**Name – Jain Samkitkumar Hasmukhlal Roll. No. - 20**

**Assignment 6A – LAN**

**Code: -**

set ns [new Simulator]

#Define different colors for data flows (for NAM)

$ns color 1 Blue

$ns color 2 Red

#Open the Trace files

set file1 [open out.tr w]

$ns trace-all $file1

#Open the NAM trace file

set file2 [open out.nam w]

$ns namtrace-all $file2

#Define a 'finish' procedure

proc finish {} {

global ns file1 file2

$ns flush-trace

close $file1

close $file2

exec nam out.nam &

exit 0

}

#Create six 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 color red

$n1 shape box

#Create links between the 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/Csma/Cd Channel]

$ns duplex-link $n3 $n4 0.5Mb 40ms DropTail

$ns duplex-link $n3 $n5 0.5Mb 30ms DropTail

#Give node position (for NAM)

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

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

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

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

$ns duplex-link-op $n3 $n4 orient right-up

$ns duplex-link-op $n3 $n5 orient right-down

$ns queue-limit $n2 $n3 10

#Setup a 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

#Setup a FTP over TCP connection

set ftp [new Application/FTP]

$ftp attach-agent $tcp

$ftp set type\_ FTP

#Setup a UDP connection

set udp [new Agent/UDP]

$ns attach-agent $n1 $udp

set null [new Agent/Null]

$ns attach-agent $n5 $null

$ns connect $udp $null

$udp set fid\_ 2

#Setup a CBR over UDP connection

set cbr [new Application/Traffic/CBR]

$cbr attach-agent $udp

$cbr set type\_ CBR

$cbr set packet\_size\_ 1000

$cbr set rate\_ 0.01mb

$cbr set random\_ false

$ns at 0.1 "$cbr start"

$ns at 1.0 "$ftp start"

$ns at 124.0 "$ftp stop"

$ns at 124.5 "$cbr stop"

$ns at 125.0 "finish"

$ns run

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**Assignment 7B – WSN**

**Code: -**

set val(chan) Channel/WirelessChannel ;# channel type

set val(prop) Propagation/TwoRayGround ;# radio-propagation model

set val(netif) Phy/WirelessPhy ;# network interface type

set val(mac) Mac/802\_11 ;# MAC type

set val(ifq) Queue/DropTail/PriQueue ;# interface queue type

set val(ll) LL ;# link layer type

set val(ant) Antenna/OmniAntenna ;# antenna model

set val(ifqlen) 100 ;# max packet in ifq

set val(nn) 20 ;# number of mobilenodes

set val(rp) AODV ;# protocol tye

set val(x) 50 ;# X dimension of topography

set val(y) 50 ;# Y dimension of topography

set val(stop) 500 ;# simulation period

set val(energymodel) EnergyModel ;# Energy Model

set val(initialenergy) 100 ;# value

set ns [new Simulator]

set tracefd [open sim\_802\_11.tr w]

set namtrace [open sim\_802\_11.nam w]

$ns use-newtrace

$ns trace-all $tracefd

$ns namtrace-all-wireless $namtrace $val(x) $val(y)

# set up topography object

set topo [new Topography]

$topo load\_flatgrid $val(x) $val(y)

create-god $val(nn)

# configure the nodes

$ns node-config -adhocRouting $val(rp) \

-llType $val(ll) \

-macType $val(mac) \

-ifqType $val(ifq) \

-ifqLen $val(ifqlen) \

-antType $val(ant) \

-propType $val(prop) \

-phyType $val(netif) \

-channel [new $val(chan)] \

-topoInstance $topo \

-agentTrace OFF \

-routerTrace OFF \

-macTrace ON \

-movementTrace OFF \

-energyModel $val(energymodel) \

-initialEnergy $val(initialenergy) \

-rxPower 35.28e-3 \

-txPower 31.32e-3 \

-idlePower 712e-6 \

-sleepPower 144e-9

for {set i 0} {$i < $val(nn) } { incr i } {

set mnode\_($i) [$ns node]

}

for {set i 1} {$i < $val(nn) } { incr i } {

$mnode\_($i) set X\_ [ expr {$val(x) \* rand()} ]

$mnode\_($i) set Y\_ [ expr {$val(y) \* rand()} ]

$mnode\_($i) set Z\_ 0

}

# Position of Sink

$mnode\_(0) set X\_ [ expr {$val(x)/2} ]

$mnode\_(0) set Y\_ [ expr {$val(y)/2} ]

$mnode\_(0) set Z\_ 0.0

$mnode\_(0) label "Sink"

for {set i 0} {$i < $val(nn)} { incr i } {

$ns initial\_node\_pos $mnode\_($i) 10

}

#Setup a UDP connection

for {set i 1} {$i < $val(nn) } { incr i } {

set udp($i) [new Agent/UDP]

$ns attach-agent $mnode\_($i) $udp($i)

}

set sink [new Agent/Null]

$ns attach-agent $mnode\_(0) $sink

for {set i 1} {$i < $val(nn) } { incr i } {

$ns connect $udp($i) $sink

}

#Setup a CBR over UDP connection

for {set i 1} {$i < $val(nn) } { incr i } {

set cbr($i) [new Application/Traffic/CBR]

$cbr($i) attach-agent $udp($i)

$cbr($i) set type\_ CBR

$cbr($i) set packet\_size\_ 100

$cbr($i) set maxpkts\_ 100

#$cbr($i) set rate\_ 0.1Mb

$cbr($i) set interval\_ 1

$cbr($i) set random\_ false

}

for {set i 1} {$i < $val(nn) } { incr i } {

$ns at [expr {$i + 5}] "$cbr($i) start"

}

for {set i 1} {$i < $val(nn) } { incr i } {

$ns at [expr $val(stop) - $i] "$cbr($i) stop"

}

# Telling nodes when the simulation ends

for {set i 0} {$i < $val(nn) } { incr i } {

$ns at $val(stop) "$mnode\_($i) reset;"

}

# ending nam and the simulation

$ns at $val(stop) "$ns nam-end-wireless $val(stop)"

$ns at $val(stop) "stop"

$ns at [expr $val(stop) + 0.01] "puts \"end simulation\"; $ns halt"

proc stop {} {

global ns tracefd namtrace

$ns flush-trace

close $tracefd

close $namtrace

}

$ns run