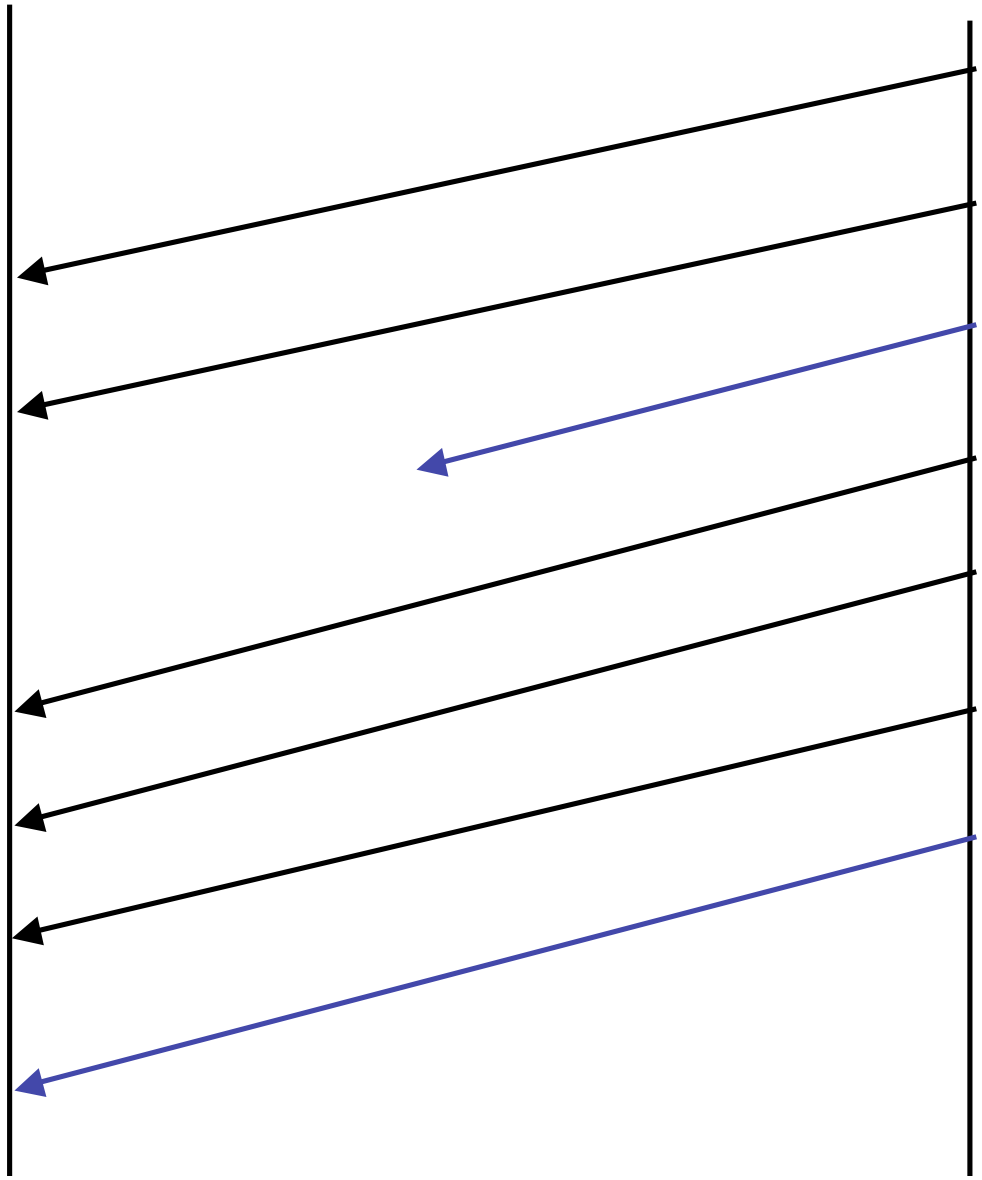
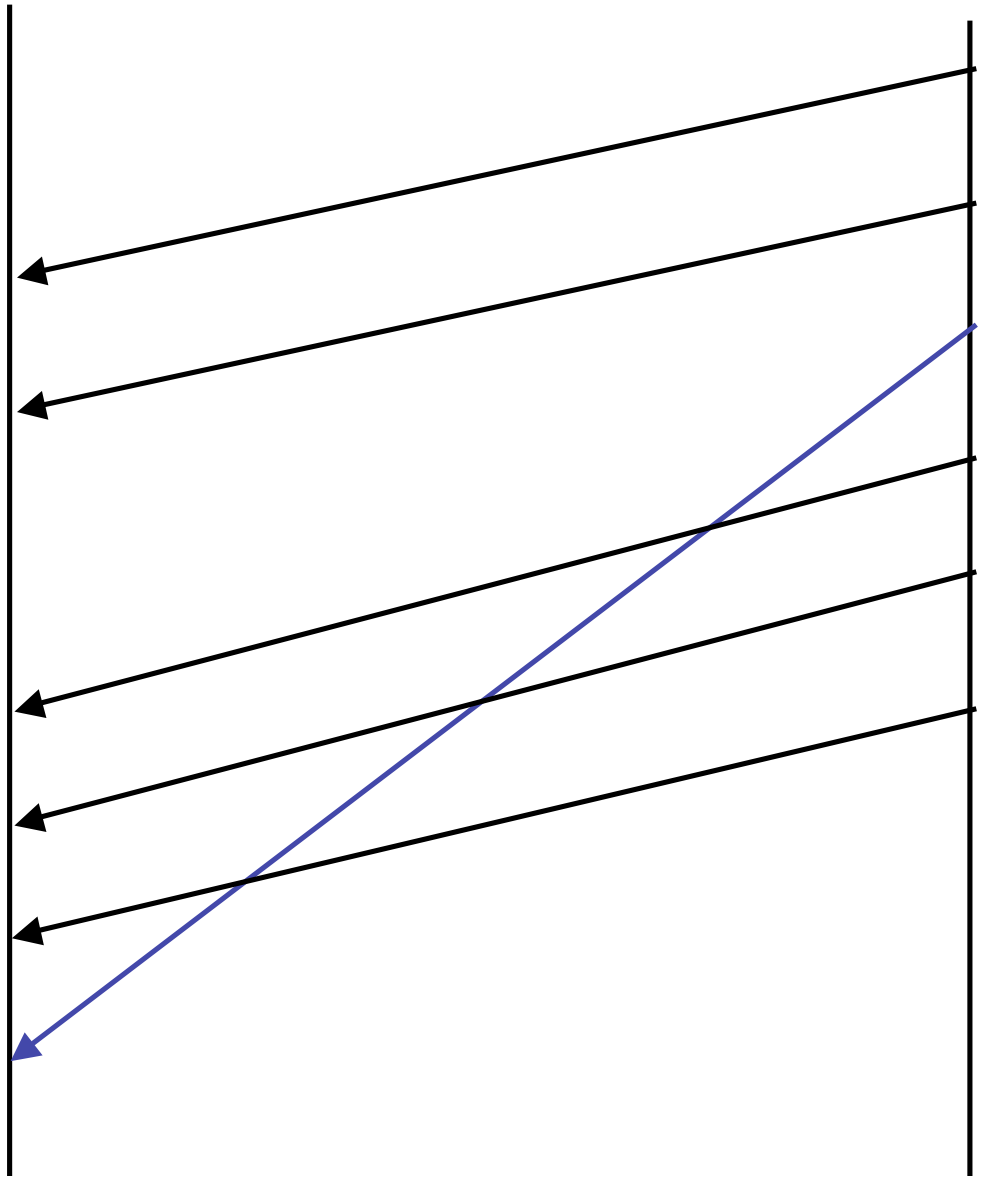
Assignment 1

Collect Traces
Compute Throughput/Loss
Compare Different Scenaric

How to tell if a packet is los
eceiver's TCP trace?



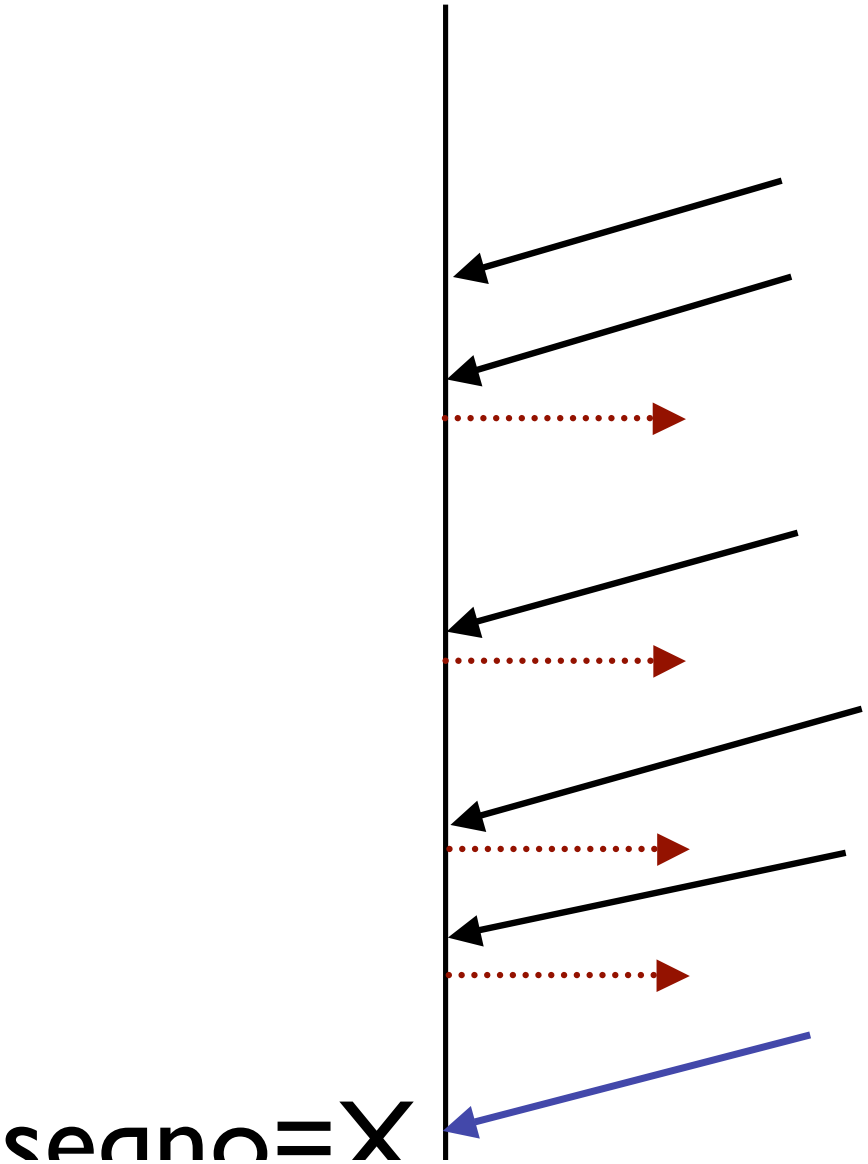
A lost packet + retransmission lead out-of-order packe (most of the time



out-of-order pack
does not imply
loss+retransmissi

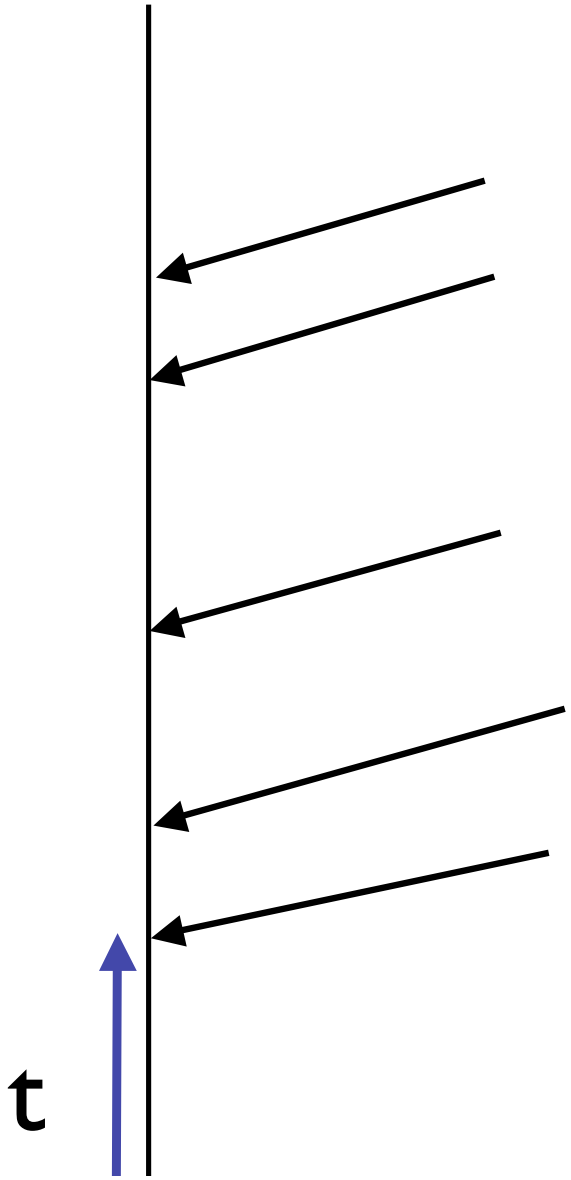
what trigger retransmission?

