Computer Network
Laboratory

Assignment 6

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Course: CSN-361

GitHub link - https://github.com/gagankumre/CSN361/tree/master/Assignment

Two problems were given for this assignment. They are-

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 3 different areas as follows (Fig 2): Area1: RouterA, RouterB, RouterC Area2: RouterD, RouterE Area3: RouterF, RouterG, RouterH . 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

Algorithms and data structure used :

Open Shortest Path First (ospf) is a routing protocol for Internet Protocol networks. It uses a link state routing algorithm and falls into the group of interior gateway protocols, operating within a single autonomous system.

The network topology is specified through the arrangement of routers and the links that interconnect these routers.The network has two cases.The first one is no area and the other one is area. The network traffic is specified in the source router by setting the cost of every link that connects each other.

The comparison between the scenario No area and the scenarios area can be done through the execution of a simulation sequence.Two scenarios can be specified in the configure simulation advanced,differing by the only option for an adapting routing or a conventional routing and by the output vector file attributes.

According to the network topology,routers links A,B and C has a same cast.Then the routers D and E links has same cast.Also remaining routers F,G and H have same cast.

According the Cisco,the formula for cast has predefined.So implements that formula on these routers and gets the cast of different links.So that OPNET router models also support the formula of Cisco.

Cost=(reference bandwidth)/(link bandwidth)

No area(Scenario 1):

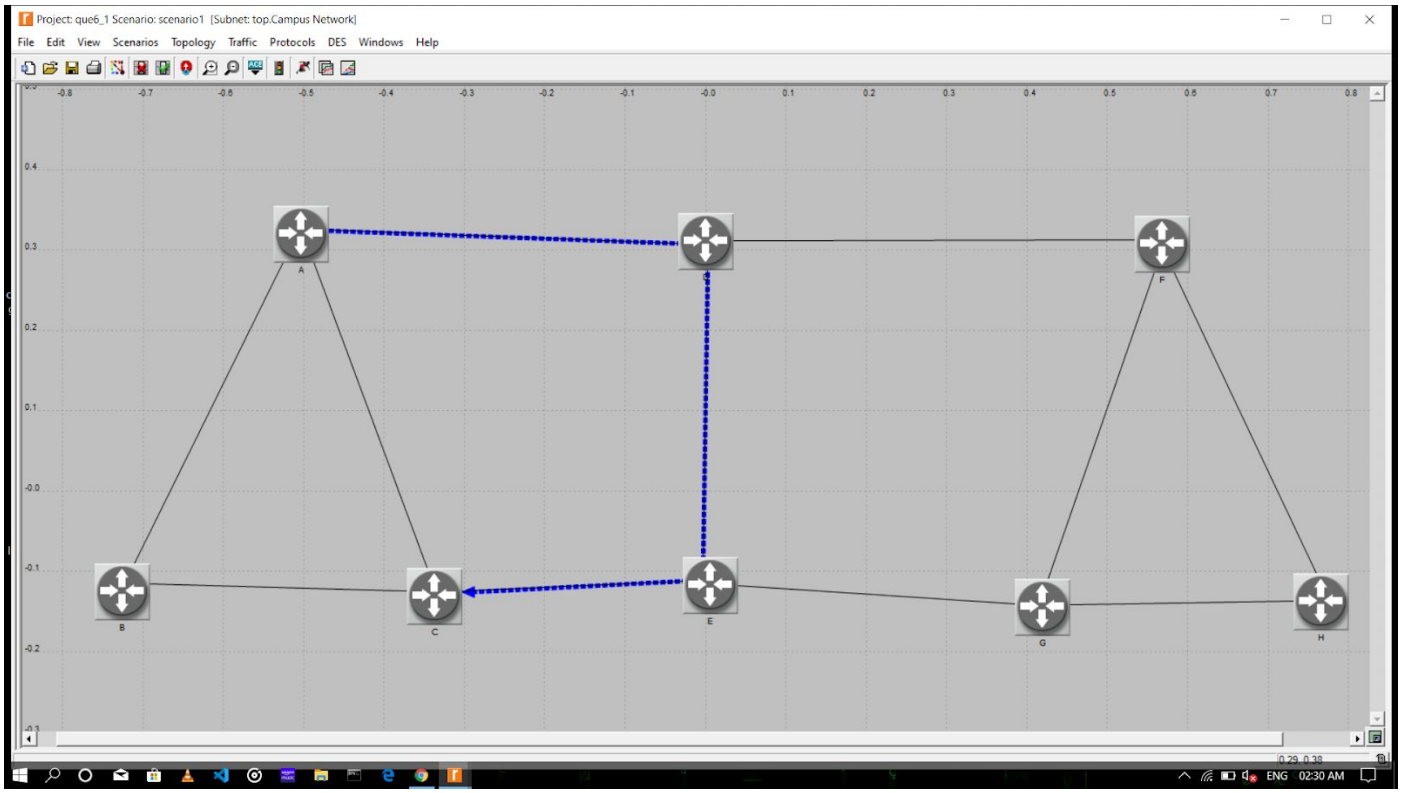
Set the parameters in the OPNET module auto assign IP.

Scenario 2(Area):

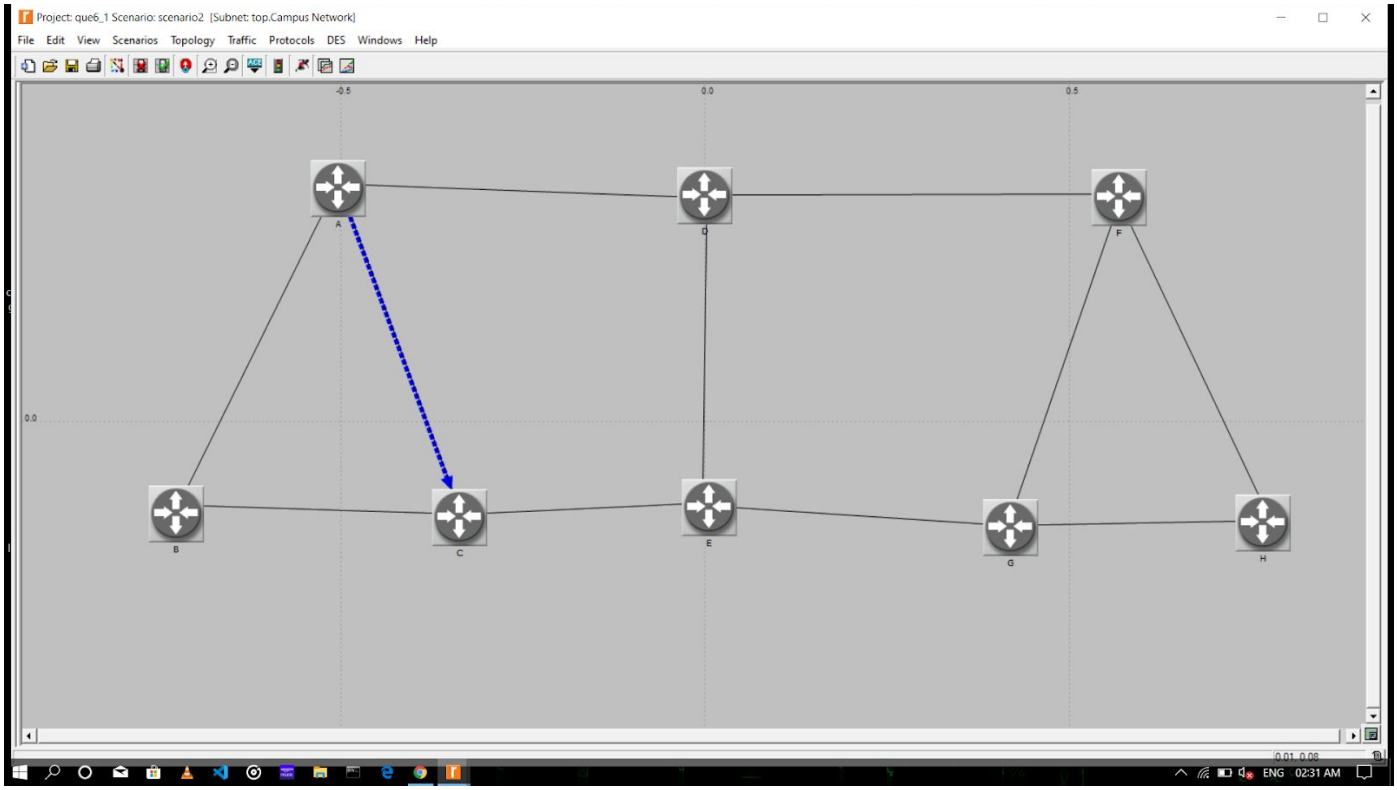
Use manually IP(Internet Protocol)to source and destination points.

Screenshots :

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



2. 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

Algorithms and data structure used :

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.

Screenshots :

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

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