Practical: 8

AIM: Define a topology with four nodes in which one node act that forwards the data that two nodes are sending to the fourth node. Also find a way to distinguish the data flows from the two nodes other, and learn how a queue can be monitored to see how full it is and how many packets are being discarded

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# 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 $n2 orient right-down
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$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"

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

Run the simulation
$ns run

Output: