**#set ns Simulator**

set ns [new Simulator]

**#define color for data flow**

$ns color 1 Blue

$ns color 2 Red

**#open trace file**

set tracefile1 [open lab3.tr w] set winfile [open winfile w]

$ns trace-all $tracefile1

**#open namtrace file**

set namfile [open lab3.nam w]

$ns namtrace-all $namfile

**#define finish procedure** proc finish { } {

global ns tracefile1 namfile

$ns flush-trace close $tracefile1 close $namfile

exec nam lab3.nam & exit 0 }

**#create 6 nodes**

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

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

$n1 shape box

**#create link between nodes**

$ns duplex-link $n0 $n2 2Mb 10ms DropTail

$ns duplex-link $n1 $n2 2Mb 10ms DropTail

$ns simplex-link $n2 $n3 0.3Mb 100ms DropTail

$ns simplex-link $n3 $n2 0.3Mb 100ms DropTail

set lan [$ns newLan "$n3 $n4 $n5" 0.5Mb 40ms LL Queue/DropTail MAC/802\_3]

**#give node position**

$ns duplex-link-op $n0 $n2 orient right-down

$ns duplex-link-op $n1 $n2 orient right-up

$ns simplex-link-op $n3 $n2 orient left

$ns simplex-link-op $n2 $n3 orient right

**#set queue size of link(n2-n3)**

$ns queue-limit $n2 $n3 20

**#setup tcp connection** set tcp [new Agent/TCP]

$ns attach-agent $n0 $tcp

set sink [new Agent/TCPSink]

$ns attach-agent $n4 $sink

$ns connect $tcp $sink

$tcp set fid\_ 1

$tcp set packetSize\_ 552

**#set ftp over tcp connection** set ftp [new Application/FTP]

$ftp attach-agent $tcp

**#setup a TCP1 connection** set tcp1 [new Agent/TCP]

$ns attach-agent $n1 $tcp1

set sink1 [new Agent/TCPSink]

$ns attach-agent $n5 $sink1

$ns connect $tcp1 $sink1

$tcp1 set fid\_ 2

$tcp1 set packetSize\_ 552

set telnet0 [new Application/Telnet]

$telnet0 attach-agent $tcp1

**#title congestion window1**

set outfile1 [open congestion1.xg w]

puts $outfile1 "TitleText: Congestion Window-- Source \_tcp" puts $outfile1 "xUnitText: Simulation Time(Secs)"

puts $outfile1 "yUnitText: Congestion WindowSize"

**#title congestion window2**

set outfile2 [open congestion2.xg w]

puts $outfile2 "TitleText: Congestion Window-- Source \_tcp1" puts $outfile2 "xUnitText: Simulation Time(Secs)"

puts $outfile2 "yUnitText: Congestion WindowSize"

proc plotWindow {tcpSource outfile} { global ns

set time 0.1

set now [$ns now]

set cwnd [$tcpSource set cwnd\_] puts $outfile "$now $cwnd"

$ns at [expr $now+$time] "plotWindow $tcpSource $outfile"

}

$ns at 0.1 "plotWindow $tcp $winfile"

$ns at 0.0 "plotWindow $tcp $outfile1"

$ns at 0.1 "plotWindow $tcp1 $outfile2"

$ns at 0.3 "$ftp start"

$ns at 0.5 "$telnet0 start"

$ns at 49.0 "$ftp stop"

$ns at 49.1 "$telnet0 stop"

$ns at 50.0 "finish"

$ns run