NITTE MEENAKSHI INSTITUTE OF TECHNOLOGY

(AN AUTONOMOUS INSTITUTION, AFFILIATED TO VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM, APPROVED BY AICTE & GOVT.OF KARNATAKA

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PROJECT REPORT

on

1. RING TOPOLOGY

2. STOP AND WAIT PROTOCOL

3. STAR TOPOLOGY

Submitted in partial fulfilment of the requirement for the award of Degree of

Bachelor of Engineering

in

Information Science and Engineering

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Department of Information Science and Engineering

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(AN AUTONOMOUS INSTITUTION, AFFILIATED TO VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM

Department of Information Science and Engineering

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CERTIFICATE

This is to certify that the Project Report on *"***NS2 PROBLEM"** is an authentic work carried out by **Jayam Naga Tulasi(1NT20IS066), Bhoomika K L (1NT20IS035),Manoj V S(1NT20IS088), Samprita P(1NT20IS143) , AkshayB Krishna(1NT20IS014**) . Bonafide students of Nitte Meenakshi Institute of Technology, Bangalore in partial fulfilment for the award of the degree of Bachelor of Engineering in Information Science and Engineering of Visvesvaraya Technological University, Belagavi during the academic year 2021-2022**.** It is certified that all corrections and suggestions indicated during the internal assessment has been incorporated in the report.

Internal Guide **Signature of the HOD**

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Acknowledgement

Acknowledgement

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NS2 PROBLEM

1.NS2 Code for simulation of RING TOPOLOGY.

```
set ns [new Simulator]
$ns rtproto DV

set nf [open out.nam w]
$ns namtrace-all $nf

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

#Creating Nodes
for {set i 0} {$i<7} {incr i} {
set n($i) [$ns node]
}

#Creating Links
for {set i 0} {$i<7} {incr i} {
$ns duplex-link $n($i) $n([expr ($i+1)%7]) 512Kb 5ms DropTail
}
```

```
$ns duplex-link-op $n(0) $n(1) queuePos 1
$ns duplex-link-op $n(0) $n(6) queuePos 1

#Creating UDP agent and attching to node 0
set udp0 [new Agent/UDP]
$ns attach-agent $n(0) $udp0

#Creating Null agent and attaching to node 3
set null0 [new Agent/Null]
$ns attach-agent $n(3) $null0

$ns connect $udp0 $null0


#Creating a CBR agent and attaching it to udp0
set cbr0 [new Application/Traffic/CBR]
$cbr0 set packetSize_ 1024
$cbr0 set interval_ 0.01
$cbr0 attach-agent $udp0

$ns rtmodel-at 0.4 down $n(2) $n(3)
$ns rtmodel-at 1.0 up $n(2) $n(3)

$ns at 0.01 "$cbr0 start"
$ns at 1.5 "$cbr0 stop"

$ns at 2.0 "finish"
$ns run
```

OUTPUT:

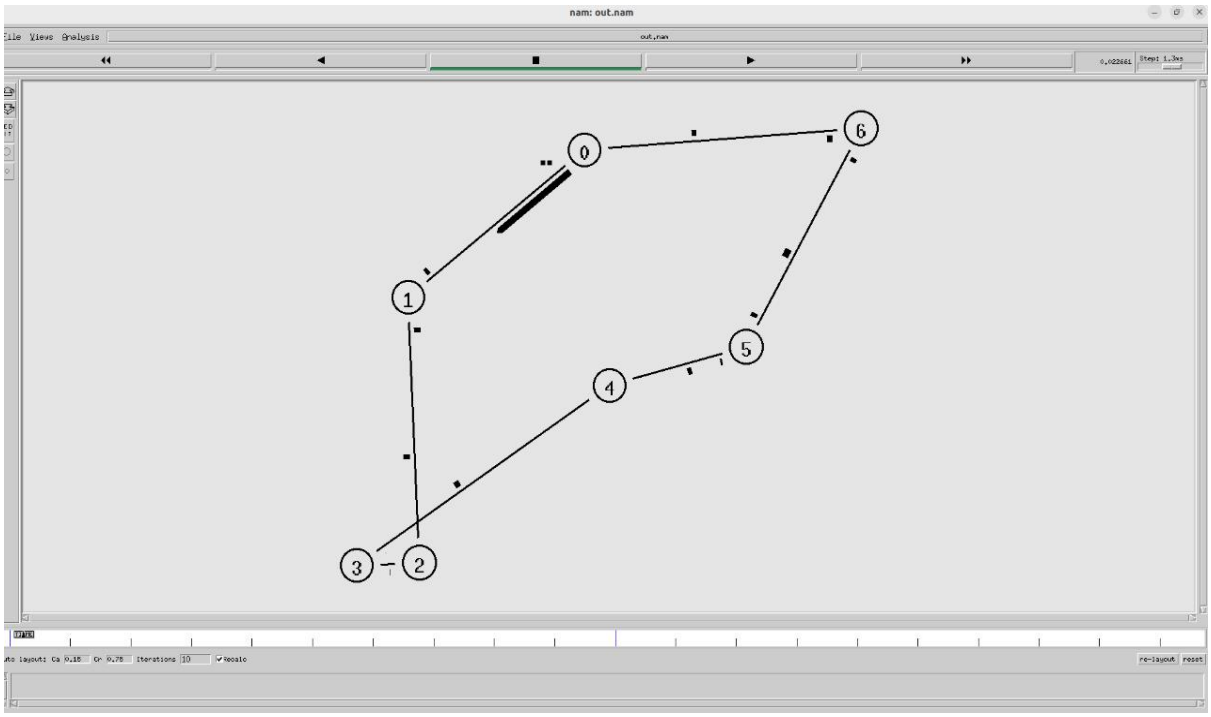

fig 1.1: Ring Topology.

2.NS2 Code for simulation of STOP AND WAIT PROTOCAL.

```
set ns [new Simulator]
set n0 [$ns node]
set n1 [$ns node]

$ns at 0.0 "$n0 label Sender"
$ns at 0.0 "$n1 label Receiver"

set nf [open stop.nam w]
$ns namtrace-all $nf
set f [open stop.tr w]
$ns trace-all $f
$ns duplex-link $n0 $n1 0.2Mb 200ms DropTail
$ns duplex-link-op $n0 $n1 orient right
$ns queue-limit $n0 $n1 10

Agent/TCP set nam_tracevar_ true

set tcp [new Agent/TCP]
$tcp set window_ 1
$tcp set maxcwnd_ 1
$ns attach-agent $n0 $tcp
set sink [new Agent/TCPSink]
$ns attach-agent $n1 $sink
$ns connect $tcp $sink
set ftp [new Application/FTP]
$ftp attach-agent $tcp
```

```
$ns add-agent-trace $tcp tcp
$ns monitor-agent-trace $tcp
$tcp tracevar cwnd_
$ns at 0.1 "$ftp start"
$ns at 3.0 "$ns detach-agent $n0 $tcp ; $ns detach-agent $n1 $sink"
$ns at 3.5 "finish"
$ns at 0.0 "$ns trace-annotate \"Stop and Wait with normal operation\""

$ns at 0.05 "$ns trace-annotate \"FTP starts at 0.1\""
$ns at 0.11 "$ns trace-annotate \"Send Packet_0\""
$ns at 0.35 "$ns trace-annotate \"Receive Ack_0\""
$ns at 0.56 "$ns trace-annotate \"Send Packet_1\""
$ns at 0.79 "$ns trace-annotate \"Receive Ack_1\""
$ns at 0.99 "$ns trace-annotate \"Send Packet_2\""
$ns at 1.23 "$ns trace-annotate \"Receive Ack_2 \""
$ns at 1.43 "$ns trace-annotate \"Send Packet_3\""
$ns at 1.67 "$ns trace-annotate \"Receive Ack_3\""
$ns at 1.88 "$ns trace-annotate \"Send Packet_4\""
$ns at 2.11 "$ns trace-annotate \"Receive Ack_4\""
$ns at 2.32 "$ns trace-annotate \"Send Packet_5\""

$ns at 2.55 "$ns trace-annotate \"Receive Ack_5 \""
$ns at 2.75 "$ns trace-annotate \"Send Packet_6\""
$ns at 2.99 "$ns trace-annotate \"Receive Ack_6\""
$ns at 3.1 "$ns trace-annotate \"FTP stops\""
```

```
proc finish {}
{
global ns nf
$ns flush-trace
close $nf
puts "running nam..."
exec nam stop.nam &
exit 0
}
$ns run
```

OUTPUT:

