CPEG 572 Data and Computer Communication

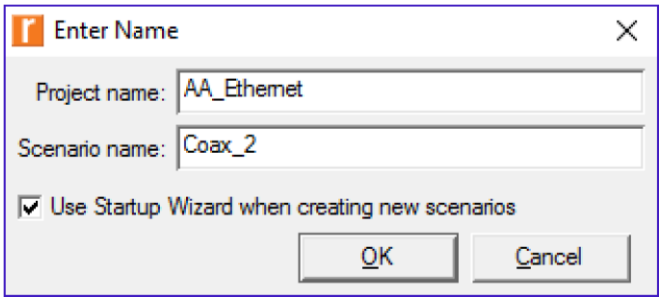
Report No. 2

Summary

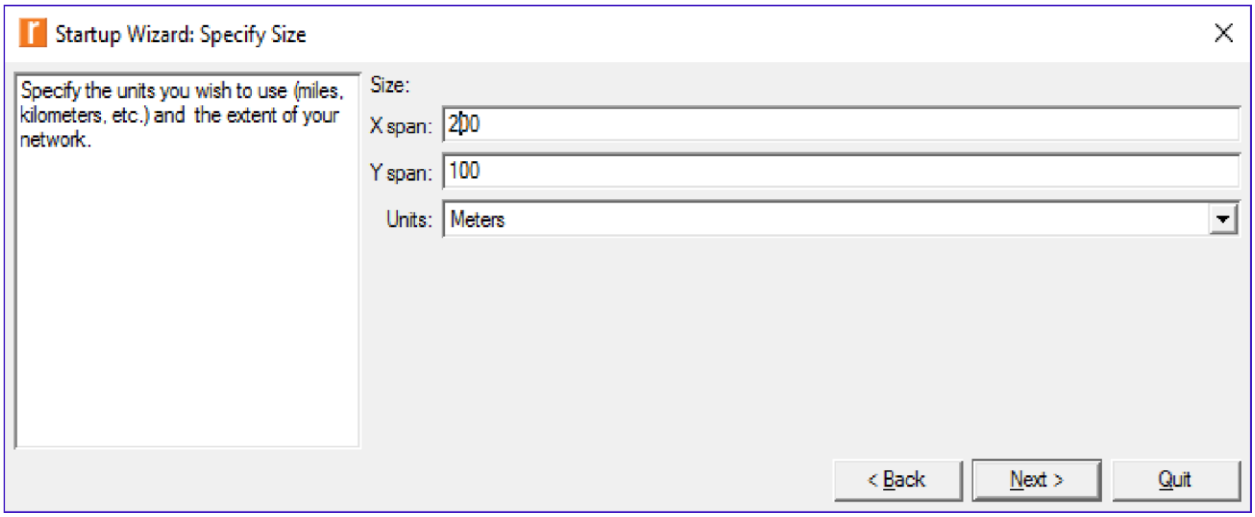
This lab is designed to demonstrate the operation of the Ethernet network. The simulation in this lab will help you examine the performance of the Ethernet network under different scenarios

Implementation

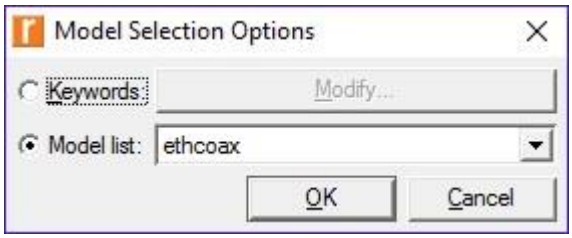
We will set up an Ethernet with 14 nodes connected via a coaxial link in a bus topology. The coaxial link is operating at a data rate of 10 Mbps. We will study how the throughput of the network is affected by the network load as well as the size of the packets, and the steps flowed to make the experiment are bellow.



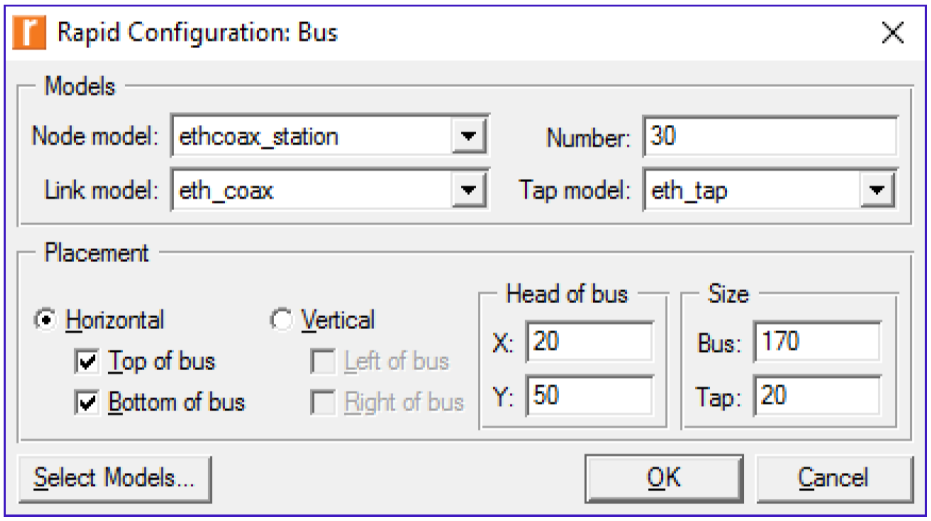
New project



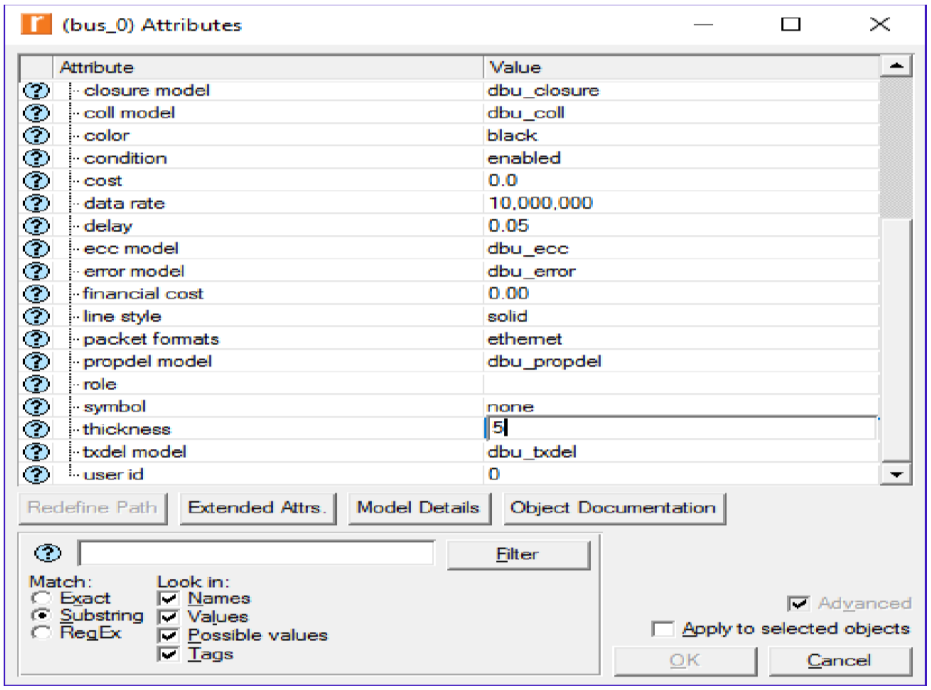
Panel Size



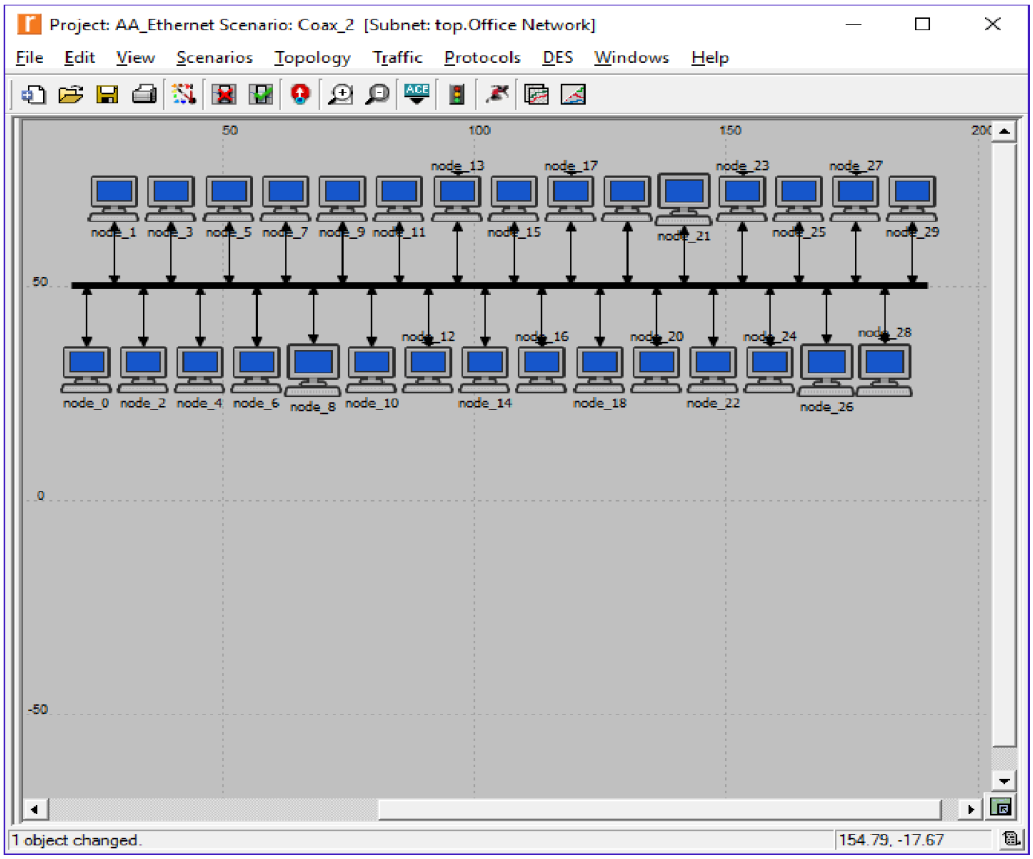
Network Model



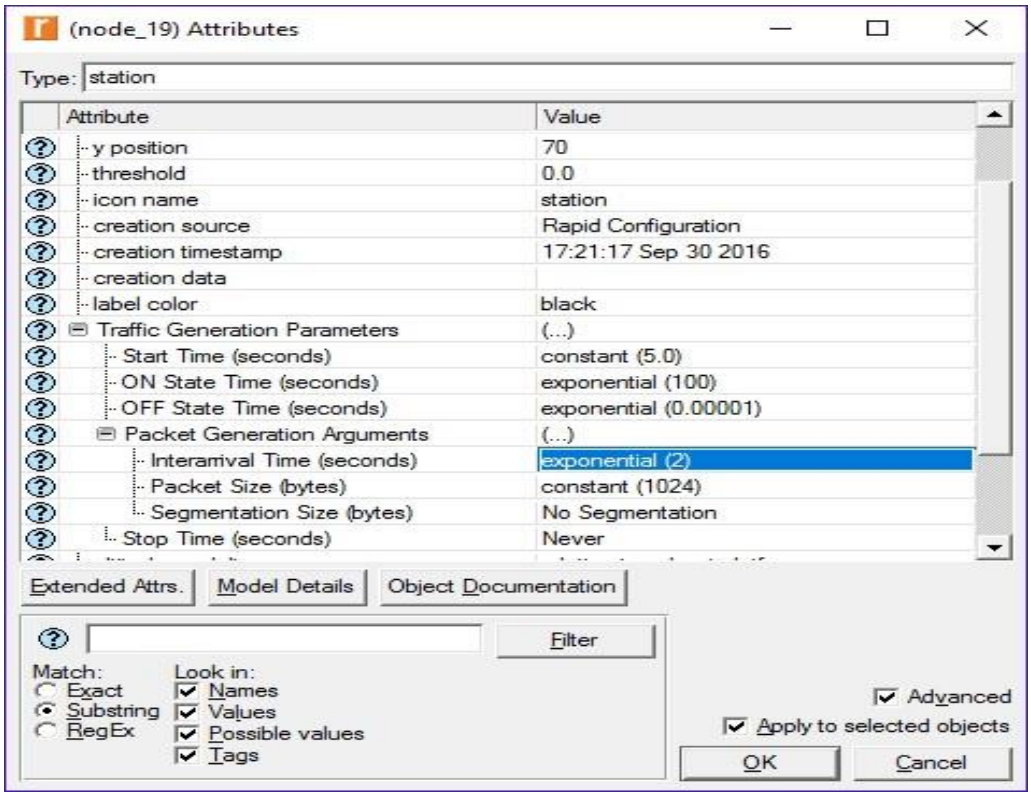
Bus Configuration



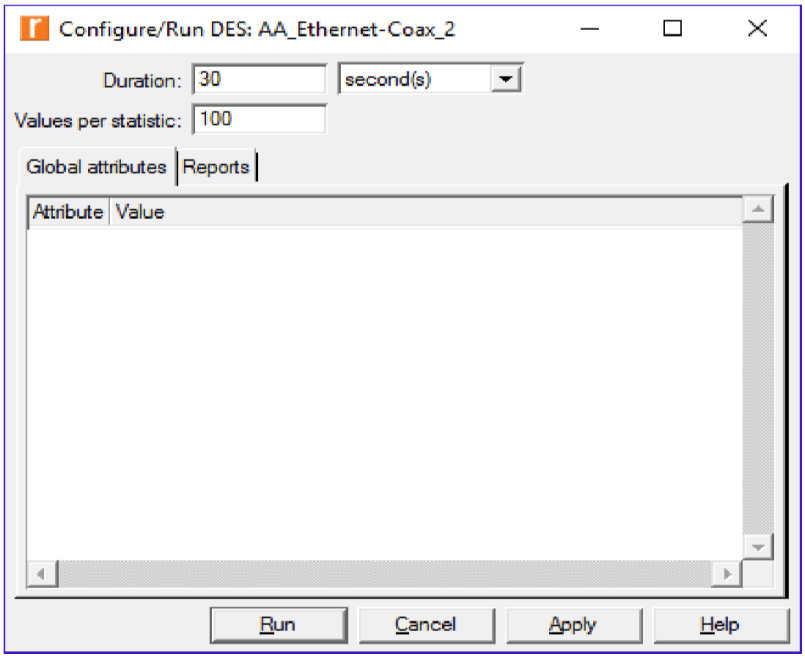
Attributes bus_0


Project: AA_Ethernet Scenario: Coax_2 [Subnet: top.Office Network]
File Edit View Scenarios Topology Traffic Protocols DES Windows Help
50
100
150
node_13
node_17
node_23
node_27
node_1
node_3
node_5
node_7
node_9
node_11
node_15
node_21
node_25
node_29
50
node_12
node_16
node_20
node_24
node_28
node_0
node_2
node_4
node_6
node_8
node_10
node_14
node_18
node_22
node_26
0
-50
1 object changed.
154.79, -17.67

