DHRUV GARG 16 BCE 1190

NETWORK LAB: NS 2

SCENARIO 1: Executing "ns-simple"

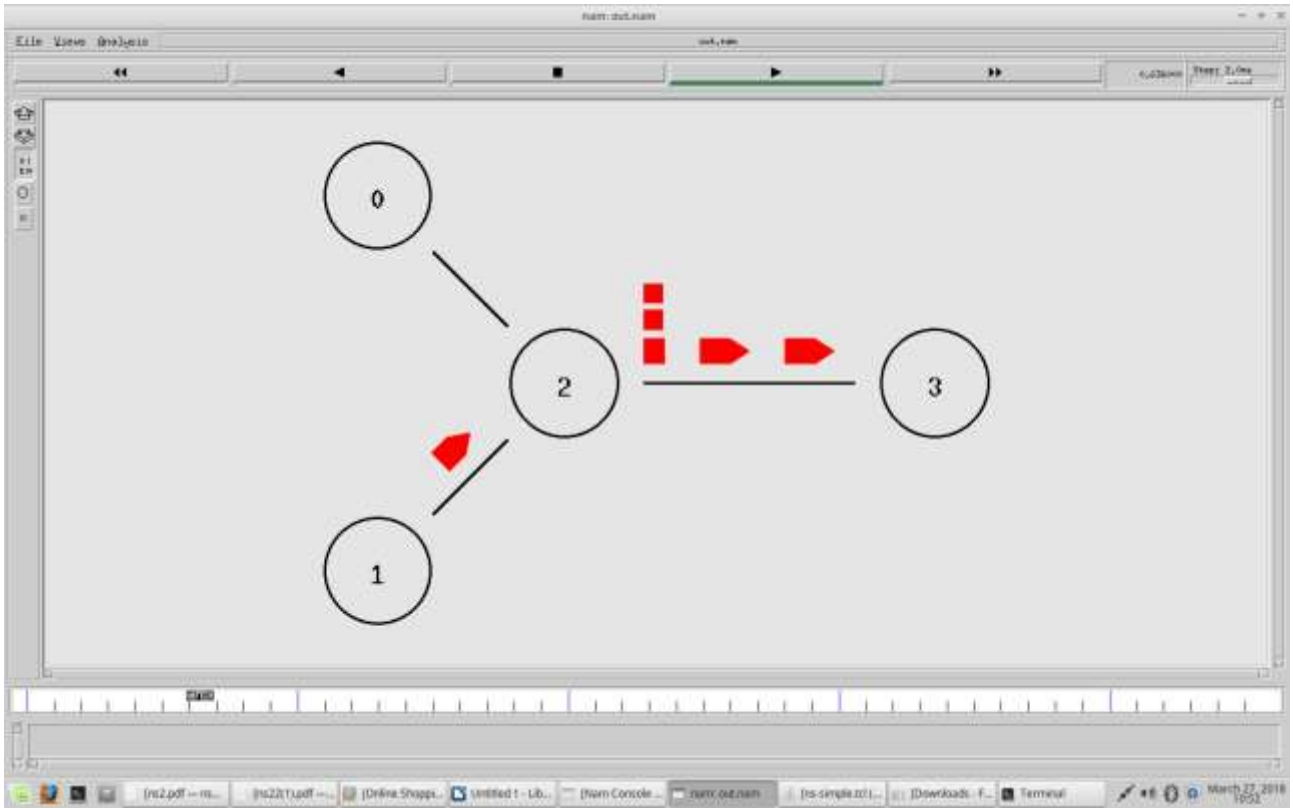
Code:

```
#Create a simulator object
set ns [new Simulator]

#Define different colors for data flows (for NAM)
$ns color 1 Blue
$ns color 2 Red

#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 NAM trace file
    close $nf
    #Execute NAM on the trace file
    exec nam out.nam &
    exit 0
}

#Create four nodes
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]

#Create links between the nodes
$ns duplex-link $n0 $n2 2Mb 10ms DropTail
$ns duplex-link $n1 $n2 2Mb 10ms DropTail
$ns duplex-link $n2 $n3 1.7Mb 20ms DropTail

#Set Queue Size of link (n2-n3) to 10
$ns queue-limit $n2 $n3 10

#Give node position (for NAM)
```

```
$ns duplex-link-op $n0 $n2 orient right-down
$ns duplex-link-op $n1 $n2 orient right-up
$ns duplex-link-op $n2 $n3 orient right

#Monitor the queue for link (n2-n3). (for NAM)
$ns duplex-link-op $n2 $n3 queuePos 0.5


#Setup a TCP connection
set tcp [new Agent/TCP]
$tcp set class_ 2
$ns attach-agent $n0 $tcp
set sink [new Agent/TCPSink]
$ns attach-agent $n3 $sink
$ns connect $tcp $sink
$tcp set fid_ 1

#Setup a FTP over TCP connection
set ftp [new Application/FTP]
$ftp attach-agent $tcp
$ftp set type_ FTP


#Setup a UDP connection
set udp [new Agent/UDP]
$ns attach-agent $n1 $udp
set null [new Agent/Null]
$ns attach-agent $n3 $null
$ns connect $udp $null
$udp set fid_ 2

#Setup a CBR over UDP connection
set cbr [new Application/Traffic/CBR]
$cbr attach-agent $udp
$cbr set type_ CBR
$cbr set packet_size_ 1000
$cbr set rate_ 1mb
$cbr set random_ false


#Schedule events for the CBR and FTP agents
$ns at 0.1 "$cbr start"
$ns at 1.0 "$ftp start"
```

```
$ns at 4.0 "$ftp stop"
$ns at 4.5 "$cbr stop"

#Detach tcp and sink agents (not really necessary)
$ns at 4.5 "$ns detach-agent $n0 $tcp ; $ns detach-agent $n3 $sink"

#Call the finish procedure after 5 seconds of simulation time
$ns at 5.0 "finish"

#Print CBR packet size and interval
puts "CBR packet size = [$cbr set packet_size_]"
puts "CBR interval = [$cbr set interval_]"

#Run the simulation
$ns run
```

Screenshot



SCENARIO 2: Executing "Example 3" from the PDF

Code:

```
#Create a simulator object
set ns [new Simulator]

set f [open droptail-queue-out.trw]
$ns trace-all $nf

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


set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]

set G [$ns node]

set r [$ns node]

$ns color 1 red
$ns color 2 SeaGreen
$ns color 3 blue


$ns duplex-link $s1 $G 6Mb 1ms DropTail
$ns duplex-link $s2 $G 6Mb 1ms DropTail
$ns duplex-link $s3 $G 6Mb 1ms DropTail
$ns duplex-link $G $r 3Mb 1ms DropTail


$ns queue-limit $G $r 5


$ns duplex-link-op $s1 $G orient right-up
$ns duplex-link-op $s2 $G orient right
$ns duplex-link-op $s3 $G orient right-down
$ns duplex-link-op $G $r orient right


$ns duplex-link-op $s1 $G queuePos 0.5
```

```
$ns duplex-link-op $s2 $G queuePos 0.5
$ns duplex-link-op $s3 $G queuePos 0.5
$ns duplex-link-op $G $r queuePos 0.5


set tcp1 [new Agent/TCP/Reno]
$ns attach-agent $s1 $tcp1
$tcp2 set window_ 8
$tcp2 set fid_ 1

set tcp2 [new Agent/TCP/Reno]
$ns attach-agent $s2 $tcp2
$tcp2 set window_ 8
$tcp2 set fid_ 2

set tcp3 [new Agent/TCP/Reno]
$ns attach-agent $s3 $tcp3
$tcp3 set window_ 4
$tcp3 set fid_ 3

set sink1 [new Agent/TCPSink]
set sink2 [new Agent/TCPSink]
set sink3 [new Agent/TCPSink]
$ns attach-agent $r $sink1
$ns attach-agent $r $sink2
$ns attach-agent $r $sink3

$ns connect $tcp1 $sink1
$ns connect $tcp2 $sink2
$ns connect $tcp3 $sink3

set ftp1 [new Application/FTP]
$ftp1 attach-agent $tcp1

set ftp2 [new Application/FTP]
$ftp2 attach-agent $tcp2

set ftp3 [new Application/FTP]
$ftp3 attach-agent $tcp3

proc finish {} {
global ns
   $ns flush-trace
```

```
puts "running nam..."
   exec nam -a droptail-queue-out.nam &
   exit 0
}

$ns at 0.0 "$s1 label Sender1"
$ns at 0.0 "$s2 label Sender2"
$ns at 0.0 "$s3 label Sender3"
$ns at 0.0 "$G label Gateway"
$ns at 0.0 "$r label Reciever"
$ns at 0.1 "Sftp1 start"
$ns at 0.1 "Sftp2 start"
$ns at 0.1 "Sftp3 start"
$ns at 0.1 "Sftp1 start"
$ns at 5.0 "Sftp1 stop"
$ns at 5.0 "Sftp2 stop"
$ns at 5.0 "Sftp3 stop"
$ns at 5.25 "finish"

$ns run
```

Screenshot