COMPUTER NETWORK

SECTION 02

PROJECT (TASK 6)

LECTURER : Ms. Hazinah Kutty Mammi

GROUP NAME : NetSecret

GROUP MEMBERS :

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1.0 Updated Subnets and Devices addressing

Step 1 (Dividing portions):

172.16.00100000.00000000

Network portion - Host portion

Step2 (Borrow bits):

Network lab: $2^x = 32$, x = 6 bits (Since 32 addresses are not enough because we still need 2 address for network address and broadcast address)

General purpose lab: $2^x = 31$, x = 6 bits,

Computer Security lab: $2^x = 25$, x = 5 bits.

IOT lab: $2^x = 25$, x = 5 bits.

VC1: 2 hosts, $2^x = 4$, x = 3 bits.

VC2: 2 hosts, $2^x = 4$, x = 3 bits.

RTA-RTB: 2 hosts, $2^x = 4$, x = 2 bits.

RTC-RTB: 2 hosts, $2^x = 4$, x = 2 bits.

RTB-RTF: 2 hosts, $2^x = 4$, x = 2 bits.

RTB-ISP: 2 hosts, $2^x = 4$, x = 2 bits.

RTF-ISP: 2 hosts, $2^x = 4$, x = 2 bits.

RTF-RTD: 2 hosts, $2^x = 4$, x = 2 bits.

RTF-RTE: 2 hosts, $2^x = 4$, x = 2 bits.

Staff Rooms(Floor 1) : 6 hosts, $2^x = 6$, x = 3 bits.

Staff Rooms(Floor 2) : 6 hosts, $2^x = 6$, x = 3 bits.

DNS Server: 2 hosts, $2^x = 4$, x = 2 bits.

Step 3 (Borrow bits):

S#0 (Network Lab):

172.16.00100000.00000000 [32.0] NA

172.16.00100000.00111111 [32.63] BA

S#1 (General Purpose lab):

172.16.00100000.01000000 [32.64] NA

172.16.00100000.01111111 [32.127] BA

S#2 (IOT Lab):

172.16.00100000.10000000 [32.128] NA

172.16.00100000.10011111 [32.159] BA

S#3 (Computer Security Lab):

172.16.00100000.10100000 [32.160] NA

172.16.00100000.10111111 [32.191] BA

S#4 (VC1):

172.16.00100000.11000000 [32.192] NA

172.16.00100000.11000111 [32.199] BA

S#5 (VC2):

172.16.00100000.11001000 [32.200] NA

172.16.00100000.11001111 [32.207] BA

S#6 (RTA-RTB):

172.16.00100000.11010000 [32.208] NA

172.16.00100000.11010011 [32.211] BA

S#7 (RTC-RTB):

172.16.00100000.11010100 [32.212] NA

172.16.00100000.11010111 [32.215] BA

S#8 (RTB-RTF):

172.16.00100000.11011000 [32.216] NA

172.16.00100000.11011011 [32.219] BA

S#9 (RTB-ISP):

172.16.00100000.11011100 [32.220] NA

172.16.00100000.11011111 [32.223] BA

S#10 (RTF-ISP):

172.16.00100000.11100000 [32.224] NA

172.16.00100000.11100011 [32.227] BA

S#11 (RTF-RTD):

172.16.00100000.11100100 [32.228] NA

172.16.00100000.11100111 [32.231] BA

S#12 (RTF-RTE):

172.16.00100000.11101000 [32.232] NA

172.16.00100000.11101011 [32.235] BA

S#13 (SRf1):

172.16.00100000.11110000 [32.240] NA

172.16.00100000.11110111 [32.247] BA

S#14 (SRf2):

172.16.00100000.11111000 [32.248] NA

172.16.00100000.11111111 [32.255] BA

S#15 (DNS Server):

