

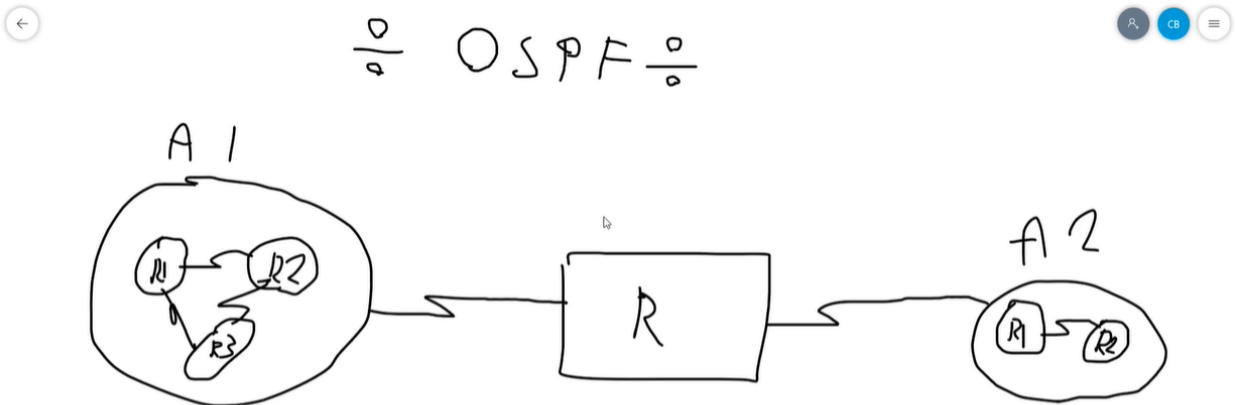
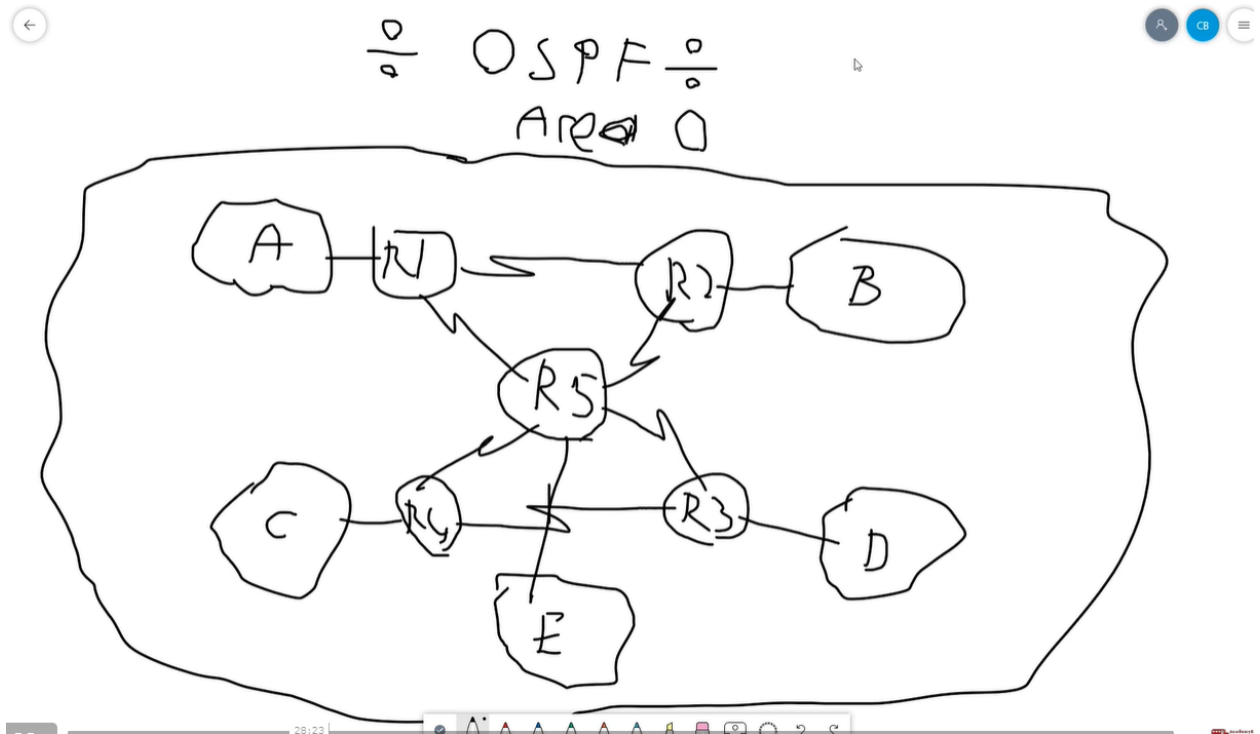
OSPF (Open Short Path First)

Asrın Andırın

Aim

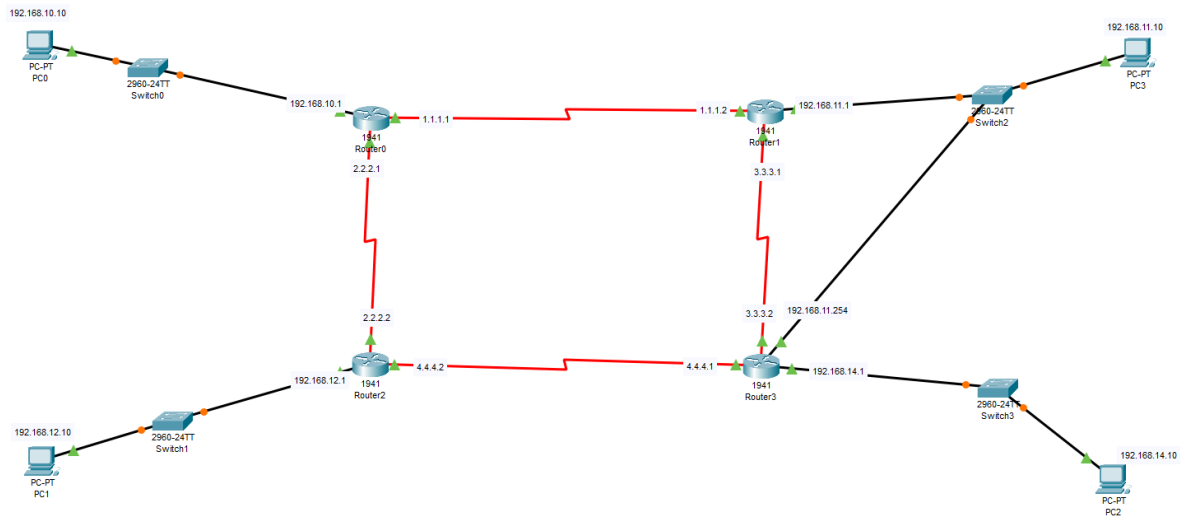
- Working and practicing on OSPF.

Single Area Project



Router OSPF Durumları :

- Down state
- Init Durumu
- 2 way state
- Extart state
- Loading state
- Full state



Router config for router 0

Bazı key pointler,

Router ospf 1, buradaki ospf 1 komşularda aynı olmak zorunda değil, ama aynı da olabilir.

Router ID tanıtılırken diğer routerlara yazdığımız IP type ID'den farklı bir ID yazmalıyız.

Network tanıtılırken white mask yazılır.

Network tanıtılırken area yazılır, bu projede tüm routerlar area 1 de olduğu için hepsine area 1 yazdık.

```
Router>
Router>
Router>ena
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
Router(config)#
Router(config)#
Router(config)#rout
Router(config)#router osp
Router(config)#router ospf 1
Router(config-router)#rout
Router(config-router)#router-id 1.1.1.1
Router(config-router)#
Router(config-router)#
Router(config-router)#net
Router(config-router)#network 192.168.10.0 0.0.0.255 are
Router(config-router)#network 192.168.10.0 0.0.0.255 area 1
Router(config-router)#
Router(config-router)#net
Router(config-router)#network 1.1.1.0 0.0.0.255 are
Router(config-router)#network 1.1.1.0 0.0.0.255 area 1
Router(config-router)#
Router(config-router)#net
Router(config-router)#network 2.2.2.0 0.0.0.255 area 1
Router(config-router)#network 2.2.2.0 0.0.0.255 area 1
Router(config-router)#
Router(config-router)#
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#wri
Router#write
Building configuration
```

Ctrl+F6 to exit CLI focus

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Router 1 config ekranı

```
% incomplete command.
Router(config)#
Router(config)#
Router(config)#rout
Router(config)#router ospf 1
Router(config-router)#
Router(config-router)#
Router(config-router)#route
Router(config-router)#router-id 2.2.2.2
Router(config-router)#
Router(config-router)#net
Router(config-router)#network 1.1.1.0 0.0.0.255 are
Router(config-router)#network 1.1.1.0 0.0.0.255 area 1
Router(config-router)#
Router(config-router)#
Router(config-router)#net
Router(config-router)#network 3.3.3.0
00:10:27: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on Serial0/1/0 from LOADING to FULL,
Loading Done

Router(config-router)#network 3.3.3.0 0.0.0.255 are
Router(config-router)#network 3.3.3.0 0.0.0.255 area 1
Router(config-router)#
Router(config-router)#
Router(config-router)#net
Router(config-router)#network 192.168.11.0 0.0.0.255 are
Router(config-router)#network 192.168.11.0 0.0.0.255 area 1
Router(config-router)#
Router(config-router)#
Router(config-router)#
```

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Router 1 routing table

```
Router>
Router>sho
Router>show ip r
Router>show ip rou
Router>show ip route
Codes: L - local, C - connected, S - static, 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

1.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    1.1.1.0/24 is directly connected, Serial0/1/0
L    1.1.1.1/32 is directly connected, Serial0/1/0
2.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    2.2.2.0/24 is directly connected, Serial0/1/1
L    2.2.2.1/32 is directly connected, Serial0/1/1
3.0.0.0/24 is subnetted, 1 subnets
O    3.3.3.0/24 [110/128] via 1.1.1.2, 00:09:40, Serial0/1/0
4.0.0.0/24 is subnetted, 1 subnets
O    4.4.4.0/24 [110/129] via 1.1.1.2, 00:04:29, Serial0/1/0
192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.10.0/24 is directly connected, GigabitEthernet0/0
--More--
```

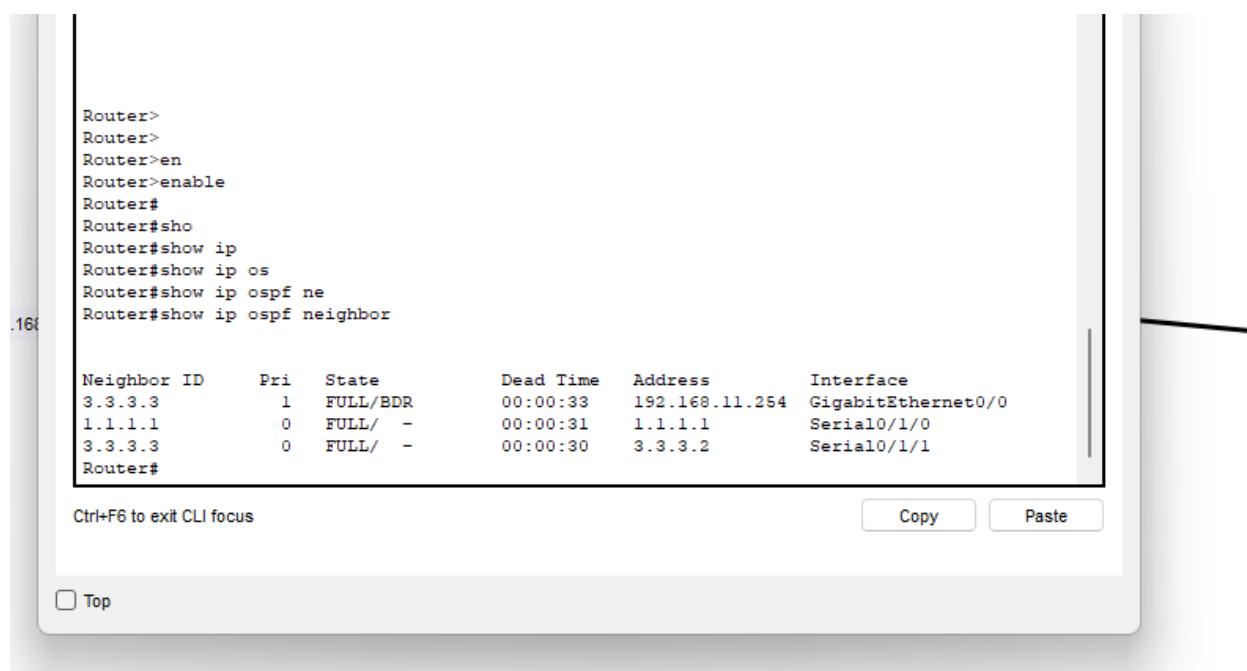
Ctrl+F6 to exit CLI focus

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Router 1 Neighbor list



The screenshot shows a terminal window with a Cisco Router CLI session. The user enters the following commands:

```
Router>
Router>
Router>en
Router>enable
Router#
Router#sho
Router#show ip
Router#show ip os
Router#show ip ospf ne
Router#show ip ospf neighbor
```

The output of the `show ip ospf neighbor` command is displayed as a table:

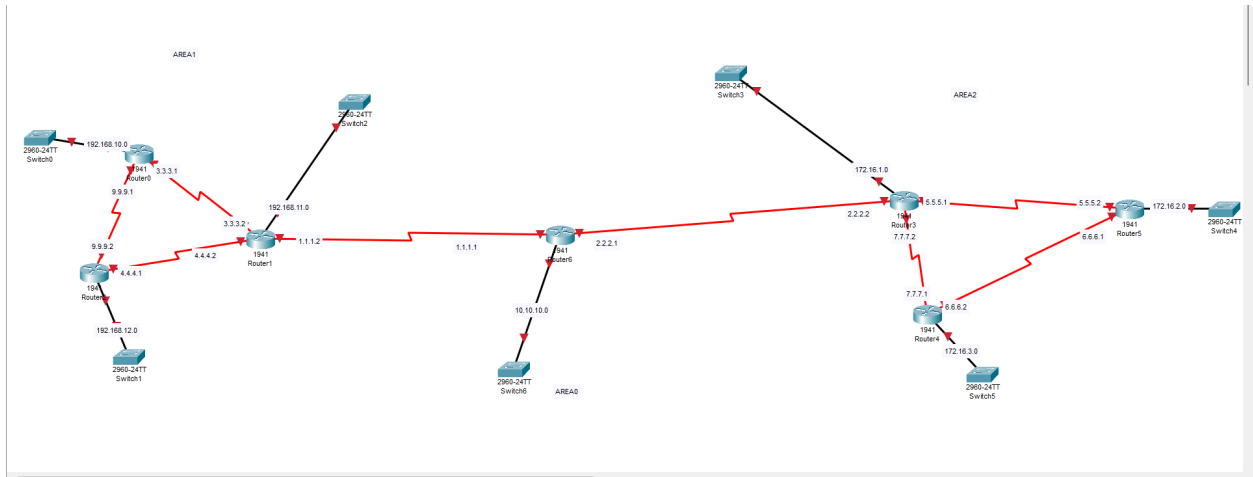
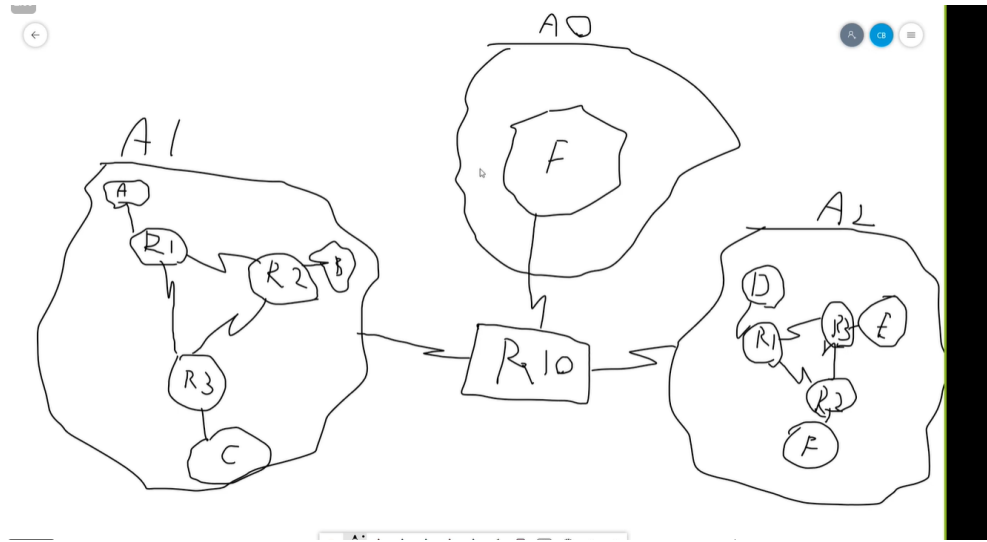
Neighbor ID	Pri	State	Dead Time	Address	Interface
3.3.3.3	1	FULL/BDR	00:00:33	192.168.11.254	GigabitEthernet0/0
1.1.1.1	0	FULL/ -	00:00:31	1.1.1.1	Serial0/1/0
3.3.3.3	0	FULL/ -	00:00:30	3.3.3.2	Serial0/1/1

