Lab-4: Objective:

Part A: Configure Floating Static Routes on given network in figure 11.

Part B: Configure Summary Routes on given network in figure 12.

Lab-4
Floating Static Routes& Summary Routes

Part A: Configure Floating Static Routes on given network in figure 11. All the possible destinations from each router must be configured.

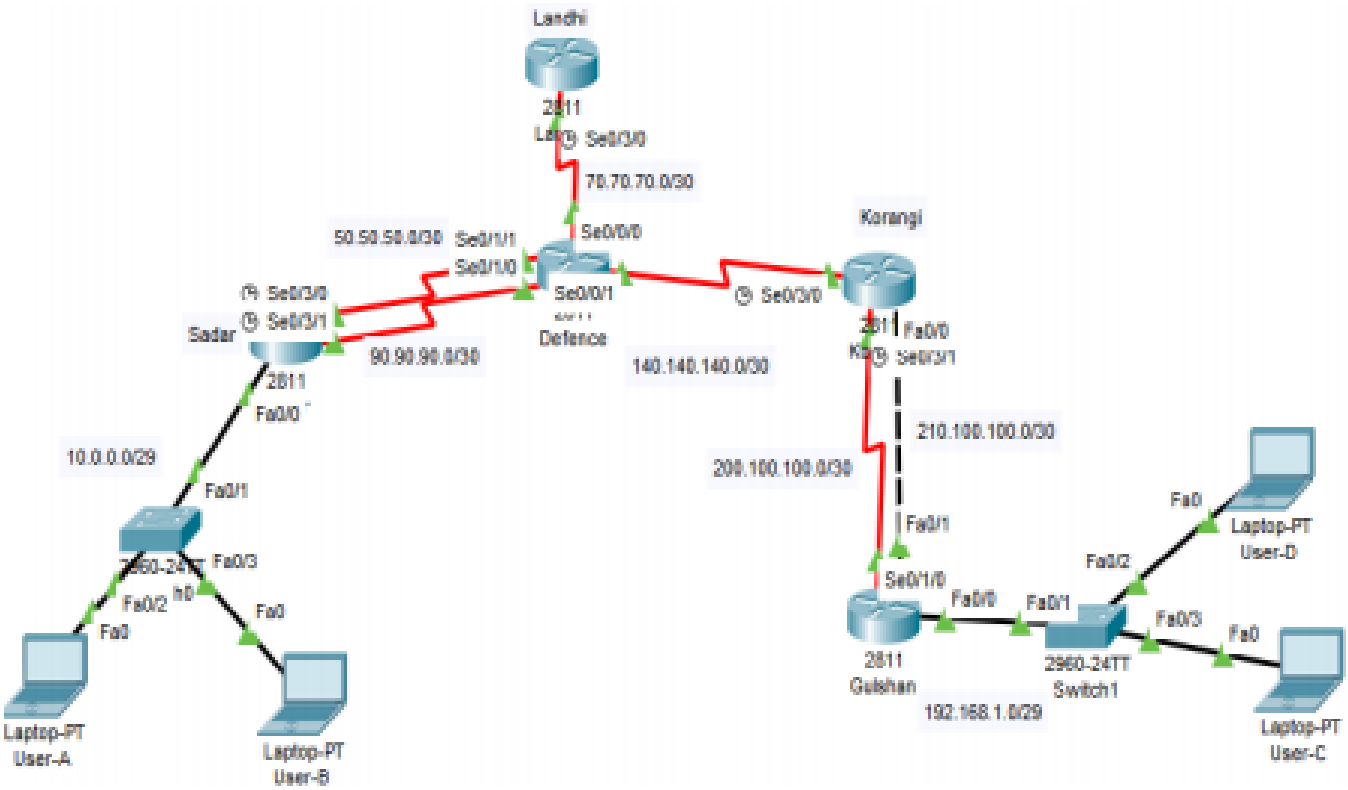

Figure 11

Sadar(config-if)#clock rate 64000

Sadar(config-if)#no shutdown

Sadar(config-if)#exit

Sadar(config)#interface serial 0/3/1

Sadar(config-if)#ip address 90.90.90.1 255.255.255.252

Sadar(config-if)#clock rate 64000

Sadar(config-if)#no shutdown

Sadar(config-if)#exit

Router Defence:

Defence >enable

Defence #configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Defence (config)#interface serial 0/1/1

Defence (config-if)#ip address 50.0.0.2 255.255.255.252

Defence (config-if)#no shutdown

Defence (config-if)#exit

Defence (config)#interface serial 0/0/0

Defence (config-if)#ip address 70.0.0.2 255.255.255.252

Defence (config-if)#no shutdown

Defence (config-if)#exit

Defence (config)#interface serial 0/0/1

Defence (config-if)#ip address 140.0.0.1 255.255.255.252

Defence (config-if)#no shutdown

Defence (config-if)#exit

Defence (config)#interface serial 0/1/0

Defence (config-if)#ip address 90.0.0.2 255.255.255.252

Defence (config-if)#no shutdown

Defence (config-if)#exit

Router Landhi:

Landhi >enable

Landhi #configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Landhi (config)#interface serial 0/3/0

Landhi (config-if)#ip address 70.0.0.1 255.255.255.252

Landhi (config)#clock rate 64000

Landhi (config-if)#no shutdown

Landhi (config-if)#exit

Router Korangi:

Korangi >enable

Korangi#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Korangi(config)#interface serial 0/3/0

Korangi(config-if)#ip address 140.140.140.2 255.255.255.252

Korangi(config)#clock rate 64000

Korangi(config-if)#no shutdown

Korangi(config-if)#exit

Korangi(config)#interface serial 0/3/1

Korangi(config-if)#ip address 200.100.100.1 255.255.255.252

Korangi(config)#clock rate 64000

Korangi(config-if)#no shutdown

Korangi(config-if)#exit

Korangi(config)#interface fa 0/0

Korangi(config-if)#ip address 210.100.100.1 255.255.255.252

Korangi(config-if)#no shutdown

Korangi(config-if)#exit

Router Gulshan:

Gulshan >enable

Gulshan#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Gulshan(config)#interface serial 0/1/0

Gulshan(config-if)#ip address 200.100.100.2 255.255.255.252

Gulshan(config)#clock rate 64000

Gulshan(config-if)#no shutdown

Gulshan(config-if)#exit

Gulshan(config)#interface fa0/0

Gulshan(config-if)#ip address 192.168.1.1 255.255.255.248

Gulshan(config-if)#no shutdown

Gulshan(config-if)#exit

Gulshan(config)#interface fa0/1

Gulshan(config-if)#ip address 210.100.100.2 255.255.255.252

Gulshan(config-if)#no shutdown

Gulshan(config-if)#exit

Task 2, Configure Floating Routes on each Router

Router Sadar:

```
Sadar(config)#ip route 70.70.70.0 255.255.255.252 50.50.50.2 5
Sadar(config)#ip route 70.70.70.0 255.255.255.252 90.90.90.2 10
Sadar(config)#ip route 140.140.140.0 255.255.255.252 50.50.50.2 15
Sadar(config)#ip route 140.140.140.0 255.255.255.252 90.90.90.2 20
Sadar(config)#ip route 200.100.100.0 255.255.255.252 50.50.50.2 25
Sadar(config)#ip route 200.100.100.0 255.255.255.252 90.90.90.2 30
Sadar(config)#ip route 210.100.100.0 255.255.255.252 50.50.50.2 35
Sadar(config)#ip route 210.100.100.0 255.255.255.252 90.90.90.2 40
Sadar(config)#ip route 192.168.1.0 255.255.255.248 50.50.50.2 45
Sadar(config)#ip route 192.168.1.0 255.255.255.248 90.90.90.2 50
Sadar(config)#exit
```

Router Defence:

```
Defence(config)#ip route 10.0.0.0 255.255.255.248 50.50.50.1
Defence(config)#ip route 10.0.0.0 255.255.255.248 90.90.90.1 5
Defence(config)#ip route 200.100.100.0 255.255.255.252 140.140.140.2
Defence(config)#ip route 210.100.100.0 255.255.255.252 140.140.140.2
Defence(config)#ip route 192.168.1.0 255.255.255.248 140.140.140.2
Defence(config)#exit
```

Router Landhi:

```
Landhi(config)#ip route 10.0.0.0 255.255.255.248 70.70.70.2
Landhi(config)#ip route 50.50.50.0 255.255.255.252 70.70.70.2
```

```
Landhi(config)#ip route 90.90.90.0 255.255.255.252 70.70.70.2

Landhi(config)#ip route 140.140.140.0 255.255.255.252 70.70.70.2

Landhi(config)#ip route 200.100.100.0 255.255.255.252 70.70.70.2

Landhi(config)#ip route 210.100.100.0 255.255.255.252 70.70.70.2

Landhi(config)#ip route 192.168.1.0 255.255.255.248 70.70.70.2

Landhi(config)#exit
```

Router Korangi:

```
Korangi(config)#ip route 10.0.0.0 255.255.255.248 140.140.140.1

Korangi(config)#ip route 50.50.50.0 255.255.255.252 140.140.140.1

Korangi(config)#ip route 90.90.90.0 255.255.255.252 140.140.140.1

Korangi(config)#ip route 70.70.70.0 255.255.255.252 140.140.140.1

Korangi(config)#ip route 192.168.1.0 255.255.255.248 200.100.100.2      5

Korangi(config)#ip route 192.168.1.0 255.255.255.248 210.100.100.2      10

Korangi(config)#exit
```

Router Gulshan:

```
Gulshan(config)#ip route 10.0.0.0 255.255.255.248 200.100.100.1      5

Gulshan(config)#ip route 10.0.0.0 255.255.255.248 210.100.100.1      10

Gulshan(config)#ip route 50.50.50.0 255.255.255.252 200.100.100.1    15

Gulshan(config)#ip route 50.50.50.0 255.255.255.252 210.100.100.1    20

Gulshan(config)#ip route 90.90.90.0 255.255.255.252 200.100.100.1    25

Gulshan(config)#ip route 90.90.90.0 255.255.255.252 210.100.100.1    30

Gulshan(config)#ip route 70.70.70.0 255.255.255.252 200.100.100.1    40

Gulshan(config)#ip route 70.70.70.0 255.255.255.252 210.100.100.1     50

Gulshan(config)#ip route 140.140.140.0 255.255.255.252200.100.100.1   55
```

```
Gulshan(config)#ip route 140.140.140.0 255.255.255.252210.100.100.1      60

Gulshan(config)#exit
```

Lab-4Exercise:

Design a hybrid network which consists of 4 routers. Attach 3 PC's with router 1 and router 4. Configure Floating Static Routes on this environment so that all the devices can send data packets to each other. What do you understand when you use the command "Show IP route" on each router?

Part B: Summary Routes

Part B: Configure Summary Routes on given network in figure 12. All the attached devices should be able to send and receive data packets to each other.

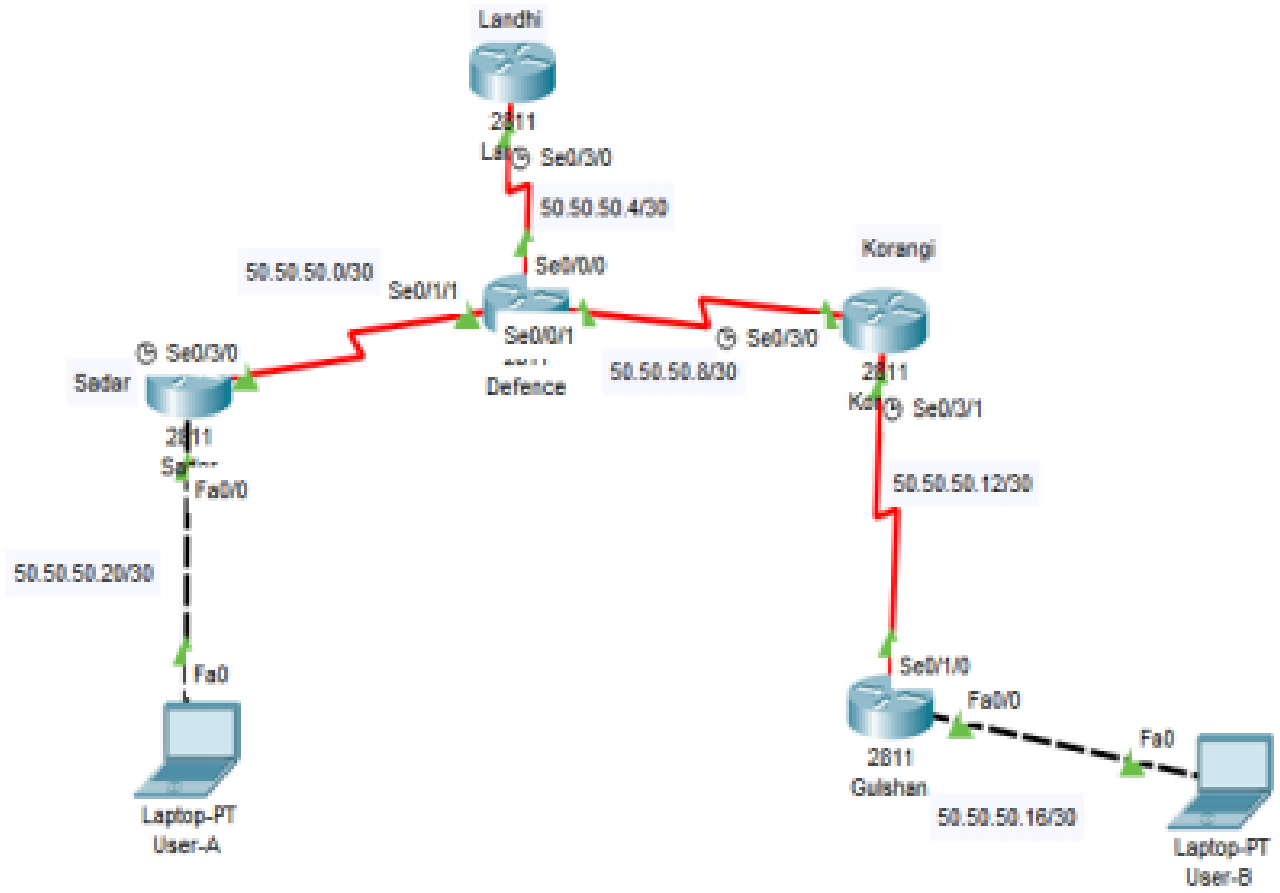

Figure 12

Summary Routes:

Summary static routes can be used to help minimize the number of static routes in the routing table. Using summary static routes can also make management of a large number of static routes easier and less prone to errors.

A summary route, sometimes called a manual summary route, is a route advertisement that lists a single route. The range of addresses that match that single route includes the same addresses in multiple other subnets in a router's routing table. Instead of advertising those multiple routes for smaller subnets, the router instead advertises that one summary route. That summary route represents a superset of the range of addresses compared to the original routes.

In large internetworks, hundreds, or even thousands, of network addresses can exist. It is often problematic for routers to maintain this volume of routes in their routing tables. Route summarization (also called route aggregation or super netting) can reduce the number of routes that a router must maintain, because it is a method of representing a series of network numbers in a single summary address.

Summarization has a number of advantages:

- **Saves memory**: routing tables will be smaller which reduces memory requirements.
- **Saves bandwidth**: there are fewer routes to advertise so we save some bandwidth.
- **Saves CPU cycles**: fewer packets to process and smaller routing tables to work on.
- **Stability**: Prevents routing table instability due to flapping networks.

