

PROGRAM - IV

8/2/19

Consider a client and a server. The server is running a FTP application over TCP. The client sends a request to download a file of size 10 MB from the server. Write a TCP script to simulate the scenario. Let node n0 be the server and node n1 be the client. TCP packet size is 1500 bytes.

Set ns [new simulator]

Set t.f [open out 4. tr w]

traces trace-all \$tf

Set of [open out4 nam w]

Set of $\text{nontrace} - \text{all } \text{set}$

Set no [fns node]

```
set n1 [puts node]
```

\$no label "S"

\$n_1\$ label "C"

\$ns duplex-link \$no \$nl 10Mb 22ms DropTail

\$n5 duplex
\$n5 duplex-link-op \$n0 \$n1 orient right

```
set tcp0 [new Agent / TCP]
```

\$ns attach-agent \$no \$tcpo

```
$tcp0 set packetsize - 1500
```

set Sink0 [new Agent / TCPSink]

\$ns attach-agent \$ns \$sinko

\$ne connect
set fipo
f fipo
f fipo
\$ne color
\$ne at
\$ne at
\$ne at
proc fipo
cl

3
\$ns

ns

Output

\$ns connect \$tcp0 \$src \$dst

set ftp0 [new Application / FTP]

\$ftp0 attach-agent \$tcp0

\$tcp0 set fd -1

\$ns color \$ blue

\$ns at 0.1 "\$ftp0 start"

\$ns at 4.5 "\$ftp0 stop"

\$ns at 5.0 "finish"

proc finish {}

global ns tf nf

\$ns flush-trace

close \$tf

close \$nf

exec nam out4.nam &

exec awk -f en5transfer.awk out4.tr &

exec awk -f en5convert.awk out4.tr >
convert.tr &

exec xgraph convert.tr -geometry 800x400

-t "bytes-received-at-client" -x

"time-in-sec" -y "bytes-in-bps" &

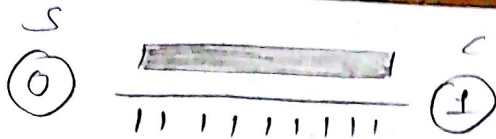
exit 0

}

\$ns run

//ns p4.tcl

Output:



transmission time required to transfer file = 4.54400
 actual data sent from server is 2.8937 mbps
 data received by client is 2.893700 mbps

awk script:-

// ex5 convert.awk

```
BEGIN {
    count = 0;
    time = 0;
}
{
    if ($1 == "r" & $4 == 1 & $5 == "tcp")
    {
        count = $6;
        time = $2;
        printf (" %10.2f %10.2f\n", time,
            (count) / 1000000);
    }
}
END {
}
```

O/p:-

3.940224	0.001540
3.941456	0.001540
,	,
4.521264	0.001540
4.522496	0.001540

awk script:
 // ex5 transfer

BEGIN {

count
 time
 to
 do

y

{ if C \$

if C \$

}

END

print

print

print

y

O/p:-

transmission

actual d

data re

awk script:
//ex5-transfer.awk

BEGIN {

count = 0;

time = 0;

total-bytes-sent = 0;

total-bytes-received = 0;

}

{ if (\$1 == "x" && \$4 == 1 && \$5 == "tcp")

total-bytes-received += \$6;

if (\$1 == "t" && \$3 == 0 && \$5 == "tcp")

total-bytes-sent += \$6;

}

END {

printf ("transmission time required to
transfer file = %.f \n", \$2);

printf ("actual data sent from server is
%.f Mbps \n", total-bytes-sent/
1000000);

printf ("data received by client is %.f Mbps",
total-bytes-received/1000000);

}

O/p:-

transmission time required to transfer file = 4.1744528
actual data sent from server is 2.8937 Mbps
data received by client is 2.893700 Mbps

Trace Analysis:-

-	0.122032	1	0	ack	40	-	.	1	1.0	0.0	0	1
8	0.144064	1	0	ack	40	-	.	1	1.0	0.0	0	1
+	0.144064	0	1	tcp	1520	-	.	1	0.0	1.0	1	2

Simulation output:-

grep -c "d" out4.tr

0

grep -c "8" out4.tr

3760