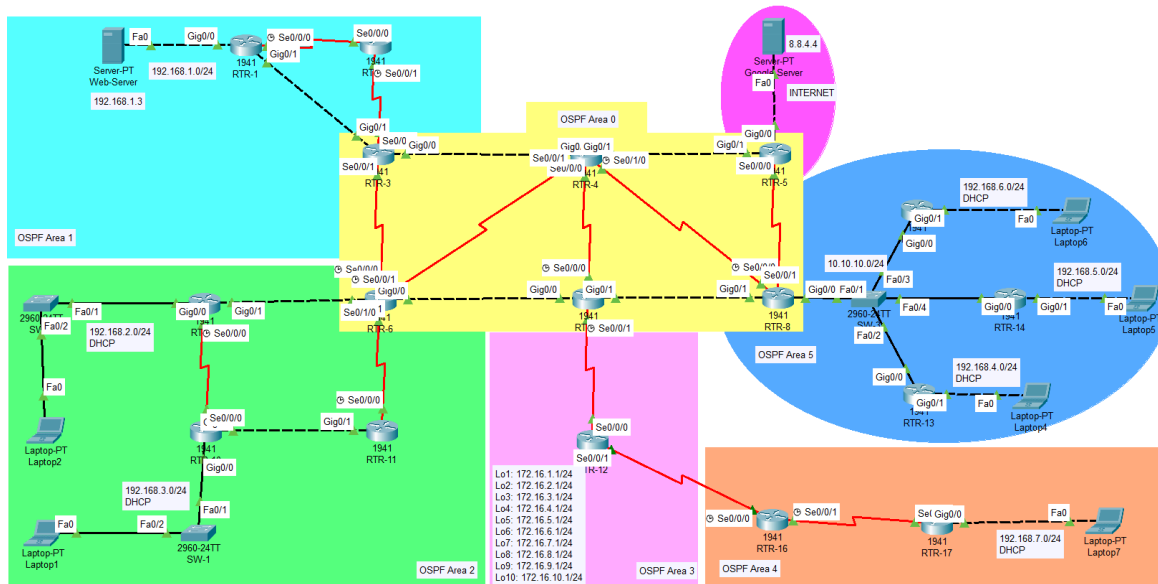


## CCNA Lab Topology - Type 2

### Topology



### Objective

No	Configure & Verify
1	OSPF Area 0 - Global Command
2	OSPF Area 1 - Quad Zero Wildcard Command
3	OSPF Area 2 - Interface Command
4	OSPF Area 3 - Default Network
5	OSPF Area 4 - Virtual Link
6	OSPF Area 5 - DR/BDR Election
7	Default Static Route
8	Redistribute Default Static Route Into OSPF
9	End-to-end Connectivity Testing



## Configuration & Verification

No.	Description
1	<b>OSPF Area 0 - Global Command</b>
	<b>Configuration</b>
	RTR-3(config)#router ospf 1
	RTR-3(config-router)#network 3.3.3.3 0.0.0.0 area 0
	RTR-3(config-router)#network 13.13.13.0 0.0.0.255 area 1
	RTR-3(config-router)#network 23.23.23.0 0.0.0.255 area 1
	RTR-3(config-router)#network 34.34.34.0 0.0.0.255 area 0
	RTR-3(config-router)#network 36.36.36.0 0.0.0.255 area 0
	RTR-4(config)#router ospf 1
	RTR-4(config-router)#network 4.4.4.4 0.0.0.0 area 0
	RTR-4(config-router)#network 34.34.34.0 0.0.0.255 area 0
	RTR-4(config-router)#network 45.45.45.0 0.0.0.255 area 0
	RTR-4(config-router)#network 46.46.46.0 0.0.0.255 area 0
	RTR-4(config-router)#network 47.47.47.0 0.0.0.255 area 0
	RTR-4(config-router)#network 48.48.48.0 0.0.0.255 area 0
	RTR-5(config)#router ospf 1
	RTR-5(config-router)#network 5.5.5.5 0.0.0.0 area 0
	RTR-5(config-router)#network 45.45.45.0 0.0.0.255 area 0
	RTR-5(config-router)#network 58.58.58.0 0.0.0.255 area 0
	RTR-6(config)#router ospf 1
	RTR-6(config-router)#network 6.6.6.6 0.0.0.0 area 0
	RTR-6(config-router)#network 36.36.36.0 0.0.0.255 area 0
	RTR-6(config-router)#network 46.46.46.0 0.0.0.255 area 0
	RTR-6(config-router)#network 67.67.67.0 0.0.0.255 area 0
	RTR-6(config-router)#network 69.69.69.0 0.0.0.255 area 2
	RTR-6(config-router)#network 116.116.116.0 0.0.0.255 area 2
	RTR-7(config)#router ospf 1
	RTR-7(config-router)#network 7.7.7.7 0.0.0.0 area 0
	RTR-7(config-router)#network 7.12.7.0 0.0.0.255 area 3
	RTR-7(config-router)#network 47.47.47.0 0.0.0.255 area 0
	RTR-7(config-router)#network 67.67.67.0 0.0.0.255 area 0
	RTR-7(config-router)#network 78.78.78.0 0.0.0.255 area 0
	RTR-8(config)#router ospf 1
	RTR-8(config-router)#network 8.8.8.8 0.0.0.0 area 0
	RTR-8(config-router)#network 10.10.10.0 0.0.0.255 area 5
	RTR-8(config-router)#network 48.48.48.0 0.0.0.255 area 0
	RTR-8(config-router)#network 58.58.58.0 0.0.0.255 area 0
	RTR-8(config-router)#network 78.78.78.0 0.0.0.255 area 0



	<b>Verification</b>  show run show ip route show ip ospf neighbor show ip route ospf show ip ospf interface
2	<b>OSPF Area 1 - Quad Zero Wildcard Command</b>  <b>Configuration</b>  RTR-1(config)#router ospf 1 RTR-1(config-router)#network 192.168.1.1 0.0.0.0 area 1 RTR-1(config-router)#network 13.13.13.1 0.0.0.0 area 1 RTR-1(config-router)#network 12.12.12.1 0.0.0.0 area 1 RTR-1(config-router)#network 1.1.1.1 0.0.0.0 area 1  RTR-2(config)#router ospf 1 RTR-2(config-router)#network 12.12.12.2 0.0.0.0 area 1 RTR-2(config-router)#network 23.23.23.3 0.0.0.1 area 1 RTR-2(config-router)#network 2.2.2.2 0.0.0.0 area 1  <b>Verification</b>  show run show ip route show ip ospf neighbor show ip route ospf show ip ospf interface
3	<b>OSPF Area 2 - Interface Command</b>  <b>Configuration</b>  RTR-9(config)#int g0/0 RTR-9(config-if)#ip ospf 1 area 2 RTR-9(config-if)#int g0/1 RTR-9(config-if)#ip ospf 1 area 2 RTR-9(config-if)#int s0/0/0 RTR-9(config-if)#ip ospf 1 area 2 RTR-9(config-if)#int lo0 RTR-9(config-if)#ip ospf 1 area 2  RTR-10(config)#int g0/0 RTR-10(config-if)#ip ospf 1 area 2 RTR-10(config-if)#int g0/1 RTR-10(config-if)#ip ospf 1 area 2 RTR-10(config-if)#int s0/0/0 RTR-10(config-if)#ip ospf 1 area 2



	<pre> RTR-10(config-if)#int lo0 RTR-10(config-if)#ip ospf 1 area 2  RTR-11(config)#int g0/1 RTR-11(config-if)#ip ospf 1 area 2 RTR-11(config-if)#int s0/0/0 RTR-11(config-if)#ip ospf 1 area 2 RTR-11(config-if)#int lo0 RTR-11(config-if)#ip ospf 1 area 2  <b>Verification</b>  show run show ip route show ip ospf neighbor show ip route ospf show ip ospf interface </pre>
4	<p><b>OSPF Area 3 - Default Network</b></p> <p><b>Configuration</b></p> <pre> RTR-12(config)#int loopback1 RTR-12(config-if)#ip address 172.16.1.1 255.255.255.0 RTR-12(config-if)#ip ospf network point-to-point RTR-12(config-if)# RTR-12(config-if)#int loopback2 RTR-12(config-if)#ip address 172.16.2.1 255.255.255.0 RTR-12(config-if)#ip ospf network point-to-point RTR-12(config-if)# RTR-12(config-if)#int loopback3 RTR-12(config-if)#ip address 172.16.3.1 255.255.255.0 RTR-12(config-if)#ip ospf network point-to-point RTR-12(config-if)# RTR-12(config-if)#int loopback4 RTR-12(config-if)#ip address 172.16.4.1 255.255.255.0 RTR-12(config-if)#ip ospf network point-to-point RTR-12(config-if)# RTR-12(config-if)#int loopback5 RTR-12(config-if)#ip address 172.16.5.1 255.255.255.0 RTR-12(config-if)#ip ospf network point-to-point RTR-12(config-if)# RTR-12(config-if)#int loopback6 RTR-12(config-if)#ip address 172.16.6.1 255.255.255.0 RTR-12(config-if)#ip ospf network point-to-point RTR-12(config-if)# RTR-12(config-if)#int loopback7 RTR-12(config-if)#ip address 172.16.7.1 255.255.255.0 RTR-12(config-if)#ip ospf network point-to-point RTR-12(config-if)# </pre>



	<pre> RTR-12(config-if)#int loopback8 RTR-12(config-if)#ip address 172.16.8.1 255.255.255.0 RTR-12(config-if)#ip ospf network point-to-point RTR-12(config-if)# RTR-12(config-if)#int loopback9 RTR-12(config-if)#ip address 172.16.9.1 255.255.255.0 RTR-12(config-if)#ip ospf network point-to-point RTR-12(config-if)# RTR-12(config-if)#int loopback10 RTR-12(config-if)#ip address 172.16.10.1 255.255.255.0 RTR-12(config-if)#ip ospf network point-to-point  RTR-12(config)#router ospf 1 RTR-12(config-router)#network 0.0.0.0 255.255.255.255 area 3 RTR-12(config)#int s0/0/1 RTR-12(config-if)#ip ospf 1 area 4  <b>Verification</b>  show run show ip route show ip ospf neighbor show ip route ospf show ip ospf interface </pre>
5	<p><b>OSPF Area 4 - Virtual Link</b></p> <p><b>Configuration</b></p> <pre> RTR-16(config)#router ospf 1 RTR-16(config-router)#network 0.0.0.0 255.255.255.255 area 4  RTR-17(config)#router ospf 1 RTR-17(config-router)#network 0.0.0.0 255.255.255.255 area 4  RTR-7(config-router)#router ospf 1 RTR-7(config-router)#area 3 virtual-link 172.16.10.1  RTR-12(config-router)#router ospf 1 RTR-12(config-router)#area 3 virtual-link 7.7.7.7  <b>Verification</b>  show run show ip route show ip ospf neighbor show ip route ospf show ip ospf interface show ip ospf virtual-link </pre>



OSPF Area 5 - DR/BDR Election	
6	<b>Configuration</b>  RTR-13 = DR RTR-14 = BDR RTR-8,15 = DROTHER  RTR-13(config)#int g0/0 RTR-13(config-if)#ip address 10.10.10.13 255.255.255.0 RTR-13(config-if)#ip ospf priority 100 RTR-13(config-if)#no shutdown RTR-13(config-if)# RTR-13(config-if)#router ospf 1 RTR-13(config-router)#network 0.0.0.0 255.255.255.255 area 5  RTR-14(config)#int g0/0 RTR-14(config-if)#ip address 10.10.10.14 255.255.255.0 RTR-14(config-if)#ip ospf priority 50 RTR-14(config-if)#no shutdown RTR-14(config-if)# RTR-14(config-if)#router ospf 1 RTR-14(config-router)#network 0.0.0.0 255.255.255.255 area 5  RTR-15(config)#int g0/0 RTR-15(config-if)#ip address 10.10.10.15 255.255.255.0 RTR-15(config-if)#no shutdown RTR-15(config-if)#router ospf 1 RTR-15(config-router)#network 0.0.0.0 255.255.255.255 area 5  RTR-13(config-router)#int g0/1 RTR-13(config-if)#ip address 192.168.4.1 255.255.255.0 RTR-13(config-if)#no shutdown RTR-13(config-if)# RTR-13(config-if)#ip dhcp pool LAN4 RTR-13(dhcp-config)#network 192.168.4.0 255.255.255.0 RTR-13(dhcp-config)#default-router 192.168.4.1 RTR-13(dhcp-config)#dns-server 8.8.4.4.  RTR-14(config)#int g0/1 RTR-14(config-if)#ip address 192.168.5.1 255.255.255.0 RTR-14(config-if)#no shutdown RTR-14(config-if)# RTR-14(config-if)#ip dhcp pool LAN5 RTR-14(dhcp-config)#network 192.168.5.0 255.255.255.0 RTR-14(dhcp-config)#default-router 192.168.5.1 RTR-14(dhcp-config)#dns-server 8.8.4.4



	<pre> RTR-15(config)#int g0/1 RTR-15(config-if)#ip address 192.168.6.1 255.255.255.0 RTR-15(config-if)#no shutdown RTR-15(config-if)# RTR-15(config-if)#ip dhcp pool LAN6 RTR-15(dhcp-config)#network 192.168.6.0 255.255.255.0 RTR-15(dhcp-config)#default-router 192.168.6.1 RTR-15(dhcp-config)#dns-server 8.8.4.4 </pre> <p><b>Verification</b></p> <pre> show run show ip route show ip ospf neighbor show ip route ospf show ip ospf interface </pre>
7	<b>Default Static Route</b>
	<p><b>Configuration</b></p> <pre> RTR-5(config)#ip route 0.0.0.0 0.0.0.0 g0/0 </pre> <p><b>Verification</b></p> <pre> show run show ip route show ip ospf neighbor show ip route ospf show ip ospf interface </pre>
8	<b>Redistribute Default Static Route Into OSPF</b>
	<p><b>Configuration</b></p> <pre> RTR-5(config)#router ospf 1 RTR-5(config-router)#default-information originate </pre> <p><b>Verification</b></p> <pre> show run show ip route show ip ospf neighbor show ip route ospf show ip ospf interface </pre>



## End-to-end Connectivity Testing

Laptop1:\>ping 8.8.4.4  
Pinging 8.8.4.4 with 32 bytes of data:  
Reply from 8.8.4.4: bytes=32 time<1ms TTL=251  
Reply from 8.8.4.4: bytes=32 time=15ms TTL=251  
Reply from 8.8.4.4: bytes=32 time=18ms TTL=251  
Reply from 8.8.4.4: bytes=32 time=26ms TTL=251  
Ping statistics for 8.8.4.4:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 0ms, Maximum = 26ms, Average = 14ms

Laptop1:\>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=24ms TTL=123  
Reply from 192.168.1.3: bytes=32 time=3ms TTL=123  
Reply from 192.168.1.3: bytes=32 time=24ms TTL=123  
Ping statistics for 192.168.1.3:  
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 3ms, Maximum = 24ms, Average = 17ms

9

Laptop7:\>ping 8.8.4.4  
Pinging 8.8.4.4 with 32 bytes of data:  
Reply from 8.8.4.4: bytes=32 time=20ms TTL=251  
Reply from 8.8.4.4: bytes=32 time=47ms TTL=251  
Reply from 8.8.4.4: bytes=32 time=36ms TTL=251  
Reply from 8.8.4.4: bytes=32 time=73ms TTL=251  
Ping statistics for 8.8.4.4:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 20ms, Maximum = 73ms, Average = 44ms

Laptop7:\>ping 192.168.1.3  
Pinging 192.168.1.3 with 32 bytes of data:  
Reply from 192.168.1.3: bytes=32 time=42ms TTL=121  
Reply from 192.168.1.3: bytes=32 time=28ms TTL=121  
Reply from 192.168.1.3: bytes=32 time=98ms TTL=121  
Reply from 192.168.1.3: bytes=32 time=33ms TTL=121  
Ping statistics for 192.168.1.3:  
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),  
Approximate round trip times in milli-seconds:  
Minimum = 28ms, Maximum = 98ms, Average = 50ms





