SASTRA DEEMED TO BE UNIVERSITY

THANJAVUR

Course Code: CSE303

Course Name: Computer Networks Laboratory (CNL)

CNL Manual

Experiment 8. Simulation and Analysis of Multicast routing

Aim:

To simulate and analysis of multicast routing using NS2 simulator.

Procedure:

Step 1: Create a simulator object with multicast ON

Step 2: Open a nam trace file and define finish procedure then close the trace file, and execute nam on trace file.

Step 3: Create n number of nodes

Step 4: Create duplex links between the nodes

Step 5: Set Dense Mode protocol for multicasting

Step 6: Set two different groups with group address

Step 7: Set UDP Transport agent for the traffic source for group1 and another agent for the traffic source for group 2

Step 8: Create more number of receivers to accept the packets for two different groups

Step 9: Specify more number of nodes join and leave from the group at various time

Step 10: Schedule events and run the program

Sample Code:

```
set ns [new Simulator -multicast on]

#Turn on Tracing

set tf [open output.tr w]

$ns trace-all $tf
```

```
# Turn on nam Tracing
set fd [open mcast.nam w]
$ns namtrace-all $fd

# Create 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]
set n6 [$ns node]
set n7 [$ns node]

# Create links with DropTail Queues
$ns duplex-link $n0 $n2 1.5Mb 10ms DropTail
$ns duplex-link $n1 $n2 1.5Mb 10ms DropTail
$ns duplex-link $n2 $n3 1.5Mb 10ms DropTail
$ns duplex-link $n3 $n4 1.5Mb 10ms DropTail
$ns duplex-link $n3 $n7 1.5Mb 10ms DropTail
$ns duplex-link $n4 $n5 1.5Mb 10ms DropTail
$ns duplex-link $n4 $n6 1.5Mb 10ms DropTail

set mproto DM
set mrthandle [$ns mrtproto $mproto {}]

# Set two groups with group addresses
set group1 [Node allocaddr]
set group2 [Node allocaddr]
```

```
# UDP Transport agent for the traffic source for group1
set udp0 [new Agent/UDP]
$ns attach-agent $n0 $udp0
$udp0 set dst_addr_ $group1
$udp0 set dst_port_ 0
set cbr1 [new Application/Traffic/CBR]
$cbr1 attach-agent $udp0

# Transport agent for the traffic source for group2
set udp1 [new Agent/UDP]
$ns attach-agent $n1 $udp1
$udp1 set dst_addr_ $group2
$udp1 set dst_port_ 0
set cbr2 [new Application/Traffic/CBR]
$cbr2 attach-agent $udp1

# Create receiver to accept the packets
set rcvr1 [new Agent/Null]
$ns attach-agent $n5 $rcvr1
$ns at 1.0 "$n5 join-group $rcvr1 $group1"
set rcvr2 [new Agent/Null]
$ns attach-agent $n6 $rcvr2
$ns at 1.5 "$n6 join-group $rcvr2 $group1"


set rcvr3 [new Agent/Null]
$ns attach-agent $n7 $rcvr3
$ns at 2.0 "$n7 join-group $rcvr3 $group1"
```

```
set rcvr4 [new Agent/Null]
$ns attach-agent $n5 $rcvr1
$ns at 2.5 "$n5 join-group $rcvr4 $group2"

set rcvr5 [new Agent/Null]
$ns attach-agent $n6 $rcvr2
$ns at 3.0 "$n6 join-group $rcvr5 $group2"

set rcvr6 [new Agent/Null]
$ns attach-agent $n7 $rcvr3

#The nodes are leaving the group at specified times
$ns at 3.5 "$n7 join-group $rcvr6 $group2"
$ns at 4.0 "$n5 leave-group $rcvr1 $group1"
$ns at 4.5 "$n6 leave-group $rcvr2 $group1"
$ns at 5.0 "$n7 leave-group $rcvr3 $group1"
$ns at 5.5 "$n5 leave-group $rcvr4 $group2"
$ns at 6.0 "$n6 leave-group $rcvr5 $group2"
$ns at 6.5 "$n7 leave-group $rcvr6 $group2"

# Schedule events

$ns at 0.5 "$cbr1 start"
$ns at 9.5 "$cbr1 stop"
$ns at 0.5 "$cbr2 start"
$ns at 9.5 "$cbr2 stop"

#post-processing

$ns at 10.0 "finish"
```

```
proc finish {} {
  global ns tf
   $ns flush-trace
   close $tf
   exec nam mcast.nam &
   exit 0
}

$ns set-animation-rate 3.0ms
$ns run
```