Advanced Computer Network

PRACTICAL NO 8

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**Practical 8 :**

**Aim:** Create MANET simulation for AODVUU Network

**Source Code:**

**Net80211\_control.ned**

**package** inet.examples.manetrouting.net80211\_control;

**import** inet.networklayer.autorouting.ipv4.IPv4NetworkConfigurator;

**import** inet.nodes.inet.AdhocHost;

**import** inet.world.radio.ChannelControl;

**network** Net80211\_control

{

**parameters**:

**int** numHosts;

**int** numFixHosts;

**submodules**:

host[numHosts]: AdhocHost {

**parameters**:

**@display**("i=device/pocketpc\_s;r=,,#707070");

}

fixhost[numFixHosts]: AdhocHost {

**parameters**:

**@display**("i=device/pocketpc\_s;r=,,#707070");

}

channelControl: ChannelControl {

**parameters**:

**@display**("p=60,50;i=misc/sun");

}

configurator: IPv4NetworkConfigurator {

**parameters**:

config=**xml**("<config><interface hosts='\*' address='145.236.x.x' netmask='255.255.0.0'/></config>");

**@display**("p=140,50;i=block/cogwheel\_s");

}

**connections** **allowunconnected**:

}

**omnetpp.ini**

[General]

*#debug-on-errors = true*

sim-time-limit = 3000s

seed-0-mt = 5

network = Net80211\_control

num-rngs = 2

cmdenv-express-mode = **true**

tkenv-plugin-path = ../../../etc/plugins

*#tkenv-default-run = 1*

description = "Aodv Simple test"

\*\*.vector-recording = **false**

\*\*.constraintAreaMinX = 0m

\*\*.constraintAreaMinY = 0m

\*\*.constraintAreaMinZ = 0m

\*\*.constraintAreaMaxX = 1500m

\*\*.constraintAreaMaxY = 1500m

\*\*.constraintAreaMaxZ = 0m

\*.numFixHosts = 1

\*.numHosts = 5

\*.numBasic = 0

\*\*.debug = **true**

\*\*.channelNumber = 0

*# channel physical parameters*

\*.channelControl.pMax = 2.0mW

*# mobility*

*#\*\*.fixhost[0].mobility.initialX = 499*

*#\*\*.fixhost[0].mobility.initialY = 499*

\*\*.mobility.initFromDisplayString = **false**

\*\*.basic[\*].mobilityType = "StationaryMobility"

\*\*.basic[0].mobility.nodeId = 0

\*\*.basic[1].mobility.nodeId = 1

\*\*.basic[2].mobility.nodeId = 2

\*\*.basic[3].mobility.nodeId = 3

\*\*.basic[4].mobility.nodeId = 4

\*\*.basic[5].mobility.nodeId = 5

\*\*.basic[6].mobility.nodeId = 6

\*\*.basic[7].mobility.nodeId = 7

\*\*.basic[8].mobility.nodeId = 8

\*\*.basic[9].mobility.nodeId = 9

\*\*.host[\*].mobilityType = "StationaryMobility"

\*\*.host\*.mobility.traceFile = "escen\_v5\_t500-1.txt"

\*\*.host[0].mobility.nodeId = 0

\*\*.host[1].mobility.nodeId = 1

\*\*.host[2].mobility.nodeId = 2

\*\*.host[3].mobility.nodeId = 3

\*\*.host[4].mobility.nodeId = 4

\*\*.host[5].mobility.nodeId = 5

\*\*.host[6].mobility.nodeId = 6

\*\*.host[7].mobility.nodeId = 7

\*\*.host[8].mobility.nodeId = 8

\*\*.host[9].mobility.nodeId = 9

*#\*\*.host\*.mobilityType = "MassMobility"*

*#\*\*.host\*.mobility.changeInterval = truncnormal(2s, 0.5s)*

*#\*\*.host\*.mobility.changeAngleBy = normal(0deg, 30deg)*

*#\*\*.host\*.mobility.speed = truncnormal(20mps, 8mps)*

*#\*\*.host\*.mobility.updateInterval = 0.1s*

\*\*.host\*.mobility.changeInterval = truncnormal(5s, 0.5s)

\*\*.host\*.mobility.changeAngleBy = normal(0deg, 90deg)

\*\*.host\*.mobility.speed = 2mps

\*\*.host\*.mobility.updateInterval = 0.1s

*# udp apps (on)*

*#\*\*.host[\*].udpApp[\*].typename = "UDPBasicApp"*

*#\*\*.host[0].numUdpApps = 1*

*#\*\*.host[1].numUdpApps = 1*

*#\*\*.host[2].numUdpApps = 1*

*#\*\*.host[3].numUdpApps = 1*

*#\*\*.host[4].numUdpApps = 1*

*#\*\*.host[5].numUdpApps = 1*

*#\*\*.host[6].numUdpApps = 1*

*#\*\*.host[7].numUdpApps = 1*

*#\*\*.host[8].numUdpApps = 1*

*#\*\*.host[9].numUdpApps = 1*

*#\*\*.host[\*].numUdpApps = 0*

*#\*\*.udpApp[0].dest\_addresses = "fixhost[0]"*

*#\*\*.udpApp[0].local\_port = 1234*

*#\*\*.udpApp[0].dest\_port = 1234*

*#\*\*.udpApp[0].message\_length = 4096 # 32 bytes*

*#\*\*.udpApp[0].message\_freq = 0.2*

*# udp apps (on)*

\*\*.host[\*].udpApp[\*].typename = "UDPBasicBurst"

\*\*.host[\*].numUdpApps = 1

\*\*.host[\*].udpApp[0].startTime = uniform(20s,35s)

\*\*.host[\*].udpApp[0].destAddresses = moduleListByNedType("inet.nodes.inet.AdhocHost")

\*\*.udpApp[0].localPort = 1234

\*\*.udpApp[0].destPort = 1234

\*\*.udpApp[0].messageLength = 512B *#*

*#\*\*.udpApp[0].sendInterval = 0.1s*

\*\*.udpApp[0].sendInterval = 0.2s + uniform(-0.001s,0.001s)

\*\*.udpApp[0].burstDuration = 0s

*#\*\*.udpApp[0].activeBurst = true*

\*\*.udpApp[0].chooseDestAddrMode = "perBurst"

\*\*.udpApp[0].sleepDuration = 1s

*# \*\*.udpApp[0].burstDuration = uniform(1s,4s,1)*

*# \*\*.udpApp[0].time\_off = uniform(20s,40s,1)*

\*\*.udpApp[0].stopTime = 0s

*##\*\*.udpApp[0].time\_begin = uniform(0s,4s,1)*

\*\*.udpApp[0].delayLimit = 1000s

\*\*.udpApp[0].destAddrRNG = 1

\*\*.fixhost[\*].udpApp[\*].typename = "UDPSink"

\*\*.fixhost[\*].numUdpApps = 0

\*\*.fixhost[\*].udpApp[0].localPort = 1234

*# tcp apps (off)*

\*\*.numTcpApps = 0

\*\*.tcpAppType = "TelnetApp"

*# ping app (off)*

\*\*.numPingApps = 0

*#\*\*.numPingApps = 1*

*#\*\*.pingApp[0].destAddr = "fixhost[0]"*

*#\*\*.pingApp[0].printPing = true*

*# tcp settings*

\*\*.tcp.mss = 1024

\*\*.tcp.advertisedWindow = 14336 *# 14\*mss*

\*\*.tcp.sendQueueClass = "TCPMsgBasedSendQueue"

\*\*.tcp.receiveQueueClass = "TCPMsgBasedRcvQueue"

\*\*.tcp.tcpAlgorithmClass = "TCPReno"

\*\*.tcp.recordStats = **true**

*# ip settings*

\*\*.routingFile = ""

\*\*.ip.procDelay = 10us

*# \*\*.IPForward = false*

*# ARP configuration*

\*\*.arp.retryTimeout = 1s

\*\*.arp.retryCount = 3

\*\*.arp.cacheTimeout = 100s

*#\*\*.networklayer.proxyARP = true # Host's is hardwired "false"*

*# manet routing*

\*\*.routingProtocol = "OLSR"

*#\*\*.routingProtocol = default*

*# nic settings*

\*\*.wlan[\*].mgmt.frameCapacity = 10

*#\*\*.wlan[\*].mgmt.Willingness = 3*

*#\*\*.wlan[\*].mgmt.Hello\_ival = 2*

*#\*\*.wlan[\*].mgmt.Tc\_ival = 5*

*#\*\*.wlan[\*].mgmt.Mid\_ival = 5*

*#\*\*.wlan[\*].mgmt.use\_mac = false*

*# nic settings*

\*\*.wlan[\*].bitrate = 54Mbps

\*\*.wlan[\*].typename="Ieee80211Nic"

\*\*.wlan[\*].opMode="g"

\*\*.wlan[\*].mac.EDCA = **false**

\*\*.wlan[\*].mgmt.frameCapacity = 10

\*\*.wlan[\*].mac.address = "auto"

\*\*.wlan[\*].mac.maxQueueSize = 14

\*\*.wlan[\*].mac.rtsThresholdBytes = 3000B

\*\*.wlan[\*].mac.basicBitrate = 6Mbps *# 24Mbps*

\*\*.wlan[\*].mac.retryLimit = 7

\*\*.wlan[\*].mac.cwMinData = 31

\*\*.wlan[\*].mac.cwMinBroadcast = 31

\*\*.wlan[\*].mac.slotTime = 9us *#*

\*\*.wlan[\*].mac.AIFSN = 2 *#DIFS*

*# channel physical parameters*

\*.channelControl.carrierFrequency = 2.4GHz

\*.channelControl.pMax = 2.0mW

\*.channelControl.sat = -110dBm

\*.channelControl.alpha = 2

\*.channelControl.numChannels = 1

\*\*.wlan[\*].radio.transmitterPower = 2.0mW

\*\*.wlan[\*].radio.pathLossAlpha = 2

\*\*.wlan[\*].radio.snirThreshold = 4dB *# in dB*

\*\*.wlan[\*].radio.thermalNoise = -110dBm

\*\*.wlan[\*].radio.sensitivity = -90dBm

\*\*.wlan[\*].radio.channelModel = "RAYLEIGH" *#1/2 rayleigh/awgn*

\*\*.wlan[\*].radio.berTableFile = "per\_table\_80211g\_Trivellato.dat"

*#\*\* = default*

\*\*.broadcastDelay=uniform(0s,0.005s)

*#/ parameters : DYMOUM*

[Config DYMOUM]

\*\*.routingProtocol="DYMOUM"

\*\*.no\_path\_acc\_ = **false**

\*\*.reissue\_rreq\_ = **false**

\*\*.s\_bit\_ = **false**

\*\*.hello\_ival\_ = 0

\*\*.MaxPktSec = 20 *#// 10*

\*\*.promiscuous = **false**

\*\*.NetDiameter = 10

\*\*.RouteTimeOut = 3000

\*\*.RouteDeleteTimeOut = 3000\*5 *#//5\*RouteTimeOut*

\*\*.RREQWaitTime = 1000

\*\*.RREQTries = 3

\*\*.noRouteBehaviour = 1

*# // parameters: AODVUU;*

[Config AODVUU]

\*\*.routingProtocol="AODVUU"

\*\*.log\_to\_file = **false**

\*\*.hello\_jittering = **true**

\*\*.optimized\_hellos = **true**

\*\*.expanding\_ring\_search = **true**

\*\*.local\_repair = **true**

\*\*.rreq\_gratuitous = **true**

*#\*\*.debug = false*

\*\*.rt\_log\_interval = 0

\*\*.unidir\_hack = 0

\*\*.internet\_gw\_mode = 0

\*\*.receive\_n\_hellos = 1

\*\*.ratelimit = 1000

\*\*.llfeedback = **false***# //1000*

\*\*.wait\_on\_reboot = 0

\*\*.active\_timeout = 6000 *# // time in ms*

\*\*.internet\_gw\_address = "0.0.0.0"

