

1. Simulate an Ethernet LAN using N nodes and set multiple traffic nodes and determine collisions across different nodes.

Step 1: Select the Experiment number 1 of the simulator to conduct the above experiment.

Step 2: Draw the suitable network topology on the workspace given in the simulator by drag and drop method.

Step 3: Select the properties of the node by right clicking the node. Select the properties like transmission type, Payload.

Step 4: Connect the Hub to Hub by right clicking the 'U' button, select add connection, choose the port number and then click connect button. Select the properties of the Hub by right clicking the 'U' button and set the properties on data rate, error rate.

Step 5: Click on the configure button and then click on simulate button.

Step 6: Experiment is saved by user-defined file and obtain the performance characteristics.

Step 7: Repeat the experiment by conducting the above steps.

Step 8: Check the performance characteristics like number of collision counts.

Step 9: Repeat the above steps for other samples and check difference of collision counts.

Step 10: Click on the analysis button and draw the graph for transmitting node v/s normalized throughput.

2. Simulate an Ethernet LAN using N nodes (6 – 10), change error rate and data rate and compare throughput.

Step 1: Select the Experiment number 3 of the simulator to conduct the above experiment.

Step 2: Draw the suitable network topology on the workspace given in the simulator by drag and drop method.

Step 3: Select the properties of the node by right clicking the node. Select the properties like transmission type, Payload.

Step 4: Connect the Hub to Hub by right clicking the 'U' button, select add connection, choose the port number and then click connect button. Select the properties of the Hub by right clicking the 'U' button and set the properties on data rate, error rate.

Step 5: Click on the configure button and then click on simulate button.

Step 6: Experiment is saved by user-defined file and obtain the performance characteristics.

Step 7: Repeat the experiment by conducting the above steps.

Step 8: Check the performance characteristics.

Step 9: Repeat the above steps for another sample

Step 10: Click on the analysis button and draw the graph for Error rate v/s throughput, data rate v/s throughput

3. Simulate an Ethernet network of 6 to 15 nodes, for 1-persistent, vary number of transmitting nodes and compare collision count, throughput, mean delay and response time.

Step 1: Select the Experiment number 3 of the simulator to conduct the above experiment.

Step 2: Draw the suitable network topology on the workspace given in the simulator by drag and drop method.

Step 3: Select the properties of the node by right clicking the node. Select the properties like transmission type, Payload.

Step 4: Connect the Hub to Hub by right clicking the 'U' button, select add connection, choose the port number and then click connect button. Select the properties of the Hub by right clicking the 'U' button and set the properties on data rate, error rate.

Step 5: Click on the configure button and then click on simulate button.

Step 6: Experiment is saved by user-defined file and obtain the performance characteristics.

Step 7: Repeat the experiment by conducting the above steps.

Step 8: Check the performance characteristics like collision counts, throughput, mean delay and response time.

Step 9: Repeat the above steps for other samples and check the difference in the values of related parameters.

Step 10: Click on the analysis button and draw the graph for transmitting node v/s normalized throughput.

4. Simulate a three nodes point – to – point networks with a duplex links between them. Set the queue size and vary the bandwidth and find the number of packets dropped.

Step 1: Select the Experiment number 13 of the simulator to conduct the above experiment.

Step 2: Draw the suitable network topology on the workspace given in the simulator by drag and drop method.

Step 3: Connect the CPE to node and node to node by click on the numbers given on the CPE and node simultaneously.

Step 4: Select the properties of the CPE by right clicking the CPE. Select traffic generator and fill-up the properties like destination, pumping rate, pay load, priority.

Step 5: Select the properties of the link by right clicking on the link and set the properties like Error rate, Physical media. Bandwidth is varies by varying the physical media.

Step 6: Select the properties for the node by right clicking the node. The properties like queue size, protocol, scheduling techniques are to be set.

Step 7: Configure the network by click on the configure button and then click on simulate button.

Step 8: Experiment is saved by user defined file and obtain the performance characteristics like number of packets dropped.

Step 9: Repeat the above steps for another sample.

Step 10: Click on the analysis button and draw the graph for packet generated v/s throughput.

5. Simulate a four-node point – to – point network, and connect the links as follows: n0 – n2, n1 – n2 and n2 – n3. Apply TCP agent between n0 – n3 and UDP n1 – n3. Apply relevant applications over TCP and UDP agents changing the parameters and determine the number of packets send by TCP / UDP.

Step 1: Select the Experiment number 14 of the simulator to conduct the above experiment.