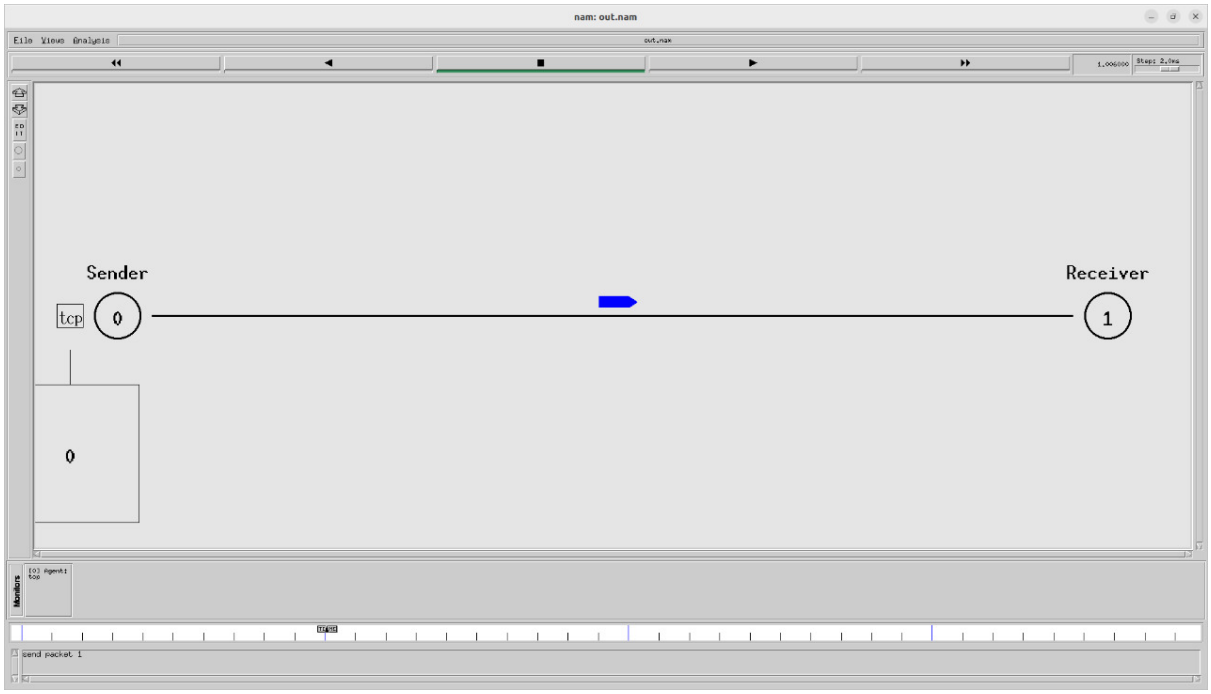

Fig 2.1: Sending frame in stop and wait protocol.

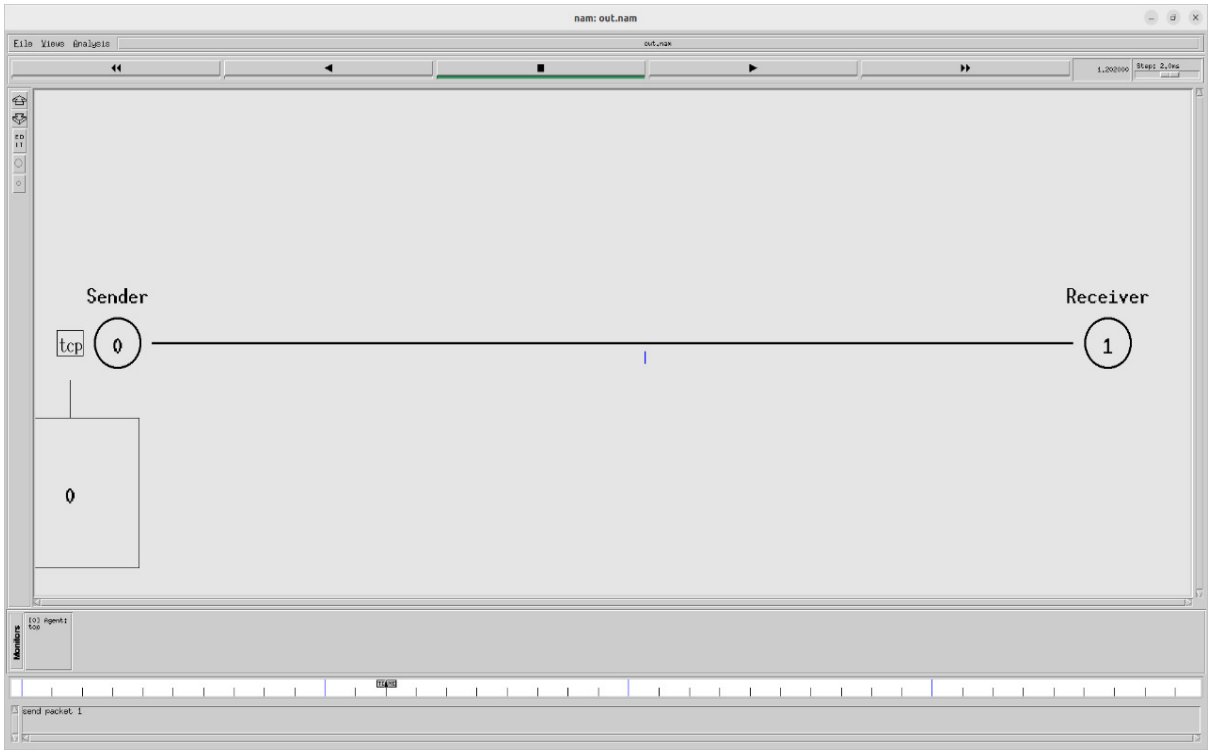

Fig 2.2: Getting ack in stop and wait protocol.

3.NS2 Code for simulation of STAR TOPOLOGY .

```
#Create a simulator object
set ns [new Simulator]
#Open the nam trace file
set nf [open out.nam w]
$ns namtrace-all $nf

#Define a 'finish' procedure

proc finish {} {
 global ns nf
 $ns flush-trace
 #Close the trace file
 close $nf
 #Executenam on the trace file
 exec nam out.nam &
 exit0
}

#Create six nodes
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]
set n4 [$ns node]
set n5 [$ns node]
```

```
#Change the shape of center node in a star topology

$n0 shape square

#Create links between the nodes
$ns duplex-link $n0 $n1 1Mb 10ms DropTail
$ns duplex-link $n0 $n2 1Mb 10ms DropTail
$ns duplex-link $n0 $n3 1Mb 10ms DropTail
$ns duplex-link $n0 $n4 1Mb 10ms DropTail
$ns duplex-link $n0 $n5 1Mb 10ms DropTail
#Create a TCP agent and attach it to node n0
set tcp0 [new Agent/TCP]
$tcp0 set class_ 1
$ns attach-agent $n1 $tcp0
#Create a TCP Sink agent (a traffic sink) for TCP and attach it to node n3
set sink0 [new Agent/TCPSink]
$ns attach-agent $n3 $sink0
#Connect the traffic sources with the traffic sink
$ns connect $tcp0 $sink0
# Create a CBR traffic source and attach it to tcp0
set cbr0 [new Application/Traffic/CBR]
$cbr0 set packetSize_ 500
$cbr0 set interval_ 0.01
$cbr0 attach-agent $tcp0
#Schedule events for the CBR agents
$ns at 0.5 "$cbr0 start"
$ns at 4.5 "$cbr0 stop"
#Call the finish procedure after 5 seconds of simulation time
$ns at 5.0 "finish"
```

#Run the simulation

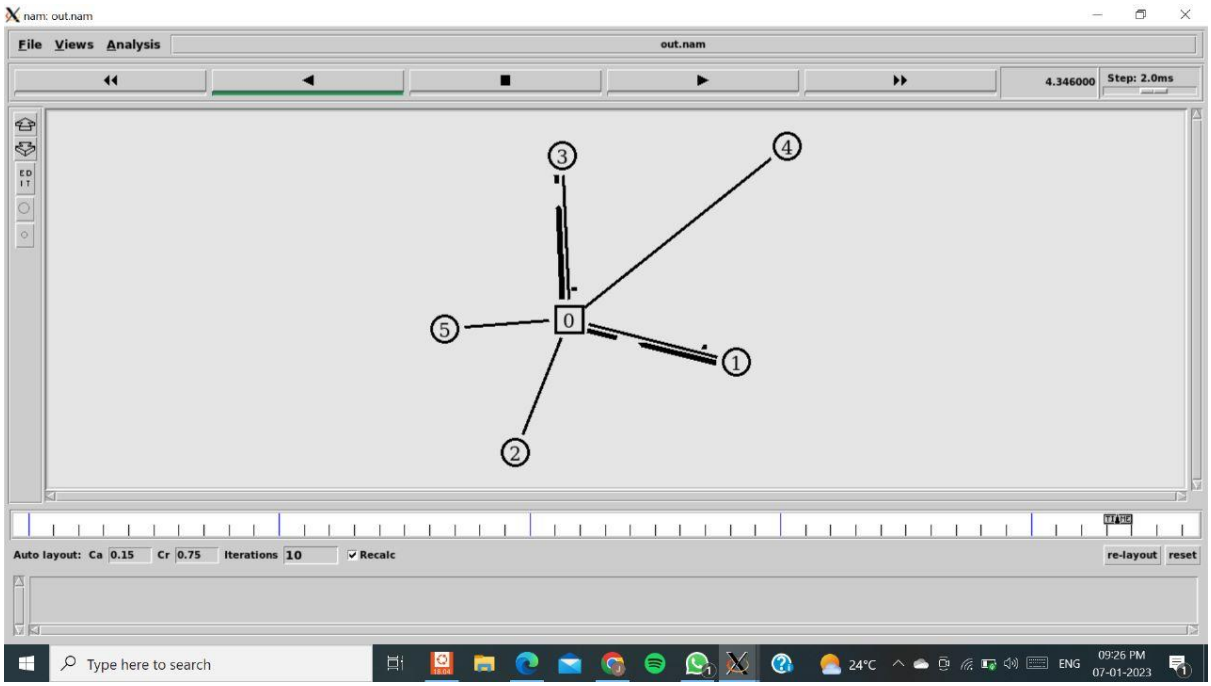

Fig 3.1: Star topology.