*# // parameters: DSRUU;*

[Config DSRUU]

\*\*.routingProtocol="DSRUU"

\*\*.PrintDebug = **true**

\*\*.FlushLinkCache = **true**

\*\*.PromiscOperation = **false**

\*\*.UseNetworkLayerAck = **false**

\*\*.BroadcastJitter = 20 *# 20 ms*

\*\*.RouteCacheTimeout = 300 *#300 seconds*

\*\*.SendBufferTimeout = 300*# //30 s*

\*\*.SendBufferSize = -1

\*\*.RequestTableSize = -1

\*\*.RequestTableIds = -1

\*\*.MaxRequestRexmt = -1 *#// 16,*

\*\*.MaxRequestPeriod = 10 *#//10 SECONDS*

\*\*.RequestPeriod = 500 *#//500 MILLISECONDS*

\*\*.NonpropRequestTimeout = 30*# //30 MILLISECONDS*

\*\*.RexmtBufferSize = -1 *#//MAINT\_BUF\_MAX\_LEN*

\*\*.MaintHoldoffTime = 250*# //250 MILLISECONDS*

\*\*.MaxMaintRexmt = 2 *# //2*

\*\*.TryPassiveAcks = **true** *#//1*

\*\*.PassiveAckTimeout = 100*# //100 MILLISECONDS*

\*\*.GratReplyHoldOff = 1 *#, //1 SECONDS*

\*\*.MAX\_SALVAGE\_COUNT = 15 *# //15*

\*\*.LifoSize = 20

\*\*.PathCache = **true**

\*\*.ETX\_Active = **false**

\*\*.ETXHelloInterval = 1 *#, // Second*

\*\*.ETXWindowNumHello = 10

\*\*.ETXRetryBeforeFail = -1

\*\*.RREPDestinationOnly = **false**

\*\*.RREQMaxVisit = 5 *# // Max Number that a RREQ can be processes by a node*

*#// Olsr*

[Config OLSR]

\*\*.routingProtocol="OLSR"

\*\*.Willingness = 3

\*\*.Hello\_ival = 2

\*\*.Tc\_ival = 5

\*\*.Mid\_ival = 5

\*\*.use\_mac = 0 *#1*

\*\*.Mpr\_algorithm = 1

\*\*.routing\_algorithm = 1

\*\*.Link\_quality = 2

\*\*.Fish\_eye = **false**

\*\*.Tc\_redundancy = 3

\*\*.Link\_delay = **true** *#//default false*

\*\*.C\_alpha = 0.2

*#// Olsr\_etx*

[Config OLSR\_ETX]

\*\*.routingProtocol="OLSR\_ETX"

\*\*.Willingness = 3

\*\*.Hello\_ival = 2

\*\*.Tc\_ival = 5

\*\*.Mid\_ival = 5

\*\*.use\_mac = 0 *#1*

\*\*.Mpr\_algorithm = 1

\*\*.routing\_algorithm = 1

\*\*.Link\_quality = 2

\*\*.Fish\_eye = **false**

\*\*.Tc\_redundancy = 3

\*\*.Link\_delay = **true** *#//default false*

\*\*.C\_alpha = 0.2

*#// DSDV*

[Config DSDV\_2]

\*\*.routingProtocol="DSDV\_2"

\*\*.manetrouting.hellomsgperiod\_DSDV = 1s *# //Period of DSDV hello message generation [seconds]*

\*\*.manetrouting.routeLifetime = 5s *# // ;[seconds]*

\*\*.manetrouting.netmask = "255.255.0.0" *# //*

\*\*.manetrouting.MaxVariance\_DSDV = 1

\*\*.manetrouting.RNGseed\_DSDV = 0

[Config DYMO]

\*\*.routingProtocol="DYMO"

[Config Batman]

\*\*.routingProtocol="Batman"

**Output:**

