

# CS-342 Computer Networks Assignment 04

Group No. 61

Group Members:

**NAMAN GOYAL - 180123029**

**AYAZ ANIS - 180123007**

## Application No. 01

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### Part 1.

Size of the packet chosen : 1.3 KB (  $1.3 * 1024$  Bytes).

No of such packets chosen : 1000000

Comparing TCP Hybla, TCP Westwood+, and TCP YeAH-TCP Performances.

Around 1-2 mins were allotted for execution.

Plots of Congestion Window, Throughput, Goodput observed are mentioned below.

Q. How to run the q1.cc file?

- Put the q1.cc file in the scratch directory in the ns3.32 directory. Run the following command in ns3.32 directory to execute the file  
**\$ ./waf --run scratch/q1**
- The following output is generated:

```
naman-ubuntu@naman-ubuntu:~/Downloads/ns-allinone-3.32/ns-3.32$ ./waf --run scratch/q1
Waf: Entering directory `/home/naman-ubuntu/Downloads/ns-allinone-3.32/ns-3.32/build'
[2714/2762] Compiling scratch/q1.cc
[2723/2762] Linking build/scratch/q1
Waf: Leaving directory `/home/naman-ubuntu/Downloads/ns-allinone-3.32/ns-3.32/build'
Build commands will be stored in build/compile_commands.json
'build' finished successfully (10.962s)
Establishing the connection's transfer rates
Concatenating H1 with R1
Concatenating H2 with R1
Concatenating H3 with R1
Concatenating H4 with R2
Concatenating H5 with R2
Concatenating H6 with R2
Concatenating R1 with R2

Installing connections in the network (Dumbbell Topology)

Assigning IP addresses
H1 address : 102.115.1.0
H2 address : 102.115.2.0
H3 address : 102.115.3.0
H4 address : 102.115.5.0
H5 address : 102.115.6.0
H6 address : 102.115.7.0
R1 address : 102.115.4.0

Establishing TCP YeAH-TCP Simulation

Establishing TCP Hybla Simulation

Establishing TCP Westwood+ Simulation

Running the flow monitor for analysing the code
Simulation Ended
naman-ubuntu@naman-ubuntu:~/Downloads/ns-allinone-3.32/ns-3.32$ |
```

## Observations:

### 1. TCP HYBLA

TCP Hybla flow (102.115.2.1 -> 102.115.6.1)

Total Packet Loss : 113

Packet Lost due to buffer overflow : 0

Packet Lost due to Congestion : 113

Maximum throughput (in kbps) : 1320.525677

Total Packets transmitted : 1000000

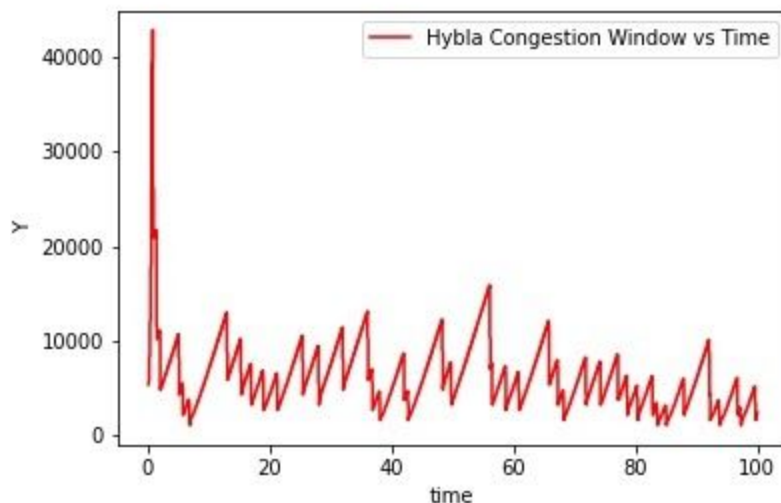
Packets Successfully Transferred : 999887

Percentage of packet loss (total) : 0.011300

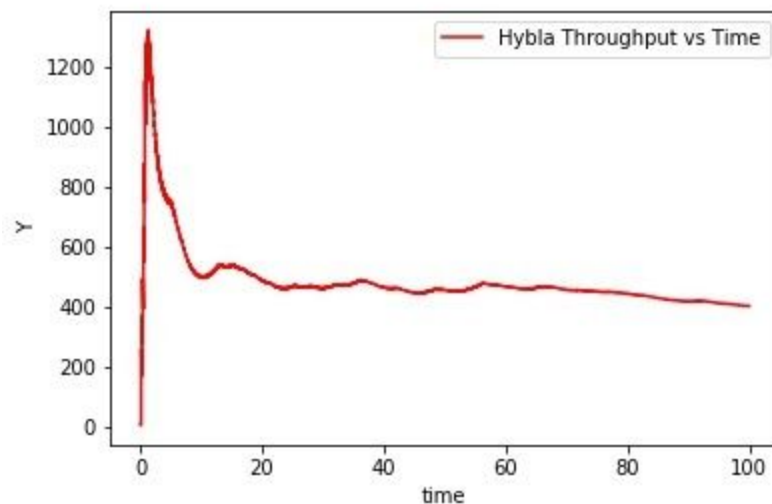
Percentage of packet loss (due to Buffer Overflow) : 0.000000

Percentage of packet loss (due to Congestion) : 0.011300

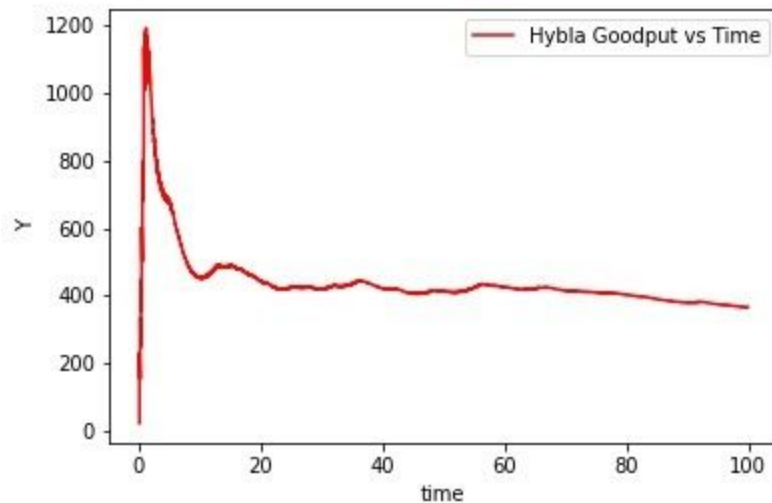
### A. Congestion Window v/s Time



### B. ThroughPut v/s Time



### C. GoodPut v/s Time



### 2. TCP WestWood+

TCP Westwood+ flow (102.115.3.1 -> 102.115.7.1)

Total Packet Loss : 98

Packet Lost due to buffer overflow : 0

Packet Lost due to Congestion : 98

Maximum throughput (in kbps) : 2018.545397

Total Packets transmitted : 1000000

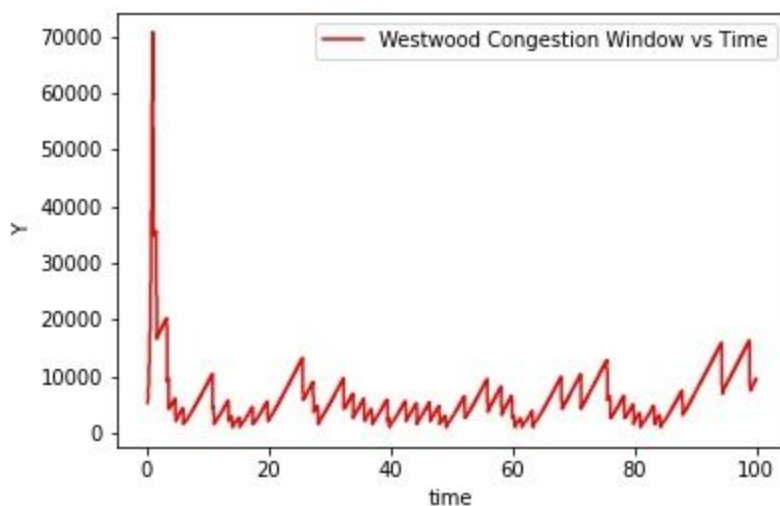
Packets Successfully Transferred : 999902

Percentage of packet loss (total) : 0.009800

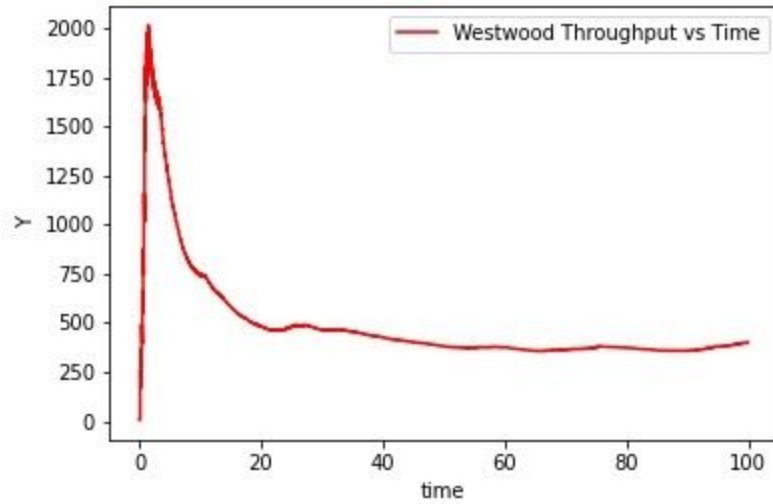
Percentage of packet loss (due to Buffer Overflow) : 0.000000

