

Practical 6

Configuring Simple and multi-area OSPF

Aim: Configuring Simple and multi-area OSPF

Theory:

Open shortest path first (OSPF) is a link-state routing protocol that is used to find the best path between the source and the destination router using its own shortest path first (SPF) algorithm. A link-state routing protocol is a protocol that uses the concept of triggered updates, i.e., if there is a change observed in the learned routing table then the updates are triggered only, not like the distance-vector routing protocol where the routing table is exchanged at a period of time.

Open shortest path first (OSPF) is developed by Internet Engineering Task Force (IETF) as one of the Interior Gateway Protocol (IGP), i.e., the protocol which aims at moving the packet within a large autonomous system or routing domain.

OSPF advantages –

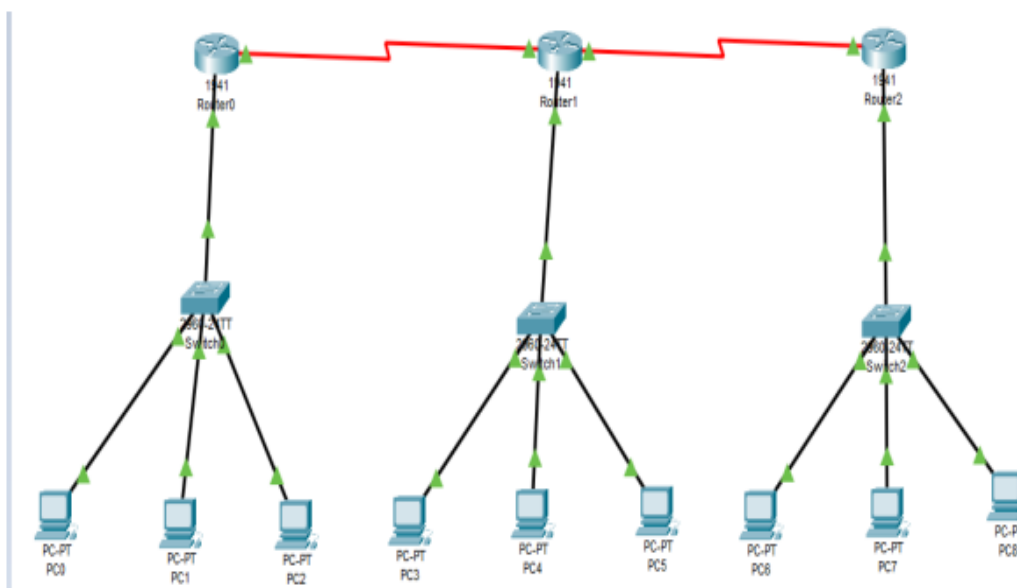
- 1) Both IPv4 and IPv6 routed protocols
- 2) Load balancing with equal-cost routes for the same destination
- 3) Unlimited hop counts
- 4) Trigger updates for fast convergence
- 5) A loop-free topology using SPF algorithm
- 6) Run-on most routers
- 7) Classless protocol

There are some disadvantages of OSPF

- 1) It requires an extra CPU process to run the SPF algorithm
- 2) Requiring more RAM to store adjacency topology, and
- 3) Being more complex to set up and hard to troubleshoot

Part a) Simple OSPF

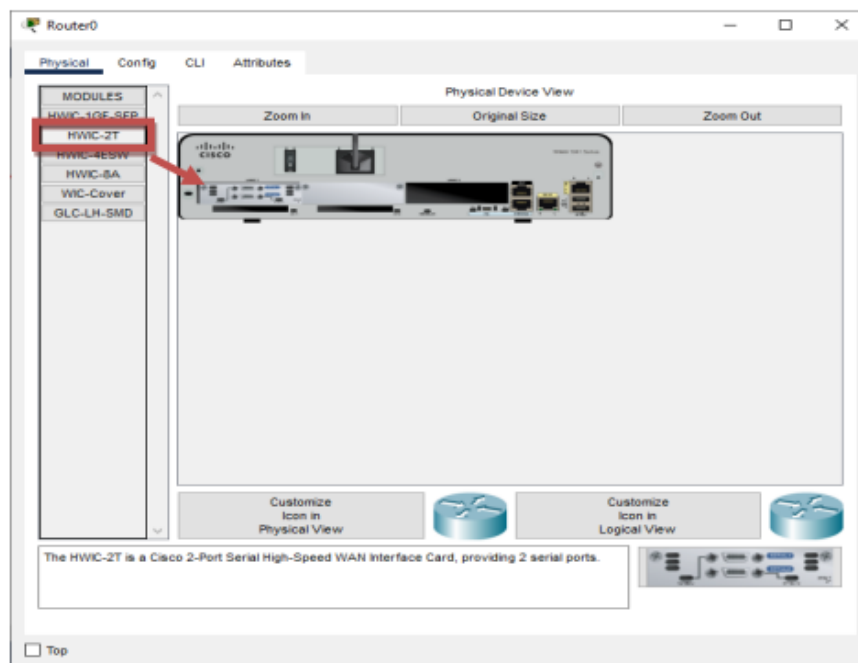
We use the following topology for the present case



We configure the above network using the following IP addresses

Host	Interface	IP address	Default Gateway	Subnet Mask	Wildcard Mask
Router 0	G0/0	10.0.0.1		255.0.0.0	0.255.255.255
	S0/1/0	40.0.0.1			
Router 1	G0/0	20.0.0.1			
	S0/1/0	40.0.0.2			
	S0/1/1	50.0.0.1			
Router 2	G0/0	30.0.0.1			
	S0/1/1	50.0.0.2			
PC0	FastEthernet0	10.0.0.2	10.0.0.1		
PC1	FastEthernet0	10.0.0.3			
PC2	FastEthernet0	10.0.0.4			
PC3	FastEthernet0	20.0.0.2	20.0.0.1		
PC4	FastEthernet0	20.0.0.3			
PC5	FastEthernet0	20.0.0.4			
PC6	FastEthernet0	30.0.0.2	30.0.0.1		
PC7	FastEthernet0	30.0.0.3			
PC8	FastEthernet0	30.0.0.4			

We need to add a Serial Interface in each Router, it is done as follows



Configuring PC0:

The screenshot shows the configuration window for PC0. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 settings are: IPv4 Address: 10.0.0.2, Subnet Mask: 255.0.0.0, Default Gateway: 10.0.0.1, and DNS Server: 0.0.0.0. The IPv6 settings are: IPv6 Address: (empty), Link Local Address: FE80::201:42FF:FE4:447, Default Gateway: (empty), and DNS Server: (empty). The '802.1X' section is also visible, with 'Use 802.1X Security' unchecked, 'Authentication' set to 'MD5', and 'Username' and 'Password' fields empty.

Configuration	Static	Dynamic
IPv4 Address	10.0.0.2	
Subnet Mask	255.0.0.0	
Default Gateway	10.0.0.1	
DNS Server	0.0.0.0	
IPv6 Address		
Link Local Address	FE80::201:42FF:FE4:447	
Default Gateway		
DNS Server		

Configuring PC1:

The screenshot shows the configuration window for PC1. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the 'FastEthernet0' interface. The 'Static' radio button is selected for both IPv4 and IPv6 configurations. The IPv4 settings are: IPv4 Address: 10.0.0.3, Subnet Mask: 255.0.0.0, Default Gateway: 10.0.0.1, and DNS Server: 0.0.0.0. The IPv6 settings are: IPv6 Address: (empty), Link Local Address: FE80::205:5EFF:FE88:E00C, Default Gateway: (empty), and DNS Server: (empty). The '802.1X' section is also visible, with 'Use 802.1X Security' unchecked, 'Authentication' set to 'MD5', and 'Username' and 'Password' fields empty.

Configuration	Static	Dynamic
IPv4 Address	10.0.0.3	
Subnet Mask	255.0.0.0	
Default Gateway	10.0.0.1	
DNS Server	0.0.0.0	
IPv6 Address		
Link Local Address	FE80::205:5EFF:FE88:E00C	
Default Gateway		
DNS Server		

Configuring PC2:

The screenshot shows the 'PC2' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 10.0.0.4, Subnet Mask to 255.0.0.0, Default Gateway to 10.0.0.1, and DNS Server to 0.0.0.0. A warning message states 'This address is already used in the network.' The 'IPv6 Configuration' section shows 'Static' selected, with IPv6 Address set to FE80::2D0:BAFF:FE8E:684C, Link Local Address set to FE80::2D0:BAFF:FE8E:684C, and Default Gateway and DNS Server fields empty. The '802.1X' section shows 'Use 802.1X Security' unchecked, Authentication set to MD5, and Username and Password fields empty.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
This address is already used in the network.	
IPv4 Address	10.0.0.4
Subnet Mask	255.0.0.0
Default Gateway	10.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::2D0:BAFF:FE8E:684C
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

Configuring PC3:

The screenshot shows the 'PC3' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 20.0.0.2, Subnet Mask to 255.0.0.0, Default Gateway to 20.0.0.1, and DNS Server to 0.0.0.0. The 'IPv6 Configuration' section shows 'Static' selected, with IPv6 Address set to FE80::202:17FF:FE81:A06, Link Local Address set to FE80::202:17FF:FE81:A06, and Default Gateway and DNS Server fields empty. The '802.1X' section shows 'Use 802.1X Security' unchecked, Authentication set to MD5, and Username and Password fields empty.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	20.0.0.2
Subnet Mask	255.0.0.0
Default Gateway	20.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::202:17FF:FE81:A06
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

Configuring PC4:

The screenshot shows the configuration window for PC4. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the configuration for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 20.0.0.3, Subnet Mask to 255.0.0.0, Default Gateway to 20.0.0.1, and DNS Server to 0.0.0.0. The IPv6 Configuration section shows 'Static' selected, with IPv6 Address, Link Local Address (FE80::20A:41FF:FE13:AB7E), Default Gateway, and DNS Server fields. The 802.1X section shows 'Use 802.1X Security' unchecked, Authentication set to 'MD5', and Username and Password fields.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	20.0.0.3
Subnet Mask	255.0.0.0
Default Gateway	20.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::20A:41FF:FE13:AB7E
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

Configuring PC5:

The screenshot shows the configuration window for PC5. The 'Desktop' tab is selected. The 'IP Configuration' section is expanded, showing the configuration for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 20.0.0.4, Subnet Mask to 255.0.0.0, Default Gateway to 20.0.0.1, and DNS Server to 0.0.0.0. The IPv6 Configuration section shows 'Static' selected, with IPv6 Address, Link Local Address (FE80::2E0:F9FF:FE0D:3AA), Default Gateway, and DNS Server fields. The 802.1X section shows 'Use 802.1X Security' unchecked, Authentication set to 'MD5', and Username and Password fields.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	20.0.0.4
Subnet Mask	255.0.0.0
Default Gateway	20.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::2E0:F9FF:FE0D:3AA
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

Configuring PC6:

The screenshot shows the configuration window for PC6. The 'Desktop' tab is selected. The 'IP Configuration' window is open, showing the configuration for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 30.0.0.2, Subnet Mask to 255.0.0.0, Default Gateway to 30.0.0.1, and DNS Server to 0.0.0.0. The 'Static' radio button is also selected under 'IPv6 Configuration'. The IPv6 Address is empty, Link Local Address is FE80::2E0:F9FF:FE9A:D3AA, Default Gateway is empty, and DNS Server is empty. The '802.1X' section has 'Use 802.1X Security' unchecked, Authentication set to MD5, and Username and Password fields empty. A 'Top' button is at the bottom left.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	30.0.0.2
Subnet Mask	255.0.0.0
Default Gateway	30.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::2E0:F9FF:FE9A:D3AA
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

☐ Top

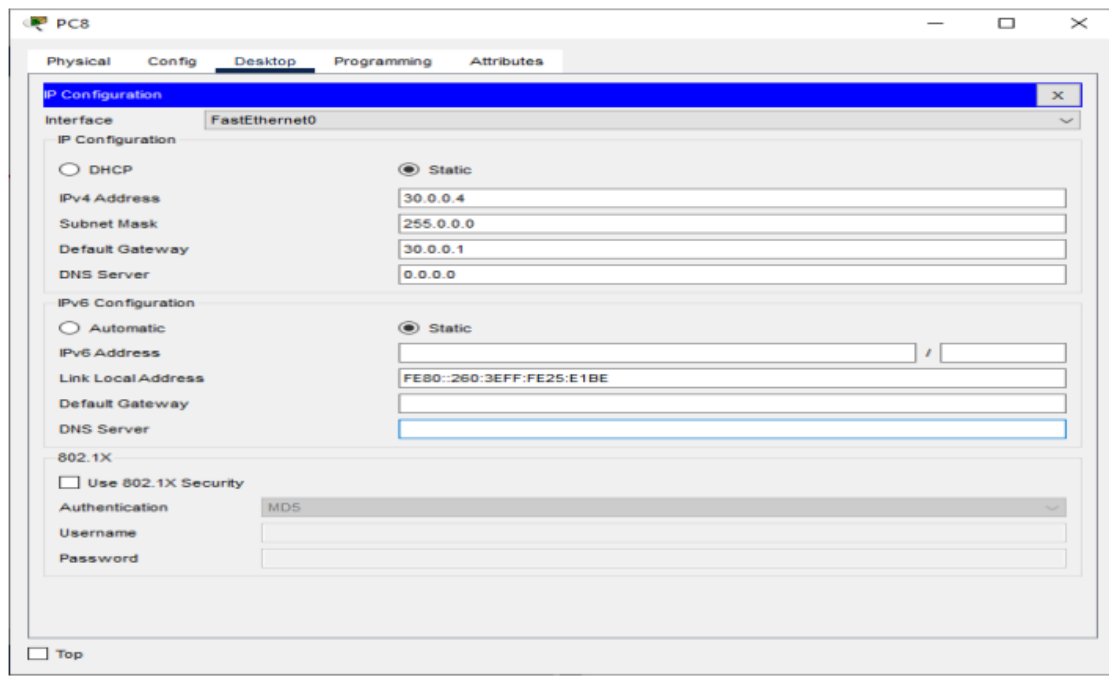
Configuring PC7:

The screenshot shows the configuration window for PC7. The 'Desktop' tab is selected. The 'IP Configuration' window is open, showing the configuration for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The IPv4 Address is set to 30.0.0.3, Subnet Mask to 255.0.0.0, Default Gateway to 30.0.0.1, and DNS Server to 0.0.0.0. The 'Static' radio button is also selected under 'IPv6 Configuration'. The IPv6 Address is empty, Link Local Address is FE80::201:C9FF:FEDC:D846, Default Gateway is empty, and DNS Server is empty. The '802.1X' section has 'Use 802.1X Security' unchecked, Authentication set to MD5, and Username and Password fields empty. A 'Top' button is at the bottom left.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	30.0.0.3
Subnet Mask	255.0.0.0
Default Gateway	30.0.0.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::201:C9FF:FEDC:D846
Default Gateway	
DNS Server	
802.1X	
<input type="checkbox"/> Use 802.1X Security	
Authentication	MD5
Username	
Password	

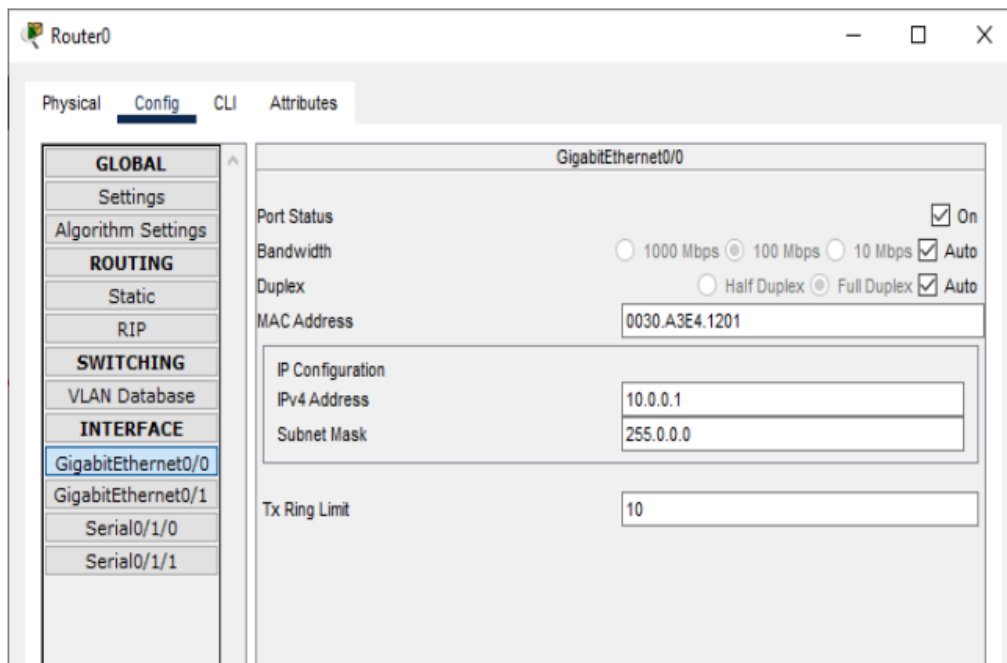
☐ Top

Configuring PC8:



Configuring IP addresses on Router 0

i) Interface G0/0



ii) Interface S0/1/0

The screenshot shows the configuration window for Router0, specifically for the Serial0/1/0 interface. The left sidebar contains a tree view with categories: GLOBAL, Settings, Algorithm Settings, ROUTING, Static, RIP, SWITCHING, VLAN Database, and INTERFACE. Under the INTERFACE category, GigabitEthernet0/0, GigabitEthernet0/1, Serial0/1/0 (selected), and Serial0/1/1 are listed. The main configuration area for Serial0/1/0 includes: Port Status (checked On), Duplex (radio button selected for Full Duplex), Clock Rate (dropdown menu set to 1200), IP Configuration (IPv4 Address: 40.0.0.1, Subnet Mask: 255.0.0.0), and Tx Ring Limit (text box set to 10).

Configuring IP addresses on Router 1

i) Interface G0/0

The screenshot shows the configuration window for Router1, specifically for the GigabitEthernet0/0 interface. The left sidebar is similar to the previous one, with the same categories and interface list. Under the INTERFACE category, GigabitEthernet0/0 (selected), GigabitEthernet0/1, Serial0/1/0, and Serial0/1/1 are listed. The main configuration area for GigabitEthernet0/0 includes: Port Status (checked On), Bandwidth (radio buttons for 1000 Mbps, 100 Mbps (selected), 10 Mbps), Duplex (radio buttons for Half Duplex, Full Duplex (selected)), MAC Address (text box set to 0001.C711.B701), IP Configuration (IPv4 Address: 20.0.0.1, Subnet Mask: 255.0.0.0), and Tx Ring Limit (text box set to 10).

