Computer Network Laboratory

Assignment 4

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Link : https://github.com/Ajayneethikannan/CSN-361-Assignment-4
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Class: 3rd year, B.Tech CSE

Course: CSN-361

Two problems were given for this assignment. They are,

Question 1 :

Create a ns2 program to create a connection of three nodes, and measure the number of packets dropped, by varying the queue length size, and the bandwidth of the links.

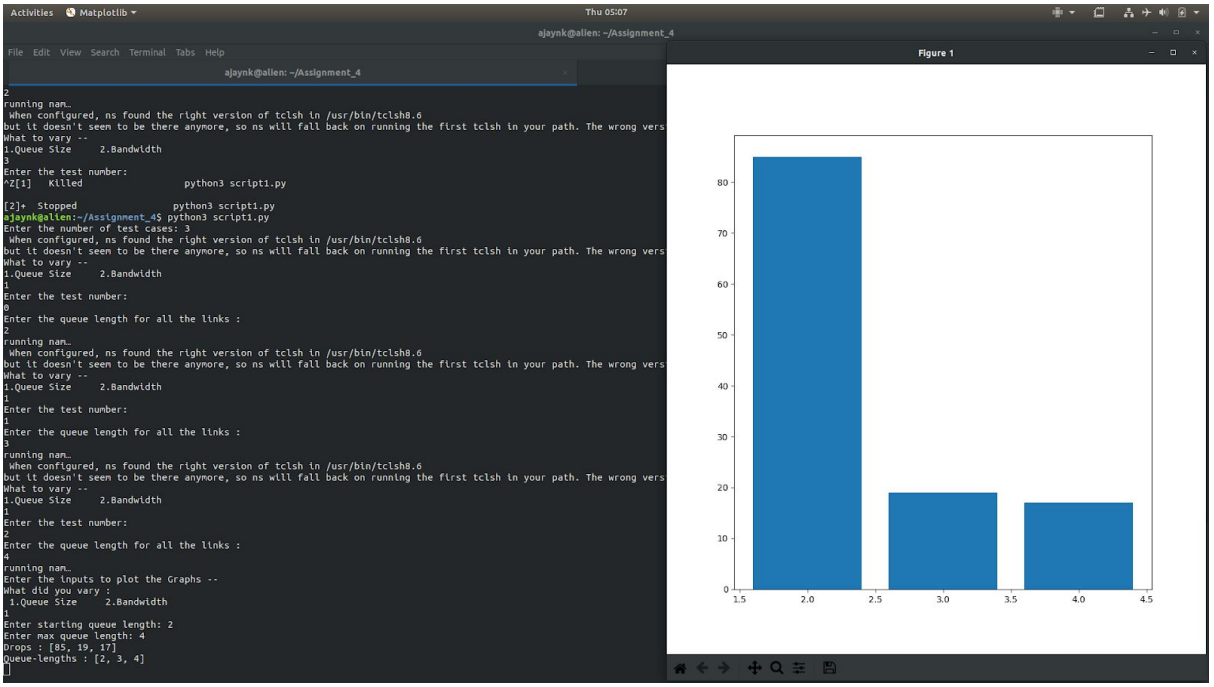
Algorithms used :

set : used to set the value of any variable
color : used to assign color to the messages sent for different protocols
Namtrace -all : writes nam events to an output file
Open : used to open a file to write the nam events
Finish : used to close the trace file and to execute nam
Puts : used to print output on the terminal
Duplex-link : creates two simplex links of specified bandwidth and delay
Attach-agent : attach an agent object to a node object
Connect : make a logical connection between two nodes
Run : used to run the simulation

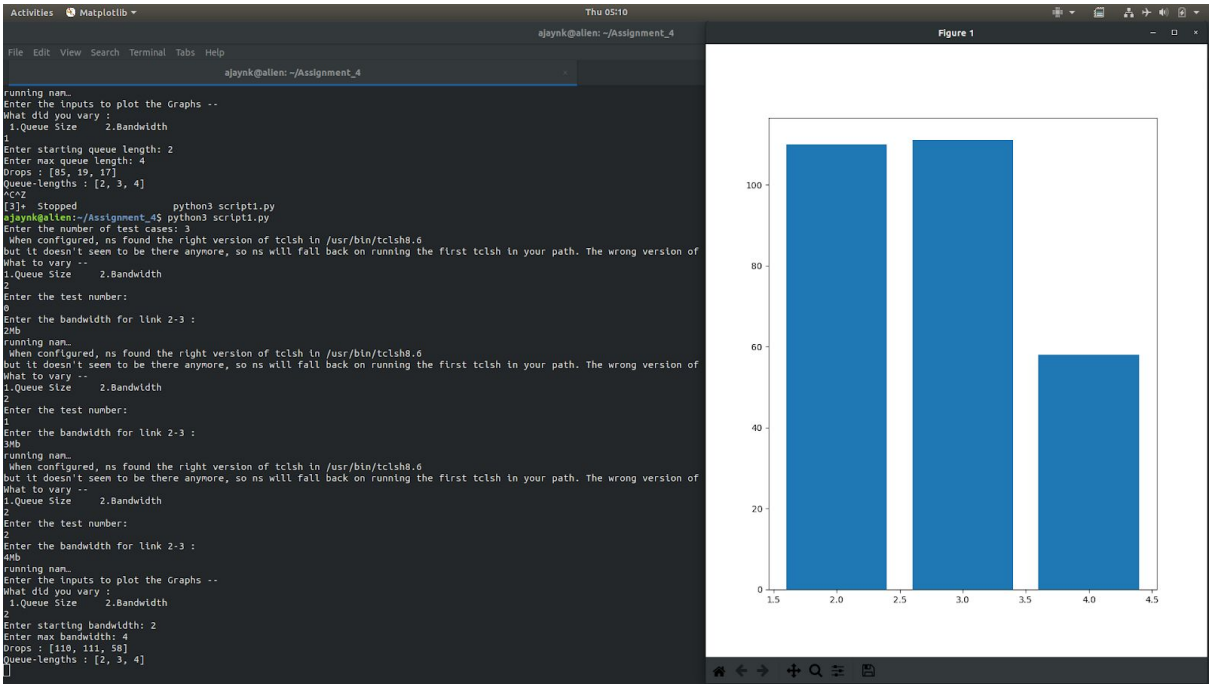
Data structures used :

Simulator : used to create nodes, links, and different agents, and connect different objects.
Agent/TCP : used to create a TCP agent
Agent/TCPSink : used to create a TCP Sink agent
At : used to schedule different functions at different moments

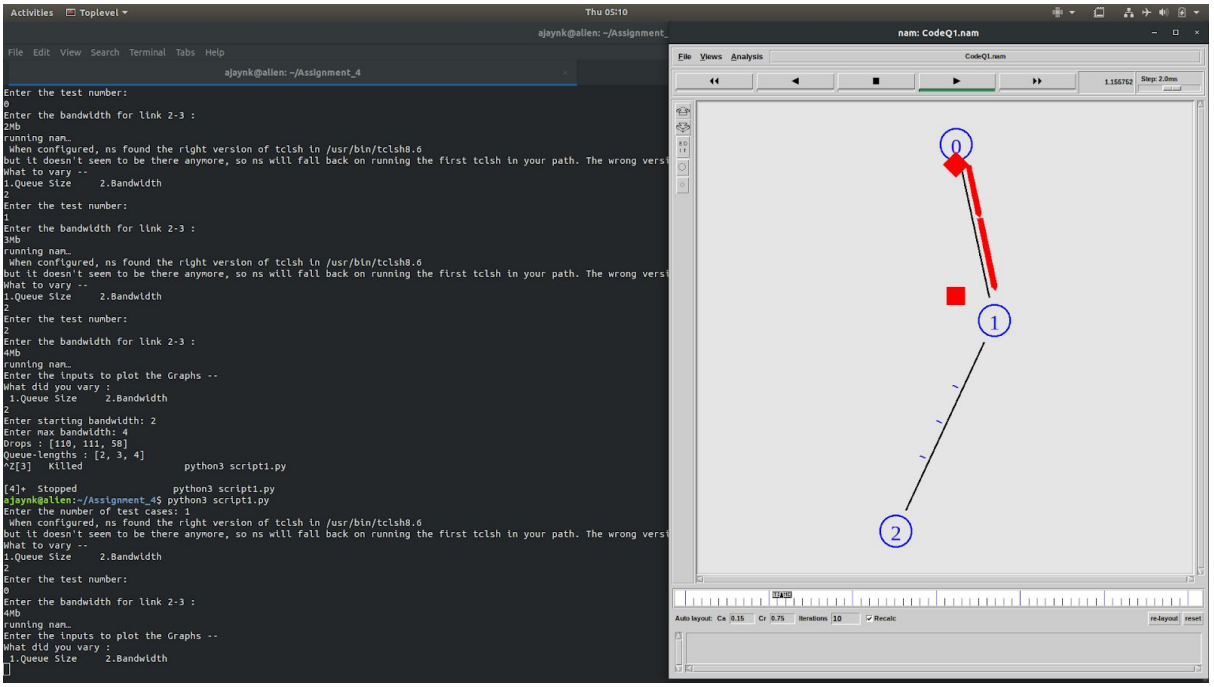
Screenshot :



Varying the queue size



Varying the bandwidth size



Working example

Question 2 :

Write an ns2 program to simulate ping between different nodes, and analyse the dropping of packets with the variation of bandwidth and the queue length.

Algorithms used :

set : used to set the value of any variable
color : used to assign color to the messages sent for different protocols
Namtrace -all : writes nam events to an output file
Open : used to open a file to write the nam events
Finish : used to close the trace file and to execute nam
Puts : used to print output on the terminal
Duplex-link : creates two simplex links of specified bandwidth and delay
Attach-agent : attach an agent object to a node object
Connect : make a logical connection between two nodes
Run : used to run the simulation

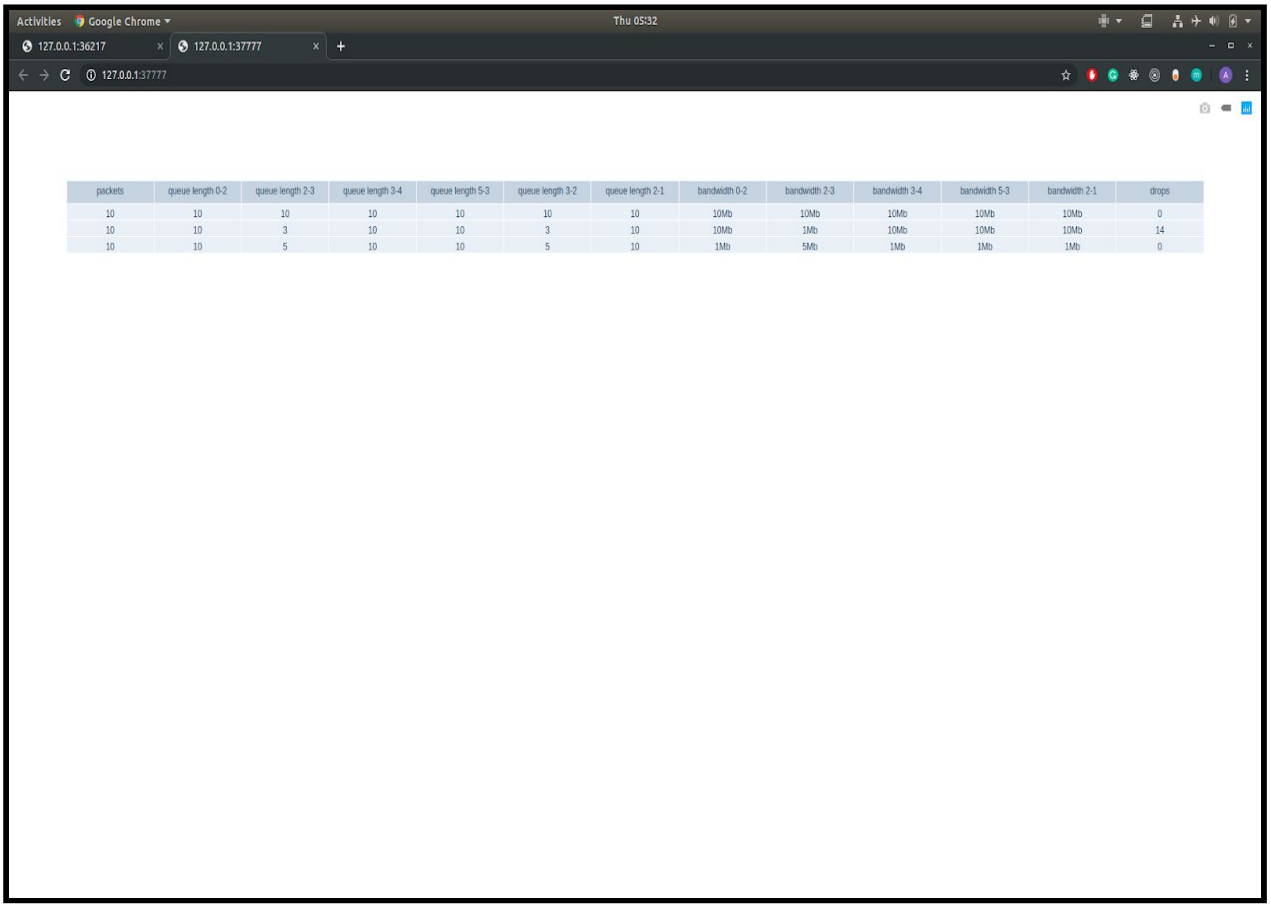
Data Structures used :

Simulator : used to create nodes, links, and different agents, and connect different objects.

Ping/ Agent : used to create a ping agent
At : used to schedule different functions at different moments

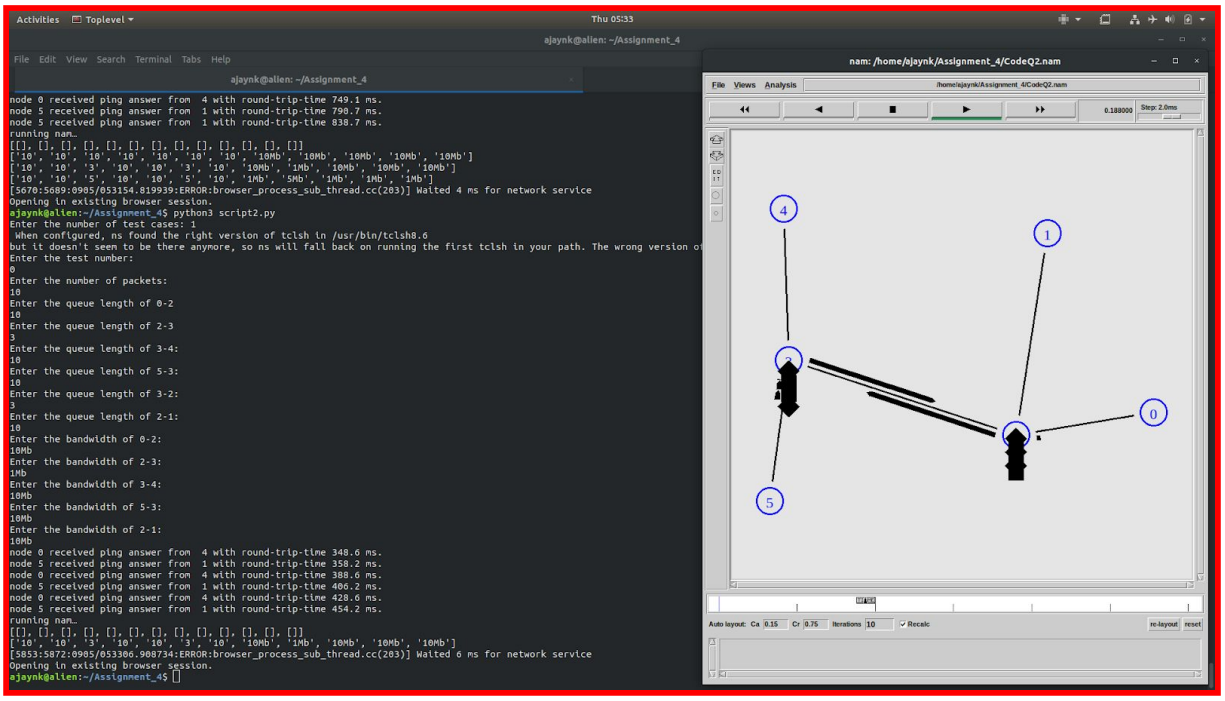
Screenshots :

