OSPF

next

next

```
conf t
router ospf 1
router-id 4.4.4.4
```

Address (Host or Network)	Netmask (i.e. 24)	Netmask for sub/supernet (optional)
3.16.128.0	/ 17	move to:

[Calculate] [Help]

```
Address:   3.16.128.0       00000011.00010000.1 0000000.00000000
Netmask:   255.255.128.0 = 17  11111111.11111111.1 0000000.00000000
Wildcard:  0.0.127.255      00000000.00000000.0 1111111.11111111
=>
Network:   3.16.128.0/17    00000011.00010000.1 0000000.00000000 (Class A)
Broadcast: 3.16.255.255     00000011.00010000.1 1111111.11111111
HostMin:   3.16.128.1       00000011.00010000.1 0000000.00000001
HostMax:   3.16.255.254     00000011.00010000.1 1111111.11111110
Hosts/Net: 32766
```

wildcard is 0.0.127.255
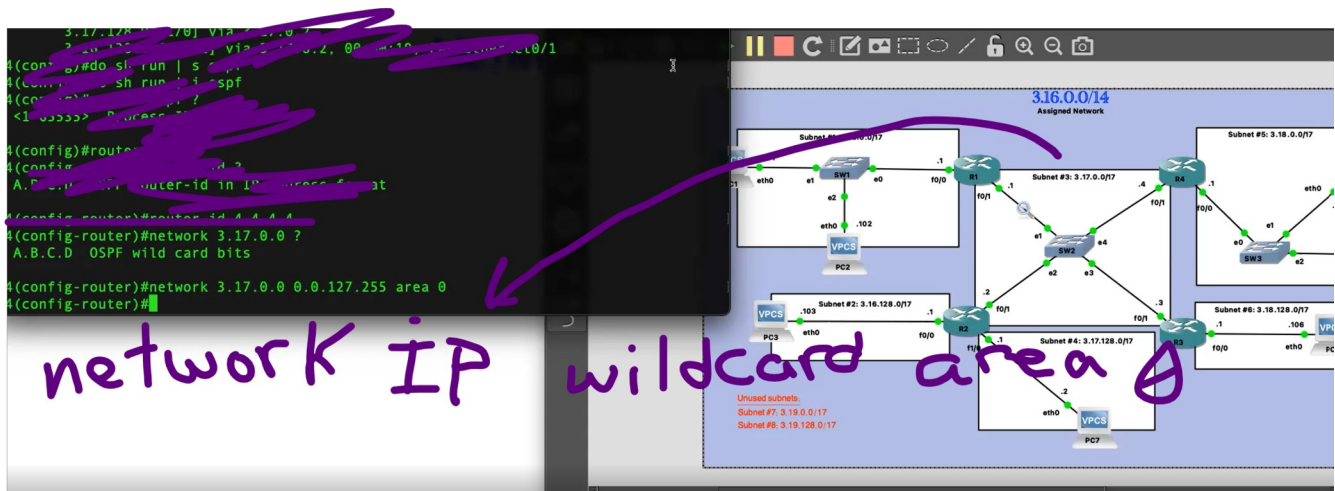
network <ip> <wildcard> area 0
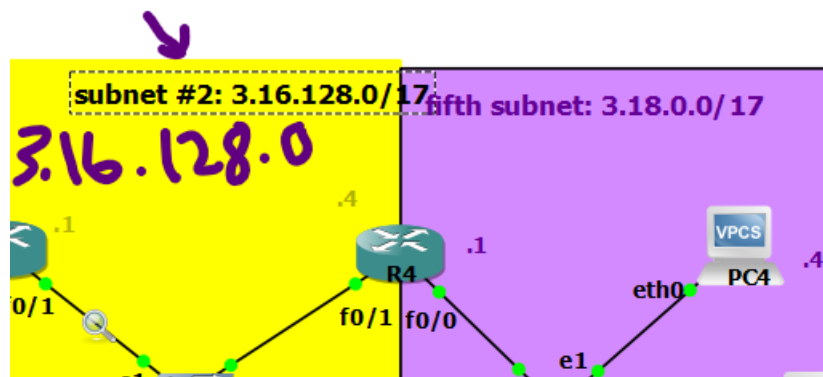
network 3.16.128.0 0.0.127.255 area 0


```
R4(config-router)#network 3.16.128.0 0.0.127.255 area 0
R4(config-router)#
*Mar  1 03:13:48.847: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on FastEthernet0/1
from LOADING to FULL, Loading Done
```


network 3.18.0.0 0.0.127.255 area 0
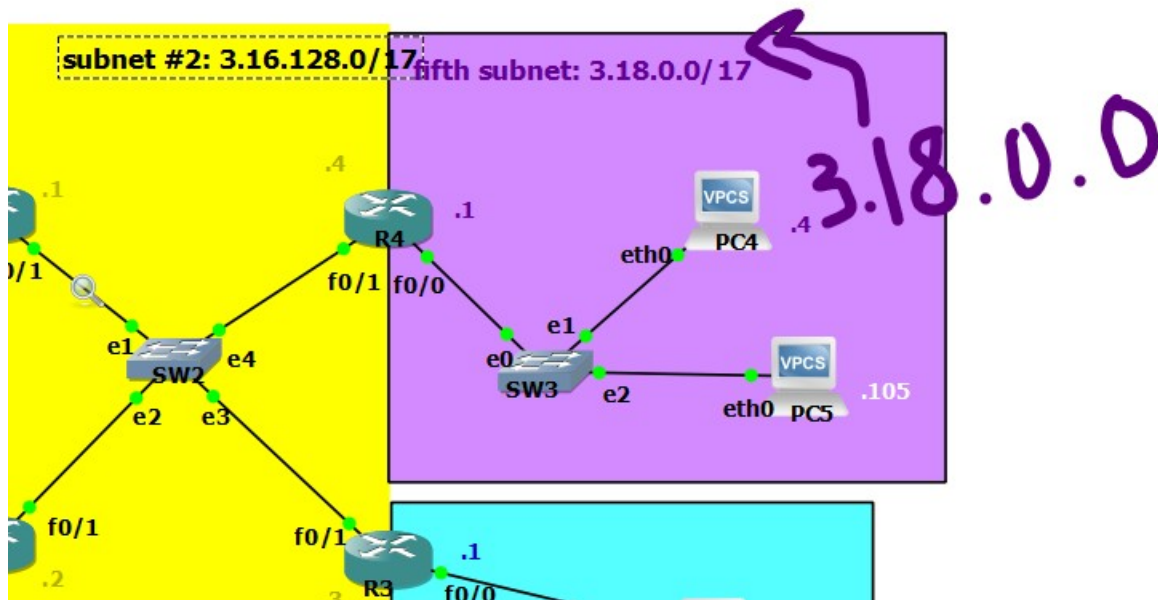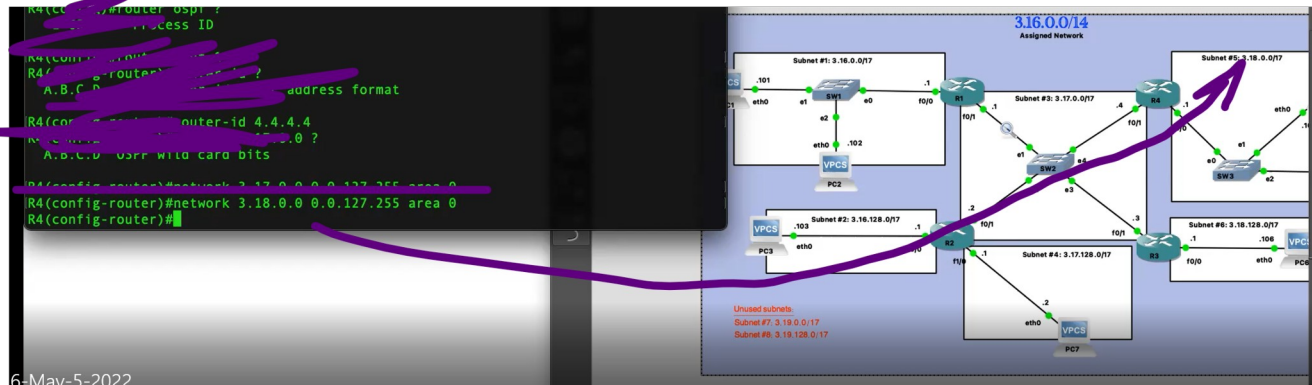
```
from LOADING to FULL, Loading Done
R4(config-router)#network 3.18.0.0 0.0.127.255 area 0
R4(config-router)#
```

next ===


```
R1(config)#router ospf 1
R1(config-router)#router-id 1.1.1.1
```



```
R1(config)#router ospf 1
R1(config-router)#router-id 1.1.1.1
```

