Computer Network
Laboratory

Assignment 4

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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-

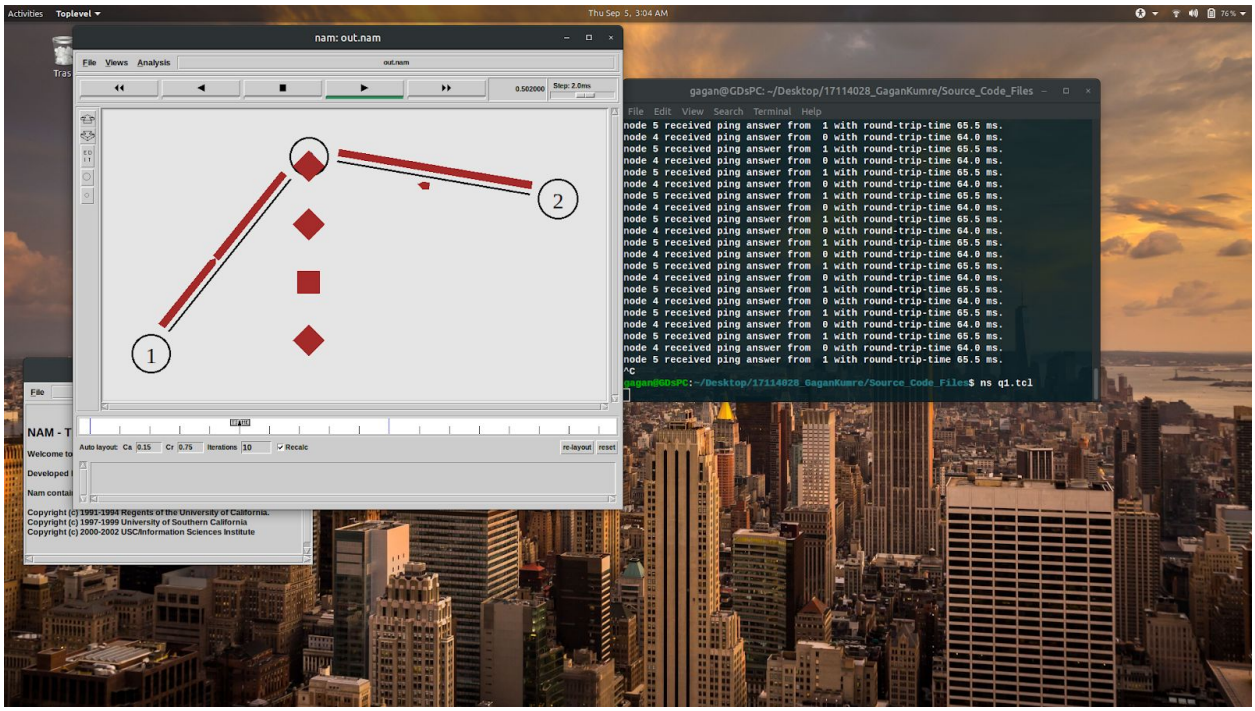
Problem 1 :

Implement a 3-node topology as given and study the variation of packets dropped with queue length and bandwidth of the channel.

Algorithms and data structure used :

1. **set function** to create nodes and a finish procedure to exit files
2. **duplex-link** to create links between two links
3. creating UDP agents and attaching them to respective nodes
4. creating a CBR traffic source and connecting it to TCP agents and set its packet_size and interval.
5. queue_limit to limit the number of packets for a link.
6. **run function** to run the TCL program

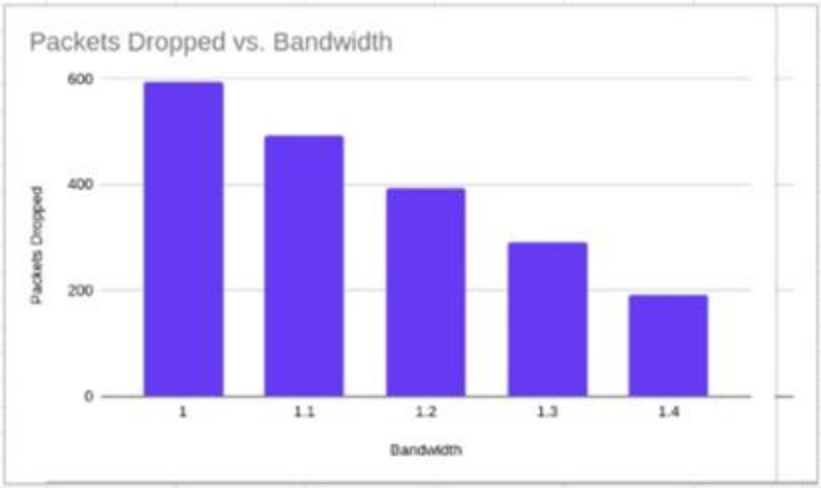
Screenshot :



Queue Length	Packets Dropped
30	273
60	243
90	213
120	183
150	153

Given the 1st connection queue length is 8.

Bandwidth	Packets Dropped
1	594
1.1	494
1.2	393
1.3	293
1.4	192



Given the bandwidth of 1st connection is 2.2 Mb.

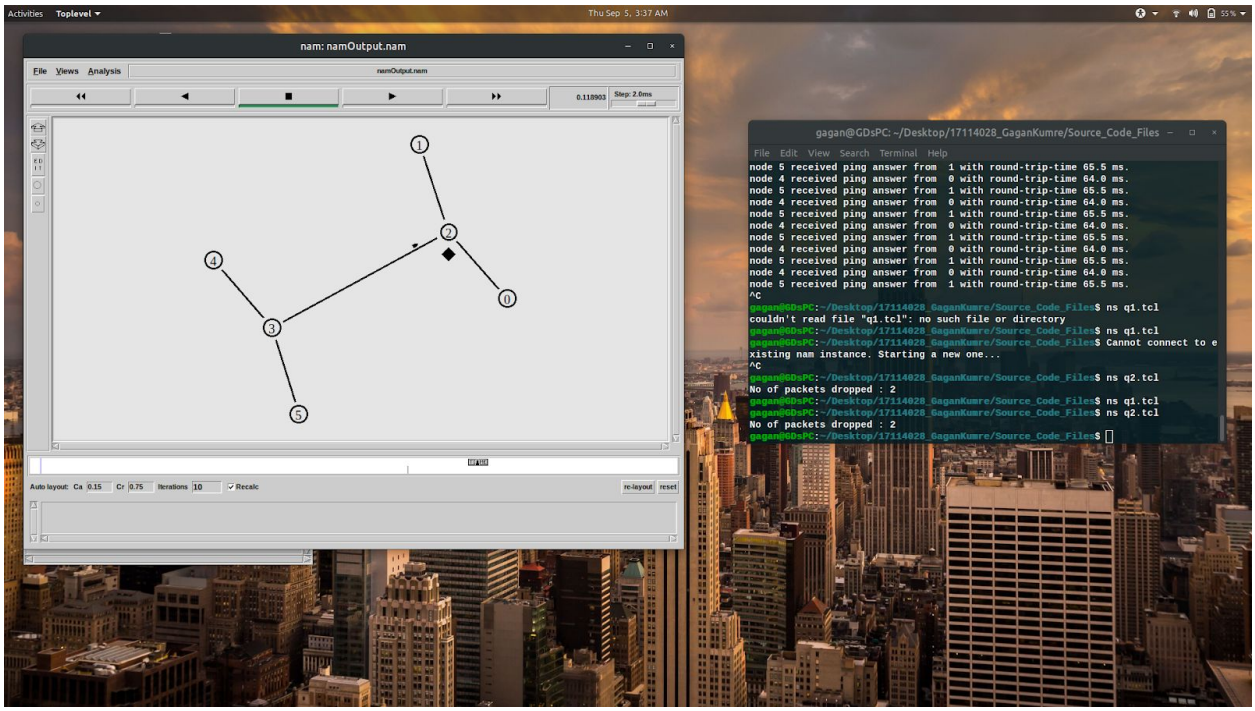
Problem 2 :

Implement the given topology of 6 nodes and find the number of packets dropped due to congestion. Also study the variation of packets dropped with variation in queue length and the bandwidth of the links.

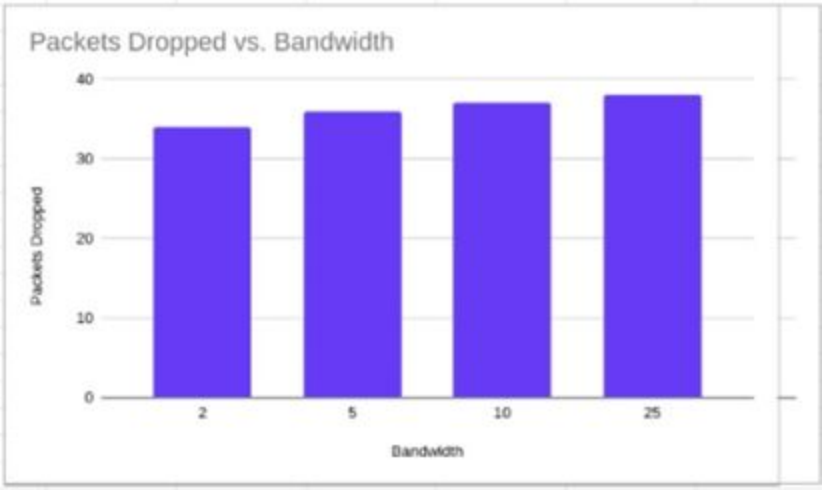
Algorithms and data structure used :

1. **set function** to create nodes and a finish procedure to exit files
2. **duplex-link** to create links between two links and allow data to transmit through both nodes
3. **Agent/Ping** to send ping requests and receive ping answer by creating ping_agents.
4. queue_limit to limit the number of packets for a link.
5. creating UDP agents and attaching them to respective nodes
6. **connect()** to connect two ping_agents.
7. creating a CBR traffic source and connecting it to TCP agents and set its packet_size and interval.
8. **run function** to run the TCL program

Screenshot :



Bandwidth	Packets Dropped
2	34
5	36
10	37
25	38



Given the Bandwidth of 1st connection in 100Mb , 3rd connection is 10Mb, 4th connection is 10Mb and 5th connection is 5Mb. After Bandwidth > 25Kb packets dropped becomes constant.

For set of Bandwidth {10Mb,1000Kb,1Mb,1000Mb,500Mb} and for set of Queue length

{5,5,2,1,1}, packets dropped are 38

{5,5,2,8,1}, packets dropped are 19

{1,1,1,1,1}, packets dropped are 39

{5,4,2,5,14}, packets dropped are 0