

1. Implement three node point-to-point networks with duplex links between them. Set the queue size, vary the bandwidth and find the number of packets dropped.

TCL:

#Create a simulator object

```
set ns [ new Simulator ]
```

#Open the nam trace file

```
set tf [ open lab1.tr w ]
```

```
$ns trace-all $tf
```

#Open the nam trace file

```
set nf [ open lab1.nam w ]
```

```
$ns namtrace-all $nf
```

#Define a 'finish' procedure

```
proc finish {} {
```

```
global ns nf tf
```

```
$ns flush-trace
```

```
exec nam lab1.nam &
```

```
close $tf
```

```
close $nf
```

```
exit 0
```

```
}
```

#Creating nodes

```
set n0 [$ns node]
```

```
set n1 [$ns node]
```

```
set n2 [$ns node]
```

```
set n3 [$ns node]
```

#Define different colors and labels for data flows

\$ns color 1 "red"

\$ns color 2 "blue"

\$n0 label "Source/udp0"

\$n1 label "Source/udp1"

\$n2 label "Router"

\$n3 label "Destination/Null"

#Create link between nodes

\$ns duplex-link \$n0 \$n2 100Mb 300ms DropTail

\$ns duplex-link \$n1 \$n2 100Mb 300ms DropTail

\$ns duplex-link \$n2 \$n3 1Mb 300ms DropTail

#Set queue size of links

\$ns set queue-limit \$n0 \$n2 50

\$ns set queue-limit \$n1 \$n2 50

\$ns set queue-limit \$n2 \$n3 5

#Setup a UDP connection

set udp0 [new Agent/UDP]

\$ns attach-agent \$n0 \$udp0

Create a CBR traffic source and attach it to udp0

set cbr0 [new Application/Traffic/CBR]

\$cbr0 set packetSize_ 500

\$cbr0 set interval_ 0.005

\$cbr0 attach-agent \$udp0

#Create a UDP agent and attach it to node n1

```
set udp1 [new Agent/UDP]
$udp1 set class_ 2
$ns attach-agent $n1 $udp1
```

Create a CBR traffic source and attach it to udp1

```
set cbr1 [new Application/Traffic/CBR]
$cbr1 set packetSize_ 500
$cbr1 set interval_ 0.005
$cbr1 attach-agent $udp1
```

#Create a Null agent (a traffic sink) and attach it to node n3

```
set null0 [new Agent/Null]
$ns attach-agent $n3 $null0
```

#Connect the traffic sources with the traffic sink

```
$ns connect $udp0 $null0
$ns connect $udp1 $null0
```

#Schedule events for the CBR agents

```
$ns at 0.5 "$cbr0 start"
$ns at 1.0 "$cbr1 start"
$ns at 4.0 "$cbr1 stop"
$ns at 4.5 "$cbr0 stop"
```

#Call the finish procedure after 5 seconds of simulation time

```
$ns at 5.0 "finish"
```

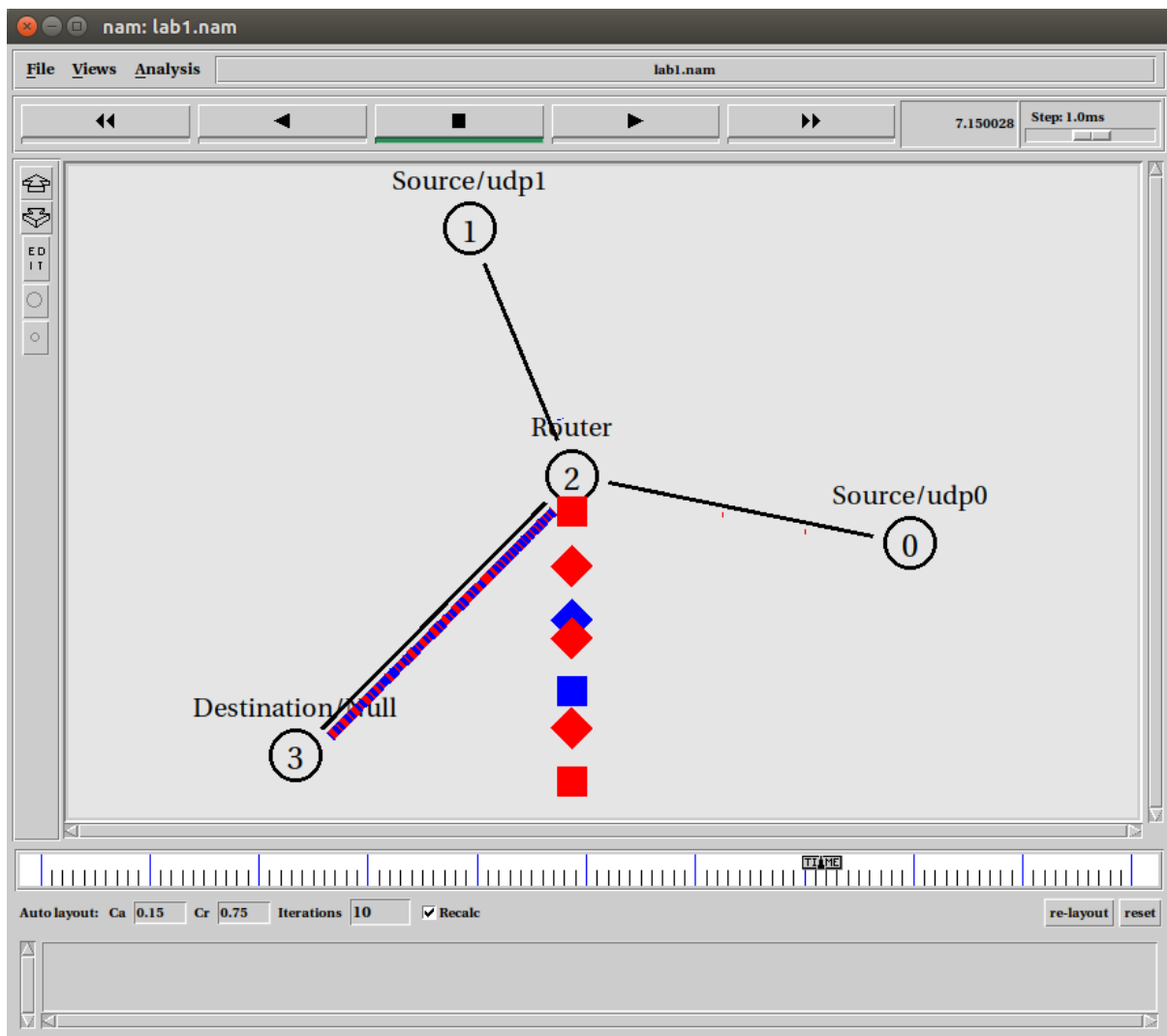
#Run the simulation

```
$ns run
```

AWK:

```
BEGIN{  
count=0;  
}  
{  
if($1=="d")  
count++  
}  
END{  
printf("The Total no of Packets Drop is :%d\n\n", count)  
}
```

Simulated Network:



Packet Dropped:

```
krishna@ubuntu: ~  
krishna@ubuntu:~$ awk -f lab1.awk lab1.tr  
The Total no of Packets Drop is :708  
krishna@ubuntu:~$
```

OR

Using grep command: `cat lab1.tr | grep ^d | wc -l`