Computer Networks
UE23CS252B

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Code for TCP + FTP -

```
# This script is created by NSG2 beta1
# <http://wushoupong.googlepages.com/nsg>

#=================================
#     Simulation parameters setup
#=================================
set val(stop)   10.0                 ;# time of simulation end

#=================================
#        Initialization
#=================================
#Create a ns simulator
set ns [new Simulator]

#Open the NS trace file
set tracefile [open out.tr w]
$ns trace-all $tracefile

#Open the NAM trace file
set namfile [open out.nam w]
$ns namtrace-all $namfile

#=================================
#        Nodes Definition
#=================================
#Create 3 nodes
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]

#=================================
#        Links Definition
#=================================
#Createlinks between nodes
$ns duplex-link $n1 $n0 100.0Mb 10ms DropTail
```

```
$ns queue-limit $n1 $n0 50
$ns duplex-link $n0 $n2 100.0Mb 10ms DropTail
$ns queue-limit $n0 $n2 50

#Give node position (for NAM)
$ns duplex-link-op $n1 $n0 orient right-up
$ns duplex-link-op $n0 $n2 orient right-down


#===================================
#        Agents Definition
#===================================
#Setup a TCP connection
set tcp0 [new Agent/TCP]
$ns attach-agent $n1 $tcp0
set sink1 [new Agent/TCPSink]
$ns attach-agent $n2 $sink1
$ns connect $tcp0 $sink1
$tcp0 set packetSize_ 1500



#===================================
#        Applications Definition
#===================================
#Setup a FTP Application over TCP connection
set ftp0 [new Application/FTP]
$ftp0 attach-agent $tcp0
$ns at 1.0 "$ftp0 start"
$ns at 10.0 "$ftp0 stop"



#===================================
#        Termination
#===================================
#Define a 'finish' procedure
proc finish {} {
    global ns tracefile namfile
    $ns flush-trace
    close $tracefile
    close $namfile
    exec nam out.nam &
    exit 0
}
$ns at $val(stop) "$ns nam-end-wireless $val(stop)"
$ns at $val(stop) "finish"
$ns at $val(stop) "puts \"done\" ; $ns halt"
$ns run

Output-
```

```
+ 1 0 1 tcp 40 ————— 0 0.0 2.0 0 0
- 1 0 1 tcp 40 ————— 0 0.0 2.0 0 0
r 1.010003 0 1 tcp 40 ————— 0 0.0 2.0 0 0
+ 1.010003 1 2 tcp 40 ————— 0 0.0 2.0 0 0
- 1.010003 1 2 tcp 40 ————— 0 0.0 2.0 0 0
r 1.020006 1 2 tcp 40 ————— 0 0.0 2.0 0 0
+ 1.020006 2 1 ack 40 ————— 0 2.0 0.0 0 1
- 1.020006 2 1 ack 40 ————— 0 2.0 0.0 0 1
r 1.03001 2 1 ack 40 ————— 0 2.0 0.0 0 1
+ 1.03001 1 0 ack 40 ————— 0 2.0 0.0 0 1
- 1.03001 1 0 ack 40 ————— 0 2.0 0.0 0 1
r 1.040013 1 0 ack 40 ————— 0 2.0 0.0 0 1
+ 1.040013 0 1 tcp 1540 ————— 0 0.0 2.0 1 2
- 1.040013 0 1 tcp 1540 ————— 0 0.0 2.0 1 2
+ 1.040013 0 1 tcp 1540 ————— 0 0.0 2.0 2 3
- 1.040136 0 1 tcp 1540 ————— 0 0.0 2.0 2 3
r 1.050136 0 1 tcp 1540 ————— 0 0.0 2.0 1 2
+ 1.050136 1 2 tcp 1540 ————— 0 0.0 2.0 1 2
- 1.050136 1 2 tcp 1540 ————— 0 0.0 2.0 1 2
r 1.050259 0 1 tcp 1540 ————— 0 0.0 2.0 2 3
+ 1.050259 1 2 tcp 1540 ————— 0 0.0 2.0 2 3
- 1.050259 1 2 tcp 1540 ————— 0 0.0 2.0 2 3
r 1.060259 1 2 tcp 1540 ————— 0 0.0 2.0 1 2
+ 1.060259 2 1 ack 40 ————— 0 2.0 0.0 1 4
- 1.060259 2 1 ack 40 ————— 0 2.0 0.0 1 4
r 1.060382 1 2 tcp 1540 ————— 0 0.0 2.0 2 3
+ 1.060382 2 1 ack 40 ————— 0 2.0 0.0 2 5
- 1.060382 2 1 ack 40 ————— 0 2.0 0.0 2 5
r 1.070262 2 1 ack 40 ————— 0 2.0 0.0 1 4
+ 1.070262 1 0 ack 40 ————— 0 2.0 0.0 1 4
- 1.070262 1 0 ack 40 ————— 0 2.0 0.0 1 4
r 1.070386 2 1 ack 40 ————— 0 2.0 0.0 2 5
+ 1.070386 1 0 ack 40 ————— 0 2.0 0.0 2 5
- 1.070386 1 0 ack 40 ————— 0 2.0 0.0 2 5
r 1.080266 1 0 ack 40 ————— 0 2.0 0.0 1 4
+ 1.080266 0 1 tcp 1540 ————— 0 0.0 2.0 3 6
- 1.080266 0 1 tcp 1540 ————— 0 0.0 2.0 3 6
+ 1.080266 0 1 tcp 1540 ————— 0 0.0 2.0 4 7
r 1.080389 1 0 ack 40 ————— 0 2.0 0.0 2 5
+ 1.080389 0 1 tcp 1540 ————— 0 0.0 2.0 5 8
+ 1.080389 0 1 tcp 1540 ————— 0 0.0 2.0 6 9
- 1.080389 0 1 tcp 1540 ————— 0 0.0 2.0 4 7
- 1.080512 0 1 tcp 1540 ————— 0 0.0 2.0 5 8
- 1.080635 0 1 tcp 1540 ————— 0 0.0 2.0 6 9
r 1.090389 0 1 tcp 1540 ————— 0 0.0 2.0 3 6
+ 1.090389 1 2 tcp 1540 ————— 0 0.0 2.0 3 6
- 1.090389 1 2 tcp 1540 ————— 0 0.0 2.0 3 6
r 1.090512 0 1 tcp 1540 ————— 0 0.0 2.0 4 7
```
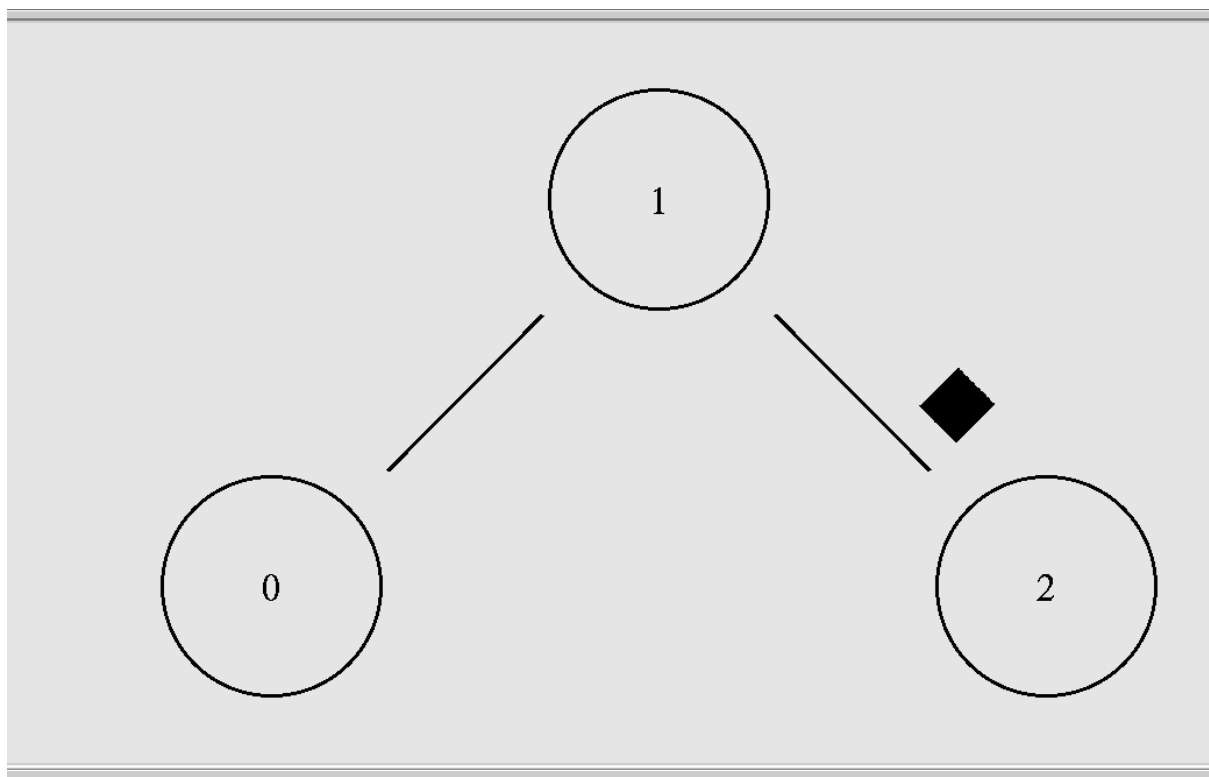
```
┌──(pranav⊛kali)-[~/Downloads]
└─$ less out.tr|grep +|wc -l
1724

┌──(pranav⊛kali)-[~/Downloads]
└─$ less out.tr|grep -|wc -l
5172

┌──(pranav⊛kali)-[~/Downloads]
└─$ less out.tr|grep r|wc -l
1724

┌──(pranav⊛kali)-[~/Downloads]
└─$ less out.tr|grep d|wc -l
0
```


Code for UDP + CBR to simulate packet dropping-

This script is created by NSG2 beta1
<http://wushoupong.googlepages.com/nsg>

#====================================
Simulation parameters setup
#====================================
set val(stop)   10.0   ;# time of simulation end

```
#=================================
#       Initialization
#=================================
#Create a ns simulator
set ns [new Simulator]

#Open the NS trace file
set tracefile [open out.tr w]
$ns trace-all $tracefile

#Open the NAM trace file
set namfile [open out.nam w]
$ns namtrace-all $namfile


#=================================
#       Nodes Definition
#=================================
#Create 3 nodes
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]


#=================================
#       Links Definition
#=================================
#Createlinks between nodes
$ns duplex-link $n0 $n1 100.0Mb 10ms DropTail
$ns queue-limit $n0 $n1 50
$ns duplex-link $n0 $n2 99.0Mb 10ms DropTail
$ns queue-limit $n0 $n2 50

#Give node position (for NAM)
$ns duplex-link-op $n0 $n1 orient left-down
$ns duplex-link-op $n0 $n2 orient right-down


#=================================
#       Agents Definition
#=================================
#Setup a UDP connection
set udp0 [new Agent/UDP]
$ns attach-agent $n1 $udp0
set null1 [new Agent/Null]
$ns attach-agent $n2 $null1
$ns connect $udp0 $null1
$udp0 set packetSize_ 1500


#=================================
#       Applications Definition
#=================================
#Setup a CBR Application over UDP connection
set cbr0 [new Application/Traffic/CBR]
$cbr0 attach-agent $udp0
$cbr0 set packetSize_ 1000
$cbr0 set rate_ 100.0Mb
```
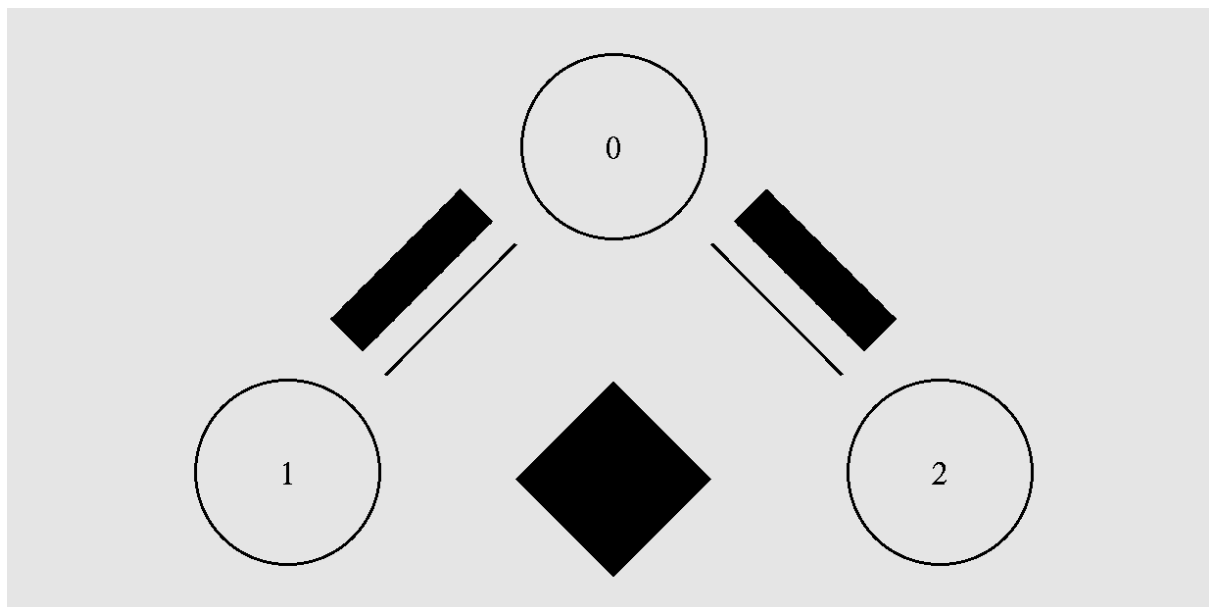
```
$cbr0 set random_ null
$ns at 1.0 "$cbr0 start"
$ns at 2.0 "$cbr0 stop"


#================================
#        Termination
#================================
#Define a 'finish' procedure
proc finish {} {
    global ns tracefile namfile
    $ns flush-trace
    close $tracefile
    close $namfile
    exec nam out.nam &
    exit 0
}
$ns at $val(stop) "$ns nam-end-wireless $val(stop)"
$ns at $val(stop) "finish"
$ns at $val(stop) "puts \"done\" ; $ns halt"
$ns run
```

Output-

```
┌──(pranav㉿kali)-[~/Downloads]
└─$ less out.tr|grep +|wc -l
225002

┌──(pranav㉿kali)-[~/Downloads]
└─$ less out.tr|grep -|wc -l
674830

┌──(pranav㉿kali)-[~/Downloads]
└─$ less out.tr|grep r|wc -l
674830

┌──(pranav㉿kali)-[~/Downloads]
└─$ less out.tr|grep d|wc -l
176

┌──(pranav㉿kali)-[~/Downloads]
└─$ 
```