Route flap damp

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RIPE/Rodos

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Route Flap Damping Made Useful
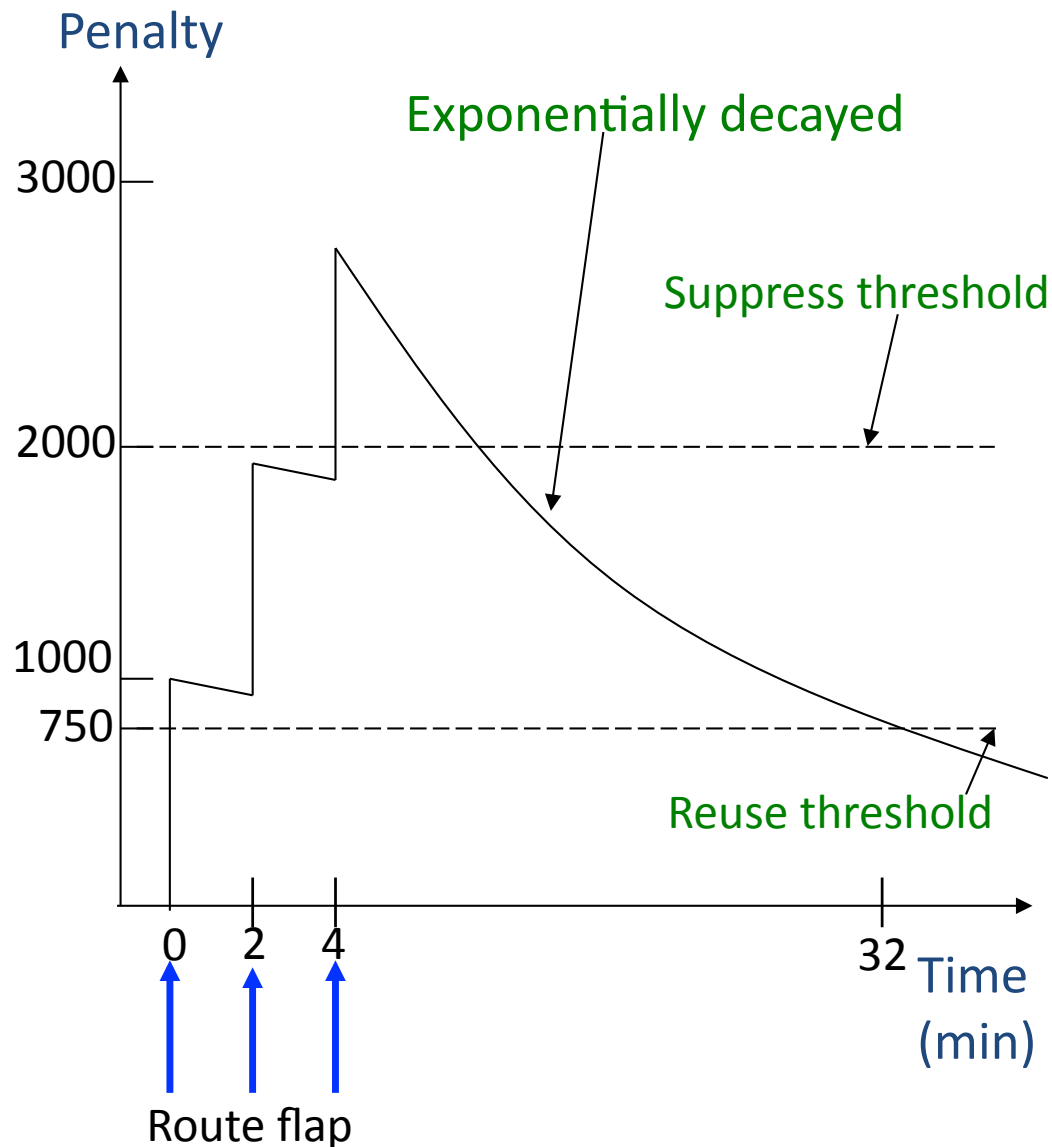
Presenter: Cristel Pelsser

Joint work with:

Randy Bush, Olaf Maennel, Pradosh Mohapatra, Keyur Patel

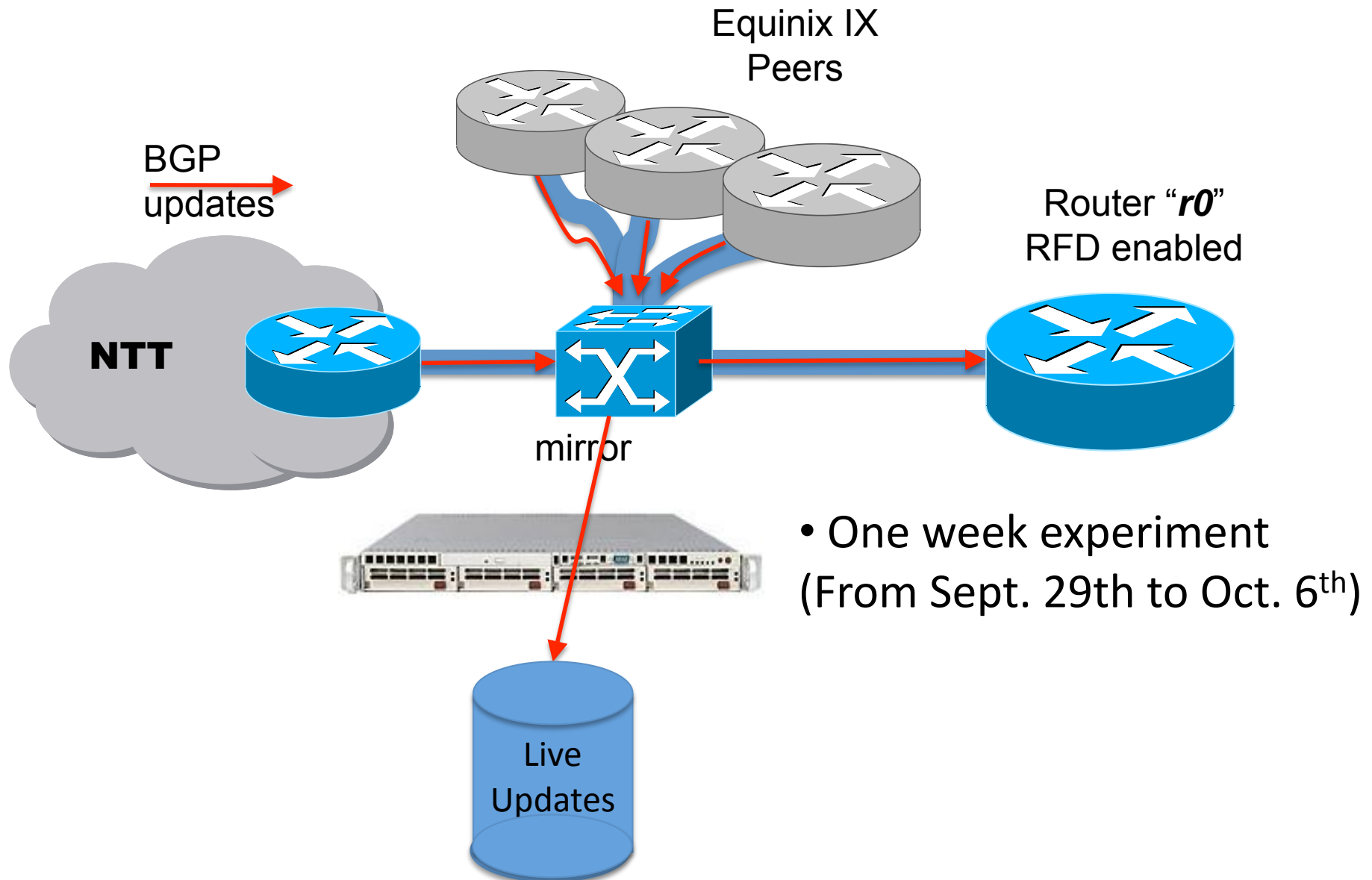Cisco NAG, Oct. 2010

Route Flap Damping

Parameter	Cisco
Withdrawal penalty	1000
Re-advertisement penalty	0
Attributes change penalty	500
Suppress threshold	2000
Half-life (min)	15
Reuse threshold	750
Max suppress time (min)	60