Step 2: Draw the suitable network topology on the workspace given in the problem statement (connect CPE1 – n1, n1 – n3, n3 – n4, n4 - receiving point apply TCP for this connection. Connect CPE2 – node2, n2 - n4 apply UDP by drag and drop method.)

Step 3: Connect the CPE to node and node to node by click on the numbers given on the CPE and node simultaneously.

Step 4: Select the properties of the CPE1 by right clicking the CPE1. Select traffic generator and fill-up the properties like duration, window size. Select the properties of the CPE2 by right clicking the CPE2. Apply UDP

Step 5: Select the properties of the link by right clicking on the link and set the properties like Error rate, Physical media. Bandwidth is varies by varying the physical media.

Step 6: Select the properties for the node by right clicking the node. The properties like buffer size is to be set.

Step 7: Configure the network by click on the configure button and then click on simulate button.

Step 8: Experiment is saved by user-defined file and obtain the performance characteristics like Number of packets dropped in TCP protocol and UDP. The packets dropped in UDP is more compare to TCP. So the TCP is more reliable than UDP.

Step 9: Repeat the above steps for another sample.

Step 10: Click on the analysis button and draw the graph for TCP and UDP packet generated v/s reliability.

6. Simulate simple BSS and with transmitting nodes in wire-less LAN by simulation and determine the performance with respect to transmission of packets.

Step 1: Select the Experiment number 6 of the simulator to conduct the above experiment.

Step 2: Draw the suitable network topology on the workspace given in the simulator by drag and drop method.

Step 3: Place the number of nodes with in the BSS and connect API to the Hub by right clicking button the API and make connection to the Hub. Select the properties of the API by right clicking the API. Select the properties like data rate and error rate.

Step 4: Select the properties of the node, which is placed inside the BSS by right clicking the node. Select the properties like transmission type and payload.

Step 5: Click on the configure button and then click on simulate button.

Step 6: Experiment is saved by user-defined file and obtain the performance characteristics.

Step 7: Repeat the experiment by conducting the above steps.

Step 8: Check the performance characteristics.

Step 9: Repeat the above steps for another samples and compare the characteristics of two samples.

Step 10: Click on the analysis button and draw the graph for LAN v/s throughput.

7. Simulator the different types of Internet traffic such as FTP,

TELNET over a network and analyze the throughput.

Step 1: Select the Experiment number 16 of the simulator to conduct the above experiment.

Step 2: Draw the suitable network topology on the workspace given in the simulator.

Step 3: Connect the CPE to node and node to node by click on the numbers given on the CPE and node simultaneously.

Step 4: Select the properties of the CPE1 by right clicking the CPE1. Select traffic generator and fill-up the properties like destination point, application type (FTP/TELNET), duration in seconds, window size.

Step 5: Select the properties of the link by right clicking on the link and set the properties like Error rate, Physical media. Bandwidth is varies by varying the physical media.

Step 6: Select the properties for the node by right clicking the node. The properties like buffer size is to be set.

Step 7: Configure the network by click on the configure button and then click on simulate button.

Step 8: Experiment is saved by user-defined file and obtain the performance characteristics.

Step 9: Repeat the experiment by selecting suitable application type FTP and TELNET.

Step 10: Check the performance characteristics by applying TELNET for all the CPE's then check the performance characteristics by applying FTP.

Step 11: Repeat the above steps for another sample.

Step 12: Click on the analysis button and draw the graph for protocol v/s reliability.

8. Simulate the transmission of ping messages over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion.

Step 1: Select the Experiment number 15 of the simulator to conduct the above experiment.

Step 2: Draw the suitable network topology on the workspace given in the simulator.

Step 3: Connect the CPE to node and node to node by click on the numbers given on the CPE and node simultaneously.

Step 4: Select the properties of the CPE1 by right clicking the CPE1. Select ping (properties like 1,2,3...) and traffic generator

Step 5: Select the properties of the link by right clicking on the link and set the properties like Error rate, Physical media. Bandwidth is varies by varying the physical media.

Step 6: Select the properties for the node by right clicking the node. The properties like buffer size is to be set.

Step 7: Click on the congest network button and set the properties like destination CPE

Step 8: Click on the configure button and then click on simulate button.

Step 9: Experiment is saved by user-defined file and obtain the performance characteristics.

Step 10: Repeat the experiment by selecting the above steps.

Step 11: Check the performance characteristics like ping message dropped.

Repeat the above steps for another sample.

Step 12: Click on the analysis button and draw the graph for protocol generated v/s ping message dropped.