


OSPF Multi Area

Adding networks

 Router0

Physical Config CLI Attributes

IOS Command Line Interface

```
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end

Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.168.1.0 0.0.0.255 area 10
Router(config-router)#network 192.168.2.0 0.0.0.255 area 0
Router(config-router)#
02:48:01: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.3.1 on FastEthernet0/1 from LOADING to FULL,
Loading Done

02:48:41: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.3.1 on FastEthernet0/1 from FULL to DOWN, Neighbor
Down: Dead timer expired

02:48:41: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.3.1 on FastEthernet0/1 from FULL to DOWN, Neighbor
Down: Interface down or detached

02:48:46: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.3.1 on FastEthernet0/1 from LOADING to FULL,
Loading Done
```

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Router1

Physical

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IOS Command Line Interface

```
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no rout
02:43:27: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.2.1 on FastEthernet0/0 from FULL to DOWN, Neighbor
Down: Dead timer expired

02:43:27: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.2.1 on FastEthernet0/0 from FULL to DOWN, Neighbor
Down: Interface down or detached

% Incomplete command.
Router(config)#no router ospf 1
Router(config)#router ospf 1
Router(config-router)#network 192.168.2.0 0.0.0.255 area 0
Router(config-router)#network
02:47:55: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.2.1 on FastEthernet0/0 from LOADING to FULL,
Loading Done

% Incomplete command.
Router(config-router)#network 192.168.3.0 0.0.0.255 area 0
Router(config-router)#
02:48:36: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.2.1 on FastEthernet0/0 from FULL to DOWN, Neighbor
Down: Dead timer expired

02:48:36: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.2.1 on FastEthernet0/0 from FULL to DOWN, Neighbor
Down: Interface down or detached

02:48:41: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.2.1 on FastEthernet0/0 from LOADING to FULL,
Loading Done

02:51:11: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.4.1 on FastEthernet0/1 from LOADING to FULL,
Loading Done
```

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Router2

Physical Config **CLI** Attributes

IOS Command Line Interface

Router con0 is now available

Press RETURN to get started.

```
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#no router osp
02:44:23: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.3.1 on FastEthernet0/0 from FULL to DOWN, Neighbor
Down: Dead timer expired


02:44:23: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.3.1 on FastEthernet0/0 from FULL to DOWN, Neighbor
Down: Interface down or detached

% Incomplete command.
Router(config)#no router ospf 1
Router(config)#router ospf 1
Router(config-router)#network 192.168.4.0 0.0.0.255 area 20
Router(config-router)#network 192.168.3.0 0.0.0.255 area 0
Router(config-router)#
02:51:07: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.3.1 on FastEthernet0/0 from LOADING to FULL,
Loading Done
Router(config-router)#
```

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Commands - ip show run and different commands

 Router0

Physical Config CLI Attributes


IOS Command Line Interface

```
ip address 192.168.1.1 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
ip address 192.168.2.1 255.255.255.0
duplex auto
speed auto
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 192.168.1.0 0.0.0.255 area 10
network 192.168.2.0 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

Router#
```

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 Router1


Physical Config CLI Attributes

IOS Command Line Interface

```
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface FastEthernet0/0
 ip address 192.168.2.2 255.255.255.0
 duplex auto
 speed auto
!
interface FastEthernet0/1
 ip address 192.168.3.1 255.255.255.0
 duplex auto
 speed auto
!
interface Vlan1
 no ip address
 shutdown
!
router ospf 1
 log-adjacency-changes
 network 192.168.2.0 0.0.0.255 area 0
 network 192.168.3.0 0.0.0.255 area 0
!
ip classless
!
ip flow-export version 9
!
!
!
!
!
!
--More--
```

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 Router2—□×

PhysicalConfigCLIAttributes

IOS Command Line Interface

```
ip address 192.168.3.2 255.255.255.0
duplex auto
speed auto
!
interface FastEthernet0/1
ip address 192.168.4.1 255.255.255.0
duplex auto
speed auto
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
log-adjacency-changes
network 192.168.4.0 0.0.0.255 area 20
network 192.168.3.0 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

Router#
```

