VLSM – Sub Netting

192.168.1.0

Step 1: Calculate The Largest Hosts 1st
Host Need : 120
192.168.1.0/25
255.255.255.128 Number Of Host Per Subnet $2^y = 2^7 = 128$ Valid Host 192.168.1.1 to 192.168.1.126

Step 2 : Calculate The 2nd Largest Host
Host Need :60
192.168.1.128/26
255.255.255.192 Number Of Host Per Subnet $2^y = 2^6 = 64$ Valid Host 192.168.1.129 to 192.168.1.190

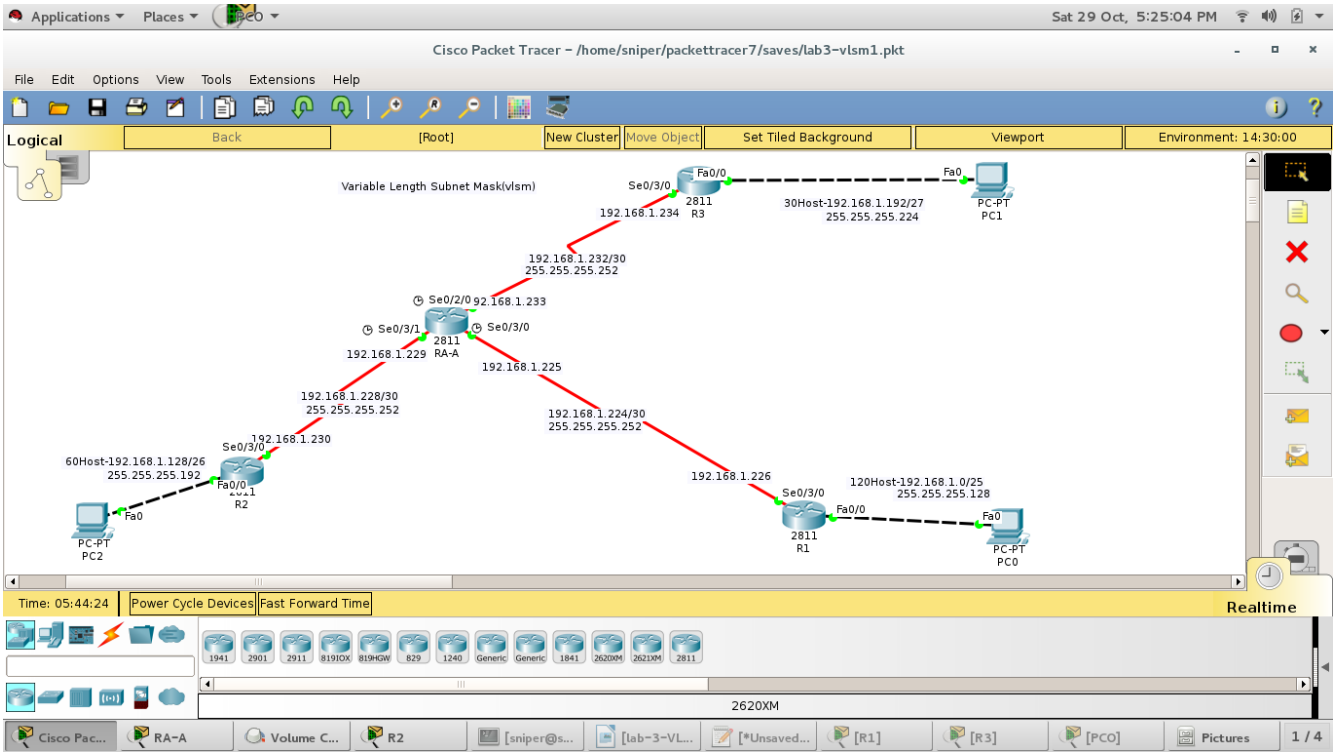
Step 3: Calculate The 3rd Largest Host
Host Need: 30
192.168.1.192/27 Number Of Host Per Subnet $2^y = 2^5 = 32$ Valid Host 192.168.1.192 to 192.168.1.122

Reserve IP address This use in serial link Connection

192.168.1.224/30
255.55.255.255.252

192.168.1.228/30
255.255.255.252

192.168.1.232/30
255.255.255.252



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Center Router RA- Configuration

```
Router>en
Router#conf t
Router(config)#host RA
RA(config)#int se0/3/0
RA(config-if)#ip add 192.168.1.225 255.255.255.252
RA(config-if)#clock rate 64000
RA(config-if)#no shut


RA(config-if)#int se0/3/1
RA(config-if)#ip add 192.168.1.229 255.255.255.252
RA(config-if)#clock rate 64000
RA(config-if)#no shut


RA(config-if)#int se0/2/0
RA(config-if)#ip add 192.168.1.233 255.255.255.252
RA(config-if)#clock rate 64000
RA(config-if)#no shut


RA(config-if)#
```

```
RA(config-if)#do sh 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

     192.168.1.0/30 is subnetted, 3 subnets
C       192.168.1.224 is directly connected, Serial0/3/0
C       192.168.1.228 is directly connected, Serial0/3/1
C       192.168.1.232 is directly connected, Serial0/2/0



RA(config)#ip route 192.168.1.0 255.255.255.128 192.168.1.226
RA(config)#ip route 192.168.1.128 255.255.255.192 192.168.1.230
RA(config)#ip route 192.168.1.192 255.255.255.224 192.168.1.234
RA(config)#do sh 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

     192.168.1.0/24 is variably subnetted, 6 subnets, 4 masks
S       192.168.1.0/25 [1/0] via 192.168.1.226
S       192.168.1.128/26 [1/0] via 192.168.1.230
S       192.168.1.192/27 [1/0] via 192.168.1.234
C       192.168.1.224/30 is directly connected, Serial0/3/0
C       192.168.1.228/30 is directly connected, Serial0/3/1
C       192.168.1.232/30 is directly connected, Serial0/2/0

RA(config)#
```

R1- Configuration

```
Router>en
Router#conf t
Router(config)#host R1
R1(config)#int fa0/0
R1(config-if)#ip add 192.168.1.1 255.255.255.128
R1(config-if)#no shut
```

```
R1(config-if)#int se0/3/0
R1(config-if)#ip add 192.168.1.226 255.255.255.252
R1(config-if)#no shut
R1>en
R1#sh 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

     192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.0/25 is directly connected, FastEthernet0/0
C       192.168.1.224/30 is directly connected, Serial0/3/0

R1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#ip route 192.168.1.228 255.255.255.252 192.168.1.225
R1(config)#ip route 192.168.1.128 255.255.255.192 192.168.1.225
R1(config)#ip route 192.168.1.132 255.255.255.192 192.168.1.225
%Inconsistent address and mask
R1(config)#ip route 192.168.1.132 255.255.255.152 192.168.1.225
%Inconsistent address and mask
R1(config)#ip route 192.168.1.132 255.255.255.252 192.168.1.225
R1(config)#ip route 192.168.1.192 255.255.255.224 192.168.1.225
R1(config)#do sh 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

     192.168.1.0/24 is variably subnetted, 6 subnets, 4 masks
C       192.168.1.0/25 is directly connected, FastEthernet0/0
S       192.168.1.128/26 [1/0] via 192.168.1.225
S       192.168.1.132/30 [1/0] via 192.168.1.225
S       192.168.1.192/27 [1/0] via 192.168.1.225
C       192.168.1.224/30 is directly connected, Serial0/3/0
S       192.168.1.228/30 [1/0] via 192.168.1.225
```

R1(config)#

R2-Configuration

```
Router>en
Router#conf t
Router(config)#host R2
R2(config)#int fa0/0
R2(config-if)#ip add 192.168.1.129 255.255.255.192
R2(config-if)#no shut

R2(config-if)#int se0/3/0
R2(config-if)#ip add 192.168.1.230 255.255.255.252
R2(config-if)#no shut



R2(config-if)#
R2>en
R2#sh 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

     192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.128/26 is directly connected, FastEthernet0/0
C       192.168.1.228/30 is directly connected, Serial0/3/0

R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#ip route 192.168.1.232 255.255.255.252 192.168.1.229
R2(config)#ip route 192.168.1.224 255.255.255.252 192.168.1.229
R2(config)#ip route 192.168.1.0 255.255.255.128 192.168.1.229
R2(config)#ip route 192.168.1.192 255.255.255.224 192.168.1.229
R2(config)#do sh 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
```

```
    192.168.1.0/24 is variably subnetted, 6 subnets, 4 masks
S       192.168.1.0/25 [1/0] via 192.168.1.229
C       192.168.1.128/26 is directly connected, FastEthernet0/0
S       192.168.1.192/27 [1/0] via 192.168.1.229
S       192.168.1.224/30 [1/0] via 192.168.1.229
C       192.168.1.228/30 is directly connected, Serial0/3/0
S       192.168.1.232/30 [1/0] via 192.168.1.229

R2(config)#
```

R3-Configuration

```
Router>en
Router#conf t
Router(config)#host R3
R3(config)#int fa0/0
R3(config-if)#ip add 192.168.1.193 255.255.255.224
R3(config-if)#no shut

R3(config-if)#int se0/3/0
R3(config-if)#ip add 192.168.1.234 255.255.255.252
R3(config-if)#no shut

R3>
R3>en
R3#sh 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

    192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.1.192/27 is directly connected, FastEthernet0/0
C       192.168.1.232/30 is directly connected, Serial0/3/0

R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#ip route 192.168.1.228 255.255.255.252 192.168.1.233
R3(config)#ip route 192.168.1.224 255.255.255.252 192.168.1.233
R3(config)#ip route 192.168.1.0 255.255.255.128 192.168.1.233
R3(config)#ip route 192.168.1.128 255.255.255.192 192.168.1.233
R3(config)#do sh 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

    192.168.1.0/24 is variably subnetted, 6 subnets, 4 masks
S       192.168.1.0/25 [1/0] via 192.168.1.233
S       192.168.1.128/26 [1/0] via 192.168.1.233
C       192.168.1.192/27 is directly connected, FastEthernet0/0
S       192.168.1.224/30 [1/0] via 192.168.1.233
S       192.168.1.228/30 [1/0] via 192.168.1.233
C       192.168.1.232/30 is directly connected, Serial0/3/0

R3(config)#
```