router ospf 1
router-id 1.1.1.1
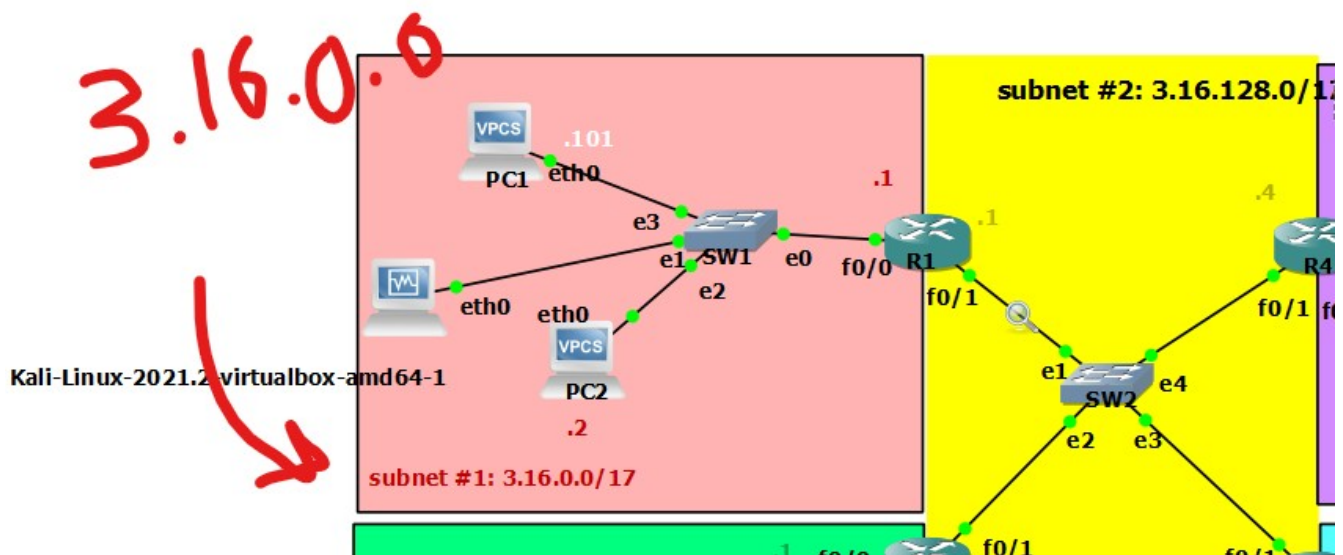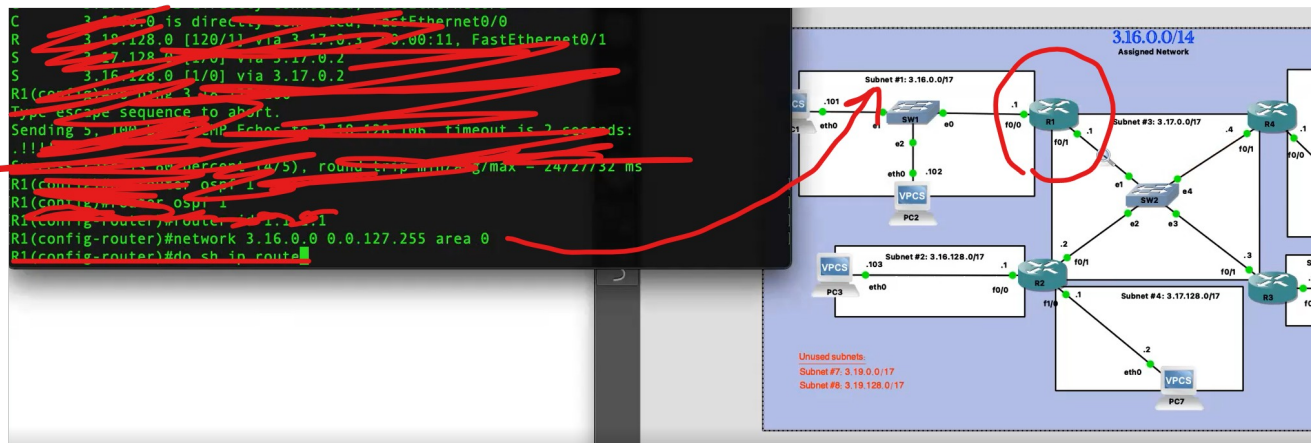
network 3.16.0.0 0.0.127.255 area 0


```
R1(config-router)#
R1(config-router)#network 3.16.0.0 0.0.127.255 area 0
R1(config-router)#
```



```
S      3.16.128.0 [1/0] via 3.17.0.2
R1(config)#do ping 3.18.128.106
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 3.18.128.106, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 24/27/32 ms
R1(config)#no router ospf 1
R1(config)#router ospf 1
R1(config-router)#router-id 1.1.1.1
R1(config-router)#network 3.16.0.0 0.0.127.255 area 0
R1(config-router)#do sh ip route static
      3.0.0.0/17 is subnetted, 6 subnets
S      3.18.0.0 [1/0] via 3.17.0.4
S      3.17.128.0 [1/0] via 3.17.0.2
S      3.16.128.0 [1/0] via 3.17.0.2
R1(config-router)#exit
R1(config)#no ip route 3.18.0.0 255.255.128.0 3.17.0.4
R1(config)#
```

no ip route < ip to remove (mask) *ip to replace with*

May-5-2022

no ip route <ip to remove from routing & mask> <ip to replace with NO mask>

no ip route 3.18.0.0 255.255.128.0 3.16.128.4

```
R1(config-router)#do sh ip route static
       3.0.0.0/17 is subnetted, 6 subnets
S         3.18.0.0 [1/0] via 3.16.128.4
S         3.17.0.0 [1/0] via 3.16.128.2
S         3.18.128.0 [1/0] via 3.16.128.2
S         3.17.128.0 [1/0] via 3.16.128.3
```

```
R1(config)#no ip route 3.18.0.0 255.255.128.0 3.16.128.4
R1(config)#
```

```
R1(config)#do sh ip route static
       3.0.0.0/17 is subnetted, 6 subnets
S         3.17.0.0 [1/0] via 3.16.128.2
S         3.18.128.0 [1/0] via 3.16.128.2
S         3.17.128.0 [1/0] via 3.16.128.3
```

```
R1(config)#do sh ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

     3.0.0.0/17 is subnetted, 6 subnets
R        3.18.0.0 [120/1] via 3.16.128.4, 00:00:27, FastEthernet0/1
S        3.17.0.0 [1/0] via 3.16.128.2
C        3.16.0.0 is directly connected, FastEthernet0/0
S        3.18.128.0 [1/0] via 3.16.128.2
S        3.17.128.0 [1/0] via 3.16.128.3
C        3.16.128.0 is directly connected, FastEthernet0/1
```

no ip route 3.16.0.0 255.255.128.0 3.16.128.1
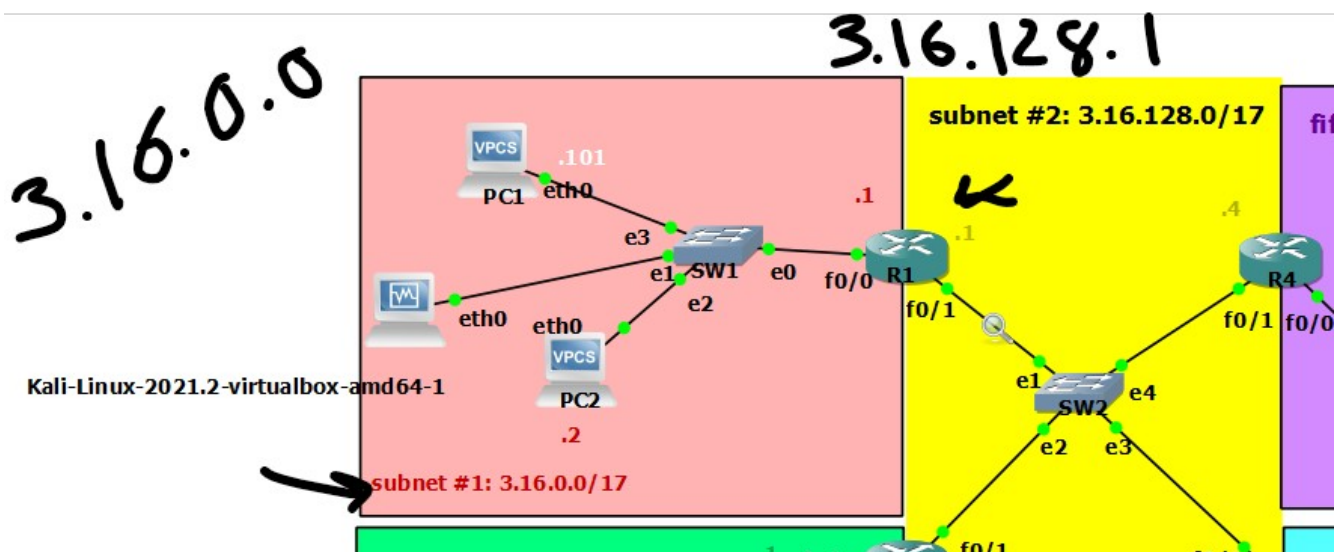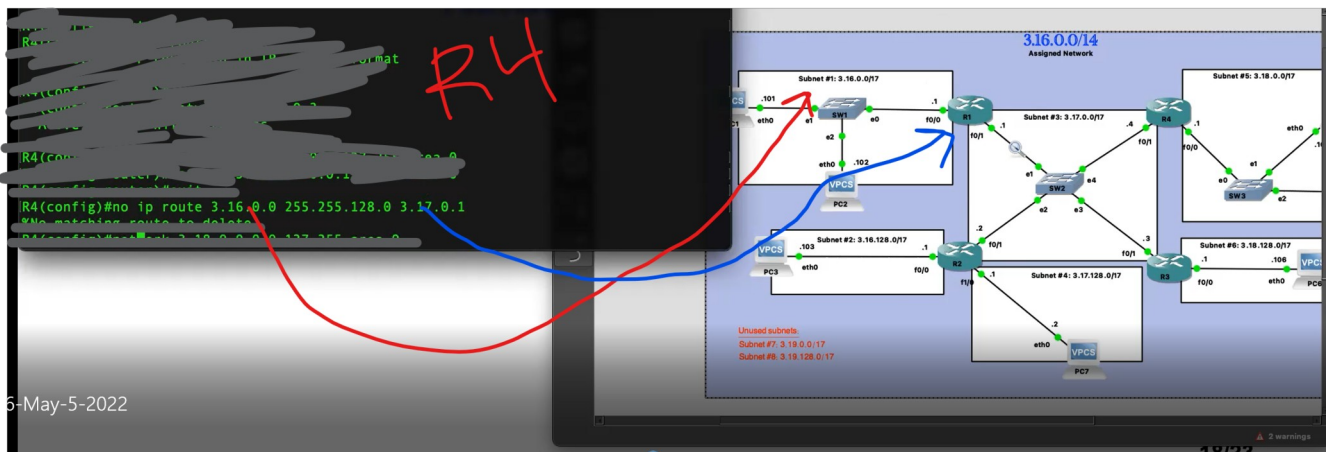
```
R4(config)#no ip route 3.16.0.0 255.255.128.0 3.16.128.1
R4(config)#do sh ip route static
      3.0.0.0/17 is subnetted, 5 subnets
S        3.17.0.0 [1/0] via 3.16.128.2
S        3.18.128.0 [1/0] via 3.16.128.2
S        3.17.128.0 [1/0] via 3.16.128.3
```

```
R4(config)#do sh ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

     3.0.0.0/17 is subnetted, 6 subnets
C       3.18.0.0 is directly connected, FastEthernet0/0
S       3.17.0.0 [1/0] via 3.16.128.2
R       3.16.0.0 [120/1] via 3.16.128.1, 00:00:16, FastEthernet0/1
S       3.18.128.0 [1/0] via 3.16.128.2
S       3.17.128.0 [1/0] via 3.16.128.3
C       3.16.128.0 is directly connected, FastEthernet0/1
```

```
R1(config)#do sh run | s ospf
router ospf 1
 router-id 1.1.1.1
 log-adjacency-changes
 network 3.16.0.0 0.0.127.255 area 0
```
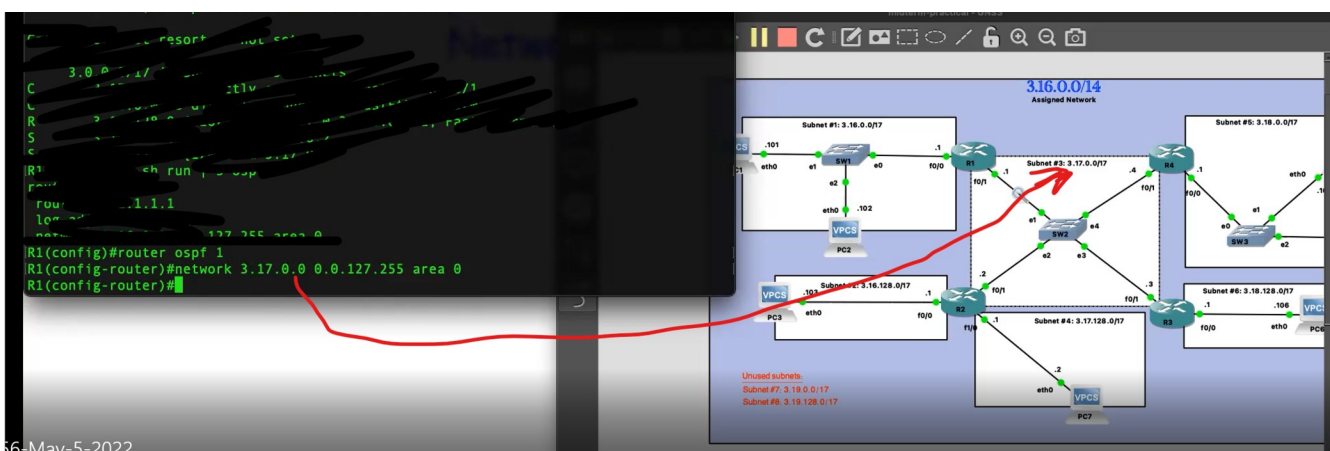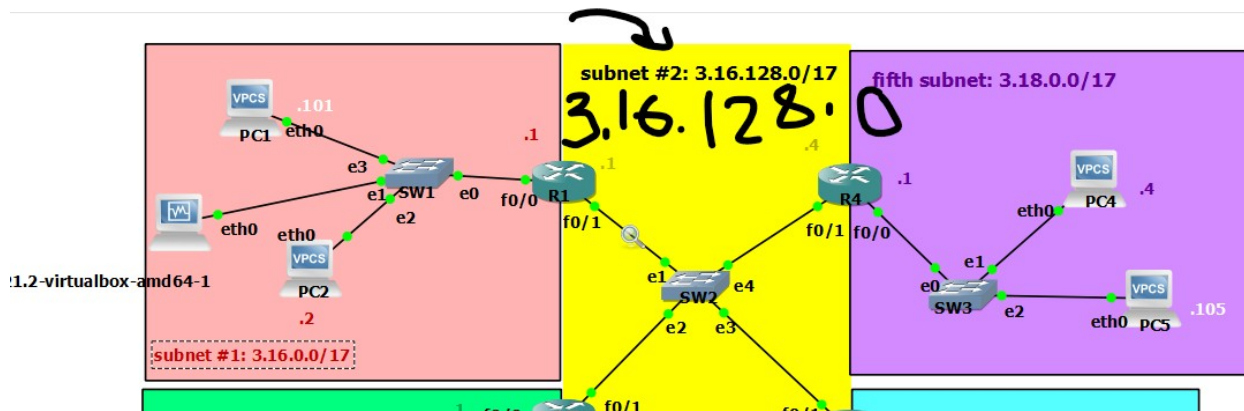
do sh run | s ospf

```
R1(config)#do sh run | s ospf
router ospf 1
 router-id 1.1.1.1
 log-adjacency-changes
 network 3.16.0.0 0.0.127.255 area 0
```

