Route Flap Damping Considered Useable

RIPE / Roma

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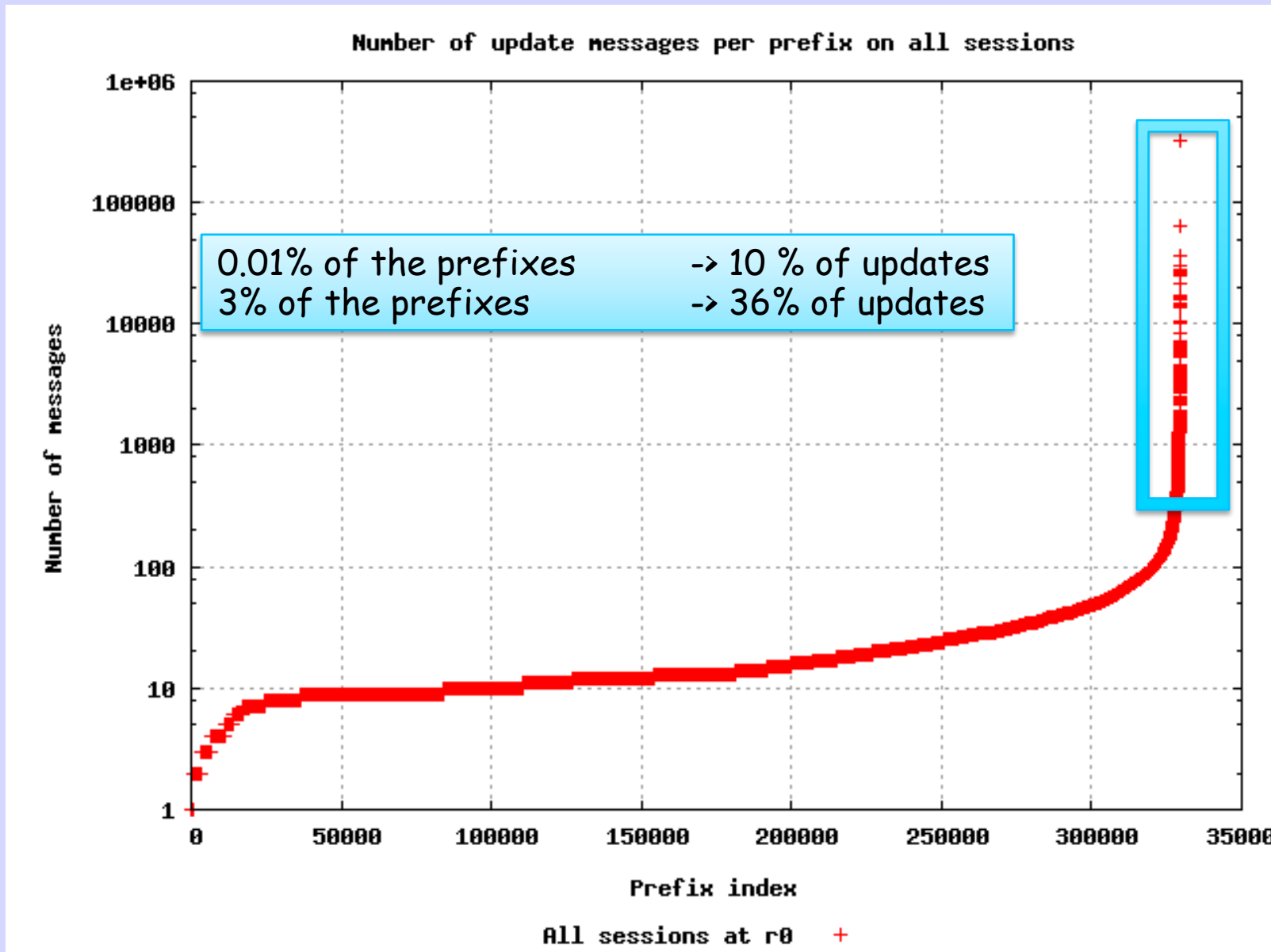Nate Kushman <nkushman@csail.mit.edu>

<http://archive.psg.com/101117.ripe-rfd.pdf>

Motivation

- RFD has been deprecated due to serious problems of over-damping

- But we still have really badly behaving prefixes causing churn

- Is there a minimal change that can start to address this issue?

Mice and Elephants

Number of update messages per prefix on all sessions

0.01% of the prefixes   -> 10 % of updates
3% of the prefixes   -> 36% of updates

Abnormal protocol convergence

All sessions at r0   +

Approach

- Current techniques: MRAI and **RFD**

- Problem: Today RFD kills mice and elephants

- Approach: Higher suppress threshold
  - Save mice
  - Churn reduction compared to no RFD
  - Trivial to implement

Measurement Structure

Equinix IX
Peers

BGP
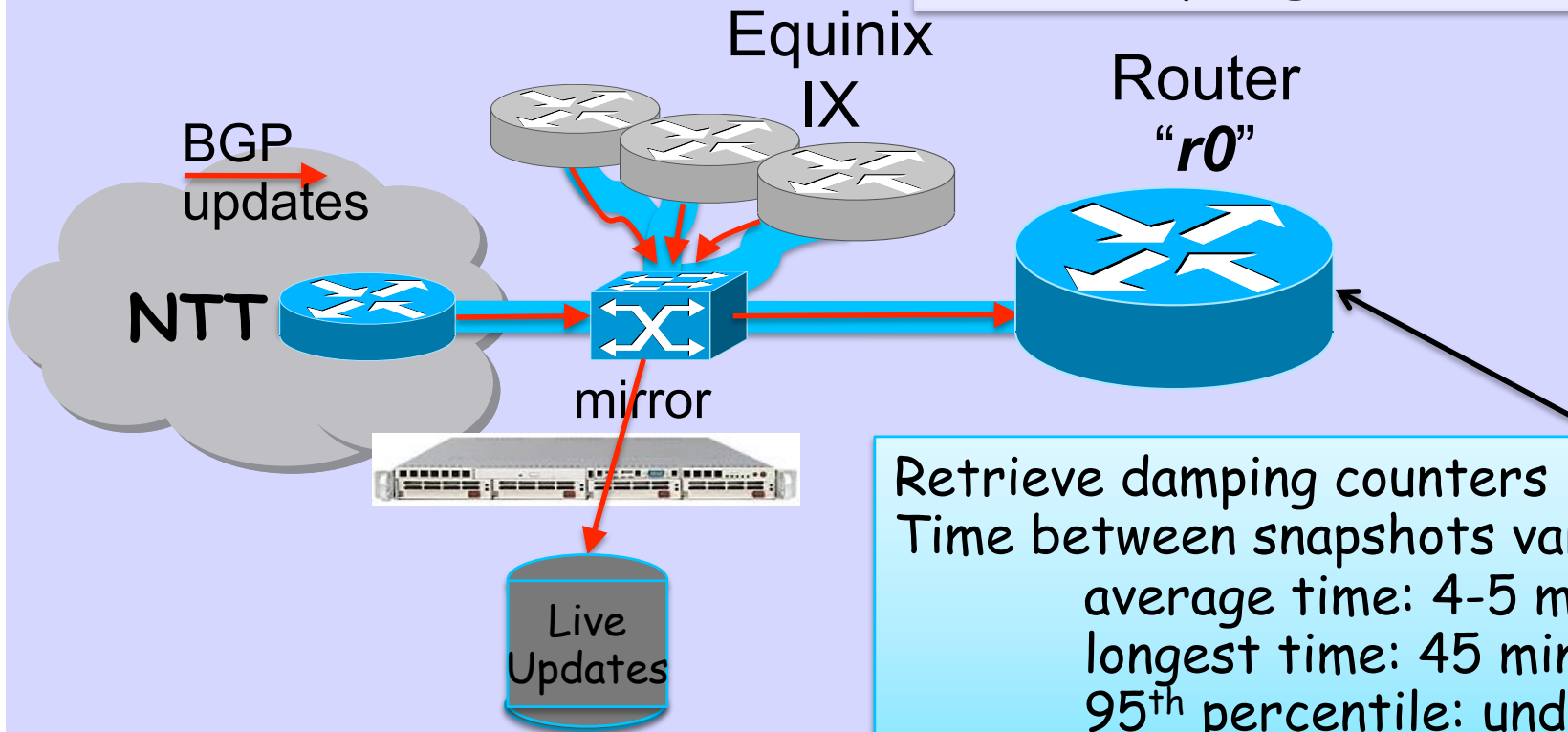updates

Router
"*r0*"

NTT

mirror

Live
Updates
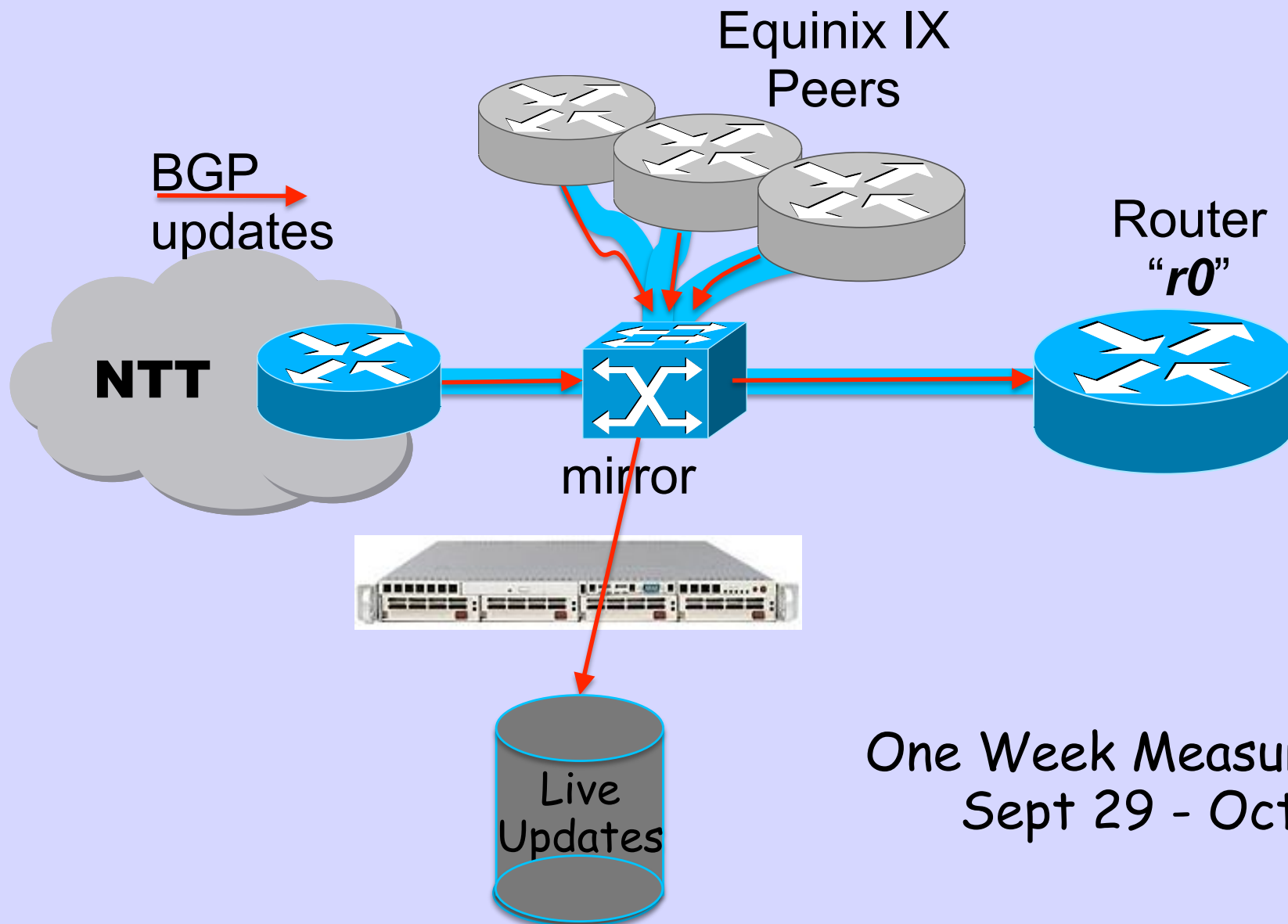
One Week Measurement
Sept 29 - Oct 6

Measurement Details

Modified code in r0
- No actual damping
- Penalty assigned to routes
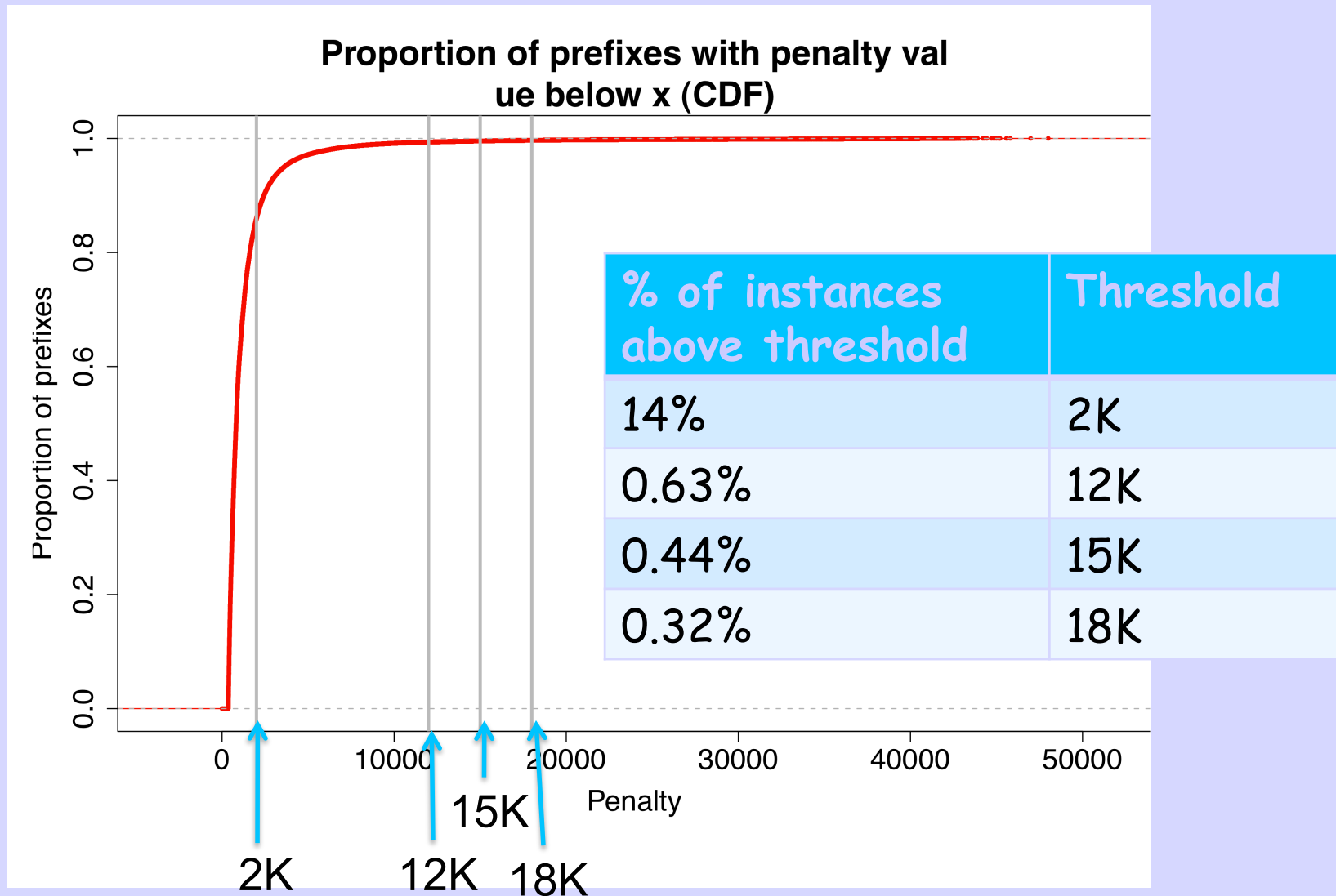- Very high maximum penalty

Equinix IX

Router "*r0*"

BGP updates

NTT

mirror

Live Updates

Retrieve damping counters
Time between snapshots varies
average time: 4-5 min
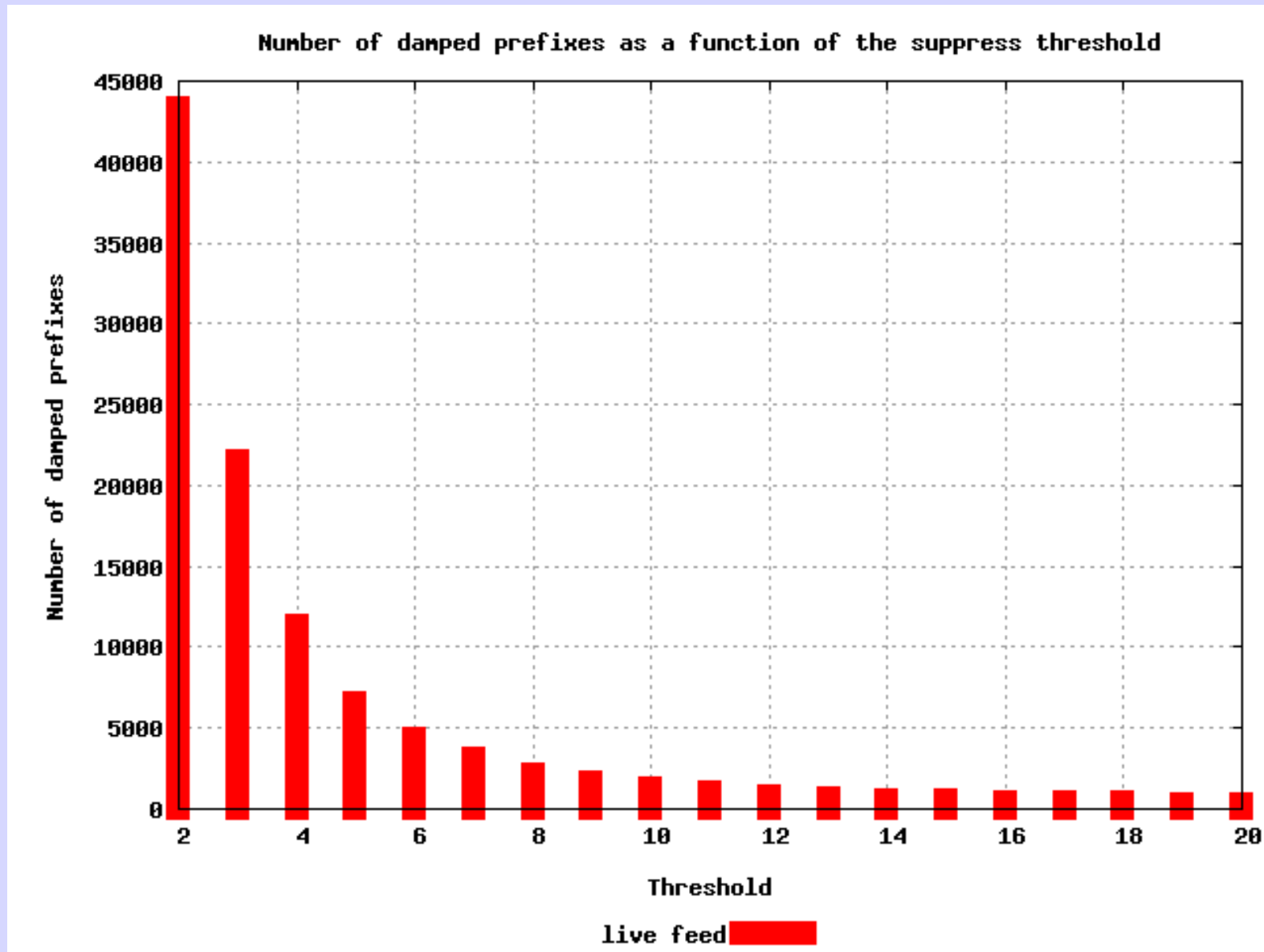longest time: 45 min
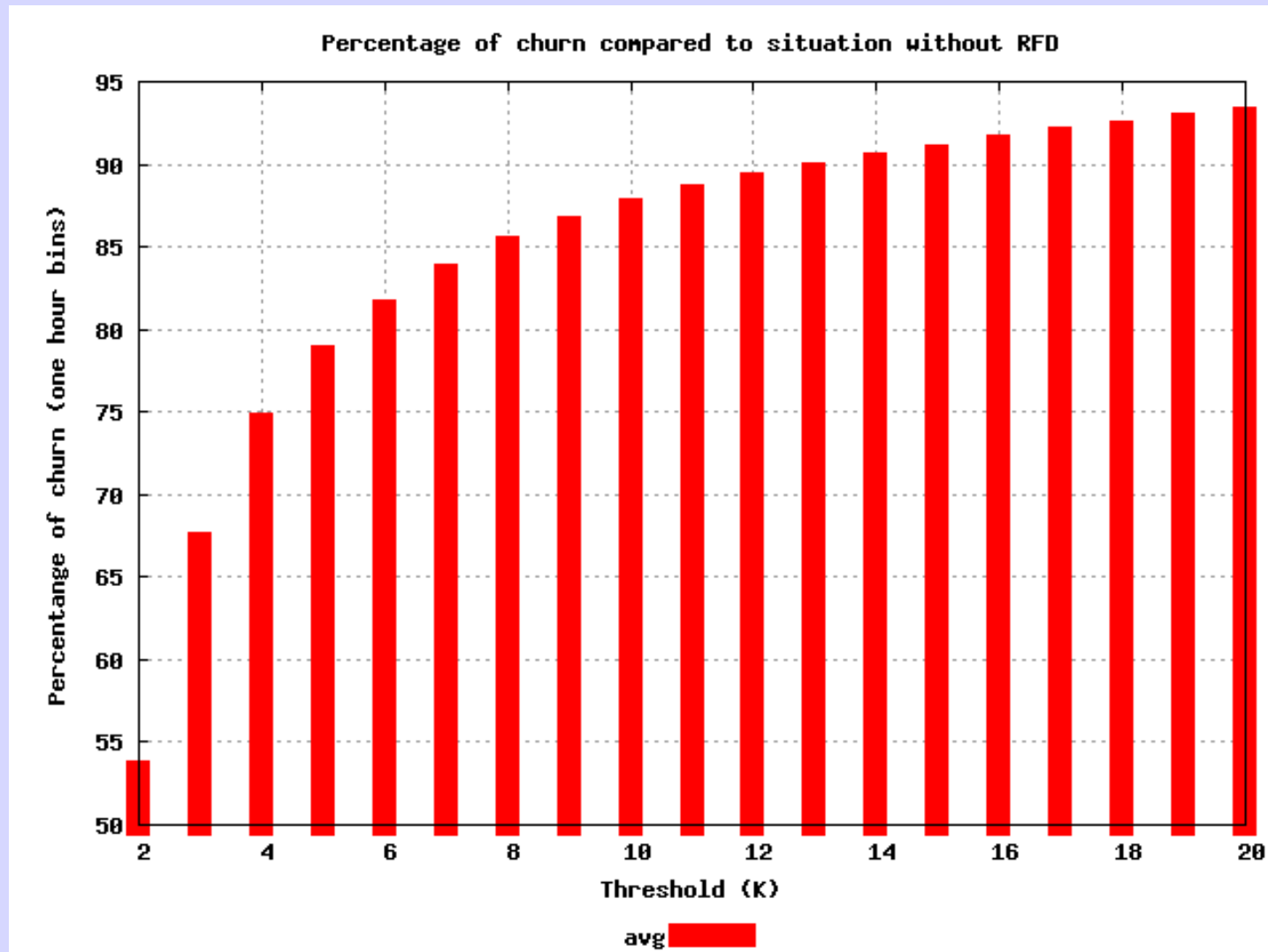95th percentile: under 10 min

Today's Default Does Cut Churn

Churn wo RFD
Median: 525 updates/min

Churn reduction with default RFD
Median: 247 updates/min

Too Much – It Kills Mice

Proportion of prefixes with penalty value below x (CDF)

% of instances above threshold	Threshold
14%	2K
0.63%	12K
0.44%	15K
0.32%	18K
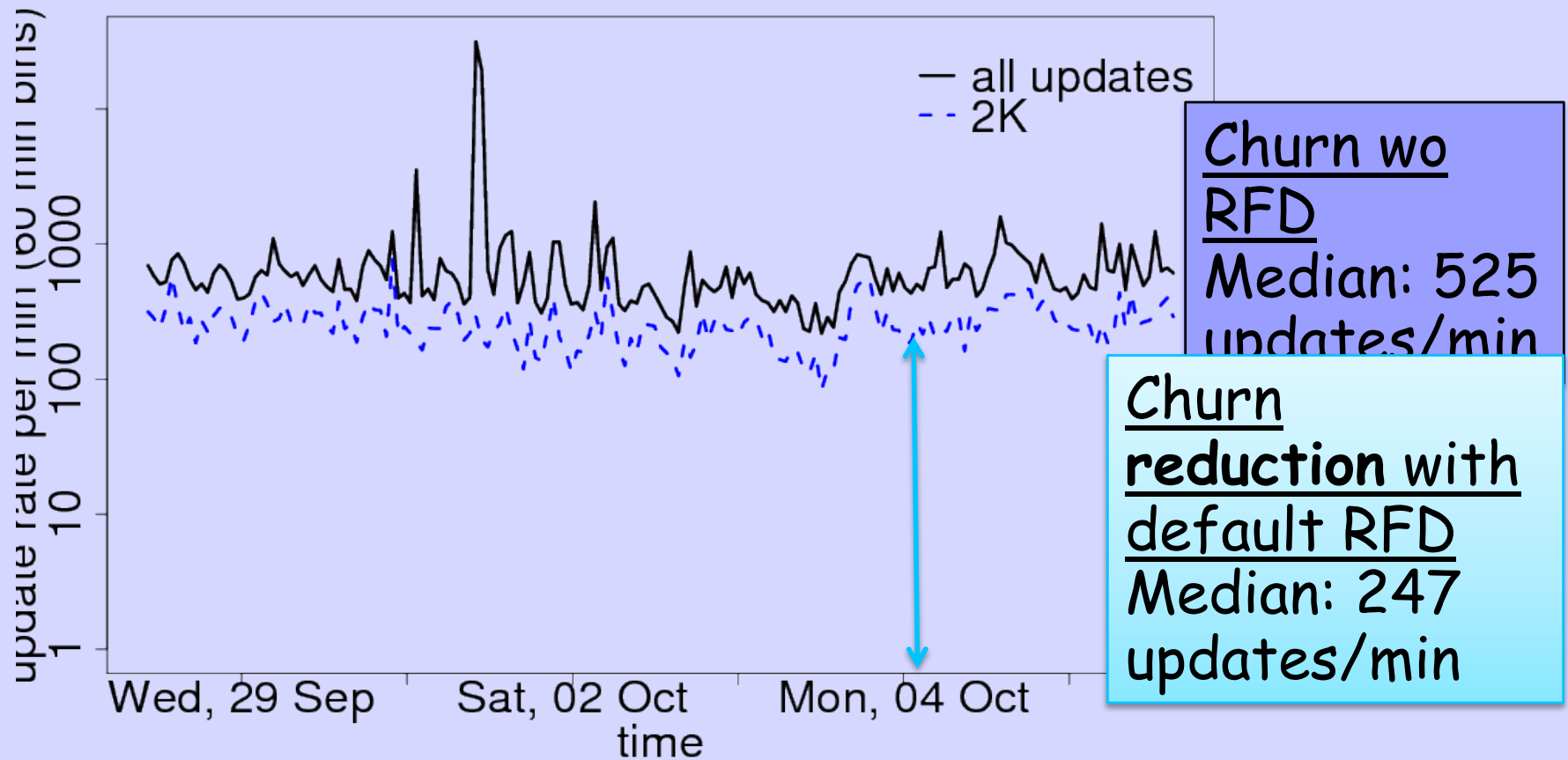
But We Can Kill Many Less

While Reducing Churn

Percentage of churn compared to situation without RFD

Checking Topo Dependence

Equinix IX
Peers

BGP
updates

Router
"*r0*"

NTT

mirror

Live
Updates

RV
Data
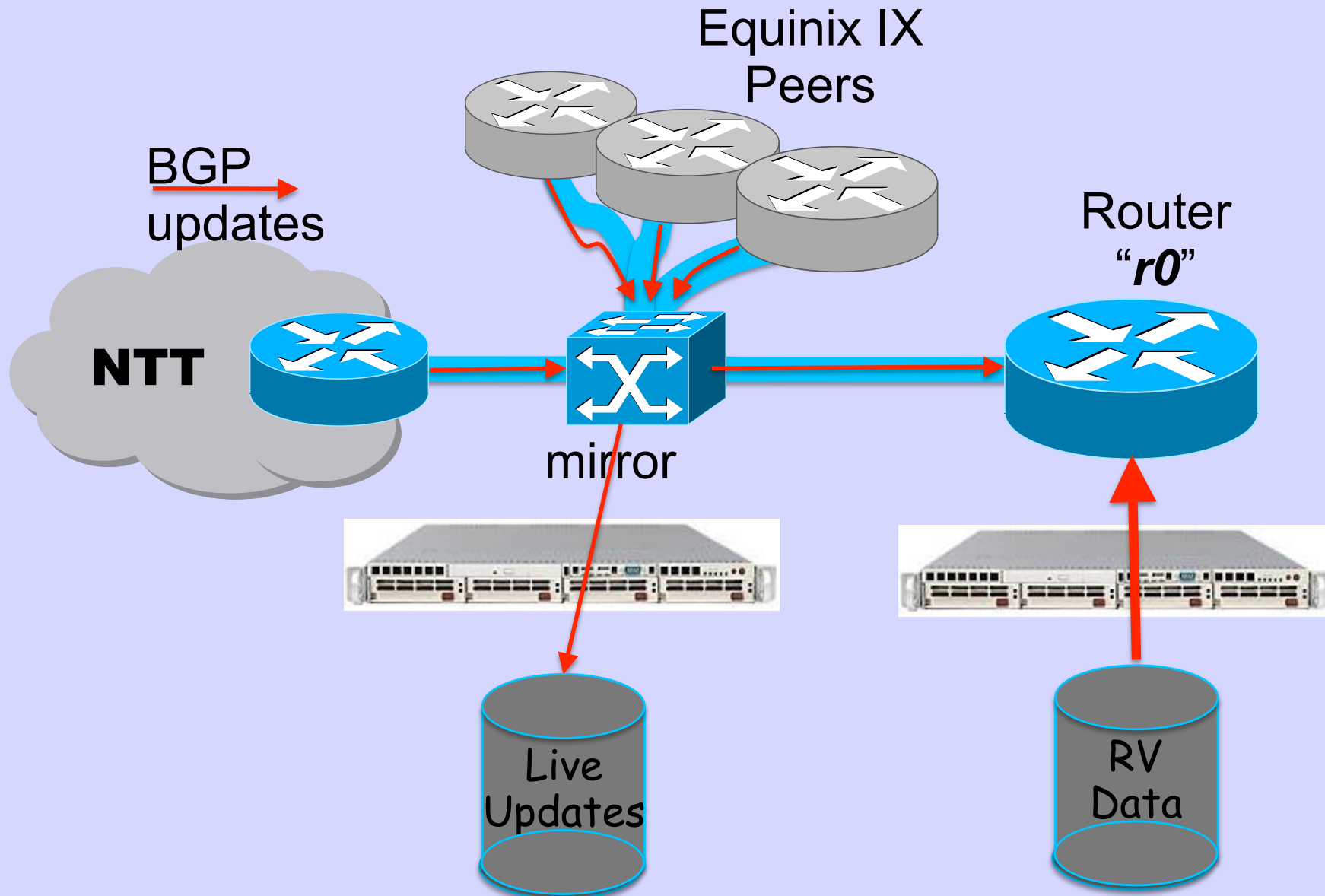
So ...

- Current RFD settings are far too aggressive

- As a consequence RFD is often turned off

- Raise the suppress threshold
  - Router implementations raise max to 50k
  - Tune parameters to 6-15k