## RTR-1

```
RTR-1#show run
Building configuration...
Current configuration : 1020 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname RTR-1
!
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO1941/K9 sn FTX152478YJ-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
interface Loopback0
ip address 1.1.1.1 255.255.255.255
!
interface GigabitEthernet0/0
ip address 192.168.1.1 255.255.255.0
duplex auto
```



```
speed auto
!
interface GigabitEthernet0/1
ip address 31.31.31.1 255.255.255.0
duplex auto
speed auto
!
interface Serial0/0/0
ip address 12.12.12.1 255.255.255.0
clock rate 2000000
!
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 192.168.1.1 0.0.0.0 area 1
network 12.12.12.1 0.0.0.0 area 1
network 1.1.1.1 0.0.0.0 area 1
network 31.31.31.1 0.0.0.0 area 1
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

**RTR-2**



```
RTR-2#show run
Building configuration...
Current configuration : 951 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname RTR-2
!
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO1941/K9 sn FTX152494T4-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback0
ip address 2.2.2.2 255.255.255.255
!
interface GigabitEthernet0/0
no ip address
duplex auto
speed auto
shutdown
```



```
!  
interface GigabitEthernet0/1  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface Serial0/0/0  
ip address 12.12.12.2 255.255.255.0  
!  
interface Serial0/0/1  
ip address 23.23.23.3 255.255.255.0  
clock rate 2000000  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router ospf 1  
log-adjacency-changes  
network 12.12.12.2 0.0.0.0 area 1  
network 23.23.23.2 0.0.0.1 area 1  
network 2.2.2.2 0.0.0.0 area 1  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
!  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
login  
!  
!  
!  
end
```

### RTR-3

```
RTR-3#show run  
Building configuration...  
Current configuration : 1028 bytes
```



```
!  
version 15.1  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname RTR-3  
!  
!  
!  
!  
!  
!  
!  
!  
!  
ip cef  
no ipv6 cef  
!  
!  
!  
!  
license udi pid CISCO1941/K9 sn FTX1524A7YE-  
!  
!  
!  
!  
!  
!  
!  
!  
!  
spanning-tree mode pvst  
!  
!  
!  
!  
!  
interface Loopback0  
ip address 3.3.3.3 255.255.255.0  
!  
interface GigabitEthernet0/0  
ip address 34.34.34.3 255.255.255.0  
duplex auto  
speed auto  
!  
interface GigabitEthernet0/1  
ip address 31.31.31.3 255.255.255.0  
duplex auto
```



```
speed auto
!
interface Serial0/0/0
ip address 23.23.23.3 255.255.255.0
!
interface Serial0/0/1
ip address 36.36.36.3 255.255.255.0
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 34.34.34.0 0.0.0.255 area 0
network 36.36.36.0 0.0.0.255 area 0
network 3.3.3.3 0.0.0.0 area 0
network 23.23.23.0 0.0.0.255 area 1
network 31.31.31.0 0.0.0.255 area 1
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

#### RTR-4

```
RTR-4#show run
Building configuration...
Current configuration : 1207 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
```



```
no service password-encryption
!
hostname RTR-4
!
!
!
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
!
!
!
license udi pid CISCO1941/K9 sn FTX1524TB18-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback0
ip address 4.4.4.4 255.255.255.255
!
interface GigabitEthernet0/0
ip address 34.34.34.4 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/1
ip address 45.45.45.4 255.255.255.0
duplex auto
speed auto
!
interface Serial0/0/0
ip address 47.47.47.4 255.255.255.0
```



```
!  
interface Serial0/0/1  
ip address 46.46.46.4 255.255.255.0  
!  
interface Serial0/1/0  
ip address 48.48.48.4 255.255.255.0  
clock rate 2000000  
!  
interface Serial0/1/1  
no ip address  
clock rate 2000000  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router ospf 1  
log-adjacency-changes  
network 4.4.4.4 0.0.0.0 area 0  
network 34.34.34.0 0.0.0.255 area 0  
network 45.45.45.0 0.0.0.255 area 0  
network 46.46.46.0 0.0.0.255 area 0  
network 47.47.47.0 0.0.0.255 area 0  
network 48.48.48.0 0.0.0.255 area 0  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
!  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
login  
!  
!  
!  
end
```

#### **RTR-5**

```
RTR-5#show run  
Building configuration...
```







```
duplex auto
speed auto
!
interface Serial0/0/0
ip address 58.58.58.5 255.255.255.0
!
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 5.5.5.5 0.0.0.0 area 0
network 45.45.45.0 0.0.0.255 area 0
network 58.58.58.0 0.0.0.255 area 0
default-information originate
!
ip classless
ip route 0.0.0.0 0.0.0.0 GigabitEthernet0/0
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

#### **RTR-6**

```
RTR-6#show run
Building configuration...
Current configuration : 1233 bytes
!
```



```
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname RTR-6
!
!
!
!
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
license udi pid CISCO1941/K9 sn FTX1524404D-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
!
!
interface Loopback0
ip address 6.6.6.6 255.255.255.255
!
interface GigabitEthernet0/0
ip address 67.67.67.6 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/1
ip address 69.69.69.6 255.255.255.0
duplex auto
speed auto
```



```
!  
interface Serial0/0/0  
ip address 36.36.36.6 255.255.255.0  
clock rate 2000000  
!  
interface Serial0/0/1  
ip address 46.46.46.6 255.255.255.0  
clock rate 2000000  
!  
interface Serial0/1/0  
ip address 116.116.116.6 255.255.255.0  
!  
interface Serial0/1/1  
no ip address  
clock rate 2000000  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router ospf 1  
log-adjacency-changes  
network 6.6.6.6 0.0.0.0 area 0  
network 36.36.36.0 0.0.0.255 area 0  
network 46.46.46.0 0.0.0.255 area 0  
network 67.67.67.0 0.0.0.255 area 0  
network 69.69.69.0 0.0.0.255 area 2  
network 116.116.116.0 0.0.0.255 area 2  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
login  
!  
!  
!  
end
```





```
speed auto
!
interface GigabitEthernet0/1
ip address 78.78.78.7 255.255.255.0
duplex auto
speed auto
!
interface Serial0/0/0
ip address 47.47.47.7 255.255.255.0
clock rate 2000000
!
interface Serial0/0/1
ip address 7.12.7.7 255.255.255.0
clock rate 2000000
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
area 3 virtual-link 172.16.10.1
network 7.7.7.7 0.0.0.0 area 0
network 47.47.47.0 0.0.0.255 area 0
network 67.67.67.0 0.0.0.255 area 0
network 78.78.78.0 0.0.0.255 area 0
network 7.12.7.0 0.0.0.255 area 3
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

**RTR-8**



```
RTR-8#show run
Building configuration...
Current configuration : 1054 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname RTR-8
!
!
!
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
!
!
!
license udi pid CISCO1941/K9 sn FTX15245WH1-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback0
ip address 8.8.8.8 255.255.255.255
!
interface GigabitEthernet0/0
ip address 10.10.10.8 255.255.255.0
duplex auto
speed auto
!
```



```
interface GigabitEthernet0/1
ip address 78.78.78.8 255.255.255.0
duplex auto
speed auto
!
interface Serial0/0/0
ip address 58.58.58.8 255.255.255.0
clock rate 2000000
!
interface Serial0/0/1
ip address 48.48.48.8 255.255.255.0
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 48.48.48.0 0.0.0.255 area 0
network 58.58.58.0 0.0.0.255 area 0
network 78.78.78.0 0.0.0.255 area 0
network 8.8.8.8 0.0.0.0 area 0
network 10.10.10.0 0.0.0.255 area 5
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

### RTR-9

```
RTR-9#show run
Building configuration...
```







```
interface GigabitEthernet0/0
ip address 192.168.2.1 255.255.255.0
ip ospf 1 area 2
duplex auto
speed auto
!
interface GigabitEthernet0/1
ip address 69.69.69.9 255.255.255.0
ip ospf 1 area 2
duplex auto
speed auto
!
interface Serial0/0/0
ip address 109.109.109.9 255.255.255.0
ip ospf 1 area 2
clock rate 2000000
!
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```



## RTR-10

```
RTR-10#show run
Building configuration...
Current configuration : 1114 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname RTR-10
!
!
!
!
ip dhcp excluded-address 192.168.3.1 192.168.3.10
!
ip dhcp pool LAN3
network 192.168.3.0 255.255.255.0
default-router 192.168.3.1
dns-server 8.8.4.4
domain-name write
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
!
license udi pid CISCO1941/K9 sn FTX1524BFX0-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
```



```
interface Loopback0
ip address 10.10.10.10 255.255.255.255
ip ospf 1 area 2
!
interface GigabitEthernet0/0
ip address 192.168.3.1 255.255.255.0
ip ospf 1 area 2
duplex auto
speed auto
!
interface GigabitEthernet0/1
ip address 10.11.10.10 255.255.255.0
ip ospf 1 area 2
duplex auto
speed auto
!
interface Serial0/0/0
ip address 109.109.109.10 255.255.255.0
ip ospf 1 area 2
!
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
```



end

### RTR-11

```
RTR-11#show run
Building configuration...
Current configuration : 933 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname RTR-11
!
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO1941/K9 sn FTX152454SX-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback0
ip address 11.11.11.11 255.255.255.255
ip ospf 1 area 2
```



```
!  
interface GigabitEthernet0/0  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface GigabitEthernet0/1  
ip address 10.11.10.11 255.255.255.0  
ip ospf 1 area 2  
duplex auto  
speed auto  
!  
interface Serial0/0/0  
ip address 116.116.116.11 255.255.255.0  
ip ospf 1 area 2  
clock rate 2000000  
!  
interface Serial0/0/1  
no ip address  
clock rate 2000000  
shutdown  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router ospf 1  
log-adjacency-changes  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
login  
!  
!  
!  
end
```



## RTR-12

```
RTR-12#show run
Building configuration...
Current configuration : 2033 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname RTR-12
!
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO1941/K9 sn FTX1524LT0Y-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback0
ip address 12.12.12.12 255.255.255.255
!
interface Loopback1
ip address 172.16.1.1 255.255.255.0
ip ospf network point-to-point
```



```
ip ospf priority 1
!
interface Loopback2
ip address 172.16.2.1 255.255.255.0
ip ospf network point-to-point
ip ospf priority 1
!
interface Loopback3
ip address 172.16.3.1 255.255.255.0
ip ospf network point-to-point
ip ospf priority 1
!
interface Loopback4
ip address 172.16.4.1 255.255.255.0
ip ospf network point-to-point
ip ospf priority 1
!
interface Loopback5
ip address 172.16.5.1 255.255.255.0
ip ospf network point-to-point
ip ospf priority 1
!
interface Loopback6
ip address 172.16.6.1 255.255.255.0
ip ospf network point-to-point
ip ospf priority 1
!
interface Loopback7
ip address 172.16.7.1 255.255.255.0
ip ospf network point-to-point
ip ospf priority 1
!
interface Loopback8
ip address 172.16.8.1 255.255.255.0
ip ospf network point-to-point
ip ospf priority 1
!
interface Loopback9
ip address 172.16.9.1 255.255.255.0
ip ospf network point-to-point
ip ospf priority 1
!
interface Loopback10
ip address 172.16.10.1 255.255.255.0
ip ospf network point-to-point
ip ospf priority 1
!
interface GigabitEthernet0/0
no ip address
duplex auto
speed auto
```



```

shutdown
!
interface GigabitEthernet0/1
no ip address
duplex auto
speed auto
shutdown
!
interface Serial0/0/0
ip address 7.12.7.12 255.255.255.0
!
interface Serial0/0/1
ip address 12.16.12.12 255.255.255.0
ip ospf 1 area 4
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
area 3 virtual-link 7.7.7.7
network 0.0.0.0 255.255.255.255 area 3
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end

