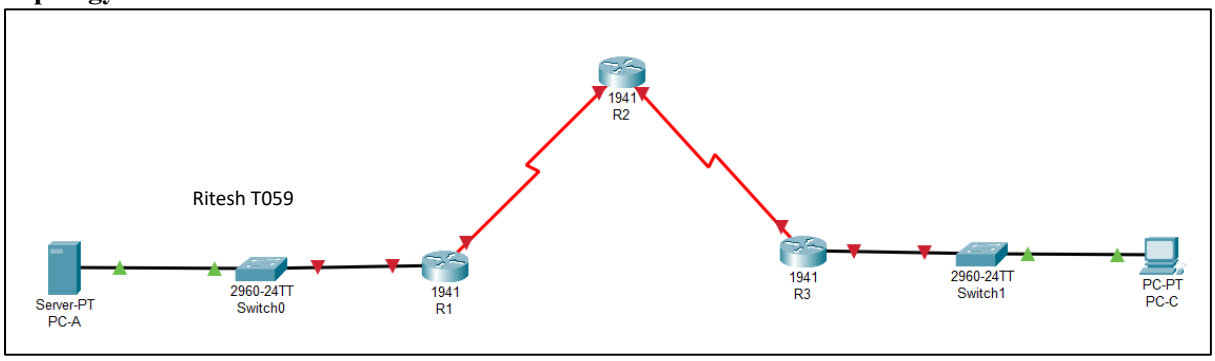
INDEX

Prac. No.		Aim	Date	Signature
1		Configure local AAA for console line and for VTY(virtual terminal) lines	13/12/2024	
2		Packet Tracer - Configure Cisco Routers for Syslog, NTP, and SSH Operations	20/12/2024	
3		Configure IPV6 ACL (access control list) that will block http and https access on R1 and allow all other IPV6 traffic to pass.	03/01/2024	
4		Configure IPV6 ACL to block ICMP(Internet Control Message Protocol) access on R3 and allow all other IPV6 traffic to pass	10/01/2025	
5		Configure an ACL that will permit FTP and HTTP access on R1 verify ACL implementation on PC1 only FTP and PC2 only HTTP	07/02/2025	
7			21/02/2025	
6			07/03/2025	

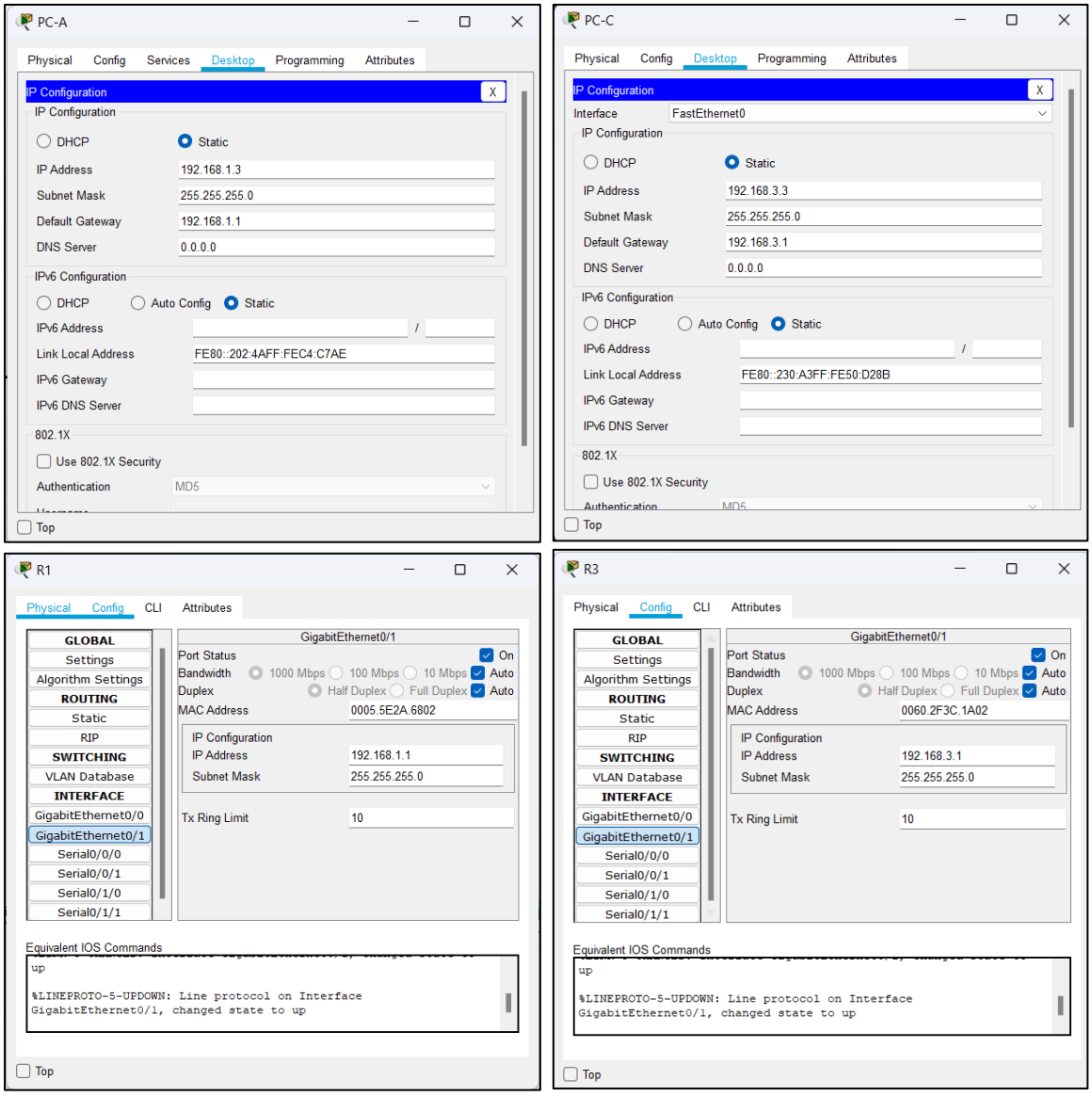
PRACTICAL 6

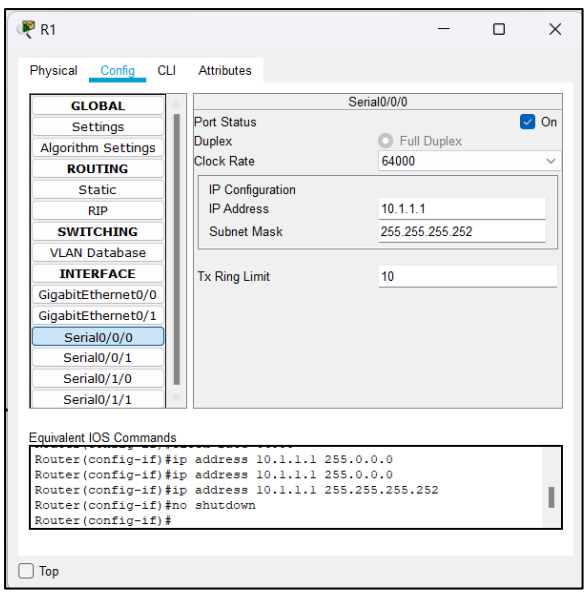
Aim: Configure a zone based policy firewall.

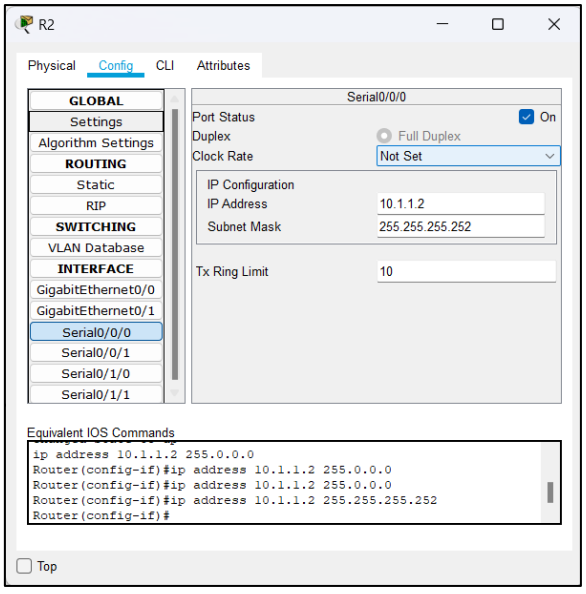
Topology:

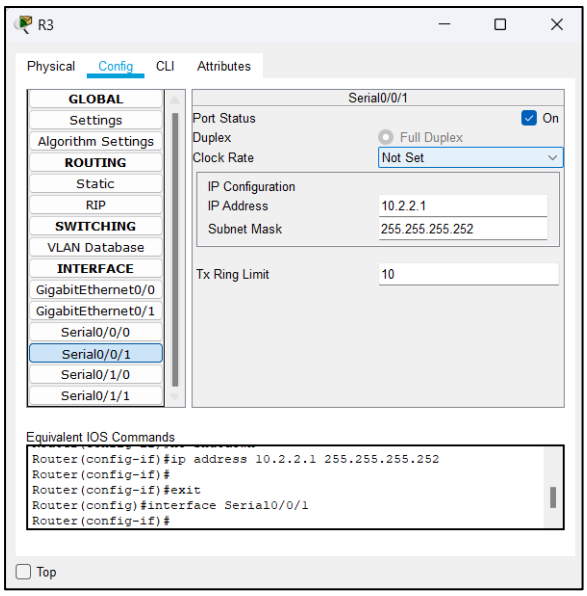


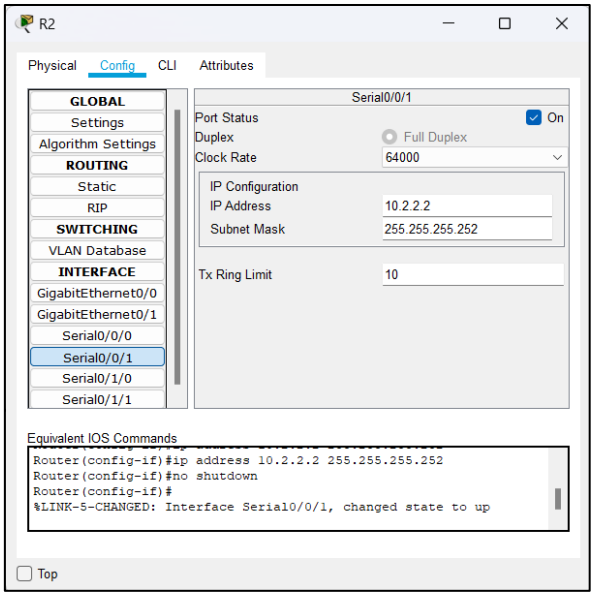
Configuration:



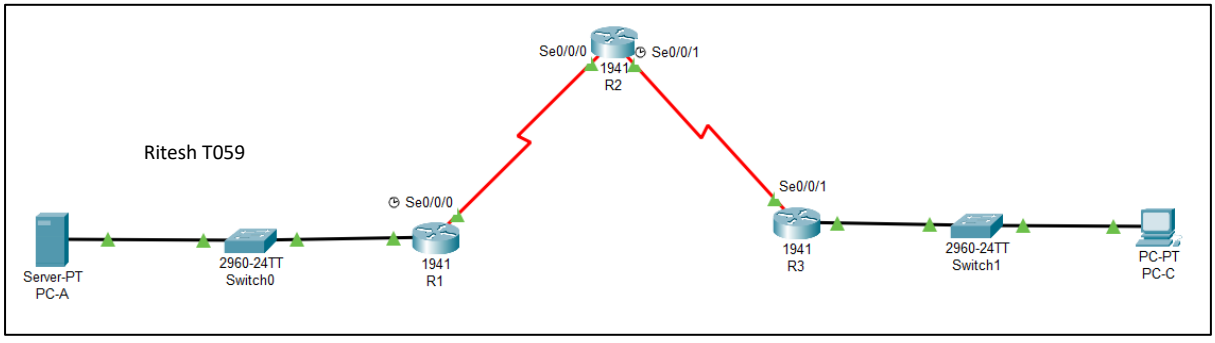






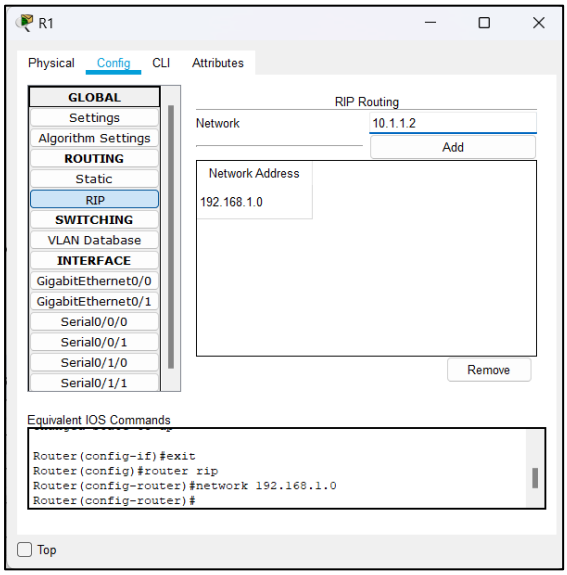


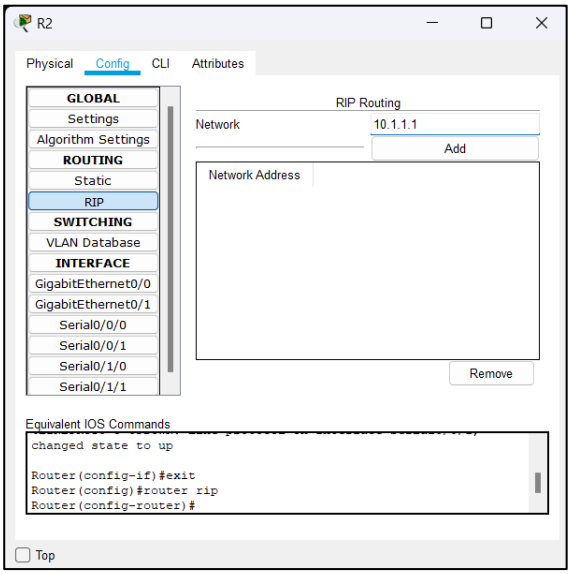
Topology(After Configuration):

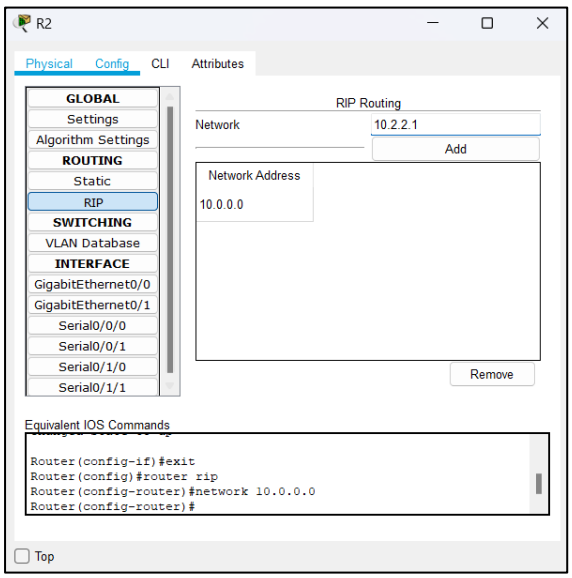


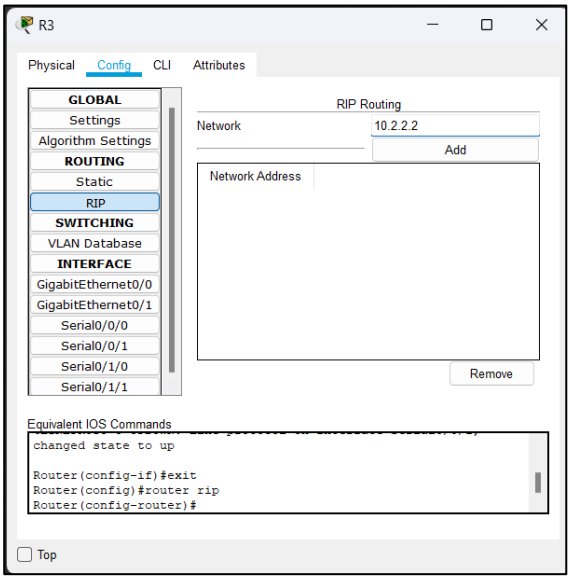
RIP Routing:

