COMPUTER NETWORKING

EXPERIMENT 7

Name: Ayush Jain
SAP ID: 60004200132
Batch: B2
Computer Engineering

Aim: To study what is network simulation and create a duplex link in NS2.

Theory:

In computer network research, network simulation is a technique whereby a software program replicates the behaviour of a real network. This is achieved by calculating the interactions between the different network entities such as routers, switches, nodes, access points, links, etc. Most simulators use discrete event simulation in which the modelling of systems in which state variables change at discrete points in time. The behaviour of the network and the various applications and services it supports can then be observed in a test lab; various attributes of the environment can also be modified in a controlled manner to assess how the network/protocols would behave under different conditions.

There are both free/open-source and proprietary network simulators available. Examples of notable network simulators / emulators include:

- NS simulator
- OPNET (Riverbed)
- NetSim (Tetcos)

All of these are open sources code editable while some of these are commercial.

Code:

```
#=================================
#     Simulation parameters setup
#=================================
set val(stop) 10.0         ;# time of simulation end

#=================================
=
#       Initialization
#=================================
=
#Create    a    ns
simulator  set  ns
[new Simulator]
```

```
#Open the NS
trace file set
tracefile [open
out.tr w]
$ns trace-all $tracefile

#Open the NAM
trace file set namfile
[open out.nam w]
$ns namtrace-all $namfile

#===================================
=
#       Nodes Definition
#===================================
=
#Create
2 nodes
set n0
[$ns
node]
set n1
[$ns
node]

#===================================
=
#       Links Definition
#===================================
=
#Createlinks between nodes
$ns duplex-link $n0 $n1 100.0Mb 10ms DropTail
$ns queue-limit $n0 $n1 50

#Give node position (for NAM)
$ns duplex-link-op $n0 $n1 orient right

#===================================
=
#       Agents Definition
#===================================
=
#Setup a TCP
connection set tcp0
[new Agent/TCP] $ns
attach-agent $n0 $tcp0
set sink1 [new
Agent/TCPSink] $ns
attach-agent $n1
$sink1
$ns connect $tcp0 $sink1
```

```
$tcp0 set packetSize_ 1500
#=================================
=
#       Applications Definition
#=================================
=
#Setup a FTP Application over TCP
connection set ftp0 [new
Application/FTP] $ftp0 attach-agent
$tcp0
$ns at 1.0 "$ftp0 start"
$ns at 2.0 "$ftp0 stop"


#=================================
=
#       Termination
#=================================
=
#Define  a  'finish'
procedure       proc
finish  {}  {  global
ns tracefile namfile
$ns       flush-trace
close       $tracefile
close $namfile
   exec nam out.nam &
   exit 0
}
$ns    at    $val(stop)    "$ns    nam-end-wireless
$val(stop)"
$ns at $val(stop) "finish"
$ns at $val(stop) "puts \"done\" ; $ns halt"
$ns run
```

Output: