VLSM Table and Routing Table
🗓 CSE421 Project IPs

Check List:

- ☑ ~~Choose an appropriate network address and create subnets to assign to each of the places~~
- ☑ ~~Assign IP addresses to all the devices and interfaces~~
- ☑ ~~Marcus lounge (756) has a **web server** to find more hitman~~
- ☑ ~~The **DNS server** will be in Marcus lounge [If anyone types the URL "www.marcuslounge.org" the web server will handle the query and the user will see a webpage that says "Welcome to Marcus Lounge!"]~~
- ☑ ~~Safe house and Vigo's place will use static IP addressing~~
- ☑ ~~Other zones' IP addresses will be assigned using DHCP and and **handled by their network's DHCP server**~~
- ☑ ~~Ms. Perkins warehouse and Safe house will have Email Servers~~
- ☑ ~~Establish connections among all the networks with the shortest route so that fewer markers are used as possible~~
  - ☑ ~~Must have at least one floating route between Russian Alley and Marcus Lounge (Floating Routing)~~
  - ☑ ~~Configure half of the network to be routed dynamically (Dynamic Routing)~~
  - ☑ ~~At least two secure routing must be established among the locations (Static Routing)~~
- ☑ ~~Showing 2 end devices per network is good enough to represent the whole population.~~
- ☑ ~~The Safe House has laptops and printers~~
- ☑ ~~You must remember that the default route cannot be used while exchanging any packets. Data will be delivered using static or dynamic routes only~~
- ☑ ~~You need to be able to ping each other after all the setups are complete~~
- ☑ ~~Dynamic Routing -> Manual RIP~~
- ☑ ~~DHCP Server -> Make Router DHCP Server~~

Deliverables:

- ☑ ~~Network Topology~~
- ☑ ~~VLSM Tree~~
- ☑ ~~VLSM/Network address table~~
- ☑ ~~IP address table / Routing Table~~

Routers

R1_LR

Host Name Set

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R1_LR
—

IP Assign

R1_LR>enable
R1_LR#
R1_LR#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1_LR(config)#interface Serial0/0/0
R1_LR(config-if)#
R1_LR(config-if)#exit
R1_LR(config)#interface Serial0/0/0
R1_LR(config-if)#ip address 10.10.93.1 255.0.0.0
R1_LR(config-if)#ip address 10.10.93.1 255.255.255.252
R1_LR(config-if)#no shutdown
R1_LR(config-if)#
R1_LR(config-if)#exit
R1_LR(config)#interface Serial0/0/1
R1_LR(config-if)#ip address 10.10.93.5 255.255.255.252
R1_LR(config-if)#ip address 10.10.93.5 255.255.255.252
R1_LR(config-if)#no shutdown
R1_LR(config-if)#
R1_LR(config-if)#exit
R1_LR(config)#interface Serial0/1/0
R1_LR(config-if)#ip address 10.10.93.9 255.255.255.252
R1_LR(config-if)#ip address 10.10.93.9 255.255.255.252
R1_LR(config-if)#no shutdown
R1_LR(config-if)#exit
R1_LR(config)#exit
R1_LR#copy run start
—

Default Gateway IP assign

R1_LR>enable
R1_LR#
R1_LR#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1_LR(config)#interface GigabitEthernet0/0
R1_LR(config-if)#ip address 10.10.80.1 255.255.255.252
R1_LR(config-if)#ip address 10.10.80.1 255.255.248.0
R1_LR(config-if)#no shutdown
R1_LR(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
R1_LR(config-if)#exit
R1_LR(config)#exit
R1_LR#
%SYS-5-CONFIG_I: Configured from console by console
R1_LR#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R1_LR#

—-

Dynamic Routing

R1_LR#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1_LR(config)#router rip
R1_LR(config-router)#version 2
R1_LR(config-router)#no auto-summary
R1_LR(config-router)#do show ip route connected
 C   10.10.80.0/21 is directly connected, GigabitEthernet0/0
 C   10.10.93.0/30 is directly connected, Serial0/0/0
 C   10.10.93.4/30 is directly connected, Serial0/0/1
 C   10.10.93.8/30 is directly connected, Serial0/1/0

R1_LR(config-router)#network 10.10.93.4
R1_LR(config-router)#network 10.10.93.0
R1_LR(config-router)#network 10.10.80.0
R1_LR(config-router)#network 10.10.93.8
R1_LR(config-router)#passive-interface g0/0
R1_LR(config-router)#end

R1_LR#
%SYS-5-CONFIG_I: Configured from console by console

R1_LR#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R1_LR#

Router DHCP Configuration

R1_LR>en
R1_LR#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1_LR(config)#ip dhcp excluded-address 10.10.80.1
R1_LR(config)#ip dhcp pool LR
R1_LR(dhcp-config)#network 10.10.80.0 255.255.248.0
R1_LR(dhcp-config)#default-router 10.10.80.1
R1_LR(dhcp-config)#end
R1_LR#
%SYS-5-CONFIG_I: Configured from console by console
R1_LR#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R1_LR#

R2_SH

Host Name Set

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R2_SH
—

IP Assign

R2_SH(config)#interface Serial0/0/0
R2_SH(config-if)#ip address 10.10.93.2 255.0.0.0

R2_SH(config-if)#ip address 10.10.93.2 255.255.255.252
R2_SH(config-if)#exit
R2_SH(config)#interface Serial0/0/0
R2_SH(config-if)#no shutdown
R2_SH(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
R2_SH(config-if)#exit
R2_SH(config)#exit
R2_SH#
%SYS-5-CONFIG_I: Configured from console by console
R2_SH#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R2_SH#
—-

Default Gateway IP assign

R2_SH>enable
R2_SH#
R2_SH#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2_SH(config)#interface GigabitEthernet0/0
R2_SH(config-if)#ip address 10.10.92.1 255.255.255.252
R2_SH(config-if)#ip address 10.10.92.1 255.255.255.0
R2_SH(config-if)#no shutdown
R2_SH(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
R2_SH(config-if)#exit
R2_SH(config)#exit
R2_SH#
%SYS-5-CONFIG_I: Configured from console by console
R2_SH#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R2_SH#
—-

Dynamic Routing

R2_SH>en
R2_SH#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
10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
C 10.10.92.0/24 is directly connected, GigabitEthernet0/0
L 10.10.92.1/32 is directly connected, GigabitEthernet0/0
C 10.10.93.0/30 is directly connected, Serial0/0/0
L 10.10.93.2/32 is directly connected, Serial0/0/0
R2_SH#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2_SH(config)#router rip
R2_SH(config-router)#version 2
R2_SH(config-router)#no auto-summary
R2_SH(config-router)#network 10.10.92.0
R2_SH(config-router)#network 10.10.93.0
R2_SH(config-router)#passive-interface g0/0
R2_SH(config-router)#end
R2_SH#
%SYS-5-CONFIG_I: Configured from console by console
R2_SH#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R2_SH#
```

R3_RA

Host Name Set

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R3_RA
R3_RA(config)#
—-

IP Assign

R3_RA(config)#interface Serial0/0/0
R3_RA(config-if)#ip address 10.10.93.6 255.0.0.0
R3_RA(config-if)#ip address 10.10.93.6 255.255.255.252
R3_RA(config-if)#no shutdown
R3_RA(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
R3_RA(config-if)#exit
R3_RA(config)#interface Serial0/0/1
R3_RA(config-if)#ip address 10.10.93.25 255.255.255.252
R3_RA(config-if)#ip address 10.10.93.25 255.255.255.252
R3_RA(config-if)#no shutdown
R3_RA(config-if)#
R3_RA(config-if)#exit
R3_RA(config)#interface Serial0/1/0
R3_RA(config-if)#ip address 10.10.93.21 255.255.255.252
R3_RA(config-if)#ip address 10.10.93.21 255.255.255.252
R3_RA(config-if)#no shutdown
R3_RA(config-if)#exit
R3_RA(config)#exit
R3_RA#
%SYS-5-CONFIG_I: Configured from console by console
R3_RA#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R3_RA#
—-

Default Gateway IP assign

R3_RA>enable

R3_RA#
R3_RA#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3_RA(config)#interface GigabitEthernet0/0
R3_RA(config-if)#ip address 10.10.64.1 255.255.255.252
R3_RA(config-if)#ip address 10.10.64.1 255.255.240.0
R3_RA(config-if)#no shutdown
R3_RA(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
R3_RA(config-if)#exit
R3_RA(config)#exit
R3_RA#
%SYS-5-CONFIG_I: Configured from console by console
R3_RA#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R3_RA#

Dynamic Routing

R3_RA>en
R3_RA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3_RA(config)#router rip
R3_RA(config-router)#version 2
R3_RA(config-router)#no auto-summary
R3_RA(config-router)#do show ip route connected
 C   10.10.64.0/20 is directly connected, GigabitEthernet0/0
 C   10.10.93.4/30 is directly connected, Serial0/0/0
 C   10.10.93.20/30 is directly connected, Serial0/1/0
 C   10.10.93.24/30 is directly connected, Serial0/0/1

R3_RA(config-router)#network 10.10.64.0
R3_RA(config-router)#network 10.10.93.4
R3_RA(config-router)#network 10.10.93.20
R3_RA(config-router)#network 10.10.93.24
R3_RA(config-router)#passive-interface g0/0
R3_RA(config-router)#end
R3_RA#
%SYS-5-CONFIG_I: Configured from console by console

R3_RA#copy run start
Destination filename [startup-config]?

Building configuration...
[OK]
R3_RA#

Static Routing

R3_RA>en
R3_RA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3_RA(config)#ip route 10.10.92.0 255.255.255.0 s0/0/0
%Default route without gateway, if not a point-to-point interface, may impact performance
R3_RA(config)#ip route 10.10.80.0 255.255.248.0 s0/0/0
%Default route without gateway, if not a point-to-point interface, may impact performance
R3_RA(config)#ip route 10.10.32.0 255.255.224.0 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R3_RA(config)#ip route 10.10.88.0 255.255.252.0 s0/1/0
%Default route without gateway, if not a point-to-point interface, may impact performance
R3_RA(config)#ip route 10.10.0.0 255.255.224.0 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R3_RA(config)#ip route 10.10.93.0 255.255.255.252 s0/0/0
%Default route without gateway, if not a point-to-point interface, may impact performance
R3_RA(config)#ip route 10.10.93.8 255.255.255.252 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R3_RA(config)#ip route 10.10.93.12 255.255.255.252 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R3_RA(config)#ip route 10.10.93.16 255.255.255.252 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R3_RA(config)#exit
R3_RA#
%SYS-5-CONFIG_I: Configured from console by console
R3_RA#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R3_RA#

Router DHCP Configuration

R3_RA>en
R3_RA#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3_RA(config)#ip dhcp excluded-address 10.10.64.1

R3_RA(config)#ip dhcp pool RA
R3_RA(dhcp-config)#network 10.10.64.0 255.255.240.0
R3_RA(dhcp-config)#default-router 10.10.64.1
R3_RA(dhcp-config)#end
R3_RA#
%SYS-5-CONFIG_I: Configured from console by console
R3_RA#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R3_RA#

R4_VP

Host Name Set:

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R4_VP
R4_VP(config)#
—-

IP Assign:

R4_VP(config)#interface Serial0/0/0
R4_VP(config-if)#ip address 10.10.93.10 255.0.0.0
R4_VP(config-if)#ip address 10.10.93.10 255.255.255.252
R4_VP(config-if)#no shutdown
R4_VP(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
R4_VP(config-if)#exit
R4_VP(config)#interface Serial0/0/1
R4_VP(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
ip address 10.10.93.26 255.255.255.252
R4_VP(config-if)#ip address 10.10.93.26 255.255.255.252
R4_VP(config-if)#no shutdown
R4_VP(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
R4_VP(config-if)#exit
R4_VP(config)#interface Serial0/1/0

```
R4_VP(config-if)#ip address 10.10.93.13 255.255.255.252
R4_VP(config-if)#ip address 10.10.93.13 255.255.255.252
R4_VP(config-if)#no shutdown
R4_VP(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
R4_VP(config-if)#exit
R4_VP(config)#interface Serial0/1/1
R4_VP(config-if)#ip address 10.10.93.17 255.255.255.252
R4_VP(config-if)#ip address 10.10.93.17 255.255.255.252
R4_VP(config-if)#no shutdown
R4_VP(config-if)#exit
R4_VP(config)#exit
R4_VP#
%SYS-5-CONFIG_I: Configured from console by console
R4_VP#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R4_VP#
```

—-

Default Gateway IP assign

```
R4_VP>enable
R4_VP#
R4_VP#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R4_VP(config)#interface GigabitEthernet0/0
R4_VP(config-if)#no ip address
R4_VP(config-if)#ip address 10.10.32.1 255.255.255.252
R4_VP(config-if)#ip address 10.10.32.1 255.255.224.0
R4_VP(config-if)#no shutdown
R4_VP(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
R4_VP(config-if)#exit
R4_VP(config)#exit
R4_VP#
%SYS-5-CONFIG_I: Configured from console by console
R4_VP#copy run start
Destination filename [startup-config]?
```

Building configuration...
[OK]
R4_VP#

Dynamic Routing

R4_VP>en
R4_VP#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
10.0.0.0/8 is variably subnetted, 18 subnets, 7 masks
S 10.10.0.0/19 is directly connected, Serial0/1/1
C 10.10.32.0/19 is directly connected, GigabitEthernet0/0
L 10.10.32.1/32 is directly connected, GigabitEthernet0/0
S 10.10.64.0/20 is directly connected, Serial0/0/1
S 10.10.80.0/21 is directly connected, Serial0/0/0
S 10.10.88.0/22 is directly connected, Serial0/1/0
S 10.10.92.0/24 is directly connected, Serial0/0/0
S 10.10.93.0/30 is directly connected, Serial0/0/0
S 10.10.93.4/30 is directly connected, Serial0/0/1
C 10.10.93.8/30 is directly connected, Serial0/0/0
L 10.10.93.10/32 is directly connected, Serial0/0/0
C 10.10.93.12/30 is directly connected, Serial0/1/0
L 10.10.93.13/32 is directly connected, Serial0/1/0
C 10.10.93.16/30 is directly connected, Serial0/1/1
L 10.10.93.17/32 is directly connected, Serial0/1/1
S 10.10.93.20/30 is directly connected, Serial0/0/1
C 10.10.93.24/30 is directly connected, Serial0/0/1
L 10.10.93.26/32 is directly connected, Serial0/0/1
R4_VP#
R4_VP#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R4_VP(config)#router rip
R4_VP(config-router)#version 2
R4_VP(config-router)#no auto-summary
R4_VP(config-router)#do show ip route connected
C 10.10.32.0/19 is directly connected, GigabitEthernet0/0
C 10.10.93.8/30 is directly connected, Serial0/0/0
C 10.10.93.12/30 is directly connected, Serial0/1/0

C 10.10.93.16/30 is directly connected, Serial0/1/1
C 10.10.93.24/30 is directly connected, Serial0/0/1
R4_VP(config-router)#network 10.10.32.0
R4_VP(config-router)#network 10.10.93.8
R4_VP(config-router)#network 10.10.93.12
R4_VP(config-router)#network 10.10.93.16
R4_VP(config-router)#network 10.10.93.24
R4_VP(config-router)#passive-interface g0/0
R4_VP(config-router)#end
R4_VP#
%SYS-5-CONFIG_I: Configured from console by console
R4_VP#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R4_VP#

Static Routing

R4_VP>en
R4_VP#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R4_VP(config)#ip route 10.10.80.0 255.255.248.0 s0/0/0
%Default route without gateway, if not a point-to-point interface, may impact performance
R4_VP(config)#ip route 10.10.92.0 255.255.255.0 s0/0/0
%Default route without gateway, if not a point-to-point interface, may impact performance
R4_VP(config)#ip route 10.10.93.0 255.255.255.252 s0/0/0
%Default route without gateway, if not a point-to-point interface, may impact performance
R4_VP(config)#ip route 10.10.93.4 255.255.255.252 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R4_VP(config)#ip route 10.10.64.0 255.255.240.0 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R4_VP(config)#ip route 10.10.93.20 255.255.255.252 s0/0/1 10
R4_VP(config)#ip route 10.10.88.0 255.255.252.0 s0/1/0
%Default route without gateway, if not a point-to-point interface, may impact performance
R4_VP(config)#ip route 10.10.0.0 255.255.224.0 s0/1/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R4_VP(config)#exit
R4_VP#
%SYS-5-CONFIG_I: Configured from console by console
R4_VP#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]

R4_VP#

R5_ML

Host Name Set:

Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R5_ML
R5_ML(config)#
—

IP Assign:

R5_ML(config)#interface Serial0/0/0
R5_ML(config-if)#ip address 10.10.93.22 255.0.0.0
R5_ML(config-if)#ip address 10.10.93.22 255.255.255.252
R5_ML(config-if)#no shutdown
R5_ML(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
R5_ML(config-if)#exit
R5_ML(config)#interface Serial0/0/1
R5_ML(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
ip address 10.10.93.14 255.255.255.252
R5_ML(config-if)#ip address 10.10.93.14 255.255.255.252
R5_ML(config-if)#no shutdown
R5_ML(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up
R5_ML(config-if)#exit
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/1, changed state to up
R5_ML(config)#exit
R5_ML#
%SYS-5-CONFIG_I: Configured from console by console
R5_ML#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R5_ML#

—

Default Gateway IP assign

R5_ML>enable
R5_ML#
R5_ML#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R5_ML(config)#interface GigabitEthernet0/0
R5_ML(config-if)#ip address 10.10.88.1 255.255.255.252
R5_ML(config-if)#ip address 10.10.88.1 255.255.252.0
R5_ML(config-if)#no shutdown
R5_ML(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
R5_ML(config-if)#exit
R5_ML(config)#exit
R5_ML#
%SYS-5-CONFIG_I: Configured from console by console
R5_ML#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R5_ML#

Dynamic Routing

R5_ML>en
R5_ML#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
10.0.0.0/8 is variably subnetted, 16 subnets, 7 masks
S 10.10.0.0/19 is directly connected, Serial0/0/1
S 10.10.32.0/19 is directly connected, Serial0/0/1
S 10.10.64.0/20 is directly connected, Serial0/0/0
S 10.10.80.0/21 is directly connected, Serial0/0/1
C 10.10.88.0/22 is directly connected, GigabitEthernet0/0

```
L 10.10.88.1/32 is directly connected, GigabitEthernet0/0
S 10.10.92.0/24 is directly connected, Serial0/0/1
S 10.10.93.0/30 is directly connected, Serial0/0/1
S 10.10.93.4/30 is directly connected, Serial0/0/1
S 10.10.93.8/30 is directly connected, Serial0/0/1
C 10.10.93.12/30 is directly connected, Serial0/0/1
L 10.10.93.14/32 is directly connected, Serial0/0/1
S 10.10.93.16/30 is directly connected, Serial0/0/1
C 10.10.93.20/30 is directly connected, Serial0/0/0
L 10.10.93.22/32 is directly connected, Serial0/0/0
S 10.10.93.24/30 is directly connected, Serial0/0/1
R5_ML#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R5_ML(config)#router rip
R5_ML(config-router)#version 2
R5_ML(config-router)#no auto-summary
R5_ML(config-router)#do show ip route connected
C 10.10.88.0/22 is directly connected, GigabitEthernet0/0
C 10.10.93.12/30 is directly connected, Serial0/0/1
C 10.10.93.20/30 is directly connected, Serial0/0/0
R5_ML(config-router)#network 10.10.88.0
R5_ML(config-router)#network 10.10.93.12
R5_ML(config-router)#network 10.10.93.20
R5_ML(config-router)#passive-interface g0/0
R5_ML(config-router)#end
R5_ML#
%SYS-5-CONFIG_I: Configured from console by console
R5_ML#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
```

Static Routing

