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#Project 2 Experiment 2 Vikramaditya Jakkula

#Create a new simulator object
set ns [new Simulator]

$ns color 1 blue
$ns color 2 red
$ns color 3 green
$ns color 4 yellow

#open the nam trace file
set tf [open ns2.nam w]
$ns namtrace-all $tf
set nf [open ns2.tr w]
$ns trace-all $nf

#Create source nodes as given in problem
for {set i 1} {$i < 5} {incr i} {
    set s($i) [$ns node]
}

#Create two router nodes as given in problem
for {set i 1} {$i < 3} {incr i} {
    set r($i) [$ns node]
}

#Create destination node
set d(1) [$ns node]

#Create links between nodes
$ns duplex-link $s(3) $r(2) 100Mb 10ms DropTail
$ns duplex-link $s(4) $r(2) 100Mb 10ms DropTail
$ns duplex-link $s(1) $r(1) 100Mb 10ms DropTail
$ns duplex-link $s(2) $r(1) 100Mb 10ms DropTail
$ns duplex-link $r(2) $r(1) 100Mb 10ms DropTail
$ns duplex-link $r(1) $d(1) 3Mb 10ms DropTail

#set the nam
$ns duplex-link-op $r(1) $r(2) orient left
$ns duplex-link-op $d(1) $r(1) orient left
$ns duplex-link-op $r(1) $s(1) orient left-up
$ns duplex-link-op $r(1) $s(2) orient left-down
$ns duplex-link-op $r(2) $s(3) orient left-up
$ns duplex-link-op $r(2) $s(4) orient left-down

# UDP agent attached to s1
set udp1 [new Agent/UDP]
$ns attach-agent $s(1) $udp1
$udp1 set fid_ 1
$udp1 set class_ 1
$udp1 set packetSize_ 400

# UDP agent attached to s2
set udp2 [new Agent/UDP]
$ns attach-agent $s(2) $udp2
$udp2 set fid_ 2
$udp2 set class_ 2
$udp2 set packetSize_ 800

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# UDP agent attached to s3
set udp3 [new Agent/UDP]
$ns attach-agent $s(3) $udp3
$udp3 set fid_ 3
$udp3 set class_ 3
$udp3 set packetSize_ 1000

# UDP agent attached to s4
set udp4 [new Agent/UDP]
$ns attach-agent $s(4) $udp4
$udp4 set fid_ 4
$udp4 set class_ 4
$udp4 set packetSize_ 400

# create poisson exponential traffic for UDP
set poi1 [new Application/Traffic/Exponential]
$poi1 set packetSize_ 400
$poi1 set burst_time_ 0ms
$poi1 set idle_time_ 10ms
$poi1 set rate_ 10000000k
$poi1 attach-agent $udp1

# create poisson exponential traffic for UDP
set poi2 [new Application/Traffic/Exponential]
$poi2 set packetSize_ 800
$poi2 set burst_time_ 0ms
$poi2 set idle_time_ 12.5ms
$poi2 set rate_ 10000000k
$poi2 attach-agent $udp2

# create poisson exponential traffic for UDP
set poi3 [new Application/Traffic/Exponential]
$poi3 set packetSize_ 1000
$poi3 set burst_time_ 0ms
$poi3 set idle_time_ 20ms
$poi3 set rate_ 10000000k
$poi3 attach-agent $udp3

# create poisson exponential traffic for UDP
set poi4 [new Application/Traffic/Exponential]
$poi4 set packetSize_ 400
$poi4 set burst_time_ 0ms
$poi4 set idle_time_ 12.5ms
$poi4 set rate_ 10000000k
$poi4 attach-agent $udp4

#Traffic sink at destination
set null0 [new Agent/Null]
$ns attach-agent $d(1) $null0

#connect the sink and source
$ns connect $udp1 $null0
$ns connect $udp2 $null0
$ns connect $udp3 $null0
$ns connect $udp4 $null0

#finish procedure
proc finish {} {
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    global ns nf tf
    $ns flush-trace
    close $nf
    close $tf
    exec nam ns2.nam &
    exit 0
}
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#Schedule
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$ns at 0.0 "$poi1 start"
$ns at 20.0 "$poi1 stop"
$ns at 0.0 "$poi2 start"
$ns at 20.0 "$poi2 stop"
$ns at 0.0 "$poi3 start"
$ns at 20.0 "$poi3 stop"
$ns at 0.0 "$poi4 start"
$ns at 20.0 "$poi4 stop"
$ns at 20.0 "finish"
```

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#run simulation
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$ns run
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