Program No. 1:Implement three nodes point – to – point network with duplex links between them for different topologies. 1 Set the queue size, vary the bandwidth and find the number of packets dropped for various iterations.

Program Objective:

- Understand the Implementation of the Duplex link between the network.

Theory:

- Create a simulatorobject.
- We open a file for writing that is going to be used for the tracedata.
- We now attach the agent to thenodes.
- Now we attach the application to run on top of thesenodes
- We now connect the agent and the application for itsworking
- Set the simulationtime
- The next step is to add a 'finish' procedure that closes the trace file and startsnam.

```
set ns [new Simulator]
set ntrace [open prog1.tr w]
$ns trace-all $ntrace
set namfile [open prog1.nam w]
$ns namtrace-all $namfile

proc Finish {} {
global ns ntrace namfile
$ns flush-trace
close $ntrace
close $namfile
exec nam prog1.nam &
puts "The number of packet drops is"
exec grep -c "^d" prog1.tr &
exit 0
}

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

$ns duplex-link $n0 $n1 10Mb 10ms DropTail
$ns duplex-link $n1 $n2 5Mb 10ms DropTail

$ns queue-limit $n0 $n1 10
$ns queue-limit $n1 $n2 05

set tcp0 [new Agent/TCP]
$ns attach-agent $n0 $tcp0
```

```
set sink0 [new Agent/TCPSink]
$ns attach-agent $n2 $sink0
$ns connect $tcp0 $sink0
set cbr0 [new Application/Traffic/CBR]
$cbr0 set type_ CBR
$cbr0 set packetSize_ 100
$cbr0 set rate_ 1Mb
$cbr0 set random_ false
$cbr0 attach-agent $tcp0
$tcp0 set class_ 1
$ns at 1.0 "$cbr0 start"
$ns at 5.0 "Finish"
$ns run
```

Output:

Steps for execution

1. Open gedit and type program. Program name should have the extension " .tcl
   student@cnpc022:~/student$ gedit prog1.tcl
2. Save the program.
3. Run the simulation program
   student@cnpc022:~/ student $ ns prog1.tcl
   The number of packet drops is 5
4. Here "ns" indicates network simulator. We get the topology shown in the snapshot.
5. Now press the play button in the simulation window and the simulation will begin.
6. To see the trace file contents open the file as ,
   student@cnpc022:~/ student $ gedit prog1.tr

Topology

Snapshot 1: