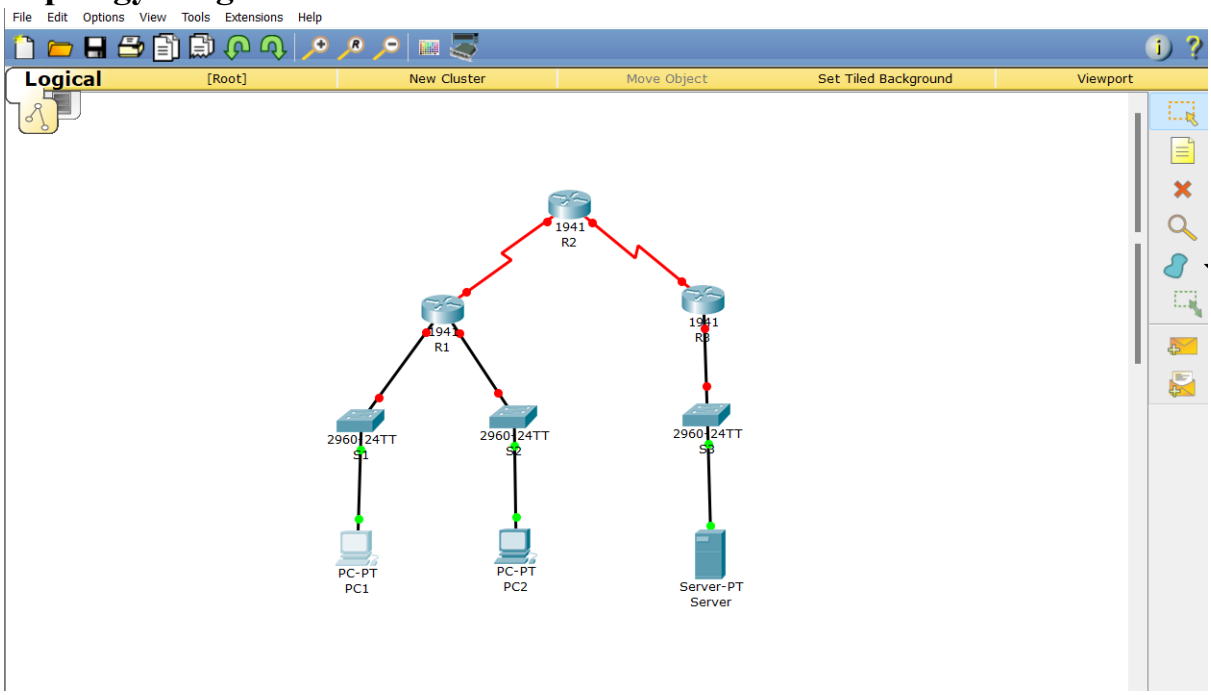
Date: 07/02/2024 **Security in Computing**

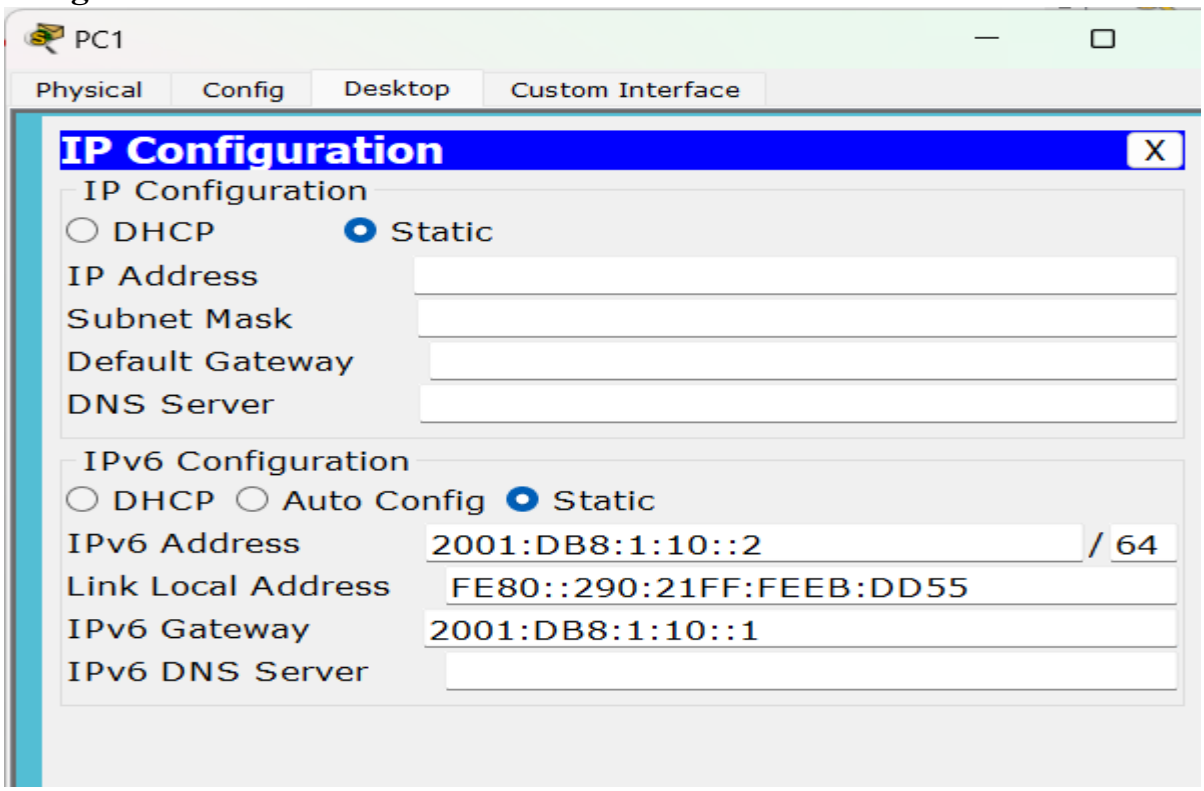
Practical 5:

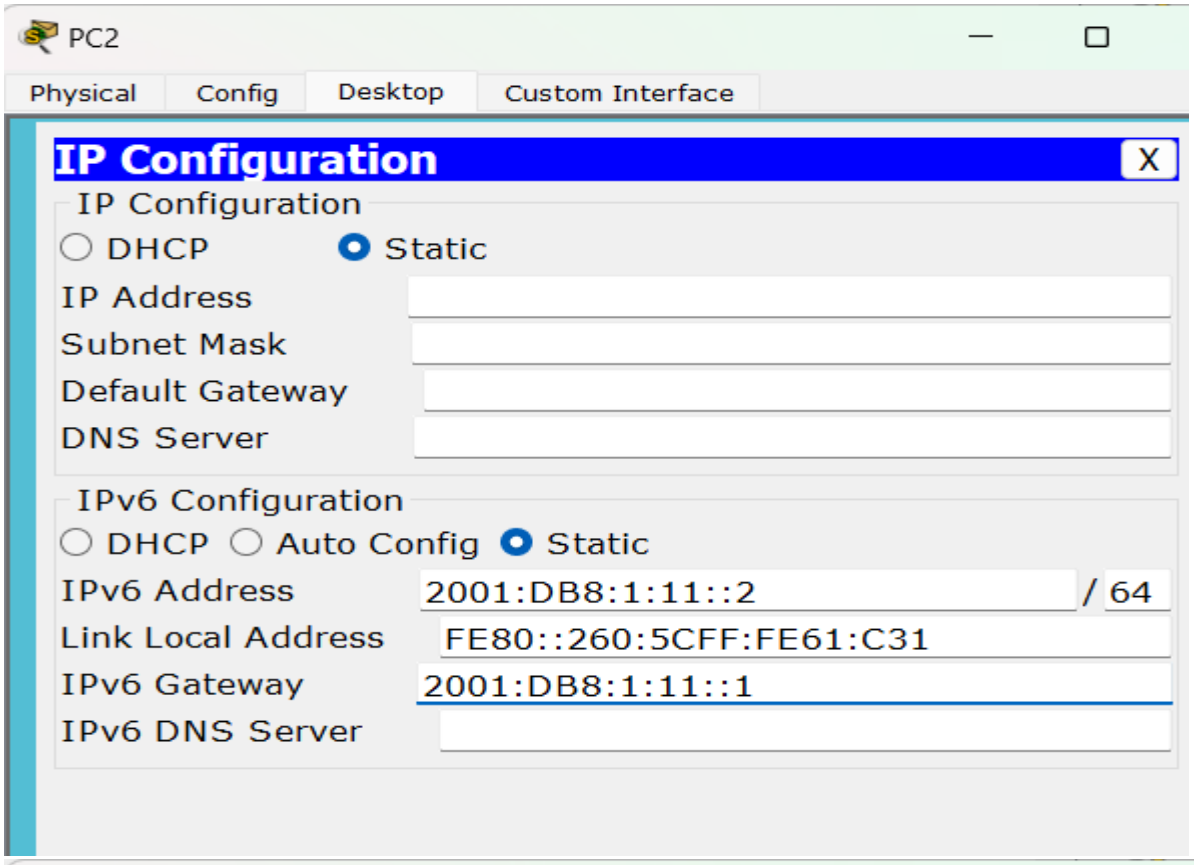
Aim: Configuring IPv6 ACLs

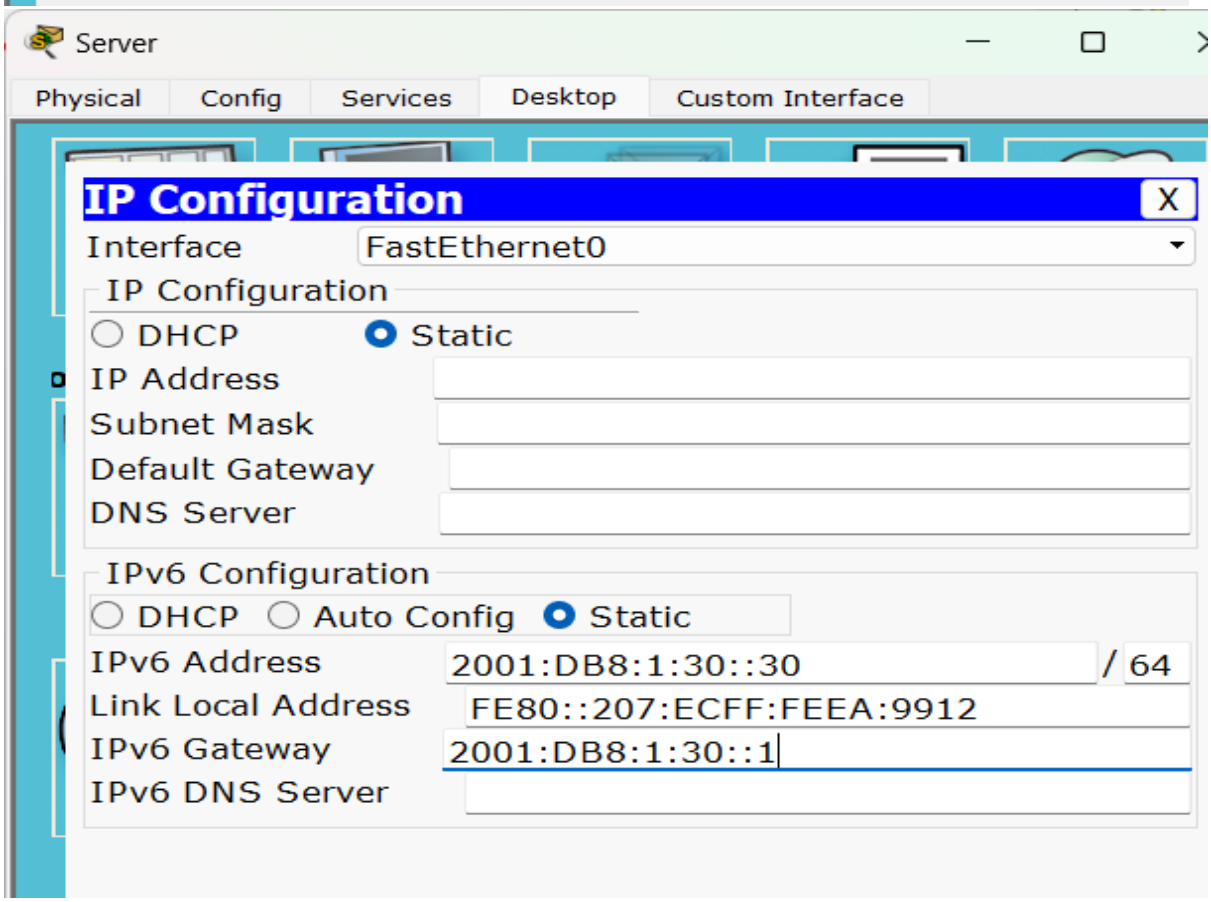
- **Topology Diagram:**



- **Assign IP Address**




PC2
Physical
Config
Desktop
Custom Interface
IP Configuration
X
IP Configuration
DHCP
Static
IP Address
Subnet Mask
Default Gateway
DNS Server
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
2001:DB8:1:11::2
/ 64
Link Local Address
FE80::260:5CFF:FE61:C31
IPv6 Gateway
2001:DB8:1:11::1
IPv6 DNS Server


Server
Physical
Config
Services
Desktop
Custom Interface
IP Configuration
X
Interface
FastEthernet0
IP Configuration
DHCP
Static
IP Address
Subnet Mask
Default Gateway
DNS Server
IPv6 Configuration
DHCP
Auto Config
Static
IPv6 Address
2001:DB8:1:30::30
/ 64
Link Local Address
FE80::207:ECFF:FEEA:9912
IPv6 Gateway
2001:DB8:1:30::1
IPv6 DNS Server

R1

Physical Config CLI

IOS Command Line Interface

```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#host R1
R1(config)#ipv6 unicast-routing
R1(config)#interface GigabitEthernet0/0
R1(config-if)#ipv6 enable
R1(config-if)#ipv6 address 2001:DB8:1:10::1/64
R1(config-if)#no shut
R1(config-if)#interface GigabitEthernet0/1
R1(config-if)#ipv6 enable
R1(config-if)#ipv6 address 2001:DB8:1:11::1/64
R1(config-if)#no shut

R1(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
interface Serial0/0/0
R1(config-if)#ipv6 enable
R1(config-if)#ipv6 address 2001:DB8:1:28::1/64
R1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
R1(config-if)#^Z
R1#
%SYS-5-CONFIG_I: Configured from console by console
exit
```

R2

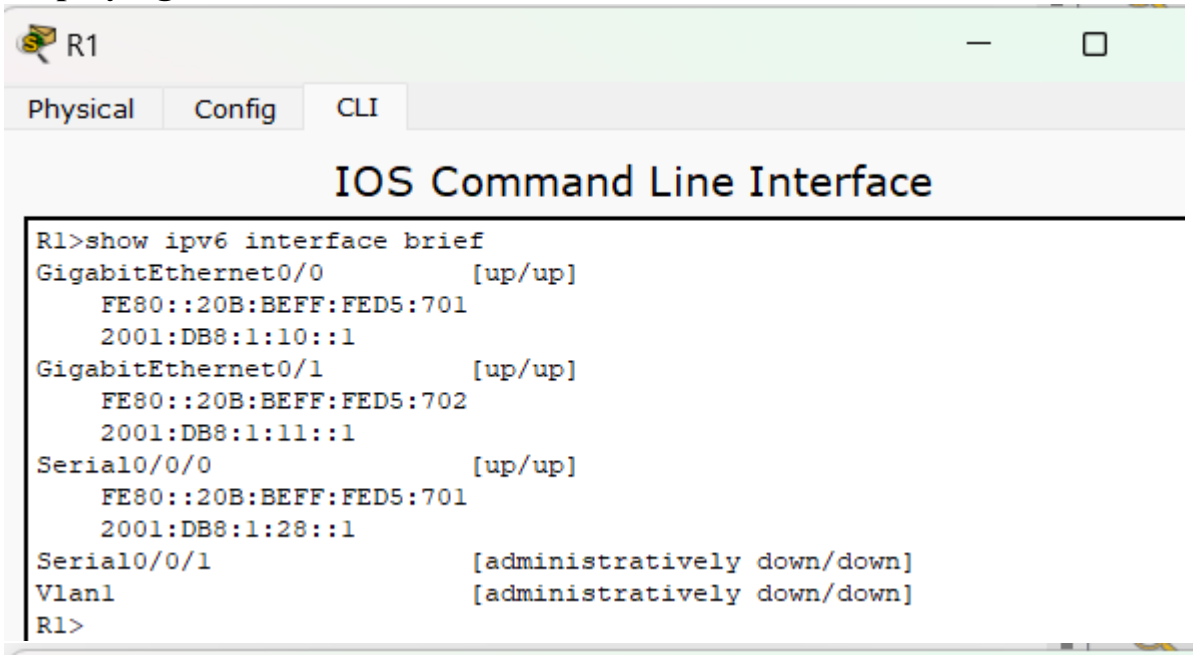
Physical Config CLI

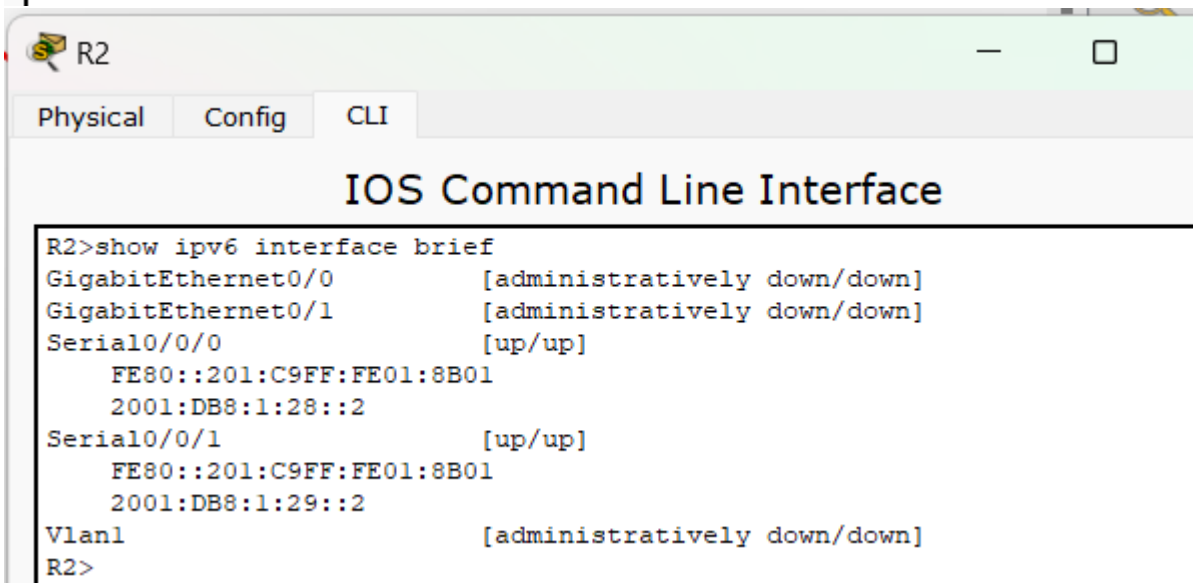
IOS Command Line Interface

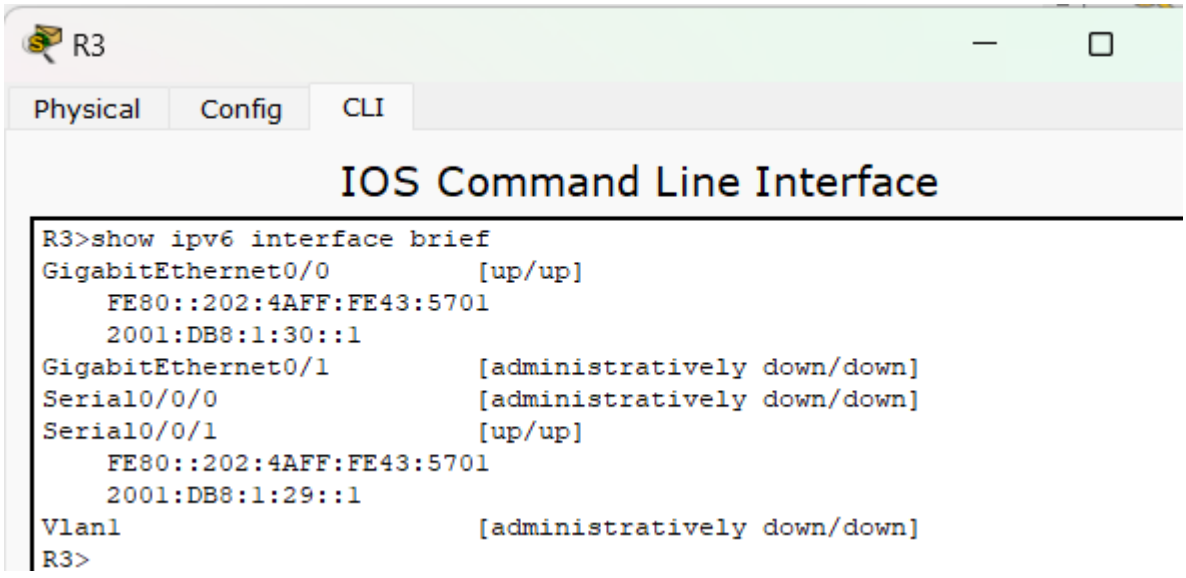
```
Router>en
Router#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#host R2
R2(config)#ipv6 unicast-routing
R2(config)#interface Serial0/0/0
R2(config-if)#ipv6 enable
R2(config-if)#ipv6 address 2001:DB8:1:28::2/64
R2(config-if)#no shut

R2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
interface Serial0/0/1
R2(config-if)#interface Serial0/0/1
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0,ipv6 enable
R2(config-if)#ipv6 address 2001:DB8:1:29::2/64
R2(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
R2(config-if)#^Z
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#exit
```


R3
Physical
Config
CLI
IOS Command Line Interface
Router>en
Router#config t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#host R3
R3(config)#ipv6 unicast-routing
R3(config)#interface GigabitEthernet0/0
R3(config-if)#ipv6 enable
R3(config-if)#ipv6 address 2001:DB8:1:30::1/64
R3(config-if)#no shut
R3(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
interface Serial0/0/1
R3(config-if)#ipv6 enable
R3(config-if)#ipv6 address 2001:DB8:1:29::1/64
R3(config-if)#no shut
R3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
^Z
R3#
%SYS-5-CONFIG_I: Configured from console by console
R3#exit

- **Displaying IP Address Details of Routers**

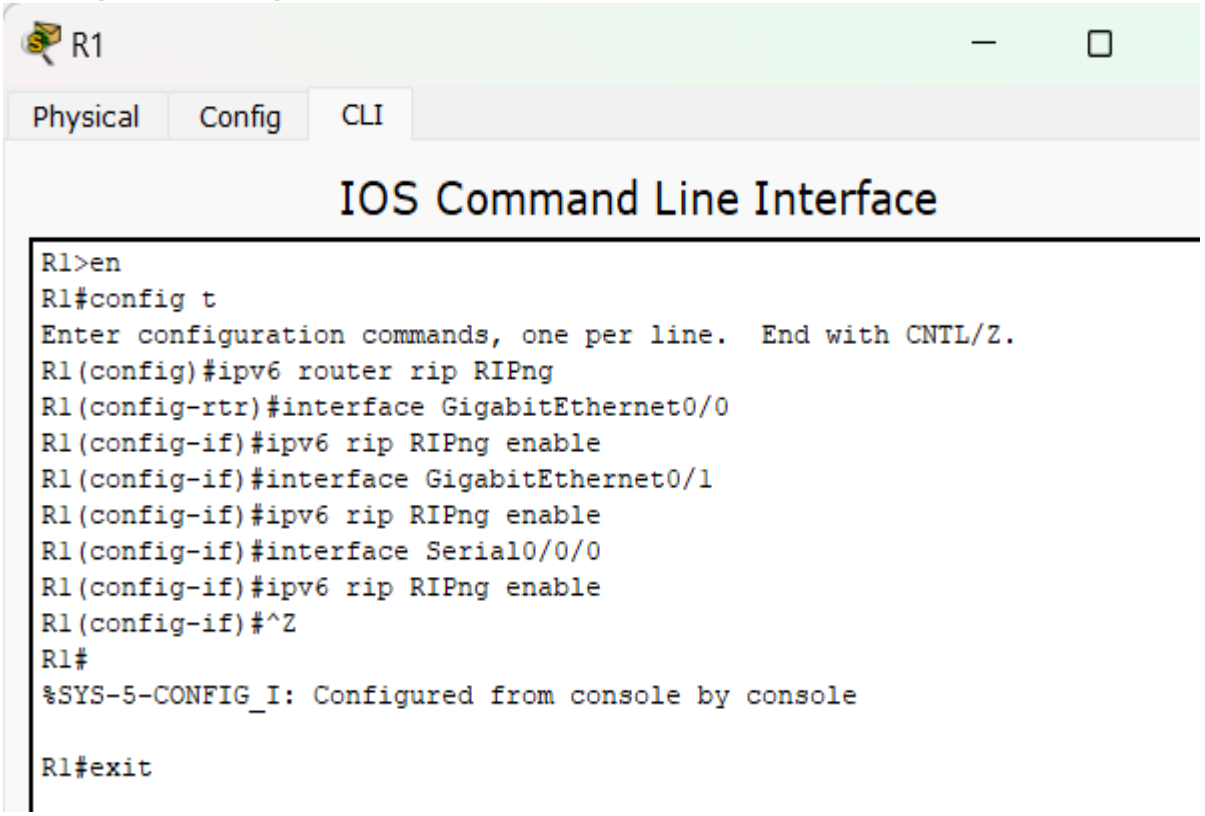


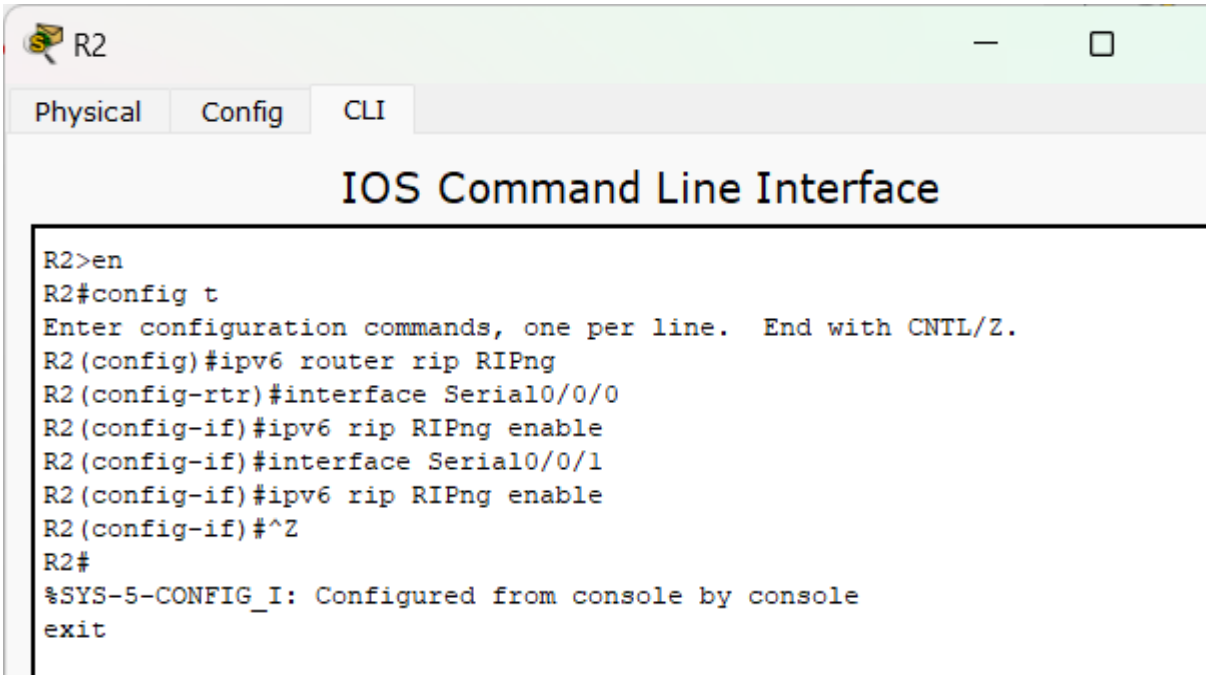




-

- **Configure RIPng on routers**





R3

Physical | Config | CLI

IOS Command Line Interface

```
R3>en
R3#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#ipv6 router rip RIPng
R3(config-rtr)#interface GigabitEthernet0/0
R3(config-if)#ipv6 rip RIPng enable
R3(config-if)#interface Serial0/0/1
R3(config-if)#ipv6 rip RIPng enable
R3(config-if)#^Z
R3#
%SYS-5-CONFIG_I: Configured from console by console

R3#exit
```

- **Displaying routing table of routers**

R1

Physical | Config | CLI

IOS Command Line Interface

```
R1>show ipv6 route
IPv6 Routing Table - 9 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       D - EIGRP, EX - EIGRP external
C   2001:DB8:1:10::/64 [0/0]
     via GigabitEthernet0/0, directly connected
L   2001:DB8:1:10::1/128 [0/0]
     via GigabitEthernet0/0, receive
C   2001:DB8:1:11::/64 [0/0]
     via GigabitEthernet0/1, directly connected
L   2001:DB8:1:11::1/128 [0/0]
     via GigabitEthernet0/1, receive
C   2001:DB8:1:28::/64 [0/0]
     via Serial0/0/0, directly connected
L   2001:DB8:1:28::1/128 [0/0]
     via Serial0/0/0, receive
R   2001:DB8:1:29::/64 [120/2]
     via FE80::201:C9FF:FE01:8B01, Serial0/0/0
R   2001:DB8:1:30::/64 [120/3]
     via FE80::201:C9FF:FE01:8B01, Serial0/0/0
L   FF00::/8 [0/0]
     via Null0, receive
R1>
```

R2

Physical Config CLI

IOS Command Line Interface

```
R2>show ipv6 route
IPv6 Routing Table - 8 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       D - EIGRP, EX - EIGRP external
R   2001:DB8:1:10::/64 [120/2]
     via FE80::20B:BEFF:FED5:701, Serial0/0/0
R   2001:DB8:1:11::/64 [120/2]
     via FE80::20B:BEFF:FED5:701, Serial0/0/0
C   2001:DB8:1:28::/64 [0/0]
     via Serial0/0/0, directly connected
L   2001:DB8:1:28::2/128 [0/0]
     via Serial0/0/0, receive
C   2001:DB8:1:29::/64 [0/0]
     via Serial0/0/1, directly connected
L   2001:DB8:1:29::2/128 [0/0]
     via Serial0/0/1, receive
R   2001:DB8:1:30::/64 [120/2]
     via FE80::202:4AFF:FE43:5701, Serial0/0/1
L   FF00::/8 [0/0]
     via Null0, receive
R2>
```

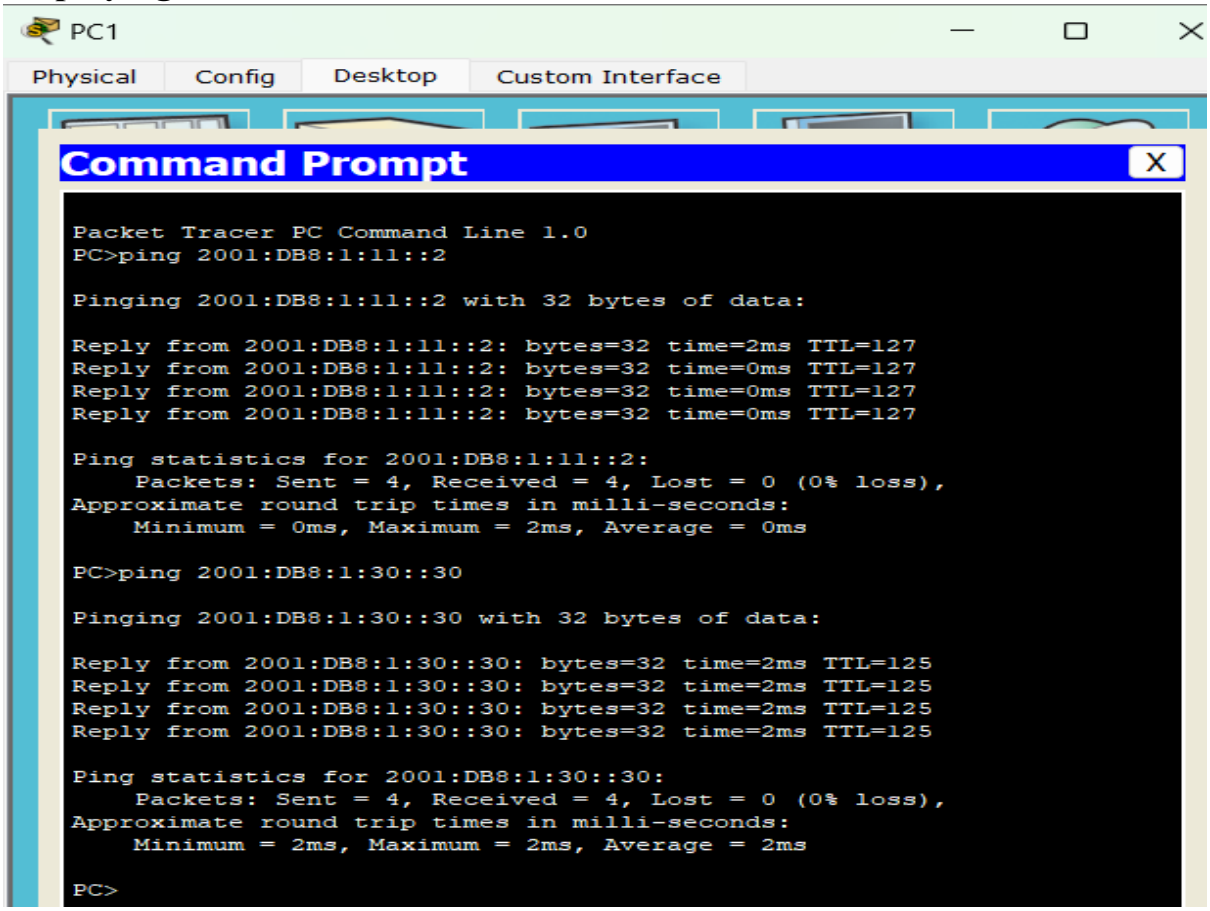
R3

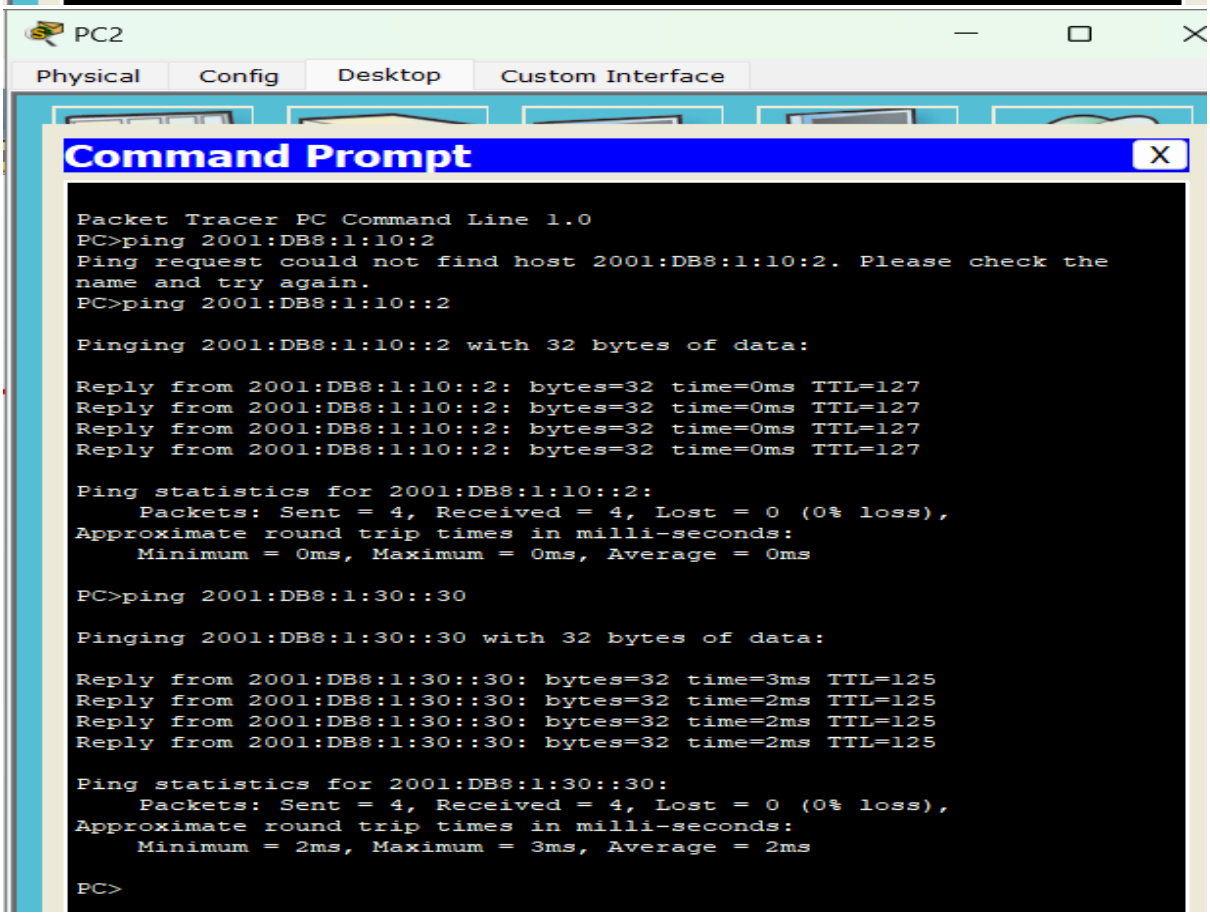
Physical Config CLI

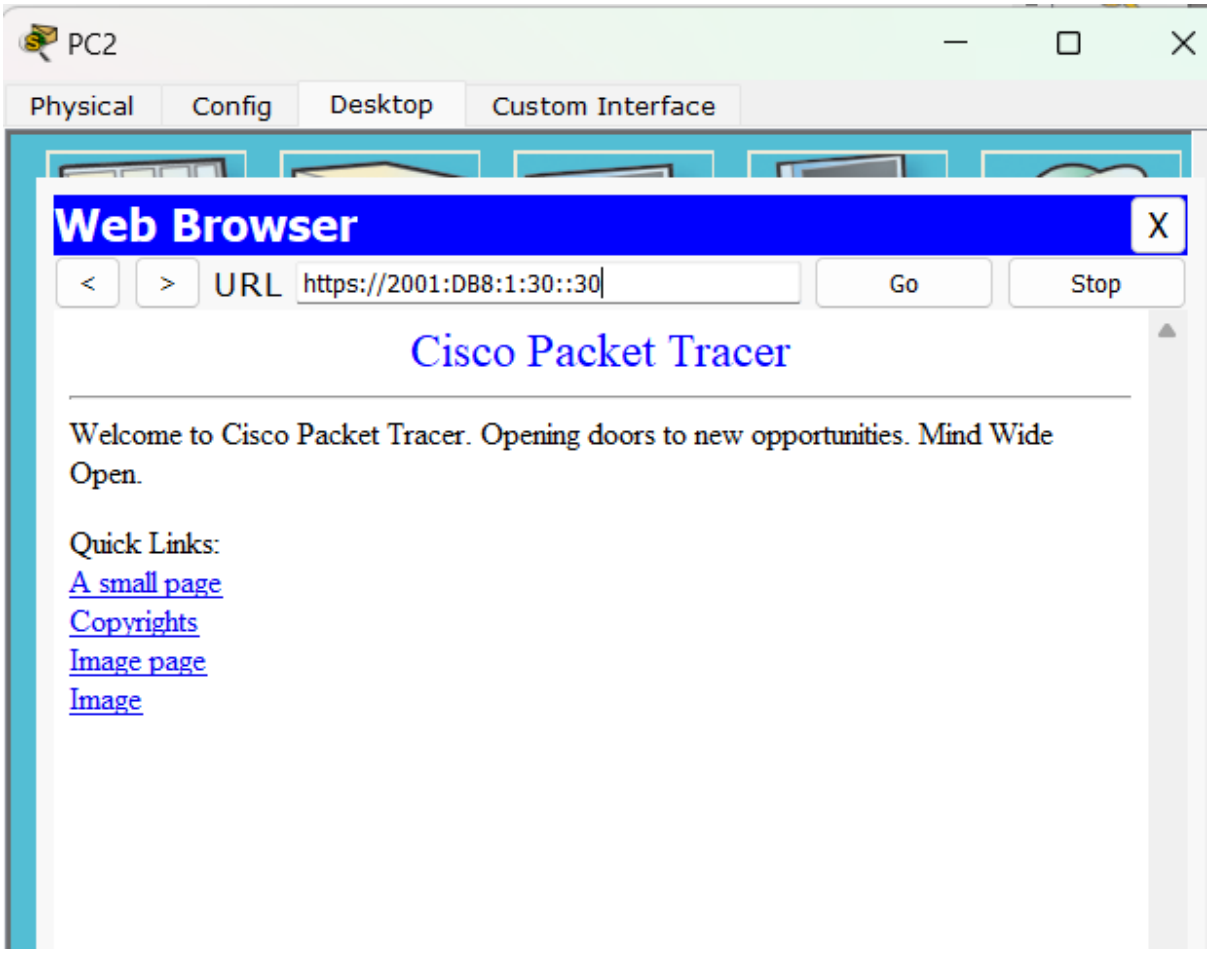
IOS Command Line Interface

```
R3>show ipv6 route
IPv6 Routing Table - 8 entries
Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP
       U - Per-user Static route, M - MIPv6
       I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary
       O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2
       ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2
       D - EIGRP, EX - EIGRP external
R   2001:DB8:1:10::/64 [120/3]
     via FE80::201:C9FF:FE01:8B01, Serial0/0/1
R   2001:DB8:1:11::/64 [120/3]
     via FE80::201:C9FF:FE01:8B01, Serial0/0/1
R   2001:DB8:1:28::/64 [120/2]
     via FE80::201:C9FF:FE01:8B01, Serial0/0/1
C   2001:DB8:1:29::/64 [0/0]
     via Serial0/0/1, directly connected
L   2001:DB8:1:29::1/128 [0/0]
     via Serial0/0/1, receive
C   2001:DB8:1:30::/64 [0/0]
     via GigabitEthernet0/0, directly connected
L   2001:DB8:1:30::1/128 [0/0]
     via GigabitEthernet0/0, receive
L   FF00::/8 [0/0]
     via Null0, receive
R3>
```

➢ Displaying IP Address Details of Routers

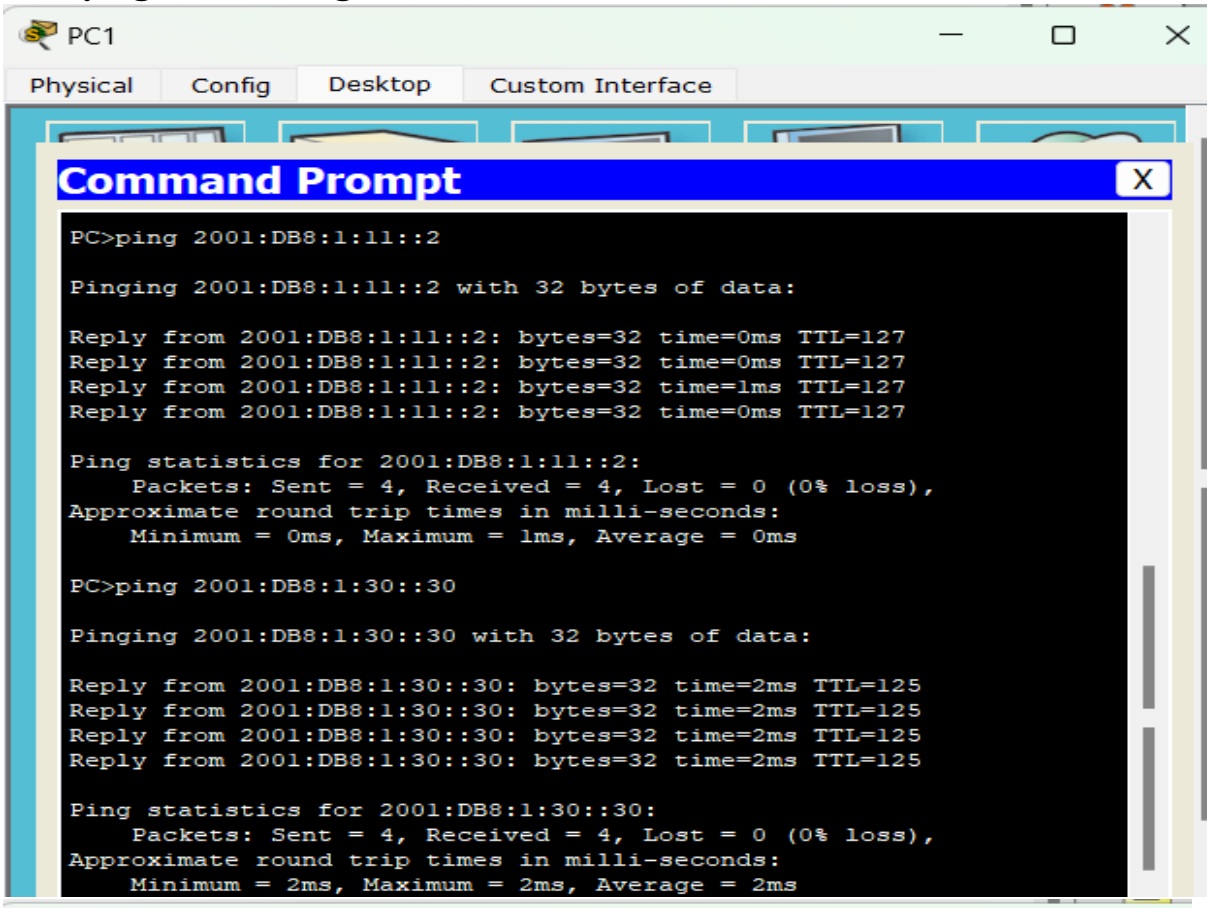


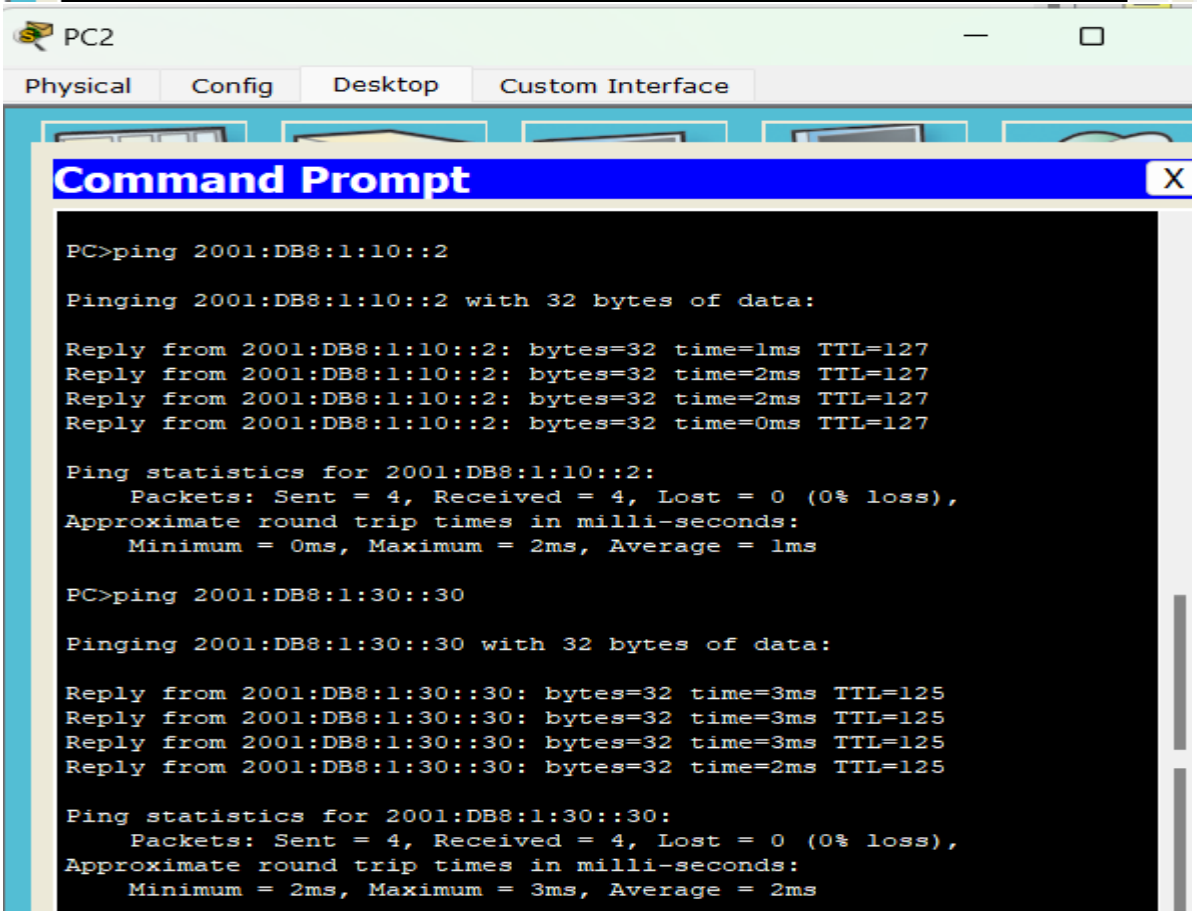


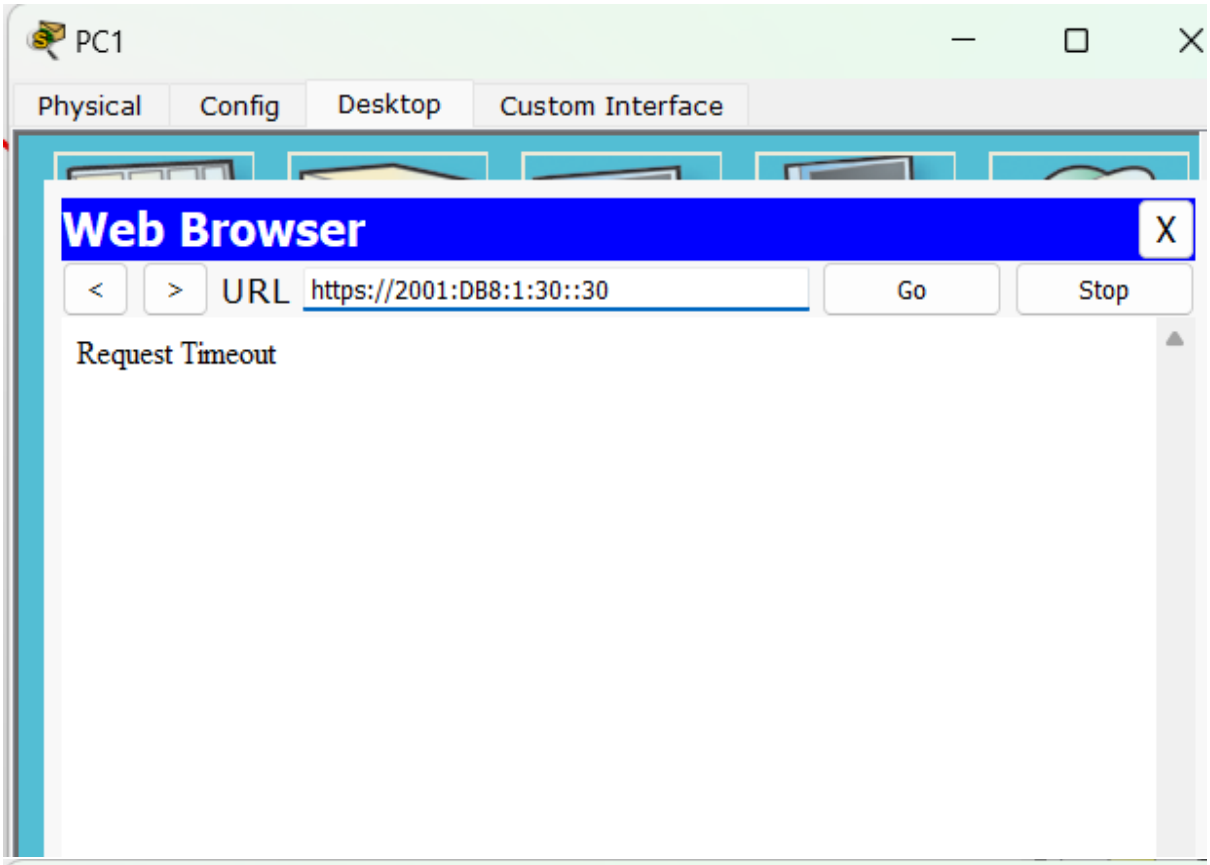


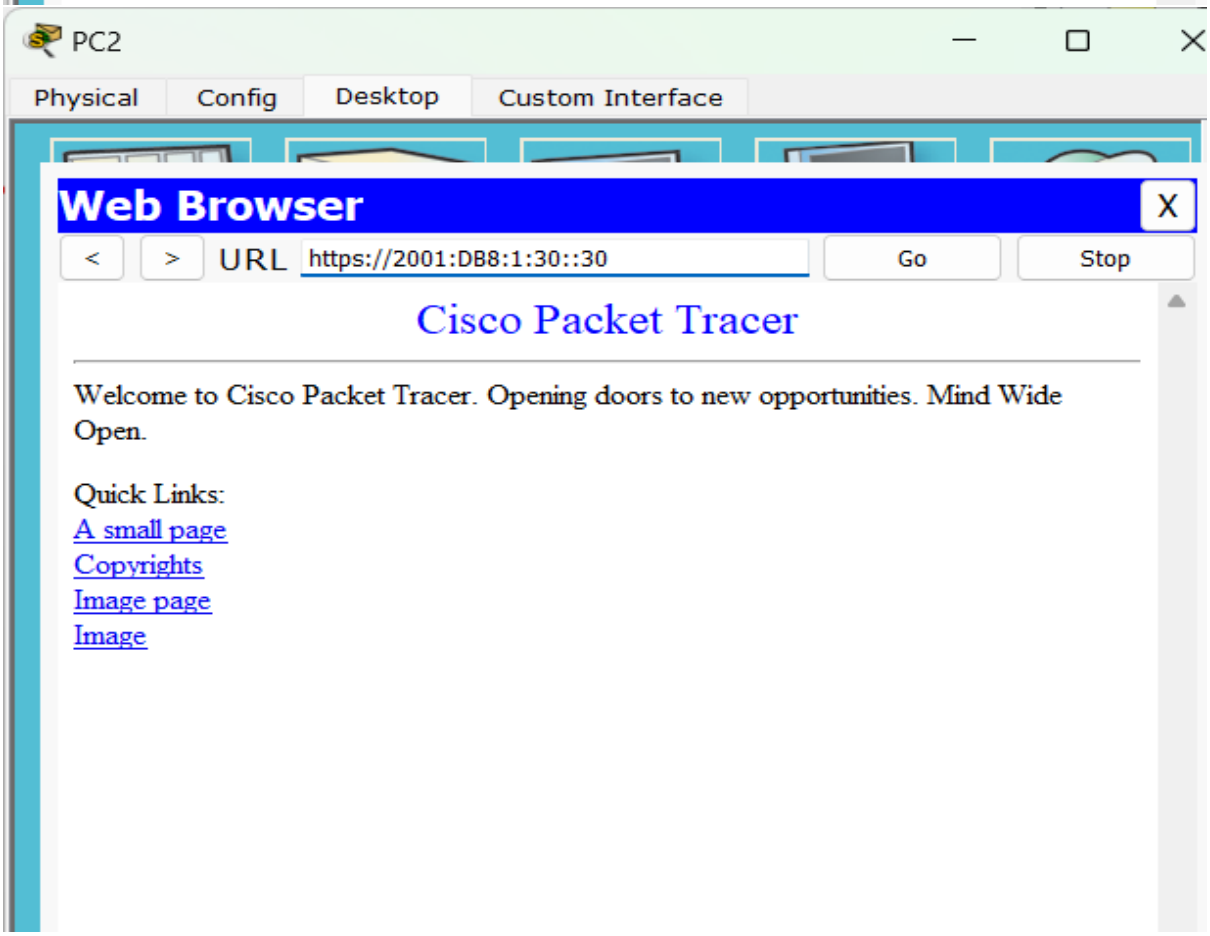
- **Configuring ACL**
  (Block HTTP and HTTPS access and Allow all other IPv6 traffic to pass)

- **Verifying the working of ACL**

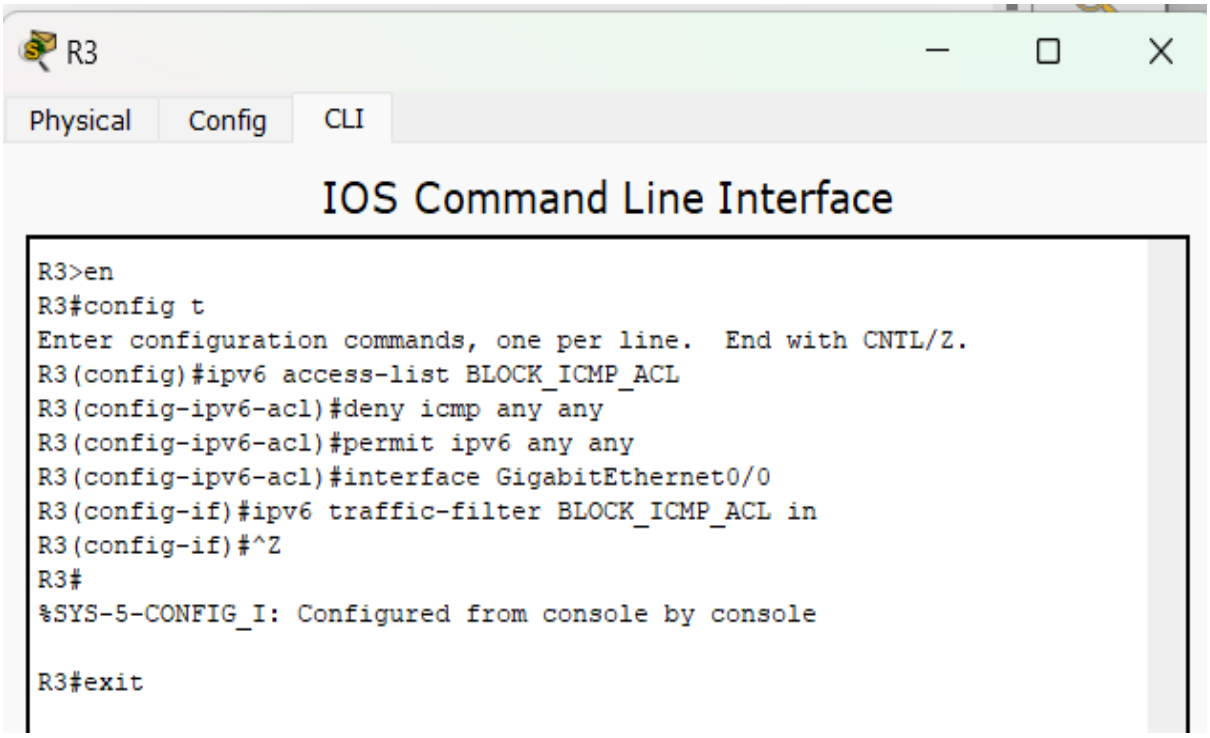




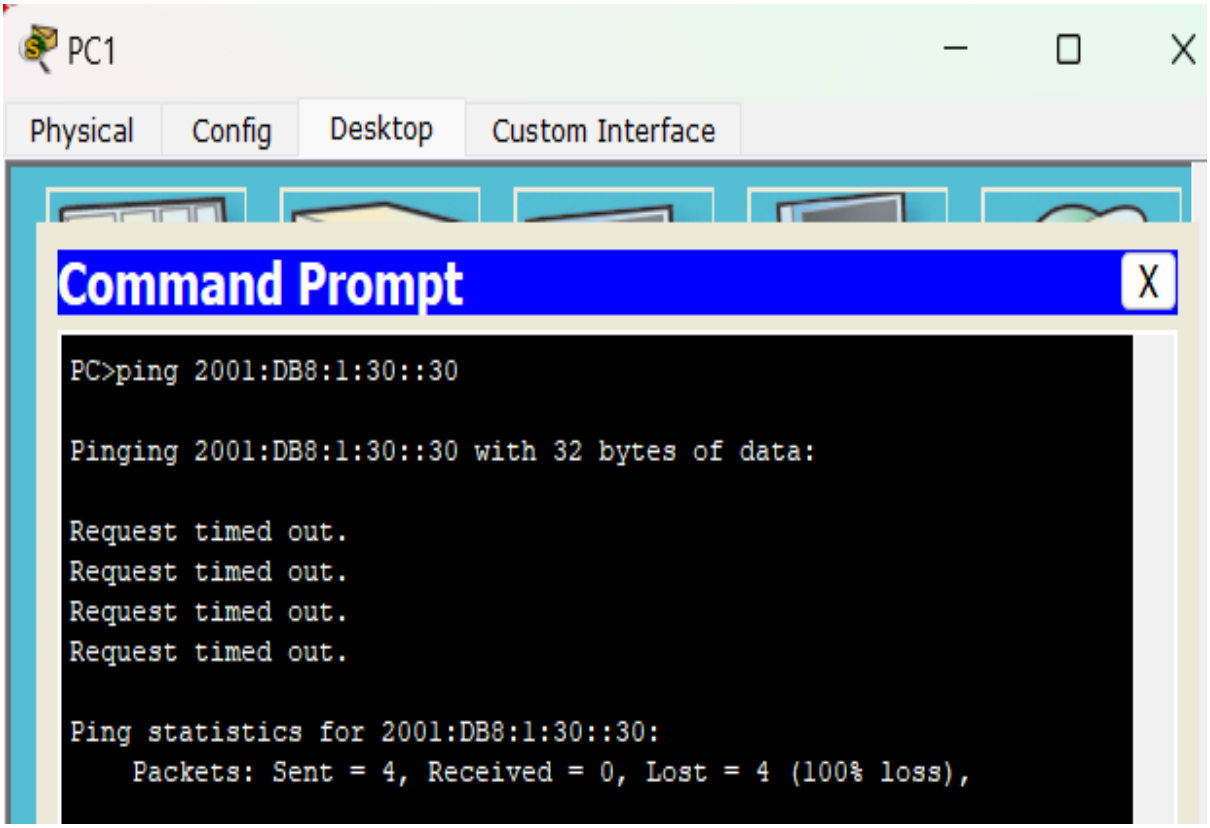

PC1
Physical
Config
Desktop
Custom Interface
Web Browser
X
<
>
URL
https://2001:DB8:1:30::30
Go
Stop
Request Timeout

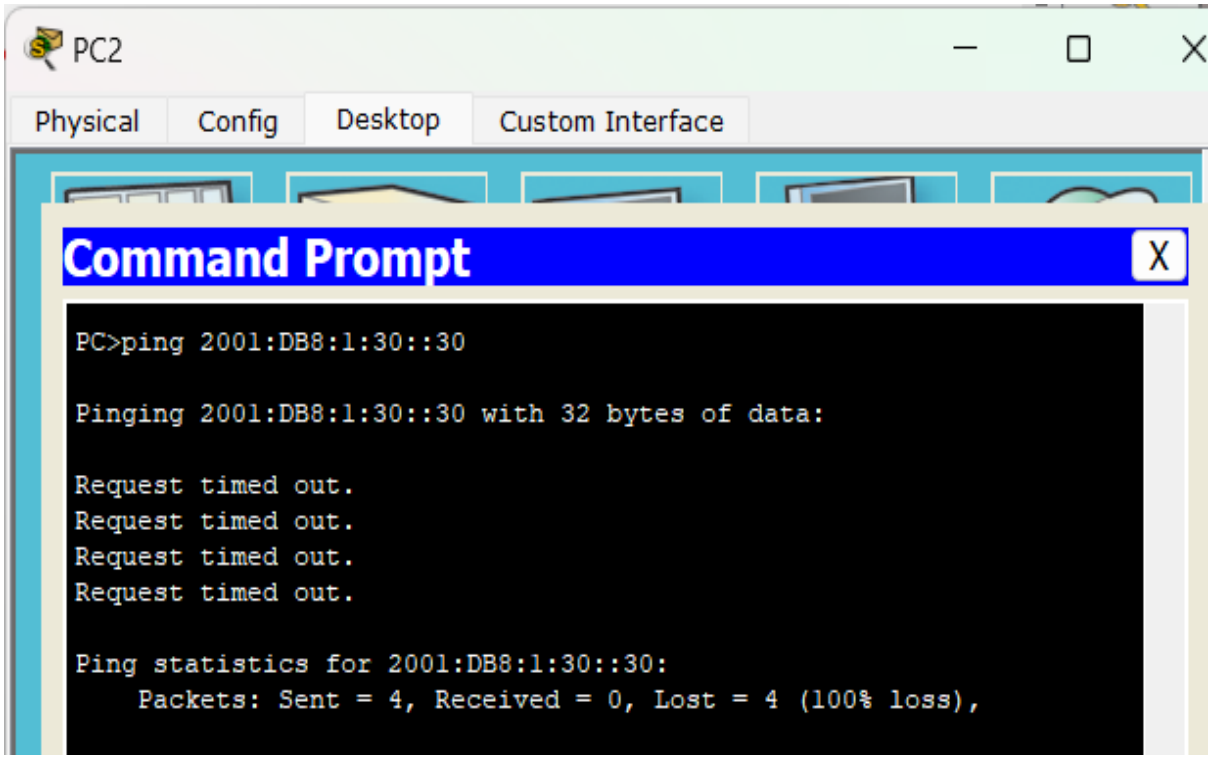

PC2
Physical
Config
Desktop
Custom Interface
Web Browser
X
<
>
URL
https://2001:DB8:1:30::30
Go
Stop
Cisco Packet Tracer
Welcome to Cisco Packet Tracer. Opening doors to new opportunities. Mind Wide Open.
Quick Links:
A small page
Copyrights
Image page
Image

- **Configuring ACL**
  (Block ICMP access and Allow all other IPv6 traffic to pass)



- **Verifying the working of ACL**




PC2
Physical
Config
Desktop
Custom Interface
Command Prompt
X
PC>ping 2001:DB8:1:30::30
Pinging 2001:DB8:1:30::30 with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Ping statistics for 2001:DB8:1:30::30:
Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),