Computer Network Laboratory

Assignment 6

Name: Hemant Singh

Enrollment Number: 17114038

Class: 3rd year, B.Tech CSE

Course: CSN-361

Github Link: https://github.com/hemant84/CSN-361

Problem Statements:

Problem 1 :

Use OPNET to implement OSPF (Open Shortest Path First) protocol. Create a scenario –Scenario1, of 8 routers of any type (e.g., slip8_gtwy) and configure the Network topology and the Link costs as shown in Fig. 1(a) and Fig. 1(b) respectively.Create a duplicate scenario – Scenario2, where the routers in Scenario1 are partitioned into 3different areas Area1: RouterA, RouterB, RouterC Area2: RouterD, RouterEArea3: RouterF, RouterG, RouterH .Display the route for the traffic demand between RouterA and RouterC in Scenario1. Display theroute for the traffic demand between RouterA and RouterC in Scenario2.

Algorithms used :

1. **Slip8_gtwy Router-** The slip8_gtwy node model represents an IP-based gateway supporting up to eight serial line interfaces at a selectable data rate. The RIP or OSPF protocols may be used to automatically and dynamically create the gateway's routing tables and select routes in an adaptive manner.
2. **PPP_DS3 link-** The PPP_DS3 link has a data rate of 44.736 Mbps.

created 8 routers of type slip8_gtwy.

OSPF protocol is used, 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.

The simulation statistics are made over 10 minutes.

In Scenario2 routers are patitioned as follows:

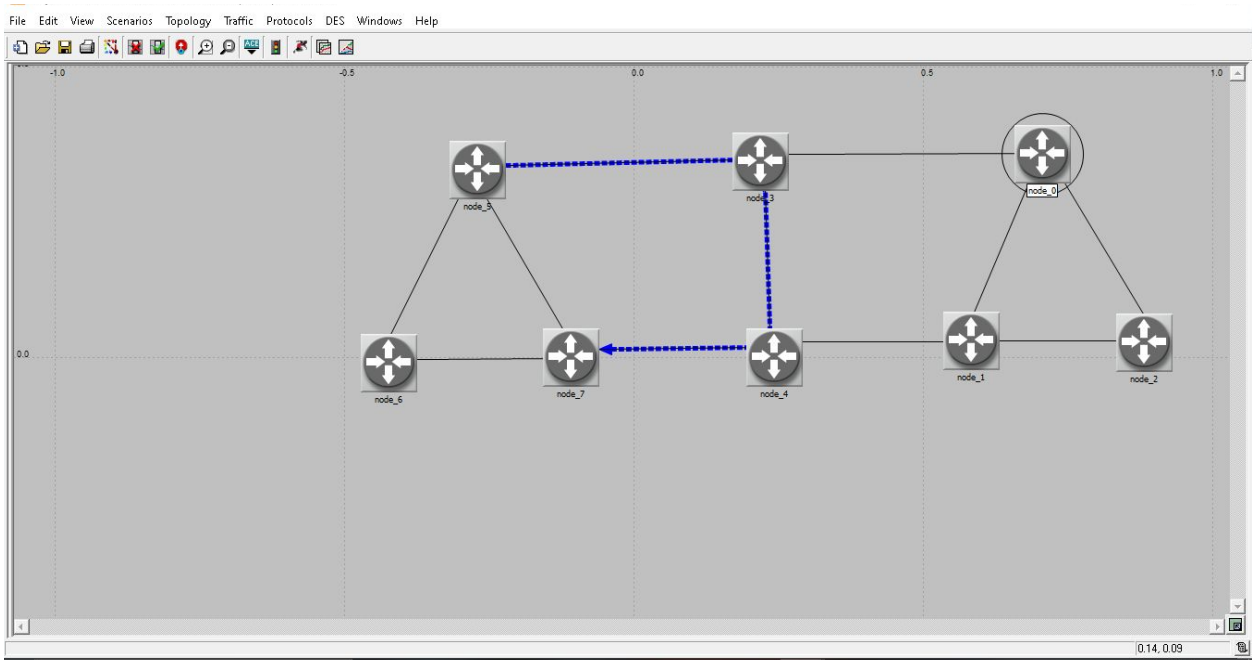
Area1: RouterA, RouterB, RouterC

Area2: RouterD, RouterE

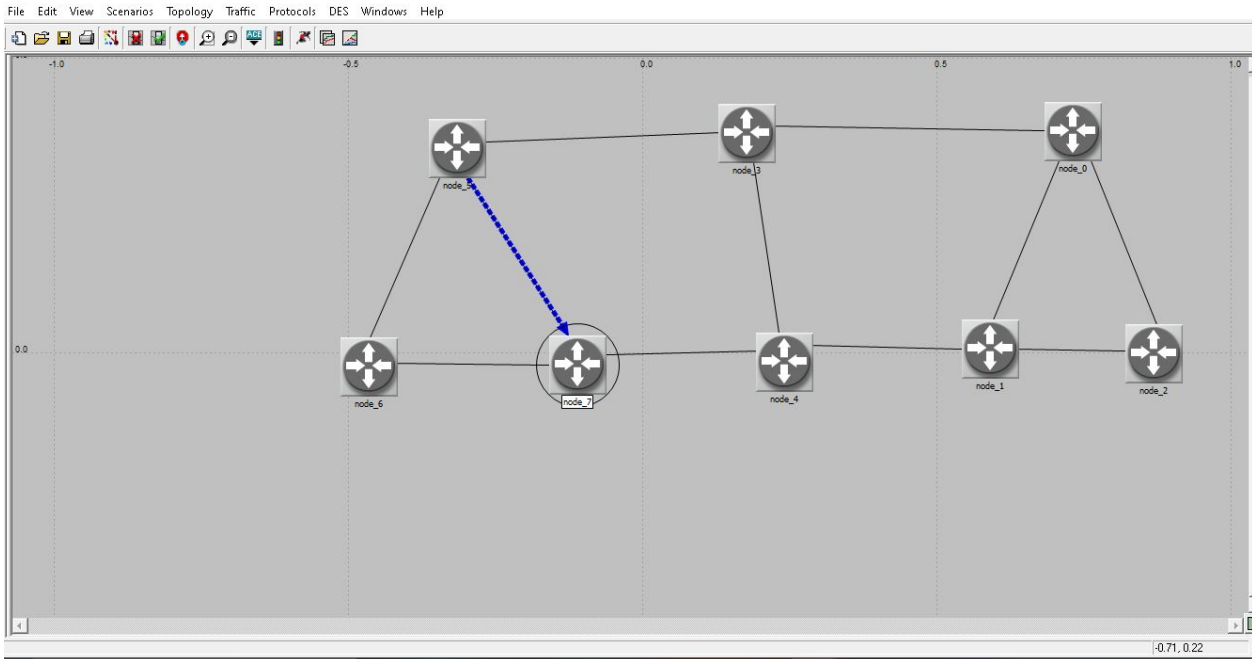
Area3: RouterF, RouterG, RouterH

Screenshot :

Route for the traffic demand between RouterA and RouterC in Scenario1-



Route for the traffic demand between RouterA and RouterC in Scenario2



Problem 2 :

Use OPNET to implement RIP (Routing Information) protocol on the same network configurations as given in Problem 1. Display the route for the traffic demand between RouterA and RouterC in Scenario1. Display the route for the traffic demand between RouterA and RouterC in Scenario2.

The Routing Information Protocol is one of the oldest distance-vector routing protocols which employ the hop count as a routing metric. RIP prevents routing loops by implementing a limit on the number of hops allowed in a path from source to destination. In Routing Information Protocol, the cost is the same for all edges. It counts and minimizes the number of hop counts for finding the best path. So, the best path should be the direct link between the routers

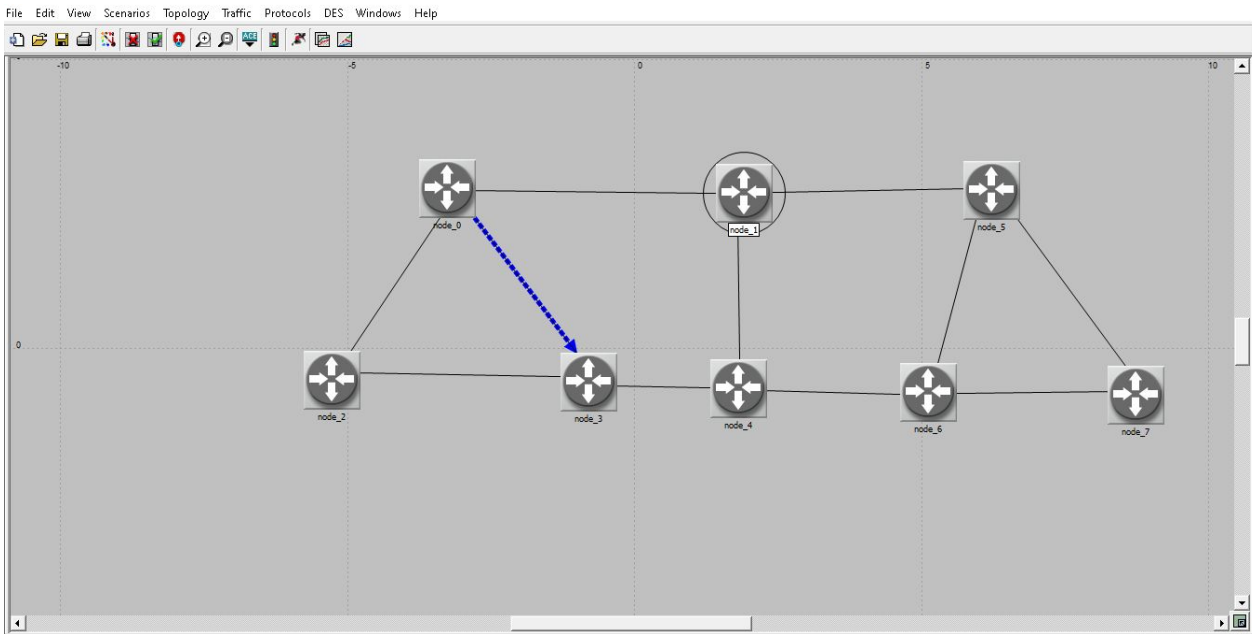
Algorithms used :

- Slip8_gtwy Router- The slip8_gtwy node model represents an IP-based gateway supporting up to eight serial line interfaces at a selectable data rate. The RIP or OSPF protocols may be used to automatically and dynamically create the gateway's routing tables and select routes in an adaptive manner.

- PPP_DS3 link- The PPP_DS3 link has a data rate of 44.736 Mbps.

Screenshot :

Route for the traffic demand between RouterA and RouterC in Scenario1:



Route for the traffic demand between RouterA and RouterC in Scenario2: