

Network topology:

Wired

Wireless 802.15.4 mobile

Wired-wireless

Parameters under variation:

1.nodes

2.flows

3.packets /sec

4.Speed (wireless)

Modifications made in the simulator:

For a given network status, the modified mechanism determines the congestion degree in the network using the change in the Round Trip Time. In entering the Fast Recovery algorithm, it can detect the change in the RTT and decreases the congestion window (cwnd) by a value related to the increase in the RTT.

Change in code:

tcp.h – define two macros my_method and my_method_2

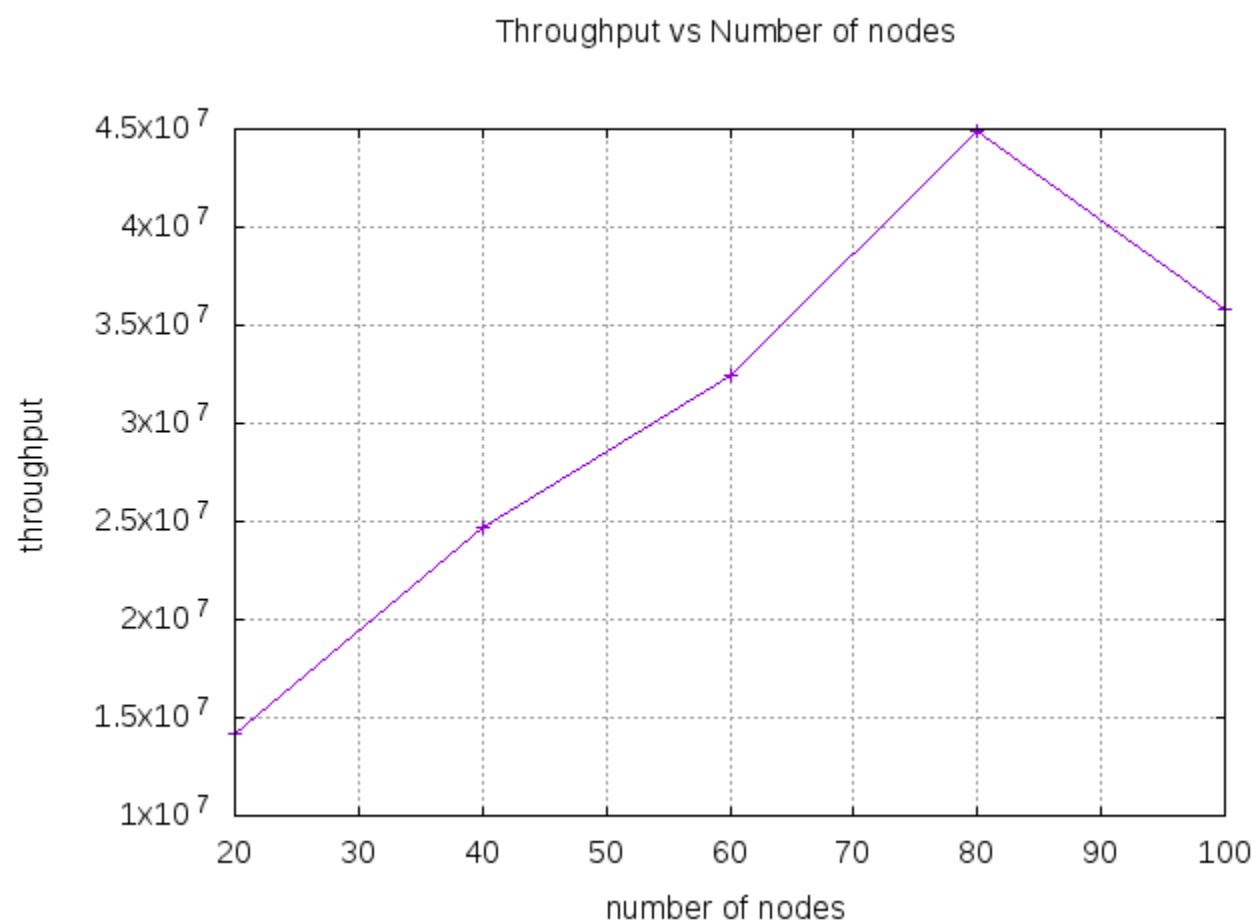
tcp.cc- add two conditions in slowdown method

call slowdown (my_method_2) in timeout method

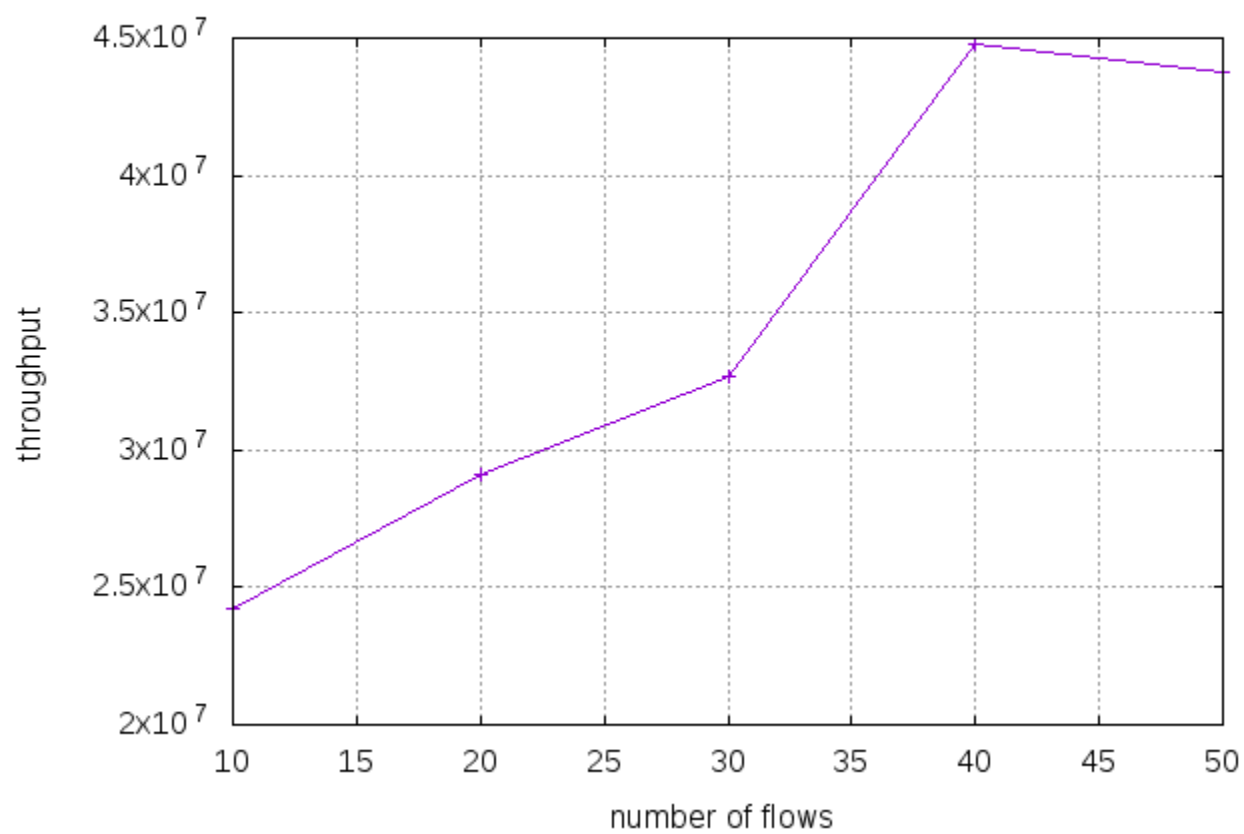
tcp-newreno.cc – call slowdown (my_method) in dupack_action method

Result with graphs:

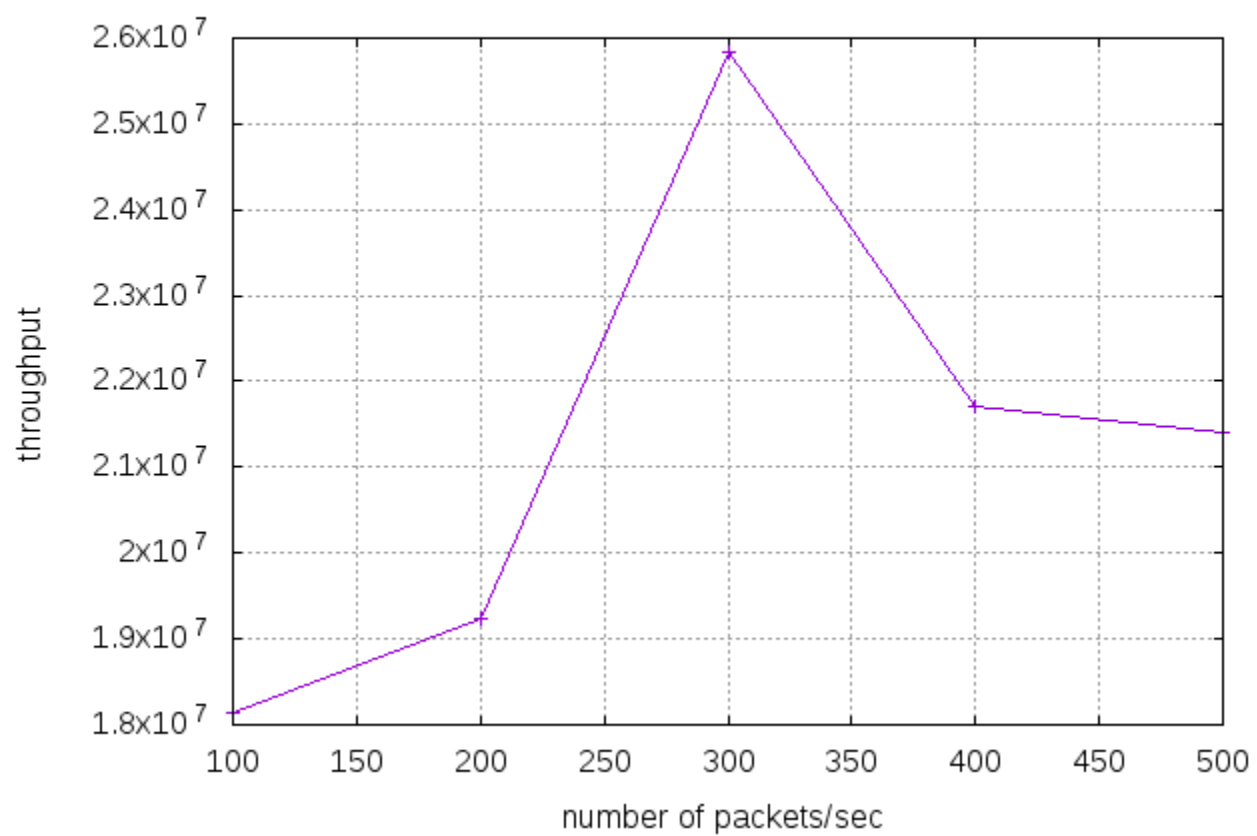
Wired:



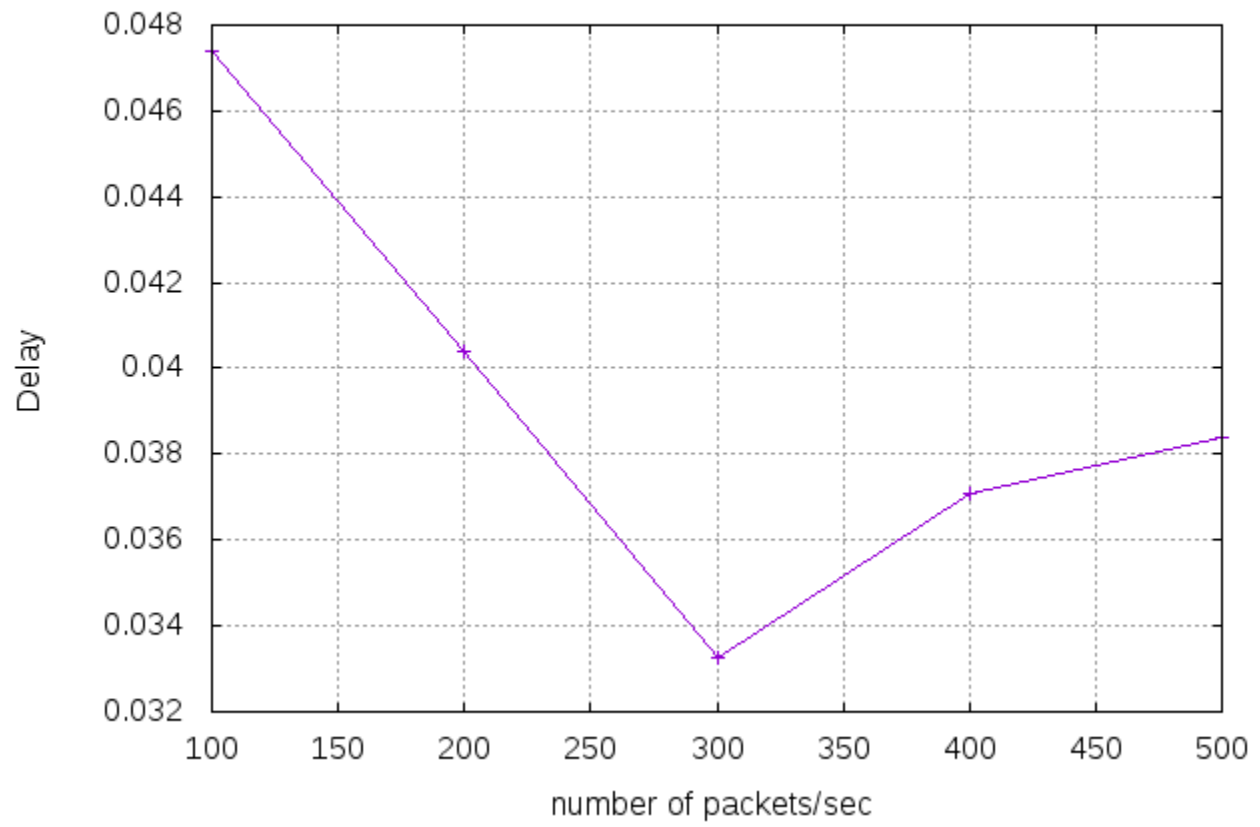
Throughput vs Number of flows



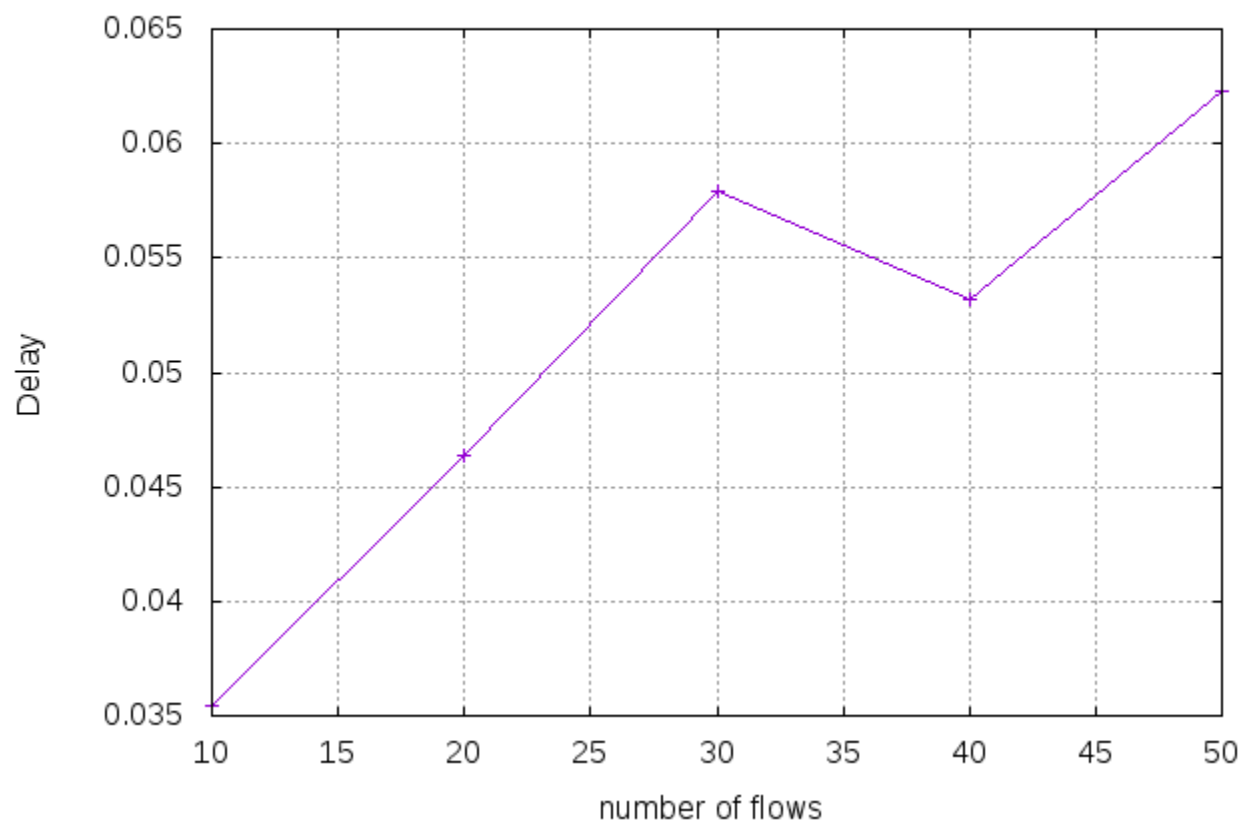
Throughput vs Number of packets



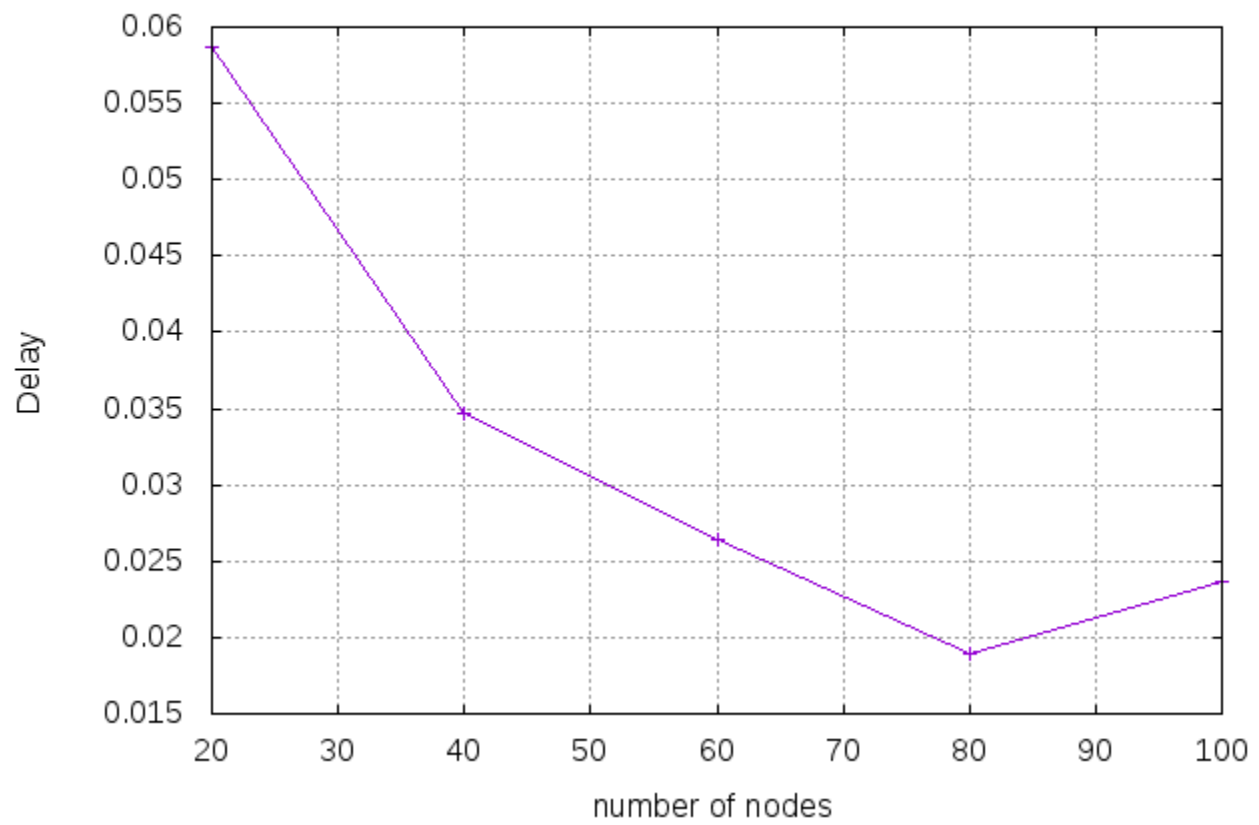
Delay vs Number of packets



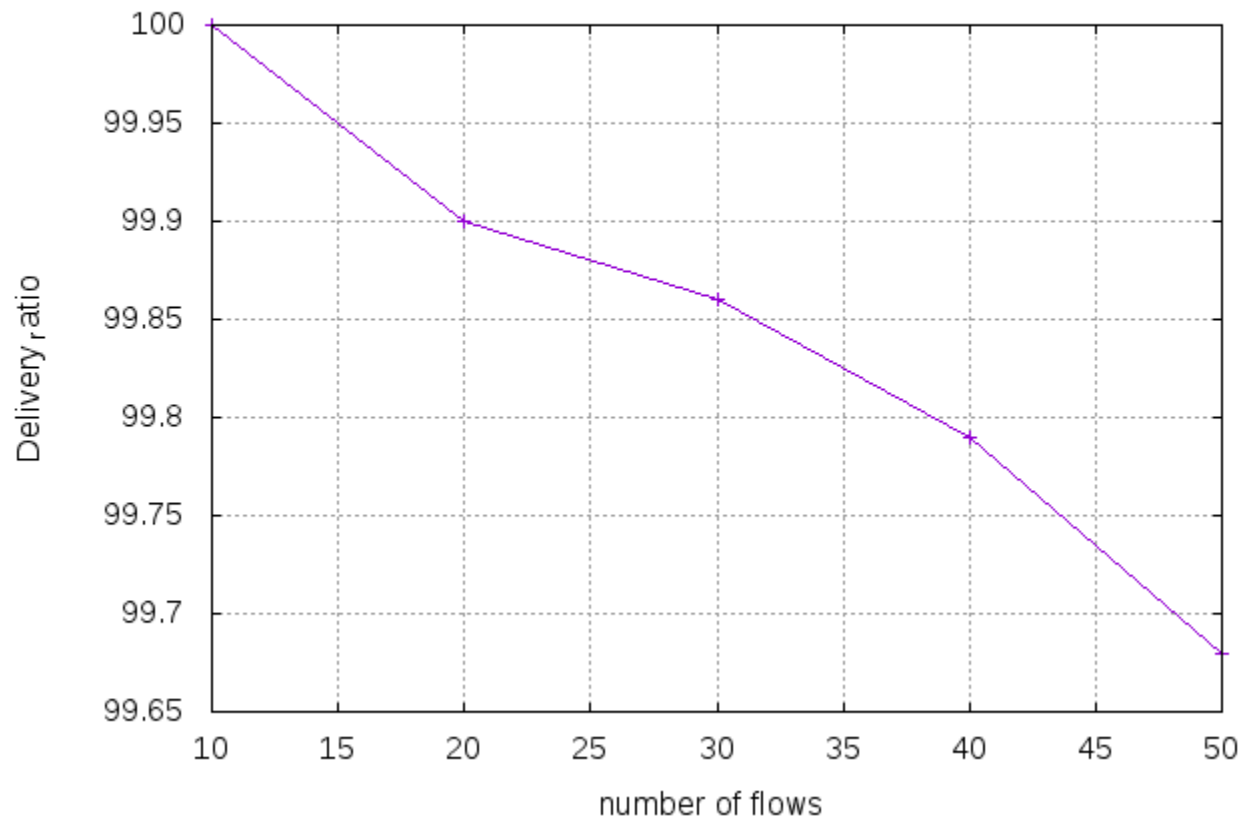
Delay vs Number of flows



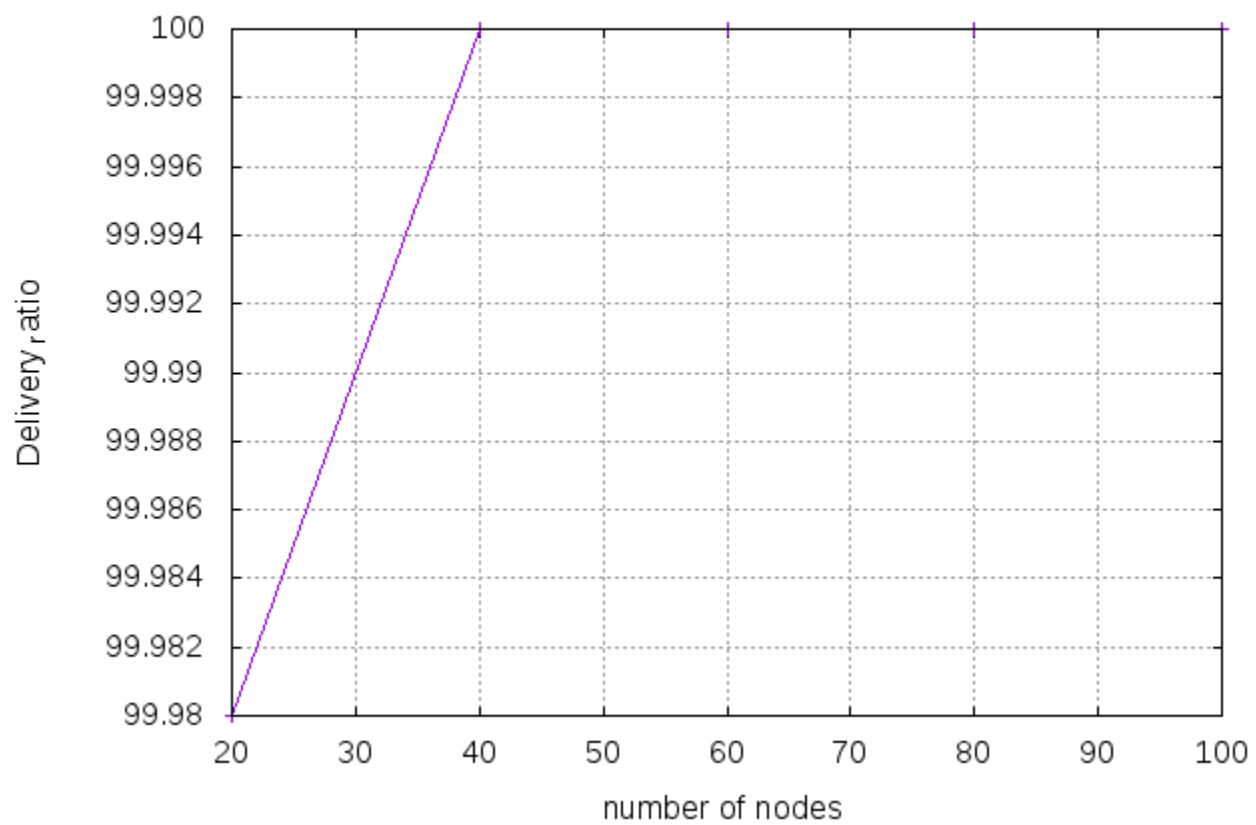
Delay vs Number of nodes



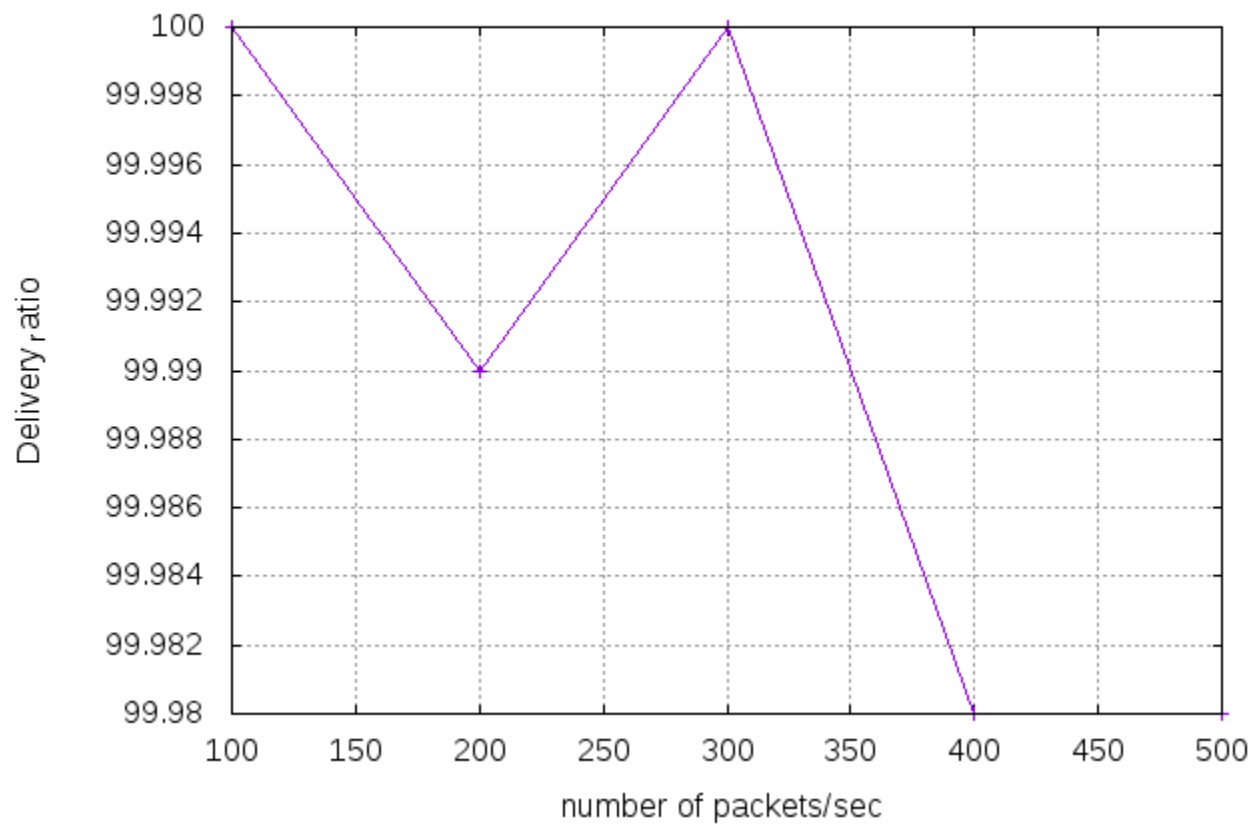
Delivery_ratio vs Number of flows



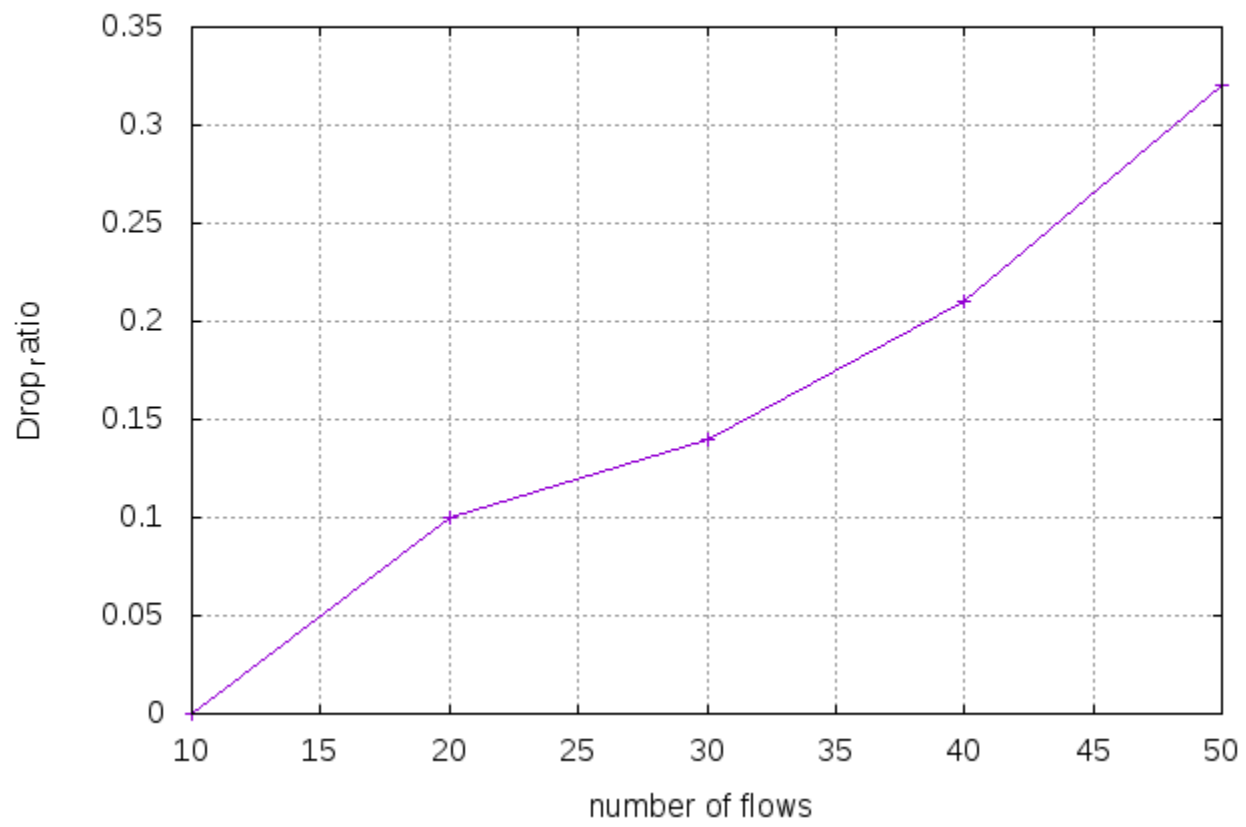
Delivery_ratio vs Number of nodes



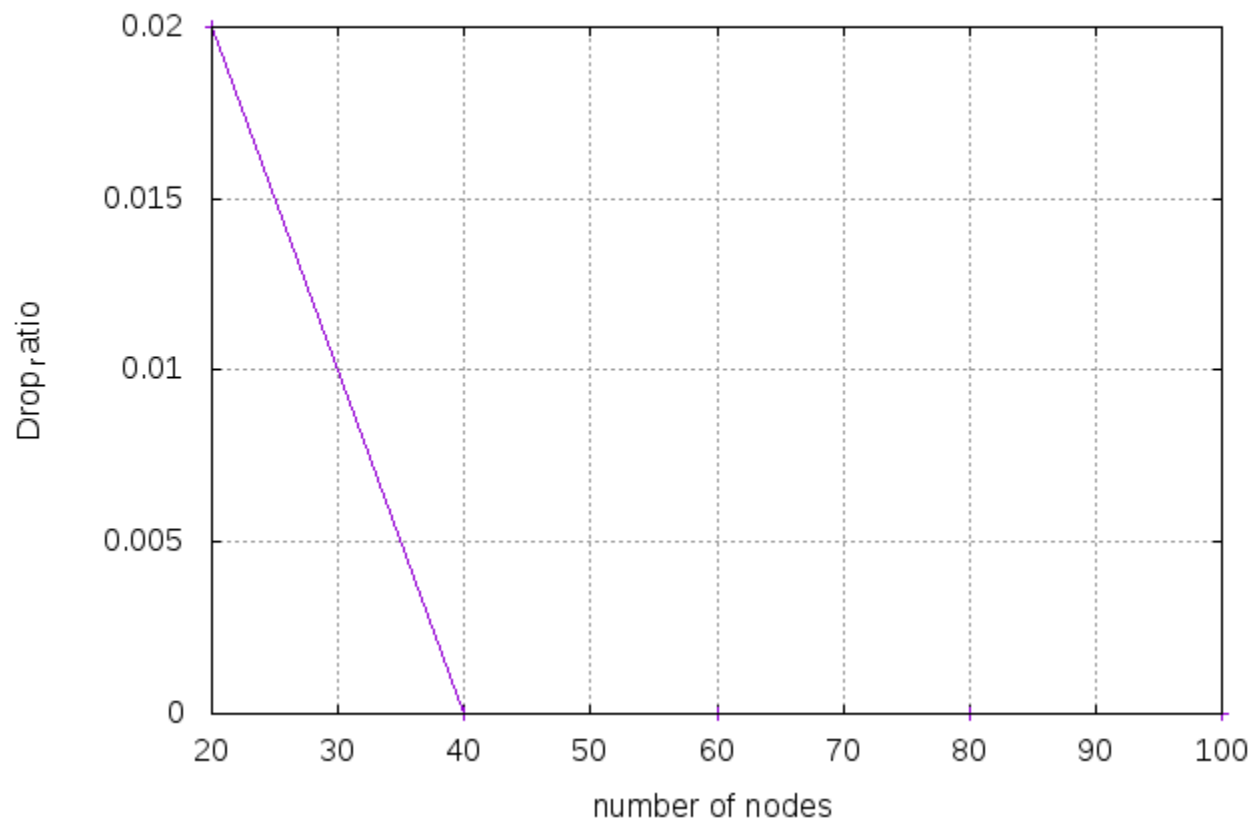
Delivery_ratio vs Number of packets



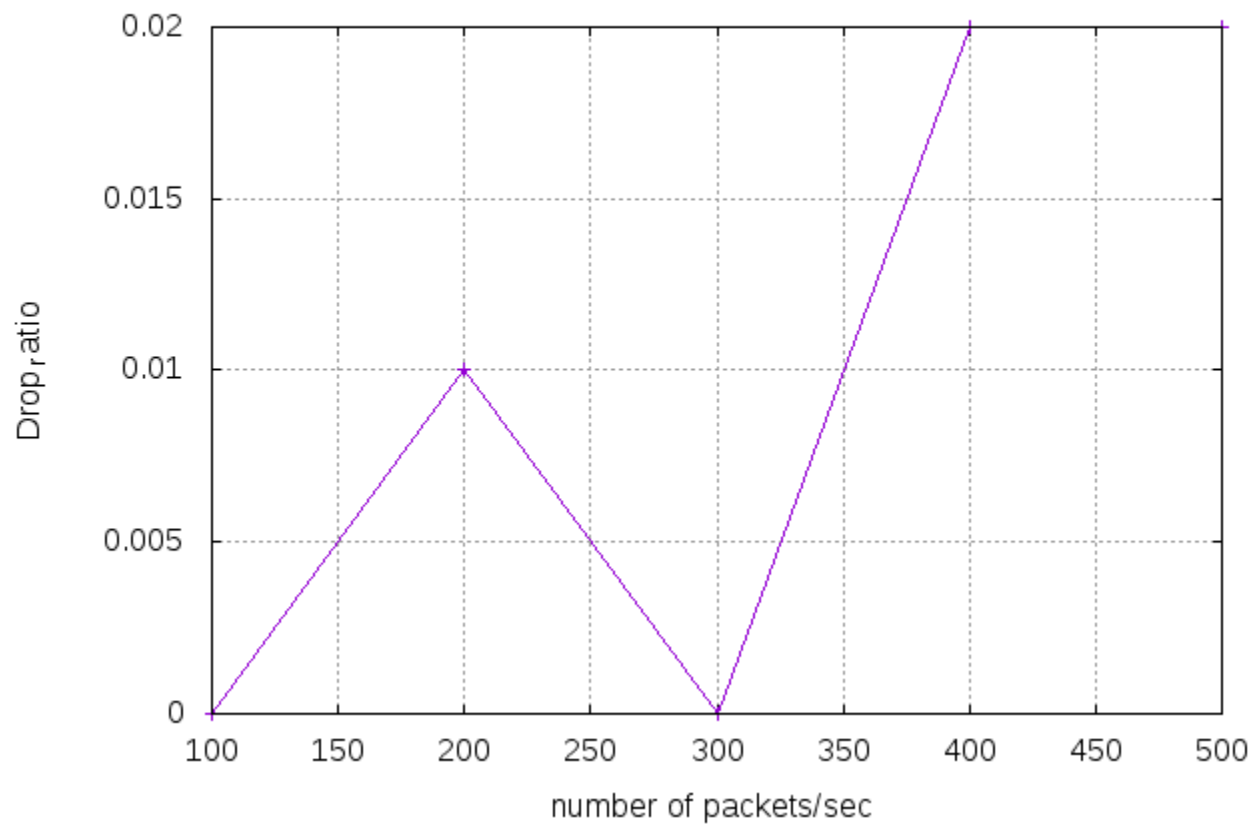
