

# How to create Mobile Ad hoc Network (MANET) in ns2

## Description

Unlike infrastructure based wireless networks, a mobile ad hoc network or MANET does not depend on a fixed infrastructure for its networking operation. MANET is an autonomous and short-lived association of group of mobile nodes that communicate with each other over wireless links. A node can directly communicate to the nodes that lie within its communication range. If a node wants to communicate with a node that is not directly within its communication range, it uses intermediate nodes as routers.

In the aspect of simulation, the primary component in designing a mobile adhoc network is mobility model while the other components include node configuration, random topology, and communication model. In mobility model, the mobility of a node from a location to another location can be enabled using the keyword "setdest" in Tool Command Language (TCL) script. The specifications for a node's target location include x-coordinate, y-coordinate along with the speed. Nodes are configured with the components of channel, networking interface, radio propagation model, Medium Access Control (MAC) protocol, adhoc routing protocol, interface queue, link layer, topography object, and antenna type. In dynamic topology, the neighbors of each node vary with the location of that particular node. Nodes in adhoc network communicate using communication model. The sample14.tcl illustrates the design of mobile adhoc network that consists of 3 mobile nodes. The movements of mobile nodes are confined to an area of 500mX500m with the pause time of 3s. Data transmission is established between nodes using UDP agent and CBR traffic. These intermediate routers forward the packets generated by other nodes to their destination.

```
#Filename: manet.tcl
```

```
##### MOBILIE ADHOC NETWORK #####
```

```
##### MOBILITY MODEL #####
```

```
#####Multiple node Creation and communication model
```

```
using UDP (User Datagram Protocol)and CBR (Constant Bit Rate)#####
```

```

# Simulator Instance Creation
set ns [new Simulator]

#Fixing the co-ordinate of simulation area
set val(x) 500
set val(y) 500

# Define options
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) 50 ;# max packet in ifq
set val(nn) 2 ;# number of mobilenodes
set val(rp) AODV ;# routing protocol
set val(x) 500 ;# X dimension of topography
set val(y) 500 ;# Y dimension of topography
set val(stop) 10.0 ;# time of simulation end

# set up topography object
set topo [new Topography]
$topo load_flatgrid $val(x) $val(y)

# general operational descriptor- storing the hop details in the network
create-god $val(nn)

# configure the nodes
$ns node-config -adhocRouting $val(rp) \
-lIType $val(ll) \
-macType $val(mac) \
-ifqType $val(ifq) \

```

```
-ifqLen $val(ifqlen) \  
-antType $val(ant) \  
-propType $val(prop) \  
-phyType $val(netif) \  
-channelType $val(chan) \  
-topoInstance $topo \  
-agentTrace ON \  
-routerTrace ON \  
-macTrace OFF \  
-movementTrace ON
```

```
# Node Creation
```

```
for {set i 0} {$i < 10} {incr i} {
```

```
set node_($i) [$ns node]
```

```
$node_($i) color black
```

```
}
```

```
#####Defining Communication Between node0 and all  
nodes #####
```

```
for {set i 1} {$i < 10} {incr i} {
```

```
# Defining a transport agent for sending
```

```
set udp [new Agent/UDP]
```

```
# Attaching transport agent to sender node
```

```
$ns attach-agent $node_($i) $udp
```

```
# Defining a transport agent for receiving
```

```
set null [new Agent/Null]
```

```
# Attaching transport agent to receiver node
```

```
$ns attach-agent $node_(0) $null
```

#Connecting sending and receiving transport agents

\$ns connect \$udp \$null

#Defining Application instance

set cbr [new Application/Traffic/CBR]

# Attaching transport agent to application agent

\$cbr attach-agent \$udp

#Packet size in bytes and interval in seconds definition

\$cbr set packetSize\_ 512

\$cbr set interval\_ 0.1

# data packet generation starting time

\$ns at 1.0 "\$cbr start"

# data packet generation ending time

#\$ns at 6.0 "\$cbr stop"

}

