2) Set up the network topology as Shown in figure .Simulate different types of internet traffic. Such as traffic wing top FTP between the nodes n1-n6 and Telnet between the nodes n2-n5. Pilot congestion window for FTP and Telnet and analyse the throughput.

Save this file as p2.tcl:

```
set ns [new Simulator]
set tf [open prog2.tr w]
$ns trace-all $tf
set nf [open prog2.nam w]
$ns namtrace-all $nf
set cwind [open win2.tr w]

set n1 [$ns node]
set n2 [$ns node]
set n3 [$ns node]
set n4 [$ns node]
set n5 [$ns node]
set n6 [$ns node]

$ns duplex-link $n1 $n3 2Mb 2ms DropTail
$ns duplex-link $n2 $n3 1Mb 2ms DropTail
$ns duplex-link $n3 $n4 2Mb 2ms DropTail
$ns duplex-link $n4 $n5 2Mb 2ms DropTail
$ns duplex-link $n4 $n6 2Mb 2ms DropTail

set tcp0 [new Agent/TCP]
$ns attach-agent $n1 $tcp0
set sink0 [new Agent/TCPSink]
$ns attach-agent $n6 $sink0
$ns connect $tcp0 $sink0

set ftp0 [new Application/FTP]
$ftp0 attach-agent $tcp0
$ns at 1.1 "$ftp0 start"

set tcp1 [new Agent/TCP]
$ns attach-agent $n2 $tcp1
set sink1 [new Agent/TCPSink]
$ns attach-agent $n5 $sink1
$ns connect $tcp1 $sink1

set tel1 [new Application/Telnet]
$tel1 attach-agent $tcp1

$ns at 0.1 "$tel1 start"
$ns at 10 "finish"

$ns color 1 Blue
$ns color 2 Red
```

```
$tcp0 set fid_ 1
$tcp1 set fid_ 2

proc plotWindow {tcpSource file} {
        global ns
        set time 0.01
        set now [$ns now]
        set cwnd0 [$tcpSource set cwnd_]
        puts $file "$now $cwnd0"
        $ns at [expr $now+$time] "plotWindow $tcpSource $file"
        }

$ns at 2.0 "plotWindow $tcp0 $cwind"
$ns at 5.5 "plotWindow $tcp1 $cwind"

proc finish {} {
        global ns tf nf cwind
        $ns flush-trace
        close $nf
        close $tf
        puts "Running nam..."
        exec nam prog2.nam &
        exec xgraph win2.tr &
        exit 0
}

$ns run
```

save this file as p2.awk:

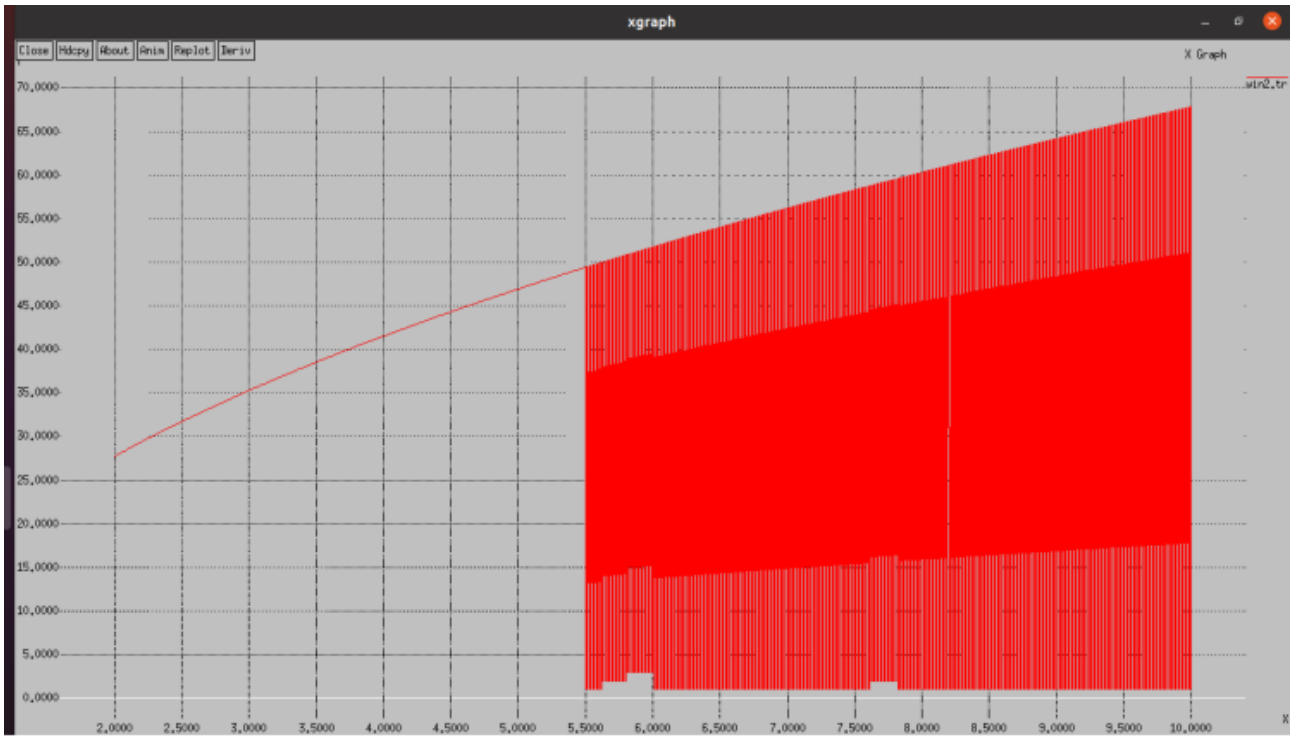
```
BEGIN{
last=0
tcp_sz=0
}{
cbr_sz=0
total_sz=0
}
{
action=$1;
time=$2;
from=$3;
to=$4;
type=$5;
pktsize=$6;
flow_id=$8;
src=$9;
dst=$10;
seq_no=$11;
packet_id=$12;
if(type=="tcp" && action=="r" && to=="3")
```

```
tcp_sz+=pktsize
if(type=="cbr" && action=="r" && to=="3")
cbr_sz+=pktsize
total_sz+=pktsize
}
END{
print time,(tcp_sz*8/1000000)
print time,(tcp_sz*8/1000000),(total_sz*8/1000000)
}
```

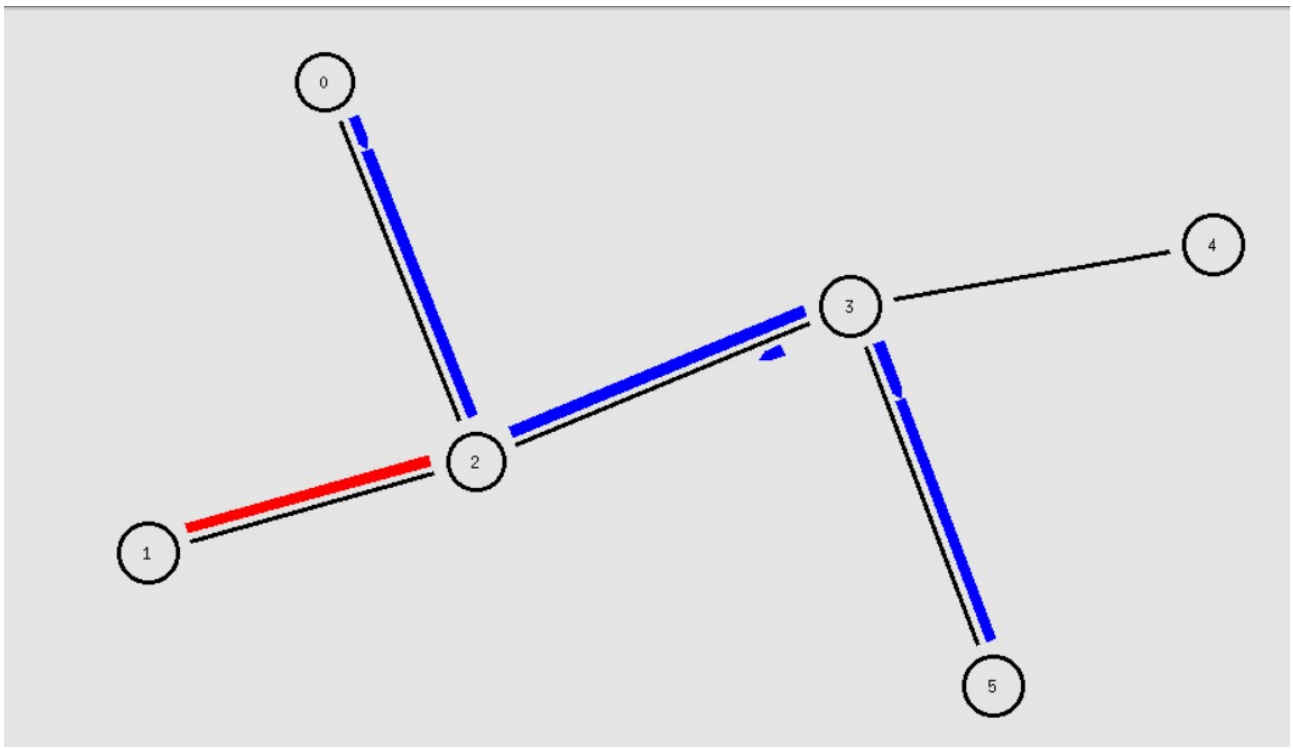
Execution commands:

1) ns p2.tcl
2) awk -f p2.awk prog2.tr

Outputs:




```
9.99872 17.7222
9.99872 17.7222 0.00832
```


0
1
2
3
4
5