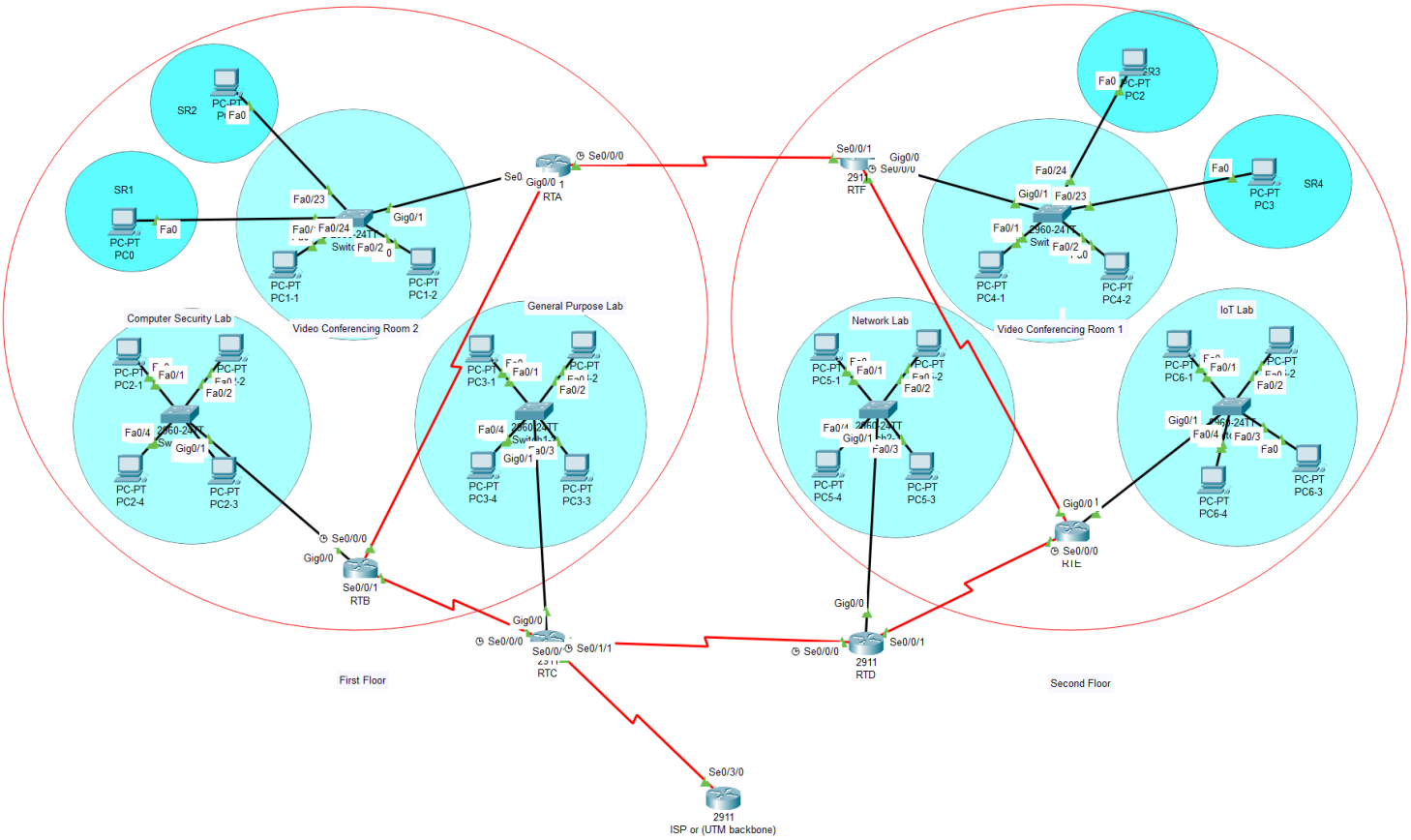
172.16.00100001.00000000 [33.0] NA

172.16.00100000.00000011 [33.3] BA

SUBNET	NETWORK ADDRESS	BROADCAST ADDRESS	USABLE ADD. RANGE	NUMBER OF USABLE IP ADDRESSES	SUBNET MASK
0	172.16.32.0	172.16.32.63	172.16.32.1 - 172.16.32.62	62	255.255.255.192
1	172.16.32.64	172.16.32.127	172.16.32.65 - 172.16.32.126	62	255.255.255.192
2	172.16.32.128	172.16.32.159	172.16.32.129 - 172.16.32.158	30	255.255.255.224
3	172.16.32.160	172.16.32.191	172.16.32.161 - 172.16.32.190	30	255.255.255.224
4	172.16.32.192	172.16.32.199	172.16.32.193 - 172.16.32.198	6	255.255.255.248
5	172.16.32.200	172.16.32.207	172.16.32.201 - 172.16.32.206	6	255.255.255.248
6	172.16.32.208	172.16.32.211	172.16.32.209 - 172.16.32.210	2	255.255.255.252
7	172.16.32.212	172.16.32.215	172.16.32.213 - 172.16.32.214	2	255.255.255.252
8	172.16.32.216	172.16.32.219	172.16.32.217 - 172.16.32.218	2	255.255.255.252
9	172.16.32.220	172.16.32.223	172.16.32.221 - 172.16.32.222	2	255.255.255.252

10	172.16.32.224	172.16.32.227	172.16.32.225 - 172.16.32.226	2	255.255.255.252
11	172.16.32.228	172.16.32.231	172.16.32.229 - 172.16.32.230	2	255.255.255.252
12	172.16.32.232	172.16.32.235	172.16.32.233 - 172.16.32.234	2	255.255.255.252
13	172.16.32.240	172.16.32.247	172.16.32.241- 172.16.32.246	6	255.255.255.248
14	172.16.32.248	172.16.32.255	172.16.32.249- 172.16.32.254	6	255.255.255.248
15	172.16.33.0	172.16.33.3	172.16.33.1- 172.16.33.2	2	255.255.255.252

Updated Topology



In our Topology we've used RTD as DHCPv4 server, thus both its interfaces work as helpers for other relay agents inside the topology.

Configurations on implementing DHCPV4 server

Network Lab :

```
Router(config)#ip dhcp excluded-address 172.16.32.5
Router(config)#ip dhc
Router(config)#ip dhcp pool Network-LAB
Router(dhcp-config)#network 172.16.32.0 255.255.255.192
Router(dhcp-config)#defa
Router(dhcp-config)#default-router 172.16.32.5
```

IOT Lab:

```
Router(config)#ip dhcp excluded-address 172.16.32.133
Router(config)#ip dhcp pool IoT-LAB
Router(dhcp-config)#network 172.16.32.128 255.255.255.224
Router(dhcp-config)#def
Router(dhcp-config)#default-router 172.16.32.133
```

VC1 and SRF2

```
Router(config)#ip dhcp excluded-address 172.16.32.195
Router(config)#ip dhcp excluded-address 172.16.32.249
Router(config)#ip dhcp pool VC1
Router(dhcp-config)#network 172.16.32.192 255.255.255.248
Router(dhcp-config)#def
Router(dhcp-config)#default-router 172.16.32.195
Router(dhcp-config)#exit
Router(config)#ip dhcp pool SRF2
Router(dhcp-config)#network 172.16.32.248 255.255.255.248
Router(dhcp-config)#def
Router(dhcp-config)#default-router 172.16.32.249
Router(dhcp-config)#exit
```

General Lab:

```
Router(config)#ip dhcp excluded-address 172.16.32.69
Router(config)#ip dhcp pool GENERAL-LAB
Router(dhcp-config)#network 172.16.32.64 255.255.255.192
Router(dhcp-config)#def
Router(dhcp-config)#default-router 172.16.32.69
```

Computer Security Lab:

```
Router(config)#ip dhcp excluded-address 172.16.32.165
Router(config)#ip dhc
Router(config)#ip dhcp pool COMPSECURITY-LAB
Router(dhcp-config)#network 172.16.32.160 255.255.255.224
Router(dhcp-config)#def
Router(dhcp-config)#default-router 172.16.32.165
```

VC2 and SRF1:

```
Router(config)#ip dhcp excluded-address 172.16.32.203
Router(config)#ip dhcp excluded-address 172.16.32.241
Router(config)#ip dh
Router(config)#ip dhcp pool VC2
Router(dhcp-config)#network 172.16.32.200 255.255.255.248
Router(dhcp-config)#def
Router(dhcp-config)#default-router 172.16.32.203
Router(dhcp-config)#exit
Router(config)#ip dh
Router(config)#ip dhcp pool SRF1
Router(dhcp-config)#network 172.16.32.240 255.255.255.248
Router(dhcp-config)#defa
Router(dhcp-config)#default-router 172.16.32.241
Router(dhcp-config)#
```

Configuring the relay agent

RTA:

```
Router(config)#int gig0/0
Router(config-if)#ip helper
Router(config-if)#ip helper-address 172.16.32.217
Router(config-if)#exit
Router(config)#int gig0/0.12
Router(config-subif)#ip helper-address 172.16.32.217
Router(config-subif)#exit
Router(config)#int gig0/0.99
Router(config-subif)#ip helper-address 172.16.32.217
Router(config-subif)#
```

RTB:

```
Router(config)#int gig0/0
Router(config-if)#
Router(config-if)#ip helper
Router(config-if)#ip helper-address 172.16.32.217
Router(config-if)#exit
Router(config)#int gig0/0.10
Router(config-subif)#ip helper
Router(config-subif)#ip helper-address 172.16.32.217
Router(config-subif)#
```

RTC:

```
Router(config)#int gig0/0
Router(config-if)#ip helper
Router(config-if)#ip helper-address 172.16.32.217
Router(config-if)#exit
Router(config)#int gig0/0.13
Router(config-subif)#ip helper
Router(config-subif)#ip helper-address 172.16.32.217
Router(config-subif)#
```

RTF:

```
Router(config)#int gig0/0
Router(config-if)#ip helper-ad
Router(config-if)#ip helper-address 172.16.32.222
Router(config-if)#exit
Router(config)#int gig0/0.12
Router(config-subif)#ip helper
Router(config-subif)#ip helper-address 172.16.32.222
Router(config-subif)#exit
Router(config)#int gig0/0.99
Router(config-subif)#ip helper
Router(config-subif)#ip helper-address 172.16.32.222
Router(config-subif)#
```

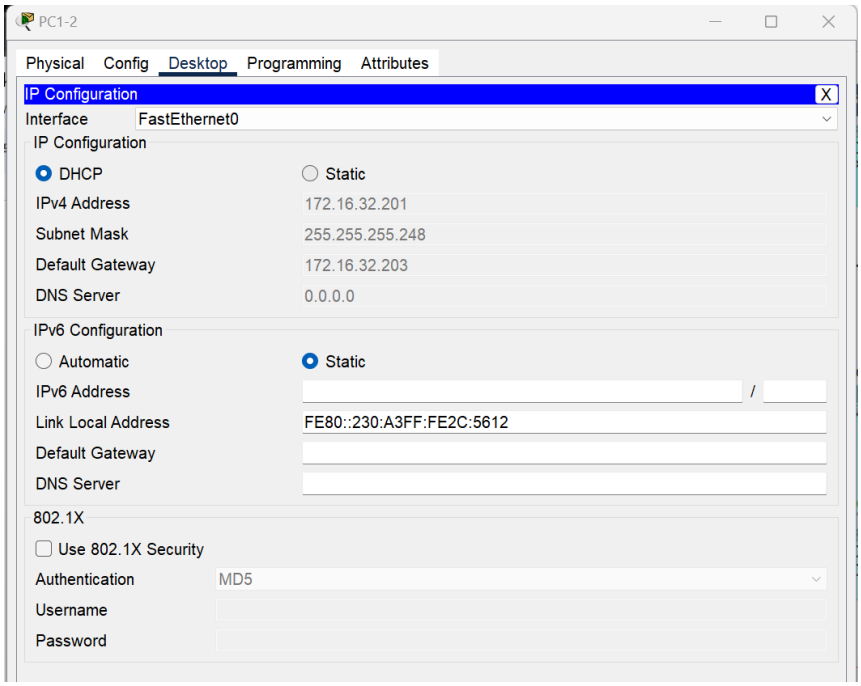
RTE:

```
Router(config)#int gig0/0
Router(config-if)#ip helper 172.16.32.222
Router(config-if)#exit
Router(config)#int gig0/0.14
Router(config-subif)#ip helper-ad
Router(config-subif)#ip helper-address 172.16.32.222
Router(config-subif)#exit
Router(config)#int gig0/0
Router(config-if)#ip helper-address 172.16.32.222
Router(config-if)#
Router(config-if)#
```

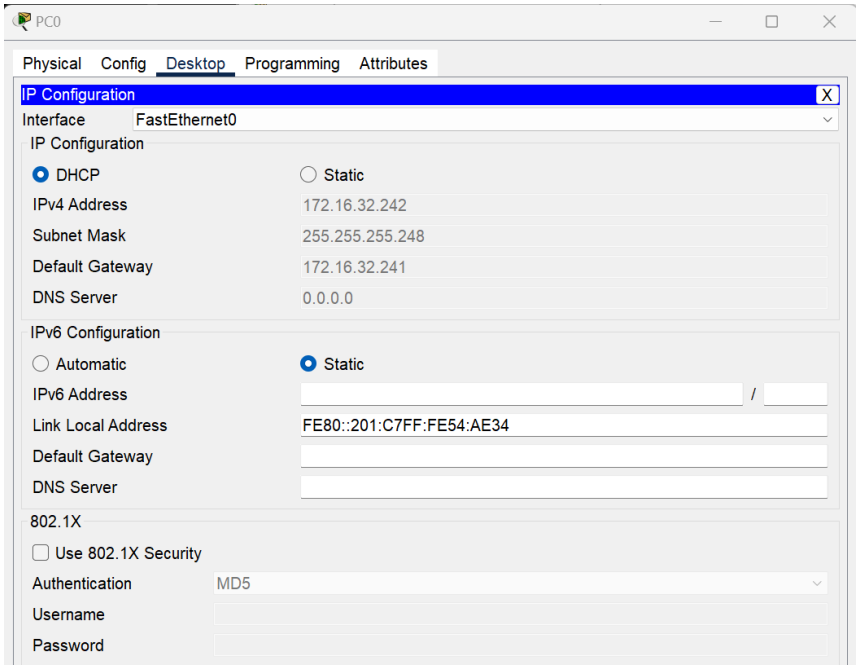
DHCP Request

RTA:

1. VC2_PC1-2

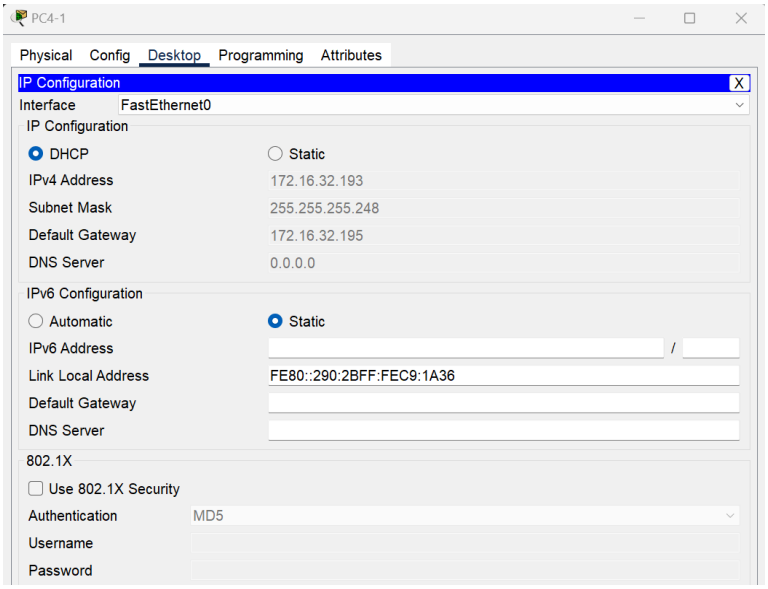


2. SR1_PC1

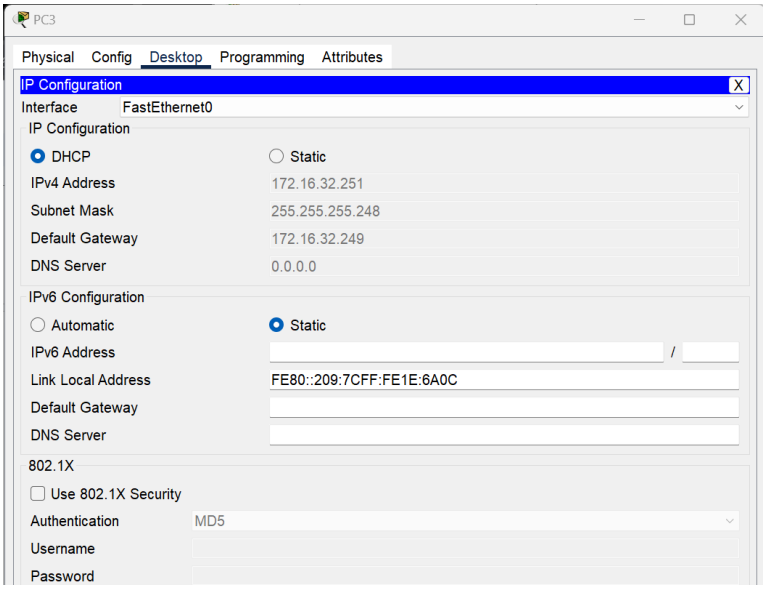


RTF:

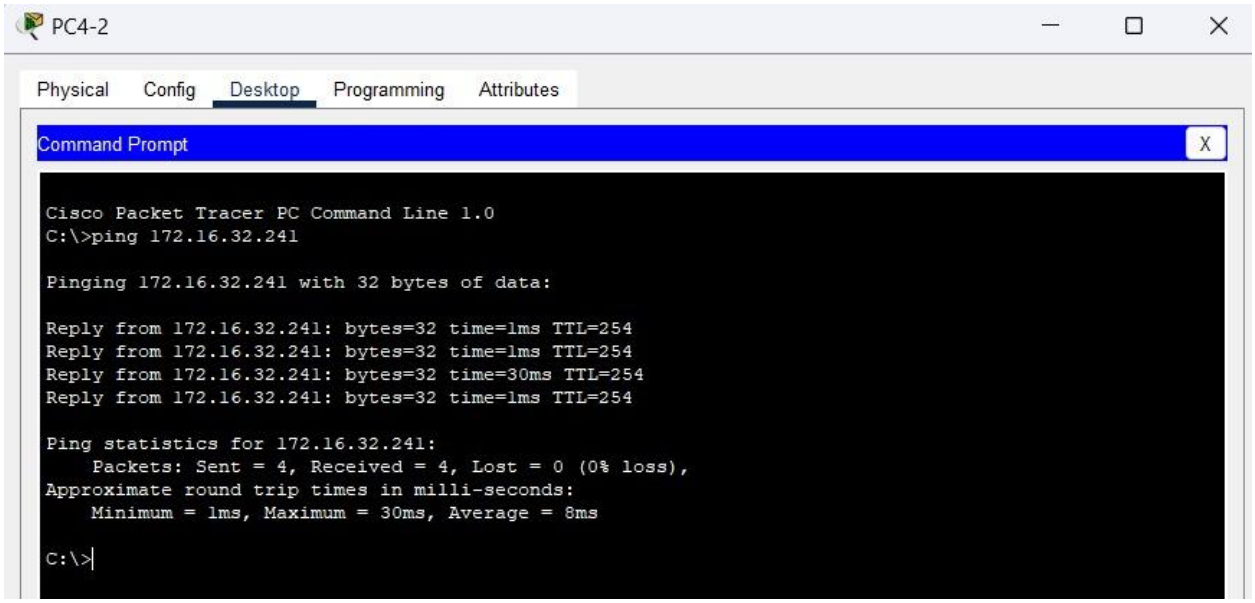
1. VC2_PC4-1

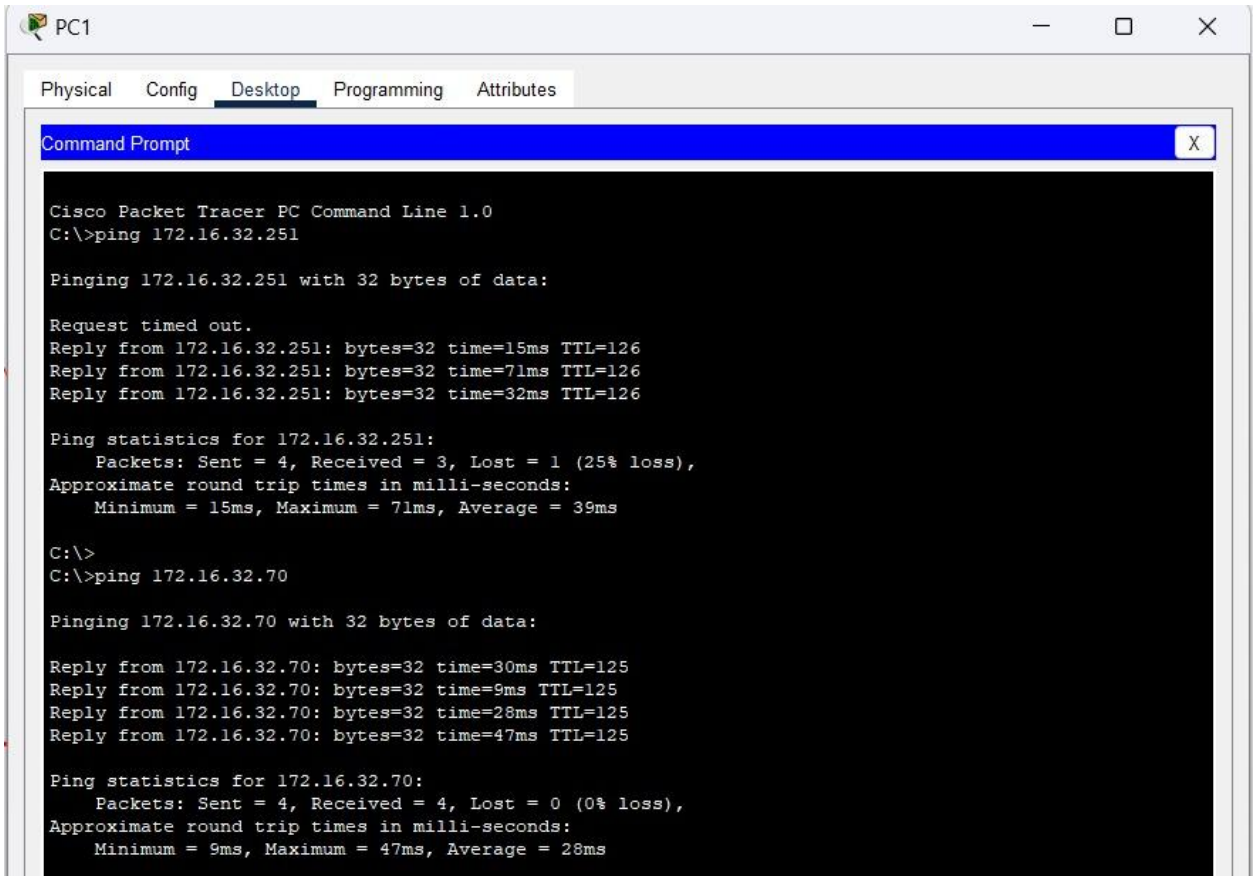


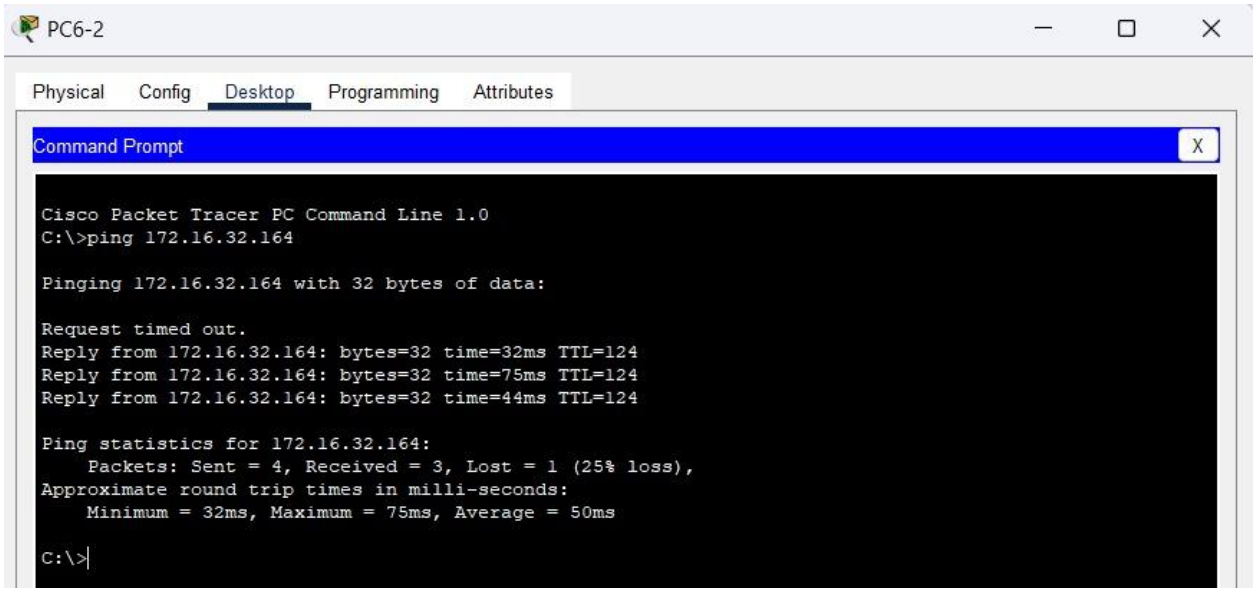
2. SR4_PC3



END TO END CONNECTIVITY






PC6-2
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 172.16.32.164
Pinging 172.16.32.164 with 32 bytes of data:
Request timed out.
Reply from 172.16.32.164: bytes=32 time=32ms TTL=124
Reply from 172.16.32.164: bytes=32 time=75ms TTL=124
Reply from 172.16.32.164: bytes=32 time=44ms TTL=124
Ping statistics for 172.16.32.164:
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
Minimum = 32ms, Maximum = 75ms, Average = 50ms
C:\>

APPENDIX

MEETING MINUTES

MEETING 1

DATE	23 June 2023
TIME	2:00 PM - 4:00 PM
VENUE	Google meet
OBJECTIVE	1. Read the task 5 questions and understand the needs. 2. Update the topology by adding staff rooms. 3. Update the addressing table and subnetting calculations. 4. Distribute each lab for each member to update.
ATTENDANCE	4 / 4