Lab Assignment-4

Computer Networks Laboratory

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B.tech CSE 3rd Year.

Problem 1.

Using OPNET create Bus topology among a set of N computer nodes out of which two nodes are the source and the rest are sink nodes. Model the traffic of source and sink nodes individually and demonstrate the packet transfer between them using Ethcoax (Ethernet using coaxial) cables. Use network scale as the “campus” of area 1km x 1km.

Procedure:

Create the Network To create our coaxial Ethernet network:

1. To create the network configuration, select Topology ⇒ Rapid Configuration. choose Bus and click Next.

2. Click the Select Models button in the Rapid Configuration dialog box. From the Model List drop-down menu chooses ethcoax and click OK.

3. In the Rapid Configuration dialog box, set the following eight values and click OK.

4. To configure the coaxial bus, right-click on the horizontal link ⇒ Select Edit Attributes (Advanced) from the menu:

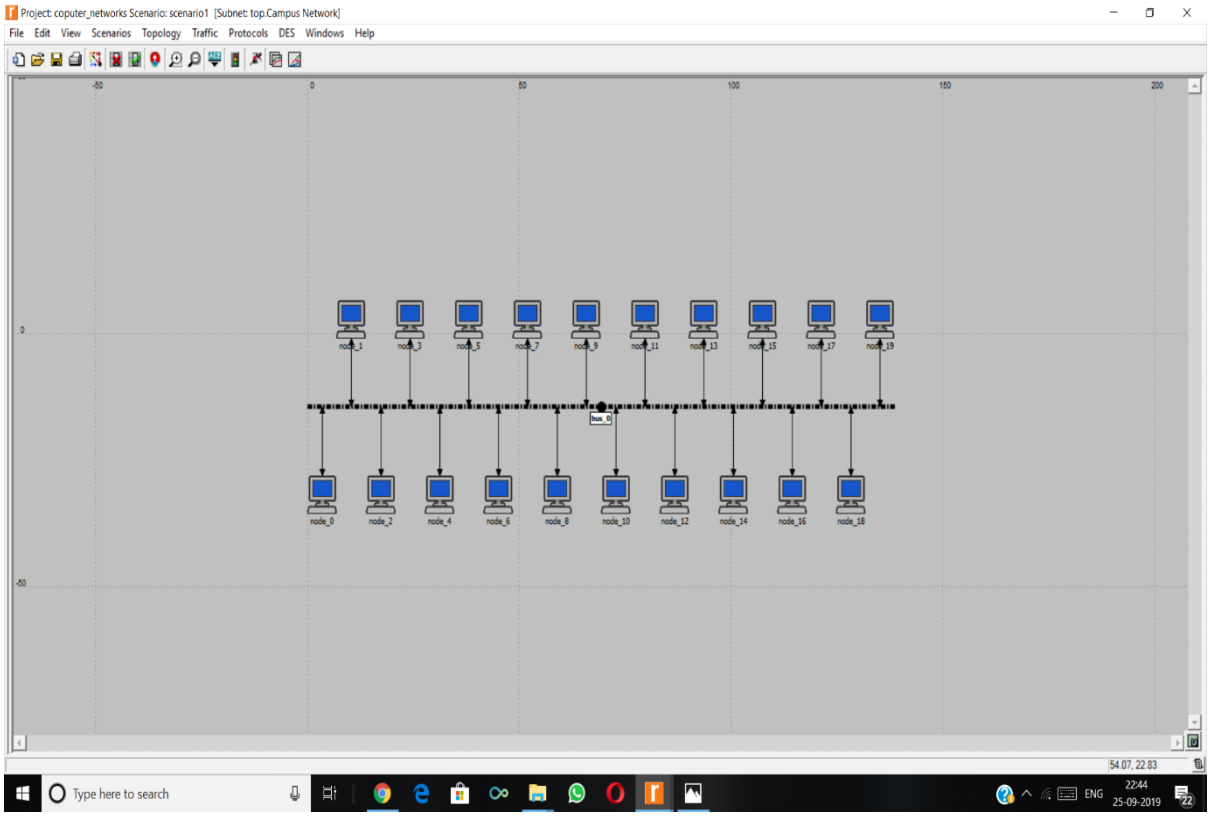
a. Click on the value of the model attribute ⇒ Select Edit from the dropdown menu ⇒ Choose the eth_coax_adv model.

b. Assign the value 0.05 to the delay attribute (propagation delay in sec/m).

c. Assign the thickness attribute. d. Click OK

5. Now you have created the network.

Traffic Received (in packets/sec) by the traffic sinks across all nodes.
Traffic Sent (in packets/sec) by the traffic sources across all nodes



