

1. **Implement three nodes point-to-point network with duplexlinks between them.
Set the queue size, vary the bandwidth and find the number of packets dropped.**

1.tcl

```
set ns [ new Simulator ]
set nf [ open 1.nam w ]
$ns namtrace-all $nf
set tf [ open 1.tr w ]
$ns trace-all $tf

proc finish {} {
    global ns nf tf
    $ns flush-trace
    close $nf
    close $tf
    exec nam 1.nam &
    exit 0
}

set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]

$ns duplex-link $n0 $n2 200Mb 10ms DropTail
$ns duplex-link $n1 $n2 100Mb 5ms DropTail
$ns duplex-link $n2 $n3 1Mb 1000ms DropTail

$ns queue-limit $n0 $n2 10
$ns queue-limit $n1 $n2 10

set udp0 [new Agent/UDP]
$ns attach-agent $n0 $udp0

set cbr0 [new Application/Traffic/CBR]
$cbr0 set packetSize_ 500
$cbr0 set interval_ 0.005
$cbr0 attach-agent $udp0

set udp1 [new Agent/UDP]
$ns attach-agent $n1 $udp1
set cbr1 [new Application/Traffic/CBR]
$cbr1 attach-agent $udp1

set udp2 [new Agent/UDP]
$ns attach-agent $n2 $udp2
set cbr2 [new Application/Traffic/CBR]
$cbr2 attach-agent $udp2

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

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

```
$ns at 0.1 "$cbr0 start"
$ns at 0.2 "$cbr1 start"
$ns at 1.0 "finish"
$ns run
```

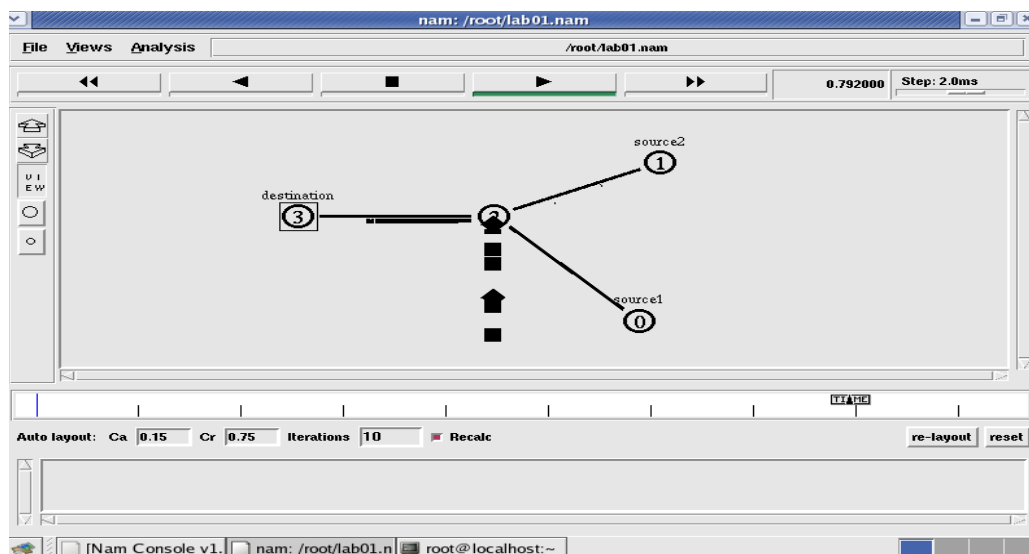
AWK file:

```
BEGIN{
c=0;
}
{
if($1=="d")
{
c++;
printf("%s\t%s\n",$5,$11);
}
}
END{
printf("The number of packets dropped =%d\n",c);
}
```

Trace file contains 12 columns:-

Event type, Event time, From Node, Source Node, Packet Type, Packet Size, Flags (indicated by -----), Flow ID, Source address, Destination address, Sequence ID, Packet ID

Topology:



Output:

A terminal window with a dark purple background. The title bar shows the user 'sdmit' on a machine named 'sdmit-ThinkCentre-M72e' in the directory '~/NS2/ns-allinone-2.35/ns-2.35/tcl/ex'. The terminal displays a list of 'cbr' followed by packet numbers: 884, 208, 209, 885, 886, 887, 888, 889, 210, 890, 891, 892, 893, 894, 211, 895, 896, 897, 898, 899, 212, and 213. Below this list, it says 'The number of packets dropped =1114'. The prompt at the bottom is 'sdmit@sdmit-ThinkCentre-M72e:~/NS2/ns-allinone-2.35/ns-2.35/tcl/ex\$' with a cursor.

```
sdmit@sdmit-ThinkCentre-M72e: ~/NS2/ns-allinone-2.35/ns-2.35/tcl/ex
cbr      884
cbr      208
cbr      209
cbr      885
cbr      886
cbr      887
cbr      888
cbr      889
cbr      210
cbr      890
cbr      891
cbr      892
cbr      893
cbr      894
cbr      211
cbr      895
cbr      896
cbr      897
cbr      898
cbr      899
cbr      212
cbr      213
The number of packets dropped =1114
sdmit@sdmit-ThinkCentre-M72e:~/NS2/ns-allinone-2.35/ns-2.35/tcl/ex$
```

Viva question and answer

1. What is Network?

Ans: A network is a set of devices connected by physical media links. A network is recursively is a connection of two or more nodes by a physical link or two or more networks connected by one or more nodes.

2. What is Link?

Ans: At the lowest level, a network can consist of two or more computers directly connected by some physical medium such as coaxial cable or optical fiber. Such a physical medium is called as Link.

3. What is Node?

Ans: A network can consist of two or more computers directly connected by some physical medium such as coaxial cable or optical fiber. Such a physical medium is called as Links and the computer it connects is called as Nodes.

4. What is point to point link?

Ans: If the physical links are limited to a pair of nodes it is said to be point-point link.

5. What is bandwidth?

Ans: Network performance is measured in Bandwidth (throughput), Bandwidth of a network is given by the number of bits that can be transmitted over the network in a certain period of time.