```

## RTR-13

```
RTR-13#show run
Building configuration...
Current configuration : 1058 bytes
```



```
!  
version 15.1  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname RTR-13  
!  
!  
!  
!  
!  
ip dhcp pool LAN4  
network 192.168.4.0 255.255.255.0  
default-router 192.168.4.1  
dns-server 8.8.4.4  
domain-name write  
!  
!  
!  
no ip cef  
no ipv6 cef  
!  
!  
!  
license udi pid CISCO1941/K9 sn FTX152412GC-  
!  
!  
!  
!  
!  
!  
!  
!  
spanning-tree mode pvst  
!  
!  
!  
!  
!  
interface Loopback0  
ip address 13.13.13.13 255.255.255.255  
!  
interface GigabitEthernet0/0  
ip address 10.10.10.13 255.255.255.0  
ip ospf priority 100
```



```
duplex auto
speed auto
!
interface GigabitEthernet0/1
ip address 192.168.4.1 255.255.255.0
duplex auto
speed auto
!
interface Serial0/0/0
no ip address
clock rate 2000000
shutdown
!
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 0.0.0.0 255.255.255.255 area 5
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

#### **RTR-14**

RTR-14#show run



```
Building configuration...
Current configuration : 1057 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname RTR-14
!
!
!
!
!
!
ip dhcp pool LAN5
network 192.168.5.0 255.255.255.0
default-router 192.168.5.1
dns-server 8.8.4.4
domain-name write
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
!
!
license udi pid CISCO1941/K9 sn FTX15240HA2-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback0
ip address 14.14.14.14 255.255.255.255
!
interface GigabitEthernet0/0
```



```
ip address 10.10.10.14 255.255.255.0
ip ospf priority 50
duplex auto
speed auto
!
interface GigabitEthernet0/1
ip address 192.168.5.1 255.255.255.0
duplex auto
speed auto
!
interface Serial0/0/0
no ip address
clock rate 2000000
shutdown
!
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 0.0.0.0 255.255.255.255 area 5
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

**RTR-15**



```
RTR-15#show run
Building configuration...
Current configuration : 1036 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname RTR-15
!
!
!
!
!
ip dhcp pool LAN6
network 192.168.6.0 255.255.255.0
default-router 192.168.6.1
dns-server 8.8.4.4
domain-name write
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO1941/K9 sn FTX1524W39U-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback0
ip address 15.15.15.15 255.255.255.255
!
```



```
interface GigabitEthernet0/0
ip address 10.10.10.15 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/1
ip address 192.168.6.1 255.255.255.0
duplex auto
speed auto
!
interface Serial0/0/0
no ip address
clock rate 2000000
shutdown
!
interface Serial0/0/1
no ip address
clock rate 2000000
shutdown
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 0.0.0.0 255.255.255.255 area 5
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

**RTR-16**



```
RTR-16#show run
Building configuration...
Current configuration : 916 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname RTR-16
!
!
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO1941/K9 sn FTX1524PK00-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback0
ip address 16.16.16.16 255.255.255.255
!
interface GigabitEthernet0/0
no ip address
duplex auto
speed auto
shutdown
```





```
!  
interface GigabitEthernet0/1  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface Serial0/0/0  
ip address 12.16.12.16 255.255.255.0  
clock rate 2000000  
!  
interface Serial0/0/1  
ip address 16.17.16.16 255.255.255.0  
clock rate 2000000  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router ospf 1  
log-adjacency-changes  
network 0.0.0.0 255.255.255.255 area 4  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
!  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
login  
!  
!  
!  
end
```

### **RTR-17**

```
RTR-17#show run  
Building configuration...  
Current configuration : 1016 bytes  
!
```



```
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname RTR-17
!
!
!
!
!
ip dhcp pool LAN7
network 192.168.7.0 255.255.255.0
default-router 192.168.7.1
dns-server 8.8.4.4
domain-name write
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO1941/K9 sn FTX152460D3-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback0
ip address 17.17.17.17 255.255.255.255
!
interface GigabitEthernet0/0
ip address 192.168.7.1 255.255.255.0
duplex auto
speed auto
```



```
!  
interface GigabitEthernet0/1  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface Serial0/0/0  
ip address 16.17.16.17 255.255.255.0  
!  
interface Serial0/0/1  
no ip address  
clock rate 2000000  
shutdown  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router ospf 1  
log-adjacency-changes  
network 0.0.0.0 255.255.255.255 area 4  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
login  
!  
!  
!  
end
```