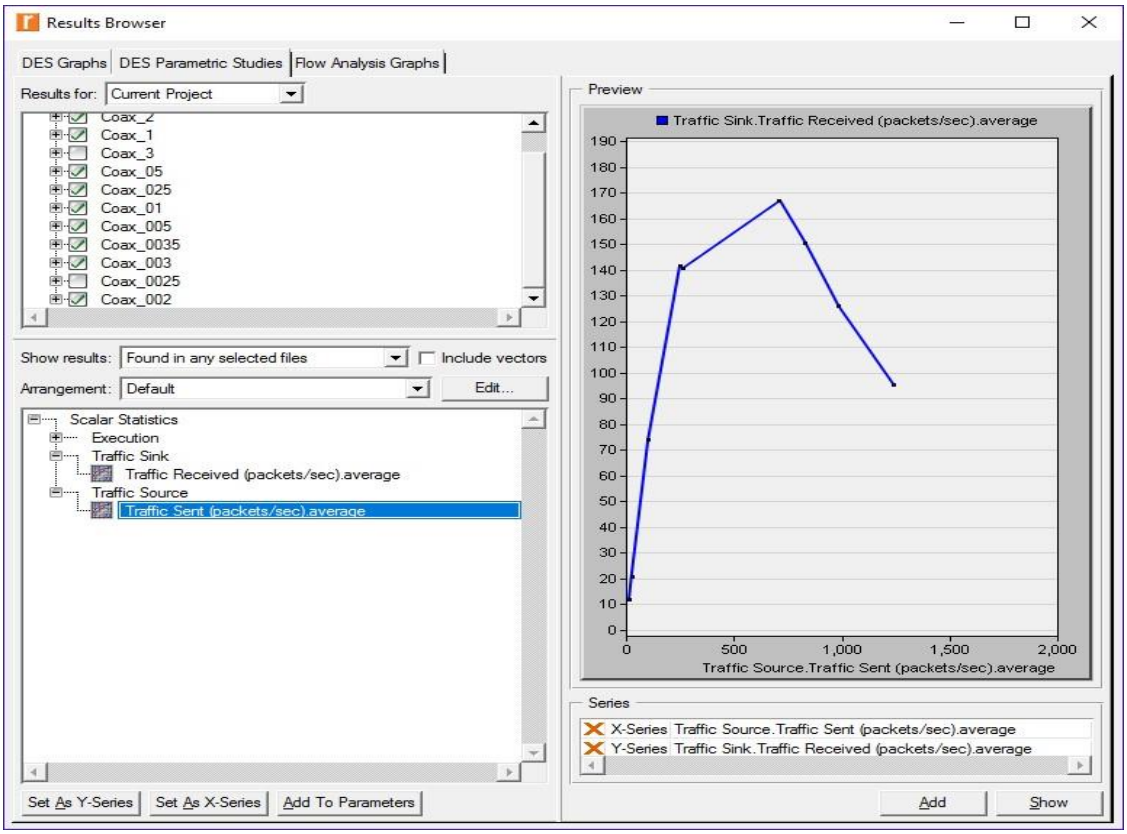
Topology



Node attributes

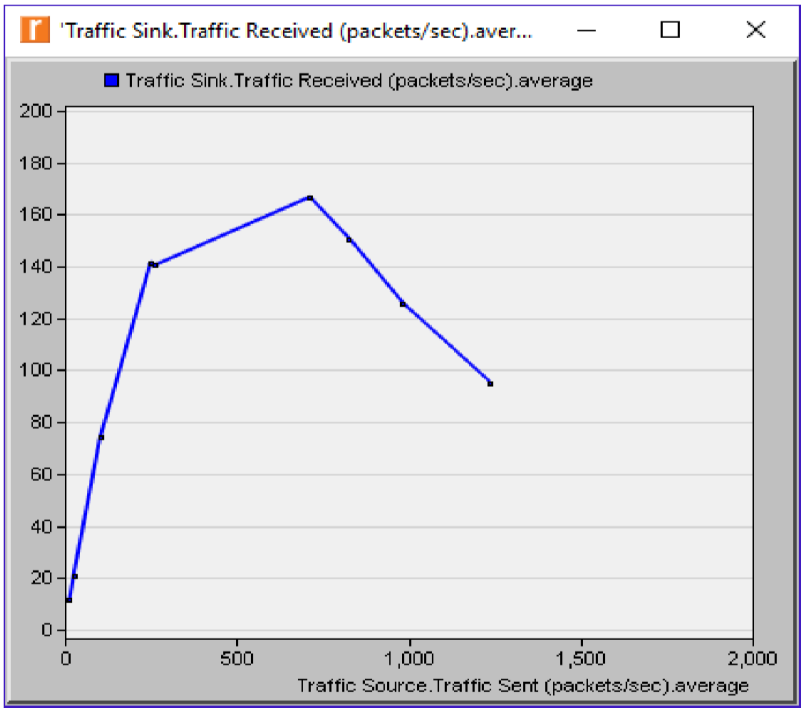


Time Interval



Result

Answers

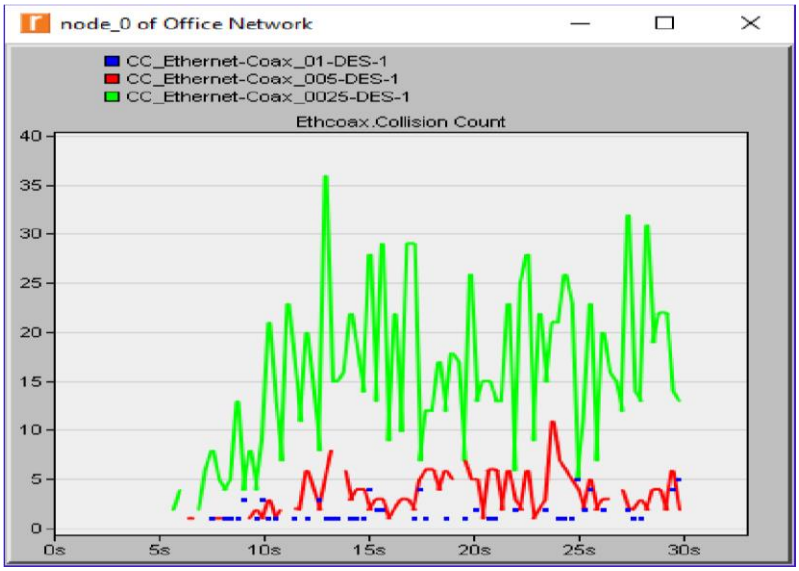


Traffic average

Question1:

As the result in the graph when the received packets are less than approximately 600, the relationship between the received and sent packets are positive. After that, the number of the received packets will be stable when the number of the sent packets is roughly between 600-1150. Then, the number of the received packets will be reducing while the sent packets are increasing.

Question2:



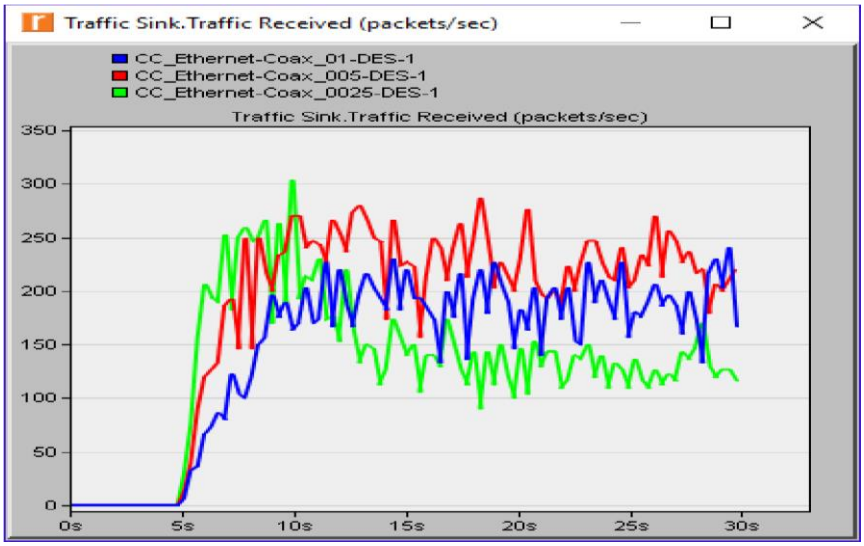
Collision count

From the figure, it is clear the amount of Collision Count of the smallest exponential, 0.025 is the largest. So exponential is smaller at time of sending packets are the larger.

In the figure, the highest point is reached by the coax_0025 which is roughly 300, and the value of exponential is 0.025. It will reduce until it will be the smallest.

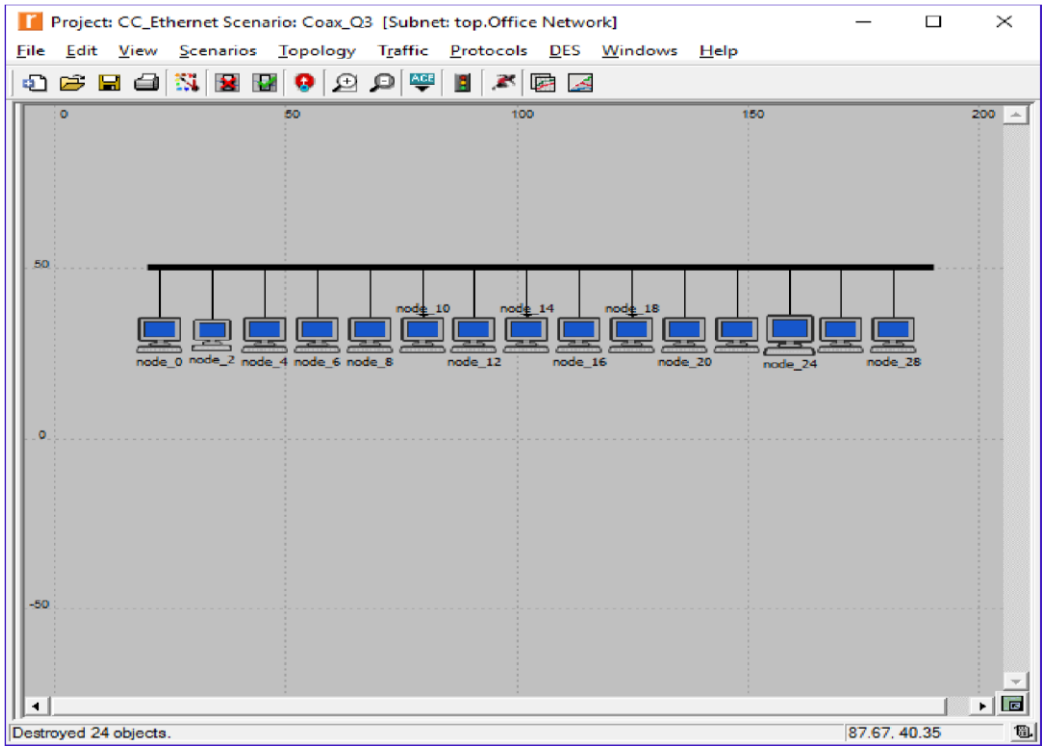
Also, that will happen when the traffic load will be massive. In addition, the Coax_01 has the lowest traffic at the beginning, and the value of exponential = 0.1. After while it is changing to become higher and higher when the load becomes larger and larger. Finally, the Coax_005 we noticed the curve is increasing more and more, and it will reach the peak when the traffic load becomes massive further and further.

These three scenarios are showing that many different exponentials will influent the performance of the networks.

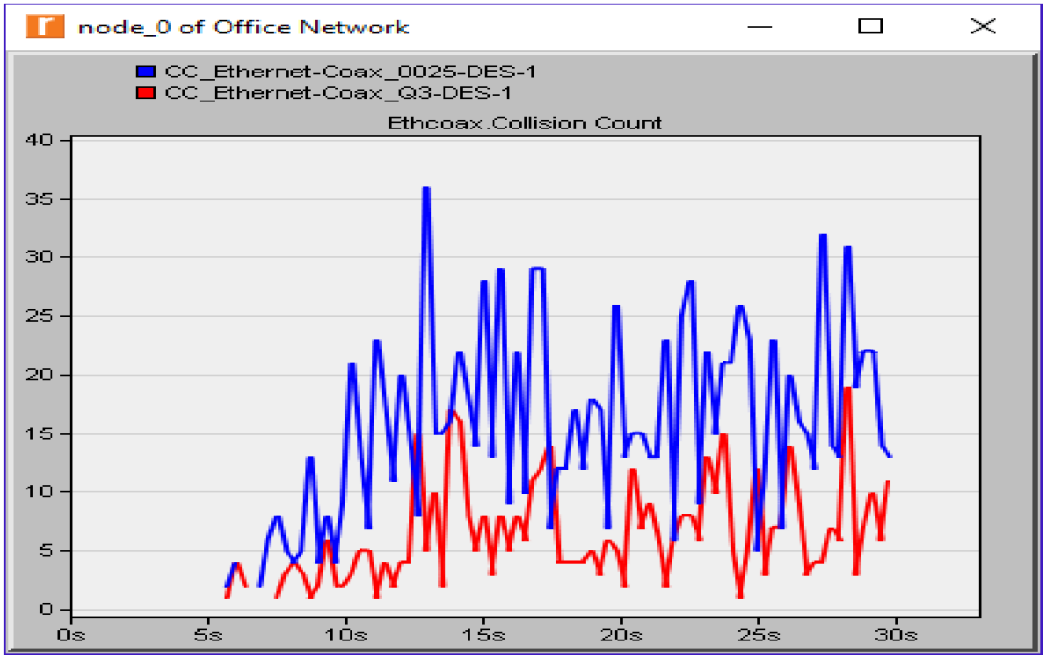


Traffic

Question3:



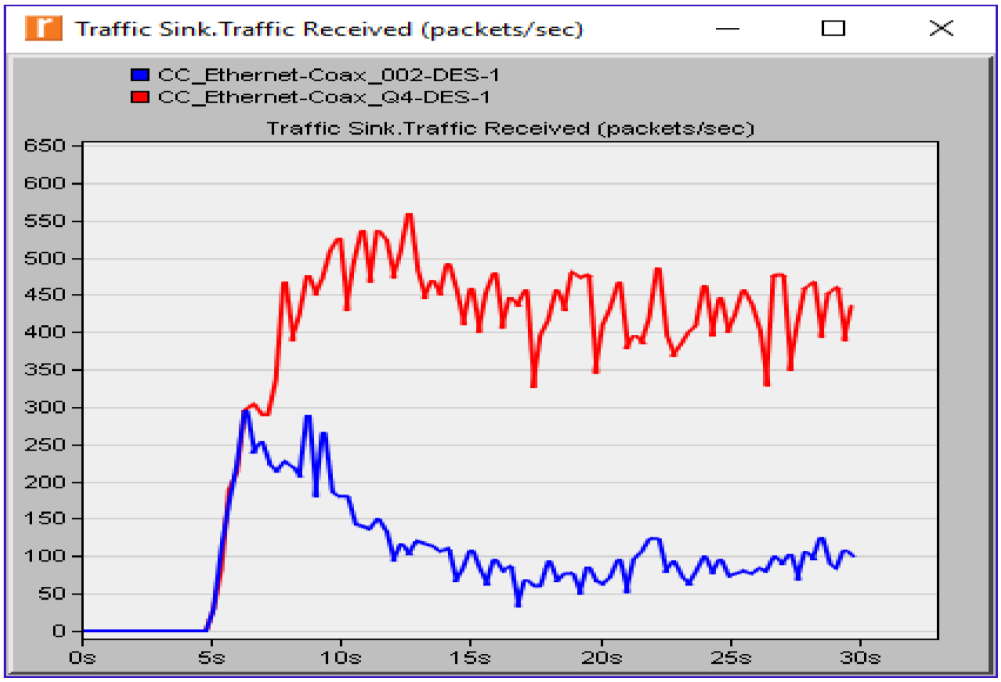
Coax_Q3 topology



Coax_0025, Coax_Q3 Count Collision

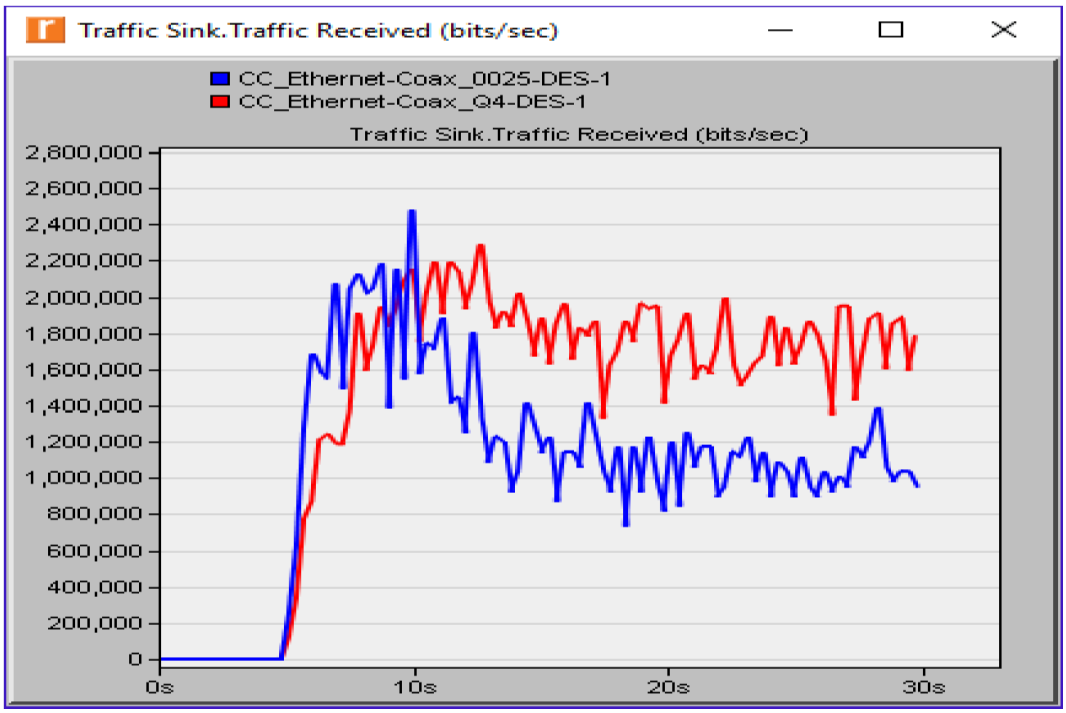
It is obvious to notice that in Coax_Q3 the collision is clearly less than the collision in Coax_0025 since the number of computers are decreased to the half in the network.

Question4:



Coax_0025, Coax_Q4 Traffic

It is obvious to notice that in Coax_Q4 the traffic Received (packets/sec) is clearly more the traffic Received (packets/sec) in Coax_0025 since the number of packet size is reduced to 512 bytes in Coax_Q4.



Coax_0025, Coax_Q4 Traffic

The traffic received in the Coax_0025 is reducing when the number of packets becomes more and more, and the number of packet is bigger than the number of packet in Coax_Q4. In another word, the traffic received becomes more and more in the Coax_Q4 when the number of packet is smaller. That means small number of packets more traffic received.

Conclusions

We learned how to create Ethernet network, control the traffic load, and change the number of packets. Also, it should be created with convenient exponential time to avoid the decrease of the traffic load. Using a small number of packet is another aspect that we have learned, and that makes the traffic received, is loaded faster.