Simulation Experiment-2

A network consists of 4 nodes(n0-n3)
Here, n0 and n1 are source nodes, n2 is a router and n3 is the destination node.
The duplex links between the nodes is as follows:

- **no and n2 has 10 Mbps pf bandwidth and 10 ms of delay.**
- **n1 and n2 has 10 Kbps of bandwidth and 100ms of delay and**
- **n2 and n3 has 10 Kbps of bandwidth and 100 ms of delay.**

A TCP agent is attached to n0 and connection is established to a TCP sink agent attached to n3.
N no-n2-n3
An UDP agent that is attached to n1 is connected to a NULL agent attached to n3.
B n1-n2-n3
An FTP and CBR traffic generator are attached to a TCP and UDP agent respectively.
The TCP agent between n0-n3 has a packet size of 200 bytes with a time intervalof 0.01 seconds and the UDP agent between n1-n3 has a packet size of 300 bytes with the time interval of 0.001 seconds
The CBR is set to start at 0.1 seconds, FTP is set to start at 0.3 seconds and both stop at 5 seconds .
Write a Tcl script to observe the packet flow for the given network and observe the output in NAM for this network scenario.

```
#simulator
    set ns [new Simulator]
    set trf [open 2.tr w]
    $ns trace-all $trf
    set namf [open 2.nam w]
    $ns namtrace-all $namf
# nodes
     set n0 [$ns node]
     set n1 [$ns node]
     set n2 [$ns node]
     set n3 [$ns node]

#Labelling
     $n0 label "TCP Source"
     $n1 label "UDP Source"
     $n2 label  "Router "
     $n3 label "Destination"

 # Connect using links
     $ns duplex-link $n0 $n2 10Mb 10ms DropTail
     $ns duplex-link $n1 $n2 10Kb 100ms DropTail
     $ns duplex-link $n2 $n3 10Kb 100ms DropTail
#Agents
     set tcp [new Agent/TCP]
     $ns attach-agent $n0 $tcp
     set sink [new Agent/TCPSink]
```

```
    $ns attach-agent $n3 $sink
    set ftp [new Application/FTP]
    $ftp attach-agent $tcp

    set udp [new Agent/UDP]
    $ns attach-agent $n1 $udp
    set null [new Agent/Null]
    $ns attach-agent $n3 $null
    set cbr [new Application/Traffic/CBR]
    $cbr attach-agent $udp

# Connect agaents
    $ns connect $tcp $sink
    $ns connect $udp $null

    #packet size and time interval
    $ftp set packetSize_ 200
    $ftp set interval_ 0.001
    $cbr set packetSize_ 300
    $cbr set interval_ 0.001
#color setup
    $ns color 1 "red"
    $ns color 2 "green"
    $tcp set class_ 1
    $udp set class_ 2


     proc finish {} {
     global ns trf namf
     $ns flush-trace
     exec nam 2.nam &
     close $namf
     close $trf
     exit 0
     }

     $ns at 0.1 "$cbr start"
     $ns at 0.3 "$ftp start"
     $ns at 5.0 "$ftp stop"
     $ns at 5.0 "$cbr stop"
     $ns at 7.0 "finish"
     $ns run
```

Execution Steps:

```
gedit 2.tcl
ns 2.tcl
gedit 2.tr
```