Drop_ratio vs Number of flows



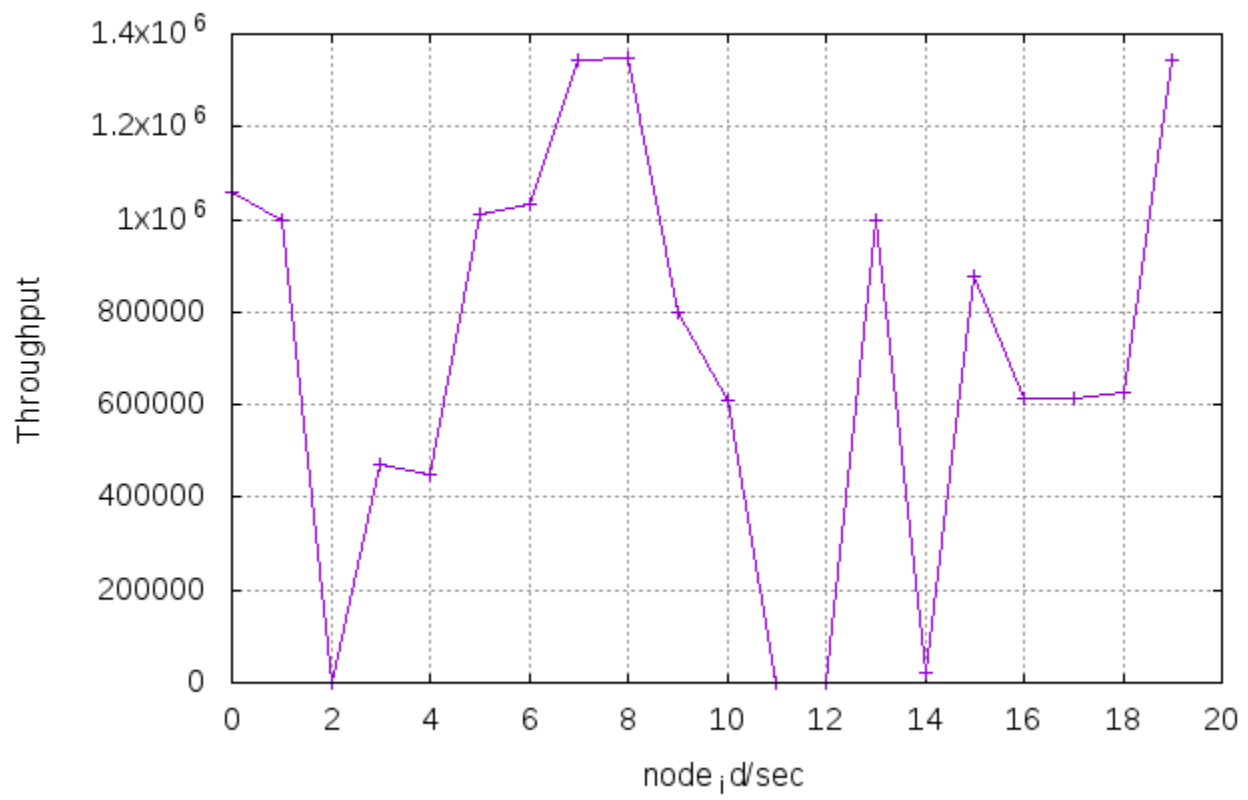
Drop_ratio vs Number of nodes



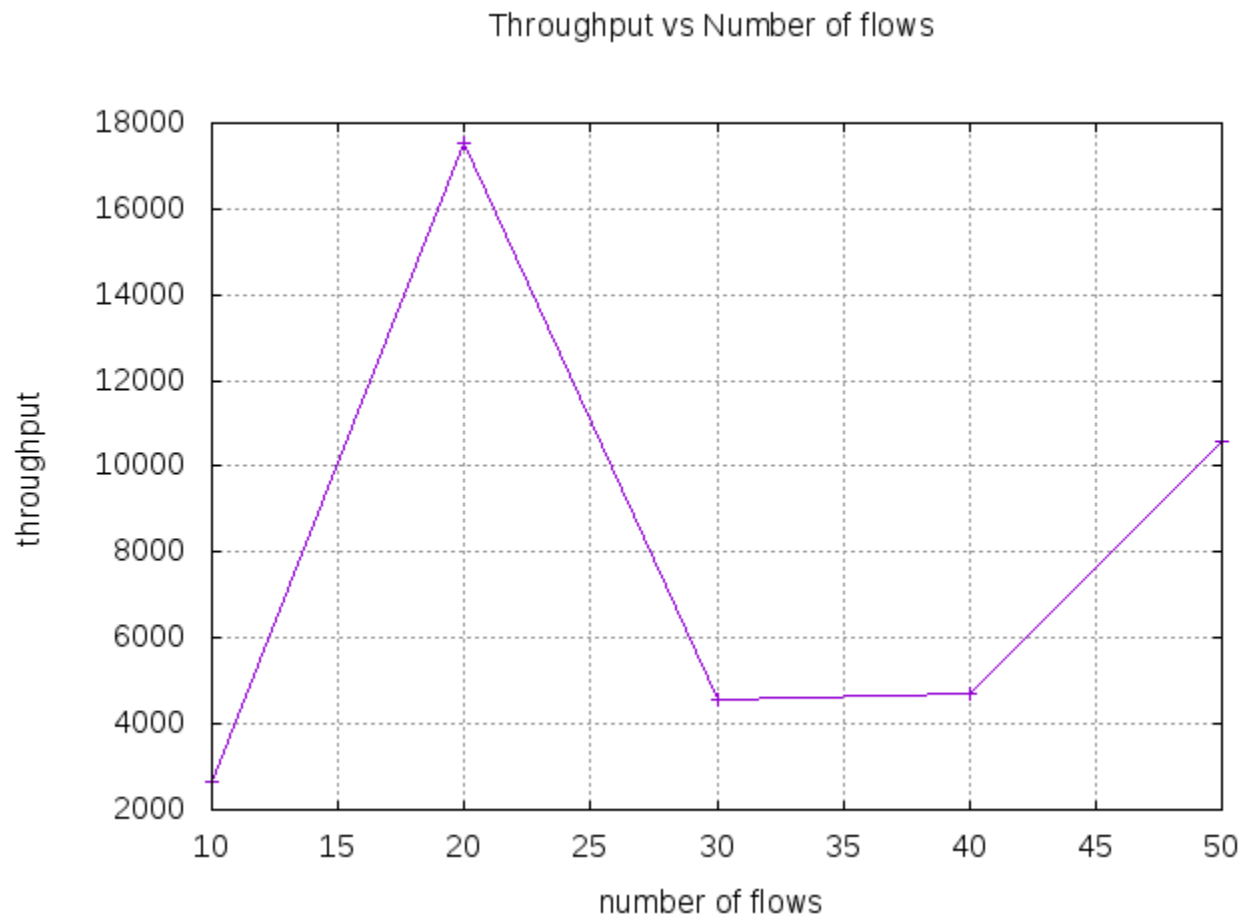
Drop_ratio vs Number of packets



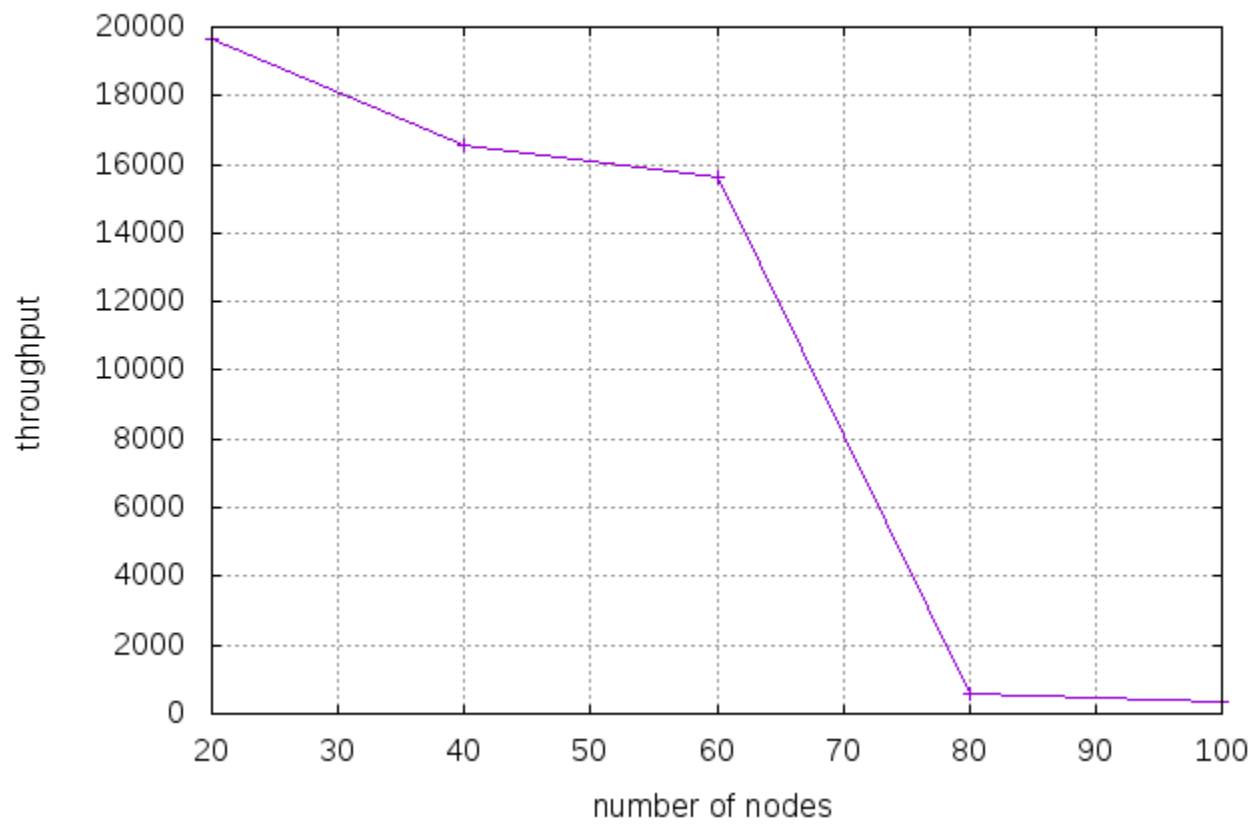
Per node throughput



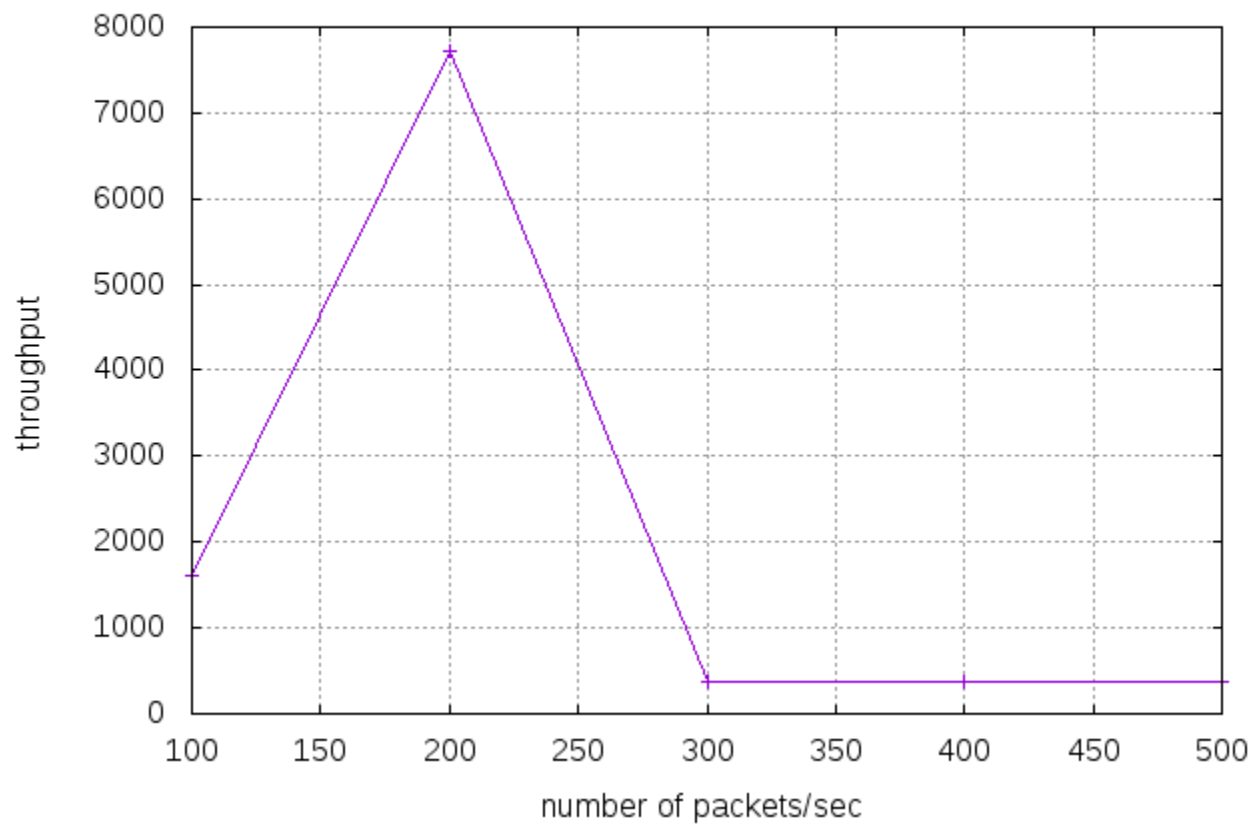
Wireless 802.15.4 mobile:



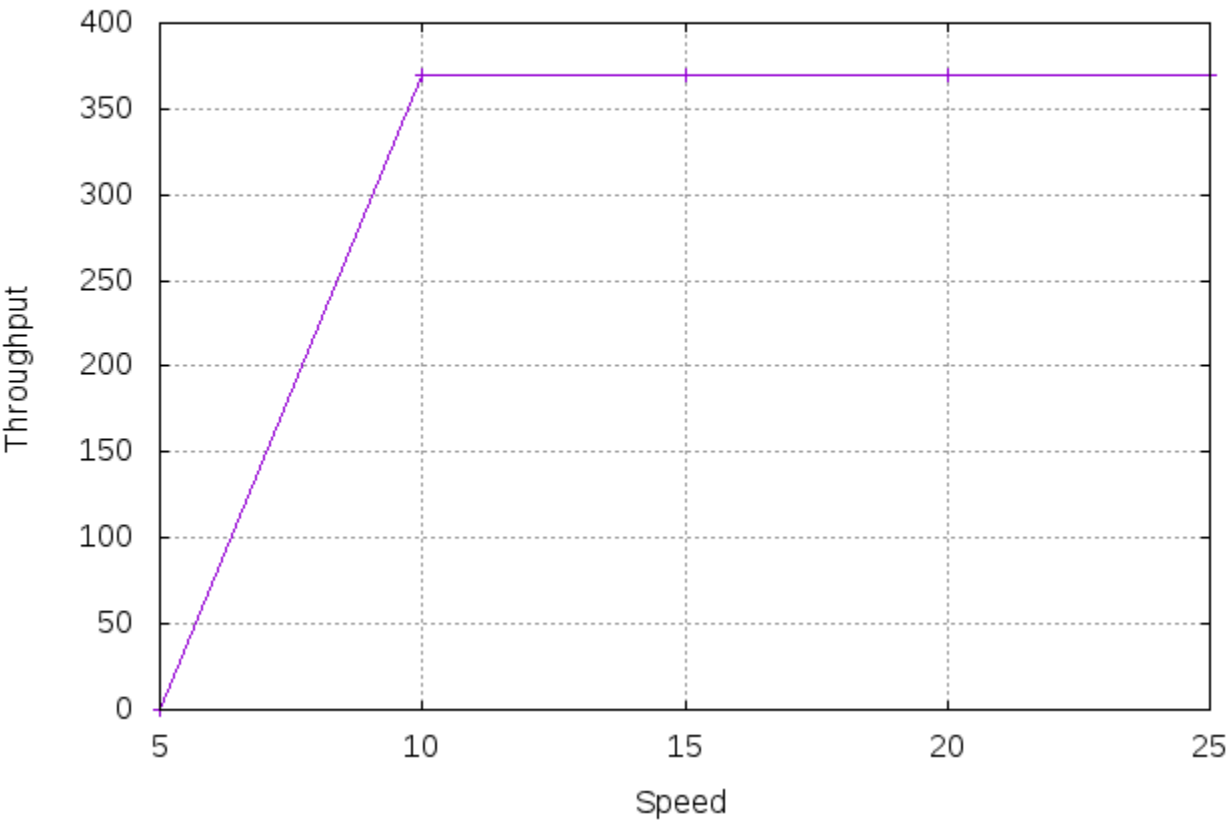
Throughput vs Number of nodes



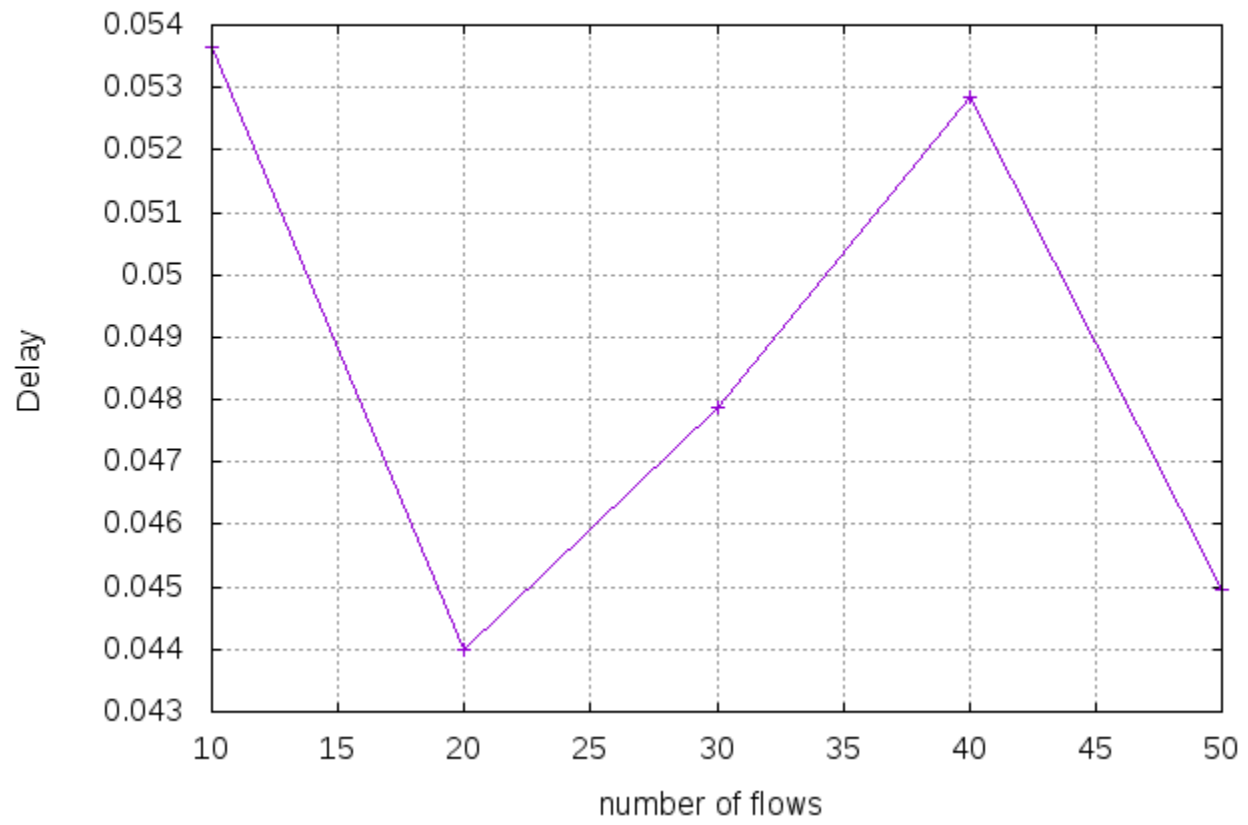
Throughput vs Number of packets



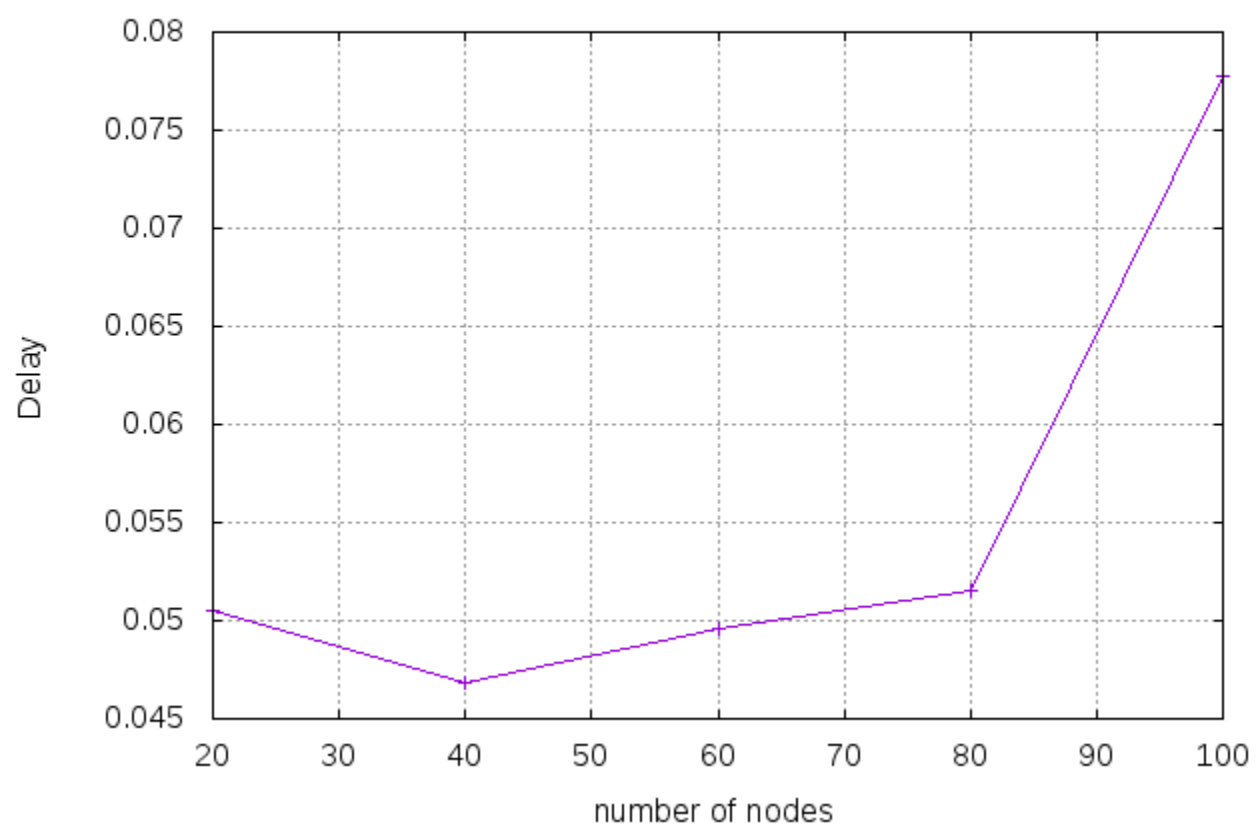
Throughput vs Speed



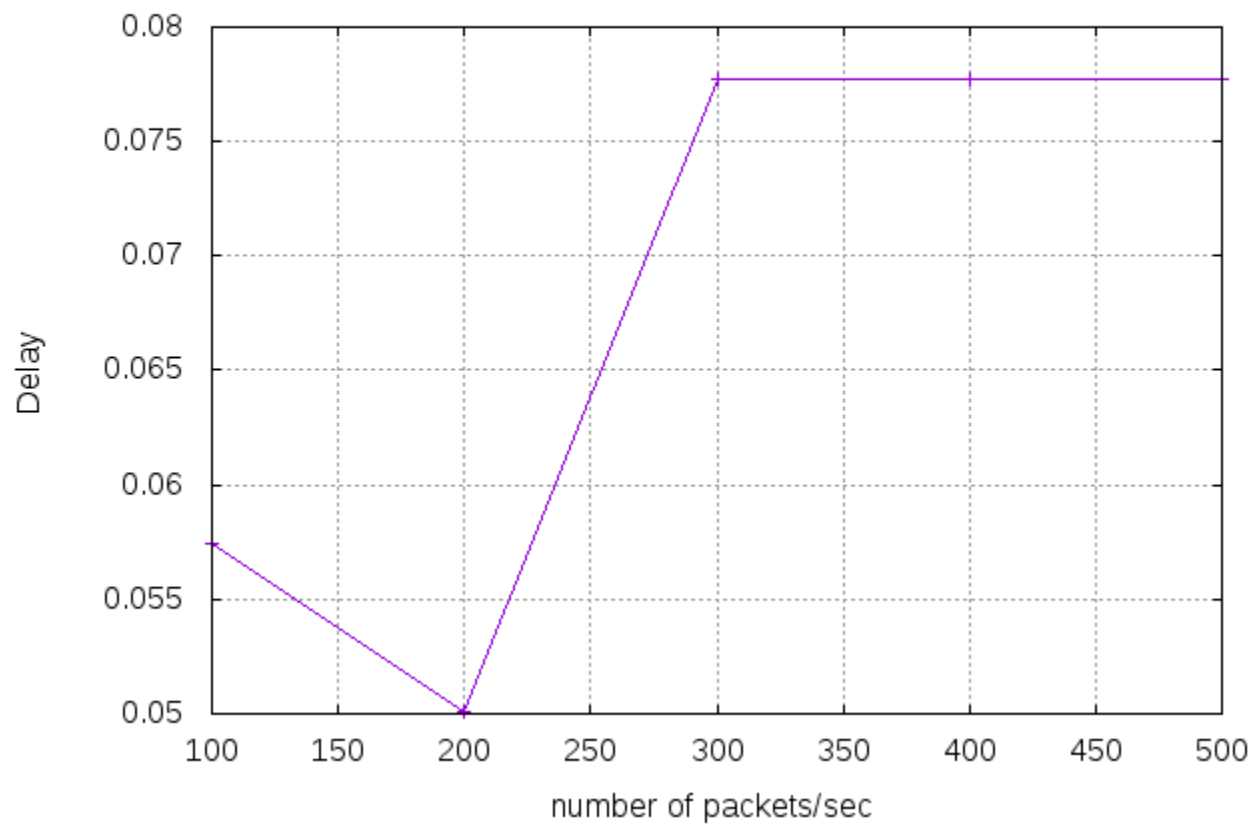
Delay vs Number of flows



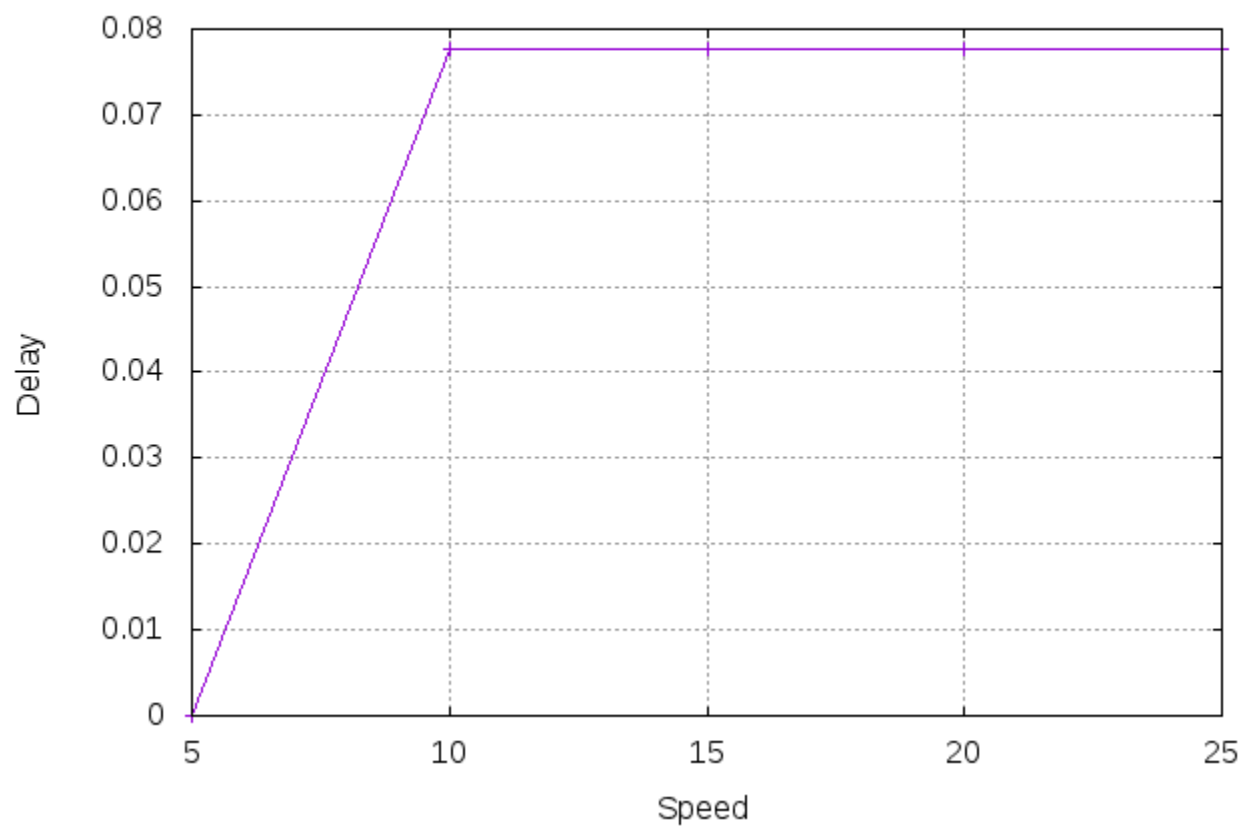
Delay vs Number of nodes



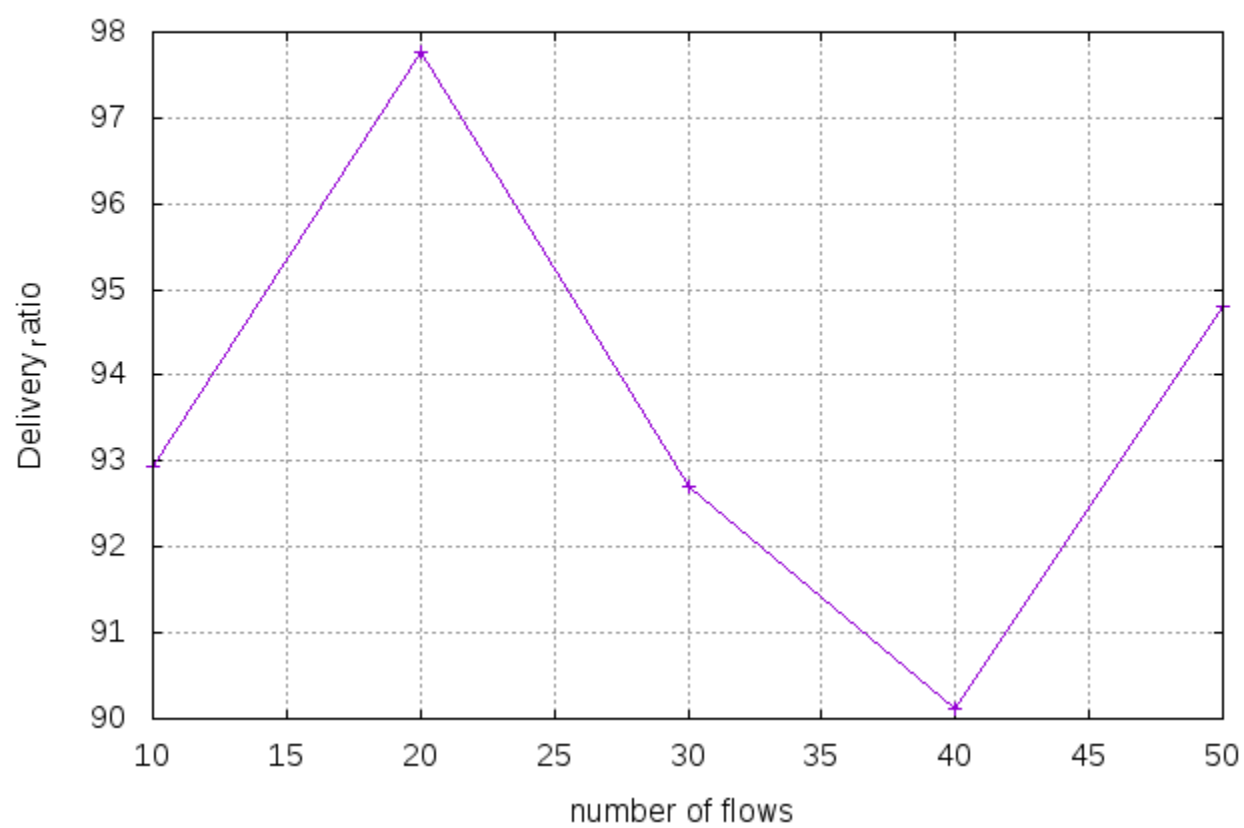
Delay vs Number of packets



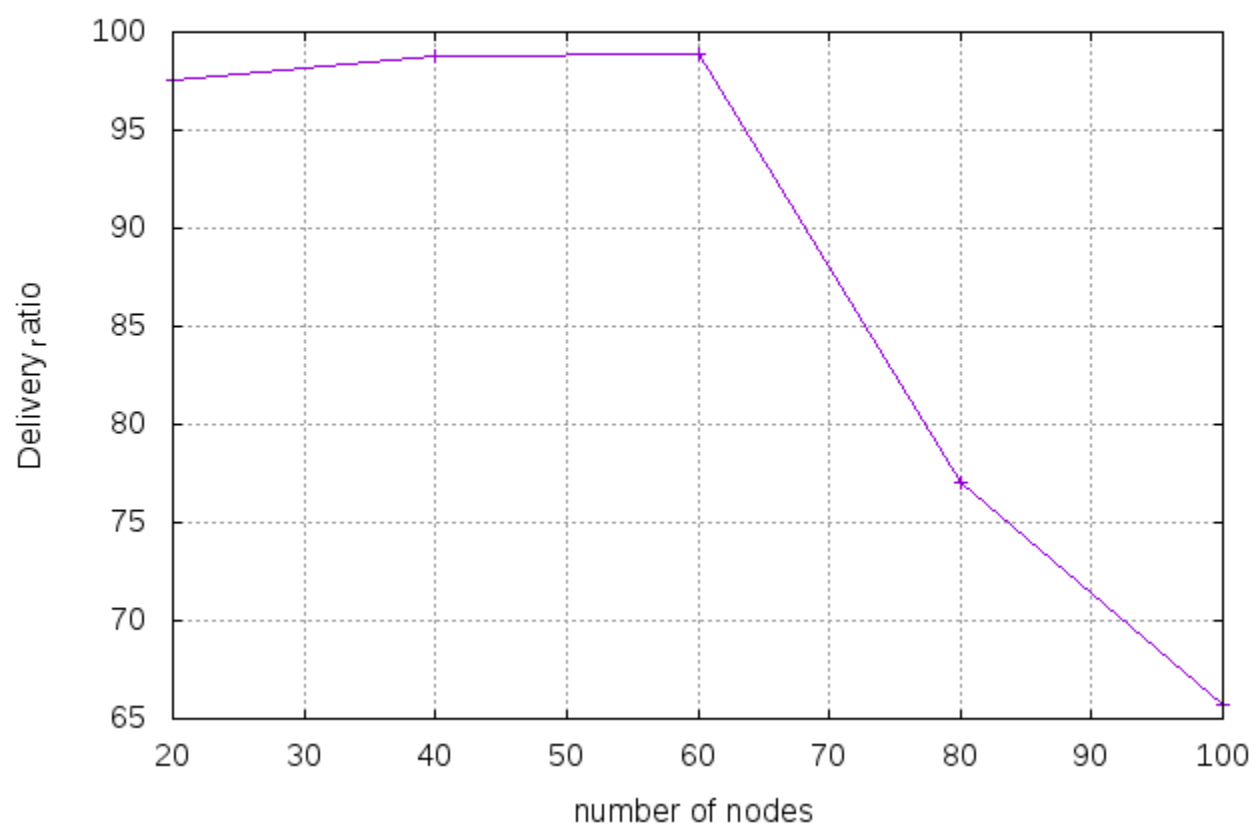
Delay vs Speed



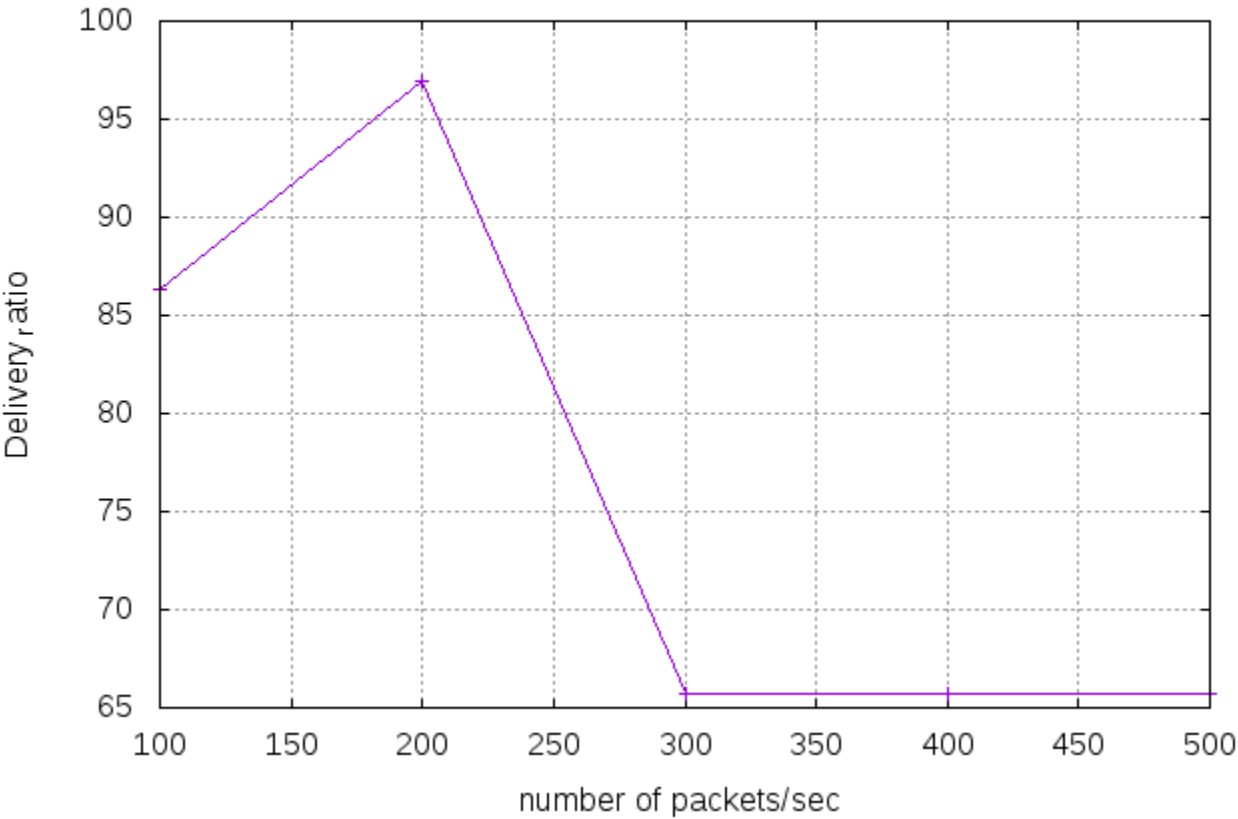
Delivery_ratio vs Number of flows



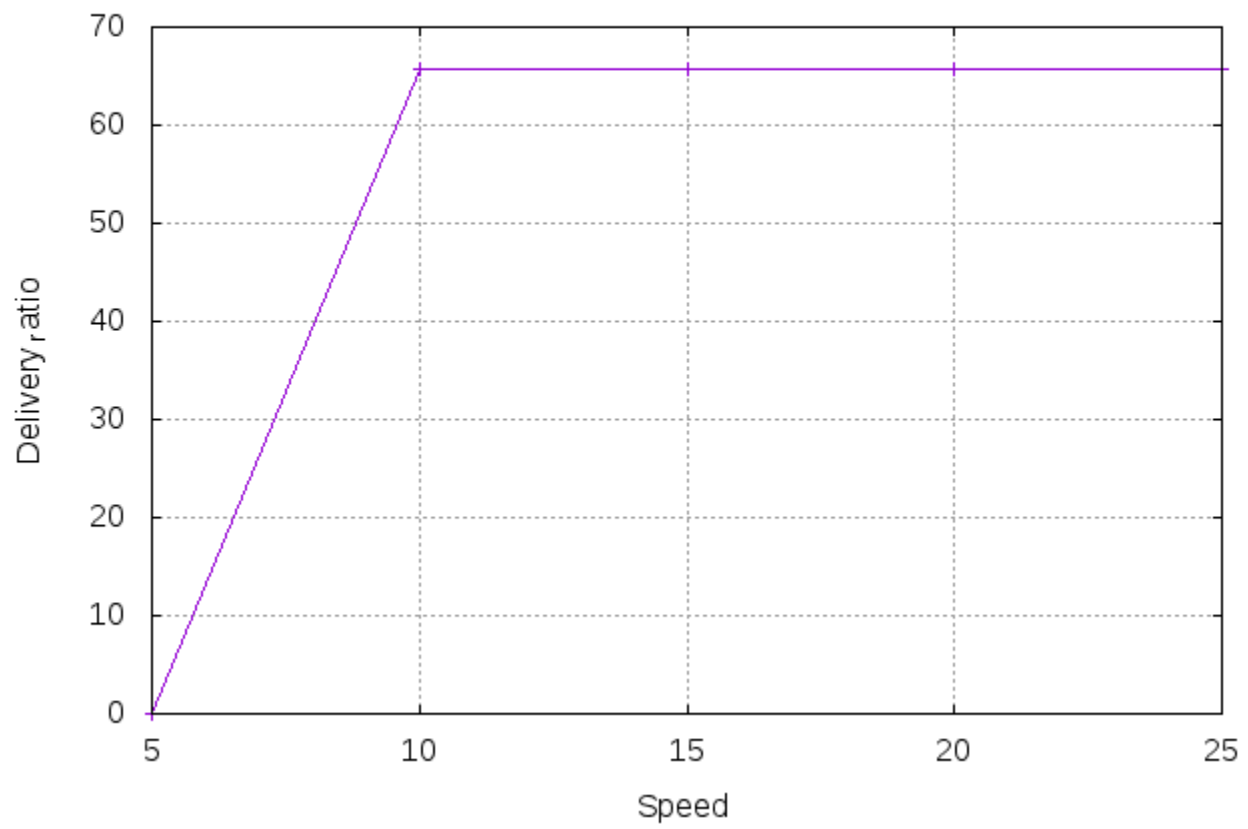
Delivery_ratio vs Number of nodes



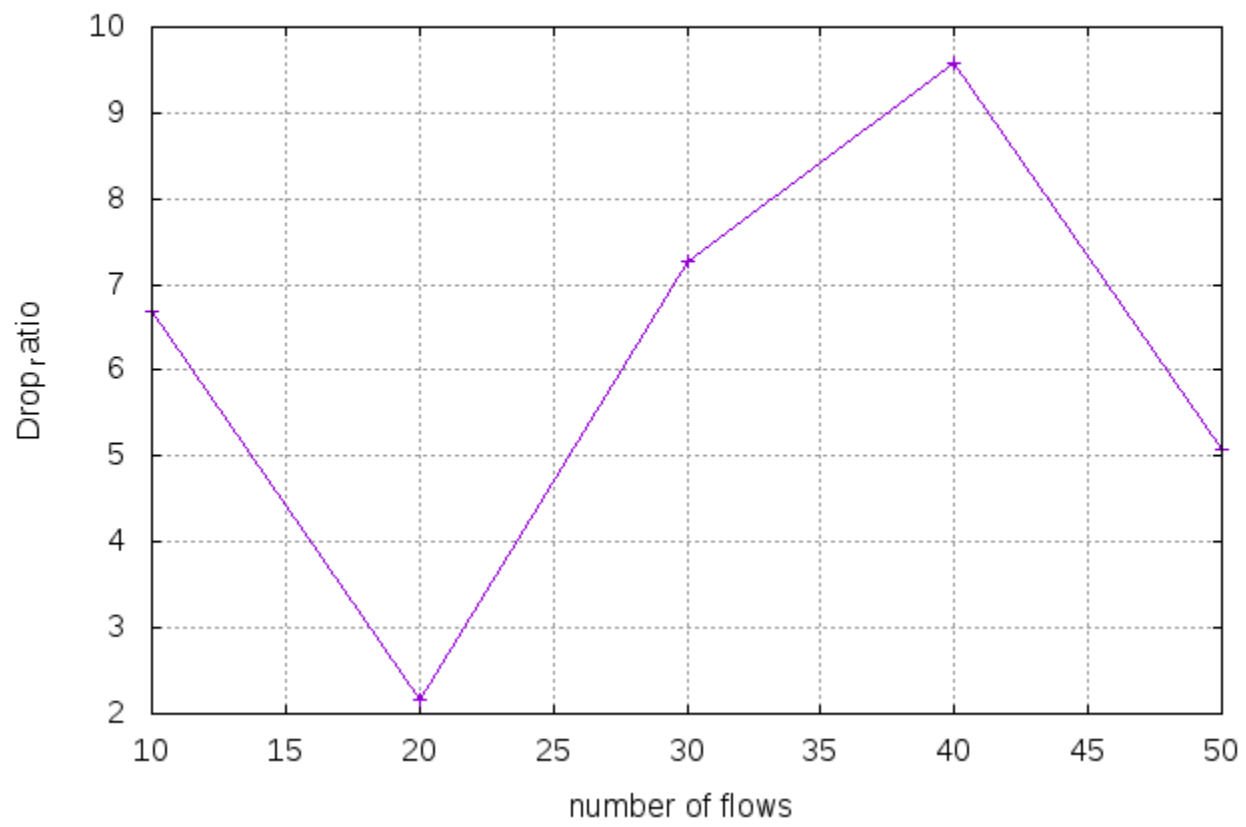
Delivery ratio vs Number of packets



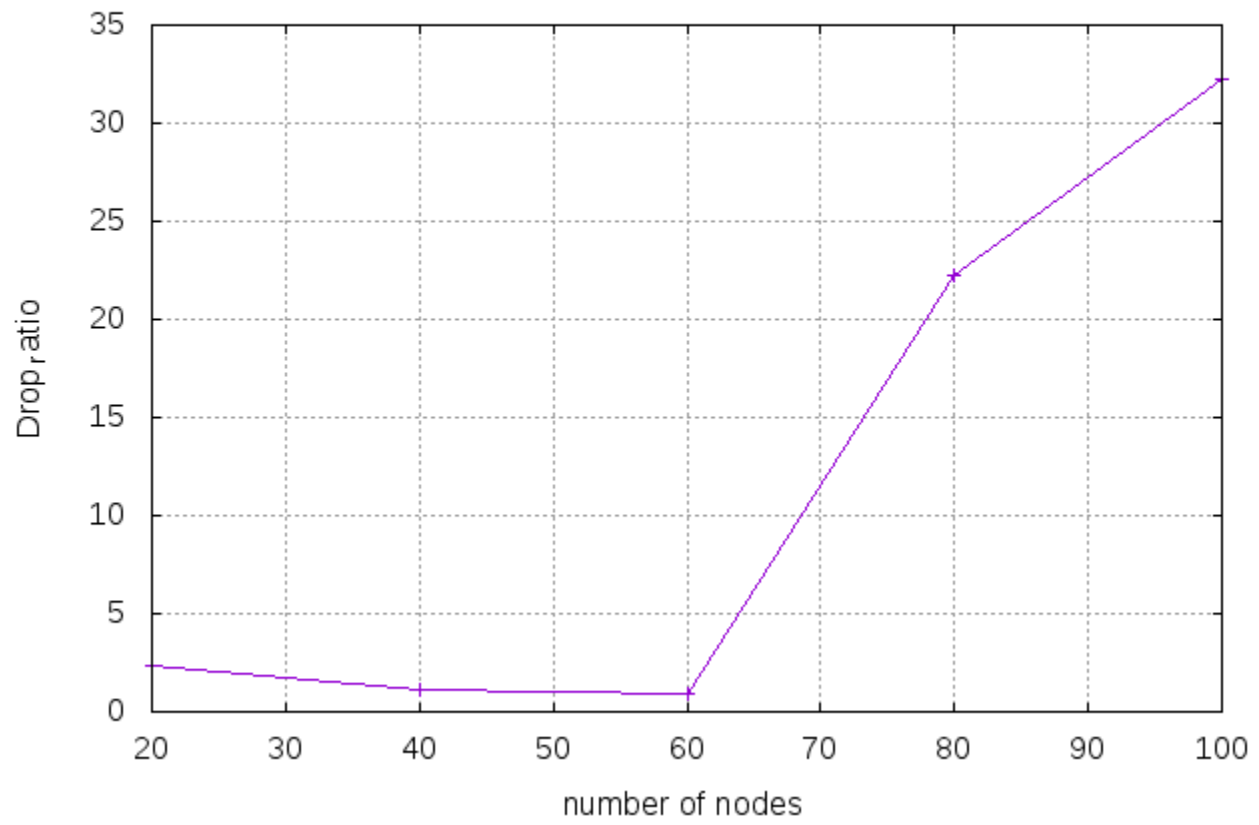
Delivery_ratio vs Speed



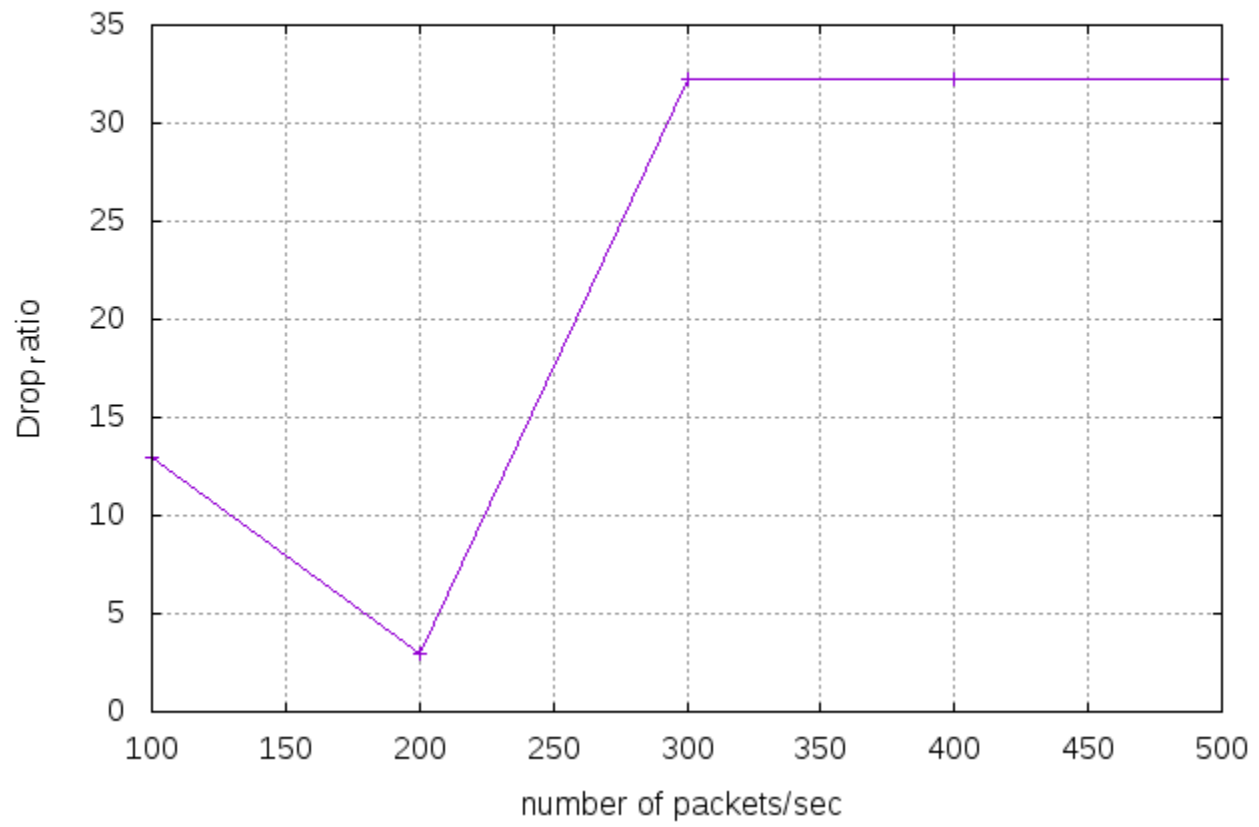
Drop_ratio vs Number of flows



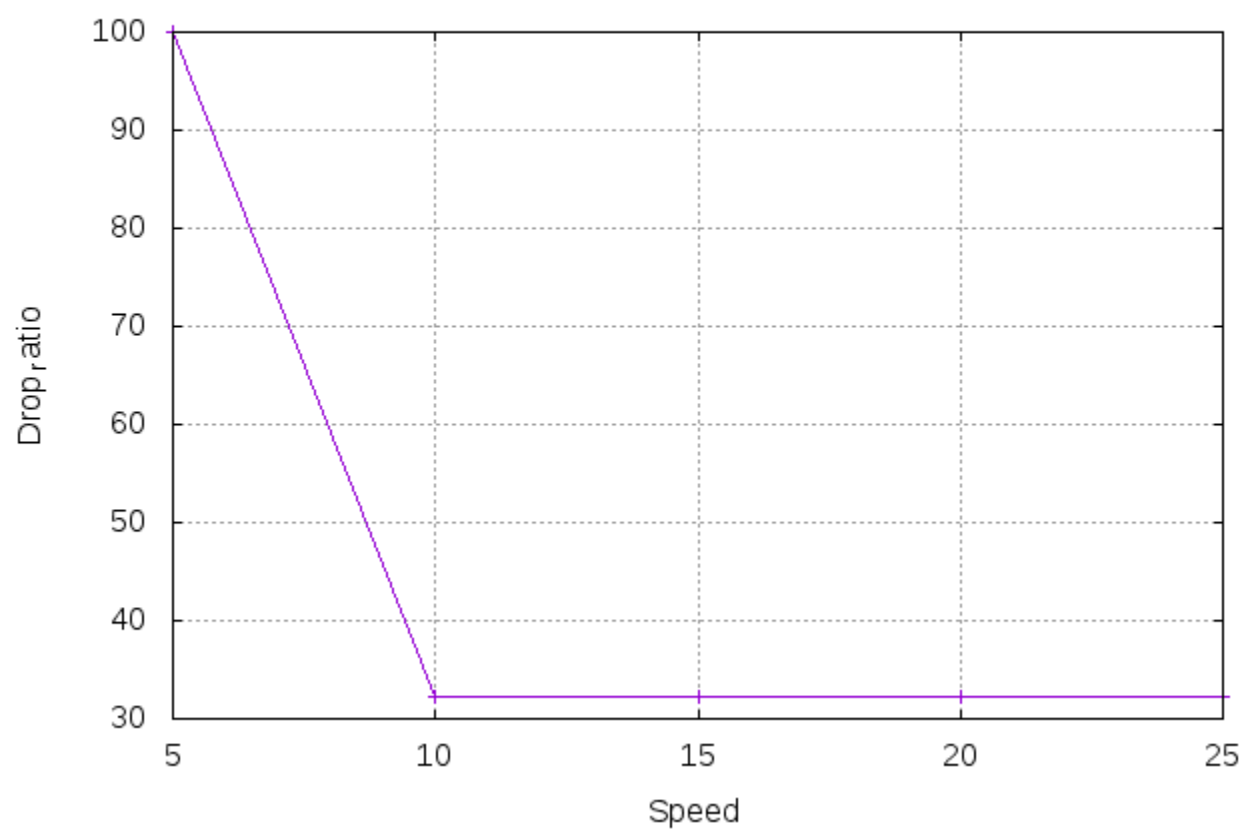
Drop_ratio vs Number of nodes



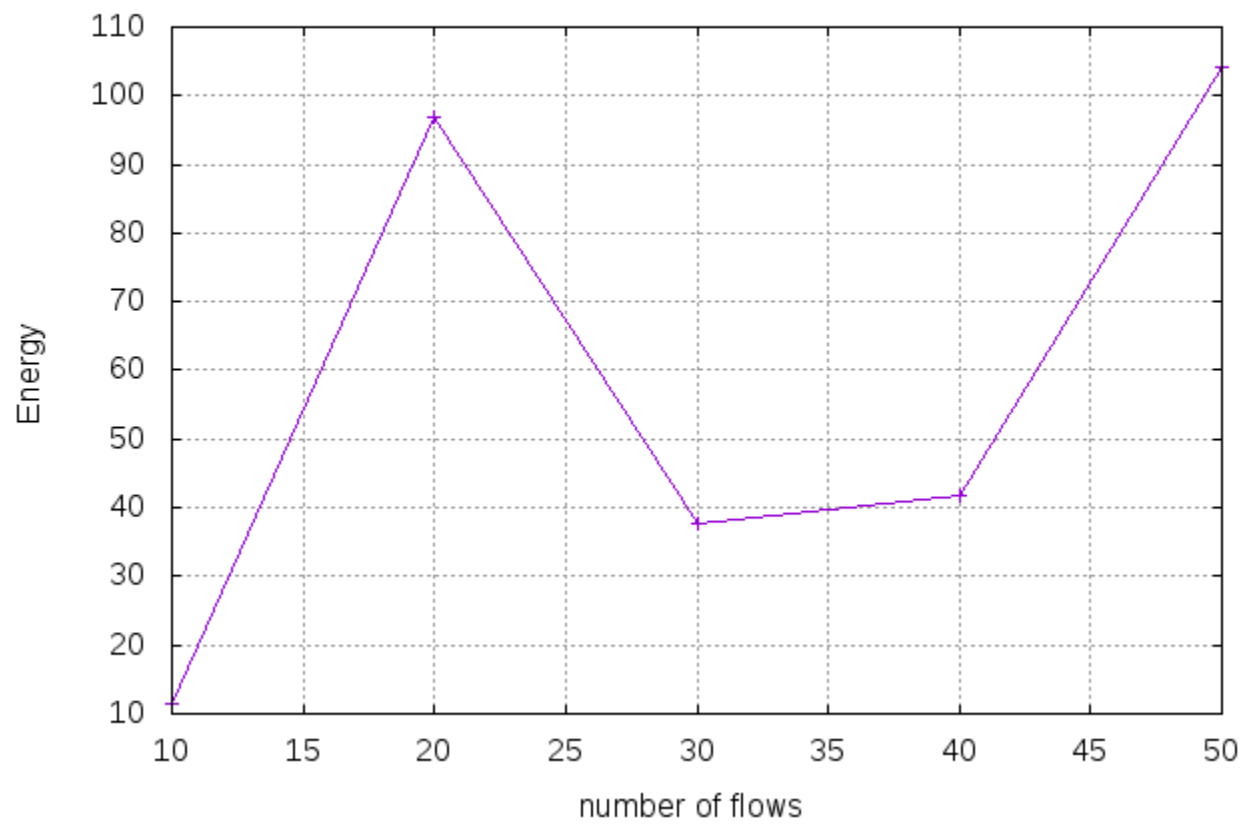
Drop_ratio vs Number of packets



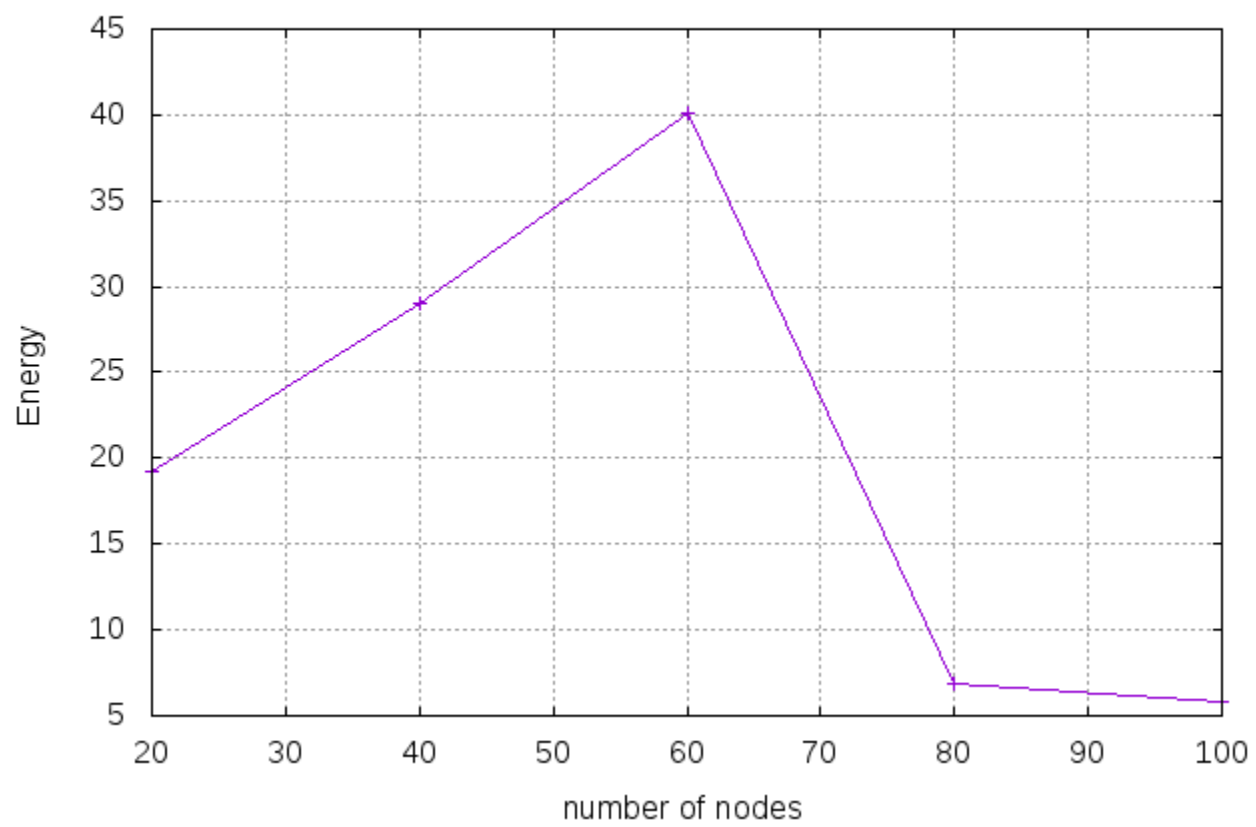
Drop_ratio vs Speed



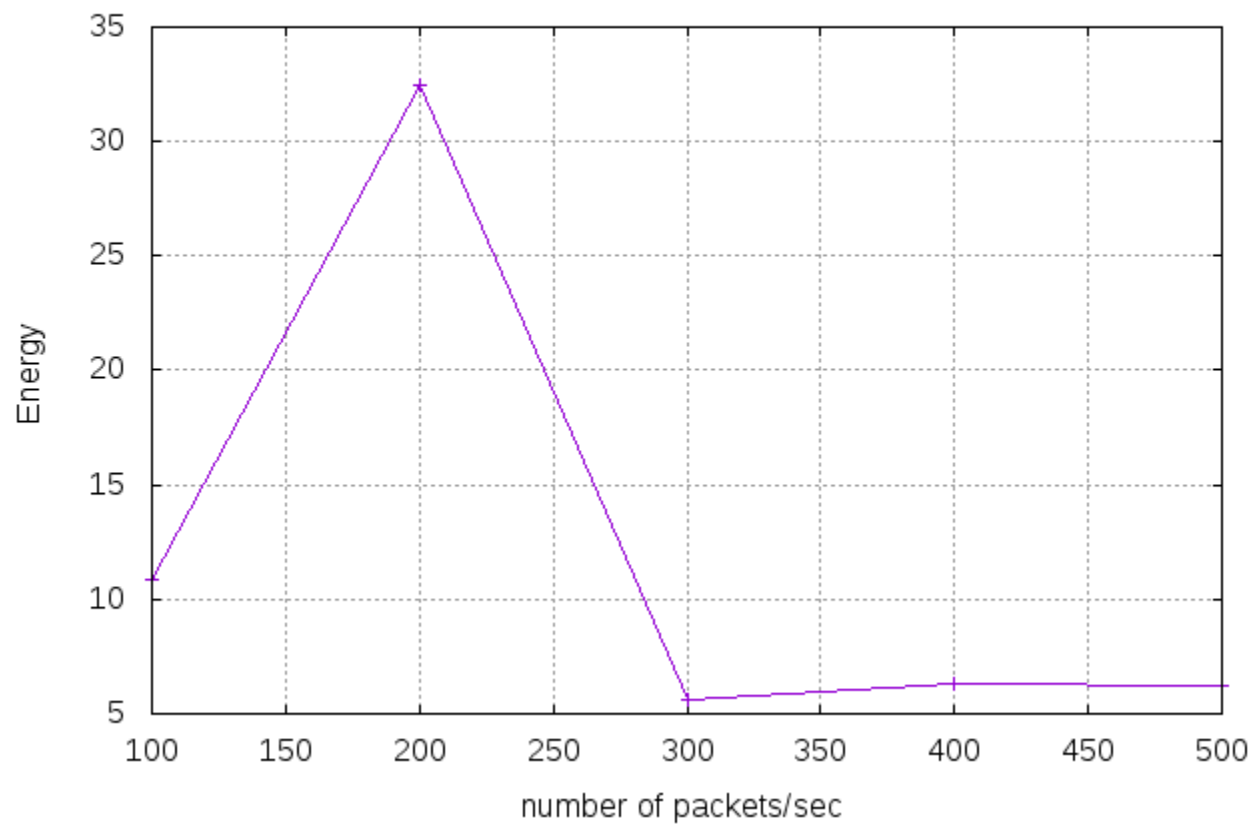
Energy vs Number of flows



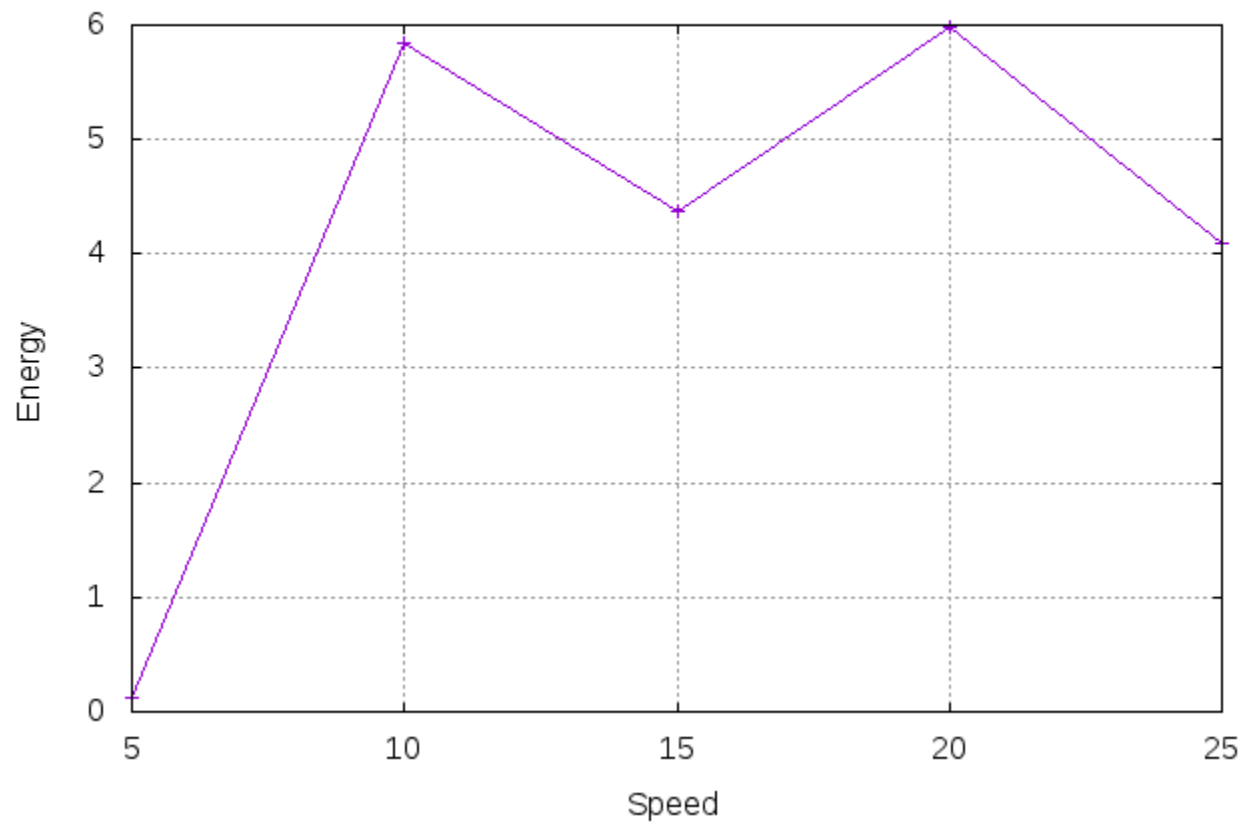
Energy vs Number of nodes



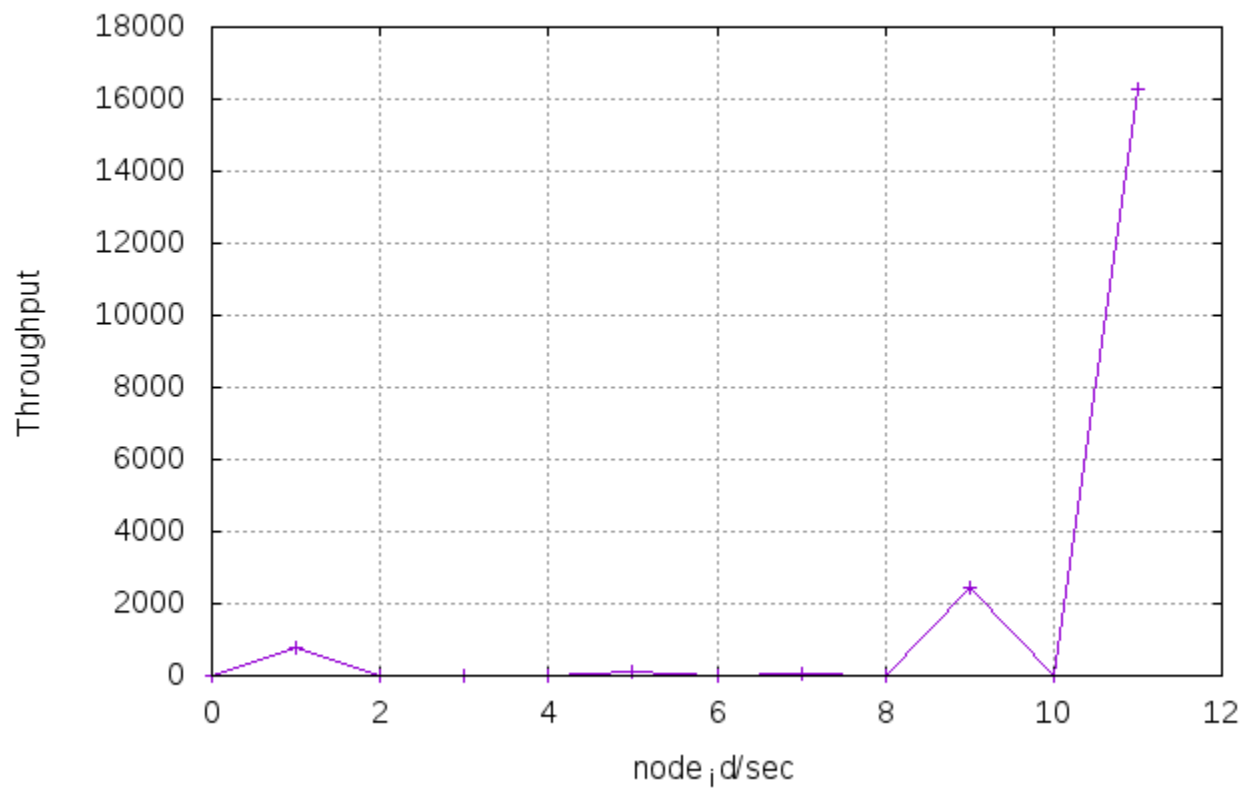
Energy vs Number of packets



Energy vs Speed



Per node throughput



comparison result between modifications and existing tcp protocols:

//modification

Throughput: 4679885.52 AverageDelay: 0.05894
Sent Packets: 54192.00 Received Packets: 53993.00 Dropped Packets: 130.00
PacketDeliveryRatio: 99.63 PacketDropRatio: 0.24
Total time: 49.99903

//newreno

Throughput: 4664410.02 AverageDelay: 0.05369
Sent Packets: 54006.00 Received Packets: 53900.00 Dropped Packets: 50.00
PacketDeliveryRatio: 99.80 PacketDropRatio: 0.09
Total time: 49.99903

//reno

Throughput: 4664112.15 AverageDelay: 0.05293
Sent Packets: 54004.00 Received Packets: 53887.00 Dropped Packets: 48.00
PacketDeliveryRatio: 99.78 PacketDropRatio: 0.09
Total time: 49.99962

//vegas

Throughput: 4650484.40 AverageDelay: 0.02665
Sent Packets: 55887.00 Received Packets: 55857.00 Dropped Packets: 0.00
PacketDeliveryRatio: 99.95 PacketDropRatio: 0.00
Total time: 49.99964

//sack

Throughput: 426.15 AverageDelay: 0.01820
Sent Packets: 60.00 Received Packets: 60.00 Dropped Packets: 0.00
PacketDeliveryRatio: 100.00 PacketDropRatio: 0.00
Total time: 45.05492

//tahoe

Throughput: 4664909.23 AverageDelay: 0.05126
Sent Packets: 54012.00 Received Packets: 53903.00 Dropped Packets: 44.00
PacketDeliveryRatio: 99.80 PacketDropRatio: 0.08
Total time: 49.99903

Summary :

The wired topology is basically point to point to link among nodes. 802.15.4 wireless mobile is a low energy , low tx range based protocol that defines the MAC and LL protocols. There are different kinds of tcp protocols used here. Each of them has plus points in some scenarios and negative effects in some scenarios.

