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: