PROJECT REPORT

**RIP (Routing Information Protocol):-**

Routing Information Protocol (RIP) is a protocol that routers can use to exchange network topology information. It is characterized as an interior gateway protocol, and is typically used in small to medium-sized networks. A router running RIP sends the contents of its routing table to each of its adjacent routers every 30 seconds. When a route is removed from the routing table, it is flagged as unusable by the receiving routers after 180 seconds, and removed from their tables after an additional 120 seconds.

There are two versions of RIP (the managed switch supports both):

* RIPv1 defined in RFC 1058.
  + Routes are specified by IP destination network and hop count.
  + The routing table is broadcast to all stations on the attached network.
* RIPv2 defined in RFC 1723.
  + Route specification also includes subnet mask and gateway.
  + The routing table is sent to a multicast address, reducing network traffic.
  + Authentication is used for security.

You can configure a given port to do the following:

* Receive packets in either or both formats.
* Send packets formatted for RIPv1 or RIPv2, or send RIPv2 packets to the RIPv1 broadcast address.
* Prevent any RIP packets from being received.
* Prevent any RIP packets from being sent.

In this project I have used RIPv2 using a class B ip address as-

Network: 172.16.0.0/16 255.255.0.0

1. For 500 Hosts:-

Network: 172.16.0.0/23

First useable ip: 172.16.0.0

Last usable ip: 172.16.1.255

Subnet Mask: 255.255.254.0

1. For 200 Hosts:-

Network: 172.16.2.0/24

First usable ip: 172.16.2.1

Last usable ip: 172.16.2.255

Subnet Mask: 255.255.255.0

1. For 100 Hosts:-

Network: 172.16.3.0/25

First usable ip: 172.16.3.1

Last usable ip: 172.16.3.127

Subnet Mask: 255.255.255.128

1. For 50 Hosts:-

Network:

First usable ip:

Last usable ip:

Subnet Mask:

1. For 30 Hosts:-

Network:  
First usable ip:

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

**OSPF(Open Shortest Path First):-**

Open Shortest Path First (OSPF) is a link-state routing protocol which is used to find the best path between the source and the destination router using its own Shortest Path First). OSPF is developed by Internet Engineering Task Force (IETF) as one of the Interior Gateway Protocol (IGP), i.e, the protocol which aims at moving the packet within a large autonomous system or routing domain. It is a network layer protocol which works on the protocol number 89 and uses AD value 110. OSPF uses multicast address 224.0.0.5 for normal communication and 224.0.0.6 for update to designated router(DR)/Backup Designated Router (BDR).

**OSPF terms –**

1. **Router I’d –** It is the highest active IP address present on the router. First, highest loopback address is considered. If no loopback is configured then the highest active IP address on the interface of the router is considered.
2. **Router priority –** It is a 8 bit value assigned to a router operating OSPF, used to elect DR and BDR in a broadcast network.
3. **Designated Router (DR) –** It is elected to minimize the number of adjacency formed. DR distributes the LSAs to all the other routers. DR is elected in a broadcast network to which all the other routers shares their DBD. In a broadcast network, router requests for an update to DR and DR will respond to that request with an update.
4. **Backup Designated Router (BDR) –** BDR is backup to DR in a broadcast network. When DR goes down, BDR becomes DR and performs its functions.

**DR and BDR election –** DR and BDR election takes place in broadcast network or multi access network. Here is the criteria for the election:

1. Router having the highest router priority will be declared as DR.
2. If there is a tie in router priority then highest router I’d will be considered. First, highest loopback address is considered. If no loopback is configured then the highest active IP address on the interface of the router is considered.

I have used Ospf on a class C ip address as:-

Ospf area 1

Network: 192.168.0.0/24 255.255.255.0

1. For 500 Hosts:-

Network: 192.168.0.0

First useable ip:

Last usable ip:

Subnet Mask:

1. For 200 Hosts:-

Network:

First usable ip:

Last usable ip:

Subnet Mask:

1. For 100 Hosts:-

Network:

First usable ip:

Last usable ip:

Subnet Mask:

1. For 50 Hosts:-

Network:

First usable ip:

Last usable ip:

Subnet Mask:

1. For 30 Hosts:-

Network:  
First usable ip:

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

1. For 2 Hosts(Routers):-

Network:

First usable ip

Last usable ip:

Subnet Mask:

**ROUTER REDISTRIBUTION:-**

Route redistribution is a process that allows a network to use a routing protocol to dynamically route traffic based on information learned from a different routing protocol. Route redistribution helps increase accessibility within networks.

**Redistributing OSPF to RIP:-**

Enter Configuration = Router Rip

Specify Version = Version 2

Redistribute OSPF networks = Redistribute ospf 1 metric 2

**Redistributing RIP to OSPF:-**

Enter Configuration = Router ospf 1

Redistribute Rip networks = Redistribute rip subnets