Configure the Network Nodes

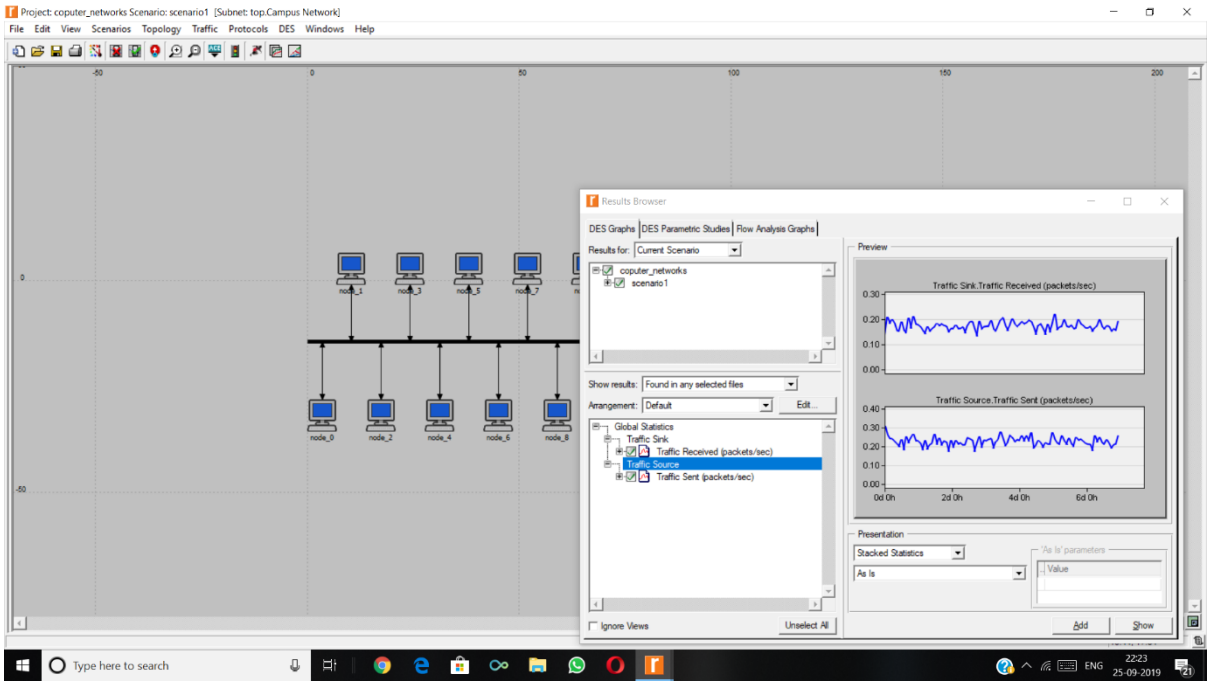
To configure the traffic generated by the nodes:

1. Right-click on any of the 20 nodes ⇒ Select Similar Nodes. Now all nodes in the network are selected.

2. Right-click on any of the 20 nodes ⇒ Edit Attributes.

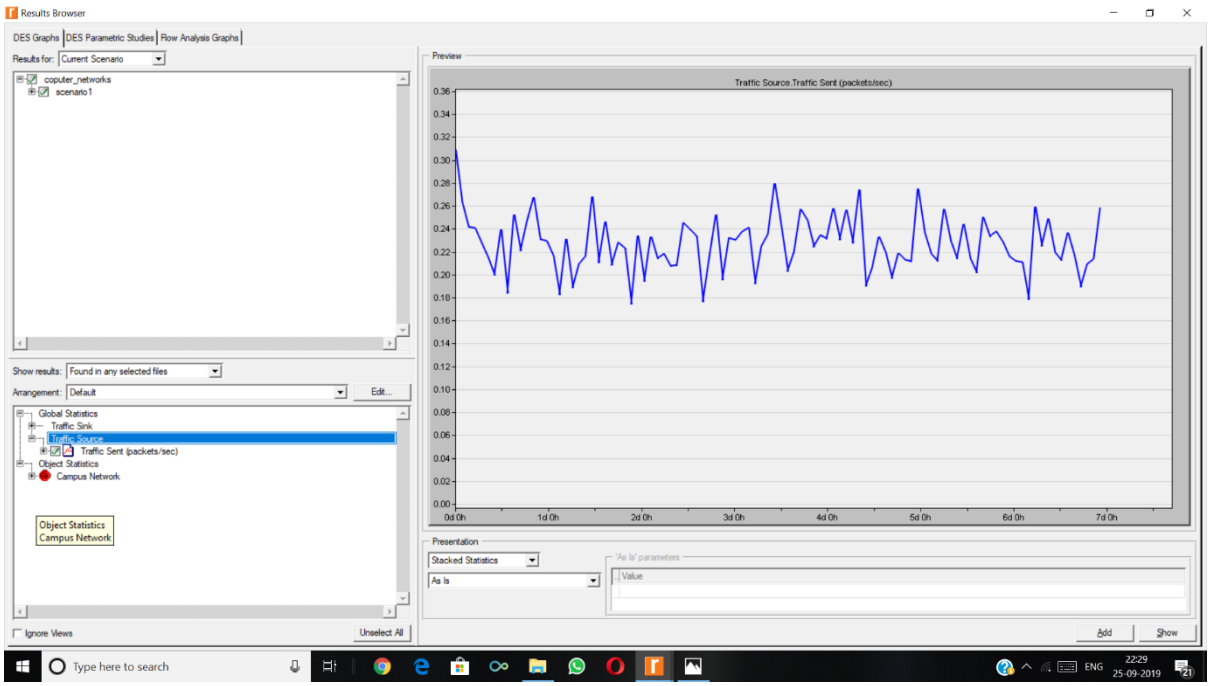
3. Check the Apply Changes to Selected Objects checkbox. This is important to avoid reconfiguring each node individually. .

4. Expand the Traffic Generation Parameters hierarchy: a. Change the value of the ON State Time to exponential (100) ⇒ Change the value of the OFF State Time to exponential (0.00001). (Note: Packets are generated only in the "ON" state.)

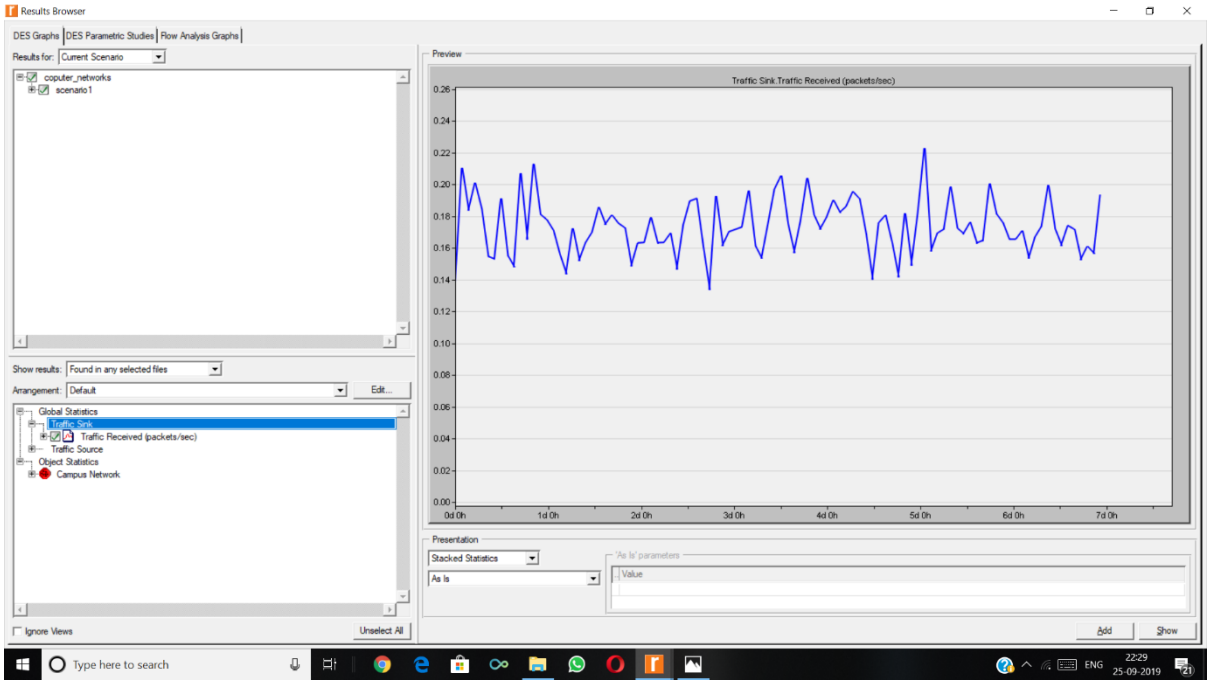


Global statistics

source



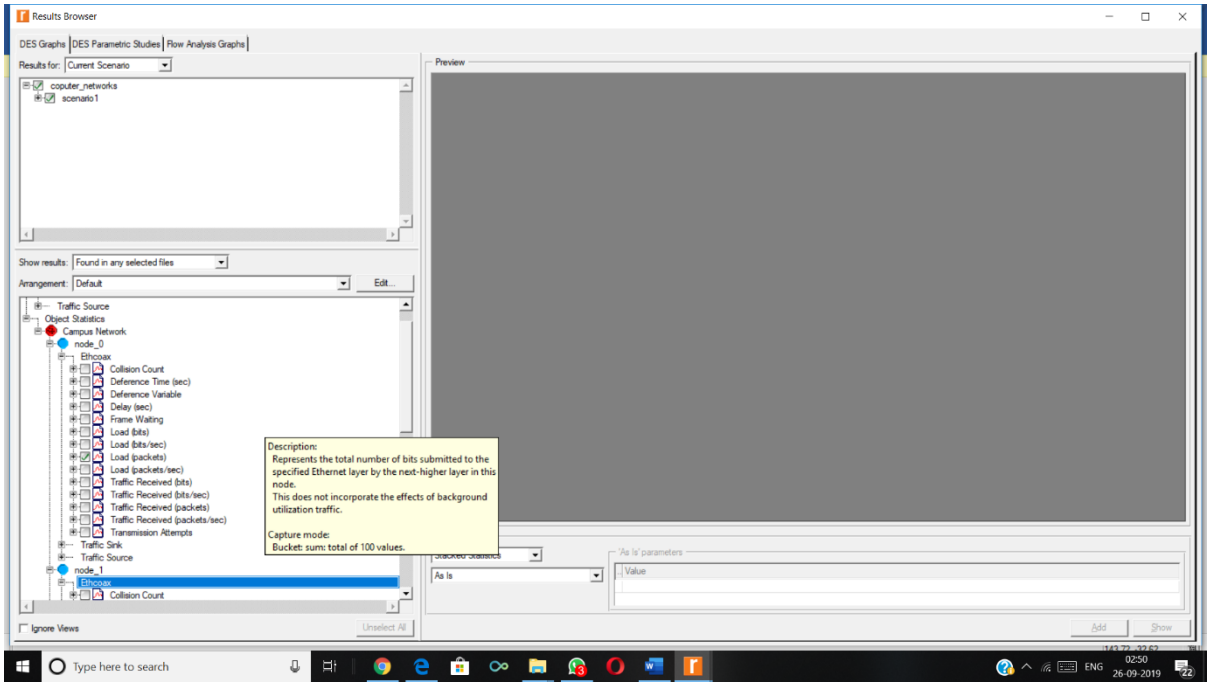
sink



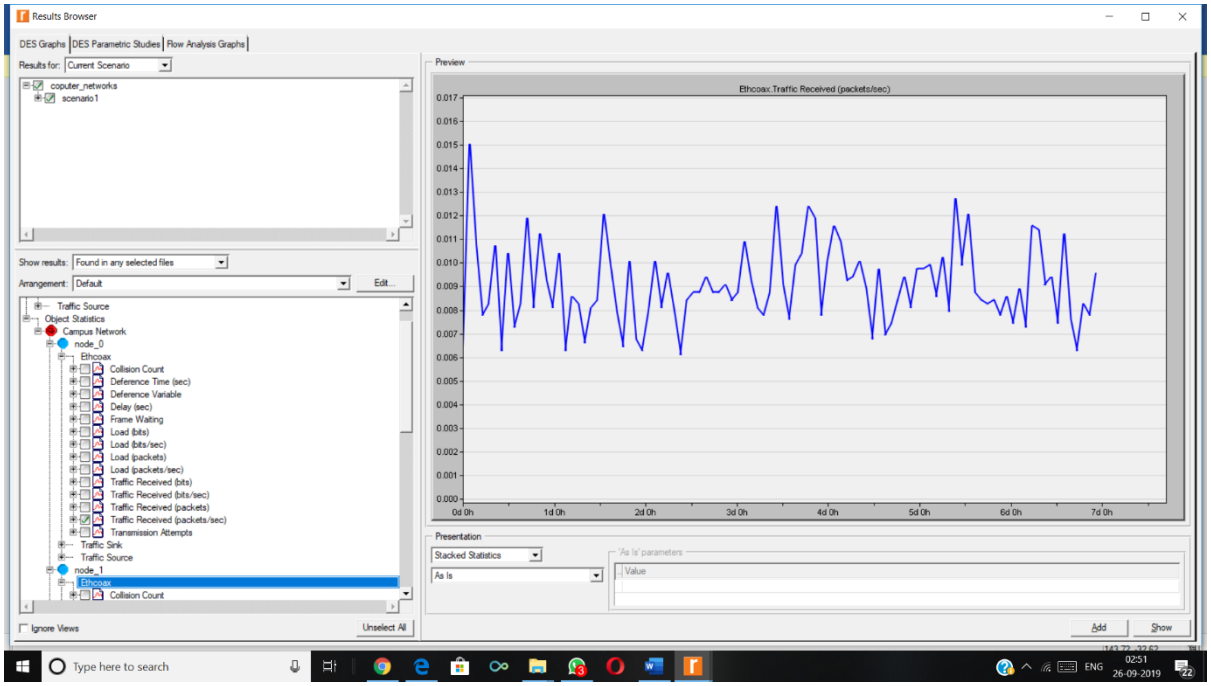