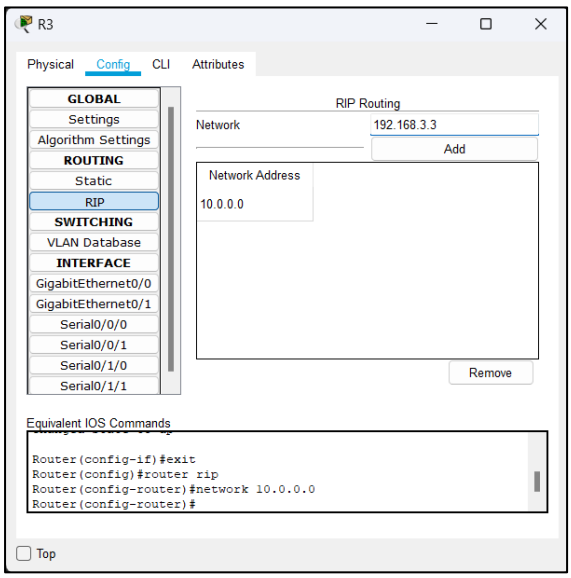
Add RIP Addresses (enter 10.1.1.0, the router makes it 10.0.0.0 automatically but it should be entered 10.1.1.0) The router also converts 10.1.1.0 and 10.2.2.0 to 10.0.0.0 so it takes it as 1 IP address



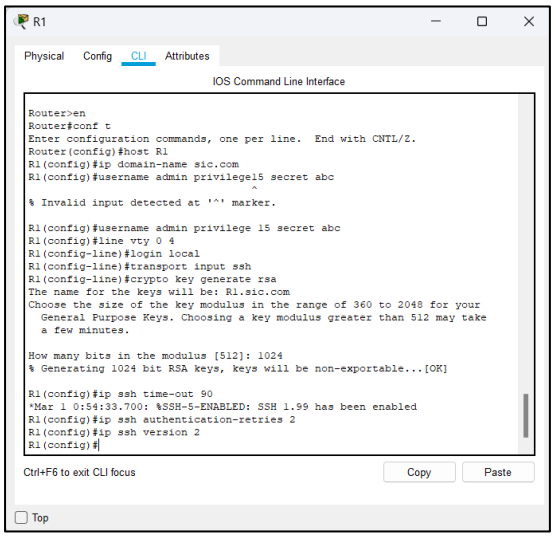


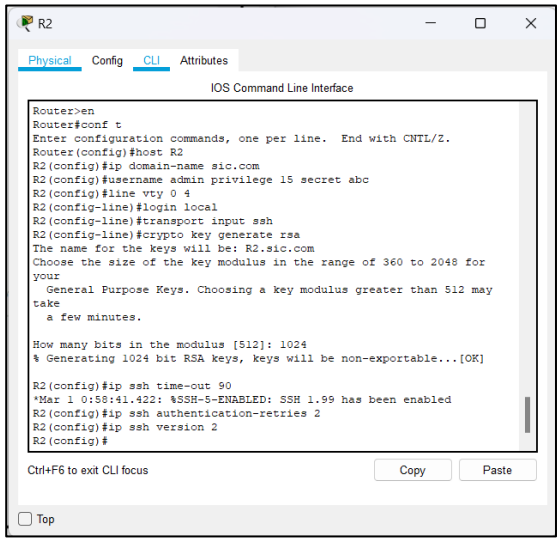


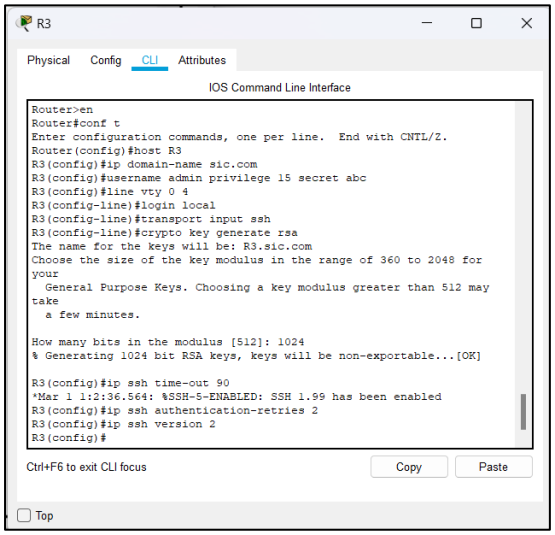




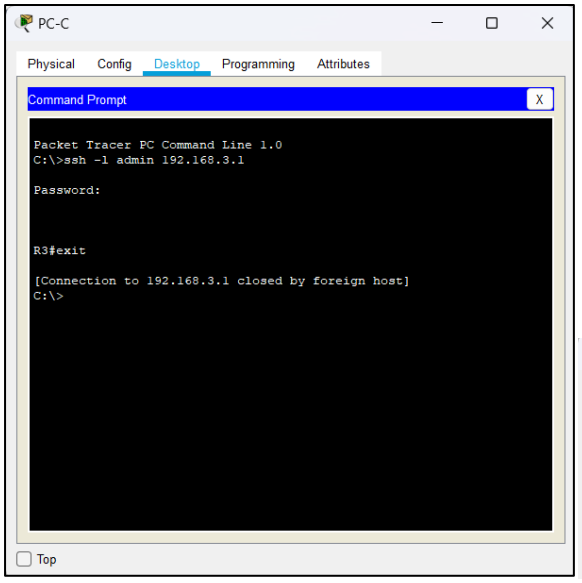
SSH Configuration in CLI:

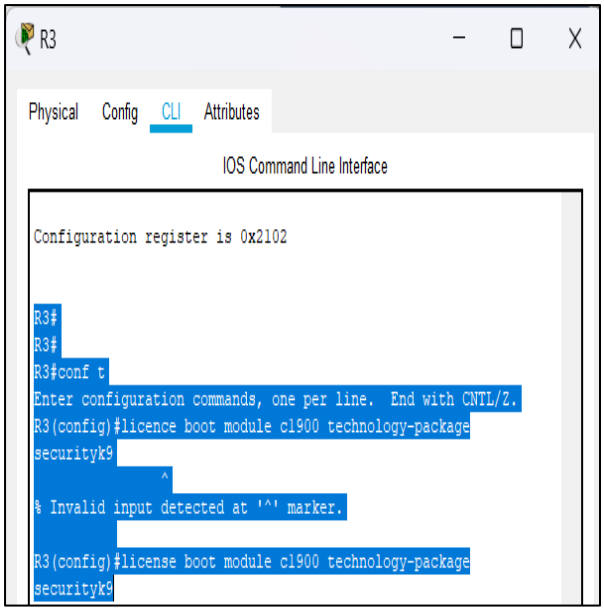


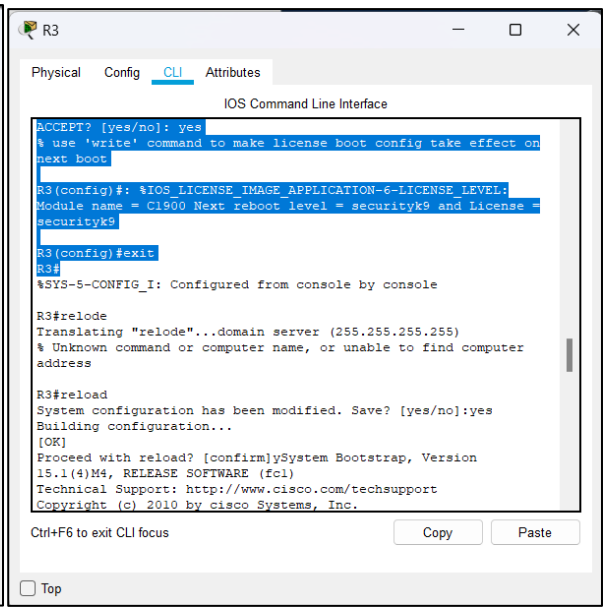


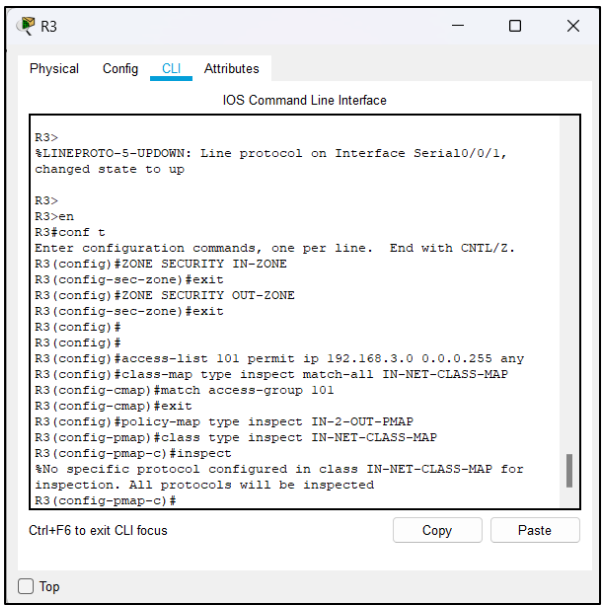


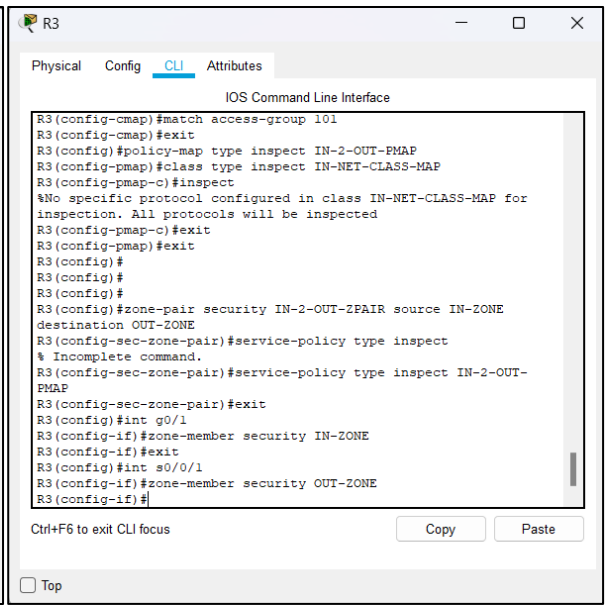
Create firewall zones on R3:



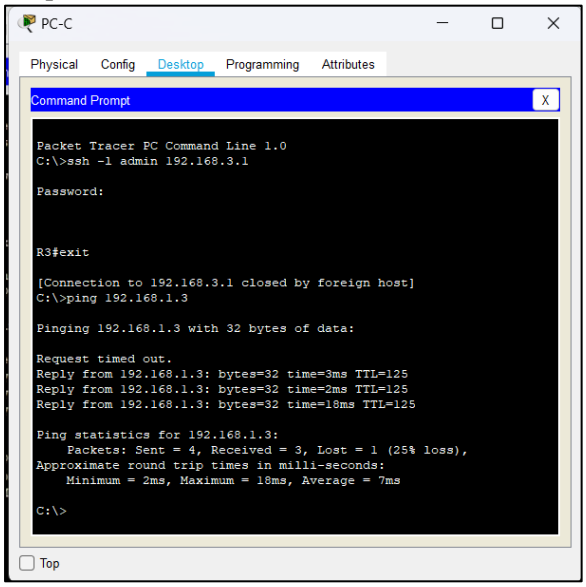

R3
Physical Config CLI Attributes
IOS Command Line Interface
Configuration register is 0x2102
R3#
R3#
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#licence boot module c1900 technology-package
securityk9
^
% Invalid input detected at '^' marker.
R3(config)#license boot module c1900 technology-package
securityk9

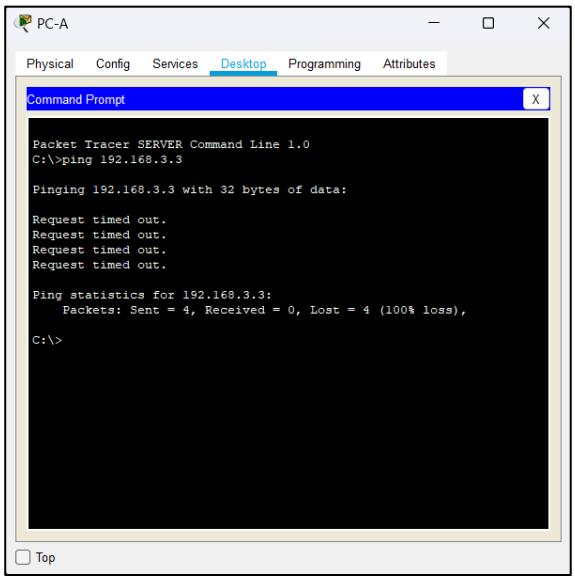

R3
Physical Config CLI Attributes
IOS Command Line Interface
ACCEPT? [yes/no]: yes
% use 'write' command to make license boot config take effect on
next boot
R3(config)#: %IOS_LICENSE_IMAGE_APPLICATION-6-LICENSE_LEVEL:
Module name = C1900 Next reboot level = securityk9 and License =
securityk9
R3(config)#exit
R3#
%SYS-5-CONFIG_I: Configured from console by console
R3#relode
Translating "relode"...domain server (255.255.255.255)
% Unknown command or computer name, or unable to find computer
address
R3#reload
System configuration has been modified. Save? [yes/no]:yes
Building configuration...
[OK]
Proceed with reload? [confirm]ySystem Bootstrap, Version
15.1(4)M4, RELEASE SOFTWARE (fc1)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 2010 by cisco Systems, Inc.
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


R3
Physical Config CLI Attributes
IOS Command Line Interface
R3>
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1,
changed state to up
R3>
R3>en
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#ZONE SECURITY IN-ZONE
R3(config-sec-zone)#exit
R3(config)#ZONE SECURITY OUT-ZONE
R3(config-sec-zone)#exit
R3(config)#
R3(config)#
R3(config)#access-list 101 permit ip 192.168.3.0 0.0.0.255 any
R3(config)#class-map type inspect match-all IN-NET-CLASS-MAP
R3(config-cmap)#match access-group 101
R3(config-cmap)#exit
R3(config)#policy-map type inspect IN-2-OUT-PMAP
R3(config-pmap)#class type inspect IN-NET-CLASS-MAP
R3(config-pmap-c)#inspect
%No specific protocol configured in class IN-NET-CLASS-MAP for
inspection. All protocols will be inspected
R3(config-pmap-c)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top


R3
Physical Config CLI Attributes
IOS Command Line Interface
R3(config-cmap)#match access-group 101
R3(config-cmap)#exit
R3(config)#policy-map type inspect IN-2-OUT-PMAP
R3(config-pmap)#class type inspect IN-NET-CLASS-MAP
R3(config-pmap-c)#inspect
%No specific protocol configured in class IN-NET-CLASS-MAP for
inspection. All protocols will be inspected
R3(config-pmap-c)#exit
R3(config-pmap)#exit
R3(config)#
R3(config)#
R3(config)#
R3(config)#zone-pair security IN-2-OUT-ZPAIR source IN-ZONE
destination OUT-ZONE
R3(config-sec-zone-pair)#service-policy type inspect
% Incomplete command.
R3(config-sec-zone-pair)#service-policy type inspect IN-2-OUT-
PMAP
R3(config-sec-zone-pair)#exit
R3(config)#int g0/1
R3(config-if)#zone-member security IN-ZONE
R3(config-if)#exit
R3(config)#int s0/0/1
R3(config-if)#zone-member security OUT-ZONE
R3(config-if)#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

Output:


PC-C
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ssh -l admin 192.168.3.1
Password:
R3#exit
[Connection to 192.168.3.1 closed by foreign host]
C:\>ping 192.168.1.3
Pinging 192.168.1.3 with 32 bytes of data:
Request timed out.
Reply from 192.168.1.3: bytes=32 time=3ms TTL=125
Reply from 192.168.1.3: bytes=32 time=2ms TTL=125
Reply from 192.168.1.3: bytes=32 time=18ms TTL=125
Ping statistics for 192.168.1.3:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 2ms, Maximum = 18ms, Average = 7ms
C:\>
Top

