```
set ns [new Simulator]

set tracefile [open t4.tr w]
$ns trace-all $tracefile;

$ns color 1 red;
$ns color 2 blue;

set namfile [open t4.nam w]
$ns namtrace-all $namfile;

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 [$ns node]
set n7 [$ns node]

$n0 shape "circle";
$n1 shape "square";
$n2 shape "circle";
$n3 shape "circle";
$n4 shape "circle";
$n5 shape "circle";
$n6 shape "circle";
$n7 shape "circle";

$n0 label "TCP-SOURCE";
$n1 label "UDP-SOURCE";
$n2 label "Router";
$n3 label "Router";
$n6 label "TCP-Sink";
$n7 label "UDP-Null";

set tcp0 [new Agent/TCP]
```

```
$ns attach-agent $n0 $tcp0

set sink6 [new Agent/TCPSink]
$ns attach-agent $n6 $sink6

$ns connect $tcp0 $sink6

$ns duplex-link $n0 $n2 1.0Mb 10ms DropTail
$ns duplex-link $n1 $n2 1.0Mb 10ms DropTail
$ns duplex-link $n2 $n3 2.0Mb 10ms DropTail
$ns duplex-link $n3 $n4 1.0Mb 10ms DropTail
$ns duplex-link $n3 $n5 1.0Mb 10ms DropTail
$ns duplex-link $n4 $n6 1.0Mb 10ms DropTail
$ns duplex-link $n5 $n7 1.0Mb 10ms DropTail

$ns duplex-link-op $n0 $n2 orient right-down
$ns duplex-link-op $n1 $n2 orient right-up
$ns duplex-link-op $n2 $n3 orient right
$ns duplex-link-op $n3 $n4 orient right-up
$ns duplex-link-op $n3 $n5 orient right-down
$ns duplex-link-op $n4 $n6 orient right
$ns duplex-link-op $n5 $n7 orient right

set udp1 [new Agent/UDP]
$ns attach-agent $n1 $udp1

set null7 [new Agent/Null]
$ns attach-agent $n7 $null7

$ns connect $udp1 $null7

set ftp0 [new Application/FTP]
$ftp0 attach-agent $tcp0

set cbr0 [new Application/Traffic/CBR]
$cbr0 attach-agent $udp1
$cbr0 set rate_ 0.5Mb
```

```
$tcp0 set packetSize_ 1500
$udp1 set packetSize_ 1500

$tcp0 set fid_ 1
$udp1 set fid_ 2

$ns at 0.1 "$cbr0 start"
$ns at 10.0 "$cbr0 stop"

$ns at 0.1 "$ftp0 start"
$ns at 10.0 "$ftp0 stop"

proc finish {} {
        global ns tracefile namfile
        $ns flush-trace
        close $tracefile
        close $namfile
        exec nam t4.nam &
        exec awk -f term4.awk t4.tr &
        exec xgraph data.dat -geometry 800*400 "Throughput" -y "Bandwidth" -
bg white &
        exit 0
}
$ns at 10.1 "finish";
$ns run;
```

Awk file:

```
BEGIN {
     count=0;
     time=0;
     dp=0;
}
{
     if($1=="r"&&$3==2&&$4==3)
```

```
    {
      count+= $6;
      time=$2;
    }
    if( $1=="d")
    {
      cp+=1;
    }
}
END{
   printf("\n Total amount of data sent %d",count);
   printf("\n Total time of data trasmission %if",time);
   printf("\n Throughput:%if Mbps",(count/time)*(8/1000000));
   printf("\n Packet Dropped=%d\n",cp);
```