Percentage of packet loss (due to Congestion) : 0.009800

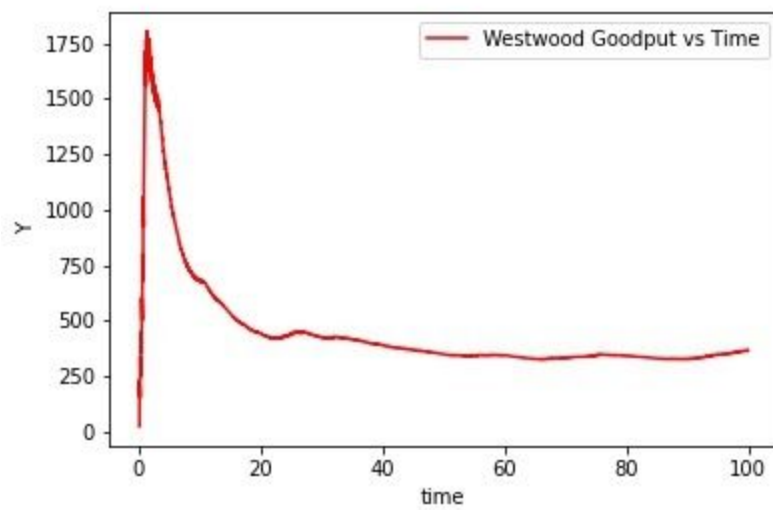
### A. Congestion Window v/s Time



## B. ThroughPut v/s Time



## C. GoodPut v/s Time



### 3. TCP YeAH-TCP

TCP Yeah flow 1 (102.115.1.1 -> 102.115.5.1)

Total Packet Loss : 99

Packet Lost due to buffer overflow : 0

Packet Lost due to Congestion : 99

Maximum throughput (in kbps) : 856.937894

Total Packets transmitted : 1000000

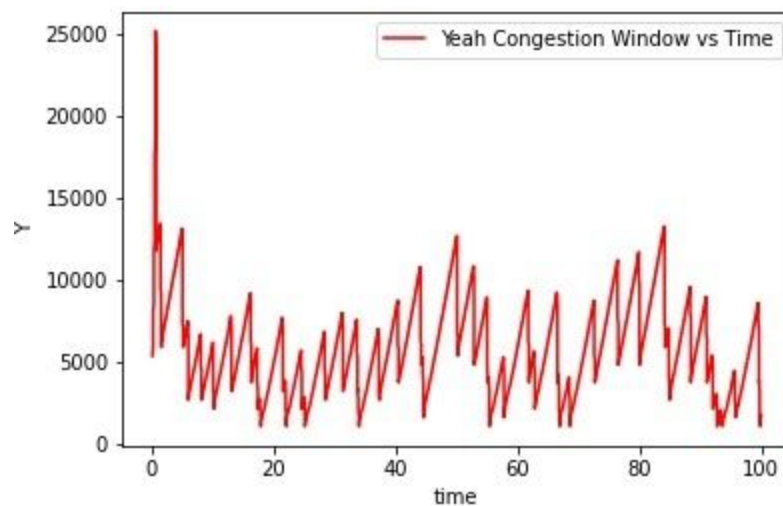
Packets Successfully Transferred : 999901

Percentage of packet loss (total) : 0.009900

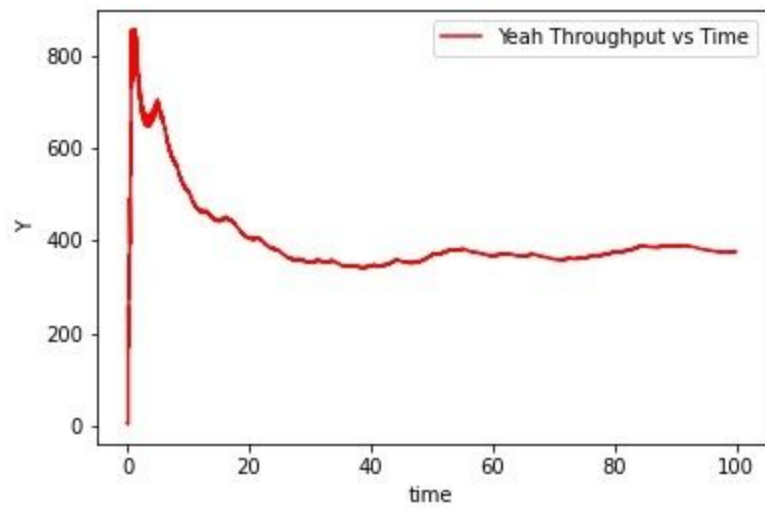
Percentage of packet loss (due to Buffer Overflow) : 0.000000

Percentage of packet loss (due to Congestion) : 0.009900

#### A. Congestion Window v/s Time



## B. ThroughPut v/s Time



## C. GoodPut v/s Time