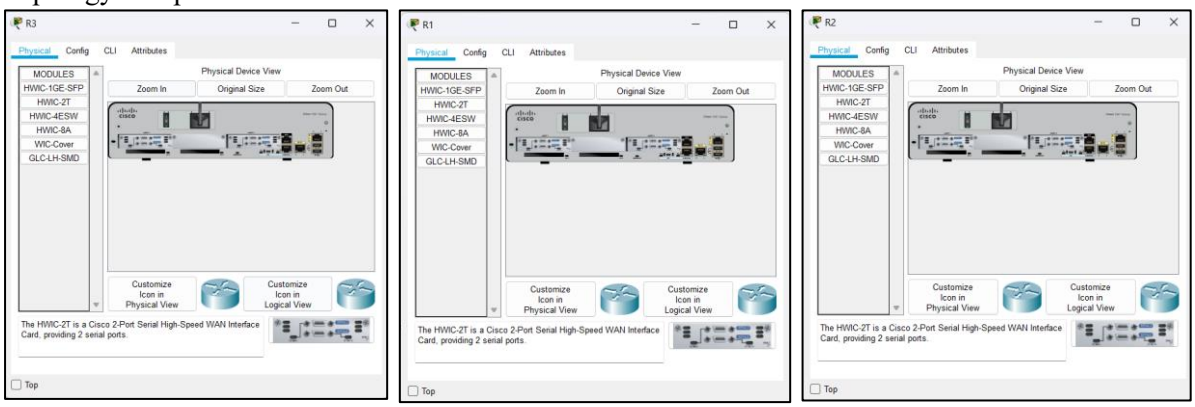

PC-A
Physical Config Services Desktop Programming Attributes
Command Prompt
Packet Tracer SERVER Command Line 1.0
C:\>ping 192.168.3.3
Pinging 192.168.3.3 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 192.168.3.3:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
C:\>
Top

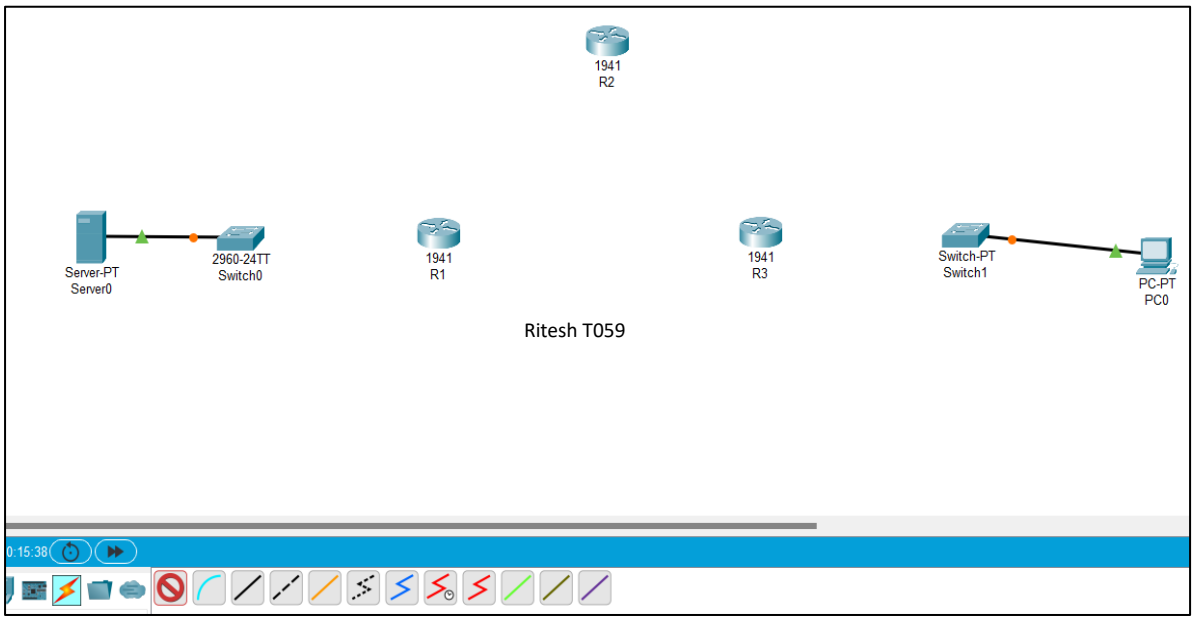
PRACTICAL 7

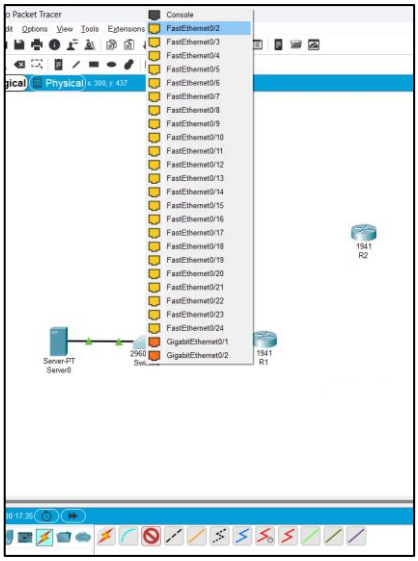
Aim: Configure IP ACL to mitigate attacks

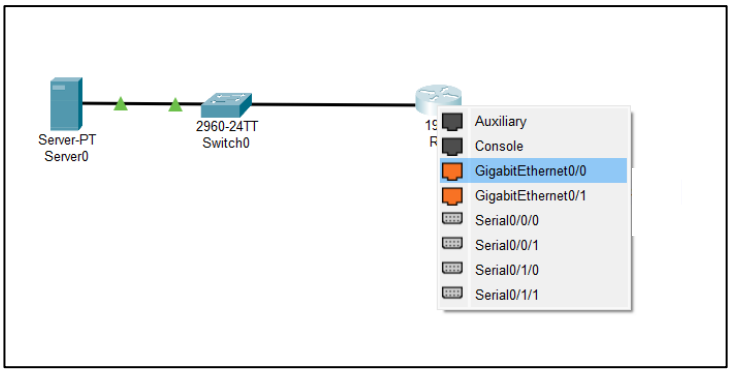
a) Verify connectivity before firewall configuration
b) Use ACL to ensure remote access to the router only from PC.
c) Configure ACL on R1 to mitigate attacks and verify ACL functionalities.

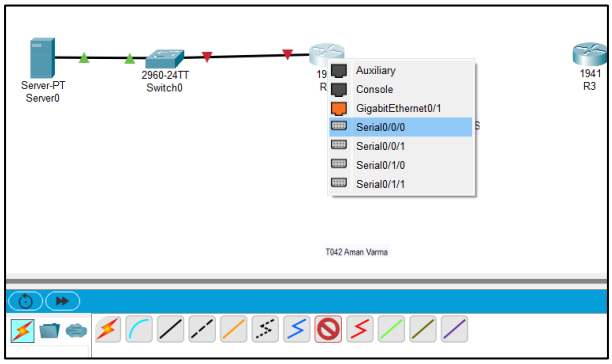
Topology Setup:

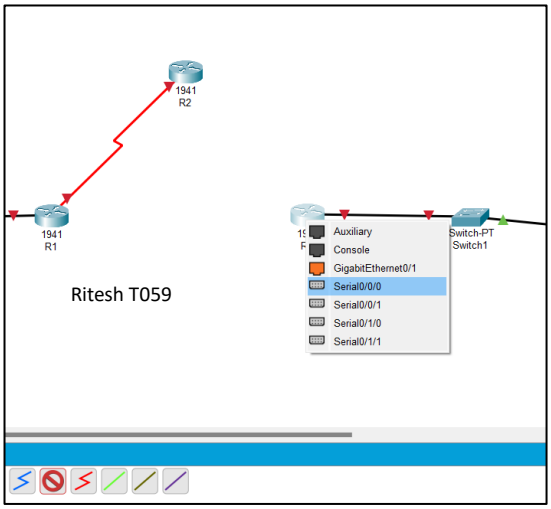




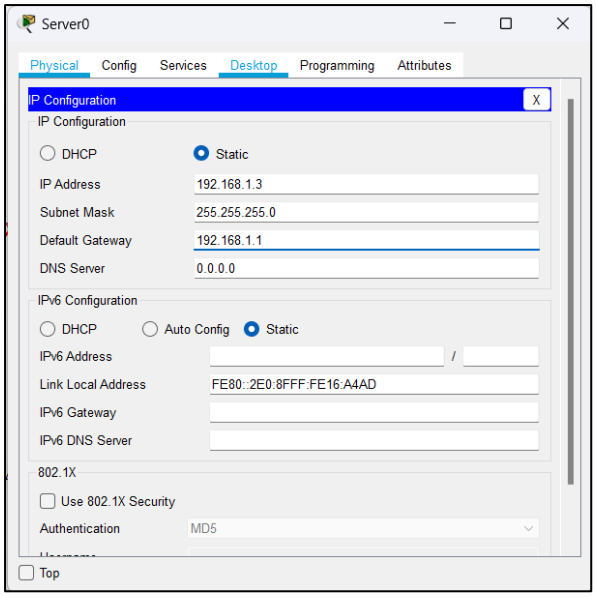


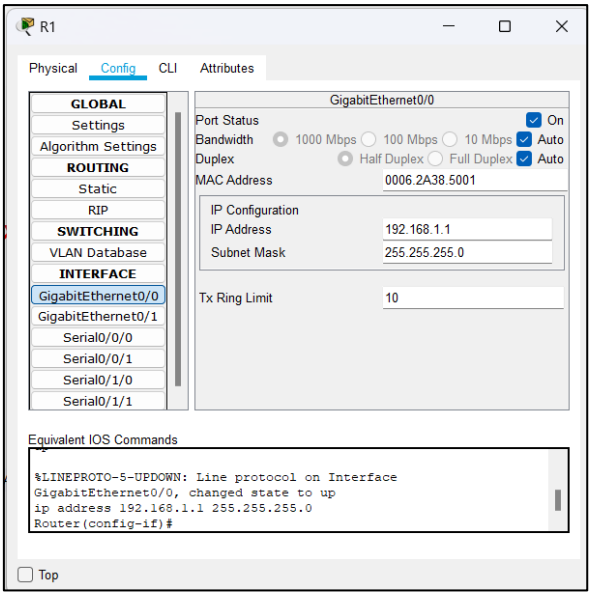


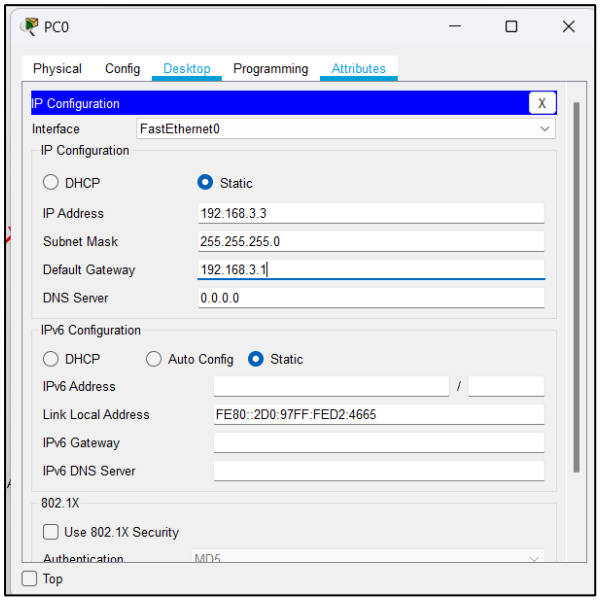


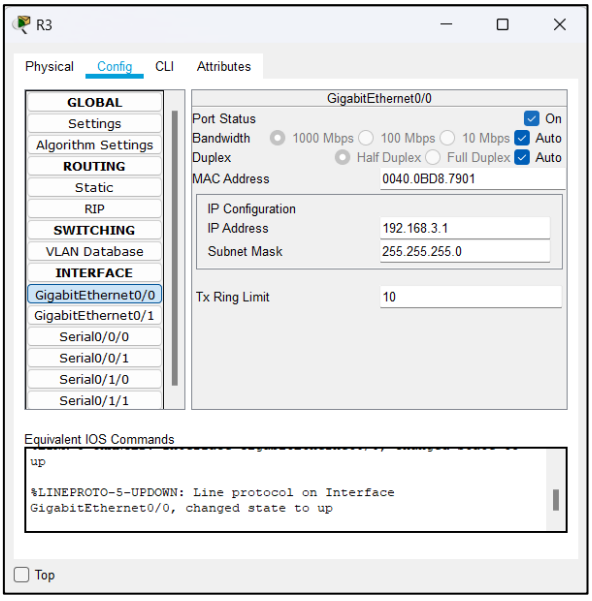


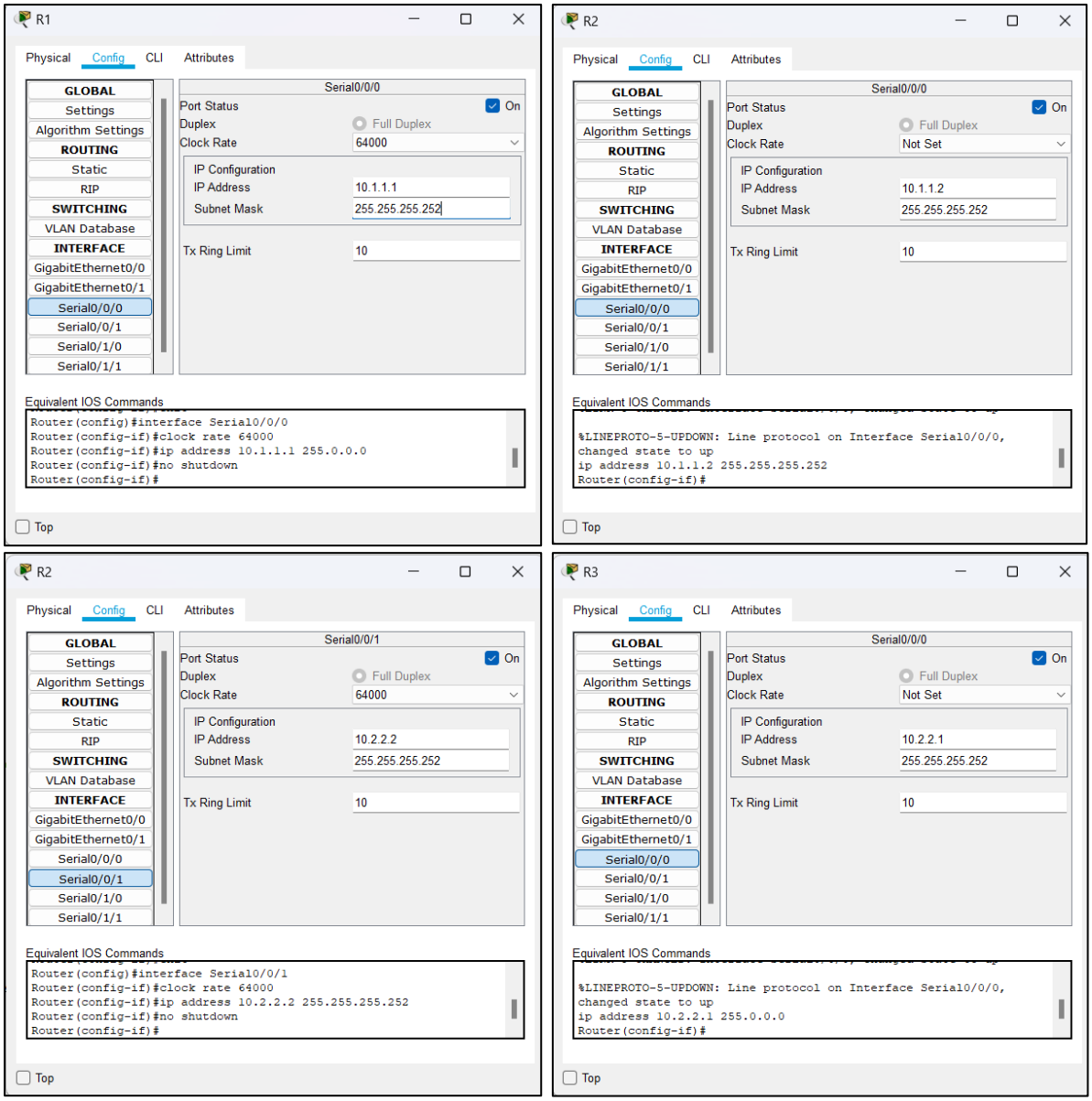
Topology Configuration


Server0
Physical Config Services Desktop Programming Attributes
IP Configuration
IP Configuration
DHCP
Static
IP Address 192.168.1.3
Subnet Mask 255.255.255.0
Default Gateway 192.168.1.1
DNS Server 0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address FE80::2E0:8FFF:FE16:A4AD
IPv6 Gateway
IPv6 DNS Server
802.1X
Use 802.1X Security
Authentication MD5
Top


R1
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
GigabitEthernet0/0
Port Status On
Bandwidth 1000 Mbps 100 Mbps 10 Mbps Auto
Duplex Half Duplex Full Duplex Auto
MAC Address 0006.2A38.5001
IP Configuration
IP Address 192.168.1.1
Subnet Mask 255.255.255.0
Tx Ring Limit 10
Equivalent IOS Commands
%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/0, changed state to up
ip address 192.168.1.1 255.255.255.0
Router(config-if)#
Top


PC0
Physical Config Desktop Programming Attributes
IP Configuration
Interface FastEthernet0
IP Configuration
DHCP
Static
IP Address 192.168.3.3
Subnet Mask 255.255.255.0
Default Gateway 192.168.3.1
DNS Server 0.0.0.0
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
Link Local Address FE80::2D0:97FF:FED2:4665
IPv6 Gateway
IPv6 DNS Server
802.1X
Use 802.1X Security
Authentication MD5
Top

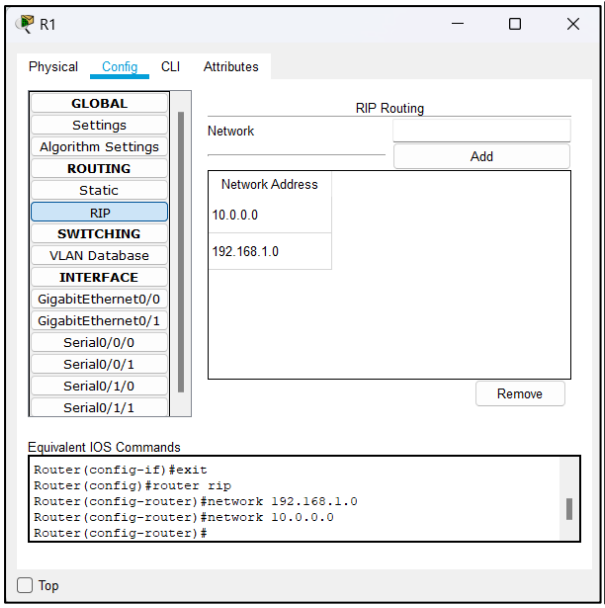

R3
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
GigabitEthernet0/0
Port Status On
Bandwidth 1000 Mbps 100 Mbps 10 Mbps Auto
Duplex Half Duplex Full Duplex Auto
MAC Address 0040.0BD8.7901
IP Configuration
IP Address 192.168.3.1
Subnet Mask 255.255.255.0
Tx Ring Limit 10
Equivalent IOS Commands
up
%LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet0/0, changed state to up
Top

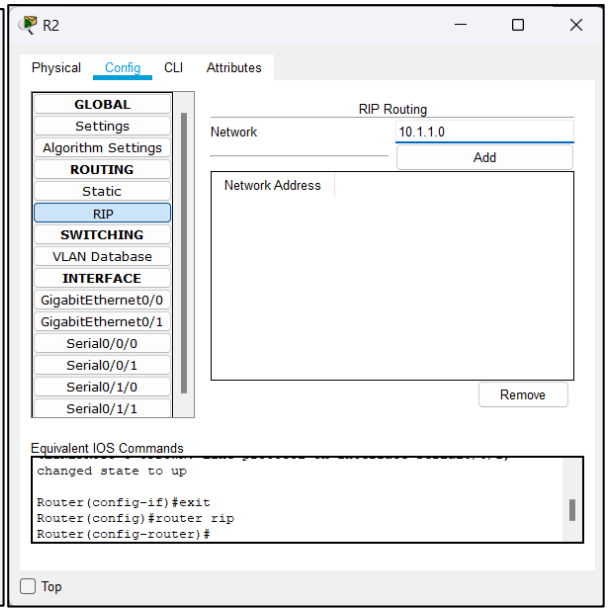


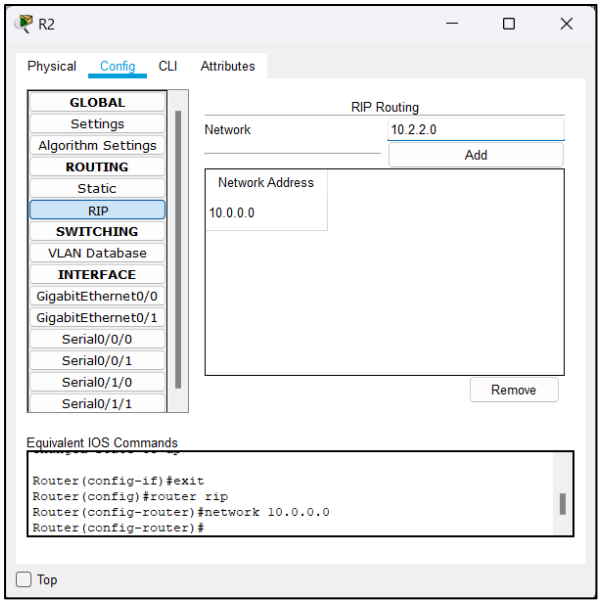
RIP Routing:

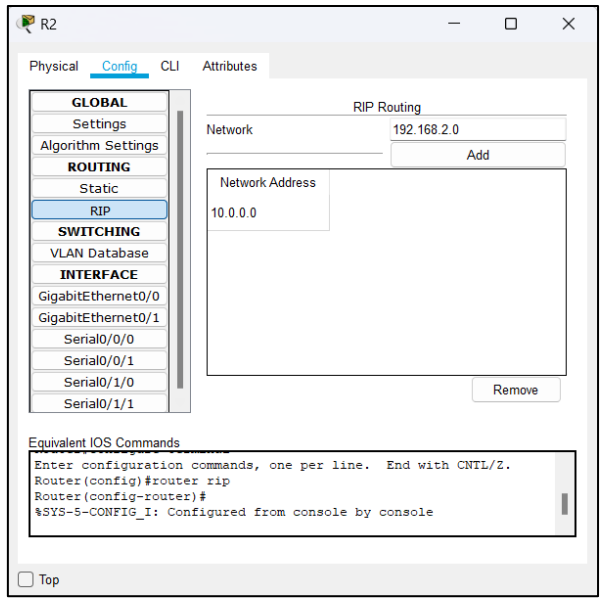
Add RIP Addresses (enter 10.1.1.0, the router makes it 10.0.0.0 automatically but it should be entered 10.1.1.0)

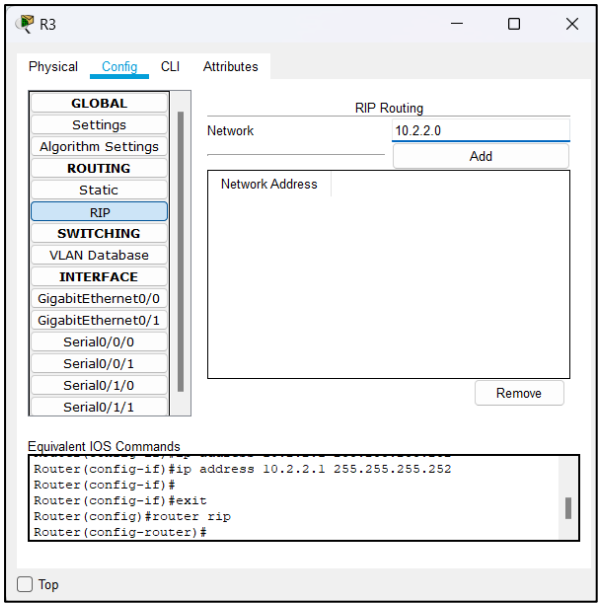
The router also converts 10.1.1.0 and 10.2.2.0 to 10.0.0.0 so it takes it as 1 IP address

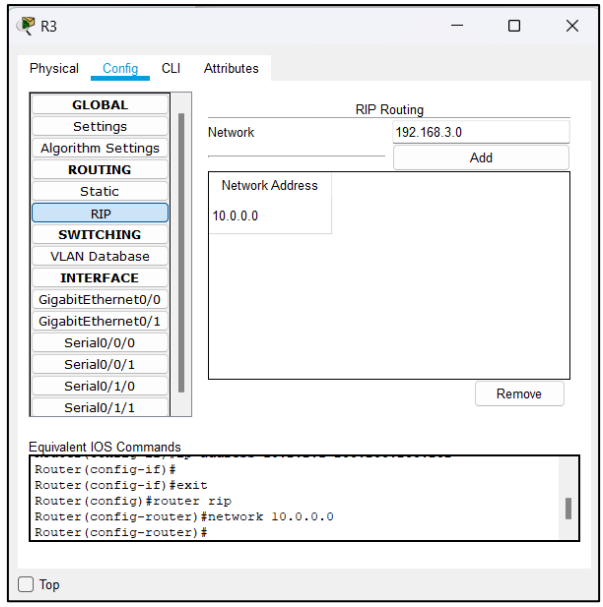

R1
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
RIP Routing
Network
Add
Network Address
10.0.0.0
192.168.1.0
Remove
Equivalent IOS Commands
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 192.168.1.0
Router(config-router)#network 10.0.0.0
Router(config-router)#
Top


