

```

set val(chan) Channel/WirelessChannel
set val(prop)
Propagation/TwoRayGround ;
set val(netif) Phy/WirelessPhy ;
set val(mac) Mac/802_11 ;
set val(ifq) Queue/DropTail/PriQueue
;
set val(ll) LL ;
set val(ant) Antenna/OmniAntenna ;
set val(ifqlen) 50 ;
set val(nn) 20 ;
set val(rp) AODV ;
set val(x) 1500 ;
set val(y) 1500 ;
set val(stop) 50.0 ;
Mac/802_11 set cdma_code_bw_start_ 0
;#cdma code
Mac/802_11 set cdma_code_bw_stop_ 63
Mac/802_11 set cdma_code_init_start_ 64
Mac/802_11 set cdma_code_init_stop_
127
Mac/802_11 set cdma_code_cqich_start_
128
Mac/802_11 set cdma_code_cqich_stop_
195
Mac/802_11 set
cdma_code_handover_start_ 196
Mac/802_11 set
cdma_code_handover_start_ 196
set f0 [open throughput.tr w]
set f1 [open lost.tr w]
set f2 [open delay.tr w]
set ns [new Simulator]
set topo [new Topography]
$topo load_flatgrid $val(x) $val(y)
create-god $val(nn)
set tracefile [open 10.tr w]
$ns trace-all $tracefile
set namfile [open 10.nam w]
$ns namtrace-all $namfile
$ns namtrace-all-wireless $namfile
$val(x) $val(y)
set chan [new $val(chan)];#Create
wireless channel

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set namfile [open 10.nam w]
$ns namtrace-all $namfile
$ns namtrace-all-wireless $namfile
$val(x) $val(y)
set chan [new $val(chan)];#Create
wireless channel
$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 $chan \
-topoInstance $topo \
-agentTrace ON \
-routerTrace ON \
-macTrace ON \
-movementTrace ON
#Create 20 nodes
set n0 [$ns node]
$n0 set X_ 286
$n0 set Y_ 412
$n0 set Z_ 0.0
$ns initial_node_pos $n0 20
set n1 [$ns node]
$n1 set X_ 451
$n1 set Y_ 408
$n1 set Z_ 0.0
$ns initial_node_pos $n1 20
set n2 [$ns node]
$n2 set X_ 620
$n2 set Y_ 401
$n2 set Z_ 0.0
$ns initial_node_pos $n2 20
set n3 [$ns node]
$n3 set X_ 790
$n3 set Y_ 404
$n3 set Z_ 0.0
$ns initial_node_pos $n3 20
set n4 [$ns node]
$n4 set X_ 959

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\$n4 set Y\_ 399  
\$n4 set Z\_ 0.0  
\$ns initial\_node\_pos \$n4 20  
set n5[\$ns node]  
\$n5 set X\_ 957  
\$n5 set Y\_ 298  
\$n5 set Z\_ 0.0  
\$ns initial\_node\_pos \$n5 20  
set n6 [\$ns node]  
\$n6 set X\_ 790  
\$n6 set Y\_ 295  
\$n6 set Z\_ 0.0  
\$ns initial\_node\_pos \$n6 20  
set n7 [\$ns node]  
\$n7 set X\_ 623  
\$n7 set Y\_ 293  
\$n7 set Z\_ 0.0  
\$ns initial\_node\_pos \$n7 20  
set n8 [\$ns node]  
\$n8 set X\_ 455  
\$n8 set Y\_ 297  
\$n8 set Z\_ 0.0  
\$ns initial\_node\_pos \$n8 20  
set n9 [\$ns node]  
\$n9 set X\_ 290  
\$n9 set Y\_ 299  
\$n9 set Z\_ 0.0  
\$ns initial\_node\_pos \$n9 20  
set n10 [\$ns node]  
\$n10 set X\_ 297  
\$n10 set Y\_ 204  
\$n10 set Z\_ 0.0  
\$ns initial\_node\_pos \$n10 20  
set n11 [\$ns node]  
\$n11 set X\_ 455  
\$n11 set Y\_ 211  
\$n11 set Z\_ 0.0  
\$ns initial\_node\_pos \$n11 20  
set n12 [\$ns node]  
\$n12 set X\_ 623  
\$n12 set Y\_ 207  
\$n12 set Z\_ 0.0  
\$ns initial\_node\_pos \$n12 20  
set n13 [\$ns node]

\$n13 set X\_ 811  
\$n13 set Y\_ 208  
\$n13 set Z\_ 0.0  
\$ns initial\_node\_pos \$n13 20  
set n14 [\$ns node]  
\$n14 set X\_ 970  
\$n14 set Y\_ 203  
\$n14 set Z\_ 0.0  
\$ns initial\_node\_pos \$n14 20  
set n15 [\$ns node]  
\$n15 set X\_ 969  
\$n15 set Y\_ 98  
\$n15 set Z\_ 0.0  
\$ns initial\_node\_pos \$n15 20  
set n16 [\$ns node]  
\$n16 set X\_ 812  
\$n16 set Y\_ 91  
\$n16 set Z\_ 0.0  
\$ns initial\_node\_pos \$n16 20  
set n17 [\$ns node]  
\$n17 set X\_ 603  
\$n17 set Y\_ 90  
\$n17 set Z\_ 0.0  
\$ns initial\_node\_pos \$n17 20  
set n18 [\$ns node]  
\$n18 set X\_ 454  
\$n18 set Y\_ 90  
\$n18 set Z\_ 0.0  
\$ns initial\_node\_pos \$n18 20  
set n19 [\$ns node]  
\$n19 set X\_ 311  
\$n19 set Y\_ 96  
\$n19 set Z\_ 0.0  
\$ns initial\_node\_pos \$n19 20  
set udp0 [new Agent/UDP]  
\$ns attach-agent \$n0 \$udp0  
set sink [new Agent/LossMonitor]  
\$ns attach-agent \$n14 \$sink  
\$ns connect \$udp0 \$sink  
\$udp0 set packetSize\_ 1500  
set cbr0 [new Application/Traffic/CBR]  
\$cbr0 attach-agent \$udp0  
\$cbr0 set packetSize\_ 1000

```

$cbro set rate_ 1.0Mb
$cbro set random_ null
$ns at 1.0 "$cbro start"
$ns at 50.0 "$cbro stop"
set holdtime 0
set holdseq 0
set holdrate1 0
proc record {} {
    global sink f0 f1 f2 holdtime holdseq
    holdrate1
    set nsi [Simulator instance]
    set time 0.9 ;#Set sampling time to 0.9
    sec
    set bw0 [$sink set bytes_]
    puts "$bw0"
    set bw1 [$sink set nlost_]
    set bw2 [$sink set lastPktTime_]
    set bw3 [$sink set npkts_]
    set now [$nsi now]

    puts $f0 "$now [expr (($bw0+
    $holdrate1)*8)/(2*$time*1000000)]"
    puts $f1 "$now [expr $bw1/$time]"
    if { $bw3 > $holdseq } {
        puts $f2 "$now [expr ($bw2 -
        $holdtime)/($bw3-$holdseq)]"
    } else {
        puts $f2 "$now [expr ($bw3-$holdseq)]"
    }
    $sink set bytes_ 0
    $sink set nlost_ 0
    set holdtime $bw2
    set holdseq $bw3
    set holdrate1 $bw0
    $nsi at [expr $now+$time] "record"
    ;#schedule record after $time interval sec
}
$ns at 0.0 "record"
$ns at 1.0 "$cbro start"
$ns at 50.0 "$cbro stop"
$ns at 2.0 "$n0 setdest 400 600 20"
$ns at 2.0 "$n1 setdest 500 650 20"

$ns at 2.0 "$n2 setdest 600 700 20"
$ns at 2.0 "$n3 setdest 700 750 20"
$ns at 2.0 "$n4 setdest 800 800 20"
$ns at 2.0 "$n5 setdest 900 950 20"
$ns at 2.0 "$n6 setdest 1000 1000 20"
$ns at 2.0 "$n7 setdest 1100 1050 20"
$ns at 10.0 "$n8 setdest 1150 1100 20"
$ns at 10.0 "$n9 setdest 1200 1150 20"
$ns at 10.0 "$n10 setdest 100 100 20"
$ns at 10.0 "$n11 setdest 200 150 20"
$ns at 10.0 "$n12 setdest 300 200 20"
$ns at 10.0 "$n13 setdest 400 250 20"
$ns at 10.0 "$n14 setdest 500 300 20"
$ns at 10.0 "$n15 setdest 600 550 20"
$ns at 10.0 "$n16 setdest 300 500 20"
$ns at 10.0 "$n17 setdest 300 550 20"
$ns at 2.0 "$n18 setdest 900 500 20"
$ns at 2.0 "$n19 setdest 1000 550 20"
$ns at 0.5 "$n0 add-mark m blue square"
$ns at 0.5 "$n14 add-mark m red square"
$ns at 0.5 "$n0 label source"
$ns at 0.5 "$n14 label Destination"

proc finish {} {
    global ns tracefile namfile
    $ns flush-trace
    close $tracefile
    close $namfile
    exec nam 10.nam &
    exec xgraph throughput.tr &
    exec xgraph lost.tr &
    exec xgraph delay.tr &
    exit 0
}
for {set i 0} {$i < $val(nn)} {incr i} {
    $ns at $val(stop) "\"$n$i reset"
}
$ns at $val(stop) "$ns nam-end-wireless
$val(stop)"
$ns at $val(stop) "finish"
$ns at $val(stop) "puts \"done\" ; $ns halt"
$ns run

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