

CSE 5004

COMPUTER NETWORKS



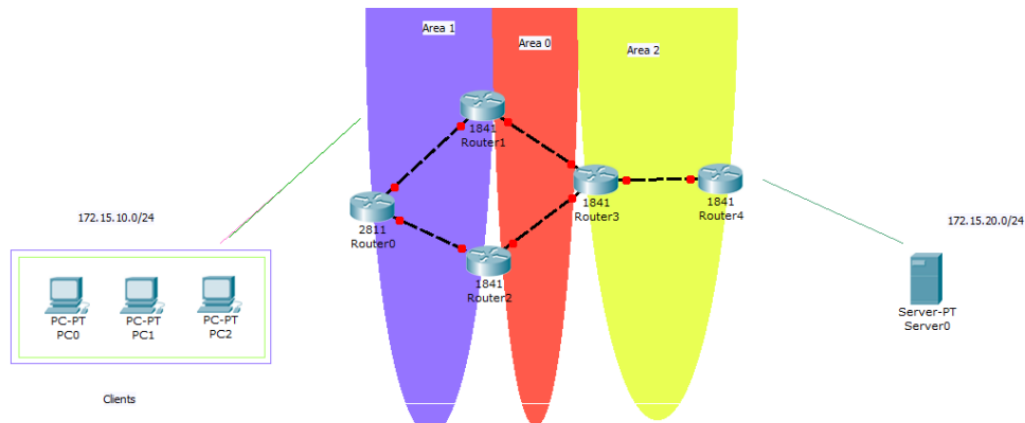
Assessment – 2

L1+L2 | SJT418
WINTER SEMESTER 2020-21

by

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19BCE2105

Question

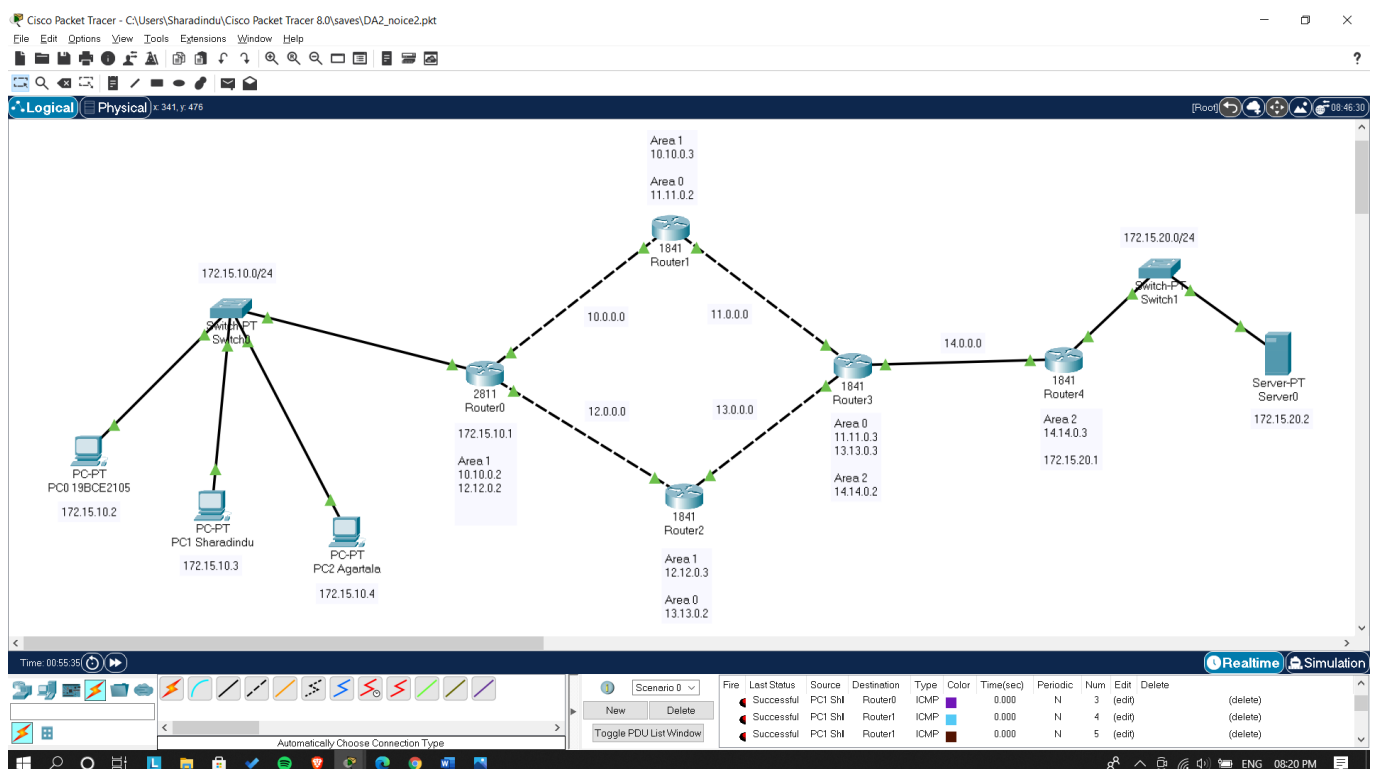


- Enable OSPF on all routers
- Enable area 0 on router 1,2 & 3
- Enable area 1 on router 0,1 & 2
- Enable area 2 on router 3 & 4
- Verify the neighbour routing on all routers
- Verify that the clients can successfully access the server.
- Rename the client name as given below.

PC Name 1 :- Your Reg.No; **PC Name 2:-** Your Name; **PC Name 3:-** Your location

- Assume the router ip address and assign PC & server ip address as per given in above figure.

Solution



a) Enable OSPF on all routers

after enabling:

```
Router>show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
11.11.0.2	1	FULL/BDR	00:00:32	10.10.0.3	FastEthernet0/1
13.13.0.2	1	FULL/BDR	00:00:30	12.12.0.3	FastEthernet1/0

```
Router>
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

```
Router#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
172.15.10.1	1	FULL/DR	00:00:35	10.10.0.2	FastEthernet0/0
13.13.0.3	1	FULL/DR	00:00:38	11.11.0.3	FastEthernet0/1

```
Router#
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

```
Router#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
172.15.10.1	1	FULL/DR	00:00:32	12.12.0.2	FastEthernet0/1
13.13.0.3	1	FULL/DR	00:00:39	13.13.0.3	FastEthernet0/0

```
Router#
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

```
Router#show ip ospf neighbor
```

Neighbor ID	Pri	State	Dead Time	Address	Interface
13.13.0.2	1	FULL/BDR	00:00:30	13.13.0.2	FastEthernet0/1
11.11.0.2	1	FULL/BDR	00:00:38	11.11.0.2	FastEthernet0/0

```
Router#
```