ii) Interface S0/1/0

The screenshot shows the configuration window for interface Serial0/1/0 on Router1. The left sidebar contains a tree view with categories: GLOBAL, Settings, Algorithm Settings, ROUTING (Static, RIP), SWITCHING (VLAN Database), and INTERFACE (GigabitEthernet0/0, GigabitEthernet0/1, Serial0/1/0, Serial0/1/1). The Serial0/1/0 interface is selected. The main panel shows the following settings:

Serial0/1/0	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input type="radio"/> Full Duplex
Clock Rate	2000000
IP Configuration	
IPv4 Address	40.0.0.2
Subnet Mask	255.0.0.0
Tx Ring Limit	10

iii) Interface S0/1/1

The screenshot shows the configuration window for interface Serial0/1/1 on Router1. The left sidebar is the same as in the previous screenshot, but Serial0/1/1 is now selected. The main panel shows the following settings:

Serial0/1/1	
Port Status	<input checked="" type="checkbox"/> On
Duplex	<input type="radio"/> Full Duplex
Clock Rate	1200
IP Configuration	
IPv4 Address	50.0.0.1
Subnet Mask	255.0.0.0
Tx Ring Limit	10

Configuring IP addresses on Router 2

i) Interface G0/0

The screenshot shows the configuration window for Router2, specifically for the GigabitEthernet0/0 interface. The left sidebar shows the configuration tree with 'GigabitEthernet0/0' selected under the 'INTERFACE' section. The main panel displays the following settings:

- Port Status:** ☒ On
- Bandwidth:** ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex:** ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address:** 000A.F337.ED01
- IP Configuration:**
 - IPv4 Address:** 30.0.0.1
 - Subnet Mask:** 255.0.0.0
- Tx Ring Limit:** 10

ii) Interface S0/1/1

The screenshot shows the configuration window for Router2, specifically for the Serial0/1/1 interface. The left sidebar shows the configuration tree with 'Serial0/1/1' selected under the 'INTERFACE' section. The main panel displays the following settings:

- Port Status:** ☒ On
- Duplex:** ☒ Full Duplex
- Clock Rate:** 2000000
- IP Configuration:**
 - IPv4 Address:** 50.0.0.2
 - Subnet Mask:** 255.0.0.0
- Tx Ring Limit:** 10

Configuring Router 0 for OSPF (using the CLI mode)

```
Router(config)#  
Router(config)#router ospf 1  
Router(config-router)#network 10.0.0.0 0.0.0.255 area 1  
Router(config-router)#network 40.0.0.0 0.0.0.255 area 1  
Router(config-router)#exit  
Router(config)#
```

Configuring Router 1 for OSPF (using the CLI mode)

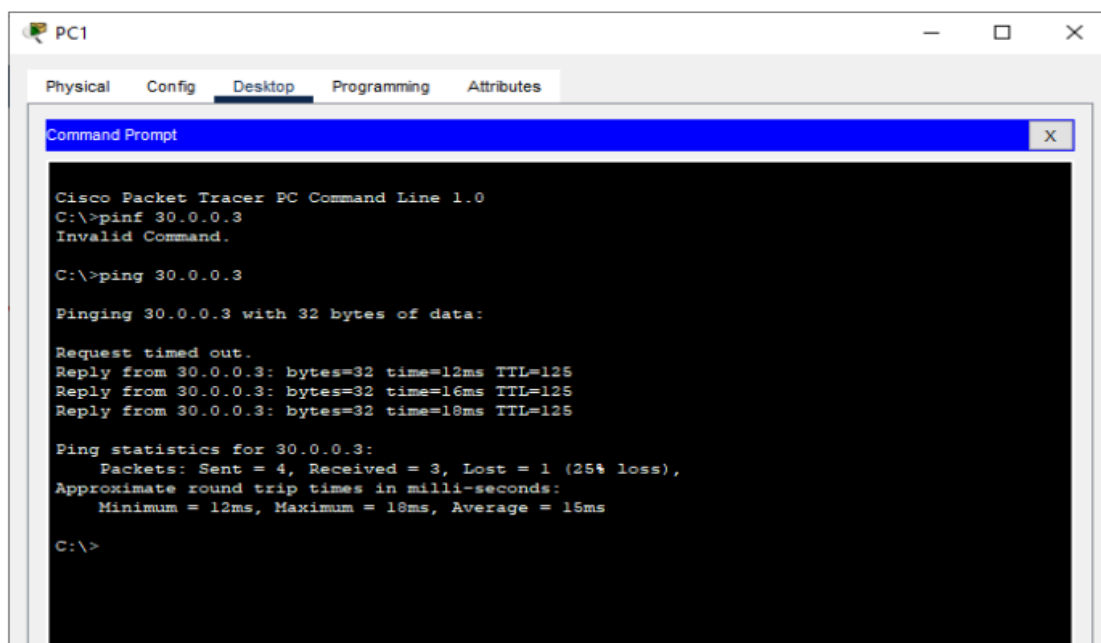
```
Router(config)#  
Router(config)#router ospf 1  
Router(config-router)#  
Router(config-router)#network 20.0.0.0 0.0.0.255 area 1  
Router(config-router)#network 40.0.0.0 0.0.0.255 area 1  
Router(config-router)#network 50.0.0.0 0.0.0.255 area 1  
Router(config-router)#exit  
Router(config)#
```

Configuring Router 2 for OSPF (using the CLI mode)

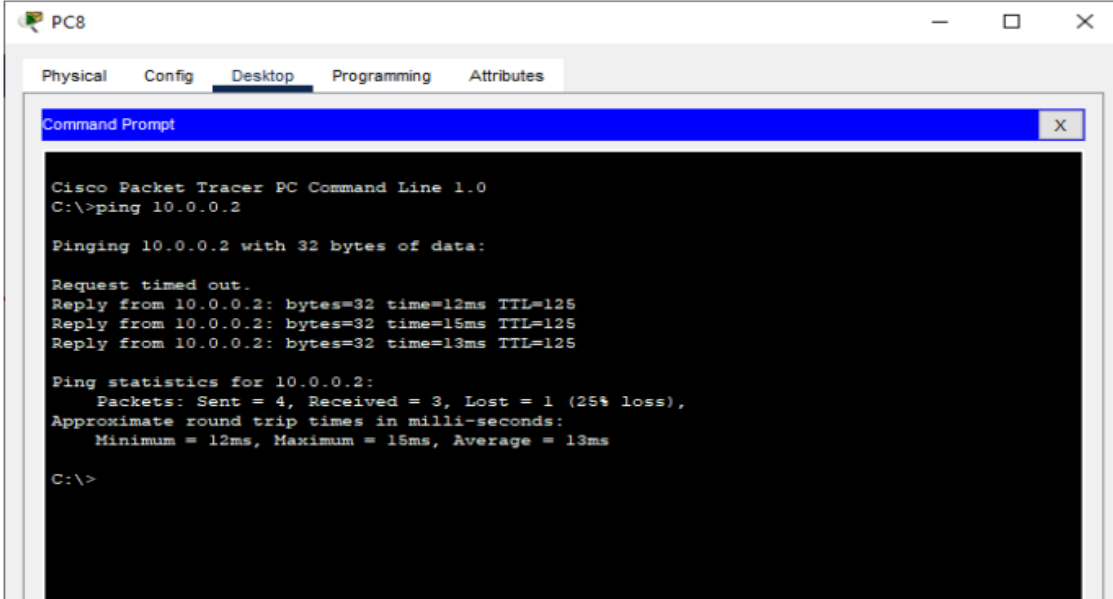
```
Router(config)#  
Router(config)#router ospf 1  
Router(config-router)#  
Router(config-router)#network 30.0.0.0 0.0.0.255 area 1  
Router(config-router)#network 50.0.0.0 0.0.0.255 area 1  
Router(config-router)# exit  
Router(config)#
```

Checking the connectivity by using the ping command

- i) Pinging PC8 (ip address 10.30.0.4) from PC1



ii) Pinging PC0 (ip address 10.10.0.2) from PC8



The screenshot shows a window titled 'PC8' with tabs for Physical, Config, Desktop, Programming, and Attributes. The 'Desktop' tab is active, displaying a 'Command Prompt' window. The command prompt shows the following output:

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 10.0.0.2

Pinging 10.0.0.2 with 32 bytes of data:

Request timed out.
Reply from 10.0.0.2: bytes=32 time=12ms TTL=125
Reply from 10.0.0.2: bytes=32 time=15ms TTL=125
Reply from 10.0.0.2: bytes=32 time=13ms TTL=125

Ping statistics for 10.0.0.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 12ms, Maximum = 15ms, Average = 13ms