```
R5_ML>en
R5_ML#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R5_ML(config)#ip route 10.10.92.0 255.255.255.0 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R5_ML(config)#ip route 10.10.80.0 255.255.248.0 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R5_ML(config)#ip route 10.10.32.0 255.255.224.0 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R5_ML(config)#ip route 10.10.0.0 255.255.224.0 s0/0/1
```

%Default route without gateway, if not a point-to-point interface, may impact performance
R5_ML(config)#ip route 10.10.64.0 255.255.240.0 s0/0/0
%Default route without gateway, if not a point-to-point interface, may impact performance
R5_ML(config)#ip route 10.10.93.0 255.255.255.252 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R5_ML(config)#ip route 10.10.93.4 255.255.255.252 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R5_ML(config)#ip route 10.10.93.8 255.255.255.252 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R5_ML(config)#ip route 10.10.93.24 255.255.255.252 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R5_ML(config)#ip route 10.10.93.16 255.255.255.252 s0/0/1
%Default route without gateway, if not a point-to-point interface, may impact performance
R5_ML(config)#exit
R5_ML#
%SYS-5-CONFIG_I: Configured from console by console
R5_ML#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R5_ML#

Static Ip Check

R5_ML#show ip route static
10.0.0.0/8 is variably subnetted, 16 subnets, 7 masks
S 10.10.0.0/19 is directly connected, Serial0/0/1
S 10.10.32.0/19 is directly connected, Serial0/0/1
S 10.10.64.0/20 is directly connected, Serial0/0/0
S 10.10.80.0/21 is directly connected, Serial0/0/1
S 10.10.92.0/24 is directly connected, Serial0/0/1
S 10.10.93.0/30 is directly connected, Serial0/0/1
S 10.10.93.4/30 is directly connected, Serial0/0/1
S 10.10.93.8/30 is directly connected, Serial0/0/1
S 10.10.93.16/30 is directly connected, Serial0/0/1
S 10.10.93.24/30 is directly connected, Serial0/0/1
R5_ML#

Router DHCP Configuration

R5_ML>en
R5_ML#conf t
Enter configuration commands, one per line. End with CNTL/Z.

```
R5_ML(config)#ip dhcp excluded-address 10.10.88.1
R5_ML(config)#ip dhcp excluded-address 10.10.88.10
R5_ML(config)#ip dhcp excluded-address 10.10.88.11
R5_ML(config)#ip dhcp pool ML
R5_ML(dhcp-config)#network 10.10.88.0 255.255.252.0
R5_ML(dhcp-config)#default-router 10.10.88.1
R5_ML(dhcp-config)#end
R5_ML#
%SYS-5-CONFIG_I: Configured from console by console
R5_ML#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R5_ML#
```

Added DNS Server

```
R5_ML>en
R5_ML#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R5_ML(config)#ip dhcp pool ML
R5_ML(dhcp-config)#dns-server 10.10.88.10
R5_ML(dhcp-config)#end
R5_ML#
%SYS-5-CONFIG_I: Configured from console by console
R5_ML#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R5_ML#
```

R6_MPW

Host Name Set:

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname R6_MPW
```
—-

IP Assign:

R6_MPW(config)#
R6_MPW(config)#interface Serial0/0/0
R6_MPW(config-if)#ip address 10.10.93.18 255.0.0.0
R6_MPW(config-if)#ip address 10.10.93.18 255.255.255.252
R6_MPW(config-if)#no shutdown
R6_MPW(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up
R6_MPW(config-if)#exit
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
R6_MPW(config)#exit
R6_MPW#
%SYS-5-CONFIG_I: Configured from console by console
R6_MPW#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R6_MPW#
—-

