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
```

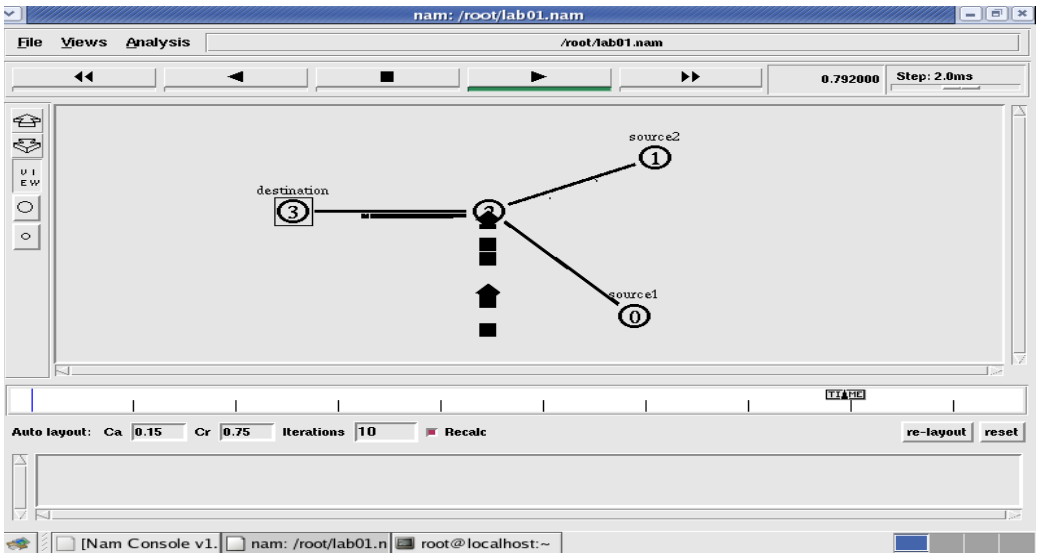
AWK file:

```
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:

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.