C:\>
```

Result:

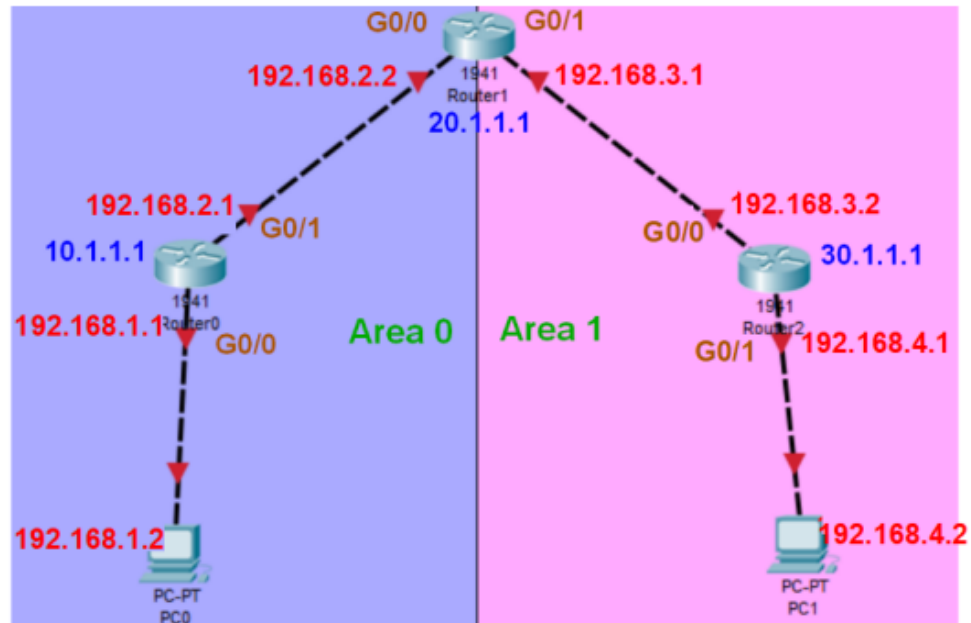
Hence the OSPF has been studied and verified through the given network

Scan the following
QR-code for the
video
demonstration of
the practical
Simple OSPF



Part b) Multi-area OSPF

Consider the following topology



We use the following IP addresses for the given topology

Host	IP Address	Network Address	Network Mask	Wild Card Mask
PC 0	192.168.1.2	192.168.1.0	255.255.255.0	0.0.0.255
PC 1	192.168.4.2	192.168.4.0	255.255.255.0	0.0.0.255
ROUTER 0	G0/0 192.168.1.1	192.168.1.0	255.255.255.0	0.0.0.255
	G0/1 192.168.2.1	192.168.2.0	255.255.255.0	0.0.0.255
	LOOPBACK 10.1.1.1	10.0.0.0	255.0.0.0	0.255.255.255
ROUTER 1	G0/0 192.168.2.2	192.168.2.0	255.255.255.0	0.0.0.255
	G0/1 192.168.3.1	192.168.3.0	255.255.255.0	0.0.0.255
	LOOPBACK 20.1.1.1	20.0.0.0	255.0.0.0	0.255.255.255
ROUTER 2	G0/0 192.168.3.2	192.168.3.0	255.255.255.0	0.0.0.255
	G0/1 192.168.4.1	192.168.4.0	255.255.255.0	0.0.0.255
	LOOPBACK 30.1.1.1	30.0.0.0	255.0.0.0	0.255.255.255

Configuring PC0

The screenshot shows the 'PC0' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The 'IPv4 Address' is set to '192.168.1.2', 'Subnet Mask' is '255.255.255.0', 'Default Gateway' is '192.168.1.1', and 'DNS Server' is '0.0.0.0'. The 'IPv6 Configuration' section is also expanded, showing 'Static' selected, with 'IPv6 Address' as an empty field, 'Link Local Address' as 'FE80::2D0:D3FF:FE0A:1A', and 'Default Gateway' as an empty field.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	192.168.1.2
Subnet Mask	255.255.255.0
Default Gateway	192.168.1.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::2D0:D3FF:FE0A:1A
Default Gateway	
DNS Server	

Configuring PC1

The screenshot shows the 'PC1' configuration window with the 'Desktop' tab selected. The 'IP Configuration' section is expanded, showing settings for the 'FastEthernet0' interface. The 'Static' radio button is selected under 'IP Configuration'. The 'IPv4 Address' is set to '192.168.4.2', 'Subnet Mask' is '255.255.255.0', 'Default Gateway' is '192.168.4.1', and 'DNS Server' is '0.0.0.0'. The 'IPv6 Configuration' section is also expanded, showing 'Static' selected, with 'IPv6 Address' as an empty field, 'Link Local Address' as 'FE80::2D0:D3FF:FE2A:A67', and 'Default Gateway' as an empty field.

Interface	FastEthernet0
IP Configuration	
<input type="radio"/> DHCP	<input checked="" type="radio"/> Static
IPv4 Address	192.168.4.2
Subnet Mask	255.255.255.0
Default Gateway	192.168.4.1
DNS Server	0.0.0.0
IPv6 Configuration	
<input type="radio"/> Automatic	<input checked="" type="radio"/> Static
IPv6 Address	
Link Local Address	FE80::2D0:D3FF:FE2A:A67
Default Gateway	
DNS Server	

Configuring Router0

```
Router>enable
Router#
Router#configure terminal
Router(config)#
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
Router(config)#interface gigabitEthernet 0/1
Router(config-if)#
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
Router(config)#interface loopback 0
Router(config-if)#
Router(config-if)#ip address 10.1.1.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
```

Configuring Router1

```
Router>enable
Router#
Router#configure terminal
Router(config)#
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#
Router(config-if)#ip address 192.168.2.2 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
Router(config)#interface gigabitEthernet 0/1
Router(config-if)#
Router(config-if)#ip address 192.168.3.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
Router(config)#interface loopback 0
Router(config-if)#
Router(config-if)#ip address 10.1.1.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
Router(config)#interface loopback 0
Router(config-if)#
Router(config-if)#ip address 20.1.1.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
```


Configuring Router2

```
Router>enable
Router#
Router#configure terminal
Router(config)#
Router(config)#interface gigabitEthernet 0/0
Router(config-if)#
Router(config-if)#ip address 192.168.3.2 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#interface gigabitEthernet 0/1
Router(config-if)#
Router(config-if)#ip address 192.168.4.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#

Router(config)#interface loopback 0
Router(config-if)#
Router(config-if)#ip address 10.1.1.1 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
```

Configuring Router0 for OSPF

```
Router(config)#
Router(config)#router ospf 1
Router(config-router)#
Router(config-router)#network 192.168.1.0 255.255.255.0 area 0
Router(config-router)#network 192.168.2.0 255.255.255.0 area 0
Router(config-router)#exit
```

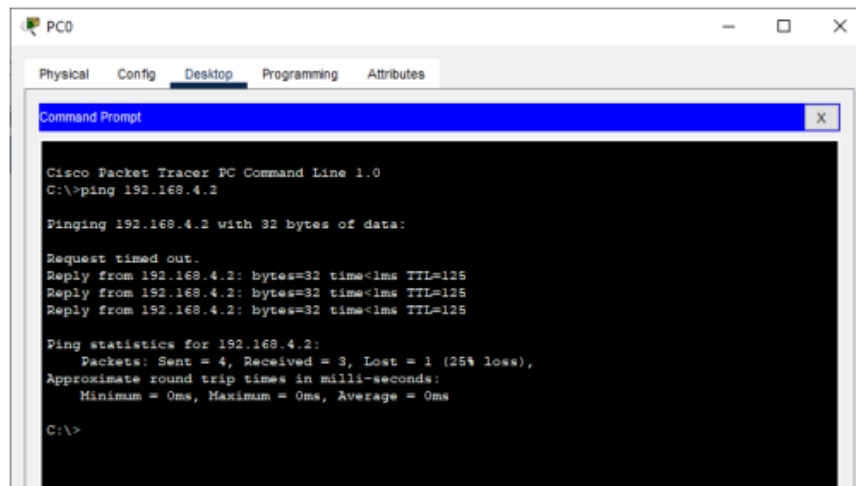
Configuring Router1 for OSPF

```
Router(config)#
Router(config)#router ospf 1
Router(config-router)#
Router(config-router)#network 192.168.2.0 255.255.255.0 area 0
Router(config-router)#network 192.168.3.0 255.255.255.0 area 1
Router(config-router)#exit
```

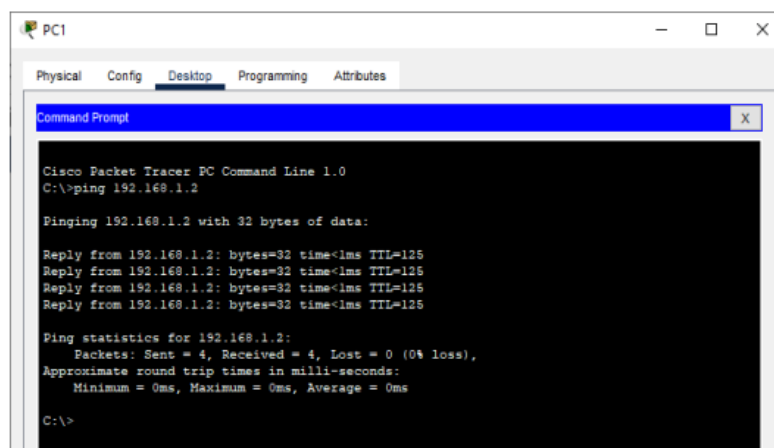

Configuring Router2 for OSPF

```
Router(config)#  
Router(config)#router ospf 1  
Router(config-router)#  
Router(config-router)#network 192.168.3.0 255.255.255.0 area 1  
Router(config-router)#network 192.168.4.0 255.255.255.0 area 1  
Router(config-router)#exit
```

Verify the connectivity (ping PC1 from PC0)



Verify the connectivity (ping PC0 from PC1)



Hence OSPF with Multiple Areas (area 0 and area 1) was successfully configured and verified

Scan the following
QR-code for the
video demonstration
of the practical
OSPF with Multiple
Areas