Object statistics

Node 0 (sink)

Load(packets/sec) must be zero

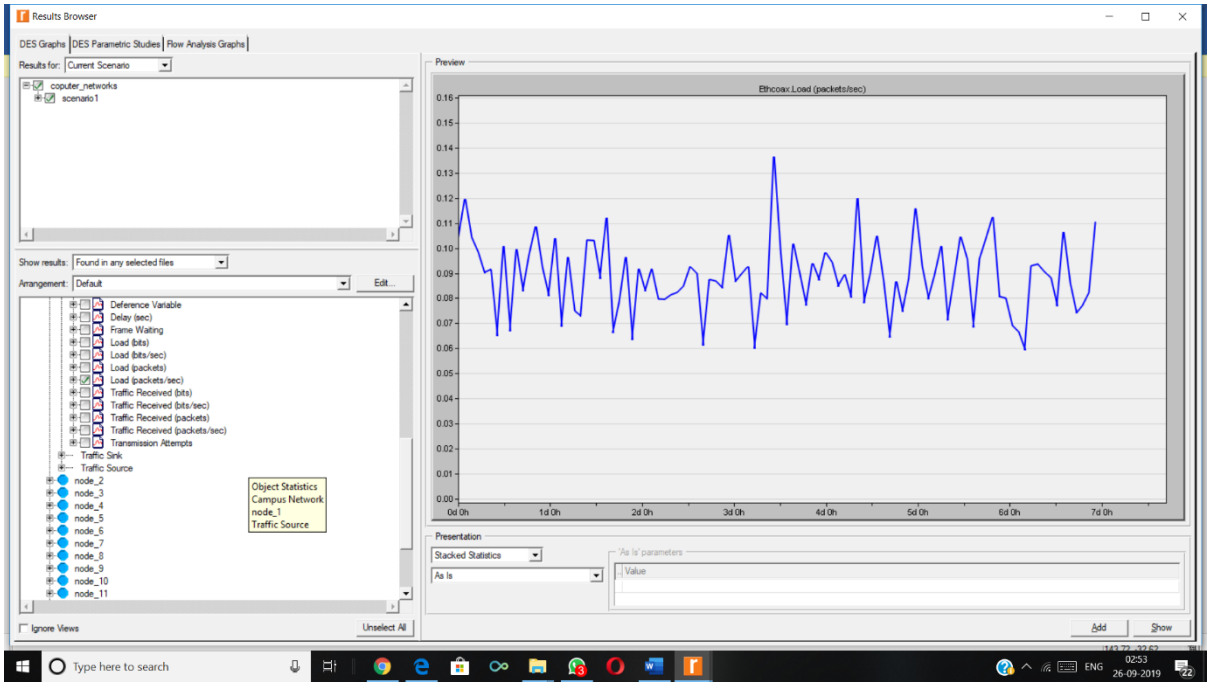


Traffic received(packets/sec)