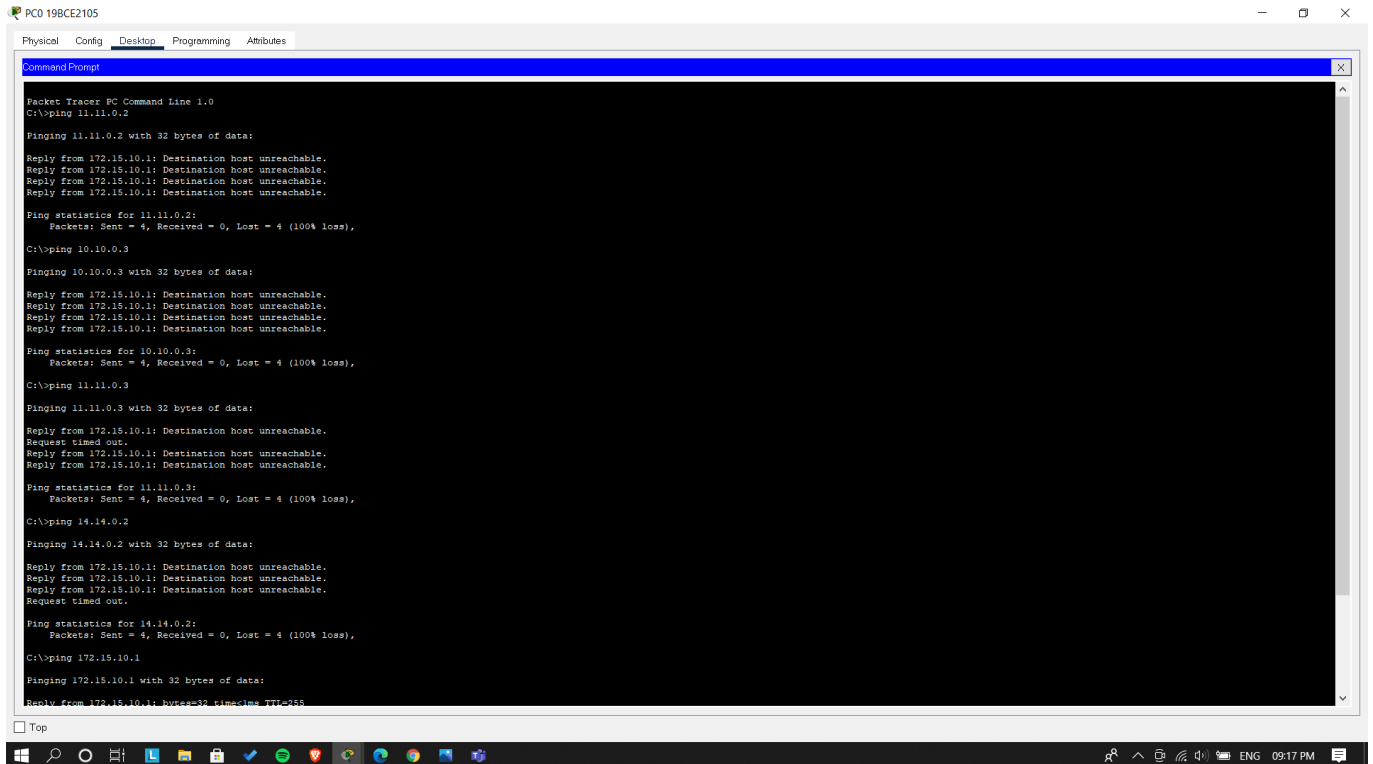
Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

Since for all PCs the input IPs and processes are similar, snaps of ping command performed from 1 PC are enclosed to keep everything clusterfree:

before OSPF:



```
PC0 19BCE2105
Physical Config Desktop Programming Attributes
Command Prompt
Packet Tracer PC Command Line 1.0
C:\>ping 11.11.0.2

Pinging 11.11.0.2 with 32 bytes of data:

Reply from 172.15.10.1: Destination host unreachable.
Reply from 172.15.10.1: Destination host unreachable.
Reply from 172.15.10.1: Destination host unreachable.
Reply from 172.15.10.1: Destination host unreachable.

Ping statistics for 11.11.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 10.10.0.3

Pinging 10.10.0.3 with 32 bytes of data:

Reply from 172.15.10.1: Destination host unreachable.
Reply from 172.15.10.1: Destination host unreachable.
Reply from 172.15.10.1: Destination host unreachable.
Reply from 172.15.10.1: Destination host unreachable.

Ping statistics for 10.10.0.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 11.11.0.3

Pinging 11.11.0.3 with 32 bytes of data:

Reply from 172.15.10.1: Destination host unreachable.
Request timed out.
Reply from 172.15.10.1: Destination host unreachable.
Reply from 172.15.10.1: Destination host unreachable.

Ping statistics for 11.11.0.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 14.14.0.2

Pinging 14.14.0.2 with 32 bytes of data:

Reply from 172.15.10.1: Destination host unreachable.
Reply from 172.15.10.1: Destination host unreachable.
Reply from 172.15.10.1: Destination host unreachable.
Request timed out.

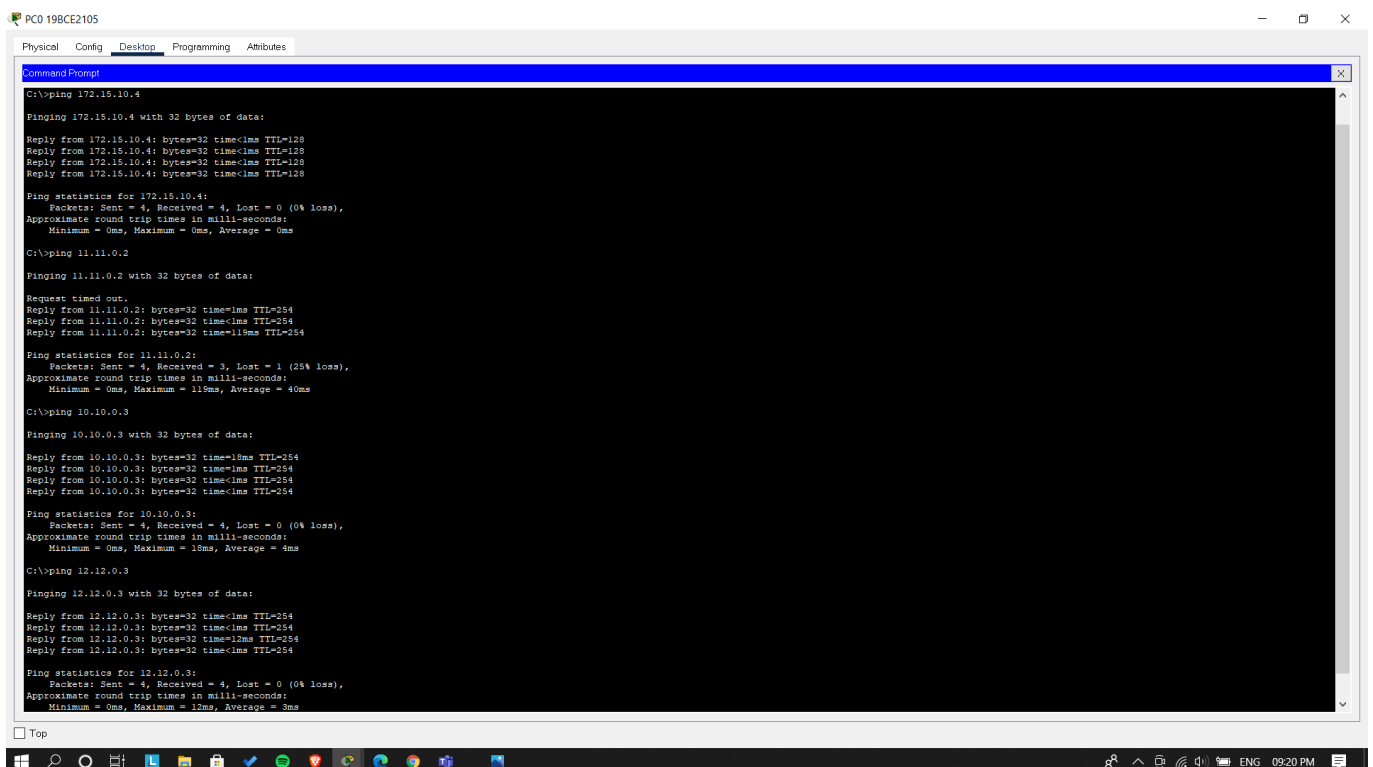
Ping statistics for 14.14.0.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 172.15.10.1

Pinging 172.15.10.1 with 32 bytes of data:

Reply from 172.15.10.1: bytes=32 time=0ms TTL=255
```

after OSPF:



```
PC0 19BCE2105
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 172.15.10.4

Pinging 172.15.10.4 with 32 bytes of data:

Reply from 172.15.10.4: bytes=32 time=0ms TTL=128
Reply from 172.15.10.4: bytes=32 time=0ms TTL=128
Reply from 172.15.10.4: bytes=32 time=0ms TTL=128
Reply from 172.15.10.4: bytes=32 time=0ms TTL=128

Ping statistics for 172.15.10.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 11.11.0.2

Pinging 11.11.0.2 with 32 bytes of data:

Request timed out.
Reply from 11.11.0.2: bytes=32 time=1ms TTL=254
Reply from 11.11.0.2: bytes=32 time=1ms TTL=254
Reply from 11.11.0.2: bytes=32 time=19ms TTL=254

Ping statistics for 11.11.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 19ms, Average = 40ms

C:\>ping 10.10.0.3

Pinging 10.10.0.3 with 32 bytes of data:

Reply from 10.10.0.3: bytes=32 time=1ms TTL=254
Reply from 10.10.0.3: bytes=32 time=1ms TTL=254
Reply from 10.10.0.3: bytes=32 time=1ms TTL=254
Reply from 10.10.0.3: bytes=32 time=1ms TTL=254

Ping statistics for 10.10.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 18ms, Average = 4ms

C:\>ping 12.12.0.3

Pinging 12.12.0.3 with 32 bytes of data:

Reply from 12.12.0.3: bytes=32 time=0ms TTL=254
Reply from 12.12.0.3: bytes=32 time=0ms TTL=254
Reply from 12.12.0.3: bytes=32 time=12ms TTL=254
Reply from 12.12.0.3: bytes=32 time=1ms TTL=254

Ping statistics for 12.12.0.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 12ms, Average = 3ms
```

Router configurations

Router0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Serial0/3/0

FastEthernet1/0

FastEthernet1/1

FastEthernet0/0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0030.A3C4.E301

IP Configuration

IPv4 Address 172.15.10.1

Subnet Mask 255.255.0.0

Tx Ring Limit 10

Router0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Serial0/3/0

FastEthernet1/0

FastEthernet1/1

FastEthernet0/1

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0030.A3C4.E302

IP Configuration

IPv4 Address 10.10.0.2

Subnet Mask 255.0.0.0

Tx Ring Limit 10

Router0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

Serial0/3/0

FastEthernet1/0

FastEthernet1/1

FastEthernet1/0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0001.9772.AB01

IP Configuration

IPv4 Address 12.12.0.2

Subnet Mask 255.0.0.0

Tx Ring Limit 10

Router1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

FastEthernet0/0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 000A.4178.8401

IP Configuration

IPv4 Address 10.10.0.3

Subnet Mask 255.0.0.0

Tx Ring Limit 10

Router1

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

FastEthernet0/1

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 000A.4178.8402

IP Configuration

IPv4 Address 11.11.0.2

Subnet Mask 255.0.0.0

Tx Ring Limit 10

Router2

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

FastEthernet0/0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00E0.A3EA.E301

IP Configuration

IPv4 Address 13.13.0.2

Subnet Mask 255.0.0.0

Tx Ring Limit 10

Router2

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/0

FastEthernet0/1

FastEthernet0/1

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00E0.A3EA.E302

IP Configuration

IPv4 Address 12.12.0.3

Subnet Mask 255.0.0.0

Tx Ring Limit 10

The image displays four screenshots of network configuration windows for Router3 and Router4, showing settings for various interfaces.

Router3 - FastEthernet0/0

- GLOBAL**
 - Settings
 - Port Status: ☒ On
 - Bandwidth: ☐ 100 Mbps ☐ 10 Mbps ☒ Auto
 - Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
 - MAC Address: 000B.BEA4.3E01
 - ROUTING
 - Static
 - RIP
 - SWITCHING
 - VLAN Database
 - INTERFACE
 - FastEthernet0/0
 - IP Configuration
 - IPv4 Address: 11.11.0.3
 - Subnet Mask: 255.0.0.0
 - Tx Ring Limit: 10

Router3 - FastEthernet0/1

- GLOBAL**
 - Settings
 - Port Status: ☒ On
 - Bandwidth: ☐ 100 Mbps ☐ 10 Mbps ☒ Auto
 - Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
 - MAC Address: 000B.BEA4.3E02
 - ROUTING
 - Static
 - RIP
 - SWITCHING
 - VLAN Database
 - INTERFACE
 - FastEthernet0/1
 - IP Configuration
 - IPv4 Address: 13.13.0.3
 - Subnet Mask: 255.0.0.0
 - Tx Ring Limit: 10

Router3 - FastEthernet0/0/0

- GLOBAL**
 - Settings
 - Port Status: ☒ On
 - Bandwidth: ☐ 100 Mbps ☐ 10 Mbps ☒ Auto
 - Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
 - ROUTING
 - Static
 - RIP
 - SWITCHING
 - VLAN Database
 - INTERFACE
 - FastEthernet0/0/0
 - Access: VLAN: 1
 - Tx Ring Limit: 10

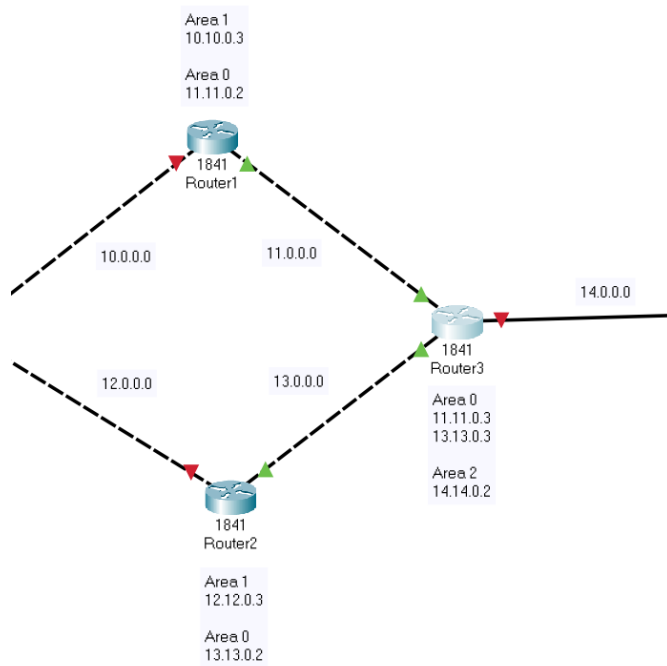
Router4 - FastEthernet0/0

- GLOBAL**
 - Settings
 - Port Status: ☒ On
 - Bandwidth: ☐ 100 Mbps ☐ 10 Mbps ☒ Auto
 - Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
 - MAC Address: 0060.5CE3.1D01
 - ROUTING
 - Static
 - RIP
 - SWITCHING
 - VLAN Database
 - INTERFACE
 - FastEthernet0/0
 - IP Configuration
 - IPv4 Address: 172.15.20.1
 - Subnet Mask: 255.255.0.0
 - Tx Ring Limit: 10

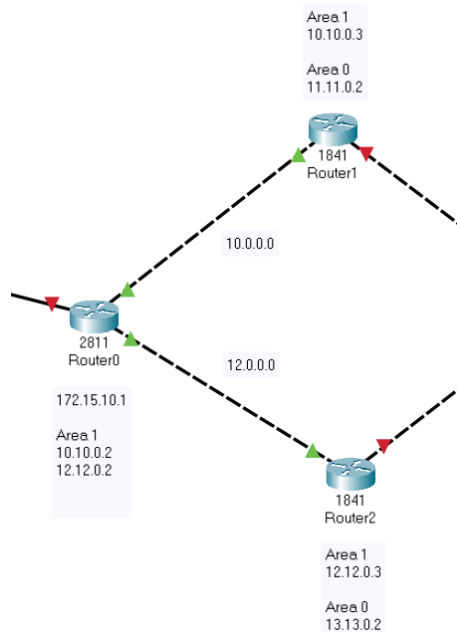
Router4 - FastEthernet0/1

- GLOBAL**
 - Settings
 - Port Status: ☒ On
 - Bandwidth: ☐ 100 Mbps ☐ 10 Mbps ☒ Auto
 - Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
 - MAC Address: 0060.5CE3.1D02
 - ROUTING
 - Static
 - RIP
 - SWITCHING
 - VLAN Database
 - INTERFACE
 - FastEthernet0/1
 - IP Configuration
 - IPv4 Address: 14.14.0.3
 - Subnet Mask: 255.0.0.0
 - Tx Ring Limit: 10

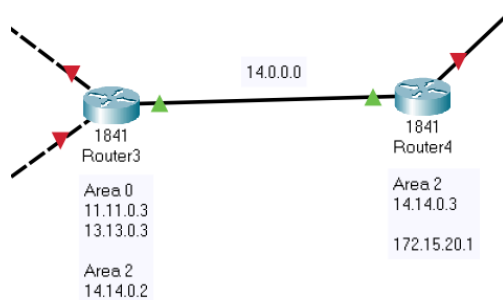
b) Enable area 0 on routers 1, 2 & 3



c) Enable area 1 on routers 0, 1 & 2



d) Enable area 2 on routers 3 & 4



e) Verify the neighbour routing on all routers

The following tables represent the CLI output from the four router windows shown in the image.

