set ns [new Simulator] set trf [open prog5.tr w]

$ns trace-all $trf

set naf [open prog5.nam w]

$ns namtrace-all $naf

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 [$ns node] set n7 [$ns node]

set lan [$ns newLan "$n0 $n1 $n2 $n3 $n4 $n5 $n6 $n7" 5Mb 10ms LL Queue/DropTail Channel] set tcp [new Agent/TCP]

$ns attach-agent $n0 $tcp

set ftp [new Application/FTP]

$ftp attach-agent $tcp

set sink [new Agent/TCPSink]

$ns attach-agent $n7 $sink

$ns connect $tcp $sink set udp [new Agent/UDP]

$ns attach-agent $n1 $udp

set cbr [new Application/Traffic/CBR]

$cbr attach-agent $udp set null [new Agent/Null]

$ns attach-agent $n5 $null

$ns connect $udp $null

proc finish {} { global ns naf trf

$ns flush-trace

exec nam prog5.nam & close $trf

close $naf

set tcpsize [ exec grep "^r" prog5.tr | grep "tcp" | tail -n 1 | cut -d " " -f 6] set numtcp [ exec grep "^r" prog5.tr | grep -c "tcp"]

set tcptime 2.3

set udpsize [ exec grep "^r" prog5.tr | grep "cbr" | tail -n 1 | cut -d " " -f 6] set numudp [ exec grep "^r" prog5.tr | grep -c "cbr"]

set udptime 4.0

puts "The throughput of FTP is"

puts "[ expr ($numtcp\*$tcpsize)/$tcptime] bytes per second" puts "The throughput of CBR is"

puts "[ expr ($numudp\*$udpsize)/$udptime] bytes per second" exit 0

}

$ns at 0.1 "$cbr start"

$ns at 2.0 "$ftp start"

$ns at 1.9 "$cbr stop"

$ns at 4.3 "$ftp stop"

$ns at 6.0 "finish"

$ns run