router R3 and test VPN Tunnel Creation:

r3#show interface Tunnel 100

Tunnel100 is up, line protocol is up (connected)



CONCLUSION:

Therefore, a Tunnel is set up between Routers R1 ans R3 in a VPN

Site-to-Site IPSec VPN Tunnels are used to allow the secure transmission of data, voice and video between two sites (e.g offices or branches). The VPN tunnel is created over the Internet public network and encrypted using a number of advanced encryption algorithms to provide confidentiality of the data transmitted between the two sites.