The prompt returns to `Router#`.

Below the terminal window, there is a status bar with the text "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste".

At the bottom left of the window, there is a checkbox labeled "Top".

Multiple Area Project 2



Router 5 = Backbone Area Router.

Left side = internal area router.

Right side = internal area router.

Bu şekilde ağıları böldüğümüzde, routing tablolar hafiflemiş oluyor ve router performansı artıyor.

R1 Config Commands

```
R1#
R1#
R1#
R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#
R1(config)#
R1(config)#rou
R1(config)#router os
R1(config)#router ospf 1
R1(config-router)#rou
R1(config-router)#router-id 1.1.1.1
R1(config-router)#netw
R1(config-router)#network 9.9.9.0 0.0.0.255 area 1
R1(config-router)#network 12.12.12.0 0.0.0.255 area 1
R1(config-router)#network 192.168.10.0 0.0.0.255 area 1
R1(config-router)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console
```

Ctrl+F6 to exit CLI focus

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BBR Config Commands

BBR config yapılırken bölge dağıtımında area yazımına dikkat etmeliyiz.

```
Router(config)#
Router(config)#rou
Router(config)#router os
Router(config)#router ospf 1
Router(config-router)#
Router(config-router)#rout
Router(config-router)#router-id 4.4.4.4
Router(config-router)#
Router(config-router)#net
Router(config-router)#network 1.1.1.0 0.0.0.255 are
Router(config-router)#network 1.1.1.0 0.0.0.255 area 1
Router(config-router)#
Router(config-router)#net
Router(config-router)#network 10.10.10.0 0.0.0.255 aer
00:52:53: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from backbone area must be virtual-link but not found
from 1.1.1.1, Serial0/1/0

00:53:03: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from backbone area must be virtual-link but not found
from 1.1.1.1, Serial0/1/0

00:53:13: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from backbone area must be virtual-link but not found
from 1.1.1.1, Serial0/1/0

00:53:23: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from backbone area must be virtual-link but not found
from 1.1.1.1, Serial0/1/0

00:53:33: %OSPF-4-ERRRCV: Received invalid packet: mismatch area ID, from backbone area must be virtual-link but not found
from 1.1.1.1, Serial0/1/0

% Invalid input detected at '^' marker.

Router(config-router)#
Router(config-router)#network 1.1.1.0 0.0.0.255 area 0
Router(config-router)#
00:53:40: %OSPF-6-AREACHG: 1.1.1.0/0 changed from area 1 to area 0

00:53:43: %OSPF-5-ADJCHG: Process 1, Nbr 3.3.3.3 on Serial0/1/0 from LOADING to FULL, Loading Done

Router(config-router)#
Router(config-router)#network 2.2.2.0 0.0.0.255 area 0
Router(config-router)#
Router(config-router)#network 10.10.10.0 0.0.0.255 area 0
Router(config-router)#end
Router(config-router)#end
Router#
%SYS-S-CONFIG_I: Configured from console by console

Router#
Router#wri
Router#write
```

Area 2 R3 Config Command

```

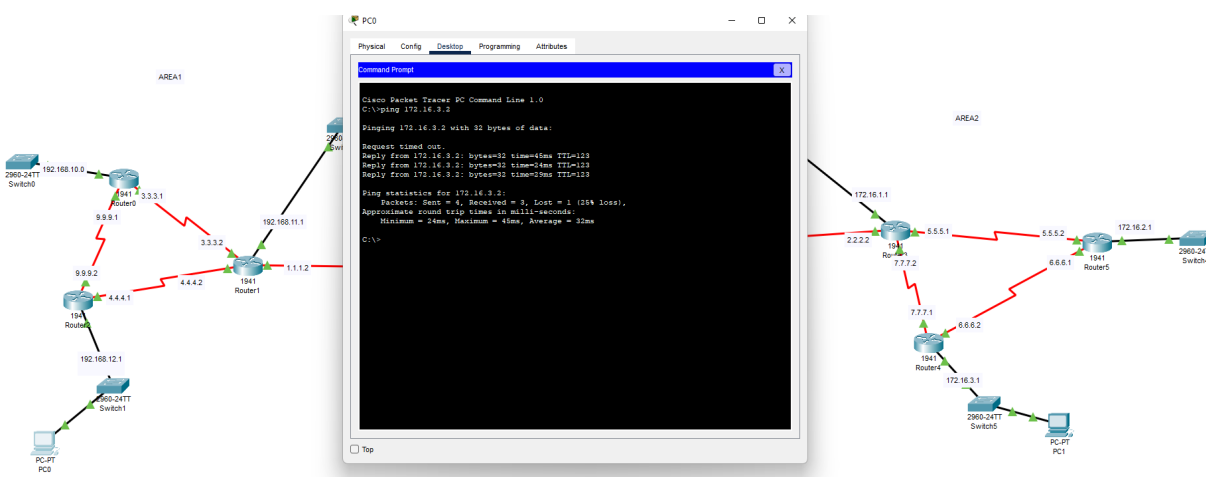
Router(config)#
Router(config)#
Router(config)#rou
Router(config)#router os
Router(config)#router ospf 1
Router(config-router)#
Router(config-router)#rou
Router(config-router)#router-id 6.6.6.6
Router(config-router)#
Router(config-router)#net
Router(config-router)#network 172.16.1.0 0.0.0.255 are
Router(config-router)#network 2.2.2.0 0.0.0.255 are
Router(config-router)#network 2.2.2.0 0.0.0.255 area 0
Router(config-router)#
Router(config-router)#net
Router(config-router)#network
00:59:58: %OSPF-5-ADJCHG: Process 1, Nbr 4.4.4.4 on Serial0/0/0 from LOADING t
Loading Done

% Incomplete command.
Router(config-router)#
Router(config-router)#net
Router(config-router)#network 172.16.1.0 0.0.0.255 are
Router(config-router)#network 172.16.1.0 0.0.0.255 area 2
Router(config-router)#
Router(config-router)#net
Router(config-router)#network 5.5.5.0 0.0.0.255 are
Router(config-router)#network 5.5.5.0 0.0.0.255 area 2
Router(config-router)#
Router(config-router)#

```

Ctrl+F6 to exit CLI focus

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Same Project made in GNS3 Software.