Default Gateway IP assign

R6_MPW>enable
R6_MPW#
R6_MPW#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R6_MPW(config)#interface GigabitEthernet0/0
R6_MPW(config-if)#ip address 10.10.0.1 255.255.255.252
R6_MPW(config-if)#ip address 10.10.0.1 255.255.224.0
R6_MPW(config-if)#no shutdown
R6_MPW(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
R6_MPW(config-if)#exit
R6_MPW(config)#exit
R6_MPW#
%SYS-5-CONFIG_I: Configured from console by console
R6_MPW#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R6_MPW#

—-

Dynamic Routing

R6_MPW>en
R6_MPW#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
10.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
C 10.10.0.0/19 is directly connected, GigabitEthernet0/0
L 10.10.0.1/32 is directly connected, GigabitEthernet0/0
C 10.10.93.16/30 is directly connected, Serial0/0/0
L 10.10.93.18/32 is directly connected, Serial0/0/0
R6_MPW#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R6_MPW(config)#router rip
R6_MPW(config-router)#version 2
R6_MPW(config-router)#no auto-summary
R6_MPW(config-router)#network 10.10.0.0
R6_MPW(config-router)#network 10.10.93.16
R6_MPW(config-router)#passive-interface g0/0
R6_MPW(config-router)#end
R6_MPW#
%SYS-5-CONFIG_I: Configured from console by console
R6_MPW#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R6_MPW#

Router DHCP Configuration

R6_MPW>en
R6_MPW#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R6_MPW(config)#ip dhcp excluded-address 10.10.0.1
R6_MPW(config)#ip dhcp excluded-address 10.10.0.12
R6_MPW(config)#ip dhcp pool MPW
R6_MPW(dhcp-config)#network 10.10.0.0 255.255.224.0

R6_MPW(dhcp-config)#default-router 10.10.0.1
R6_MPW(dhcp-config)#end
R6_MPW#
%SYS-5-CONFIG_I: Configured from console by console
R6_MPW#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R6_MPW#

Added DNS Server

R6_MPW>en
R6_MPW#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R6_MPW(config)#ip dhcp pool MPW
R6_MPW(dhcp-config)#dns-server 10.10.88.10
R6_MPW(dhcp-config)#end
R6_MPW#
%SYS-5-CONFIG_I: Configured from console by console
R6_MPW#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
R6_MPW#

Switch

S1 (R1_LR)

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#exit
S1#
%SYS-5-CONFIG_I: Configured from console by console
S1#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
S1#

S2 (R3_RA)

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S2
S2(config)#exit
S2#
%SYS-5-CONFIG_I: Configured from console by console
S2#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
S2#

S3 (R4_VP)

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
Switch(config)#hostname S3
S3(config)#exit
S3#
%SYS-5-CONFIG_I: Configured from console by console
S3#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
S3#

S4 (R2_SH)

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S4
S4(config)#exit
S4#
%SYS-5-CONFIG_I: Configured from console by console
S4#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
S4#

S5 (R6_MPW)

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S5
S5(config)#exit
S5#
%SYS-5-CONFIG_I: Configured from console by console
S5#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
S5#

S6 (R5_ML)

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#hostname S6
S6(config)#exit
S6#
%SYS-5-CONFIG_I: Configured from console by console
S6#copy run start
Destination filename [startup-config]?
Building configuration...
[OK]
S6#

VLSM Tree

```
                              Root
                           10.10.0.0/17


        MPW                   VP
     10.10.0.0/19         10.10.32.0/19          10.10.64.0/19

       (8192)               (8192)                  (8192)


                    RA                      10.10.80.0/20
                10.10.64.0/20

                  (4096)                       (4096)


                        LR                  10.10.88.0/21
                    10.10.80.0/21

                      (2048)                    (2048)


                            ML                  10.10.92.0/22
                        10.10.88.0/22

                          (1024)                   (1024)


                                SH              10.10.93.0/24
                            10.10.92.0/24

                              (256)                 (256)


   W1            W2            W3            W4            W5            W6            W7
10.10.93.0/30  10.10.93.4/30  10.10.93.8/30  10.10.93.12/30  10.10.93.16/30  10.10.93.20/30  10.10.93.24/30

   (4)           (4)           (4)           (4)           (4)           (4)           (4)
```