timeout or 3 dup A

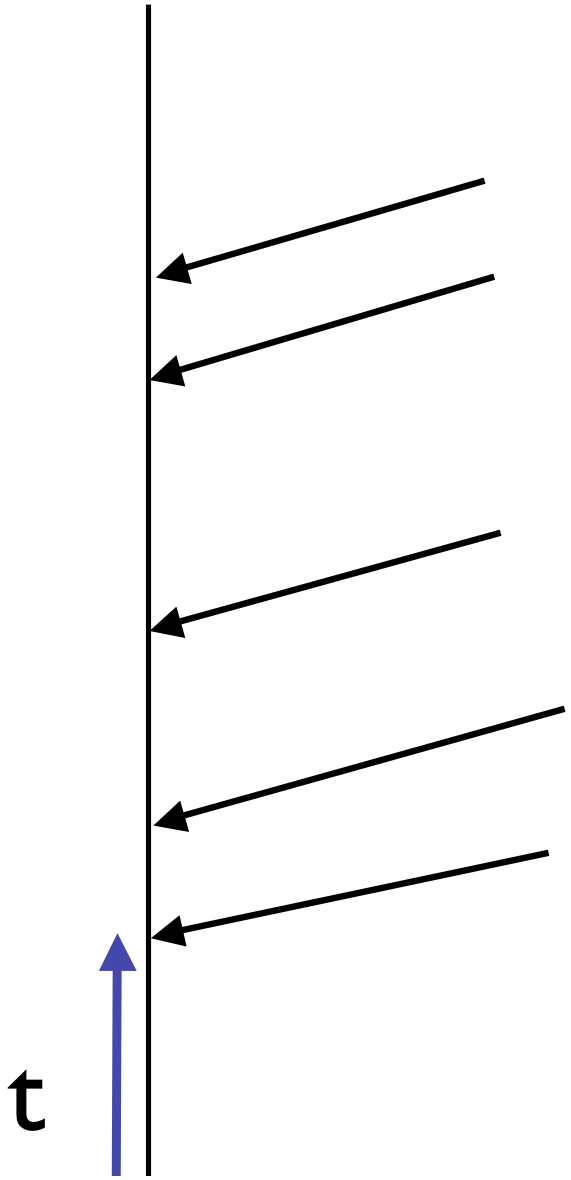


are there 3 du
asking for se

if yes, it's a fast re

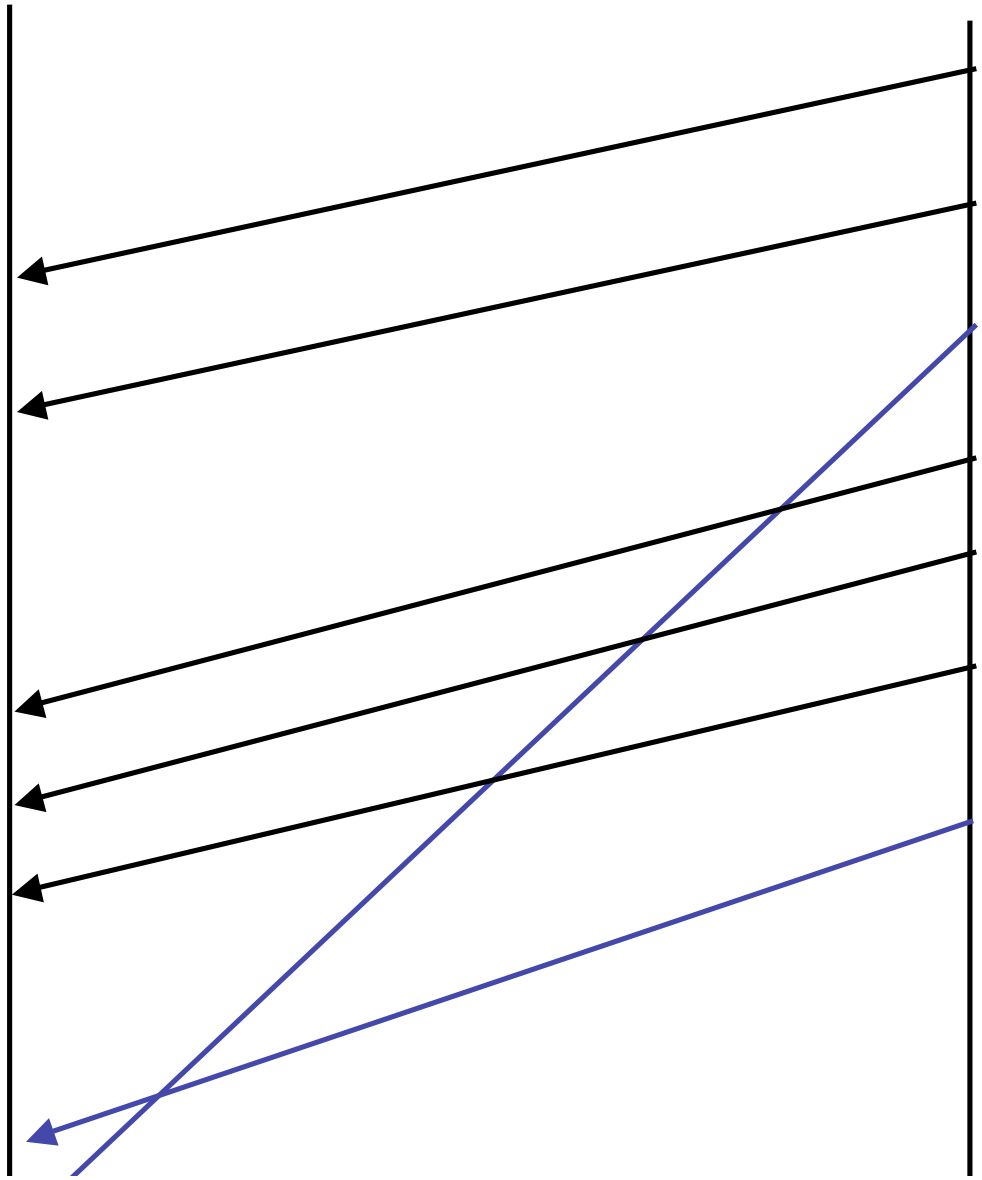


If not, is t large

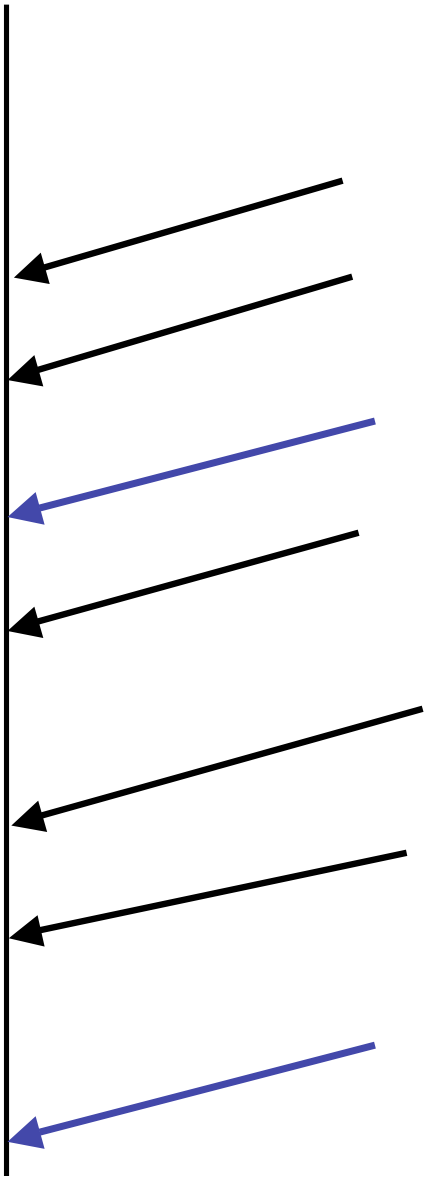


if t is large (>=3ms in V
the packet is a retransm
it's an out-of-order

A lost packet leads retransmission

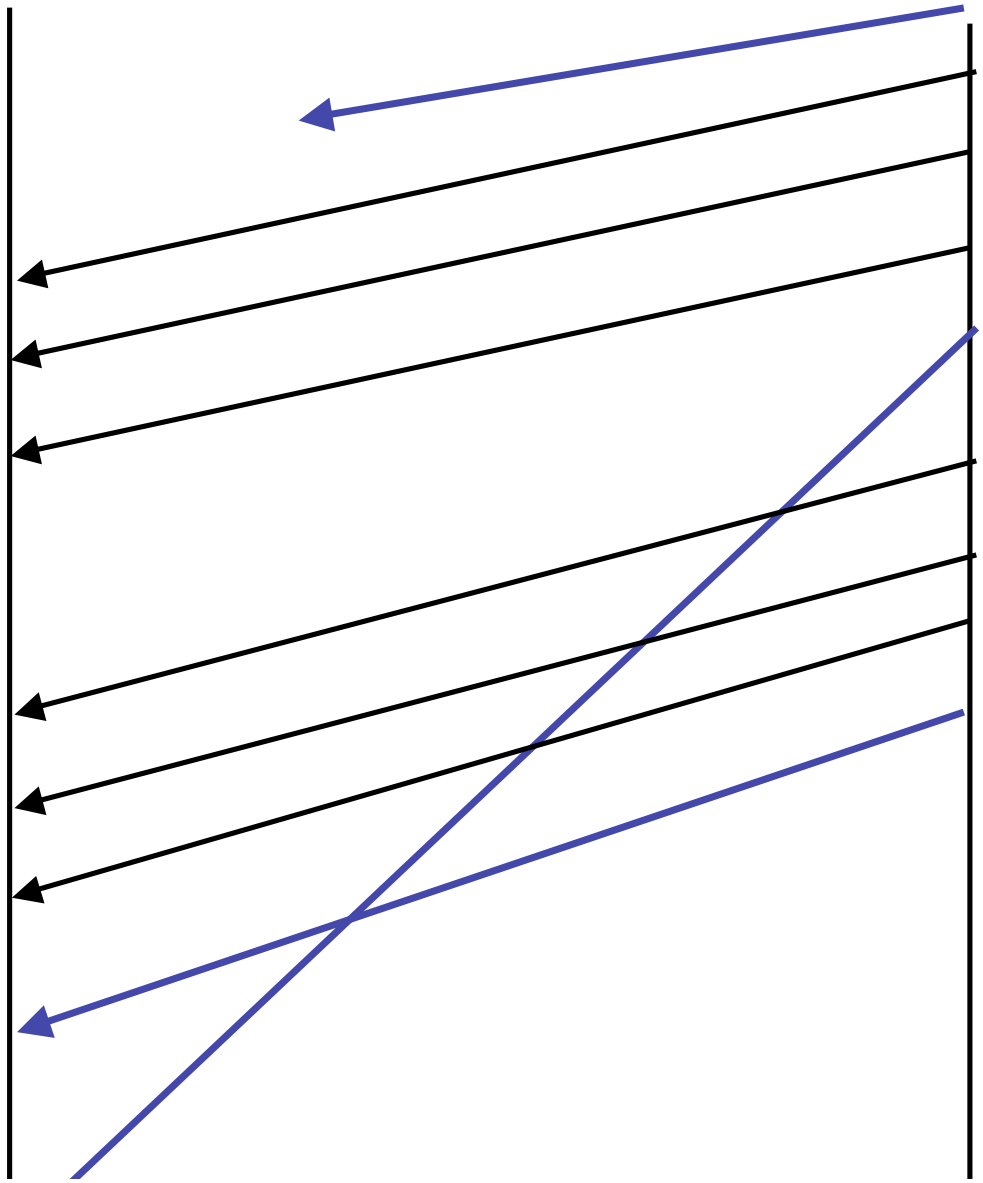


But retransmission c
not imply packet l



did we receive an
packet with same s

if yes, the packet is



OK, we have to st somewhere..

Loss packets: retransmitted pack without duplicate

upper or lower boui

the actual loss rat

Some lost packets ar
counted

Some counted packe
not lost (just out-of-c

Other Methods

Count number of ti windows is halve

Use TCP throughp
Equation

Collect Traces
Compute Throughput/Loss
Compare Different Scenaric

The Expected

Wired > Wireless

Strong Signal > Weak Sig

NUSOPEN > NUS

Evening > Day (at work)

Day > Evening (at home)

The Unexpected

Wireless@SG is excelle

(~DSL, 350kbps, no loss)

Boon Lay Hostel not too g

(40 kbps, 10% loss)

I^2R off-peak 1500kbps

Interesting Finding

NUS VPN uses small W_m

RTT is as small as 2ms (bu

Faster "slow start"?

ate: 07/12/2007
ime: 7:30 PM
uration: 2 h
ocation: SR3A/B
pen Book: Y
nswer Book: Y

Final Exam Reminde

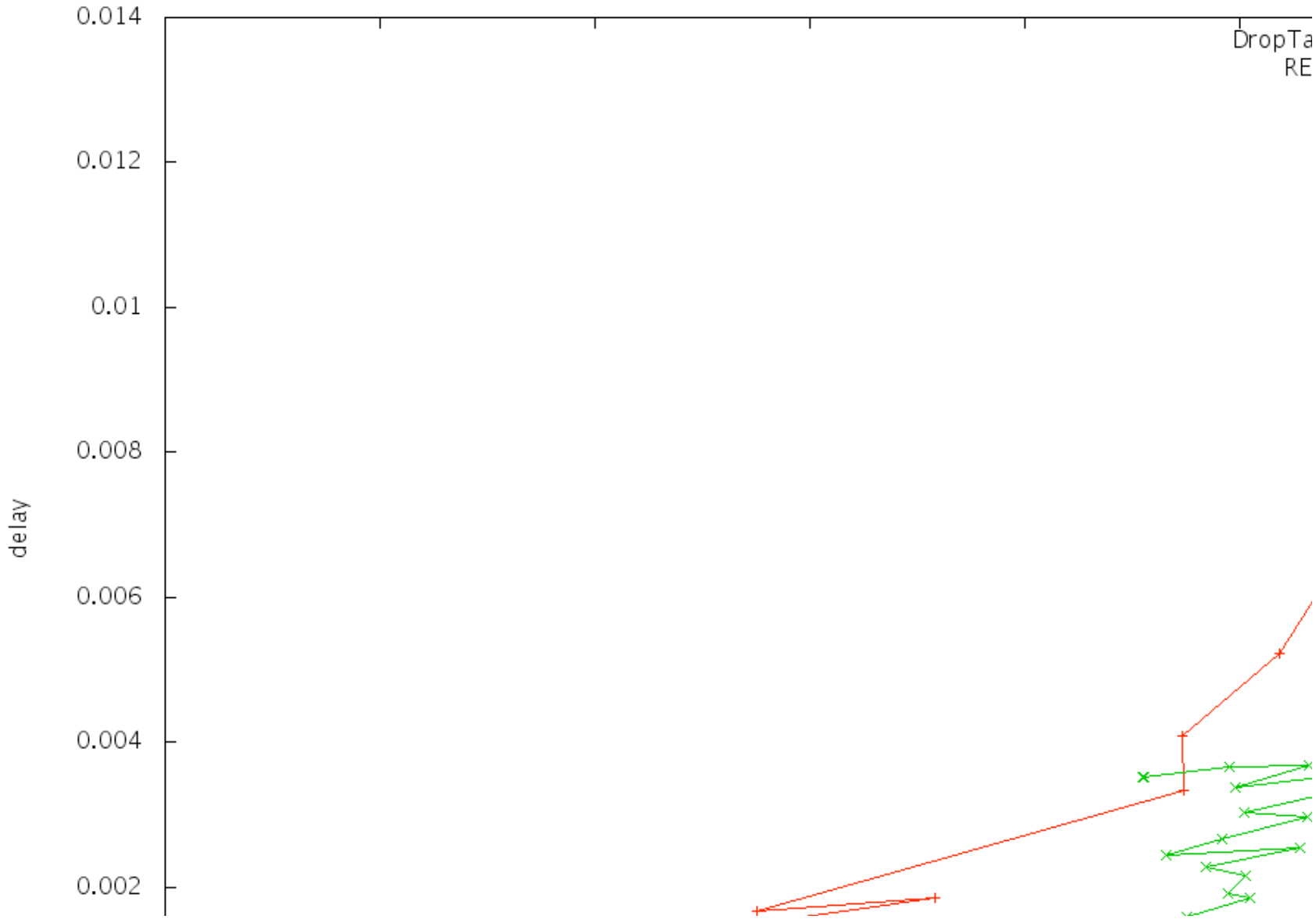
Bring the papers

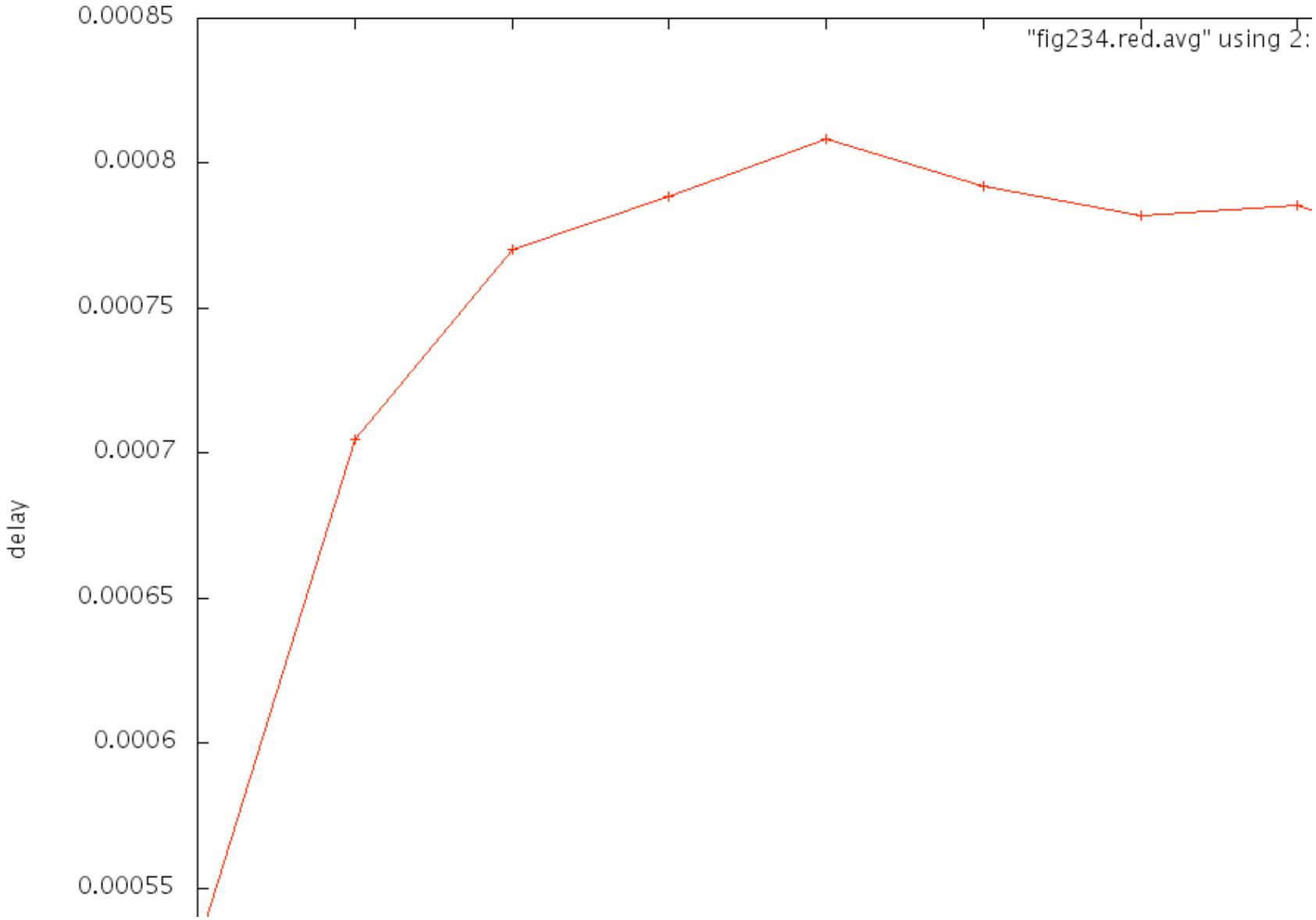
Bring calculator

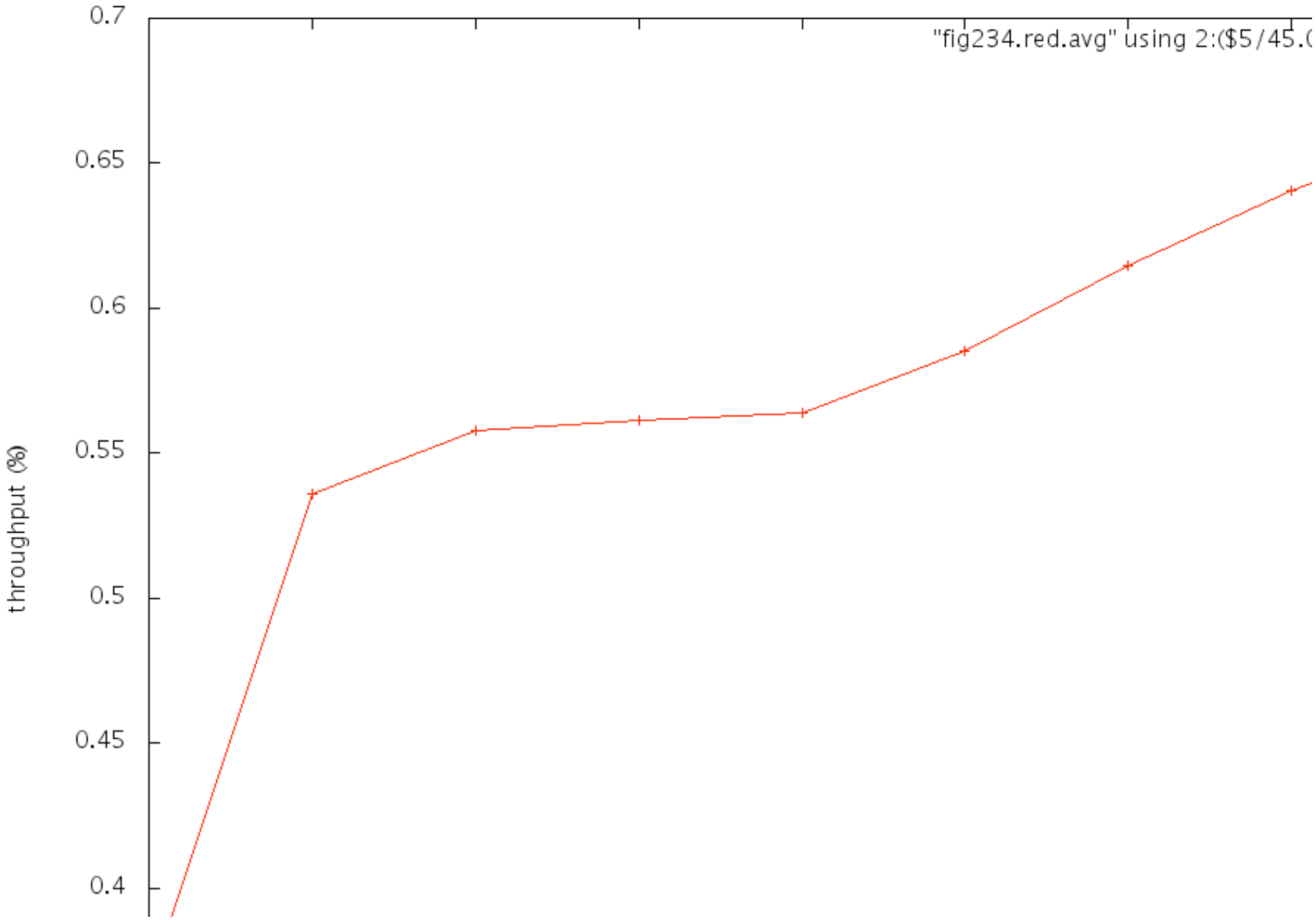
Lecture 1-12 (except 9)

Date:	07/12/2007
Time:	7:30 PM
Duration:	2 h
Location:	SR3A/B
Open Book:	Y
Answer Book:	Y

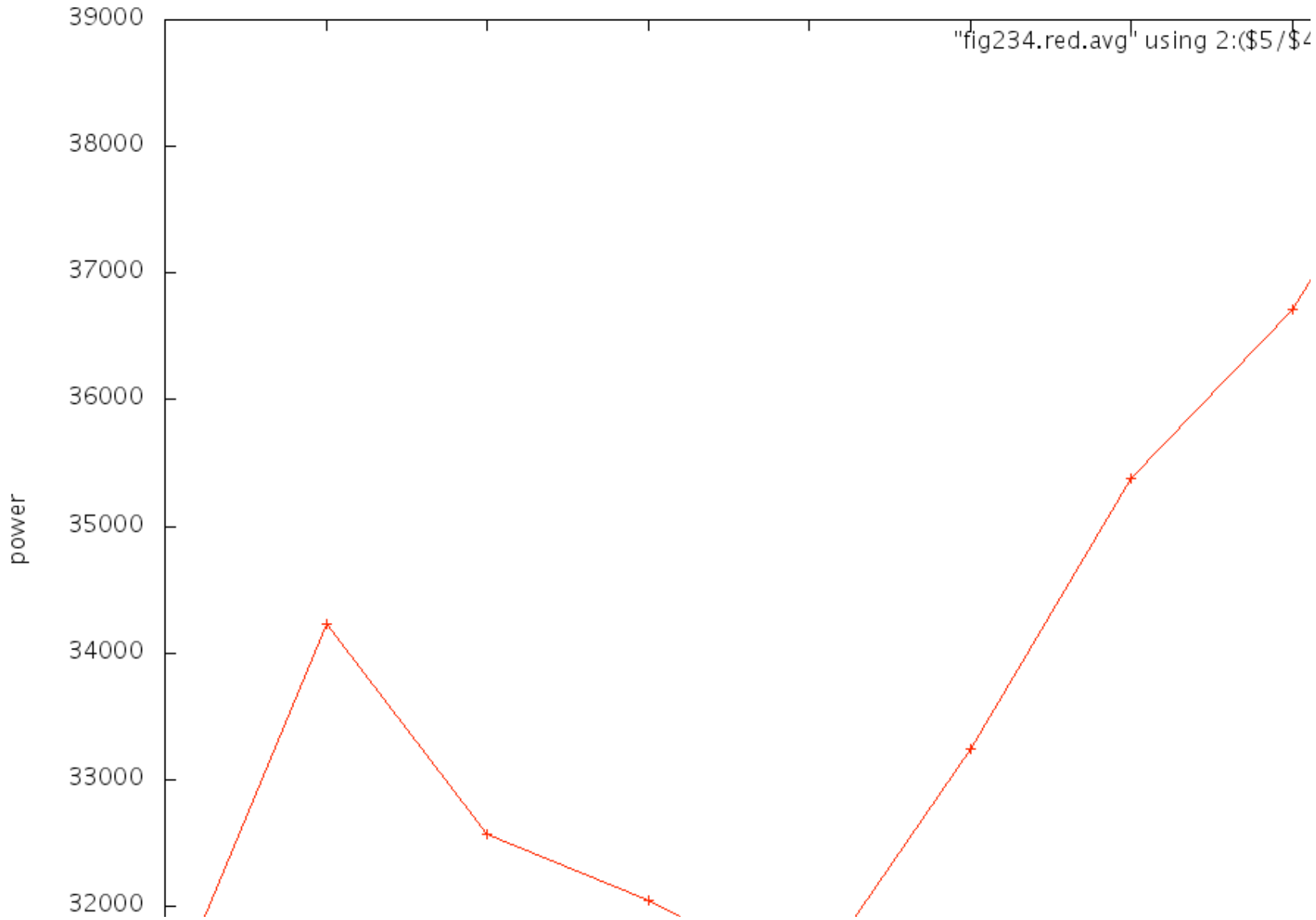
Assignment 2

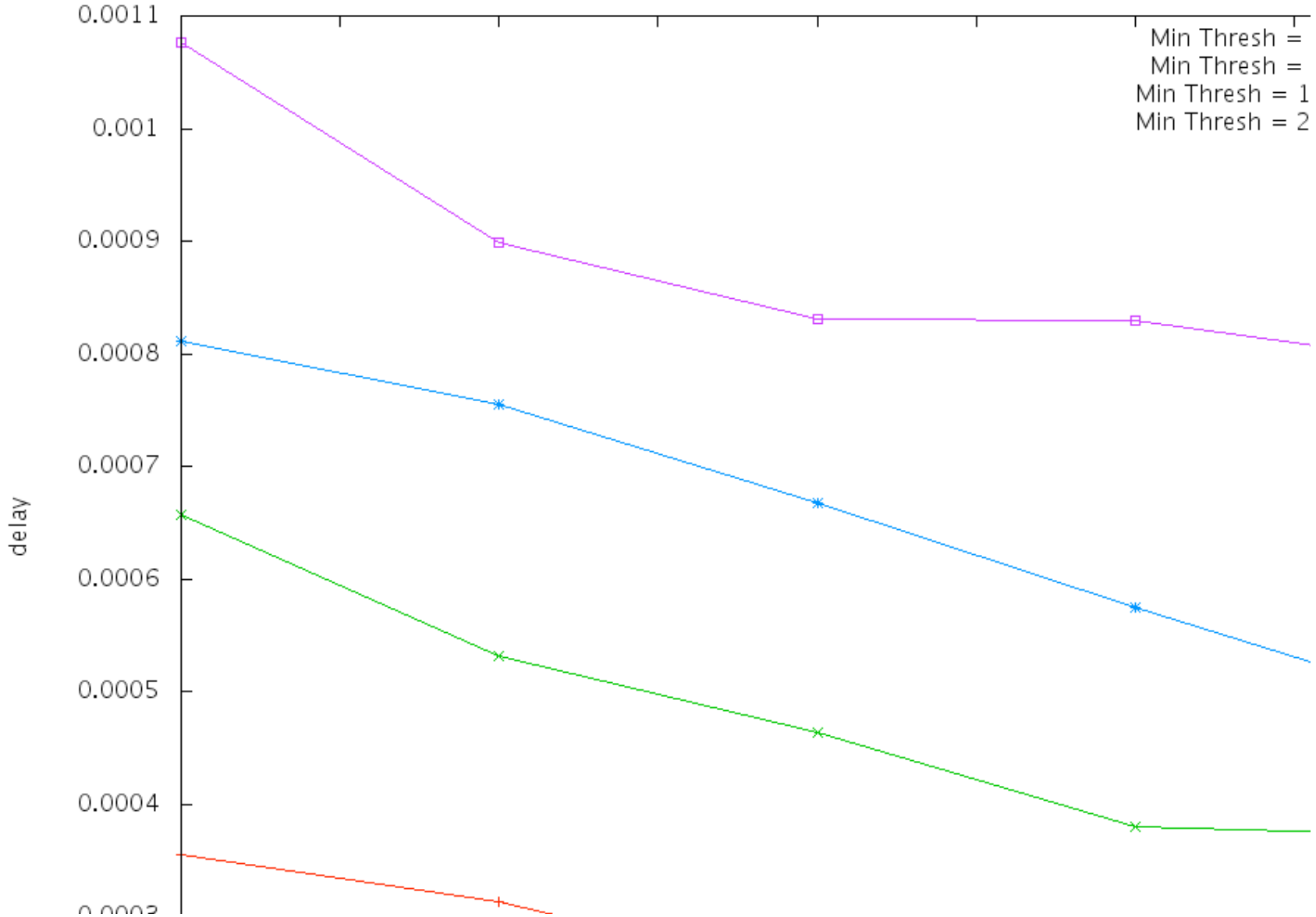

0.014
0.012
0.01
0.008
0.006
0.004
0.002
delay
DropTa
RE


0.00085
0.0008
0.00075
0.0007
0.00065
0.0006
0.00055
delay
"fig234.red.avg" using 2:


0.7
0.65
0.6
0.55
0.5
0.45
0.4
throughput (%)
"fig234.red.avg" using 2:($5/45.(

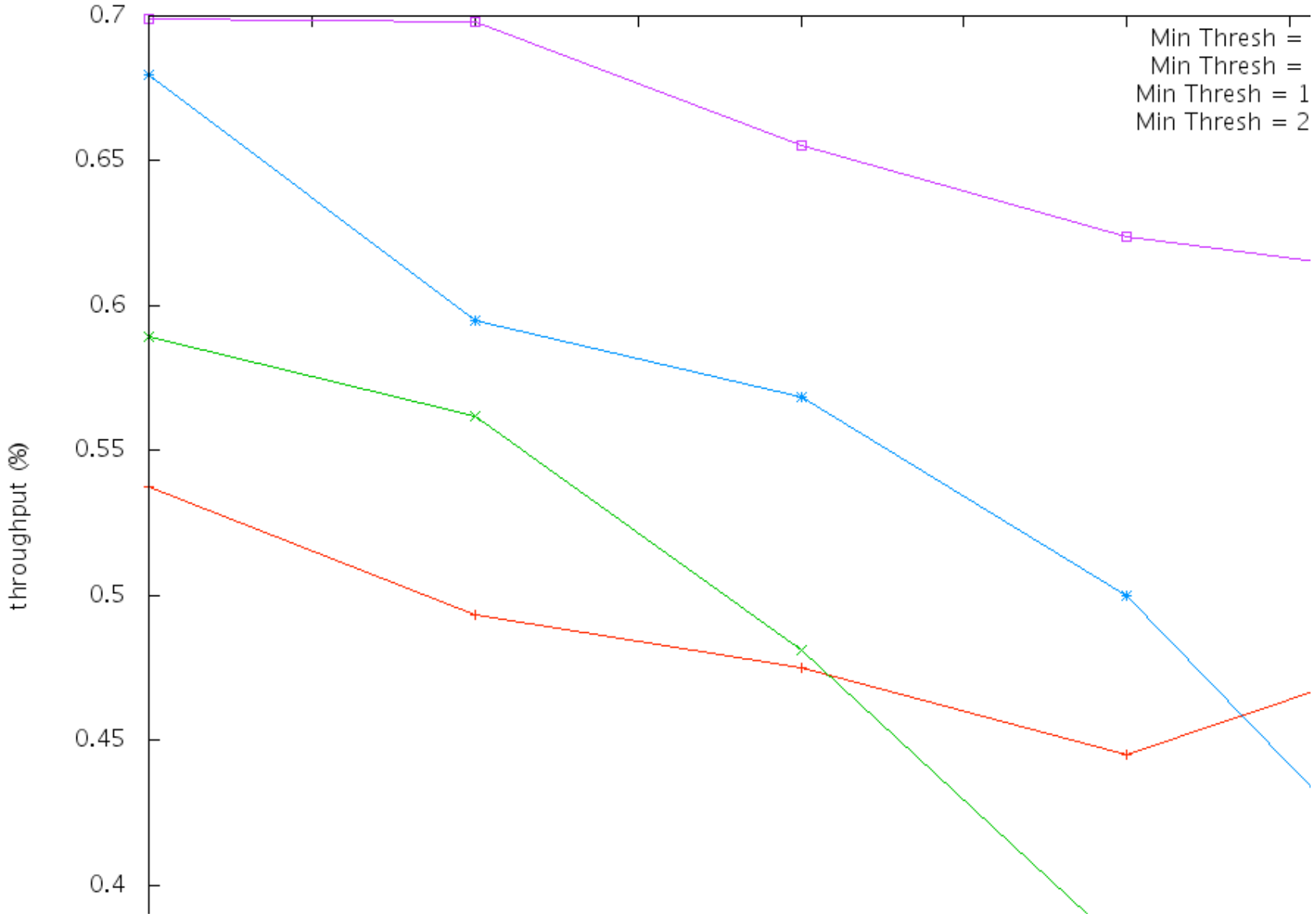
Max threshold increa
drop probability redu
queue length increas

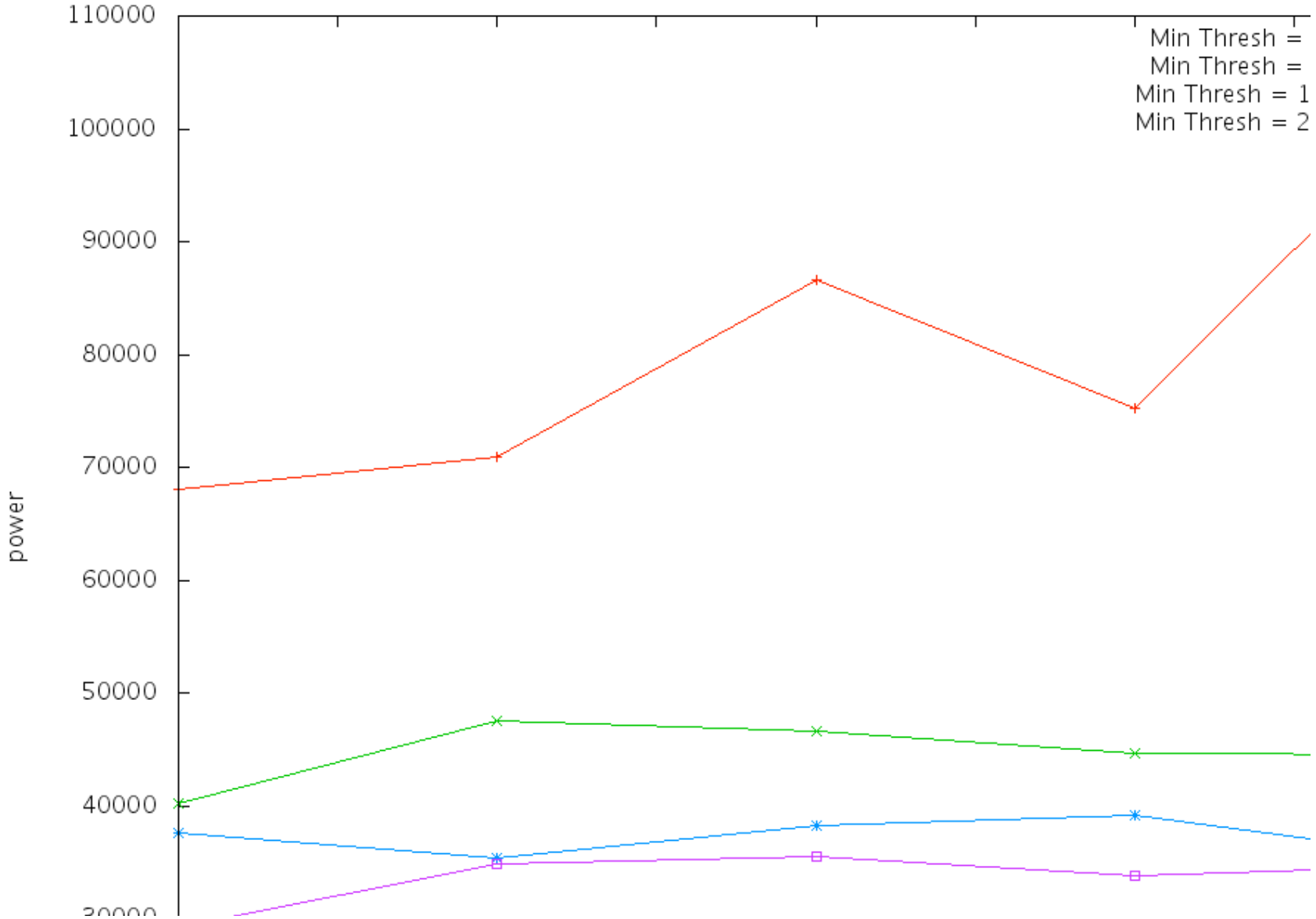

"fig234.red.avg" using 2:($5/$4
power
39000
38000
37000
36000
35000
34000
33000
32000

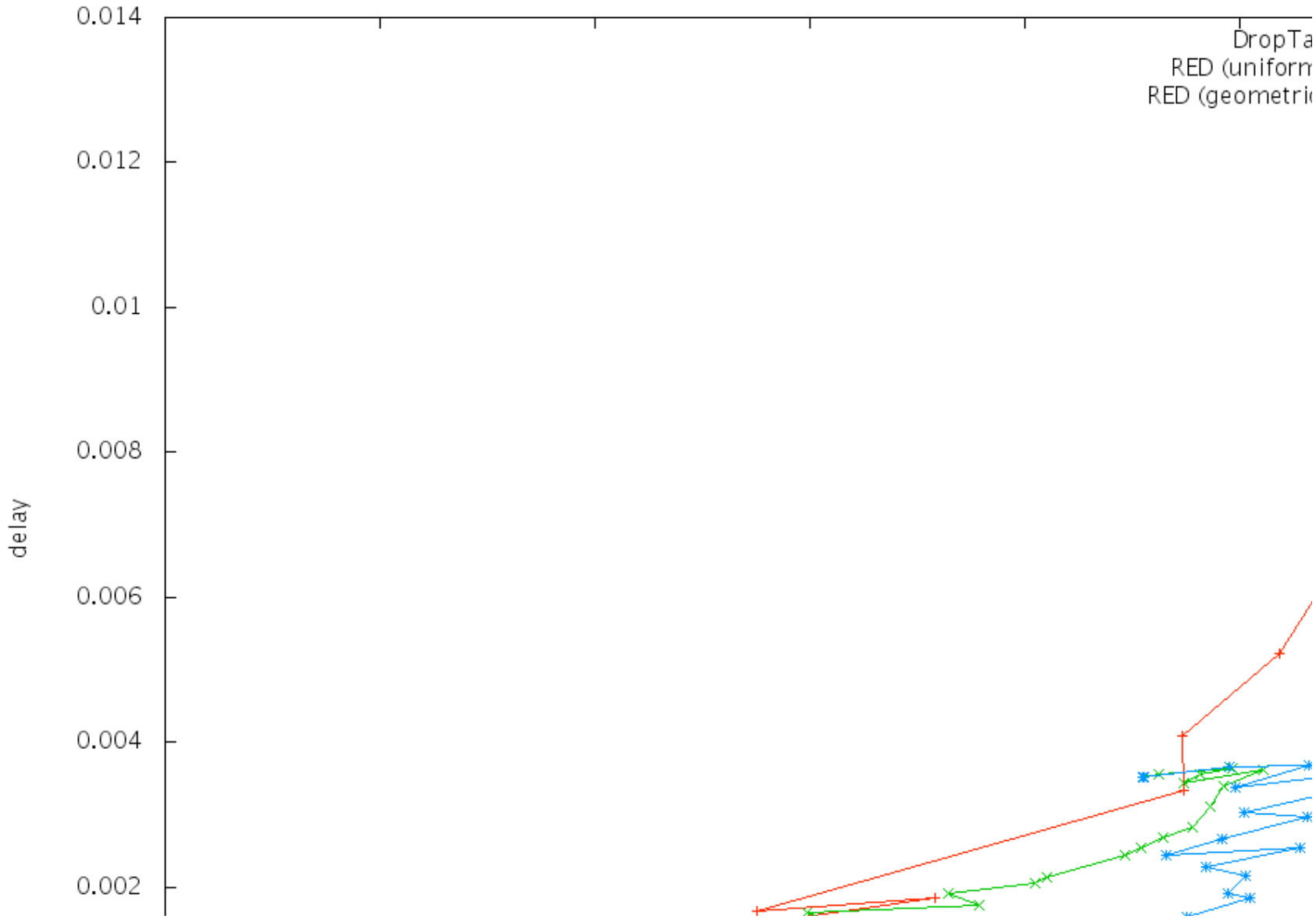

0.0011
0.001
0.0009
0.0008
0.0007
0.0006
0.0005
0.0004
delay
Min Thresh =
Min Thresh =
Min Thresh = 1
Min Thresh = 2

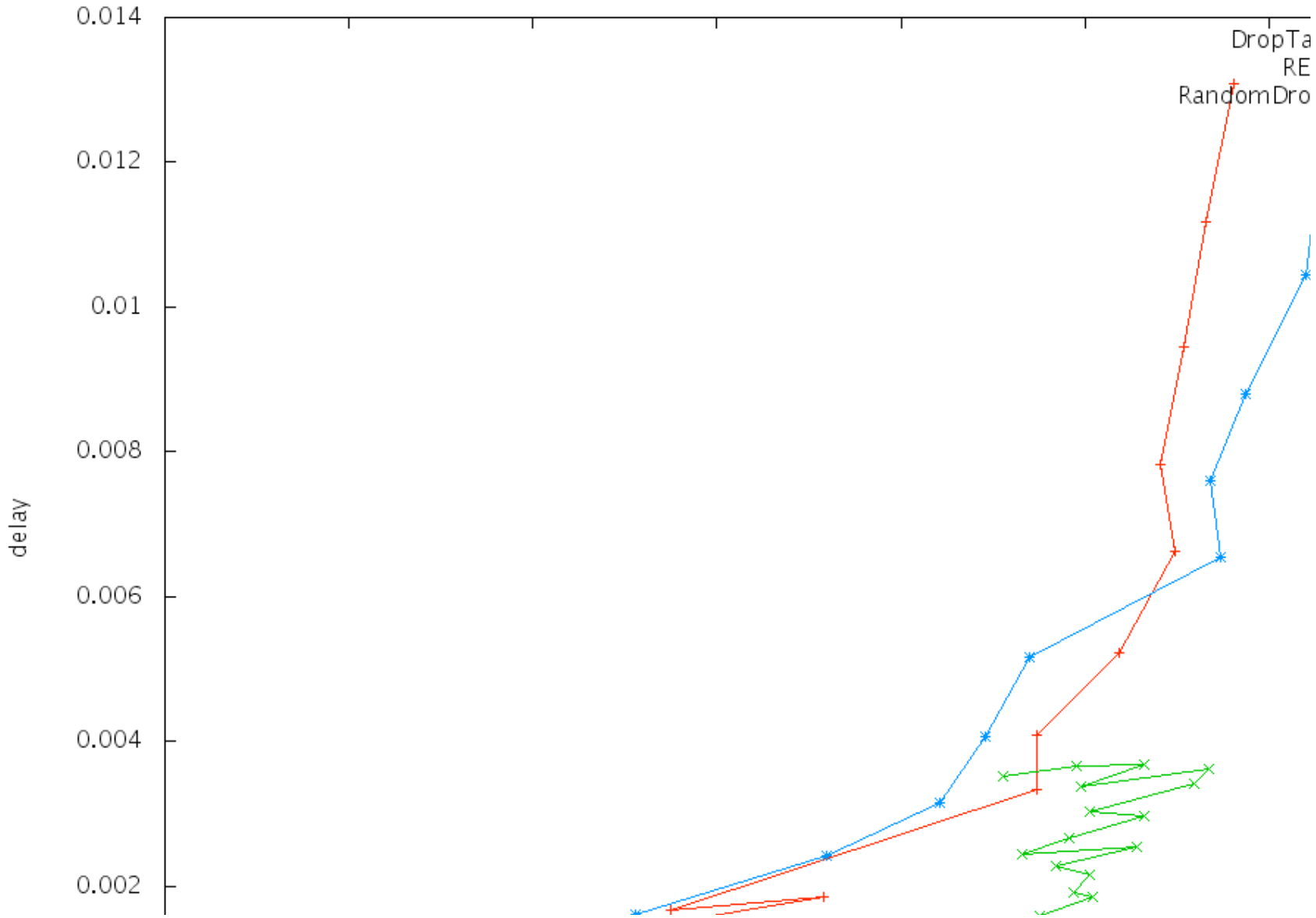
Min threshold increas
queue length increas

Q weight increases
avg Q length fluctuat
drop more


0.7
0.65
0.6
0.55
0.5
0.45
0.4
throughput (%)
Min Thresh =
Min Thresh =
Min Thresh = 1
Min Thresh = 2


110000
100000
90000
80000
70000
60000
50000
40000
power
Min Thresh =
Min Thresh =
Min Thresh = 1
Min Thresh = 2


0.014
0.012
0.01
0.008
0.006
0.004
0.002
delay
DropTa
RED (uniform
RED (geometri


0.014
0.012
0.01
0.008
0.006
0.004
0.002
delay
DropTa
RE
RandomDro