router ospf 1
network 3.16.128.0 0.0.127.255 area 0

```
R1(config)#router ospf 1
R1(config-router)#network 3.16.128.0 0.0.127.255 area 0
R1(config-router)#
*Mar  1 06:03:11.366: %OSPF-5-ADJCHG: Process 1, Nbr 4.4.4.4 on FastEthernet0/1
from LOADING to FULL, Loading Done
```

```
R1(config-router)#do sh ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

     3.0.0.0/17 is subnetted, 6 subnets
O       3.18.0.0 [110/20] via 3.16.128.4, 00:01:09, FastEthernet0/1
S       3.17.0.0 [1/0] via 3.16.128.2
C       3.16.0.0 is directly connected, FastEthernet0/0
S       3.18.128.0 [1/0] via 3.16.128.2
S       3.17.128.0 [1/0] via 3.16.128.3
C       3.16.128.0 is directly connected, FastEthernet0/1
R1(config-router)#
```

next ===

```
[R2(config)#router ospf 2
[R2(config-router)# router-
[R2(config-router)# router-id 2.2.2.2
[R2(config-router)#network 0.0.0.0 255.255.255.255 area 0
```

router ospf 2
router-id 2.2.2.2
network 0.0.0.0 255.255.255.255 area 0

```
R2#router ospf 2
    ^
% Invalid input detected at '^' marker.

R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#router ospf 2
R2(config-router)#router-id 2.2.2.2
R2(config-router)#network 0.0.0.0 255.255.255.255 area 0
R2(config-router)#
*Mar  1 03:29:58.699: %OSPF-5-ADJCHG: Process 2, Nbr 1.1.1.1 on FastEthernet0/1
from LOADING to FULL, Loading Done
*Mar  1 03:29:58.699: %OSPF-5-ADJCHG: Process 2, Nbr 4.4.4.4 on FastEthernet0/1
from LOADING to FULL, Loading Done
```

```
R2(config-router)#do sh ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

     3.0.0.0/17 is subnetted, 6 subnets
S       3.18.0.0 [1/0] via 3.16.128.4
C       3.17.0.0 is directly connected, FastEthernet0/0
S       3.16.0.0 [1/0] via 3.16.128.1
C       3.18.128.0 is directly connected, FastEthernet1/0
S       3.17.128.0 [1/0] via 3.16.128.3
C       3.16.128.0 is directly connected, FastEthernet0/1
```

```
  neighbor                Neighbor list
  request-list            Link state request list
  retransmission-list     Link state retransmission list
  rib                     Routing Information Base (RIB)
  sham-links              Sham link information
  statistics              Various OSPF Statistics
  summary-address         Summary-address redistribution Information
  timers                  OSPF timers information
  traffic                 Traffic related statistics
  virtual-links           Virtual link information
  |                       Output modifiers
  <cr>

R2#sh ip ospf database

            OSPF Router with ID (2.2.2.2) (Process ID 2)

              Router Link States (Area 0)

Link ID           ADV Router      Age         Seq#        Checksum Link count
1.1.1.1           1.1.1.1         1729        0x80000002 0x00A5A0 2
2.2.2.2           2.2.2.2         92          0x80000001 0x004255 3
4.4.4.4           4.4.4.4         1730        0x80000004 0x0042E4 2

              Net Link States (Area 0)

Link ID           ADV Router      Age         Seq#        Checksum
3.17.0.4          4.4.4.4         92          0x80000002 0x00D29D
R2#
```

sh ip ospf database

```
R2#sh ip ospf database

            OSPF Router with ID (2.2.2.2) (Process ID 2)

              Router Link States (Area 0)

Link ID           ADV Router      Age         Seq#        Checksum Link count
1.1.1.1           1.1.1.1         345         0x80000004 0x0098AC 2
2.2.2.2           2.2.2.2         289         0x80000001 0x00C452 3
4.4.4.4           4.4.4.4         489         0x80000006 0x0029FC 2

              Net Link States (Area 0)

Link ID           ADV Router      Age         Seq#        Checksum
3.16.128.4        4.4.4.4         290         0x80000003 0x005798
R2#
```

```
R2#sh ip ospf statistics

          OSPF Router with ID (2.2.2.2) (Process ID 2)

  Area 0: SPF algorithm executed 1 times

  Summary OSPF SPF statistic

  SPF calculation time
Delta T    Intra D-Intra Summ      D-Summ  Ext        D-Ext    Total     Reason
00:01:57   4    0         0         0       0          0        4         R, N,
```

sh ip ospf statistics

```
R2#sh ip ospf st
R2#sh ip ospf statistics

          OSPF Router with ID (2.2.2.2) (Process ID 2)

  Area 0: SPF algorithm executed 1 times

  Summary OSPF SPF statistic

  SPF calculation time
Delta T    Intra D-Intra Summ      D-Summ  Ext        D-Ext    Total     Reason
00:07:10   4    0         0         0       0          0        4         R, N,
```

```
R2#sh ip ospf rib

OSPF local RIB for Process 2
Codes: * - Best, > - Installed in global RIB

*    3.16.0.0/17, Intra, cost 20, area 0
     via 3.17.0.1, FastEthernet0/1
*    3.16.128.0/17, Intra, cost 10, area 0, Connected
     via 3.16.128.1, FastEthernet0/0
*    3.17.0.0/17, Intra, cost 10, area 0, Connected
     via 3.17.0.2, FastEthernet0/1
*    3.17.128.0/17, Intra, cost 1, area 0, Connected
     via 3.17.128.1, FastEthernet1/0
*    3.18.0.0/17, Intra, cost 20, area 0
     via 3.17.0.4, FastEthernet0/1
```

sh ip ospf rib

```
R2#sh ip ospf rib

OSPF local RIB for Process 2
Codes: * - Best, > - Installed in global RIB

*    3.16.0.0/17, Intra, cost 20, area 0
        via 3.16.128.1, FastEthernet0/1
*    3.16.128.0/17, Intra, cost 10, area 0, Connected
        via 3.16.128.2, FastEthernet0/1
*    3.17.0.0/17, Intra, cost 10, area 0, Connected
        via 3.17.0.1, FastEthernet0/0
*    3.18.0.0/17, Intra, cost 20, area 0
        via 3.16.128.4, FastEthernet0/1
*    3.18.128.0/17, Intra, cost 1, area 0, Connected
        via 3.18.128.11, FastEthernet1/0
```
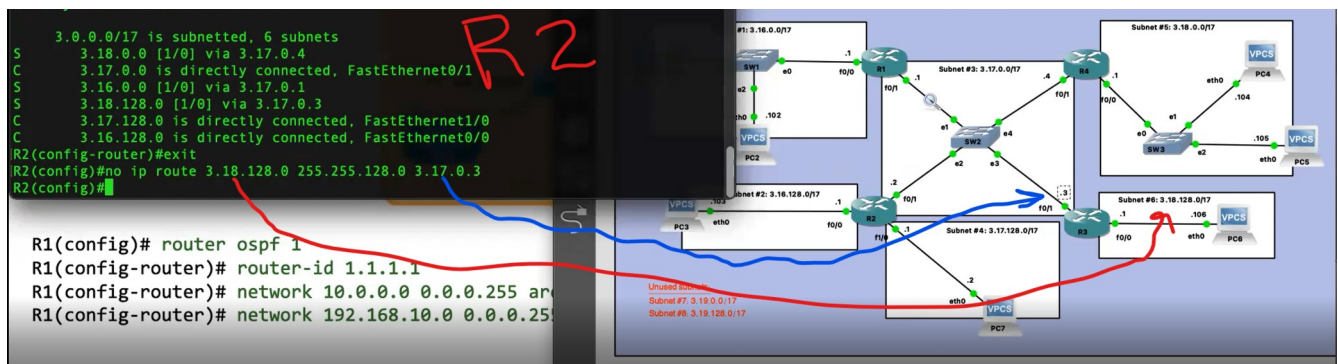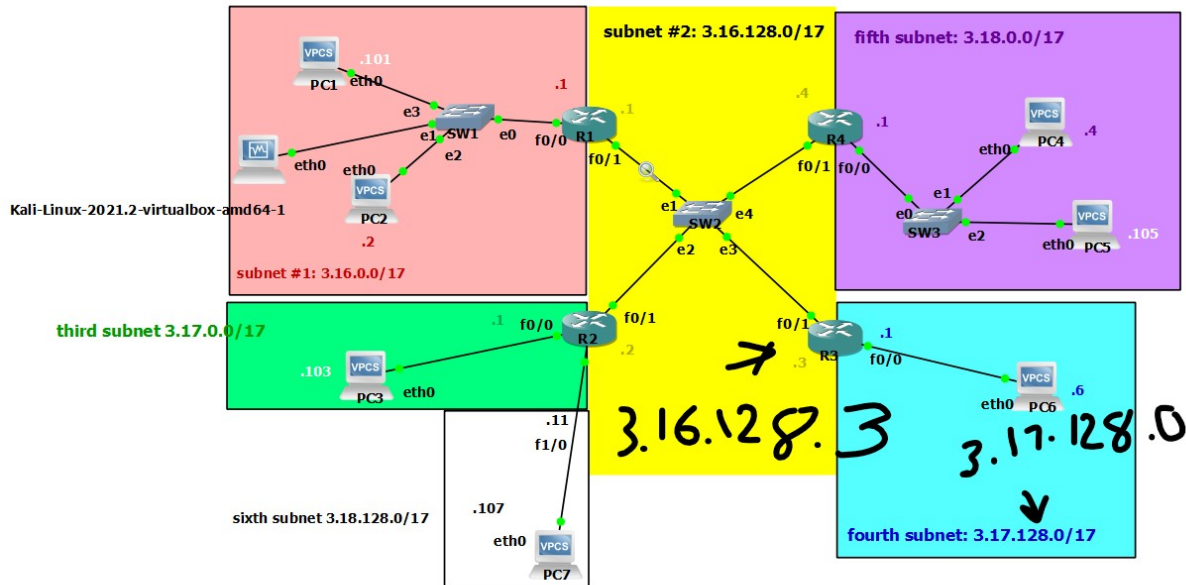
no ip route 3.17.128.0 255.255.128.0 3.16.128.3

```
R2(config)#no ip route 3.17.128.0 255.255.128.0 3.16.128.3
R2(config)#do sh ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

     3.0.0.0/17 is subnetted, 5 subnets
S       3.18.0.0 [1/0] via 3.16.128.4
C       3.17.0.0 is directly connected, FastEthernet0/0
S       3.16.0.0 [1/0] via 3.16.128.1
C       3.18.128.0 is directly connected, FastEthernet1/0
C       3.16.128.0 is directly connected, FastEthernet0/1
R2(config)#do wr
Building configuration...
[OK]
```

next ==

```
R3(config)#router ospf 1
R3(config-router)#network 0.0.0.0 255.255.255.255 area 0
```

router ospf 1
network 0.0.0.0 255.255.255.255 area 0

```
R3(config)#router ospf 1
R3(config-router)#network 0.0.0.0 255.255.255.255 area 0
R3(config-router)#
*Mar  1 03:49:43.811: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on FastEthernet0/1
from LOADING to FULL, Loading Done
*Mar  1 03:49:43.815: %OSPF-5-ADJCHG: Process 1, Nbr 4.4.4.4 on FastEthernet0/1
from LOADING to FULL, Loading Done
R3(config-router)#do wr
Building configuration...
[OK]
```

```
R2(config)#do sh ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

     3.0.0.0/17 is subnetted, 6 subnets
S       3.18.0.0 [1/0] via 3.16.128.4
C       3.17.0.0 is directly connected, FastEthernet0/0
S       3.16.0.0 [1/0] via 3.16.128.1
C       3.18.128.0 is directly connected, FastEthernet1/0
O       3.17.128.0 [110/20] via 3.16.128.3, 00:01:12, FastEthernet0/1
C       3.16.128.0 is directly connected, FastEthernet0/1
```