R2
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
RIP Routing
Network
10.1.1.0
Add
Network Address
Remove
Equivalent IOS Commands
changed state to up
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#
Top

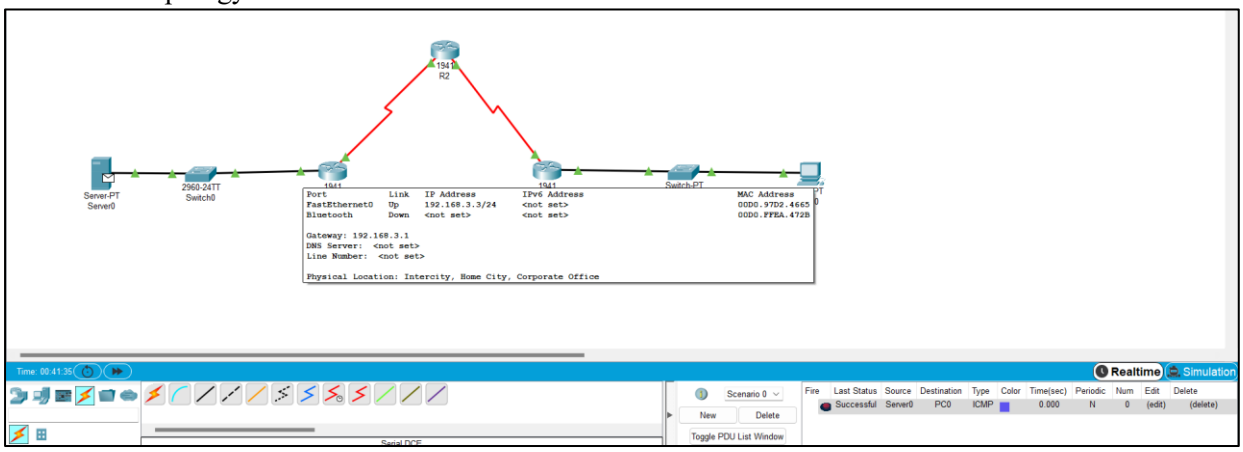

R2
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
RIP Routing
Network
10.2.2.0
Add
Network Address
10.0.0.0
Remove
Equivalent IOS Commands
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#
Top


R2
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
RIP Routing
Network
192.168.2.0
Add
Network Address
10.0.0.0
Remove
Equivalent IOS Commands
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#
%SYS-5-CONFIG_I: Configured from console by console
Top

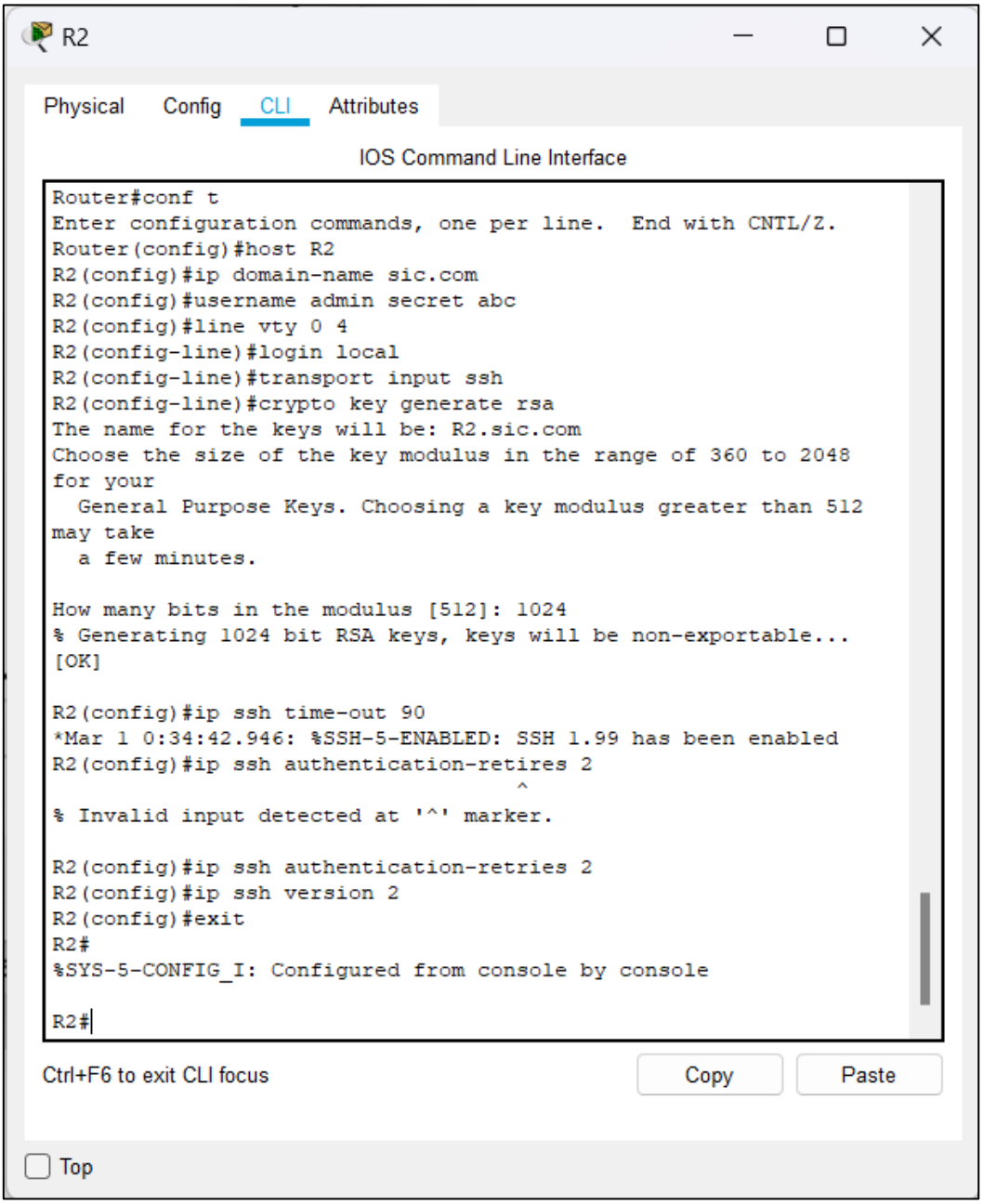

R3
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
RIP Routing
Network
10.2.2.0
Add
Network Address
Remove
Equivalent IOS Commands
Router(config-if)#ip address 10.2.2.1 255.255.255.252
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#
Top


R3
Physical Config CLI Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
GigabitEthernet0/0
GigabitEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
RIP Routing
Network
192.168.3.0
Add
Network Address
10.0.0.0
Remove
Equivalent IOS Commands
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#network 10.0.0.0
Router(config-router)#
Top

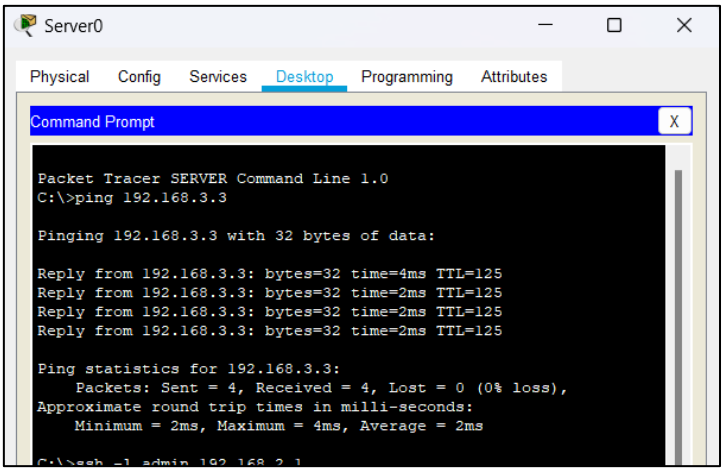
Successful Topology:



Configure SSH on R2



(wait for this part as it is not complete)



Configure ACL on routers(block all remote access to the routers accept from PC)