Router0 CLI Output:

```

Router>en
Router#ping 10.10.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.0.3, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router#ping 12.12.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 12.12.0.3, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router#

```

Router1 CLI Output:

```

Router>en
Router#ping 10.10.0.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.10.0.2, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/17/88 ms

Router#ping 11.11.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 11.11.0.3, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router#

```

Router2 CLI Output:

```

Router>en
Router#ping 12.12.0.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 12.12.0.2, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router#ping 13.13.0.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 13.13.0.3, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router#

```

Router3 CLI Output:

```

Router>en
Router#ping 11.11.0.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 11.11.0.2, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

Router#ping 13.13.0.2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 13.13.0.2, timeout is 2 seconds:
!!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms

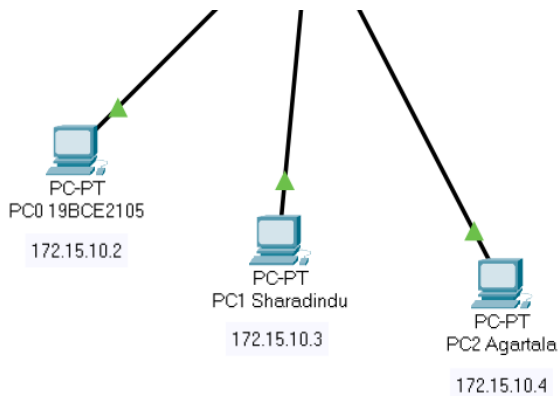
Router#

```

f) Verify that the clients can successfully access the server

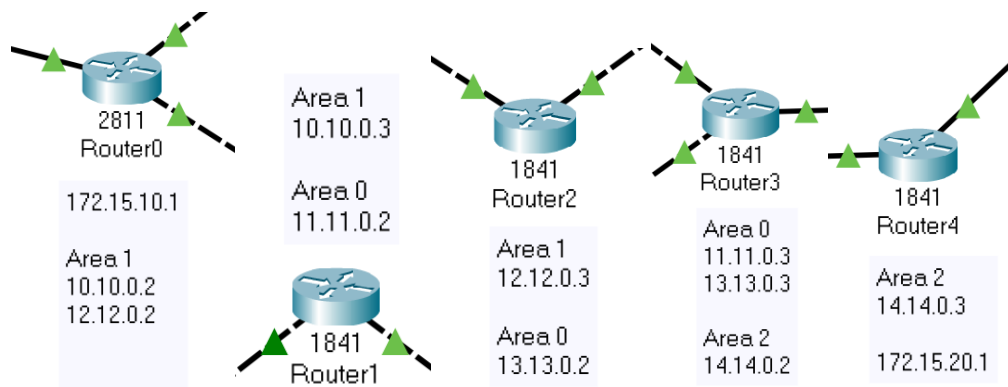
Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
●	Successful	PC0 19BCE2105	Router0	ICMP	Green	0.000	N	18	(edit)	(delete)
●	Successful	PC1 Sharadindu	Router1	ICMP	Blue	0.000	N	19	(edit)	(delete)
●	Successful	PC2 Agartala	Router2	ICMP	Green	0.000	N	20	(edit)	(delete)
●	Successful	PC1 Sharadindu	Router3	ICMP	Blue	0.000	N	21	(edit)	(delete)
●	Successful	PC0 19BCE2105	Router2	ICMP	Red	0.000	N	22	(edit)	(delete)
●	Successful	PC1 Sharadindu	PC2 Agartala	ICMP	Grey	0.000	N	23	(edit)	(delete)
●	Successful	PC0 19BCE2105	Router3	ICMP	Red	0.000	N	24	(edit)	(delete)

g) Rename the client name as given: PC Name 1: Your Reg. No.; PC Name 2: Your Name; PC Name 3: Your Location



h) Assume the router IP address and assign PC & server IP address as per given in the figure.

Given, the IP addresses of PCs and Server, the IPs of Routers are assumed as:



with the networks as:

