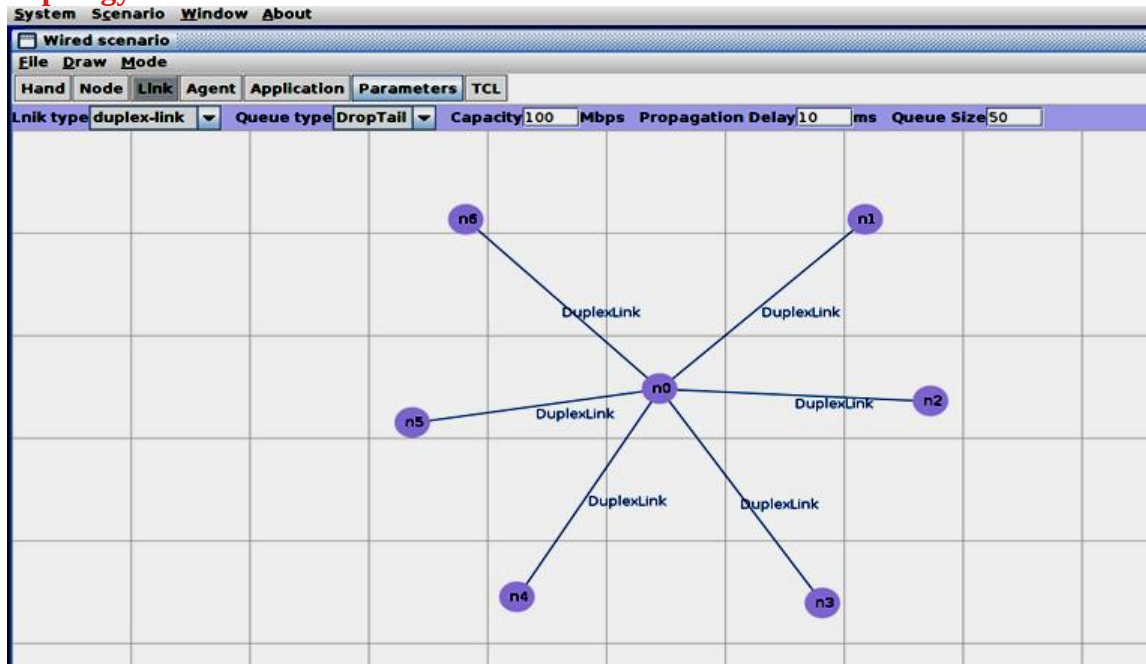


**2.Implement transmission of ping messages/trace route over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion.**

## Topology



## p2.tcl

```
#=====
#   Simulation parameters setup
#=====
set val(stop) 10.0 ; # time of simulation end

#=====
#   Initialization
#=====
#Create a ns simulator
set ns [new Simulator]

#Open the NS trace file
set tracefile [open p2.tr w]
$ns trace-all $tracefile

#Open the NAM trace file
set namfile [open p2.nam w]
$ns namtrace-all $namfile

#=====
#   Nodes Definition
#=====
#Create 7 nodes
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]
```

```
set n3 [$ns node]
set n4 [$ns node]
set n5 [$ns node]
set n6 [$ns node]
```

```
#=====
```

## # Links Definition

```
#=====
```

### #Createlinks between nodes

```
$ns duplex-link $n0 $n1 1.0Mb 10ms DropTail
$ns queue-limit $n0 $n1 50
$ns duplex-link $n0 $n2 1.0Mb 10ms DropTail
$ns queue-limit $n0 $n2 50
$ns duplex-link $n0 $n3 1.0Mb 5ms DropTail
$ns queue-limit $n0 $n3 50
$ns duplex-link $n0 $n4 1.0Mb 8ms DropTail
$ns queue-limit $n0 $n4 2
$ns duplex-link $n0 $n5 1.0Mb 2ms DropTail
$ns queue-limit $n0 $n5 2
$ns duplex-link $n0 $n6 1.0Mb 10ms DropTail
$ns queue-limit $n0 $n6 1
```

### #Give node position (for NAM)

```
$ns duplex-link-op $n0 $n1 orient right-up
$ns duplex-link-op $n0 $n2 orient right
$ns duplex-link-op $n0 $n3 orient right-down
$ns duplex-link-op $n0 $n4 orient left-down
$ns duplex-link-op $n0 $n5 orient left-down
$ns duplex-link-op $n0 $n6 orient left-up
```

```
#=====
```

## # Agents Definition

```
#=====
```

```
Agent/Ping instproc recv {from rtt} {
$self instvar node_
puts "node [$node_ id] received ping answer from $from with round-trip time $rtt ms." }
#=====
```

## # Applications Definition

```
#=====
```

```
set p1 [new Agent/Ping]
set p2 [new Agent/Ping]
set p3 [new Agent/Ping]
set p4 [new Agent/Ping]
set p5 [new Agent/Ping]
set p6 [new Agent/Ping]
$ns attach-agent $n1 $p1
$ns attach-agent $n2 $p2
$ns attach-agent $n3 $p3
$ns attach-agent $n4 $p4
$ns attach-agent $n5 $p5
```

```

$ns attach-agent $n6 $p6
$ns connect $p1 $p4
$ns connect $p2 $p5
$ns connect $p3 $p6
$ns at 0.2 "$p1 send"
$ns at 0.4 "$p2 send"
$ns at 0.6 "$p3 send"
#=====
#      Termination
#=====
#Define a 'finish' procedure
proc finish {} {
    global ns tracefile namfile
    $ns flush-trace
    close $tracefile
    close $namfile
    exec nam p2.nam &
    exit 0
}
$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

```

### **p2.awk**

```

BEGIN {
    drop = 0;
}
{
    if($1 == "d")
    {
        drop++;
    }
}
END {
    printf("Total number of packets dropped due to the congestion: %d\n",drop);
}

```

### **Results**