There are also some disadvantages to summarization:

- **Forwarding traffic for unused networks**: a router will drop traffic when it doesn't have a matching destination in its routing table. When we use summarization, it's possible that the summary route covers networks that are not in use. The router that has a summary route will forward them to the router that has advertised the summary route.
- **Sub-optimal routing**: routers prefer the path with the longest prefix match. When you use summaries, it's possible that your router prefers another path where it has learned a more specific network from. The summary route also has a single metric.

Task 1, Assign the IP address on each Router

Router Sadar:

Sadar>enable

Sadar#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Sadar(config)#interfacefastEthernet 0/0

Sadar(config-if)#ip address 50.50.50.21 255.255.255.252

Sadar(config-if)#no shutdown

Sadar(config-if)#exit

Sadar(config)#interface serial 0/3/0

Sadar(config-if)#ip address 50.50.50.1 255.255.255.252

Sadar(config-if)#clock rate 64000

Sadar(config-if)#no shutdown

Sadar(config-if)#exit

Router Defence:

Defence >enable

Defence #configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Defence (config)#interface serial 0/1/1

Defence(config-if)#ip address 50.50.50.2 255.255.255.252

Defence (config-if)#no shutdown

Defence (config-if)#exit

Defence (config)#interface serial 0/0/0

Defence(config-if)#ip address 50.50.50.6 255.255.255.252

Defence (config-if)#no shutdown

Defence (config-if)#exit

Defence (config)#interface serial 0/0/1

Defence(config-if)#ip address 50.50.50.9 255.255.255.252

Defence (config-if)#no shutdown

Defence (config-if)#exit

Router Landhi:

Landhi >enable

Landhi #configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Landhi (config)#interface serial 0/3/0

Landhi (config-if)#ip address 50.50.50.5 255.255.255.252

Landhi (config)#clock rate 64000

Landhi (config-if)#no shutdown

Landhi (config-if)#exit

Router Korangi:

Korangi >enable

Korangi#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Korangi(config)#interface serial 0/3/0

Korangi(config-if)#ip address 50.50.50.10 255.255.255.252

Korangi(config)#clock rate 64000

Korangi(config-if)#no shutdown

Korangi(config-if)#exit

Korangi(config)#interface serial 0/3/1

Korangi(config-if)#ip address 50.50.50.13 255.255.255.252

Korangi(config)#clock rate 64000

Korangi(config-if)#no shutdown

Korangi(config-if)#exit

Router Gulshan:

Gulshan >enable

Gulshan#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

Gulshan(config)#interface serial 0/1/0

Gulshan(config-if)#ip address 50.50.50.14 255.255.255.252

Gulshan(config)#clock rate 64000

Gulshan(config-if)#no shutdown

Gulshan(config-if)#exit

Gulshan(config)#interface fa0/0

Gulshan(config)#ip address 50.50.50.17 255.255.255.252

Gulshan(config-if)#no shutdown

Gulshan(config-if)#exit

Task 2, Configure Summary Routes on each Router

Router Sadar:

Sadar(config)#ip route 50.0.0.0 255.0.0.0 50.50.50.2

Sadar(config)#exit

Router Defence:

Defence(config)#ip route 50.0.0.0 255.0.0.0 50.50.50.10

Defence(config)#ip route 50.50.50.20 255.255.255.252 50.50.50.1

Defence(config)#exit

Router Landhi:

Landhi(config)#ip route 50.0.0.0 255.0.0.0 50.50.50.6

Landhi(config)#exit

Router Korangi:

Korangi(config)#ip route 50.0.0.0 255.0.0.0 50.50.50.9

Korangi(config)#ip route 50.50.50.16 255.255.255.252 50.50.50.14

Korangi(config)#exit

Router Gulshan:

```
Gulshan(config)#ip route 50.0.0.0 255.0.0.0 50.50.50.13

Gulshan(config)#exit
```

Lab-4 Exercise:

Design a mesh network which consists of 4 routers. Attach 3 PC's with each router. Configure Summary Routes on this environment so that all the devices can send data packets to each other. What do you understand when you use the command "Show IP route" on each router?