Drop data for different combinations



packets	queue length 0-2	queue length 2-3	queue length 3-4	queue length 5-3	queue length 3-2	queue length 2-1	bandwidth 0-2	bandwidth 2-3	bandwidth 3-4	bandwidth 5-3	bandwidth 2-1	drops
10	10	10	10	10	10	10	10Mb	10Mb	10Mb	10Mb	10Mb	0
10	10	3	10	10	3	10	10Mb	1Mb	10Mb	10Mb	10Mb	14
10	10	5	10	10	5	10	1Mb	5Mb	1Mb	1Mb	1Mb	0

Packet drop due to congestion :


Activities
Toplevel
Thu 05:33
ajaynk@alien: ~/Assignment_4
File Edit View Search Terminal Tabs Help
ajaynk@alien: ~/Assignment_4
node 0 received ping answer from 4 with round-trip-time 749.1 ms.
node 5 received ping answer from 1 with round-trip-time 790.7 ms.
node 5 received ping answer from 1 with round-trip-time 838.7 ms.
running nam…
[[], [], [], [], [], [], [], [], [], [], [], []]
['10', '10', '10', '10', '10', '10', '10', '10Mb', '10Mb', '10Mb', '10Mb', '10Mb']
['10', '10', '3', '10', '10', '3', '10', '10Mb', '1Mb', '10Mb', '10Mb', '10Mb']
['10', '10', '5', '10', '10', '5', '10', '1Mb', '5Mb', '1Mb', '1Mb', '1Mb']
[5670:5689:0905/053154.819939:ERROR:browser_process_sub_thread.cc(203)] Waited 4 ms for network service
Opening in existing browser session.
ajaynk@alien:~/Assignment_4$ python3 script2.py
Enter the number of test cases: 1
When configured, ns found the right version of tclsh in /usr/bin/tclsh8.6
but it doesn't seem to be there anymore, so ns will fall back on running the first tclsh in your path. The wrong version o
Enter the test number:
0
Enter the number of packets:
10
Enter the queue length of 0-2
10
Enter the queue length of 2-3
3
Enter the queue length of 3-4:
10
Enter the queue length of 5-3:
10
Enter the queue length of 3-2:
3
Enter the queue length of 2-1:
10
Enter the bandwidth of 0-2:
10Mb
Enter the bandwidth of 2-3:
1Mb
Enter the bandwidth of 3-4:
10Mb
Enter the bandwidth of 5-3:
10Mb
Enter the bandwidth of 2-1:
10Mb
node 0 received ping answer from 4 with round-trip-time 348.6 ms.
node 5 received ping answer from 1 with round-trip-time 358.2 ms.
node 0 received ping answer from 4 with round-trip-time 388.6 ms.
node 5 received ping answer from 1 with round-trip-time 406.2 ms.
node 0 received ping answer from 4 with round-trip-time 428.6 ms.
node 5 received ping answer from 1 with round-trip-time 454.2 ms.
running nam…
[[], [], [], [], [], [], [], [], [], [], [], []]
['10', '10', '3', '10', '10', '3', '10', '10Mb', '1Mb', '10Mb', '10Mb', '10Mb']
[5853:5872:0905/053306.908734:ERROR:browser_process_sub_thread.cc(203)] Waited 6 ms for network service
Opening in existing browser session.
ajaynk@alien:~/Assignment_4$
nam: /home/ajaynk/Assignment_4/CodeQ2.nam
File Views Analysis
/home/ajaynk/Assignment_4/CodeQ2.nam
0.188000
Step: 2.0ms
4
1
0
5
Auto layout: Ca 0.15 Cr 0.75 Iterations 10 Recalc
re-layout
reset