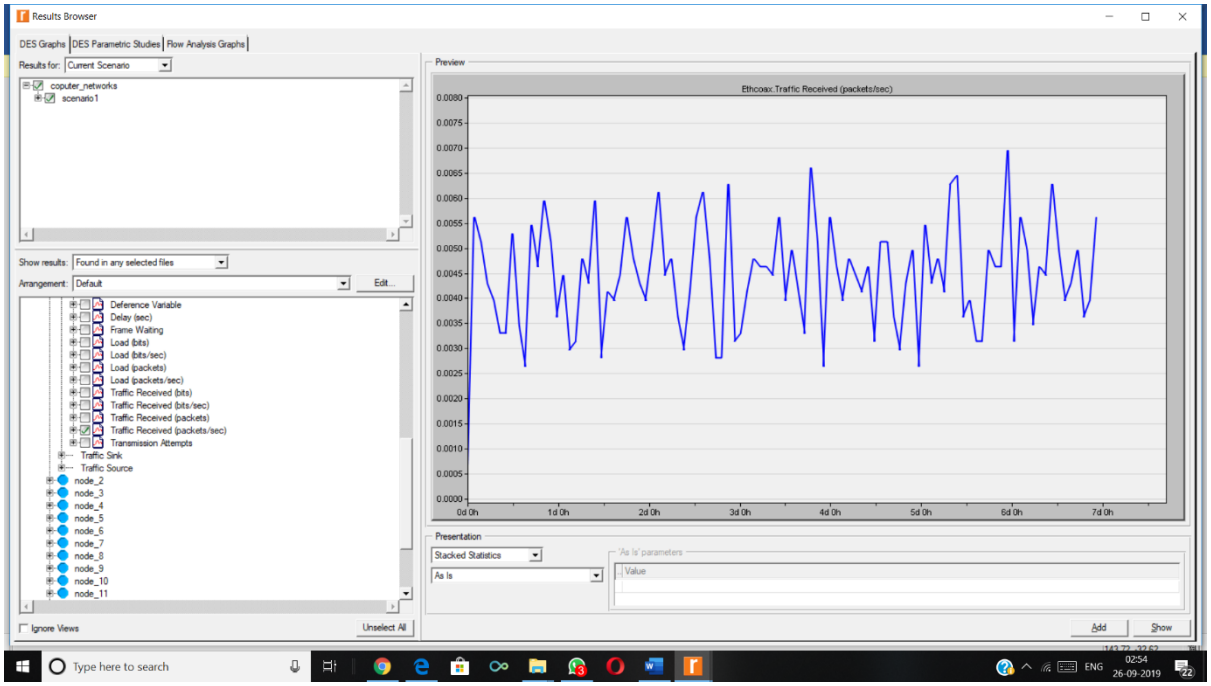


NODE 1 (source +sink)

Load(packets/sec)



Traffic received(packets/sec)



Problem Statement 2:

Using OPNET create Star topology among a set of N computer nodes out of which one node is the source and the rest are sink nodes. Model the traffic of source and sink nodes individually and demonstrate the packet transfer between them using Ethcoax (Ethernet using coaxial) cables. Use network scale as the “campus” of area 1km x 1km.

Procedure:To create Star :

1. Select Topology Rapid Configuration. From the drop-down menu choose Star and click OK.

2. Click the Select Models button in the Rapid Configuration dialog box. From the Mod List drop-down menu choose Ethernet and click OK.

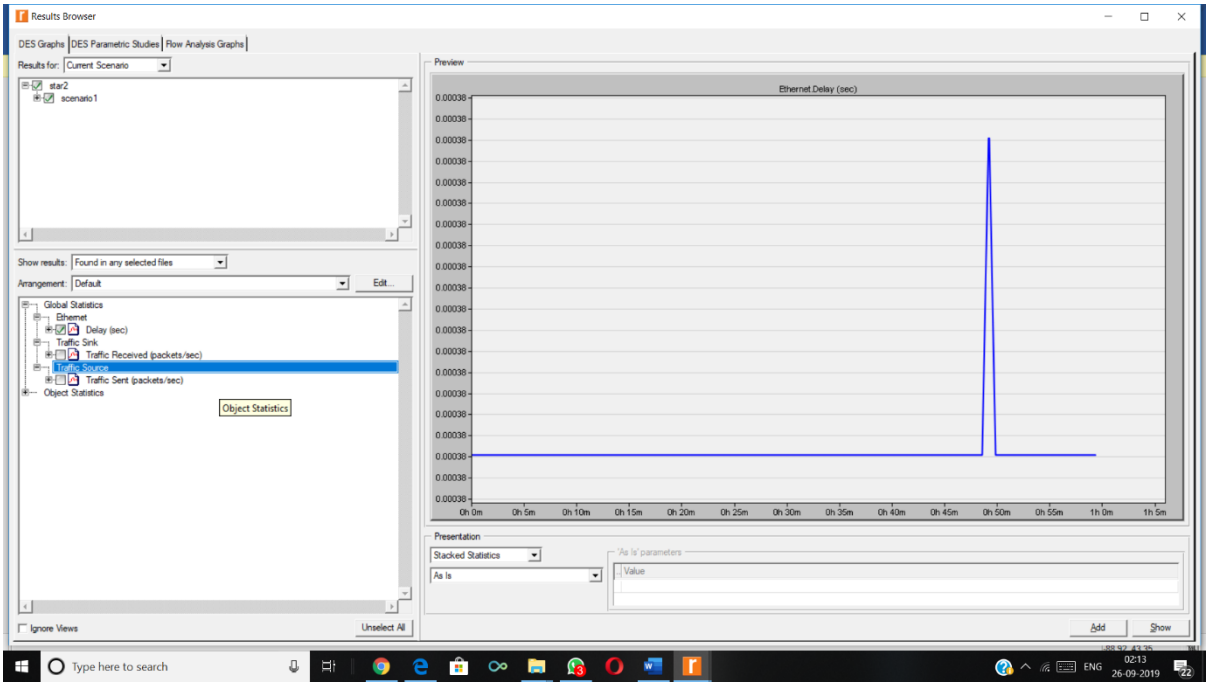
3. In the Rapid Configuration dialog box, set the following six values: Center Node Mod= ethernet16_hub, Periphery Node Model = Ethernet station, Link Model = 10BaseT, Number =16, Y=50, and Radius = 42 Click OK. The 10BaseT link represents an Ethernet connection operating at 10Mbps.

4. Now that the network has been created, it should look like the network on Figure below. (rest is same as bus topology).

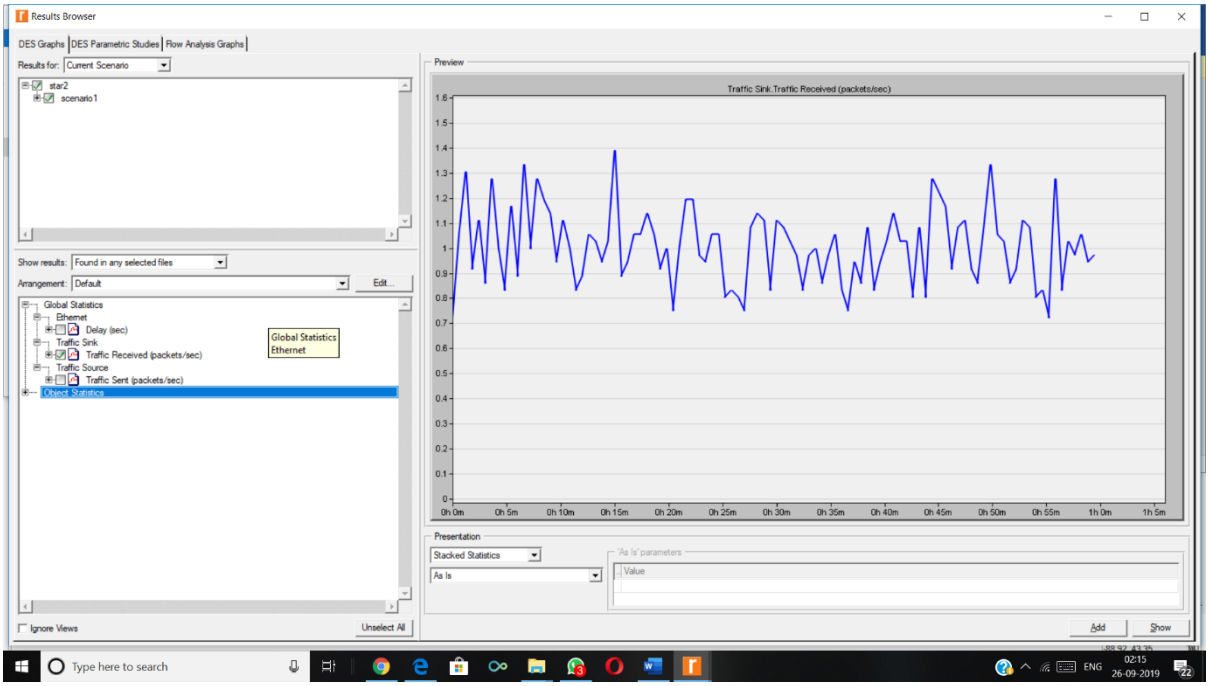
Traffic Received (in packets/sec) by the traffic sinks across all nodes. Traffic Sent (in packets/sec) by the traffic sources across all nodes