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Router0

Physical

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IOS Command Line Interface

```
end

Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    192.168.1.0/24 is directly connected, FastEthernet0/0
C    192.168.2.0/24 is directly connected, FastEthernet0/1
O    192.168.3.0/24 [110/2] via 192.168.2.2, 00:11:55, FastEthernet0/1
O IA 192.168.4.0/24 [110/3] via 192.168.2.2, 00:11:55, FastEthernet0/1

Router#show ip route ospf
O    192.168.3.0 [110/2] via 192.168.2.2, 00:12:02, FastEthernet0/1
O IA 192.168.4.0 [110/3] via 192.168.2.2, 00:12:02, FastEthernet0/1

Router#show ip protocols

Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 192.168.2.1
  Number of areas in this router is 2. 2 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    192.168.1.0 0.0.0.255 area 10
    192.168.2.0 0.0.0.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    192.168.2.1          110         00:14:46
    192.168.3.1          110         00:12:16
    192.168.4.1          110         00:12:15
  Distance: (default is 110)

Router#
```

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Router#show ip ospf database

OSPF Router with ID (192.168.2.1) (Process ID 1)

Router Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
192.168.2.1	192.168.2.1	942	0x80000004	0x00ff9e	1
192.168.3.1	192.168.3.1	792	0x80000006	0x00d4d9	2
192.168.4.1	192.168.4.1	791	0x80000002	0x000495	1

Net Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum
192.168.2.2	192.168.3.1	987	0x80000001	0x00d273
192.168.3.2	192.168.4.1	792	0x80000001	0x0061d4

Summary Net Link States (Area 0)

Link ID	ADV Router	Age	Seq#	Checksum
192.168.1.0	192.168.2.1	1042	0x80000001	0x00b6d0
192.168.4.0	192.168.4.1	791	0x80000001	0x0087fa

Router Link States (Area 10)

Link ID	ADV Router	Age	Seq#	Checksum	Link count
192.168.2.1	192.168.2.1	1047	0x80000002	0x009d71	1

Summary Net Link States (Area 10)

Link ID	ADV Router	Age	Seq#	Checksum
192.168.2.0	192.168.2.1	1037	0x80000001	0x00abda
192.168.3.0	192.168.2.1	965	0x80000002	0x00a8da
192.168.4.0	192.168.2.1	781	0x80000003	0x00a5da

Router#

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```
Router#show ip interface fa0/0
FastEthernet0/0 is up, line protocol is up (connected)
  Internet address is 192.168.1.1/24
  Broadcast address is 255.255.255.255
  Address determined by setup command
  MTU is 1500 bytes
  Helper address is not set
  Directed broadcast forwarding is disabled
  Outgoing access list is not set
  Inbound access list is not set
  Proxy ARP is enabled
  Security level is default
  Split horizon is enabled
  ICMP redirects are always sent
  ICMP unreachable are always sent
  ICMP mask replies are never sent
  IP fast switching is disabled
  IP fast switching on the same interface is disabled
  IP Flow switching is disabled
  IP Fast switching turbo vector
  IP multicast fast switching is disabled
  IP multicast distributed fast switching is disabled
  Router Discovery is disabled
  IP output packet accounting is disabled
  IP access violation accounting is disabled
  TCP/IP header compression is disabled
  RTP/IP header compression is disabled
  Probe proxy name replies are disabled
  Policy routing is disabled
  Network address translation is disabled
  BGP Policy Mapping is disabled
  Input features: MCI Check
  WCCP Redirect outbound is disabled
  WCCP Redirect inbound is disabled
  WCCP Redirect exclude is disabled
```

Router# |

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

Neighbor ID	Pri	State	Dead Time	Address	Interface
192.168.3.1	1	FULL/DR	00:00:39	192.168.2.2	FastEthernet0/1

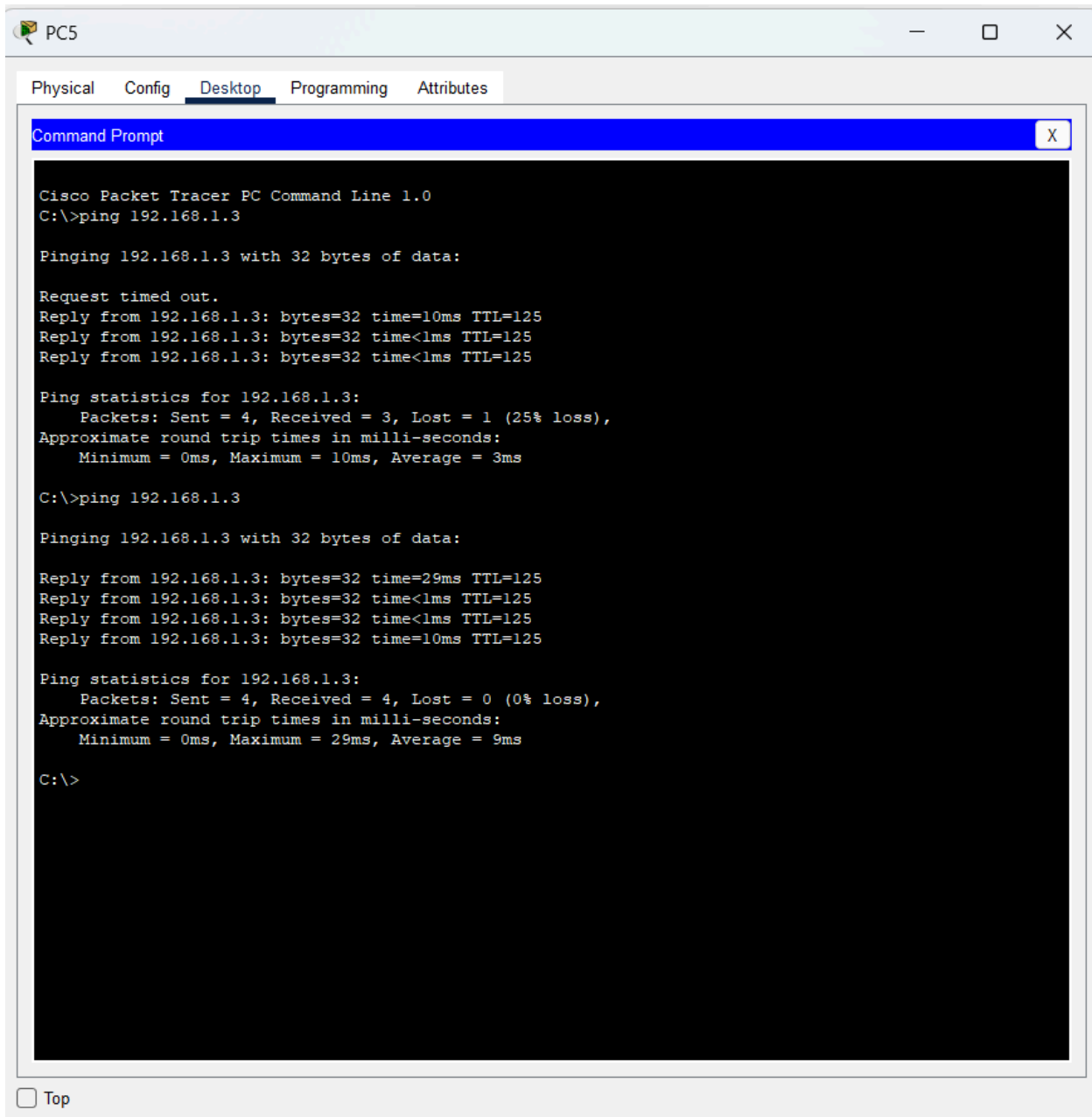
Router#

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Ping command



The screenshot shows a Cisco Packet Tracer interface with a PC5 configuration window. The 'Desktop' tab is selected, displaying a 'Command Prompt' window. The command prompt shows the execution of the 'ping 192.168.1.3' command twice. The first execution shows a 'Request timed out' followed by three successful replies. The second execution shows four successful replies. Ping statistics are displayed for both attempts, showing a 25% loss in the first and 0% loss in the second.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>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=10ms TTL=125
Reply from 192.168.1.3: bytes=32 time<1ms TTL=125
Reply from 192.168.1.3: bytes=32 time<1ms TTL=125

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 3ms

C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=29ms TTL=125
Reply from 192.168.1.3: bytes=32 time<1ms TTL=125
Reply from 192.168.1.3: bytes=32 time<1ms TTL=125
Reply from 192.168.1.3: bytes=32 time=10ms TTL=125

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 29ms, Average = 9ms

C:\>
```

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