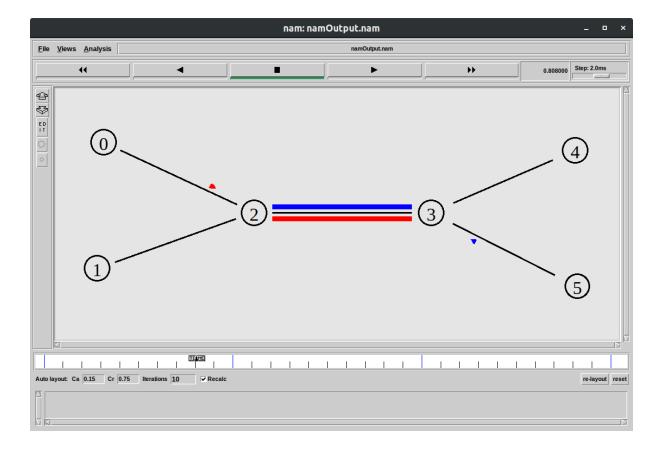
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Batch:CS-2

## Assignment L4

1. Write a Network Simulator (NS2) code to simulate a three node network with duplex links among them as shown in figure. Show the topology using NAM. Study the variation in number of packets dropped with the variation of the queue size in the nodes and with the variation of the bandwidth of the links.



```
pulkit@PukInspiron: ~/Desktop/Sudip Assi/A4/assignment 4/ping
                                                                                                                                        File Edit View Search Terminal Help
node 0 received ping answer from
                                       with round-trip-time 233.4 ms.
                                       with round-trip-time 184.6 ms. with round-trip-time 184.6 ms.
node 5 received ping answer from
node 0 received ping answer from
node 5 received ping answer from
                                       with round-trip-time 233.4 ms.
 ode 0 received ping answer from
                                       with round-trip-time 164.4 ms.
node 5 received ping answer from
                                     1 with round-trip-time 184.6 ms.
node 5 received ping answer from
                                       with round-trip-time 233.4 ms.
     O received ping answer from
                                       with round-trip-time 164.4 ms.
     5 received ping answer from
                                       with round-trip-time 184.6 ms.
node
                                       with round-trip-time 233.4 ms.
node 5 received ping answer from
node 0 received ping answer from
                                       with round-trip-time 164.4 ms.
     5 received ping answer from
                                       with round-trip-time 184.6 ms.
node
     5 received ping answer from
                                       with round-trip-time 233.4 ms.
                                     4 with round-trip-time 164.4 ms.
node 0 received ping answer from
node 5 received ping answer from
                                     1 with round-trip-time 184.6 ms.
     5 received ping answer from
                                       with round-trip-time 233.4 ms.
node 0 received ping answer from
                                     4 with round-trip-time 164.4 ms.
                                     1 with round-trip-time 184.6 ms.
node 5 received ping answer from
                                       with round-trip-time 233.4 ms.
     5 received ping answer from
     O received ping answer from
                                       with round-trip-time 164.4 ms.
node
node 5 received ping answer from
                                       with round-trip-time 184.6 ms.
     5 received ping answer from
                                     1 with round-trip-time 233.4 ms.
node
node 0 received ping answer from
                                       with round-trip-time 164.4 ms.
     5 received ping answer from
                                       with round-trip-time 184.6 ms.
ahor
     5 received ping answer from
                                     1 with round-trip-time 233.4 ms.
node
node 0 received ping answer from
                                       with round-trip-time 164.4 ms.
                                       with round-trip-time 184.6 ms.
     5 received ping answer from
node
     5 received ping answer from
                                       with round-trip-time 233.4 ms.
node 0 received ping answer from
                                     4 with round-trip-time 164.4 ms.
     5 received ping answer from
                                     1 with round-trip-time 184.6 ms.
node
     5 received ping answer from
                                       with round-trip-time 233.4 ms.
node 0 received ping answer from
node 5 received ping answer from
node 5 received ping answer from
                                     4 with round-trip-time 164.4 ms.
                                     1 with round-trip-time 184.6 ms.
node
                                     1 with round-trip-time 233.4 ms.
     O received ping answer from
                                     4 with round-trip-time 164.4 ms.
node
     5 received ping answer from
                                     1 with round-trip-time 184.6 ms.
     5 received ping answer from
                                     1 with round-trip-time 233.4 ms.
node
     O received ping answer from
                                     4 with round-trip-time 164.4 ms.
node 5 received ping answer from 1 with round-trip-time 184.6 ms.
pulkit@PukInspiron:~/Desktop/Sudip_Assi/A4/assignment_4/ping$ No of packets dropped : 13
pulkit@PukInspiron:~/Desktop/Sudip_Assi/A4/assignment_4/ping$
```

## (when bandwidth is 0.01)

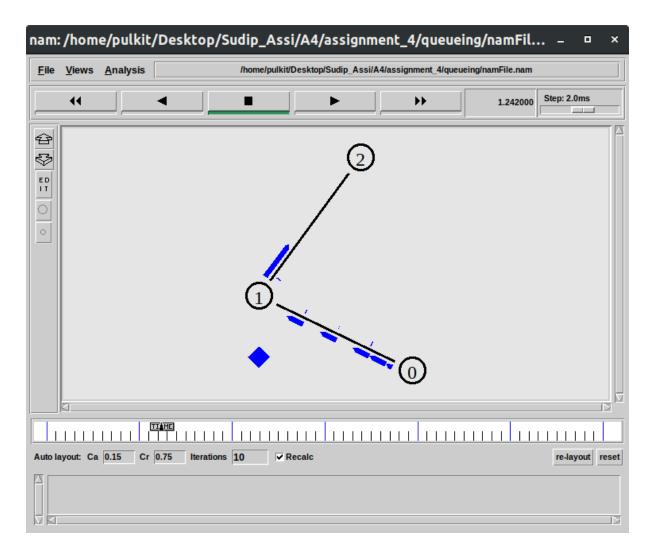
```
ulkit@PukInspiron:~/Desktop/Sudip_Assi/A4/assignment_4/ping$ ns ping.
When configured, ns found the right version of tclsh in /usr/bin/tclsh8.6
but it doesn't seem to be there anymore, so ns will fall back on running the first tclsh in your path. The wrong version of tcls
h may break the test suites. Reconfigure and rebuild ns if this is a problem.
node 5 received ping answer from 1 with round-trip-time 338.2 ms.
node 0 received ping answer from 4 with round-trip-time 338.2 ms.
node 5 received ping answer from 1 with round-trip-time 340.6 ms.
node 5 received ping answer from
node 0 received ping answer from
                                          4 with round-trip-time 443.0 ms.
      5 received ping answer from
                                          1 with round-trip-time 445.4 ms.
                                          1 with round-trip-time 550.2 ms. 1 with round-trip-time 552.6 ms.
node
     5 received ping answer from
node 5 received ping answer from
node 0 received ping answer from
                                            with round-trip-time 552.6 ms.
      5 received ping answer from
                                            with round-trip-time 555.0 ms.
node 5 received ping answer from
node 0 received ping answer from
                                            with round-trip-time 659.8 ms.
                                          4 with round-trip-time 659.8 ms.
      5 received ping answer from
                                          1 with round-trip-time 662.2 ms.
node
                                            with round-trip-time 767.0 ms.
      5 received ping answer from
node
     5 received ping answer from
                                          1 with round-trip-time 769.4 ms.
node
     5 received ping answer from
                                          1 with round-trip-time 771.8 ms.
node 0 received ping answer from
                                            with round-trip-time 771.8 ms.
 node
      5 received ping answer from
                                            with round-trip-time 774.2 ms.
node 5 received ping answer from
                                            with round-trip-time 879.0 ms.
      5 received ping answer from
                                          1 with round-trip-time 881.4 ms.
node
node 0 received ping answer from
                                            with round-trip-time 881.4 ms.
      5 received ping answer from
                                            with round-trip-time 883.8 ms.
 node
                                          1 with round-trip-time 988.6 ms.
node
      5 received ping answer from
      5 received ping answer from
                                            with round-trip-time 991.0 ms.
node
        received ping answer from
                                            with round-trip-time 993.4 ms.
node 5 received ping answer from
node 0 received ping answer from
node 5 received ping answer from
                                            with round-trip-time 995.8 ms.
                                          4 with round-trip-time 995.8 ms.
                                          1 with round-trip-time 998.2 ms.
      packets dropped : 20
pulkit@PukInspiron:~/Desktop/Sudip_Assi/A4/assignment_4/ping$
```

(when bandwidth is 0.005)

2. Write a Network Simulator (NS2) code to simulate the transmission of ping messages over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion. Study the variation in number of packets dropped with the variation of the queue size in the nodes and with the variation of the bandwidth of the links.

Nodes are connected as follows: 0-2, 1-2, 2-3, 3-4 and 3-5

Packet transmissions: 0-4 and 5-1



pulkit@PukInspiron:~/Desktop/Sudip\_Assi/A4/assignment\_4/queueing\$ ns queue.tcl
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 of tclsh may break the test suites. Reconfigure and rebuild ns if this is a problem.
pulkit@PukInspiron:~/Desktop/Sudip\_Assi/A4/assignment\_4/queueing\$ No of packets dropped: 60

## (When queue sizes are 6(0-1) and 5(1-2))

pulkit@PukInspiron:~/Desktop/Sudip\_Assi/A4/assignment\_4/queueing\$ ns queue.tcl
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 of tclsh may break the test suites. Reconfigure and rebuild ns if this is a problem.
pulkit@PukInspiron:~/Desktop/Sudip\_Assi/A4/assignment\_4/queueing\$ No of packets dropped : 3

(When queue sizes are 7(0-1) and 6(1-2))