**#A network consists of three nodes(n0-n2)**

**Link existence (duplex in nature) between the nodes is as follows: n0-n1 and n1-n2**

**The link n0-n1 has 10Kbps of bandwidth and 100 ms delay**

**The link n1-n2 has 5 Mbps of bandwidth and 200ms delay**

**Node n0 is having some data to send to node n2 through n1, which is a hub device.**

**Each node uses DropTail queue of which the maximum size is 10**

**Write a TCL script to observe the packet flow for the given network in network animator (NAM)**

## File name : 1.tcl

```
# Create Simulator
set ns [new Simulator]

# Open trace files
set trf [open 1.tr w]
$ns trace-all $trf

set namf [open 1.nam w]
$ns namtrace-all $namf

# Create nodes
set n0 [$ns node]
set n1 [$ns node]
set n2 [$ns node]

$n0 label "source node"
```

```
$n1 label "Intermediate node"
$n2 label "destination node"

# Create links
$ns duplex-link $n0 $n1 100Kb 100ms DropTail
$ns duplex-link $n1 $n2 5Mb 200ms DropTail

# Queue limit between n0 and n1
$ns queue-limit $n0 $n1 10

# ------------------------------
# Create TCP Agent (Data packets)
# ------------------------------
set tcp [new Agent/TCP]
$tcp set fid_ 1         ;# Data Flow ID
$ns color 1 Blue        ;# Data packets color
$ns attach-agent $n0 $tcp

# -------------------------------
# Create TCP Sink (ACK packets)
# -------------------------------
set sink [new Agent/TCPSink]
$sink set fid_ 2        ;# ACK Flow ID
$ns color 2 Red         ;# ACK packets color
$ns attach-agent $n2 $sink

# Connect agents
$ns connect $tcp $sink

# FTP application
set ftp [new Application/FTP]
$ftp attach-agent $tcp

# Packet size and interval
```

```
$ftp set packetSize_ 500
$ftp set interval_ 0.001

# Finish procedure
proc finish {} {
   global ns trf namf
   $ns flush-trace
   close $trf
   close $namf
   exec nam 1.nam &
   exit 0
}

# Simulation events
$ns at 0.1 "$ftp start"
$ns at 10.0 "finish"

# Run simulation
$ns run
```

Execution steps:

```
gedit 1.tcl
ns 1.tcl
gedit 1.awk
```

to open trace file

```
gedit 1.tr
awk -f 1.awk 1.tr
```