Global Statistics

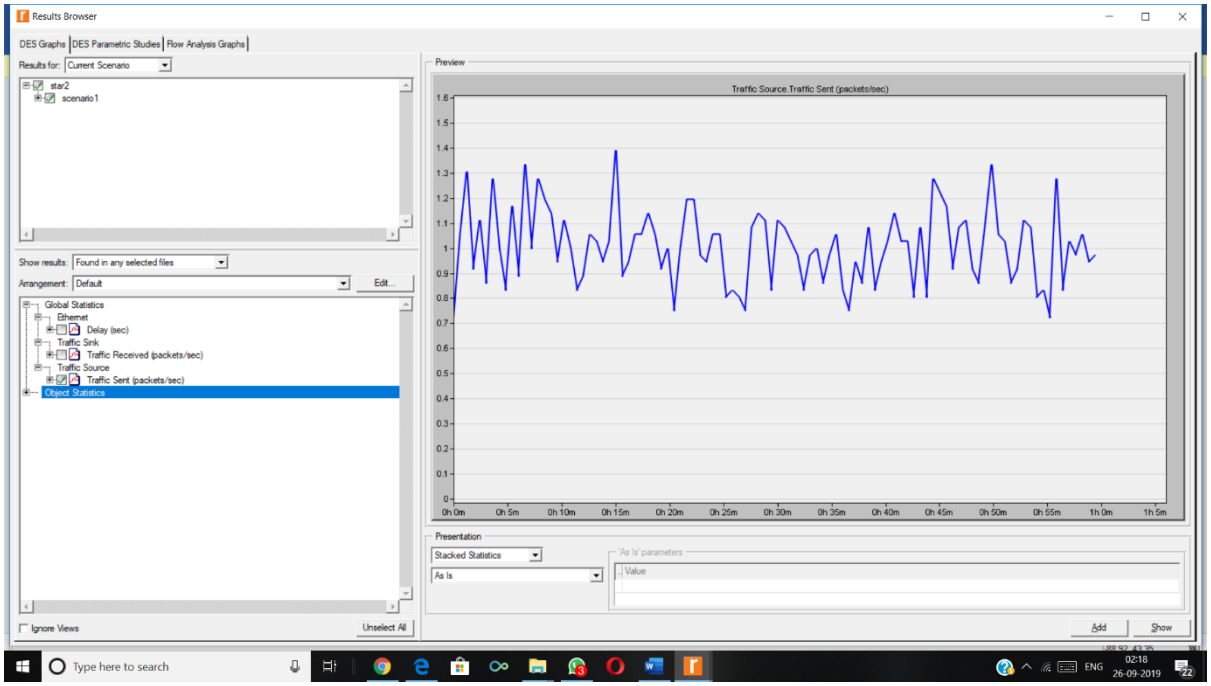
Delay(sec)



Traffic received(packets/sec)



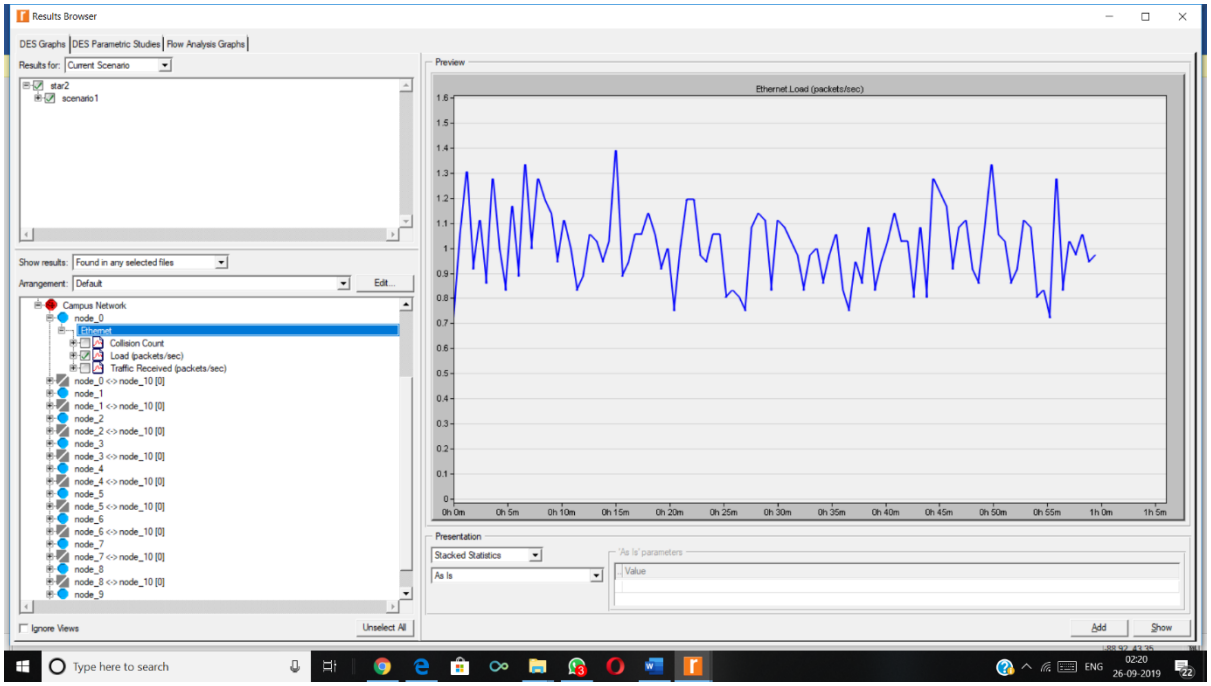
Traffic sent (packets /sec)



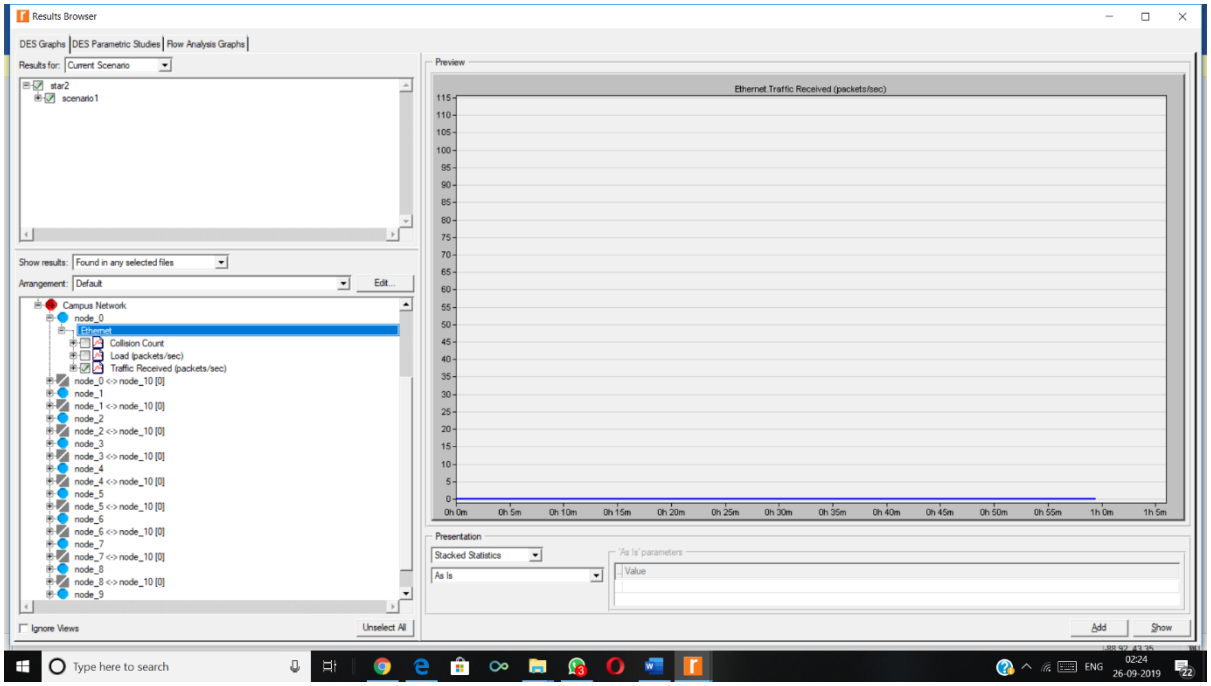
Object Statistics

Node 0 (is our only source)

Load(packet sent) must be positive.

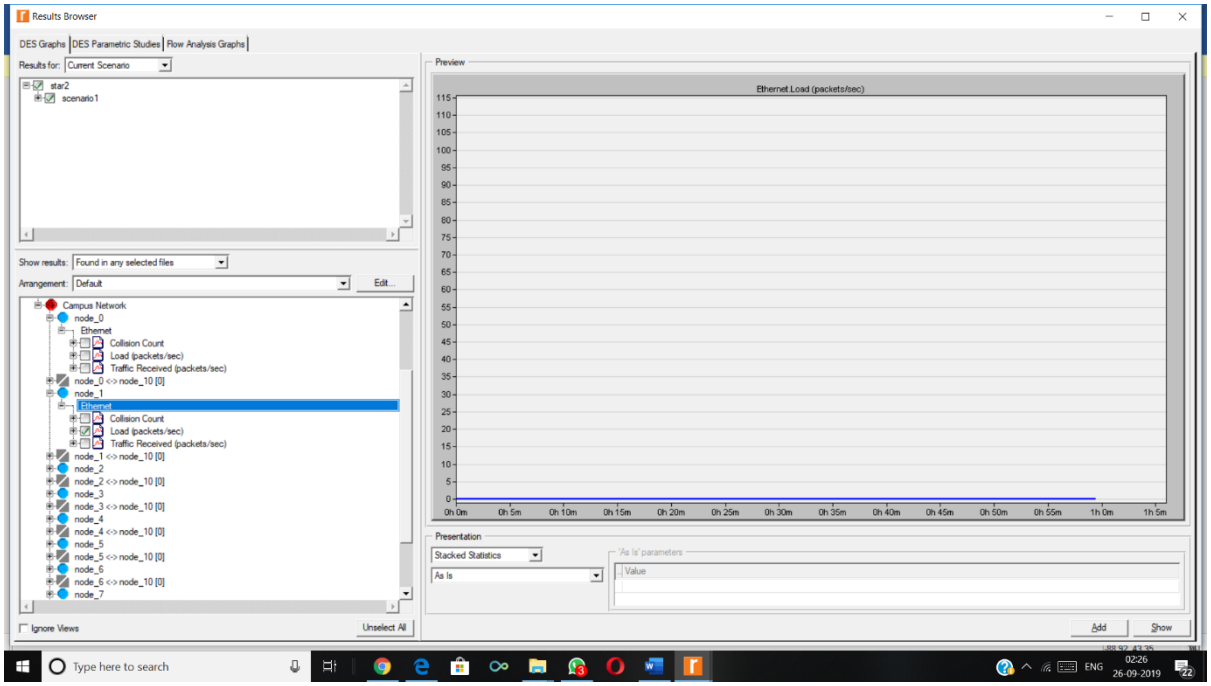


Traffic received (must be zero for single source)



Node 1 (sink)

Load(must be zero)



Traffic received (packets /sec)