Bond Internet Systems

Impact of DNS over TCP a resolver point of view

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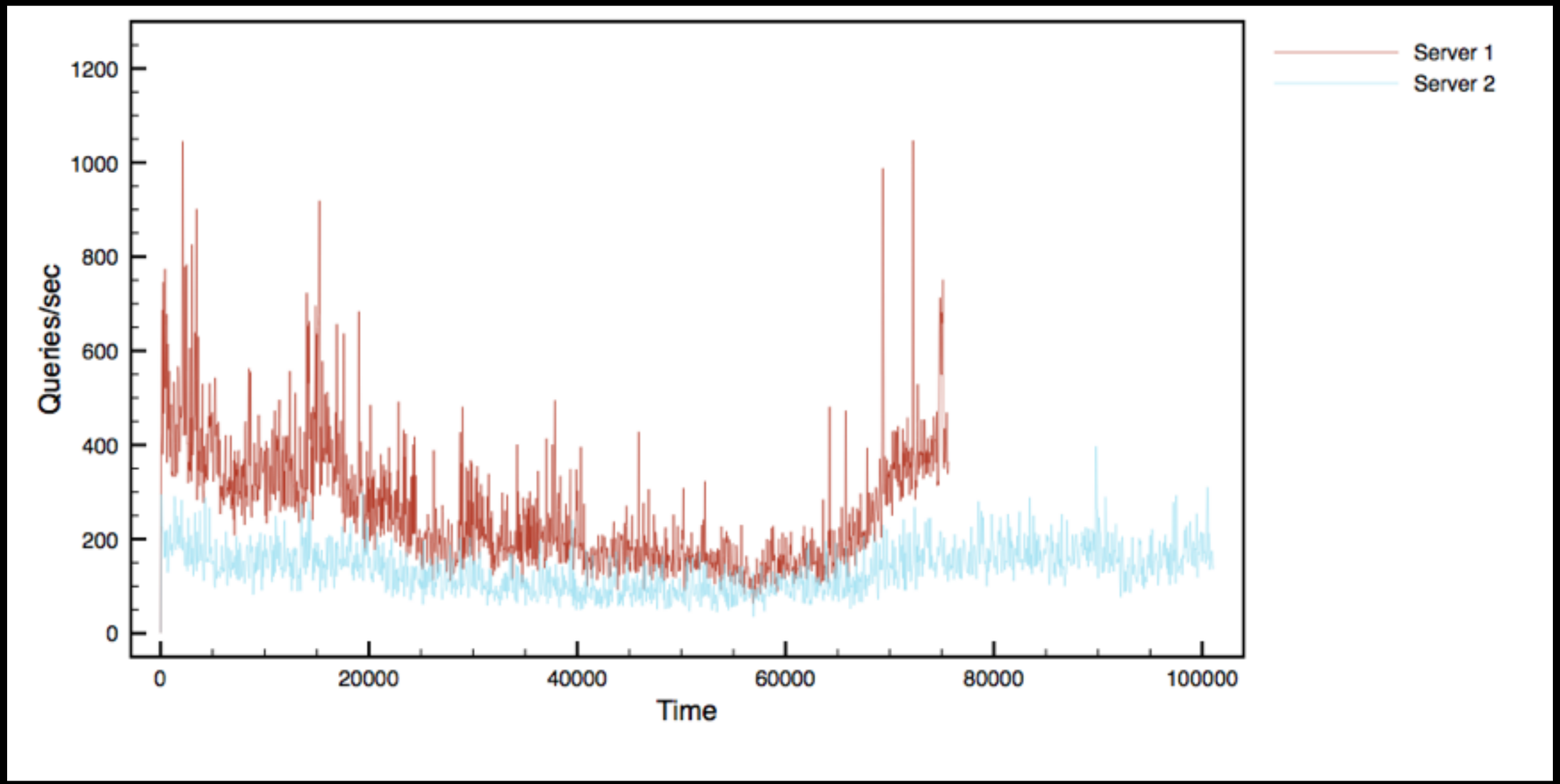
Objective

Look at traffic between DNS recursive resolvers and the authoritative servers they query and…

Simulate the effect on the recursive server of using TCP for all DNS traffic

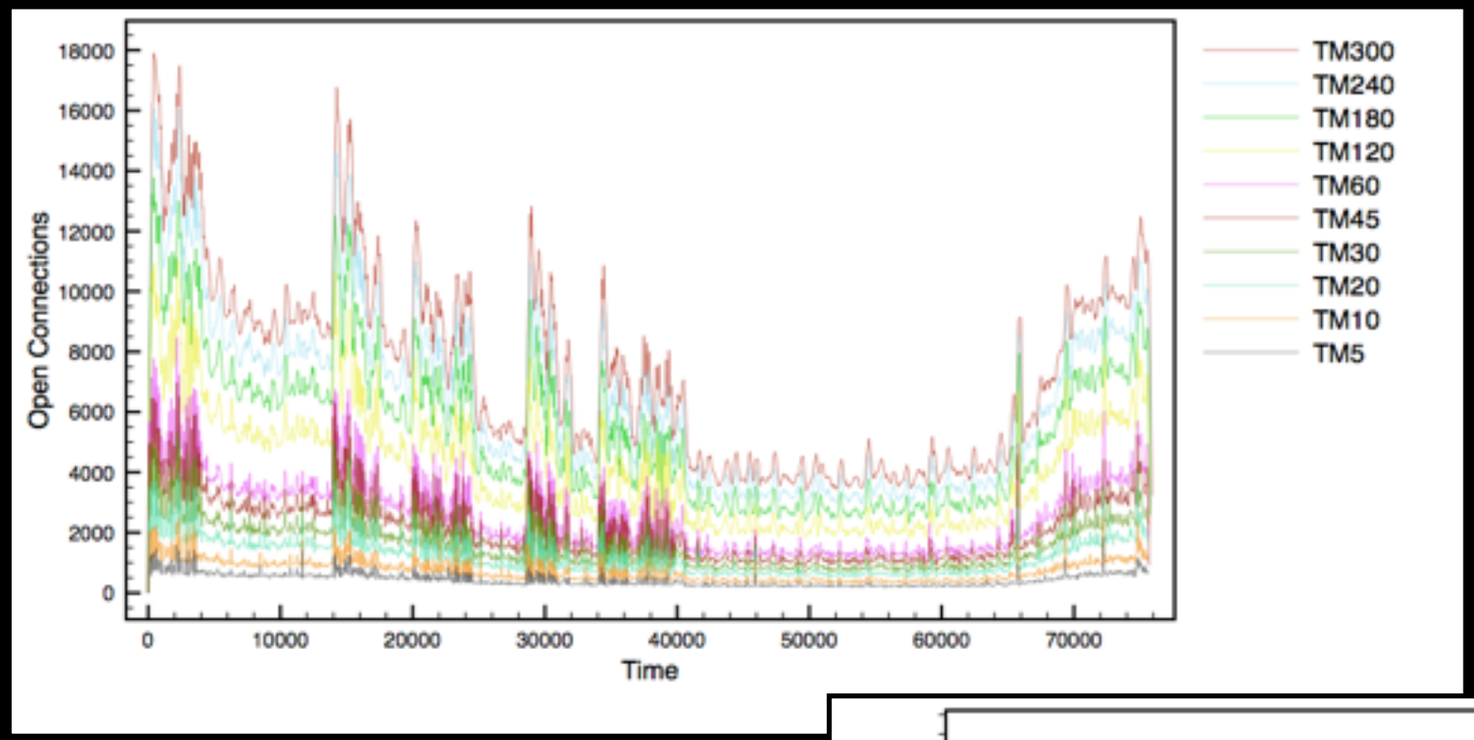
- The data
- The cost
- The benefit
- The need

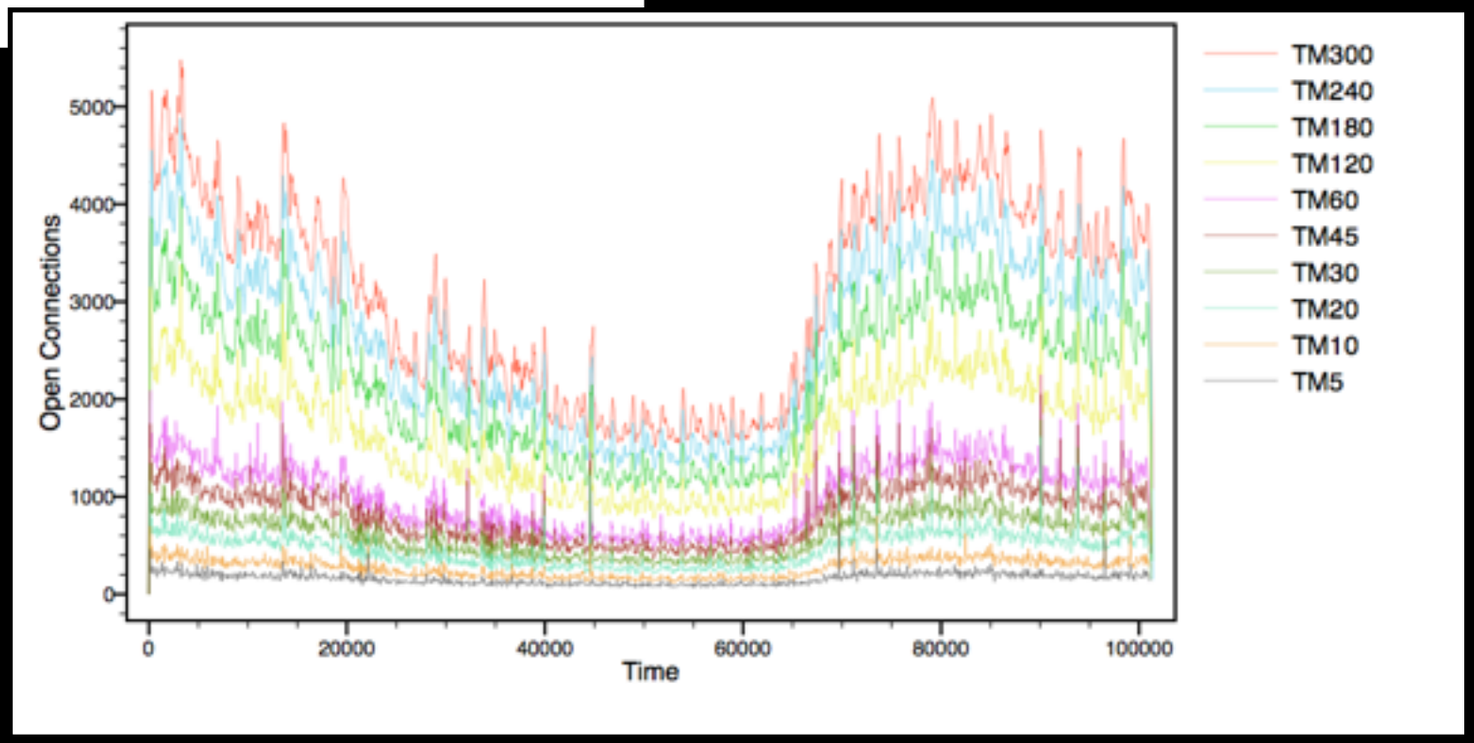

Server 1
Server 2
Queries/sec
1200
1000
800
600
400
200
0
0
20000
40000
60000
80000
100000
Time

Data (qps)

The cost

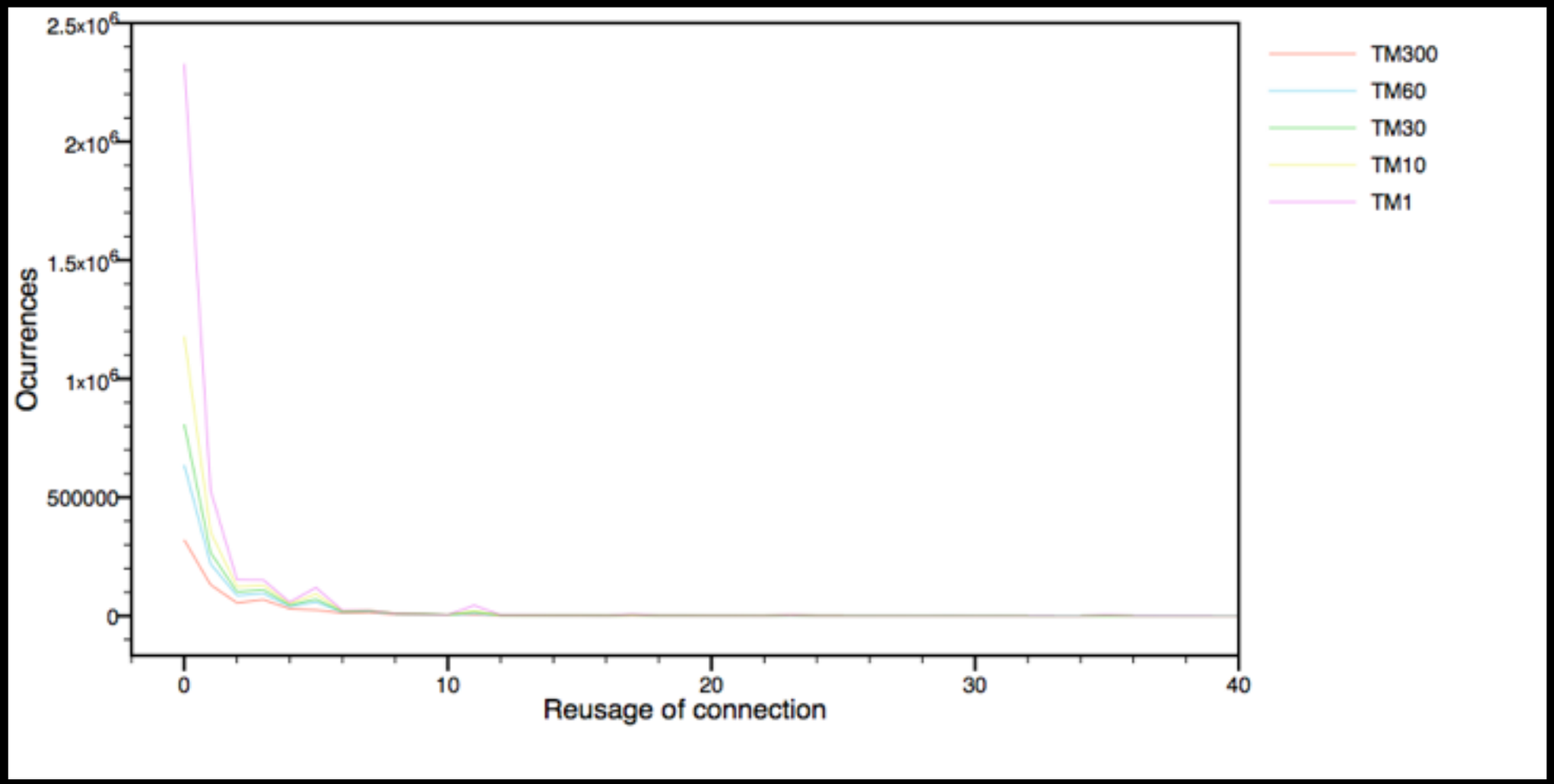
- Main impact of using TCP for everything is the state that is kept on the server, which is proportional to the number of established connections at a given time



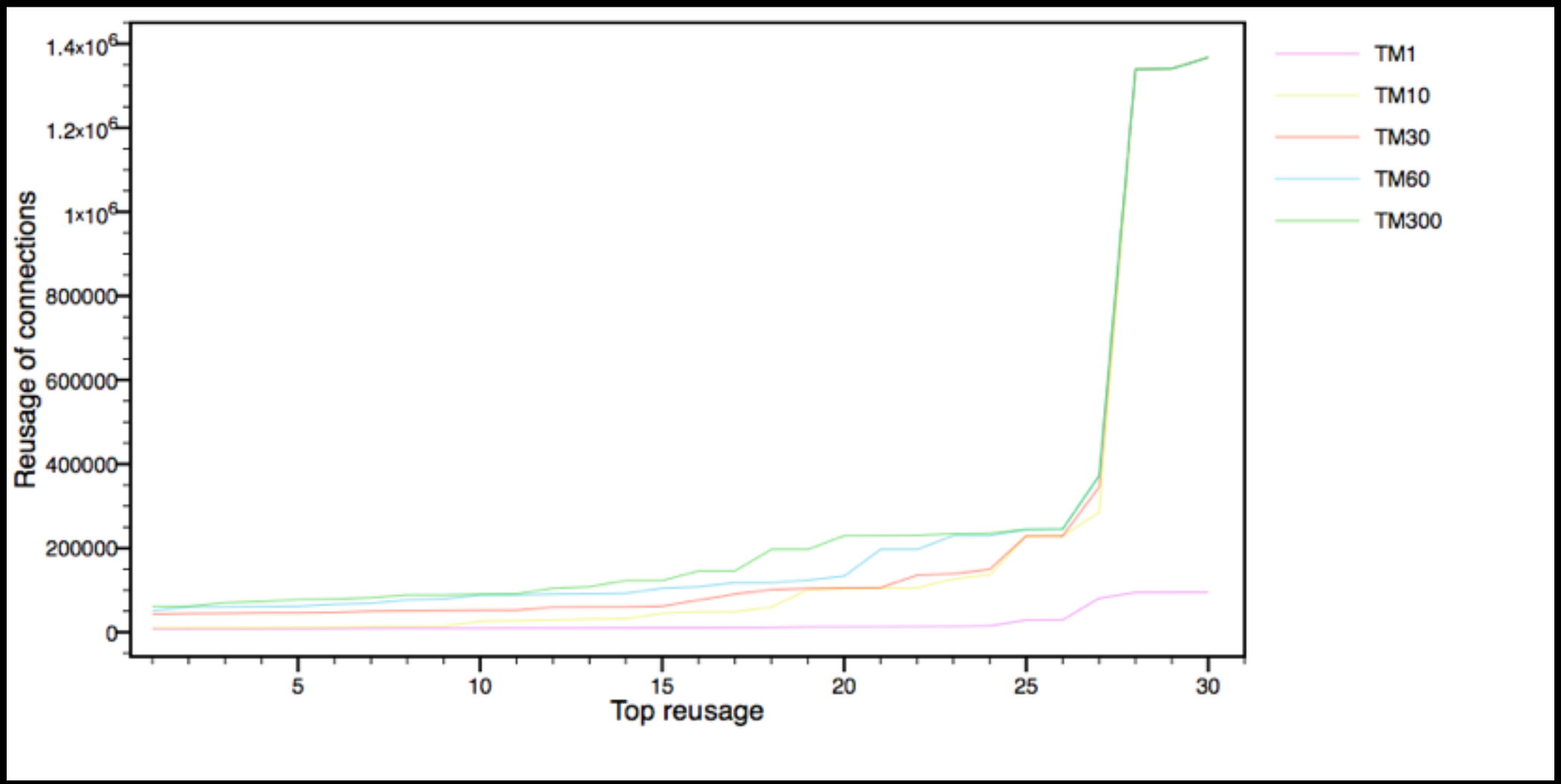


connections

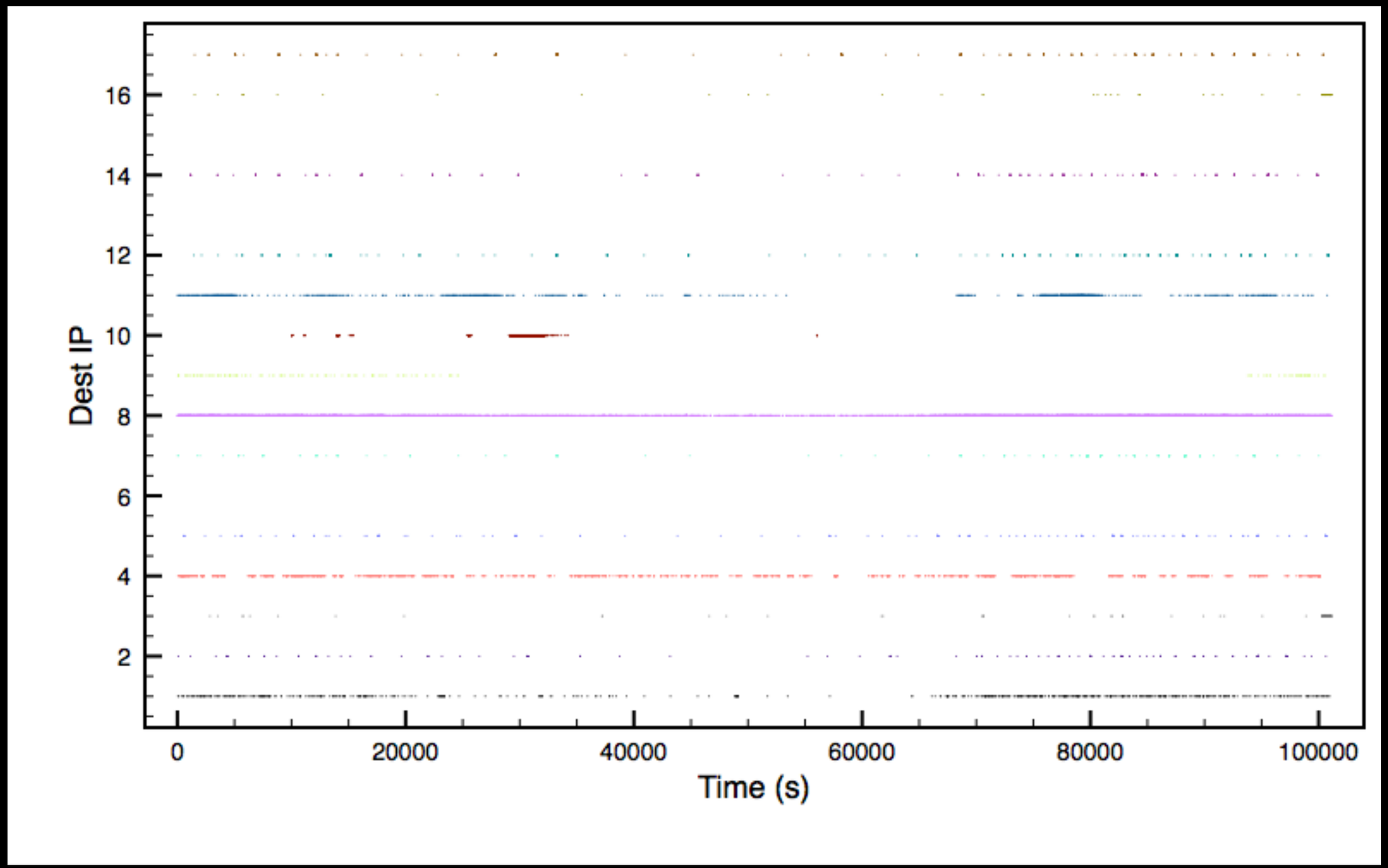
The benefit



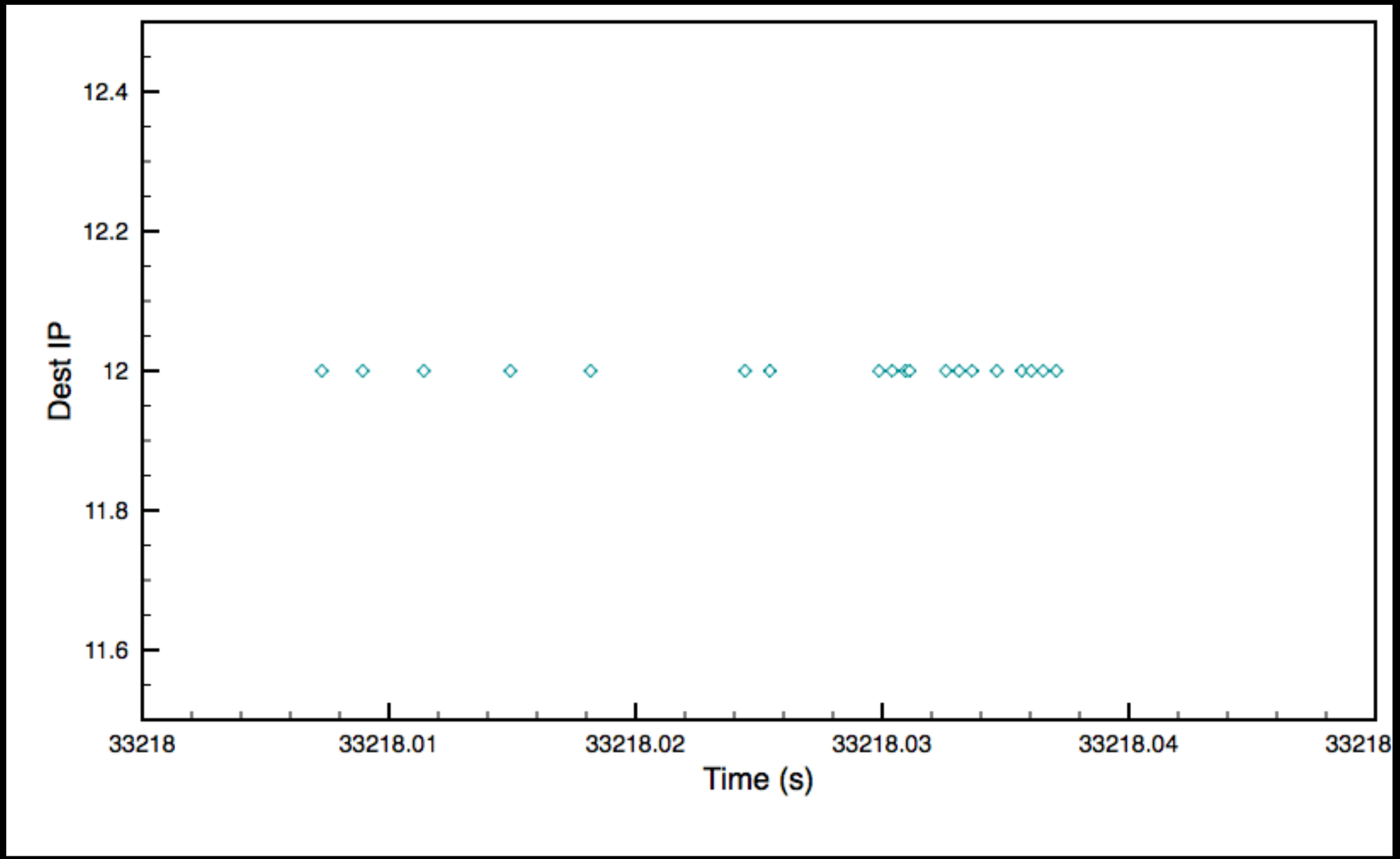
connection reuse



connection reuse



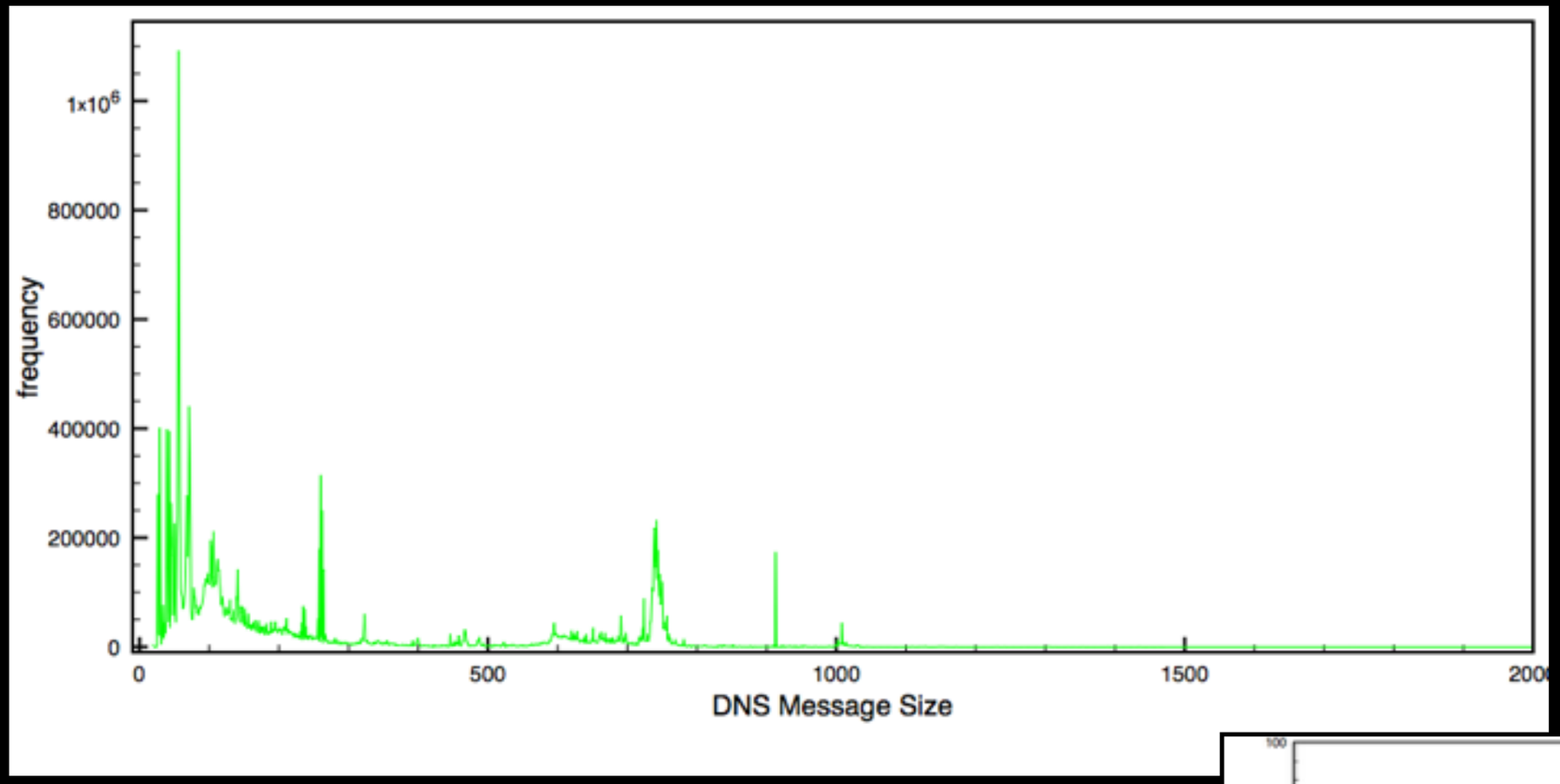
query timeline

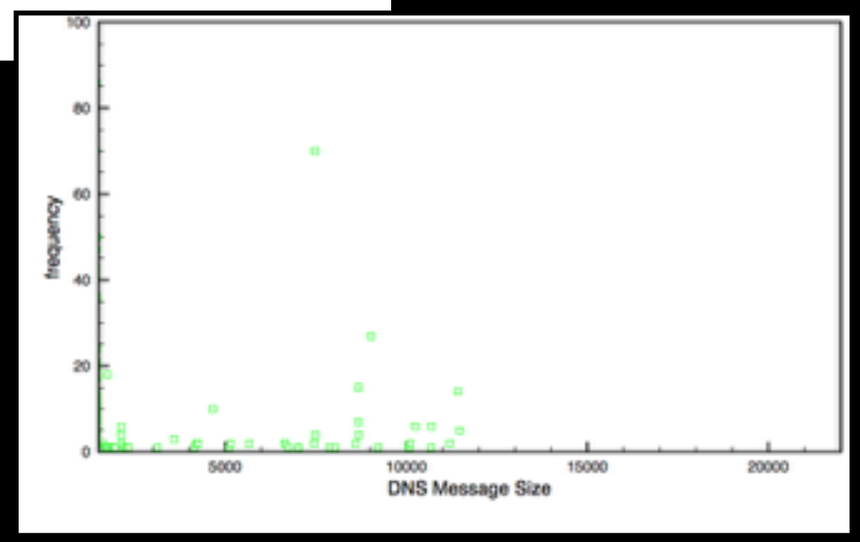


query timeline zoom

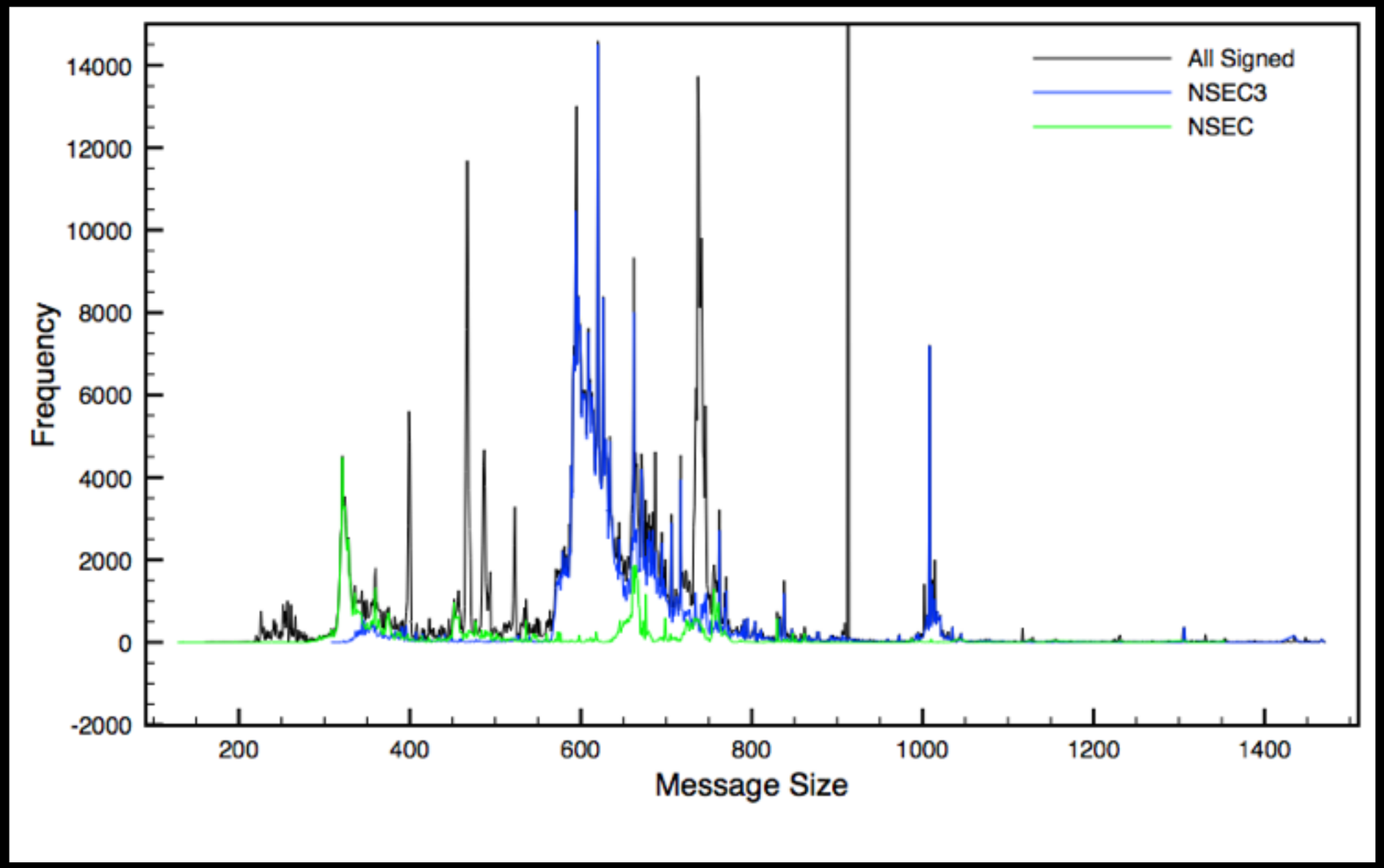
The *need*

- Helps with spoof prevention
  - reflection attacks
- Do we need it to cope with larger messages?
  - DNSSEC, in particular NSEC3
  - Long NS lists, other





Size distribution - all



Size distribution - DNSSEC

Observations

- Message size doesn’t seem to be a big problem at this time
- Management of TCP timeout is critical
- Some servers would reuse connections quite effectively
  - queries come in bursts.
    - tuning and signalling needed

Next steps

- Analyse impact on the recursive->stub
  - Coming up

Thanks

Our thanks to:

Comcast (grant)

Questions?

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