1

```
set ns [new Simulator]
set f [open lab1.tr w]
$ns trace-all $f
set nf [open lab1.nam w]
$ns namtrace-all $nf
proc finish {} {
global f nf ns
$ns flush-trace
close $f
close $nf
exec nam lab1.nam &
exit 0
}

set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]

$ns duplex-link $n0 $n1 0.3Mb 10ms DropTail
$ns duplex-link $n1 $n2 0.3Mb 20ms DropTail
$ns duplex-link $n2 $n3 0.3Mb 20ms DropTail #vary bandwidth

$ns queue-limit $n0 $n1 20
$ns queue-limit $n1 $n2 20
$ns queue-limit $n2 $n3 20

set udp0 [new Agent/UDP]
$ns attach-agent $n0 $udp0
set cbr0 [new Application/Traffic/CBR]
$cbr0 attach-agent $udp0
$cbr0 set packetSize_ 500
$cbr0 set interval_ 0.005
set null0 [new Agent/Null]
$ns attach-agent $n3 $null0
$ns connect $udp0 $null0
$ns at 0.1 "$cbr0 start"
$ns at 4.5 "$cbr0 stop"
$ns at 5.0 "finish"
$ns run
```

Execution

gedit name.tcl

ns_name.tcl

#grep_^r_lab1.tr_|_grep_“cbr”_|_awk_‘{s+=$6}END{print_s}’(packets

#grep_^r_lab1.tr_|_grep_“cbr”_|_awk_‘{s+=$2}END{print_s}’(time

Network performace = (Packet received/ Total Time)

Sl. No. Bandwidth Network performance

```
2
set ns [new Simulator]
set f [open bha2.tr w]
$ns trace-all $f
set nf [open bha2.nam w]
$ns namtrace-all $nf
$ns color 1 "blue"
$ns color 2 "red"
proc finish {} {
global ns f nf
$ns flush-trace
close $f
close $nf
exec nam bha2.nam &
exit 0
}
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]
$ns duplex-link $n0 $n2 2Mb 10ms DropTail
$ns duplex-link $n1 $n2 2Mb 10ms DropTail
$ns duplex-link $n2 $n3 2.7Mb 20ms DropTail
$ns queue-limit $n2 $n3 50
set tcp0 [new Agent/TCP]
$ns attach-agent $n0 $tcp0
$tcp0 set class_ 1
set ftp0 [new Application/FTP]
$ftp0 attach-agent $tcp0
set sink [new Agent/TCPSink]
$ns attach-agent $n3 $sink
$ns connect $tcp0 $sink
set udp0 [new Agent/UDP]
$ns attach-agent $n1 $udp0
$udp0 set class_ 2
set cbr0 [new Application/Traffic/CBR]
$cbr0 attach-agent $udp0
$cbr0 set packetsize_ 1000
$cbr0 set interval_ 0.005
set null0 [new Agent/Null]
$ns attach-agent $n3 $null0
$ns connect $udp0 $null0
$ns at 0.1 "$cbr0 start"
$ns at 1.0 "$ftp0 start"
$ns at 4.0 "$ftp0 stop"
$ns at 4.5 "$cbr0 stop"
$ns at 5.0 "finish"
$ns run
```

Execution

```
#grep_^r_lab2.tr__ grep_“tcp”_–c    tcp
# grep_^r_lab2.tr__ grep_“cbr”_–c      udp
```

```
3
set ns [new Simulator]
set trf [open akm3.tr w]
$ns trace-all $trf
set naf [open akm3.nam w]
$ns namtrace-all $naf

proc finish {} {
global nf ns tf
exec nam akm3.nam &
close $naf
close $trf
exit 0
}
set n0 [$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]

$n1 label "Source"
$n2 label "Error Node"
$n5 label "Destination"

$ns make-lan "$n0 $n1 $n2 $n3" 10Mb 10ms LL Queue/DropTail
Mac /802_3
$ns make-lan "$n4 $n5 $n6" 10Mb 10ms LL Queue/DropTail
Mac /802_3

$ns duplex-link $n2 $n6 30Mb 100ms DropTail

set udp0 [new Agent/UDP]
$ns attach-agent $n1 $udp0
set cbr0 [ new Application/Traffic/CBR]
$cbr0 attach-agent $udp0
set null5 [new Agent/Null]
$ns attach-agent $n5 $null5
$ns connect $udp0 $null5

$cbr0 set packetsize_ 100
$cbr0 set interval_ 0.001
$udp0 set class_ 1

set err [new ErrorModel]
$ns lossmodel $err $n2 $n6
$err set rate_ 0.7
$ns at 6.0 "finish"
$ns at 0.1 "$cbr0 start"
$ns run
Execution  Throughput = (Packet received/ Total Time) (bps)

#grep_^r_lab3.tr_|_grep_“2_6”_|_awk_‘{s+=$6}END{print_s}’
ortotpackets#grep_^r_lab3.tr_|_grep_“2_6”_|_awk_‘{s+=$2}END{print_s}’for tot time
```

```
4
set ns [new Simulator]
set f [open akm4.tr w]
$ns trace-all $f
set nf [open akm4.nam w]
$ns namtrace-all $nf

proc finish {} {
global ns f nf outFile1 outFile2
$ns flush-trace
close $f
close $nf
exec nam akm4.nam &
exec xgraph Congestion1.xg Congestion2.xg -geometry
400x400 &
exit 0
}

set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]
set n4 [$ns node]
set n5 [$ns node]

$n0 label "Src1"
$n4 label "Dst1"
$n1 label "Src2"
$n5 label "Dst2"

$ns make-lan "$n0 $n1 $n2 $n3 $n4 $n5 " 10Mb 30ms
LL Queue/DropTail
Mac /802_3

set tcp1 [new Agent/TCP]
$ns attach-agent $n0 $tcp1
set ftp1 [new Application/FTP]
$ftp1 attach-agent $tcp1

set sink1 [new Agent/TCPSink]
$ns attach-agent $n4 $sink1
$ftp1 set maxPkts_ 1000
$ns connect $tcp1 $sink1

set tcp2 [new Agent/TCP/Reno]
$ns attach-agent $n1 $tcp2
set ftp2 [new Application/FTP]
$ftp2 attach-agent $tcp2

set sink2 [new Agent/TCPSink]
$ns attach-agent $n5 $sink2
$ftp2 set maxPkts_ 1000
$ns connect $tcp2 $sink2

set outFile1 [open Congestion1.xg w]
set outFile2 [open Congestion2.xg w]

proc findWindowSize {tcpSource outFile} {
        global ns
        set now [$ns now]
        set cWindSize [$tcpSource set cwnd_]
        puts $outFile "$now $cWindSize"
        $ns at [expr $now + 0.1] "findWindowSize
$tcpSource $outFile"
}

$ns at 0.0 "findWindowSize $tcp1 $outFile1"
$ns at 0.1 "findWindowSize $tcp2 $outFile2"
$ns at 0.3 "$ftp1 start"
$ns at 0.5 "$ftp2 start"
$ns at 50.0 "$ftp1 stop"
$ns at 50.0 "$ftp2 stop"
$ns at 50.0 "finish"
$ns run


Execution

Gedit +ns
```

5

```
set ns [new Simulator]
set tf [open akm5.tr w]
$ns trace-all $tf
set topo [new Topography]

$topo load_flatgrid 1300 1300
set nf [open akm5.nam w]

$ns namtrace-all-wireless $nf 1300 1300
$ns node-config -adhocRouting DSDV \
                -llType LL \
                -macType Mac/802_11 \
                -ifqType Queue/DropTail/PriQueue\
                -channelType
Channel/WirelessChannel \
                -propType
Propagation/TwoRayGround \
                -antType Antenna/OmniAntenna \
                -ifqLen 50 \
                -phyType Phy/WirelessPhy \
                -topoInstance $topo \
                -agentTrace ON \
                -routerTrace ON
create-god 3

set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]

$n0 label "ESS"
$n1 label "mob1"
$n2 label "mob2"

$n0 set X_ 10
$n0 set Y_ 600
$n0 set Z_ 0
$n1 set X_ 80
$n1 set Y_ 600
$n1 set Z_ 0
$n2 set X_ 1200
$n2 set Y_ 600
$n2 set Z_ 0

$ns at 0.3 "$n0 setdest 10 600 15"
$ns at 0.3 "$n1 setdest 80 600 25"
$ns at 0.3 "$n2 setdest 1200 600 25"

set tcp0 [new Agent/TCP]
$ns attach-agent $n0 $tcp0

set ftp0 [new Application/FTP]
$ftp0 attach-agent $tcp0

set sink1 [new Agent/TCPSink]
$ns attach-agent $n1 $sink1
$ns connect $tcp0 $sink1

set tcp1 [new Agent/TCP]
$ns attach-agent $n0 $tcp1

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

set sink2 [new Agent/TCPSink]
$ns attach-agent $n2 $sink2
$ns connect $tcp1 $sink2

$ns at 2 "$ftp0 start"
$ns at 2 "$ftp1 start"
$ns at 2 "$n1 setdest 1000 600 250"
$ns at 2 "$n2 setdest 80 600 250"



proc finish { } {
global ns nf tf
$ns flush-trace
exec nam akm5.nam &
close $tf
exit 0
}
$ns at 20 "finish"
$ns run
```

execution

grep_^r_lab5.tr_|_grep_“AGT”_|_grep_“tcp”_|_awk_‘{ s+=$8}END{print_s}’ for pkt rec

grep_^r_lab5.tr_|_grep_“AGT”_|_grep_“tcp”_|_awk_‘{ s+=$2}END{print_s}’ for tot tim

```
6
set ns [new Simulator]
$ns rtproto LS
set nf [open akm6.nam w]
$ns namtrace-all $nf
proc finish {} {
global ns nf
$ns flush-trace
close $nf
exec nam akm6.nam &
exit 0
}
for {set i 0} {$i < 7} {incr i} {
set n($i) [$ns node]
}
for {set i 0} {$i < 7} {incr i} {
$ns duplex-link $n($i) $n([expr ($i+1)%7]) 1Mb 10ms DropTail
}
set udp0 [new Agent/UDP]
$ns attach-agent $n(0) $udp0
set cbr0 [new Application/Traffic/CBR]
$cbr0 set packetSize_ 500
$cbr0 set interval_ 0.005
$cbr0 attach-agent $udp0
set null0 [new Agent/Null]
$ns attach-agent $n(3) $null0
$ns connect $udp0 $null0
$ns at 0.5 "$cbr0 start"
$ns rtmodel-at 1.0 down $n(1) $n(2)
$ns rtmodel-at 1.0 up $n(1) $n(2)
$ns at 4.5 "$cbr0 stop"
$ns at 5.0 "finish"
$ns run
```

Execution

Gesdit+ns