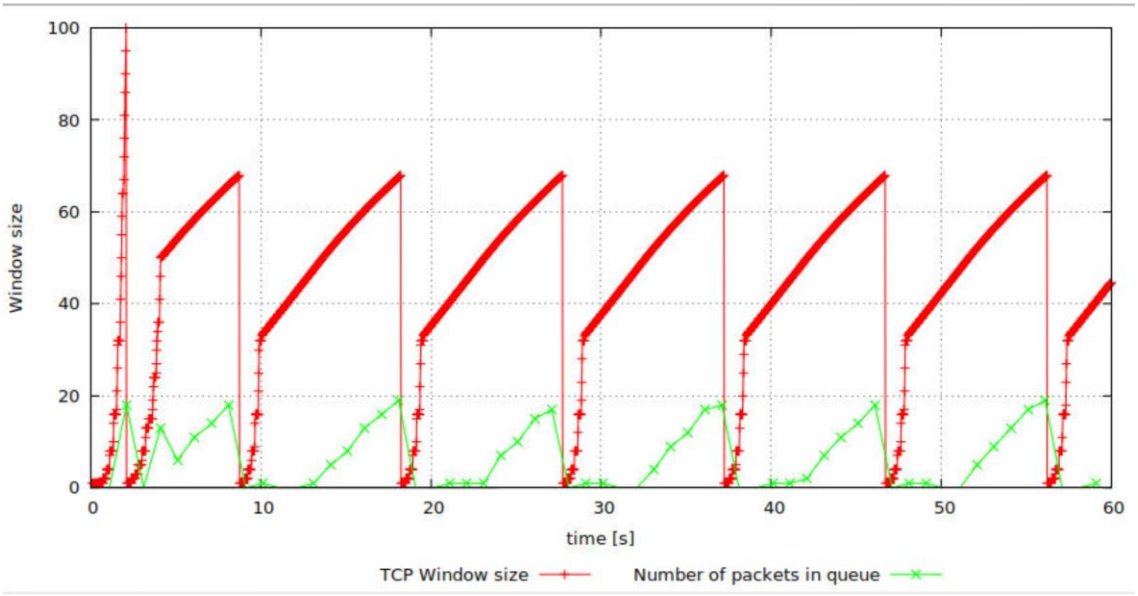
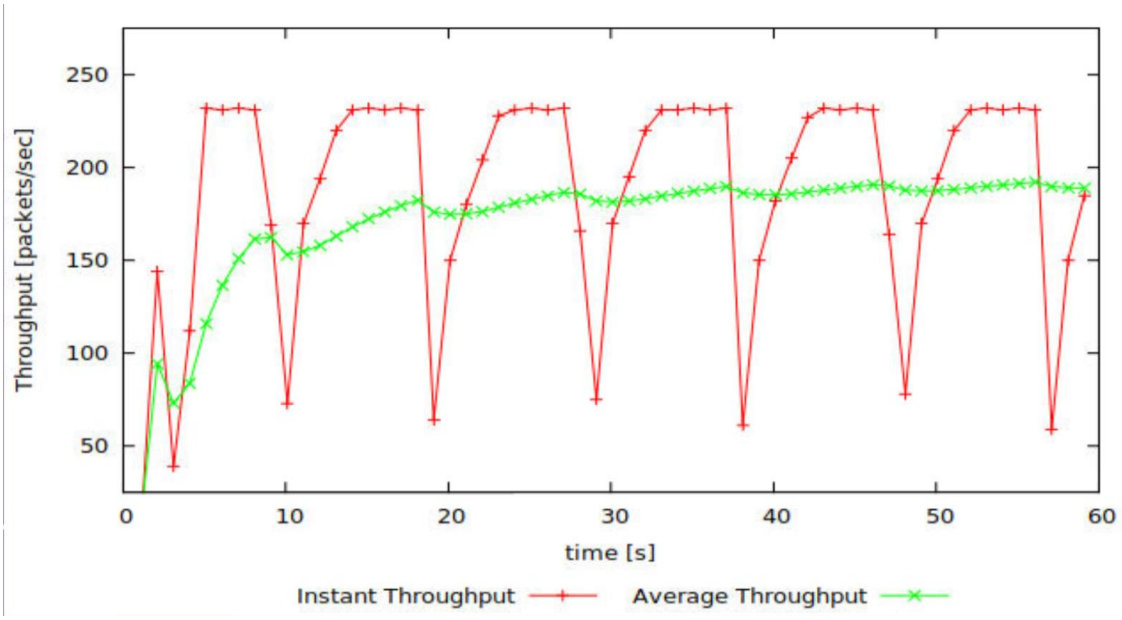
EXERCISE 1

(QUESTION1) $ns tpWindow.tcl 150 100ms



- The maximum size of the congestion window that the tcp flow reaches 100 packets;
- Some packets will be dropped because the maximum 100 packet congestion is greater than the queue;
- It will back to the point (approx. 30) every time because of the congestion and packet dropping.

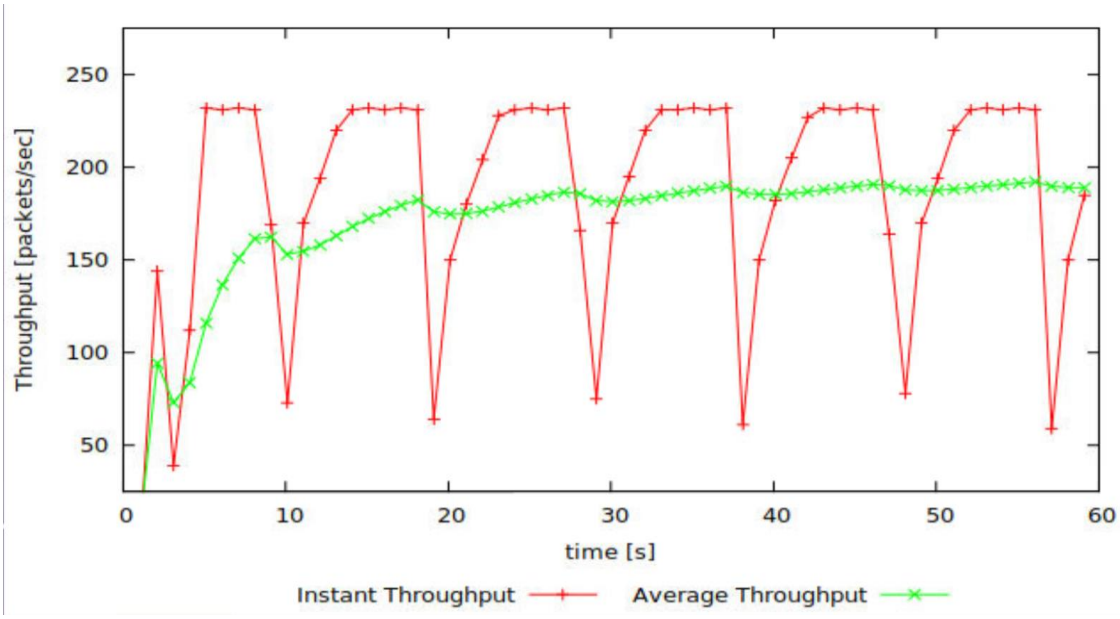
(QUESTION 2)



- Ip = headers = 20Bytes payload of packet = 500 bytes packet per sec throughput = (approx. 180) pps
- (500+40)*8*190=820800 bps

(QUESTION3)

- When we change the max congestion window, the throughput graph is still the same.
  ns tpWindow.tcl 150 100ms



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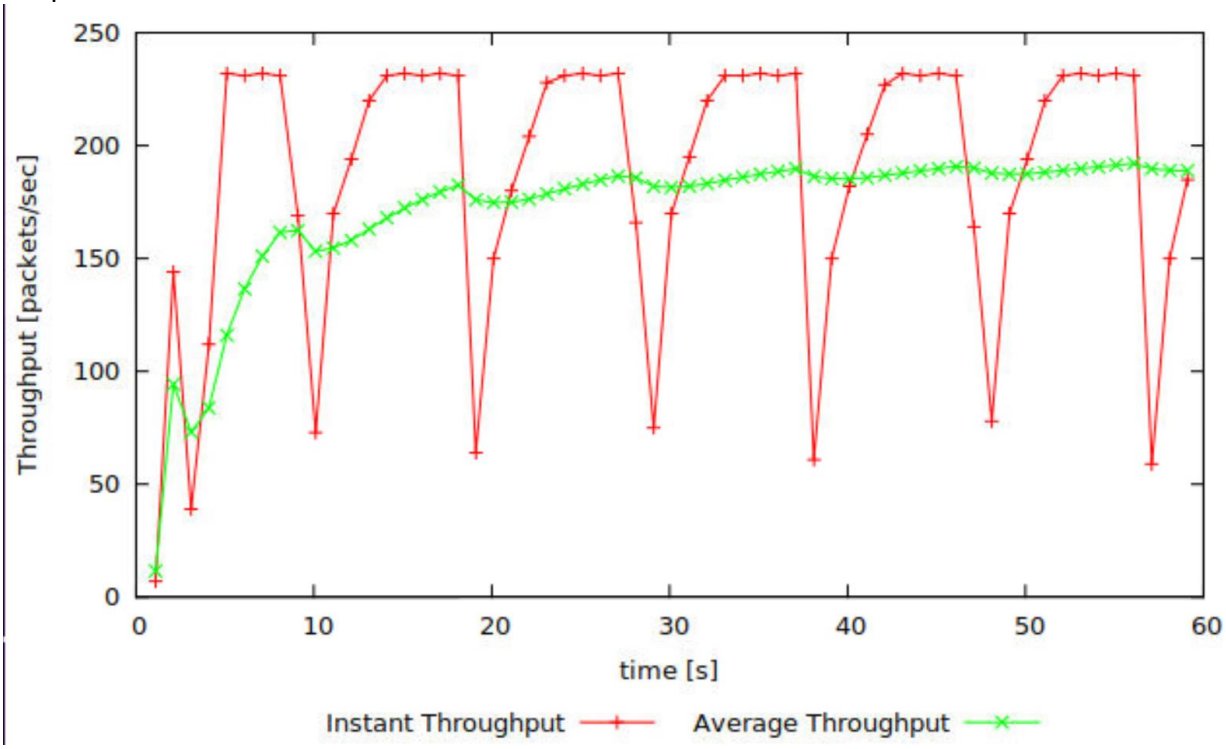
- ns tpWindow.tcl 250 100ms



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- $ns tpWindow.tcl 350 100ms
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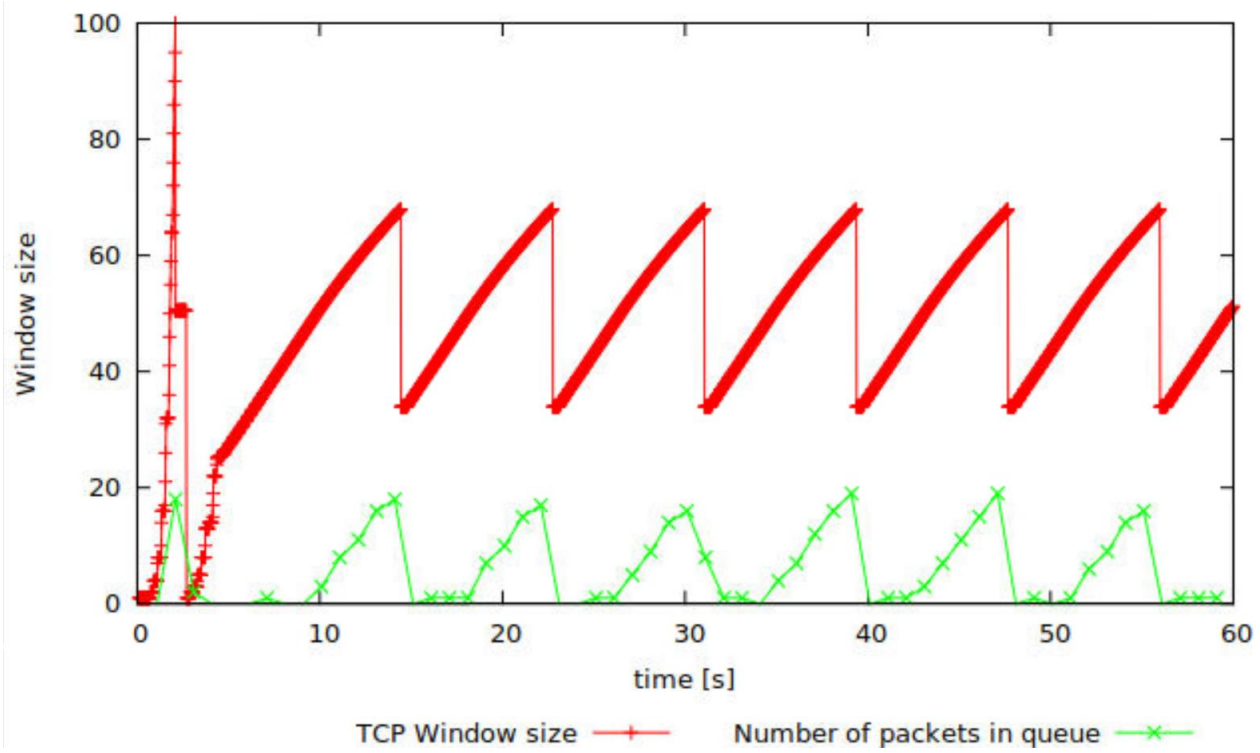
(QUESTION4)

Open the file tpWindows.tcl, search the line “set tcp0 [new Agent/TCP]” and replace it with “set tcp0 [new Agent/TCP/Reno]

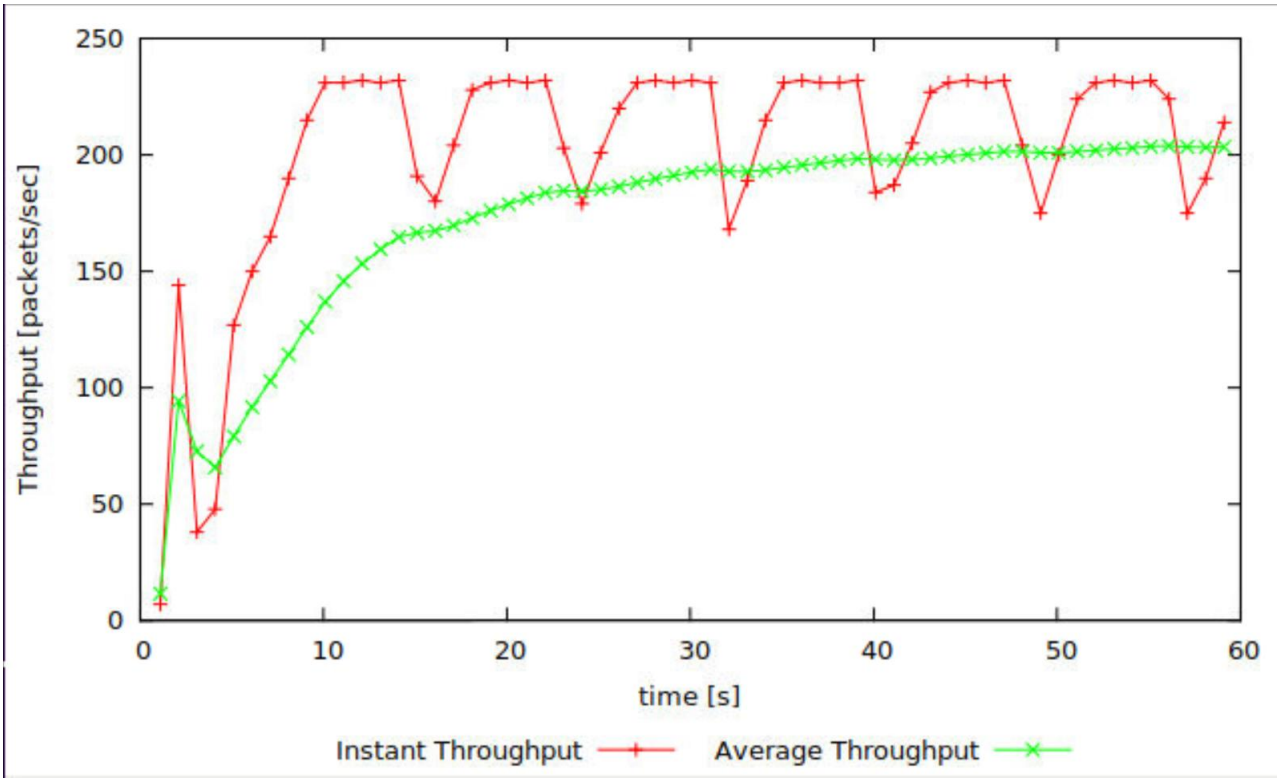
And repeat the question1/2

$ns tpWindow.tcl 150 100ms

$gnuplot Window.plot

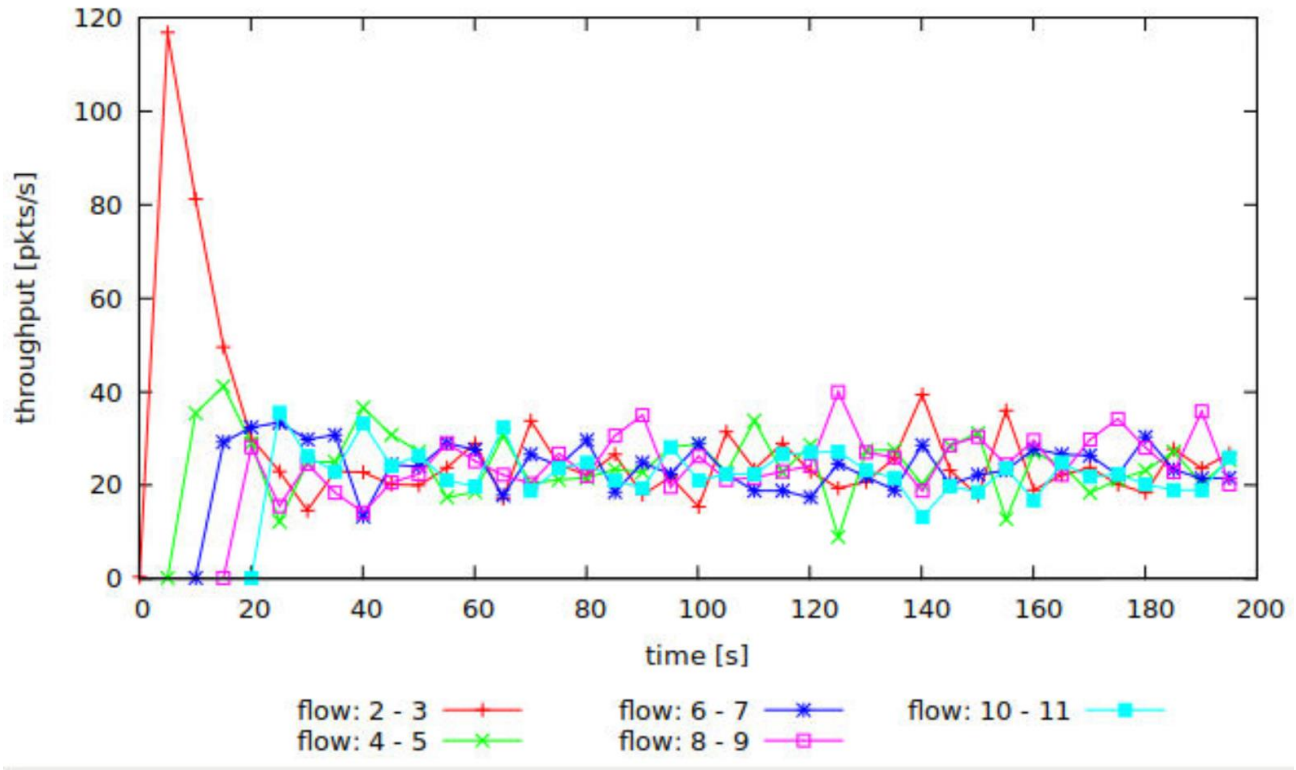


$gnuplot WindowTPut.plot



- It doesn't have slow-start phase for tcp reno
- (500 + 40) *8*200=864000bps its better than TCP Tahoe

EXERCISE 2:



- Yes, each flow gets an equal share of the capacity of common link because most of the flows are fluctuant as expected even the first few points are higher than others

(QUESTION2)

- As the throughput for the first few points are higher than others and then decreases, each new flow is created, so they are averaged out over time.
- It depends on the congestion control mechanisms
- It's a fair behaviour because it allows to share the common link

EXERCISE 3:

- I expect the UDP throughput is higher than the TCPs; yes blue for the TCP and red for UDP can be predicted by looking at the NAM window
- UDP should be higher because theres no congestion control
- TCP-> if all users are using the same network they could get fair share throughput
- UDP->doesn't have congestion control
- If everybody started using UDP instead of TCP, the network would be collapse