



# Future Vision BIE

Future Vision

## ONE STOP FOR ALL STUDY MATERIALS & LAB PROGRAMS



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17CSL57  
COMPUTER NETWORK LABORATORY  
[As per Choice Based Credit  
System (CBCS) scheme]  
(Effective from the academic  
year 2017-2018)  
SEMESTER - V

This Page Provides Program &  
Output.  
Program 5

Program 5  
Implement and study the  
performance of GSM on NS2/NS3  
(Using MAC layer) or equivalent  
environment.

## 5.tcl

```
1 puts "Enter number of nodes"
2 set tnn [gets stdin]
3 set val(chan) Channel/WirelessChannel
4 set val(prop) Propagation/TwoRayGround
5 set val(netif) Phy/WirelessPhy
6 set val(mac) Mac/802_11
7 set val(ifq) Queue/DropTail/PriQueue
8 set val(ll) LL
9 set val(ant) Antenna/OmniAntenna
10 set val(x) 1500;#add manually
11 set val(y) 1500;#add manually
12 set val(ifqlen) 1000;#add manually
13 set val(adhocRouting) AODV;#add manually
14 set val(nn) $tnn
15 set val(stop) 10.0
16 #add manually
17 Mac/802_11 set cdma_code_bw_start_ 0;# cdma code for
18 Mac/802_11 set cdma_code_bw_stop_ 63;# cdma code for
19 Mac/802_11 set cdma_code_init_start_ 64;# cdma code for
20 Mac/802_11 set cdma_code_init_stop_ 127;# cdma code for
21 Mac/802_11 set cdma_code_cqich_start_ 128 ;# cdma code for
22 Mac/802_11 set cdma_code_cqich_stop_ 195;# cdma code for
23 Mac/802_11 set cdma_code_handover_start_ 196 ;# cdma code for
24 Mac/802_11 set cdma_code_handover_stop_ 255;# cdma code for
25 #end
26 set f0 [open out02.tr w]
27 set f1 [open lost02.tr w]
28 set f2 [open delay02.tr w]
29 set ns_ [new Simulator]
30 set topo [new Topography]
31 set tracefd [open out.tr w]
32 set namtrace [open out.nam w]
```

```
33
34 $ns_ trace-all $tracefd
35 $ns_ namtrace-all-wireless $namtrace $val(x) $val(y)
36 $topo load_flatgrid $val(x) $val(y)
37 set god_ [create-god $val(nn)]
38 $ns_ color 0 red
39 $ns_ node-config -adhocRouting AODV \
40 -llType $val(ll) \
41 -macType $val(mac) \
42 -ifqType $val(ifq) \
43 -ifqLen $val(ifqlen) \
44 -antType $val(ant) \-propType $val(prop) \
45 -phyType $val(netif) \
46 -channelType $val(chan) \
47 -energyModel EnergyModel \
48 -initialEnergy 100 \
49 -rxPower 0.3 \
50 -txPower 0.6 \
51 -topoInstance $topo \
52 -agentTrace ON \
53 -routerTrace ON \
54 -macTrace OFF
55 #add manually
56 for {set i 0} {$i < $val(nn)} {incr i} {
57 set node_($i) [$ns_ node]
58 $node_($i) set X_ [expr rand() * 500]
59 $node_($i) set Y_ [expr rand() * 500]
60 $node_($i) set Z_ 0.000000000000;
61 }
62 for {set i 0} {$i < $val(nn)} {incr i} {
63 set xx [expr rand() * 1500]
64 set yy [expr rand() * 1000]
65 $ns_ at 0.1 "$node_($i) setdest $xx 4yy 5"
66 }
67 puts "Loading connection pattern..."
68 puts "Loading scenario file..."
69 for {set i 0} {$i < $val(nn)} {incr i} {
70 $ns_ initial_node_pos $node_($i) 55
71 }
72 for {set i 0} {$i < $val(nn)} {incr i} {
```

```

73 $ns_ at $val(stop).0 "$node_($i) reset";
74 }
75 puts "Enter source node"
76 set source [gets stdin]
77 puts "Enter destination node"
78 set dest [gets stdin]
79 set udp_(0) [new Agent/UDP]
80 $ns_ attach-agent $node_($source) $udp_(0)
81 set sink [new Agent/LossMonitor]
82 $ns_ attach-agent $node_($dest) $sink
83 set cbr1_(0) [new Application/Traffic/CBR]
84 $cbr1_(0) set packetSize_ 1000

85 $cbr1_(0) set interval_ 0.1
86 $cbr1_(0) set maxpkts_ 10000
87 $cbr1_(0) attach-agent $udp_(0)
88 $ns_ connect $udp_(0) $sink
89 $ns_ at 1.00 "$cbr1_(0) start"
90 set holdtime 0
91 set holdseq 0
92 set holdrate1 0
93 proc record {} {
94 global sink f0 f1 f2 holdtime holdseq holdrate1
95 set ns [Simulator instance]
96 set time 0.9 ;#Set Sampling Time to 0.9 Sec
97 set bw0 [$sink set bytes_]
98 set bw1 [$sink set nlost_]
99 set bw2 [$sink set lastPktTime_]
100 set bw3 [$sink set npkts_]
101 set now [$ns now]
102 # Record Bit Rate in Trace Files
103 puts $f0 "$now [expr (($bw0+$holdrate1)*8)/(2*$time*
104 # Record Packet Loss Rate in File
105 puts $f1 "$now [expr $bw1/$time]"
106 if { $bw3 > $holdseq } {
107 puts $f2 "$now [expr ($bw2 - $holdtime)/($bw3 - $hol
108 } else {
109 puts $f2 "$now [expr ($bw3 - $holdseq)]"
110 }
111 $sink set bytes_ 0
112 $sink set nlost 0

```

```

113 set holdtime $bw2
114 set holdseq $bw3
115 set holdrate1 $bw0
116 $ns at [expr $now+$time] "record" ;# Schedule Record at
117 #end
118 # Start Recording at Time 0
119 $ns_ at 0.0 "record"
120 source link.tcl
121 proc stop {} {
122 global ns_ tracefd f0 f1 f2
123 # Close Trace Files
124 close $f0

125 close $f1
126 close $f2
127 exec nam out.nam
128 exec xgraph out02.tr -geometry -x TIME -y thr -t Thr
129 exec xgraph lost02.tr -geometry -x TIME -y loss -t F
130 exec xgraph delay02.tr -geometry -x TIME -y delay -t l
131 $ns_ flush-trace
132 }
133 $ns_ at $val(stop) "stop"
134 $ns_ at $val(stop).0002 "puts \"NS EXITING...\" ; $r
135 puts $tracefd "M 0.0 nn $val(nn) x $val(x) y $val(y)
136 puts $tracefd "M 0.0 prop $val(prop) ant $val(ant)"
137 puts "Starting Simulation..."
138 $ns_ run

```

## link.tcl

```

1 $ns_ at 0.5 "$node_($source) add-mark m blue square"
2 $ns_ at 0.5 "$node_($dest) add-mark m magenta square"
3 $ns_ at 0.5 "$node_($source) label SENDER"
4 $ns_ at 0.5 "$node_($dest) label RECEIVER"
5 $ns_ at 0.01 "$ns_ trace-annotate \"Network Deploymer

```

## Process to Execute the Program

Step 1: We need to have ns2 pre installed

Step 2: Head to Cmd

Step 3: Navigate to file saved using cd & ls [command](#)

Step 4: ns 5.tcl

Step 5: Note both 5.tcl & link.tcl file is required

```
student@student-virtual-machine: ~/codeW/pro5
student@student-virtual-machine:~/codeW$ cd pro5
student@student-virtual-machine:~/codeW/pro5$ ls
5.tcl link.tcl
student@student-virtual-machine:~/codeW/pro5$ ns 5.tcl
Enter number of nodes
8
num_nodes is set 8
warning: Please use -channel as shown in tcl/ex/wireless-mitf.tcl
INITIALIZE THE LIST xListHead
Loading connection pattern...
Loading scenario file...
Enter source node
1
Enter destination node
5
Starting Simulation...
channel.cc:sendUp - Calc highestAntennaZ_ and distCST_
highestAntennaZ_ = 1.5, distCST_ = 550.0
SORTING LISTS ...DONE!
NS EXITING...
student@student-virtual-machine:~/codeW/pro5$ Warning: cannot open file `TIME'
Warning: cannot open file `800x400'
Parameter LabelFont: can't translate `helvetica-10' into a font (defaulting to `fixed')
Parameter TitleFont: can't translate `helvetica-18' into a font (defaulting to `fixed')
Warning: cannot open file `TIME'
Warning: cannot open file `TIME'
Warning: cannot open file `800x400'
Warning: cannot open file `800x400'
Parameter LabelFont: can't translate `helvetica-10' into a font (defaulting to `fixed')
Parameter LabelFont: can't translate `helvetica-10' into a font (defaulting to `fixed')
Parameter TitleFont: can't translate `helvetica-18' into a font (defaulting to `
```

Fig 5.1: Output

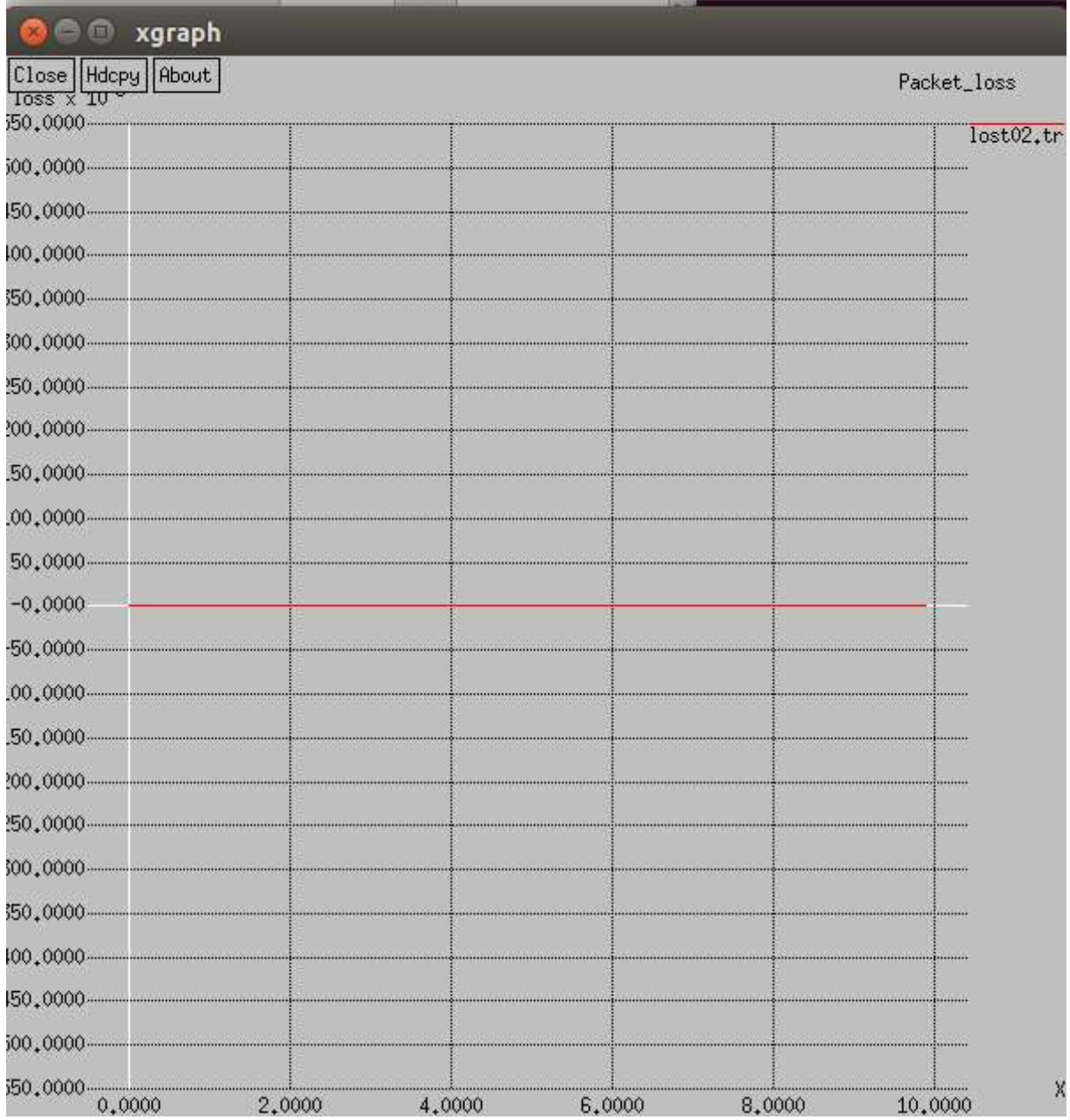


Fig 5.2: Output



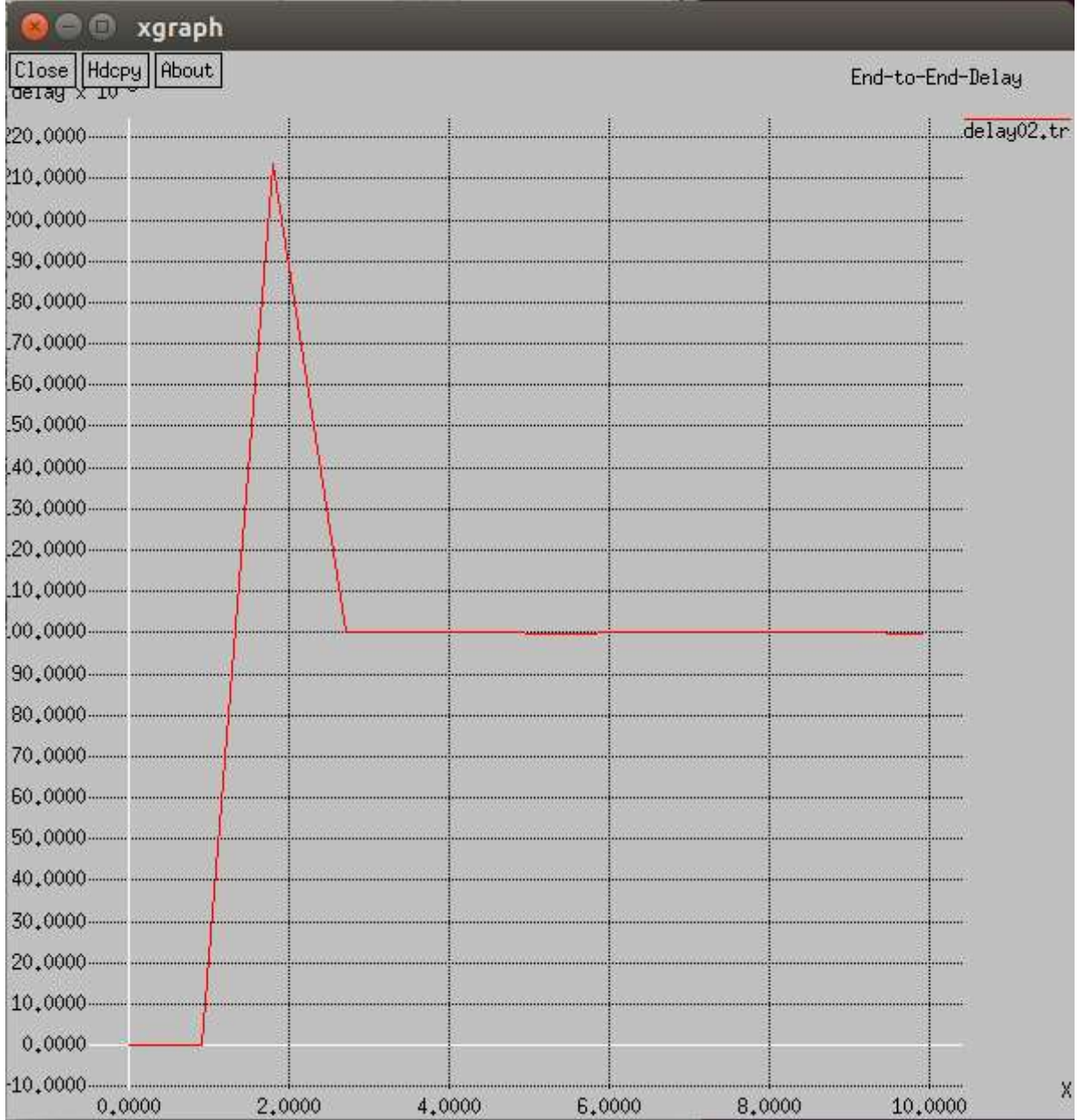


Fig 5.3: Output

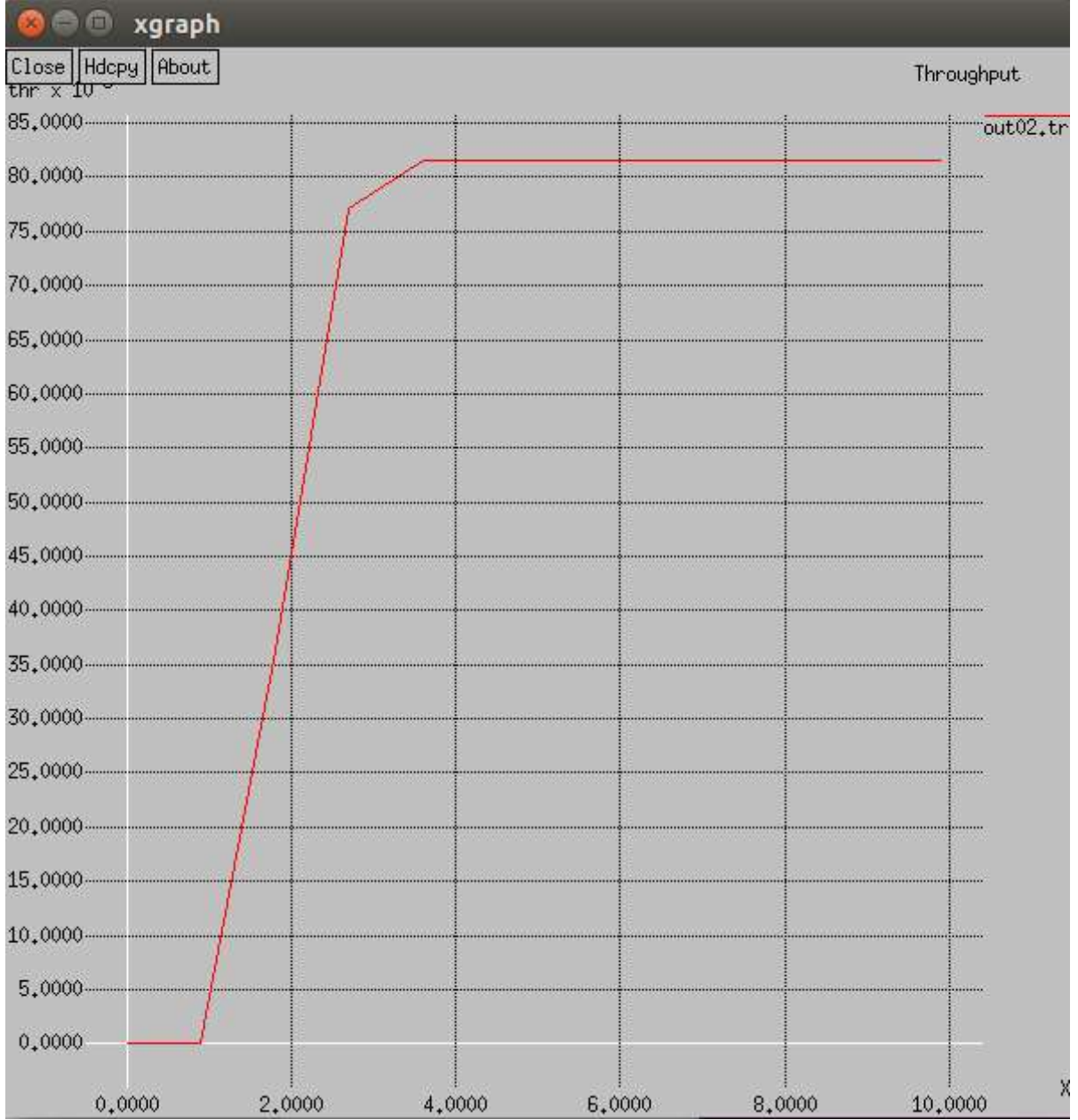


Fig 5.4: Output

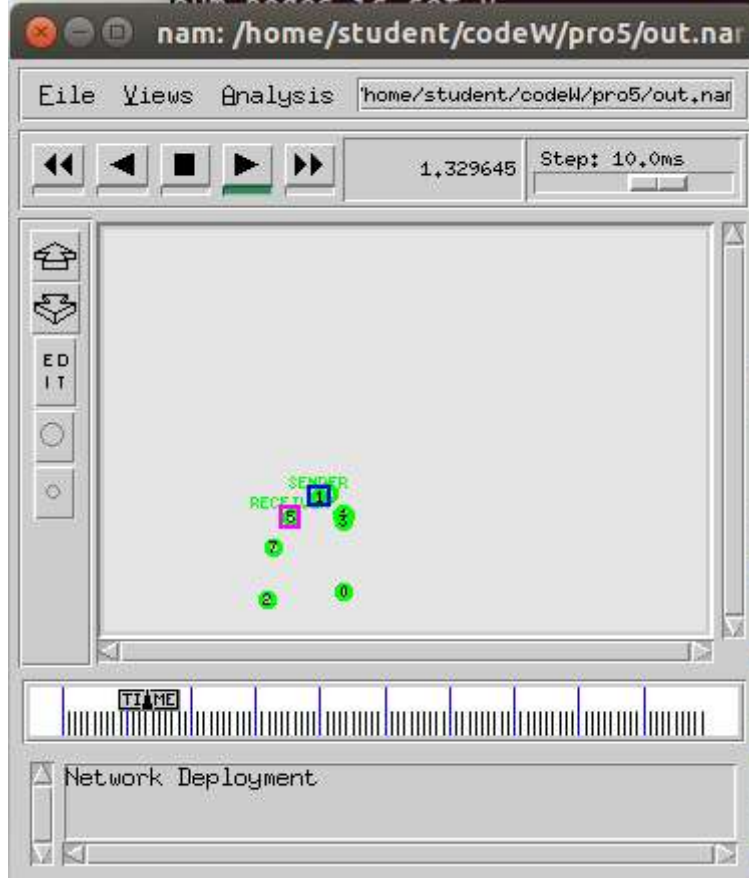


Fig 5.5: Output

Step 6: Check the output.

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QB = Question Bank

AS = Answer Script

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