COL 334 ASSIGNMENT

REPORT

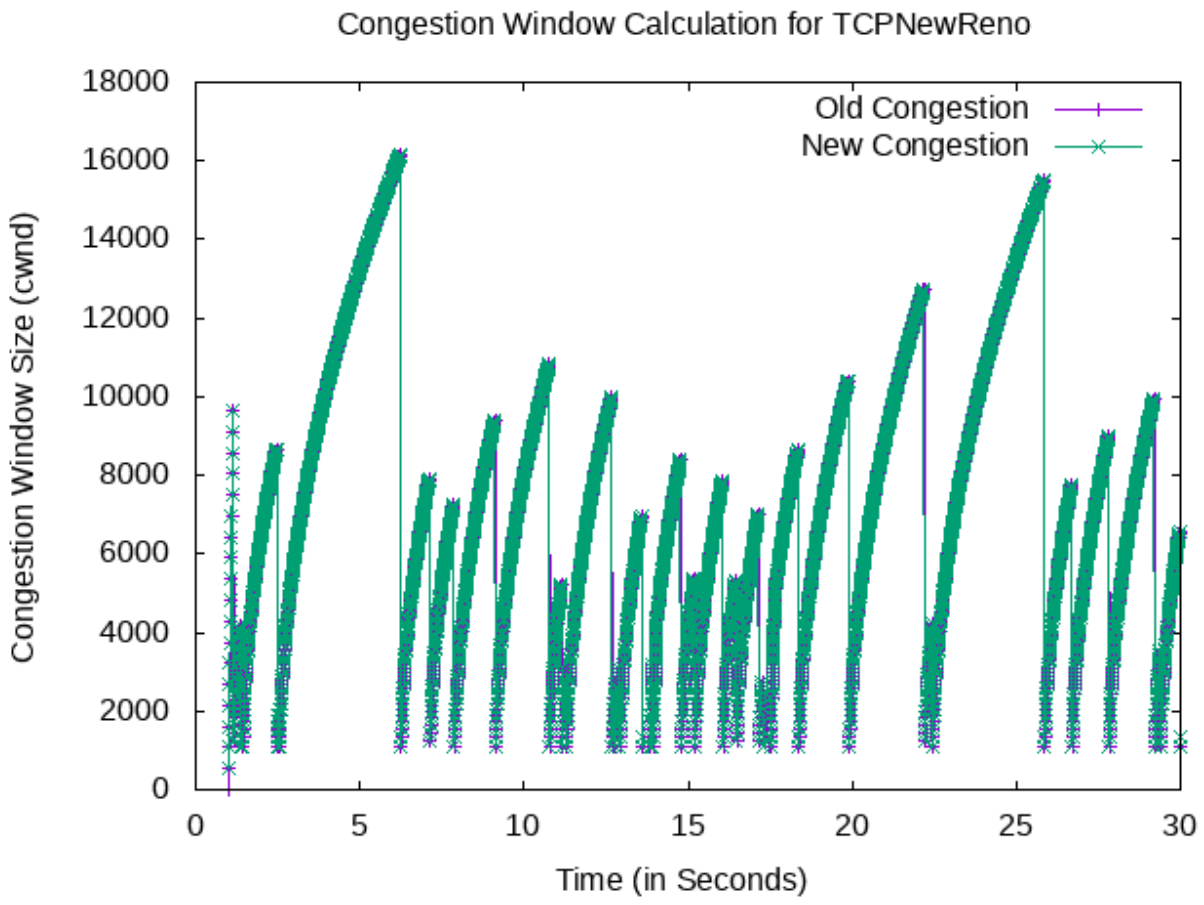
SOURAV

2019CS10404

- PART 1:
  - TCP NEWRENO
  - TCP VENO
  - TCP VEGAS
  - TCP HIGHSPEED
- PART 2:
  - APPLICATION DATA = 2MBPS (CONSTANT) CHANGE LINK DATA
  - LINK DATA = 6MBPS (CONSTANT) CHANGE APPLICATION DATA
- PART 3:
  - CONFIGURATION 1
  - CONFIGURATION 2
  - CONFIGURATION 3

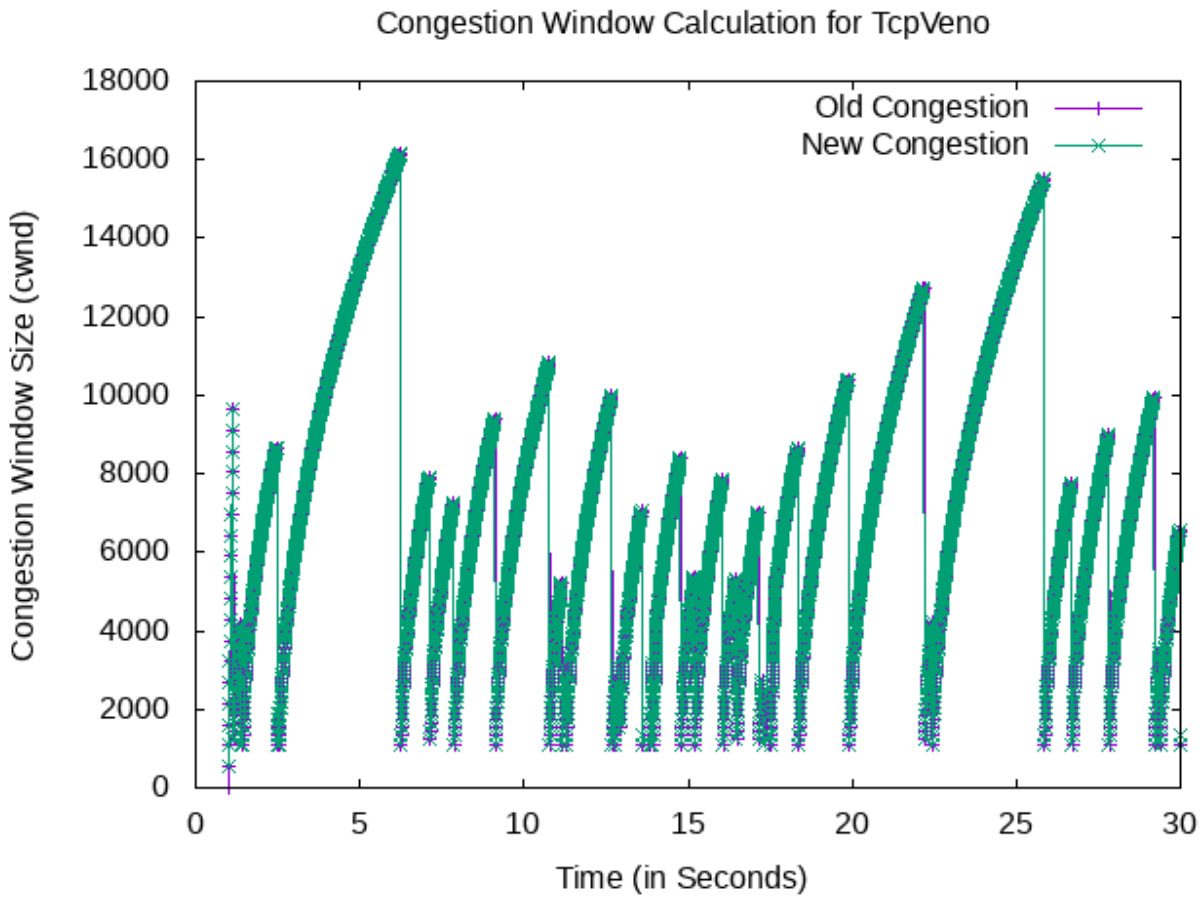
A.) PART 1 :

CONGESTION CONTROL: TCP NEW RENO



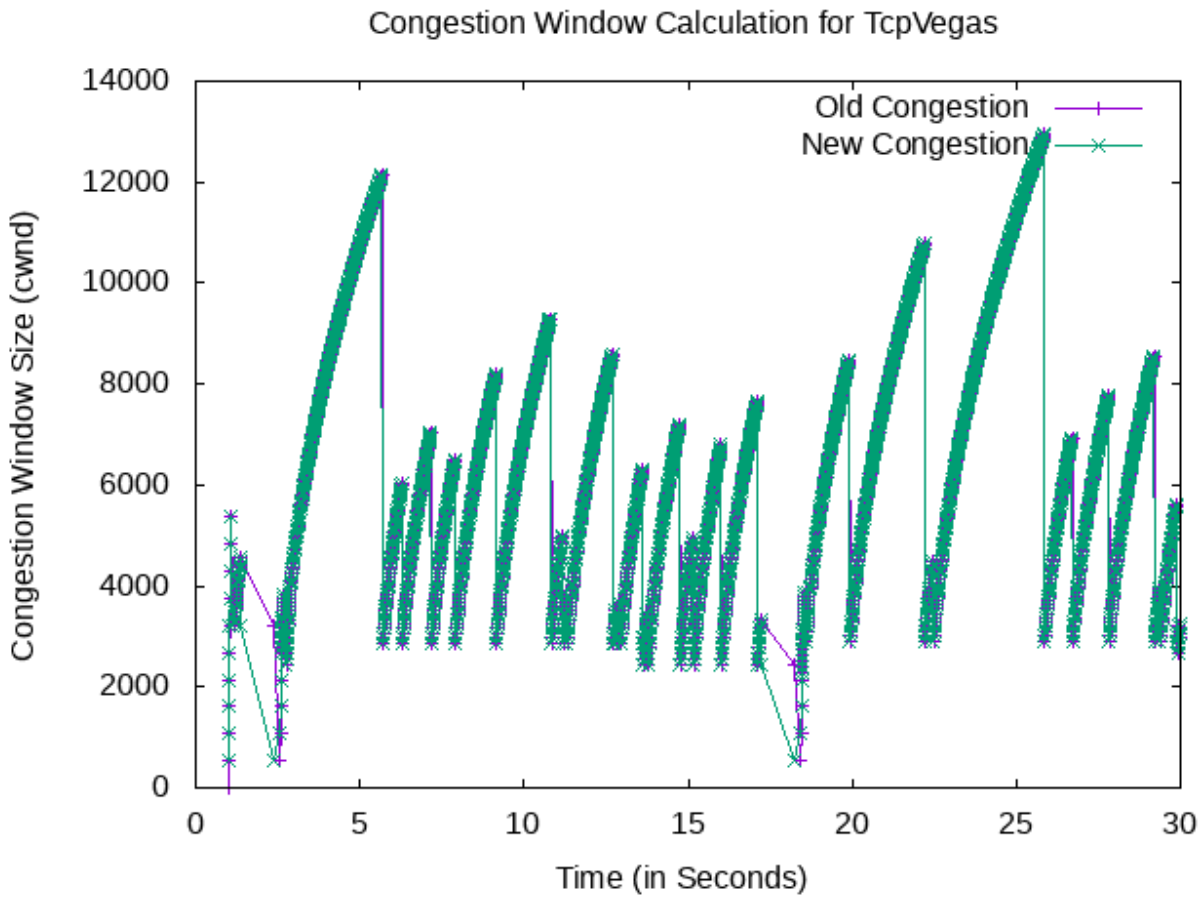
Dropped Packets = 38

CONGESTION CONTROL: TCP VENO



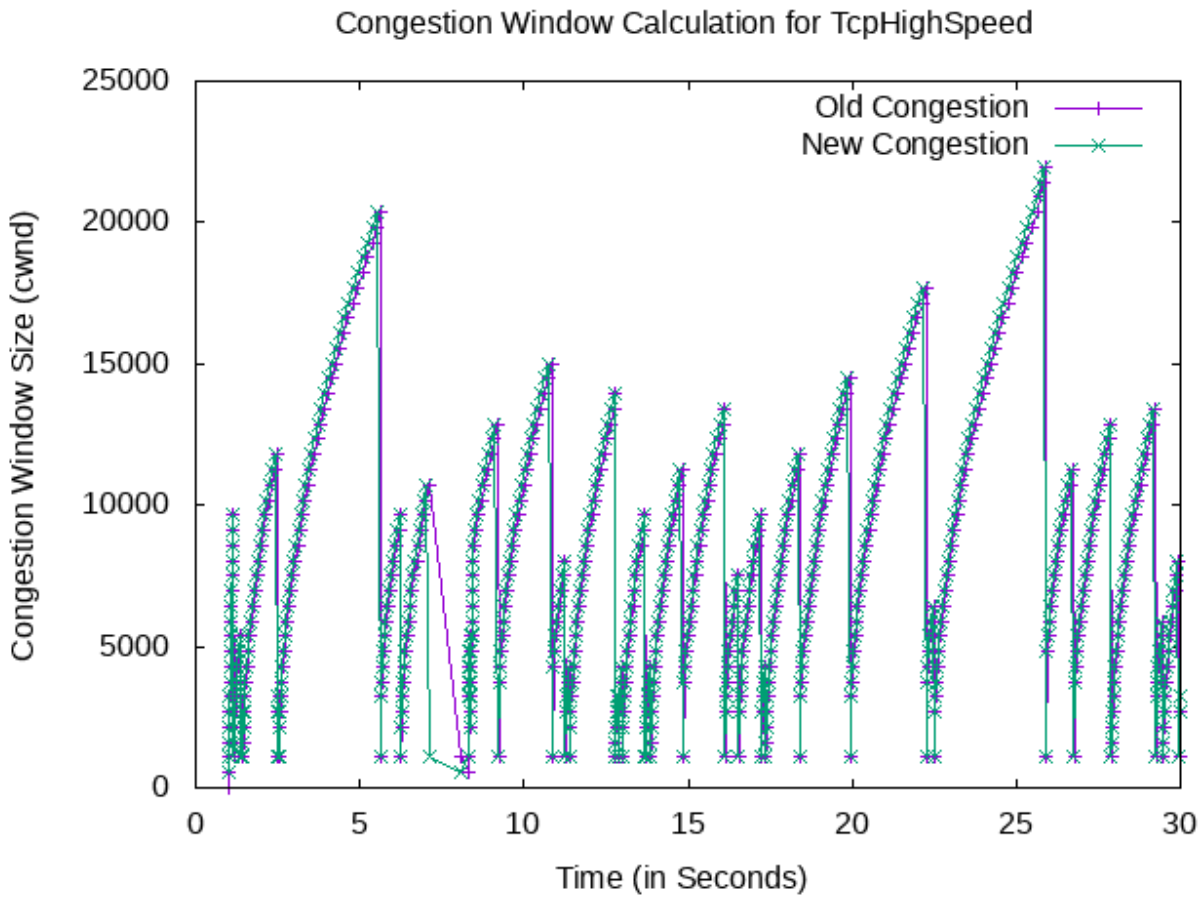
Dropped Packets = 38

CONGESTION CONTROL: TCP VEGAS



Dropped Packets = 39

CONGESTION CONTROL: TCP HIGHSPEED



Dropped Packets = 39

From the packets dropped in the four protocols we can see that almost same number of packets are dropped in all the cases which can be due to the fact that congestion control protocols are used to control the network congestion which is sensed by the dropping of packets and then will be acted responsibly by the sender. Although in some of the protocols there is a small difference in the packets dropped due to the fact that because of multiplicative decrease their segment size can be changed to different values.

C

The trends observered in the graph and different congestion control algorithms used in the above protocols:

TCP new reno: cWnd += SegmentSize*segmentAcked

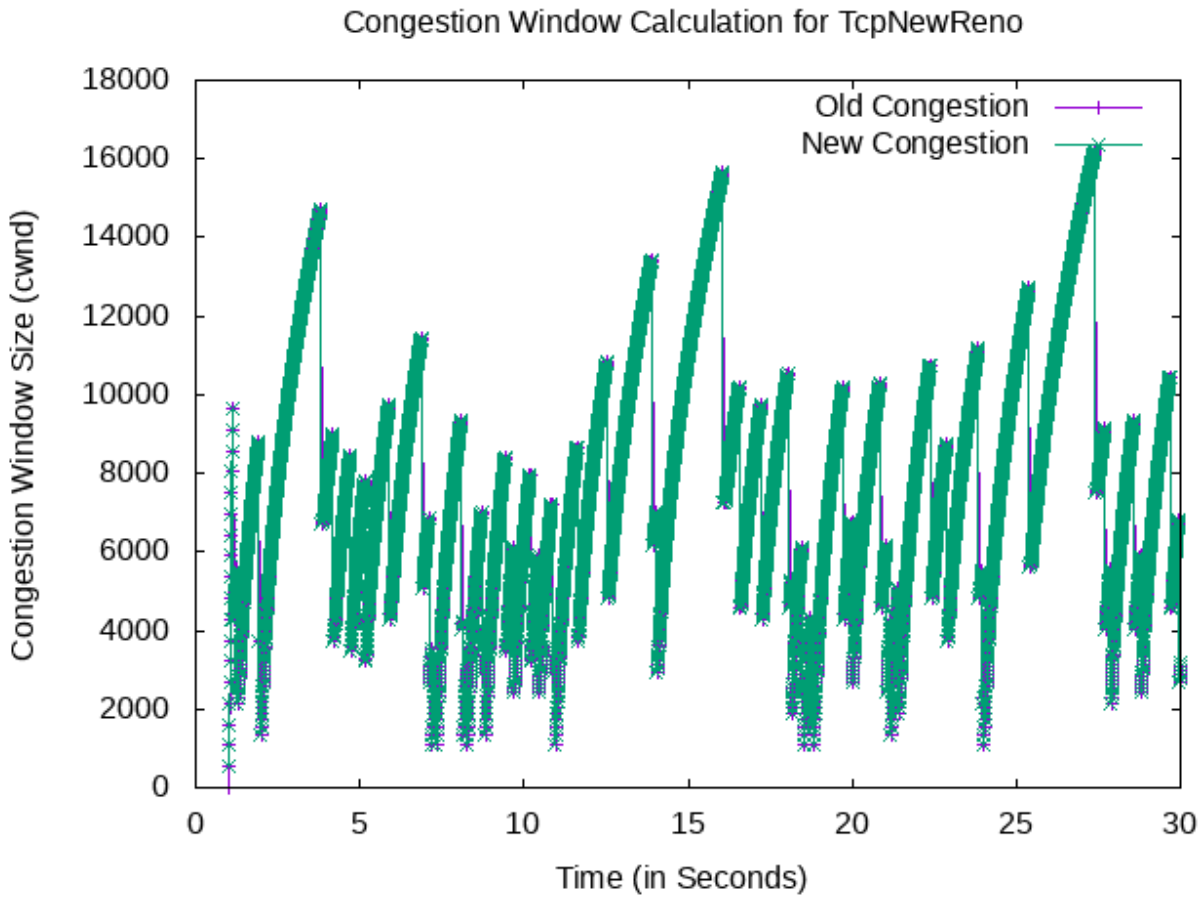
TCP highspeed: cWnd = (1-b*cWnd)*cWnd

TCP Vegas: Packets queued are given by (cWnd/RTT – cWnd/BaseRTT)

TCP Veno: Here the difference is given by (cWnd/BaseRTT – cWnd/RTT).

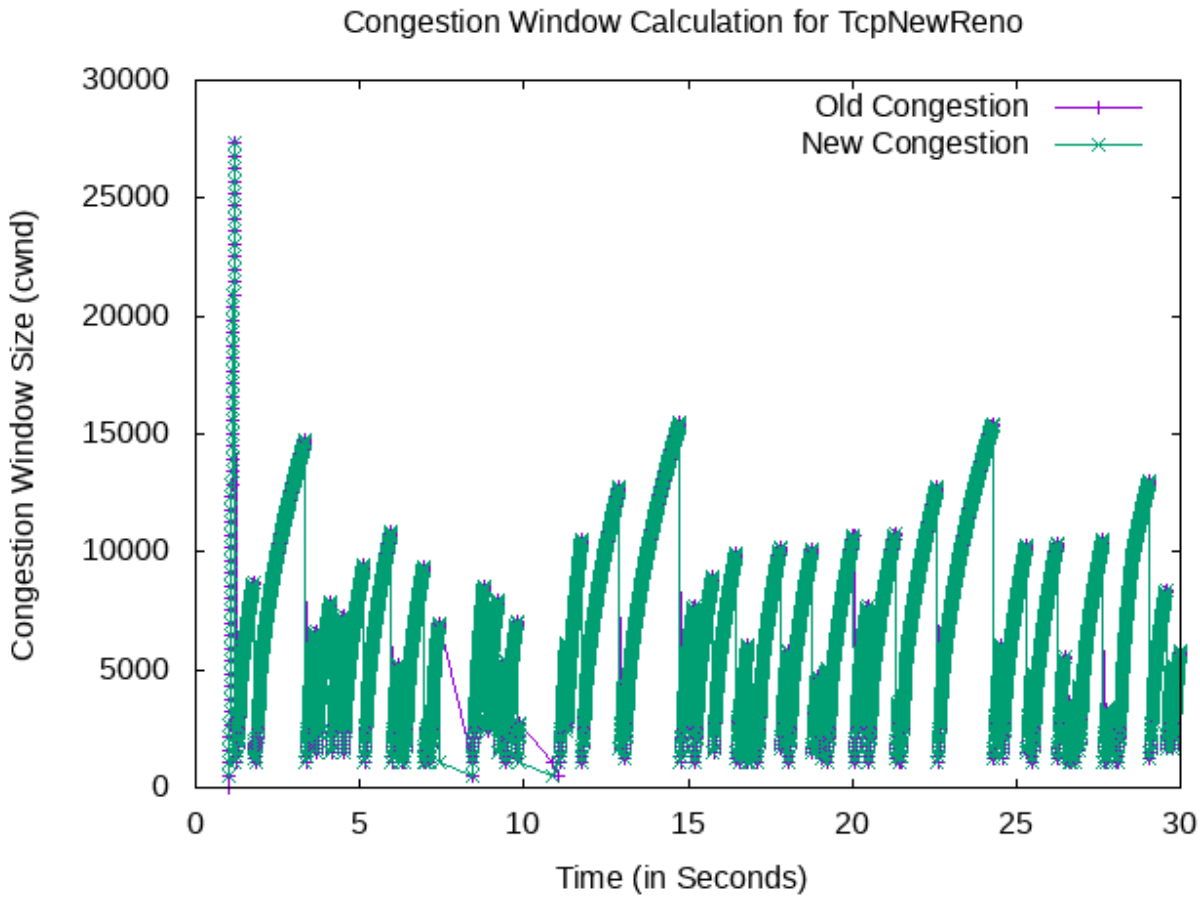
B.) PART 2 : **CONGESTION CONTROL: TCP NEW RENO**

NODE LINK DATA RATE = 2MBPS, APPLICATION DATA RATE = 2MBPS



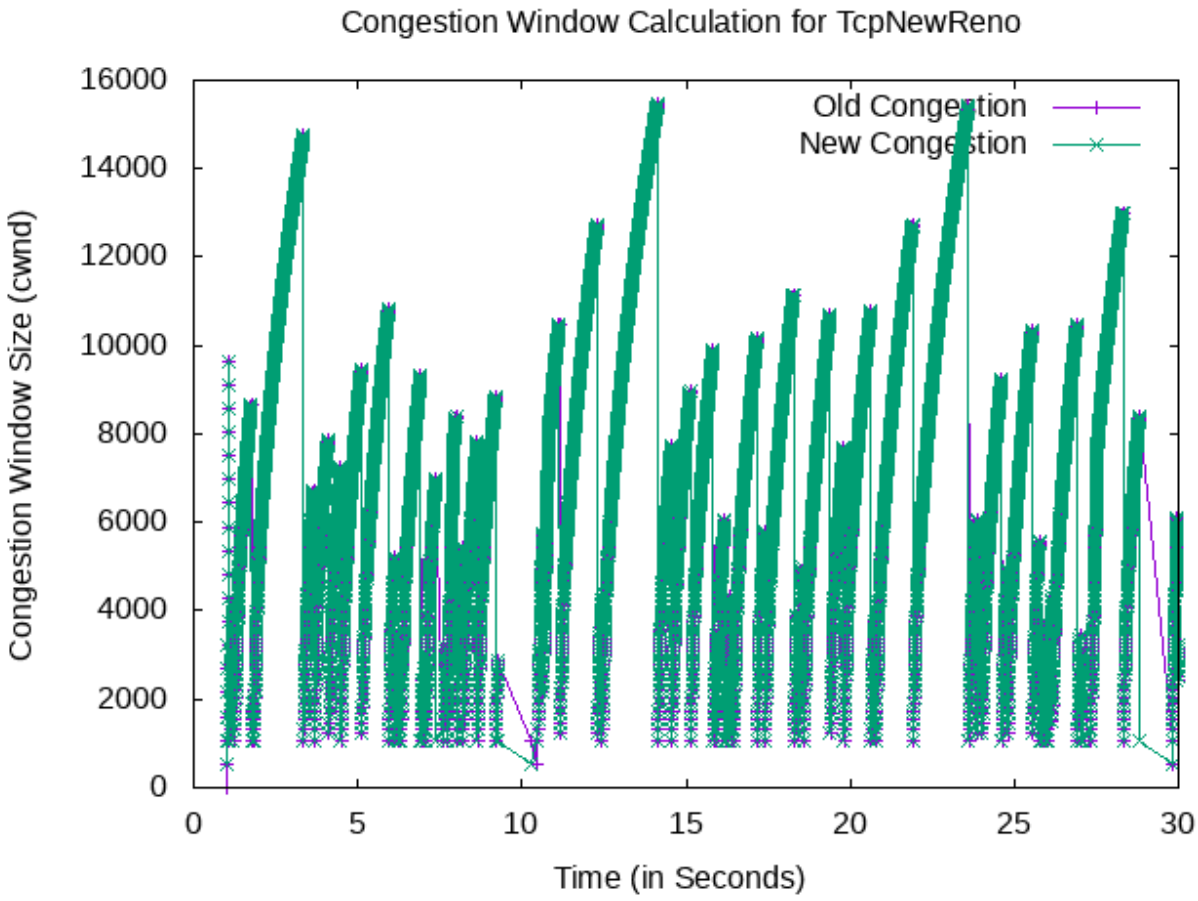
Dropped Packets = 62

NODE LINK DATA RATE = 4MBPS, APPLICATION DATA RATE = 2MBPS



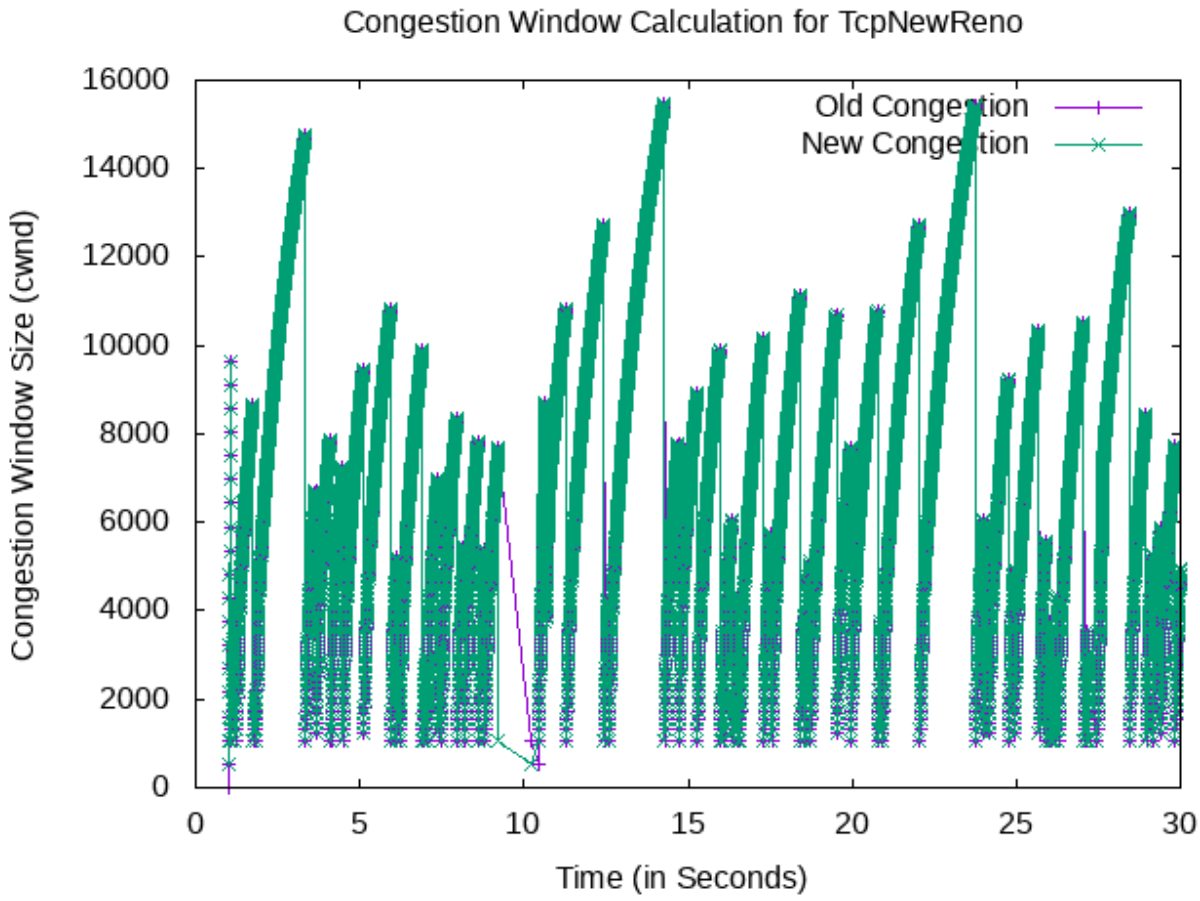
Dropped Packets = 72

NODE LINK DATA RATE = 10MBPS, APPLICATION DATA RATE = 2MBPS



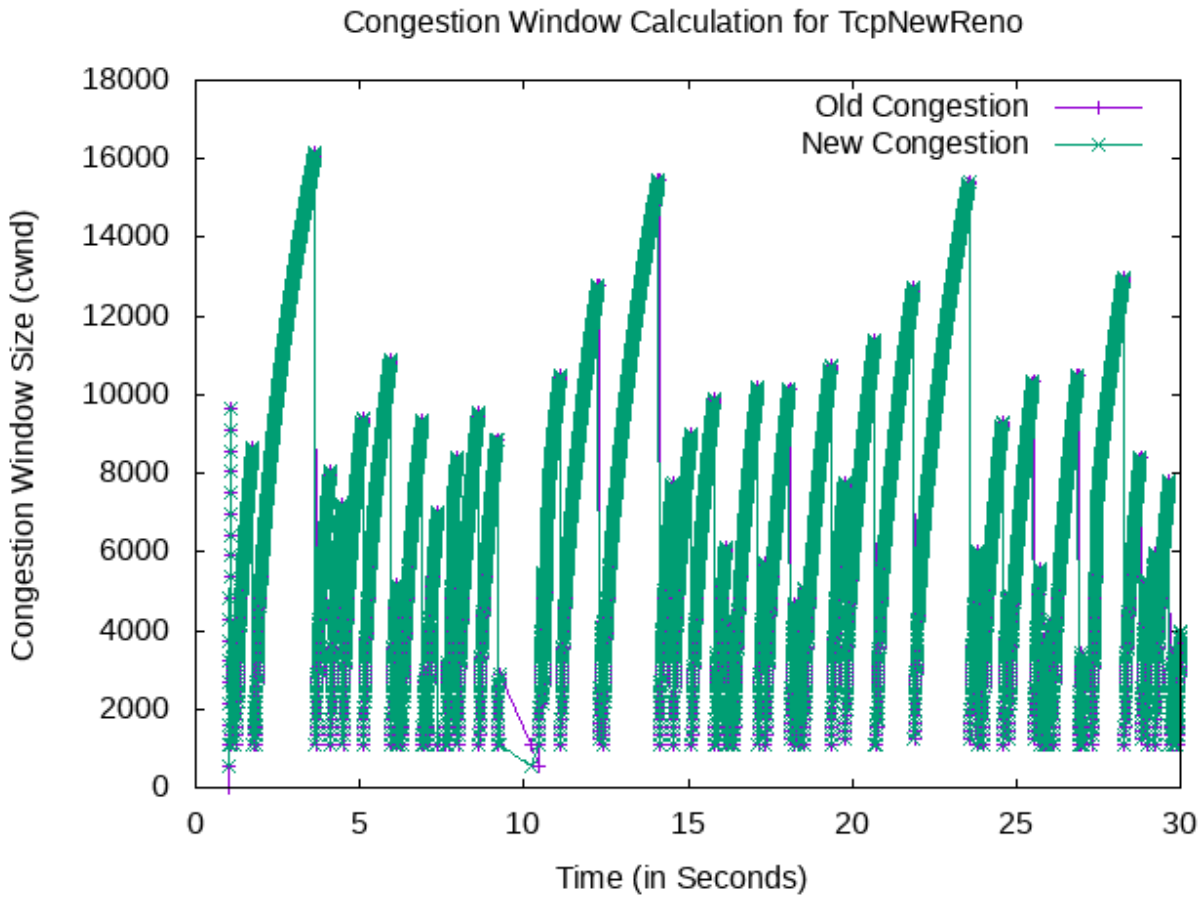
Dropped Packets = 73

NODE LINK DATA RATE = 20MBPS, APPLICATION DATA RATE = 2MBPS



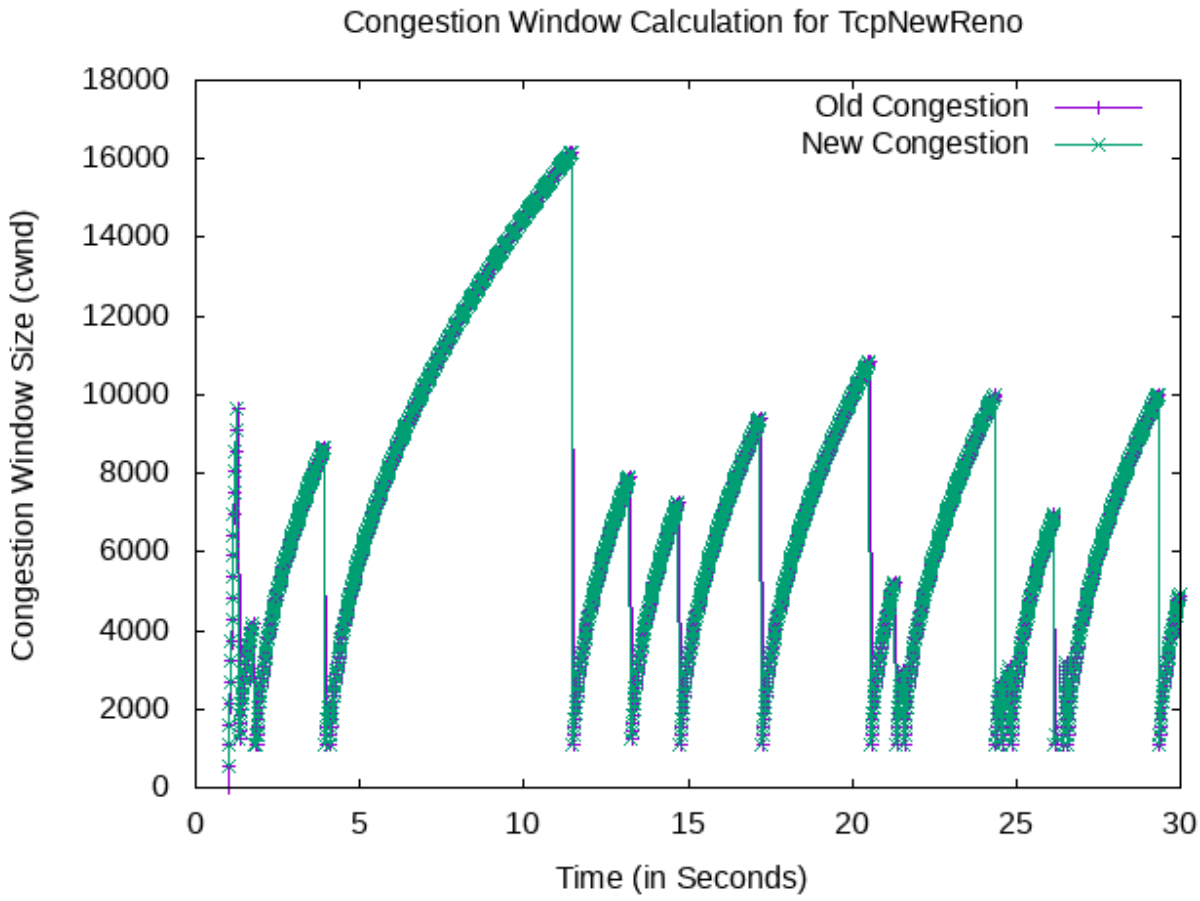
Dropped Packets = 74

NODE LINK DATA RATE = 50MBPS, APPLICATION DATA RATE = 2MBPS



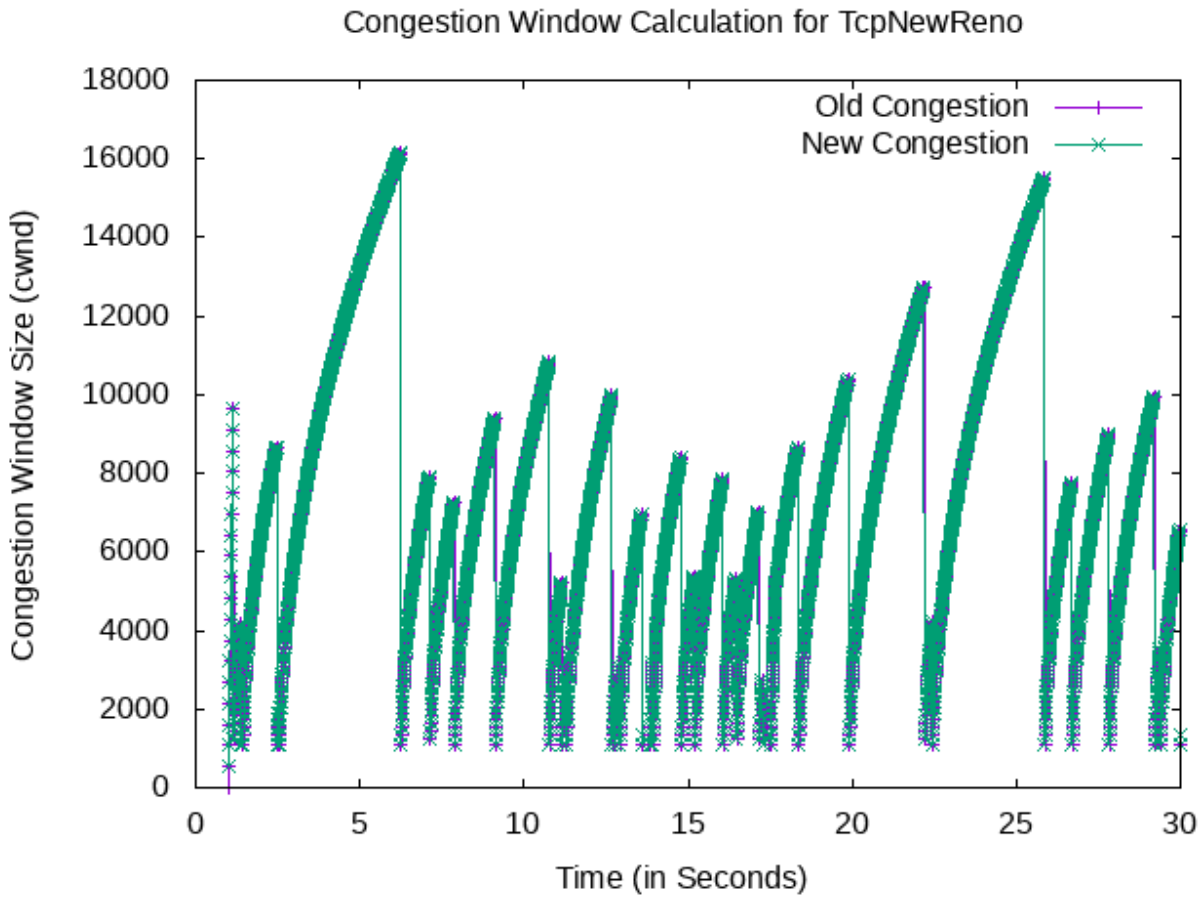
Dropped Packets = 75

NODE LINK DATA RATE = 6MBPS, APPLICATION DATA RATE = 0.5MBPS



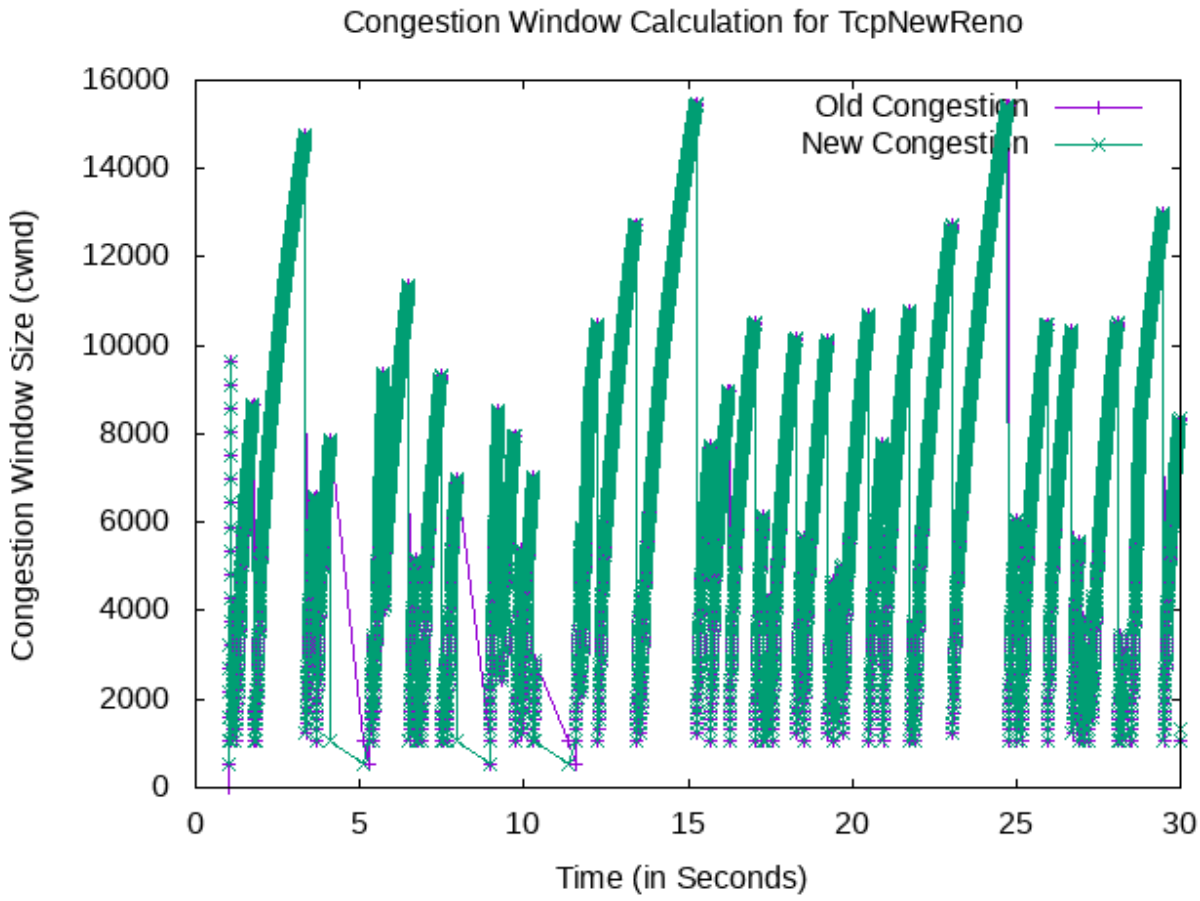
Dropped Packets = 22

NODE LINK DATA RATE = 6MBPS, APPLICATION DATA RATE = 1MBPS



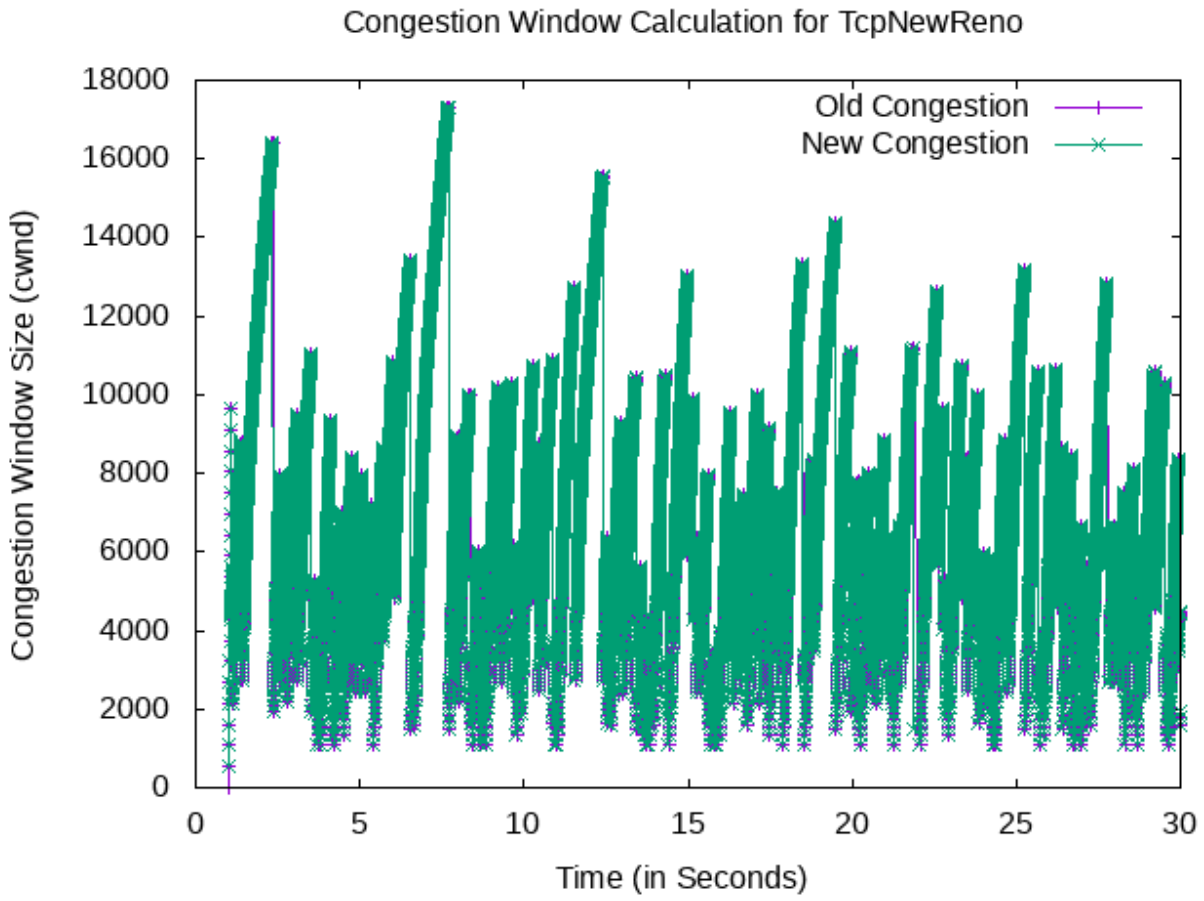
Dropped Packets = 38

NODE LINK DATA RATE = 6MBPS, APPLICATION DATA RATE = 2MBPS



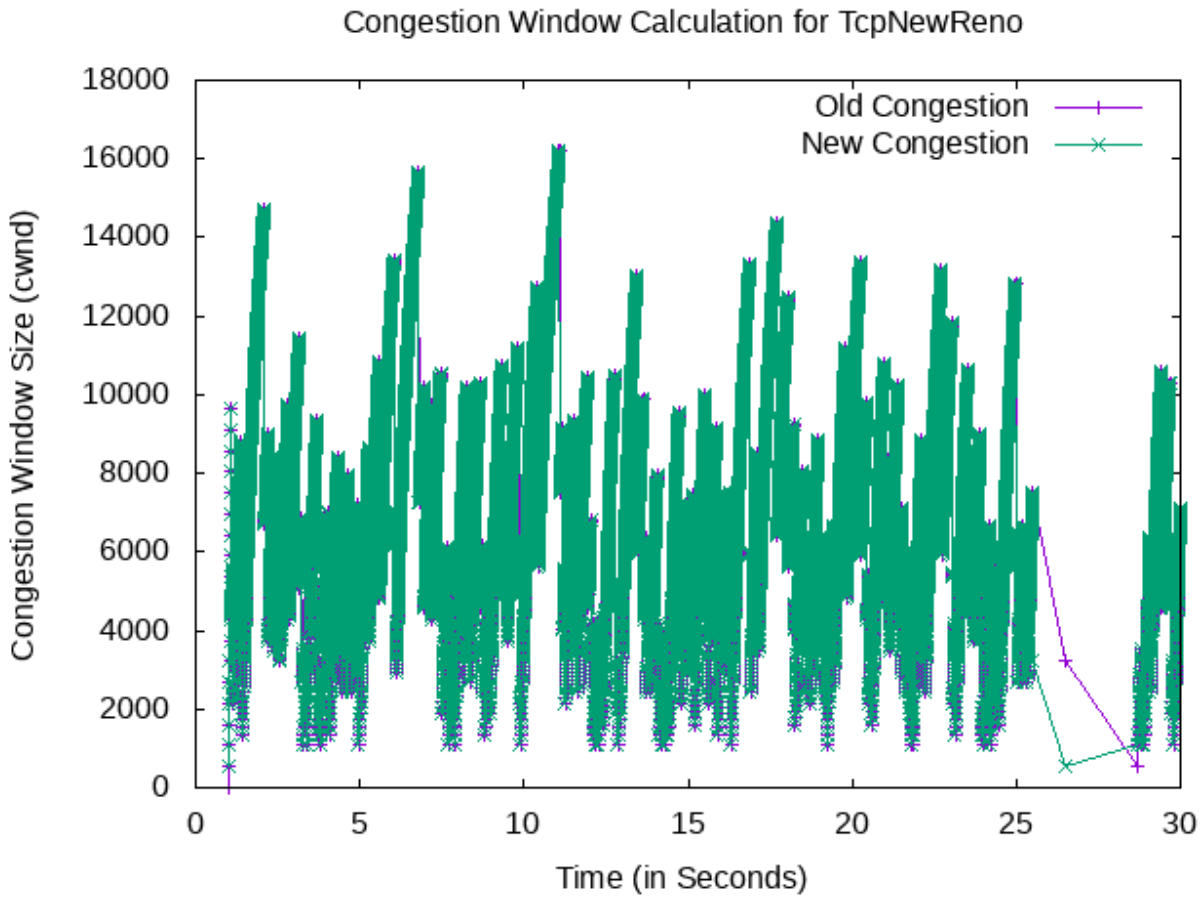
Dropped Packets = 71

NODE LINK DATA RATE = 6MBPS, APPLICATION DATA RATE = 4MBPS



Dropped Packets = 156

NODE LINK DATA RATE = 6MBPS, APPLICATION DATA RATE = 10MBPS



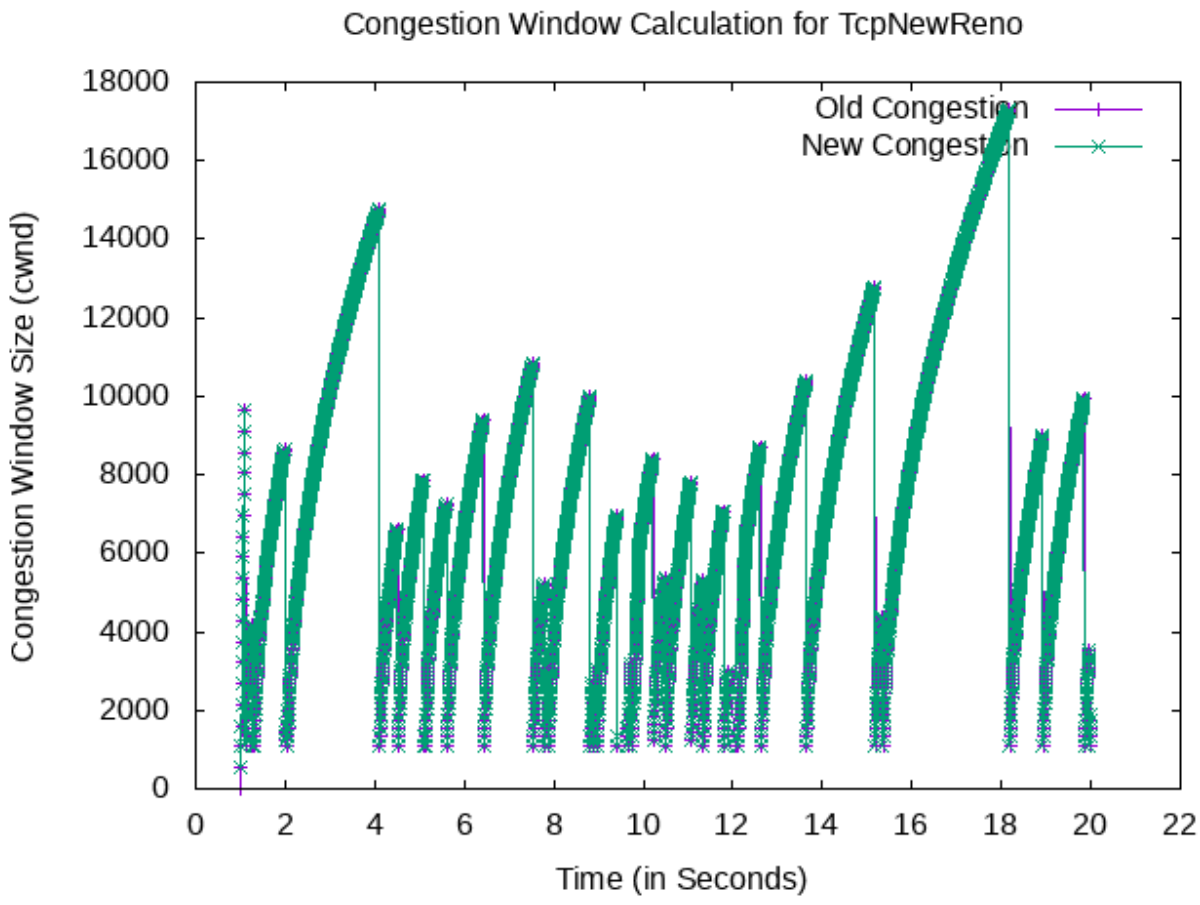
Dropped Packets = 156

From the first subpart of the problem we can say that on increasing the data rate packet loss increases as it is shown as 62, 72, 73,74,75. This is due to the fact that on increasing the data rate the packet drop rate due to the interference queue dominates and hence the total number of packets lost increases as due the queues of forwarding nodes overflow which results in packet drops at interference queue.

In the second part of the problem we can say that on increasing the application rate the packet loss increases as can be shown from the data collected above 22, 38, 71,156,156 and this is because on increasing the application rate the queue will be overfilling spontaneously and hence there will be a lot of packet drops. One more thing one can say is that while having a high application data rate one gets a chance to have a lot of errors in headers or many malicious packets which can result in a loss of a large number of packets.

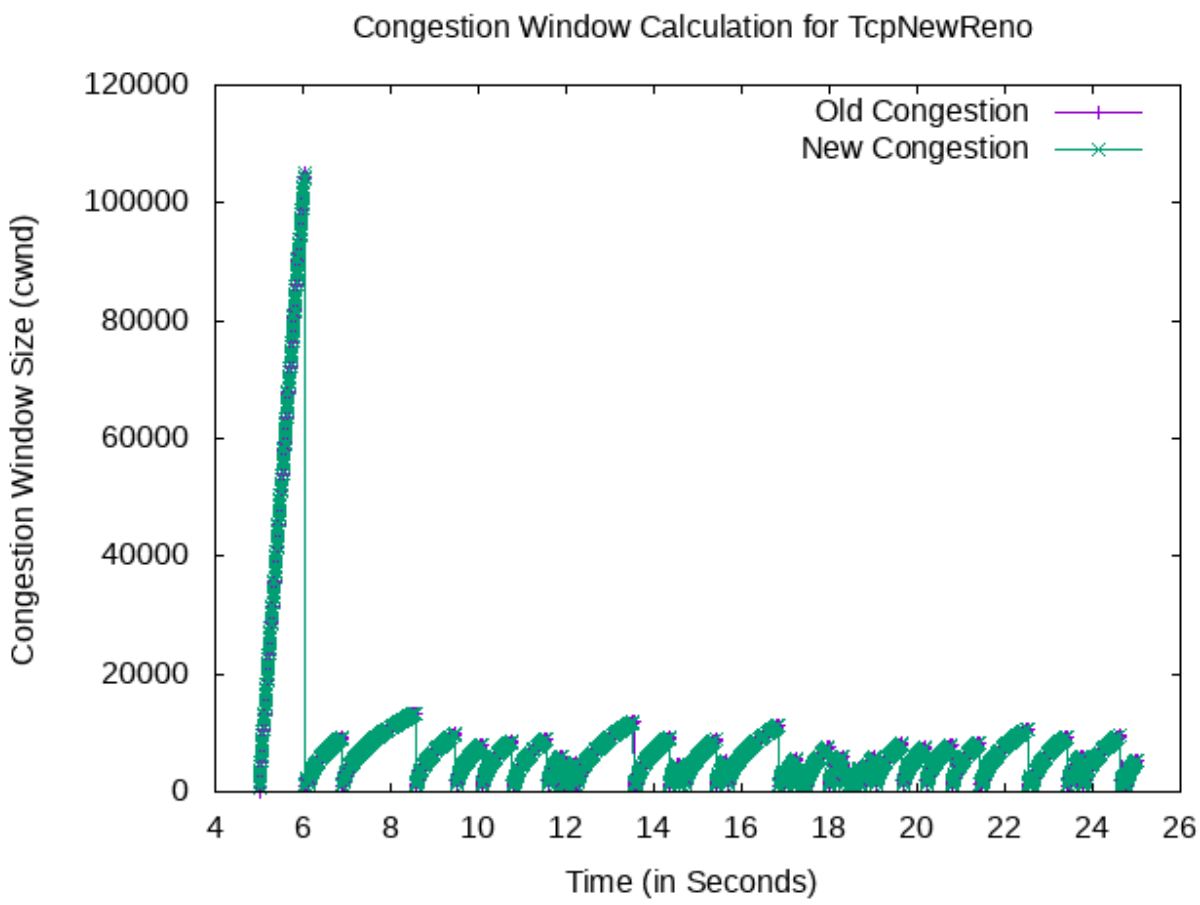
C.)PART 3: CONFIGURATION1: ALL CONNECTION USED TCPNEWRENO

CONNECTION1



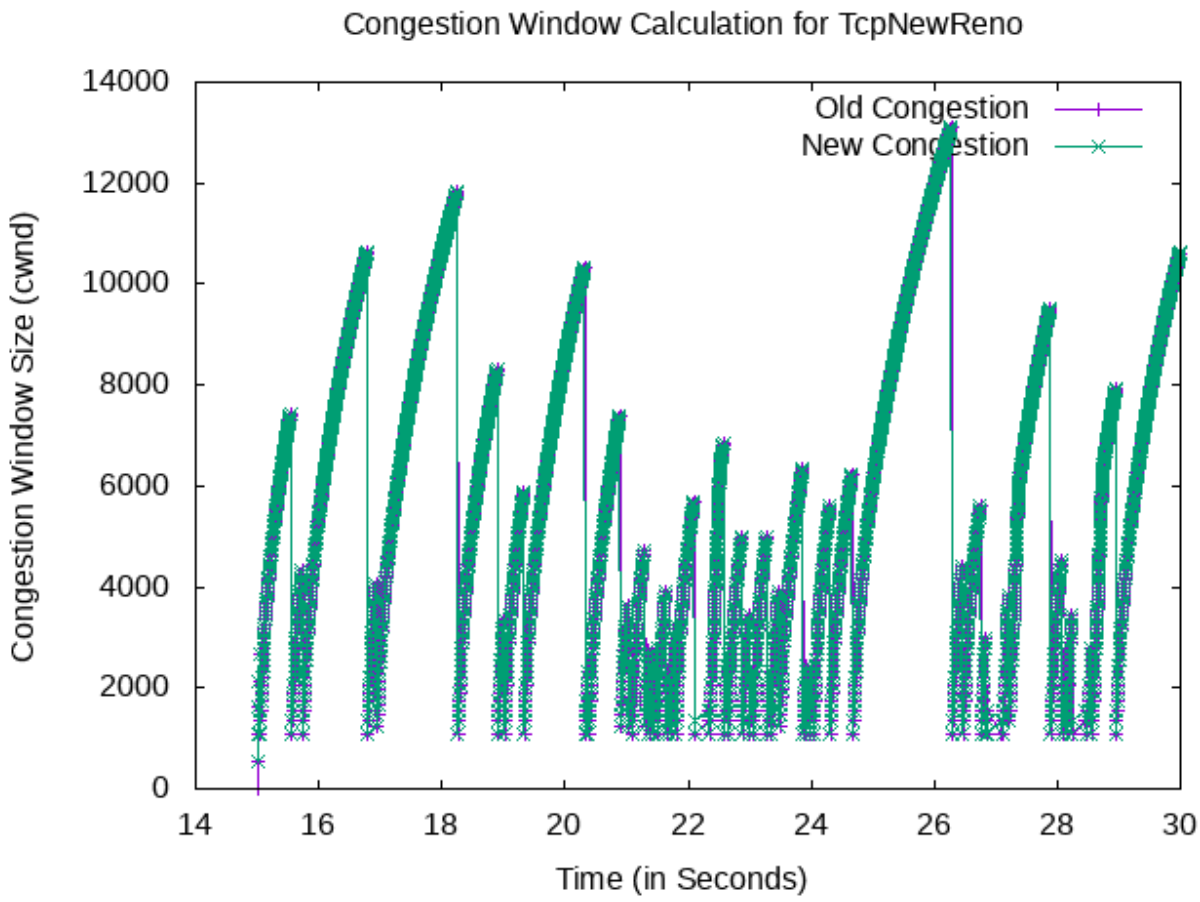
Dropped Packets = 81

CONNECTION2



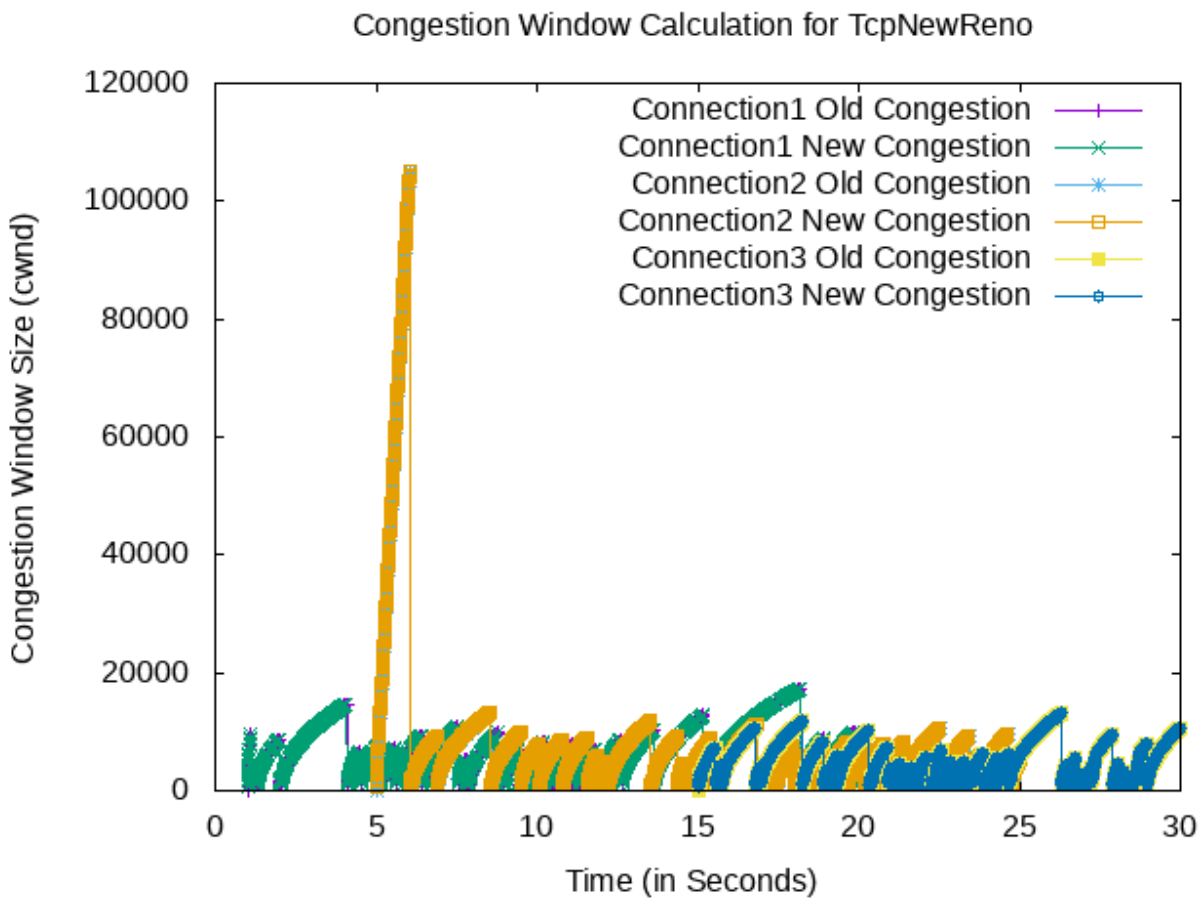
Dropped Packets = 39

CONNECTION3



Dropped Packets = 15

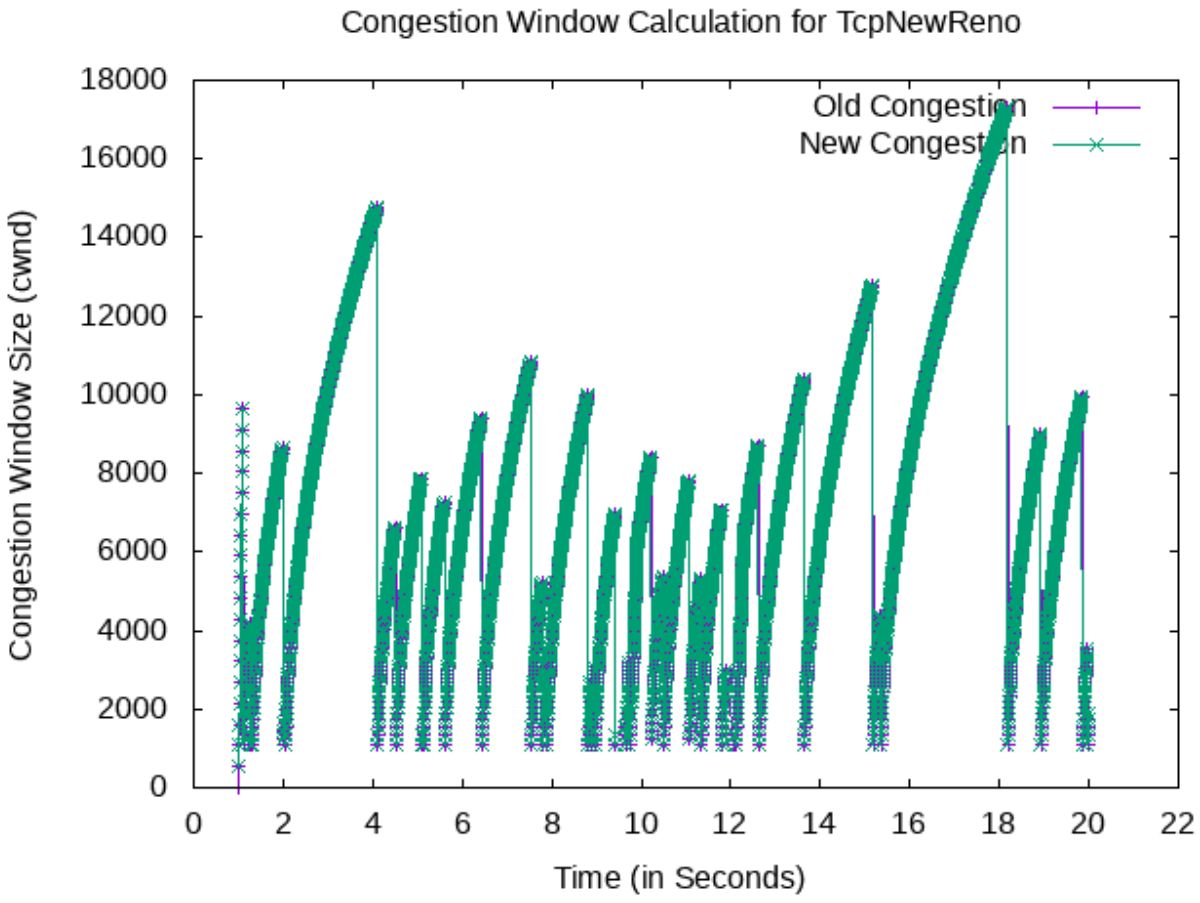
ALL CONNECTION



Dropped Packets = 135

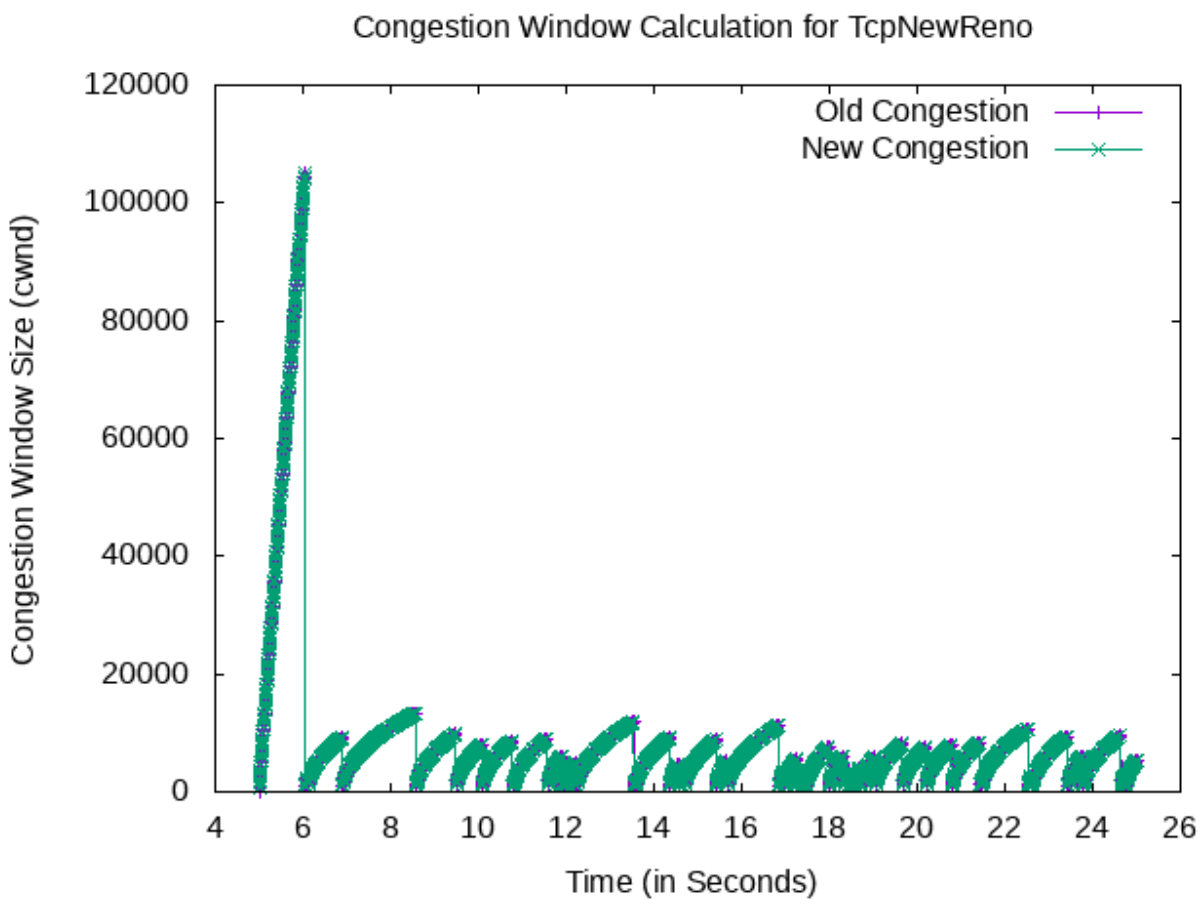
CONFIGURATION2: CONNECTION1, CONNECTION2 USED TCPNEWRENO CONNECTION3 USED TCPNEWRENOCSE

CONNECTION1



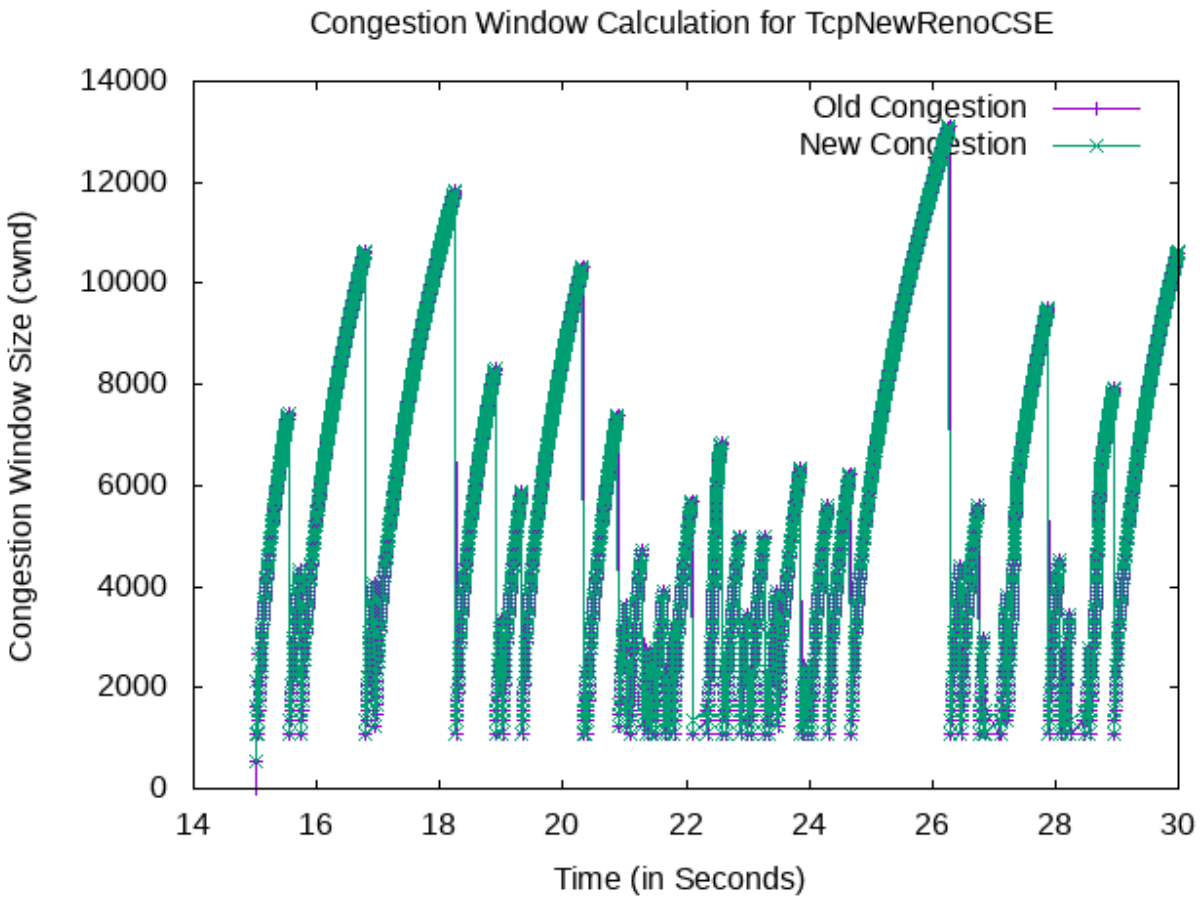
Dropped Packets = 81

CONNECTION2



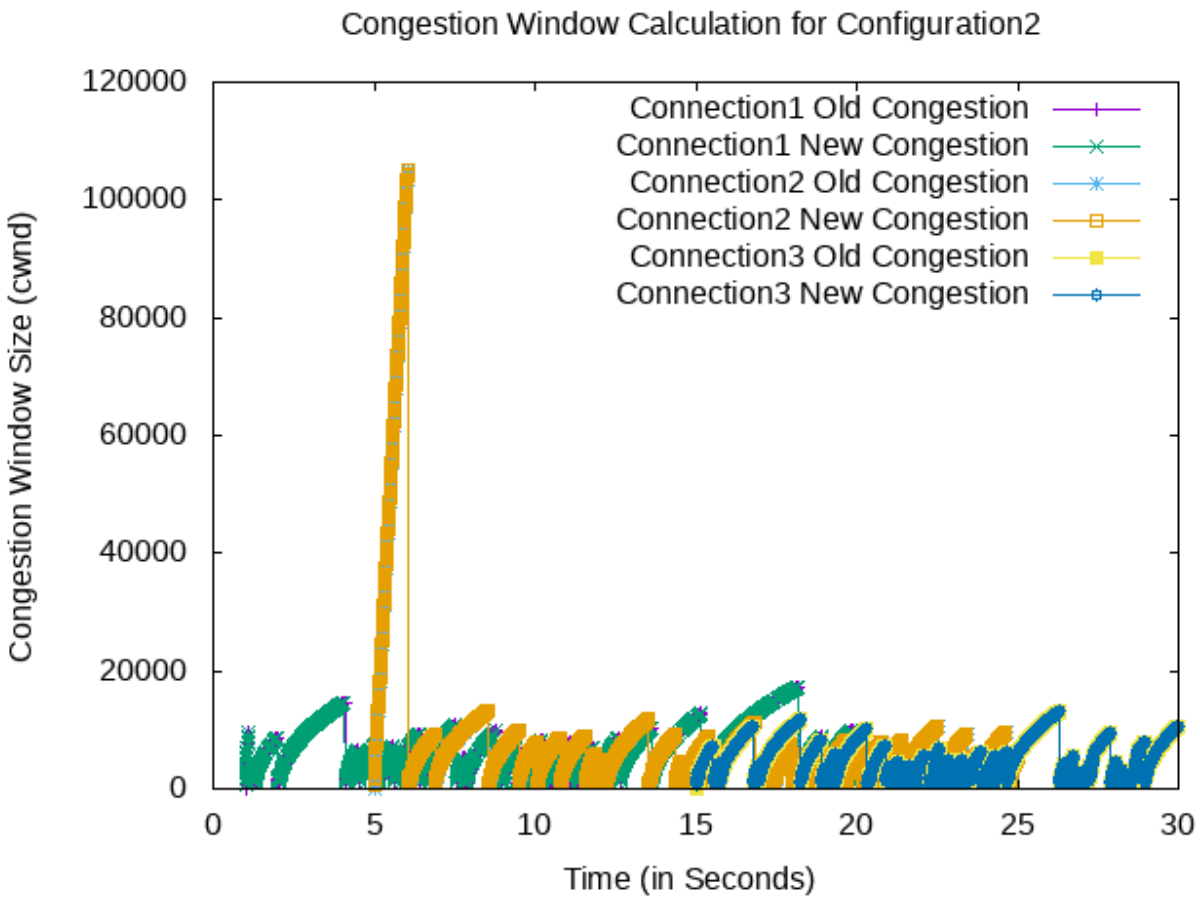
Dropped Packets = 39

CONNECTION3



Dropped Packets = 15

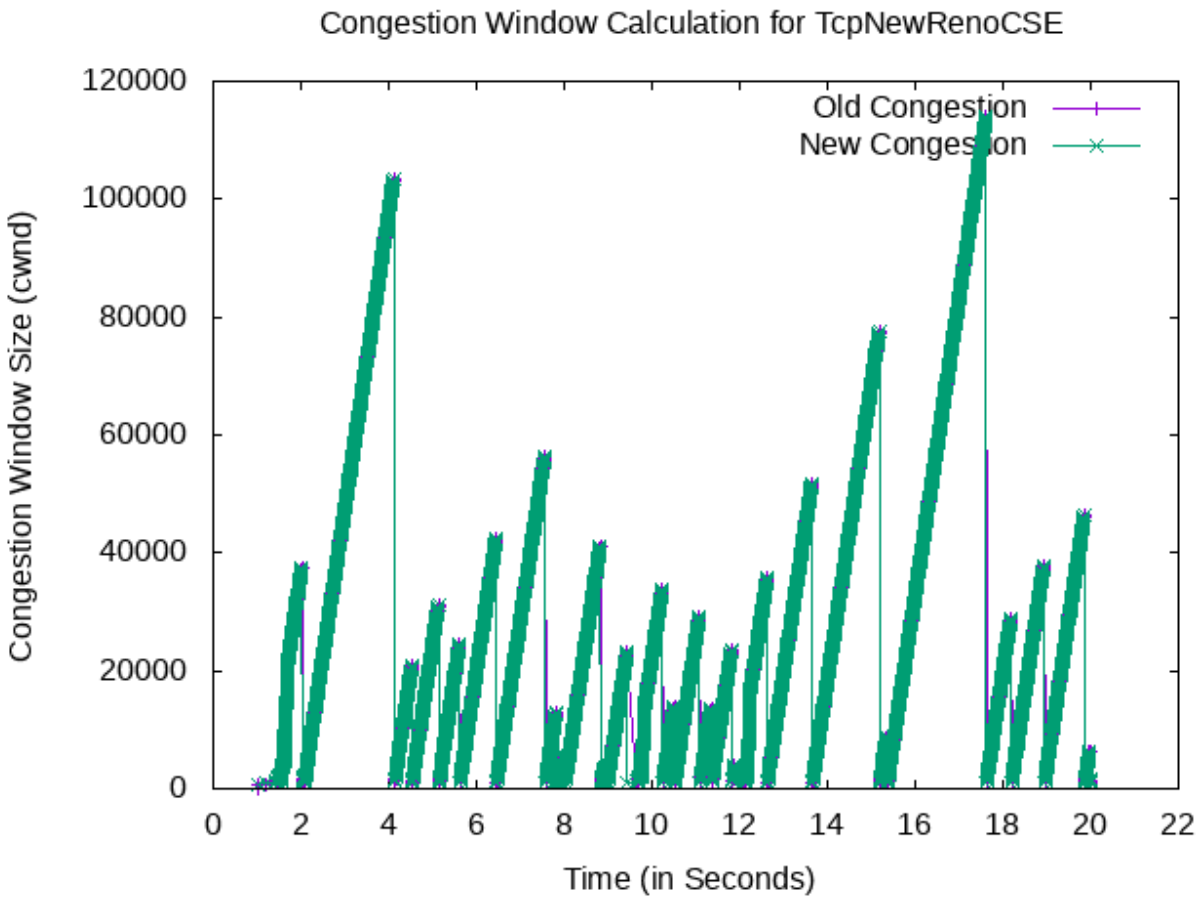
ALL CONNECTION



Dropped Packets = 135

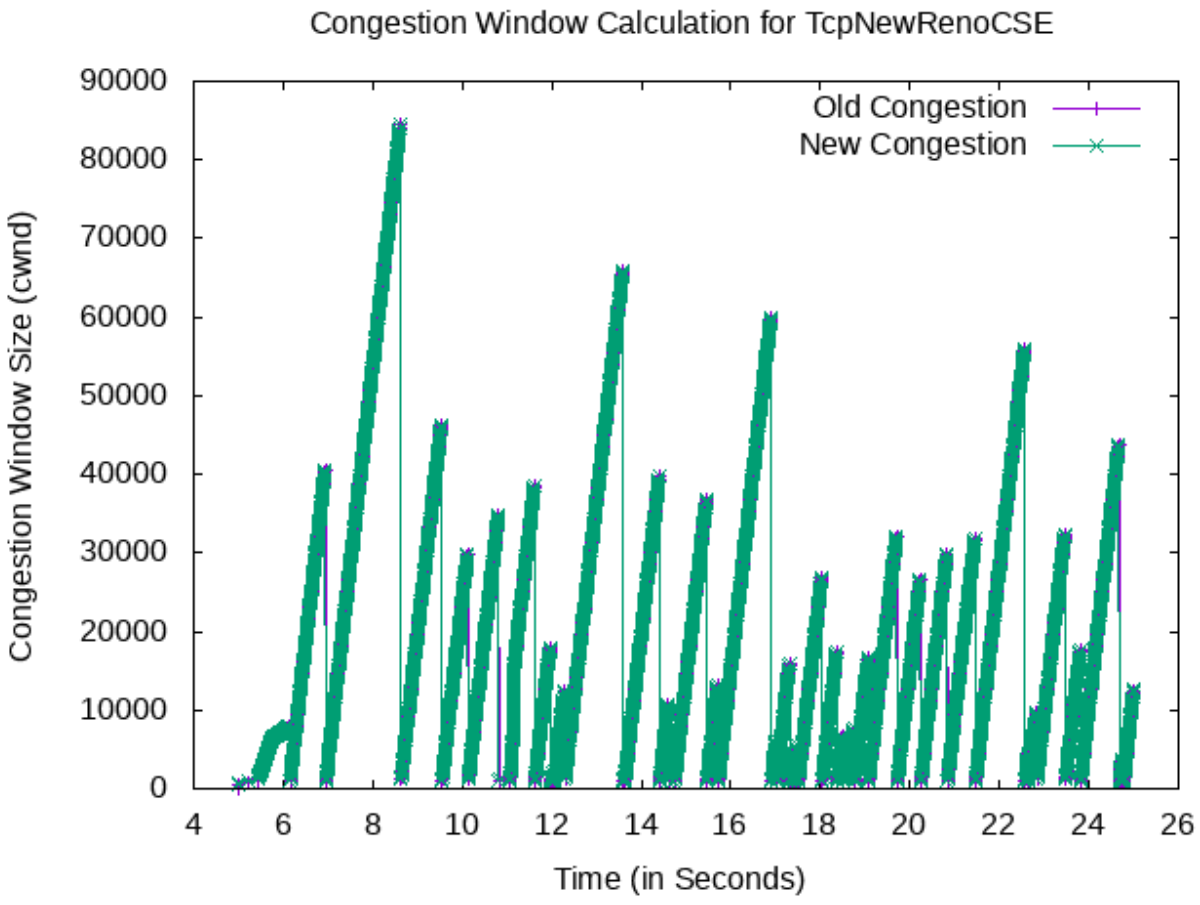
CONFIGURATION3: ALL CONNECTION USED TCPNEWRENOCSE

CONNECTION1



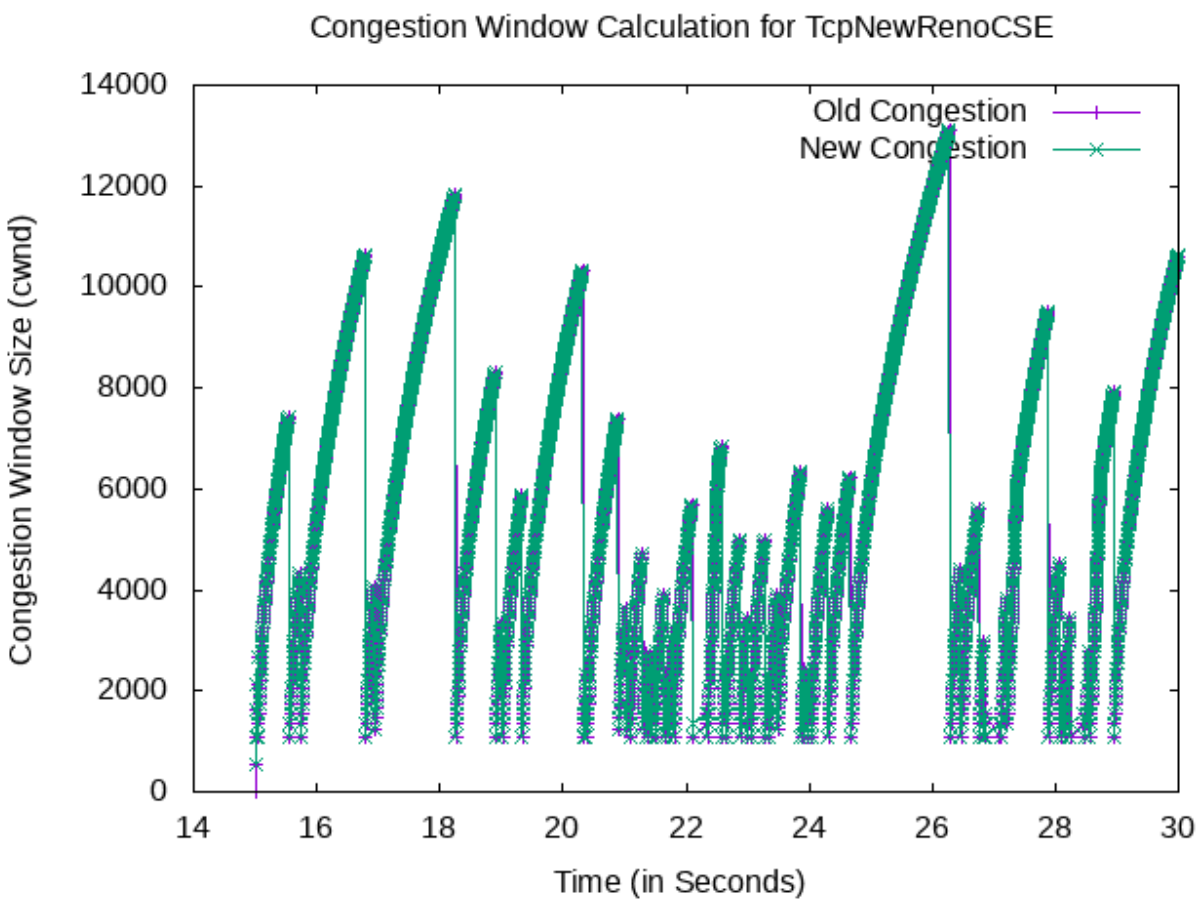
Dropped Packets = 81

CONNECTION2



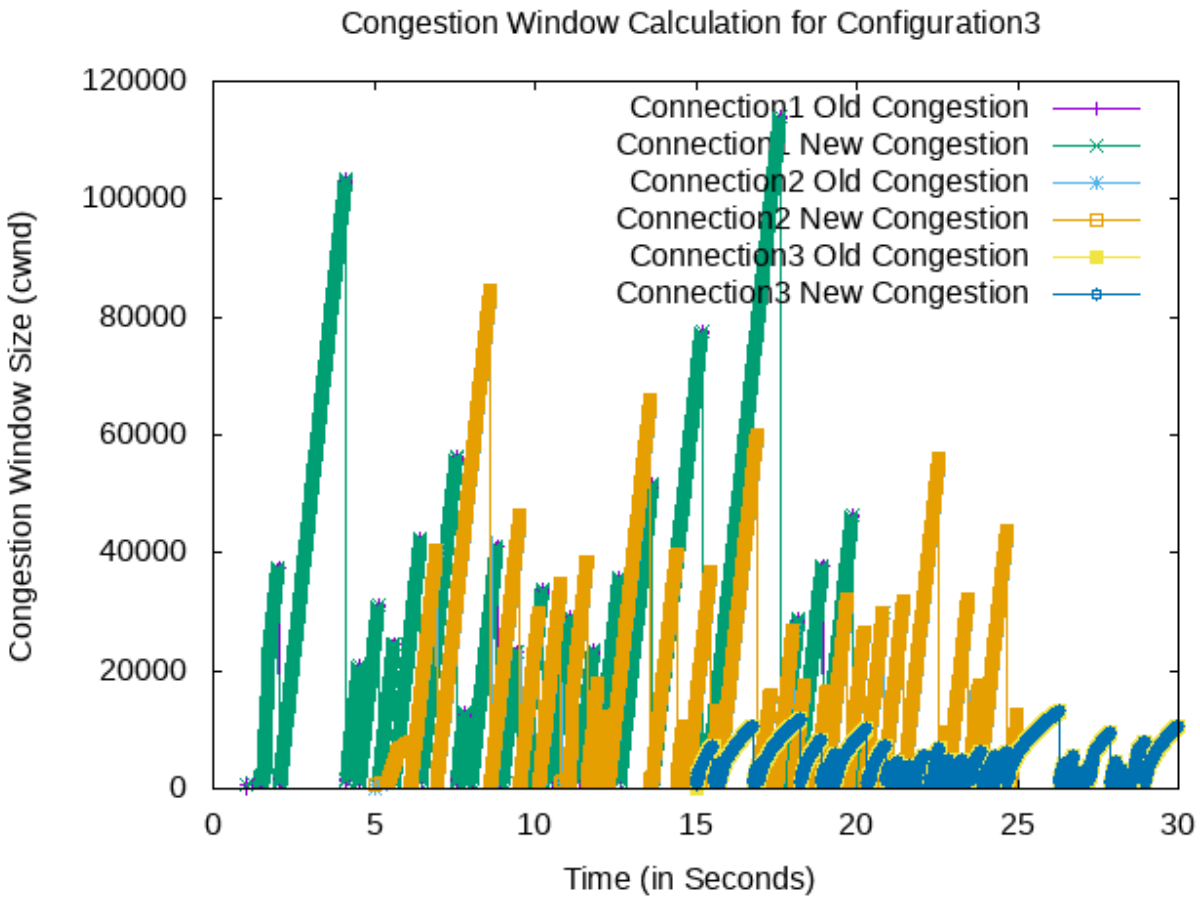
Dropped Packets = 39

CONNECTION3



Dropped Packets = 15

ALL CONNECTION



Dropped Packets = 135

The congestion avoidance phase vary for same ender on using two different protocols i.e. TCP NewReno and TCP newRenoCSE because these have different protocols used in different stages i.e. slow start phase, congestion avoidance phase. Congestion avoidance phase vary for the same

sender because there are two connections and it can be the fact one has to stop sending packets when the other one Is filling the queues in there. This impacts the entire network because there is a common sink and if there are no acknowledgements coming from the other side the situation may get worsened because it will keep transmitting the packets to that node.