CSN-361 Computer Networks Laboratory

Assignment 4

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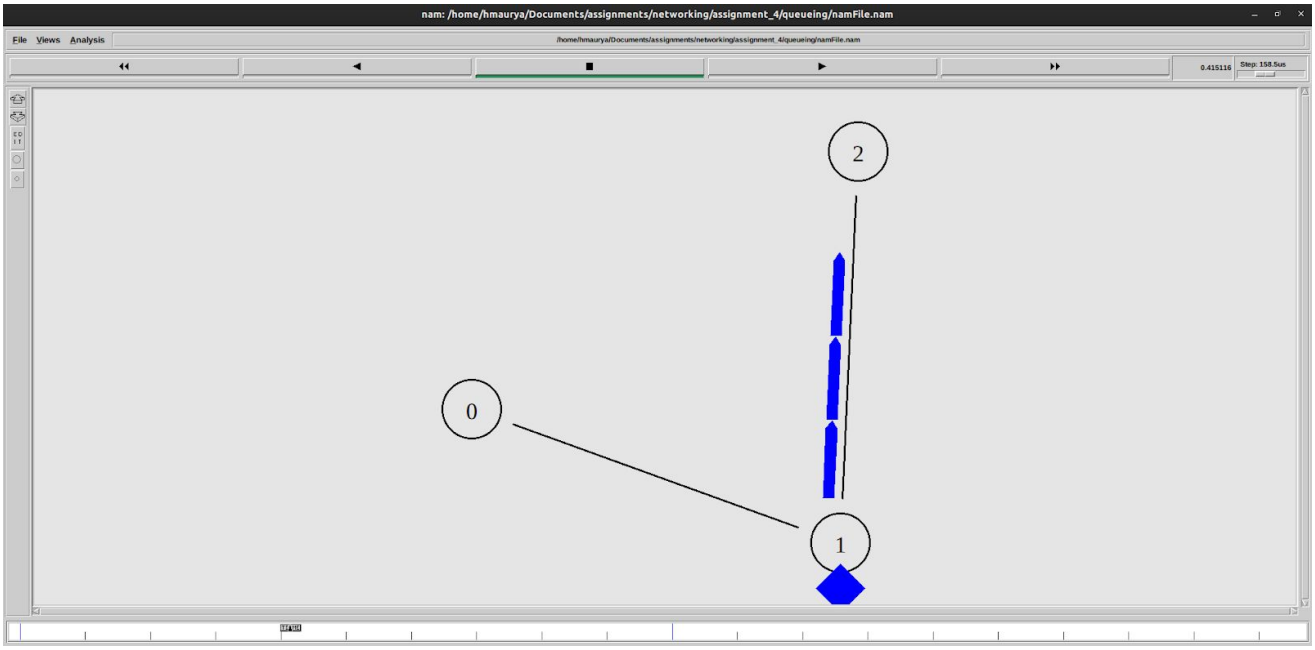
Problem Statement 1:

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.

```
22   $ns duplex-link $n(0) $n(1) 50Mb 1.2ms DropTail
23   $ns duplex-link $n(1) $n(2) 25Mb 1.2ms DropTail
24   $ns queue-limit $n(0) $n(1) 6
25   $ns queue-limit $n(1) $n(2) 5
```




```
I  ~/D/a/n/a/queueing  No of packets dropped : 24
```

Problem Statement 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:

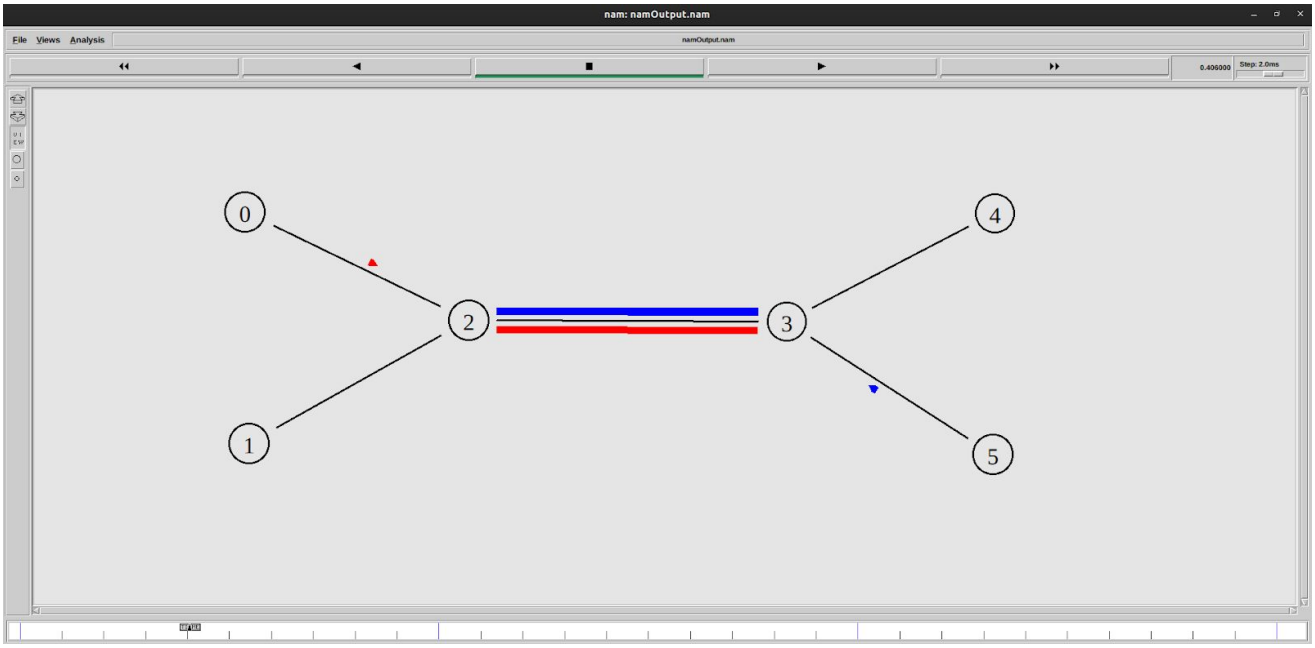
0-2, 1-2, 2-3, 3-4 and 3-5

Packet transmissions:

0-4 and 5-1

```
31  ## Creating Duplex-Link
32  ## {lnode rnode bandwidth}
33  set links {
34      {0 2 1}
35      {1 2 1}
36      {2 3 0.01}
37      {3 4 1}
38      {3 5 1}
39  }
40  for {set i 0} {$i < [llength $links]} {incr i} {
41      set lnode $node([lindex $links $i 0])
42      set rnode $node([lindex $links $i 1])
43      $ns duplex-link $lnode $rnode [lindex $links $i 2]Mb 10ms DropTail
44  }
```

```
62  ## Setting different queue limits
63  set queueLimits {
64      {0 2 2}
65      {2 1 3}
66      {2 3 2}
67      {3 4 4}
68      {5 3 4}
69  }
70  for {set i 0} {$i < [llength $queueLimits]} {incr i} {
71      set lnode $node([lindex $queueLimits $i 0])
72      set rnode $node([lindex $queueLimits $i 1])
73      set limit [lindex $queueLimits $i 2]
74      $ns queue-limit $lnode $rnode $limit
75  }
```



```
I  ~/D/a/n/a/ping  ns ping.tcl
node 0 received ping answer from  4 with round-trip-time 164.4 ms.
node 5 received ping answer from  1 with round-trip-time 164.4 ms.
node 5 received ping answer from  1 with round-trip-time 233.4 ms.
node 0 received ping answer from  4 with round-trip-time 233.4 ms.
node 5 received ping answer from  1 with round-trip-time 184.6 ms.
node 0 received ping answer from  4 with round-trip-time 184.6 ms.
node 5 received ping answer from  1 with round-trip-time 233.4 ms.
node 0 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.
node 5 received ping answer from  1 with round-trip-time 233.4 ms.
node 0 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.
node 5 received ping answer from  1 with round-trip-time 233.4 ms.
node 0 received ping answer from  4 with round-trip-time 164.4 ms.
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node 5 received ping answer from  1 with round-trip-time 184.6 ms.
node 5 received ping answer from  1 with round-trip-time 233.4 ms.
node 0 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.
No of packets dropped : 13
```