Ref: R. Bush, T. Griffin, Z. M. Mao, Route flap damping: harmful?, RIPE 43, 2002
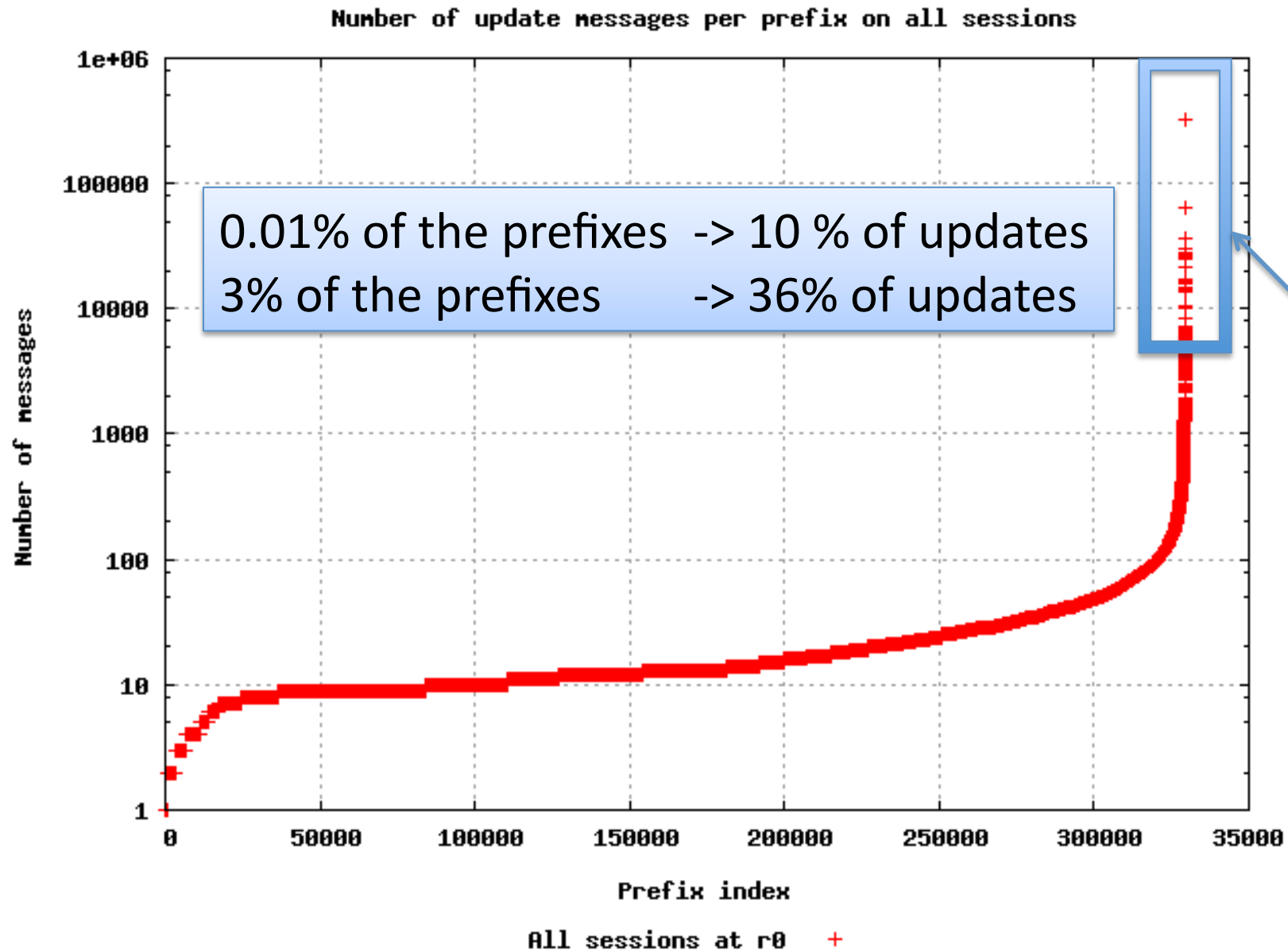
Problem statement

- Small number of BGP routes flap heavily
  - Elephants and Mice
- Problem: Today we kill mice and elephants

- Solution: Higher suppress threshold
  - Save mice
  - Churn reduction compared to RFD turned off
  - Easy to implement

Experimental setup

Equinix IX Peers

BGP updates

NTT

Router "*r0*" RFD enabled

mirror

Live Updates

- One week experiment (From Sept. 29th to Oct. 6th)

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   +
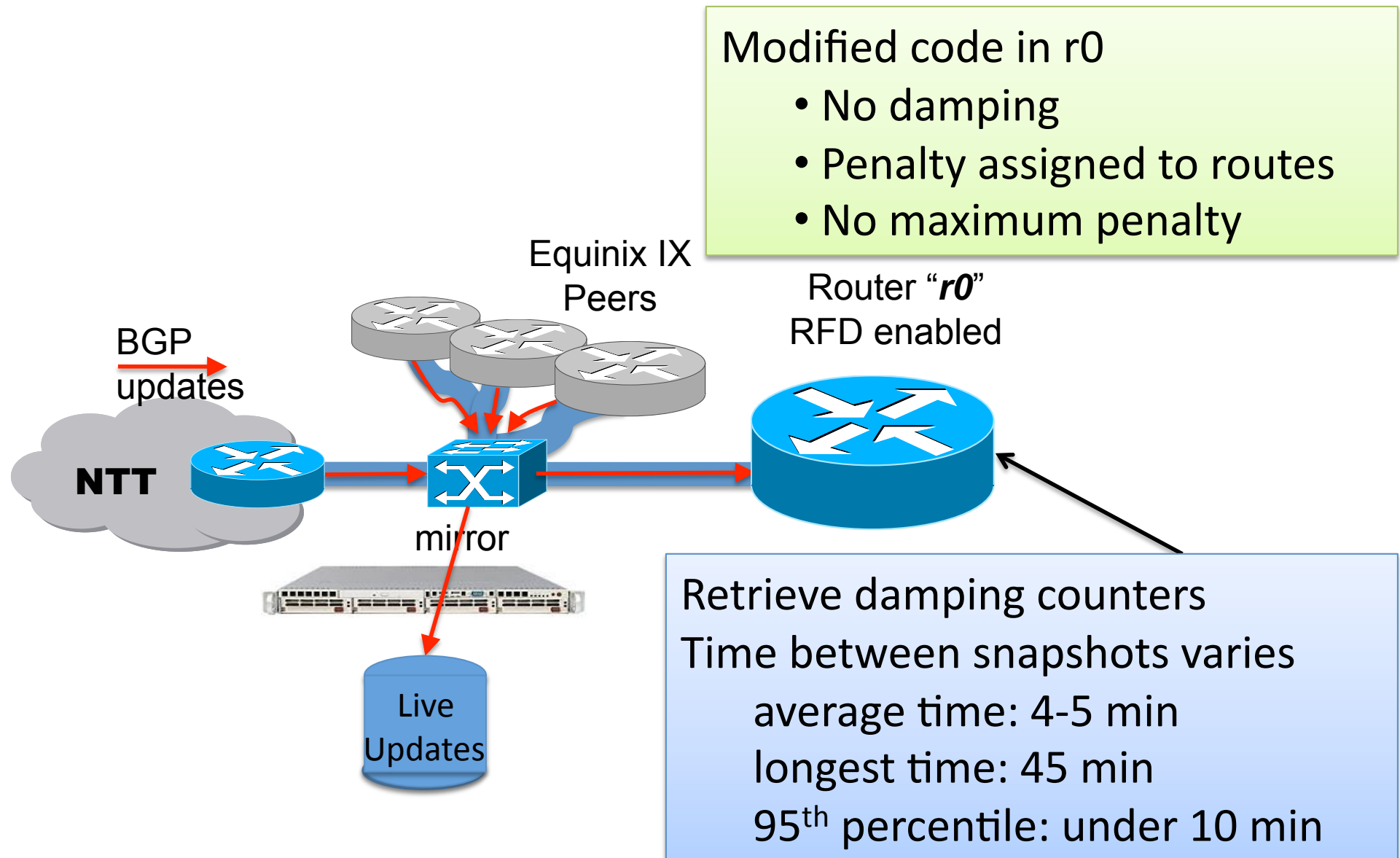
Today's defaults kill mice (and elephants)

- Peer: 212.47.190.1, AS=9177 from RIPE
- In response to WD-beacon at 18:00, Aug 10th.
- Using Cisco setting + RIPE229 recommendation

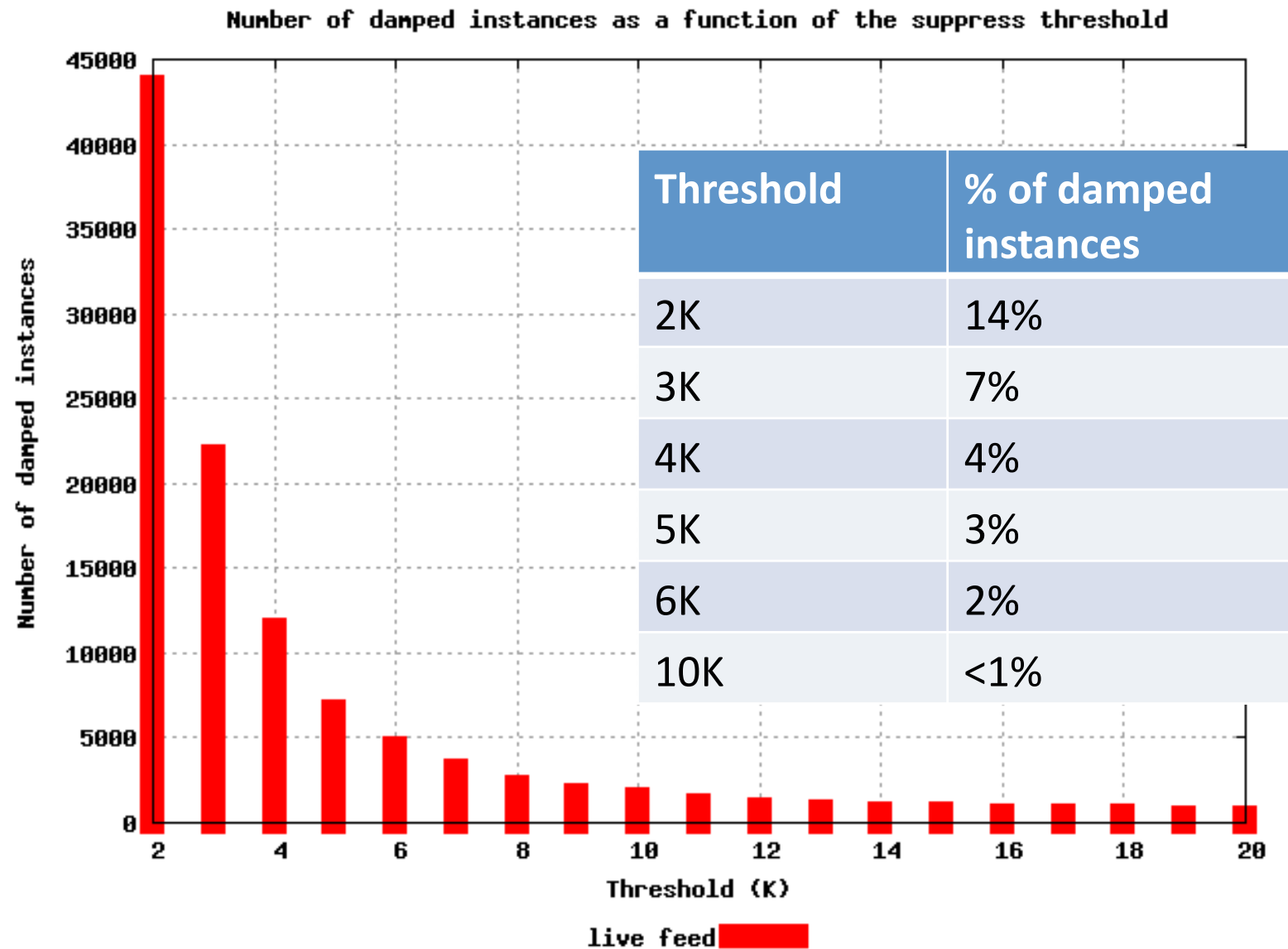| Time 8/10	A/W	ASPath	Penalty
18:00:15	A	9177 3320 1 2914 3130 3927	500
18:00:41	A	9177 6730 5400 2914 3130 3927	990
18:01:41	A	9177 3320 2914 3130 3927	1445
18:03:06	A	9177 3320 1239 2914 3130 3927	1853
18:03:35	W		2812
18:04:03	A	9177 6730 5400 2914 3130 3927	2752
18:04:31	W		3694

Ref: R. Bush, T. Griffin, Z. M. Mao, Route flap damping: harmful?, RIPE 43, 2002

How about changing the suppress threshold?

Experimental setup

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

Equinix IX
Peers

Router "*r0*"
RFD enabled

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

With 4K and more, we kill many less mice

Number of damped instances as a function of the suppress threshold

Threshold	% of damped instances
2K	14%
3K	7%
4K	4%
5K	3%
6K	2%
10K	<1%

Update rate (estimation)

Percentage of update rate compared to situation without RFD
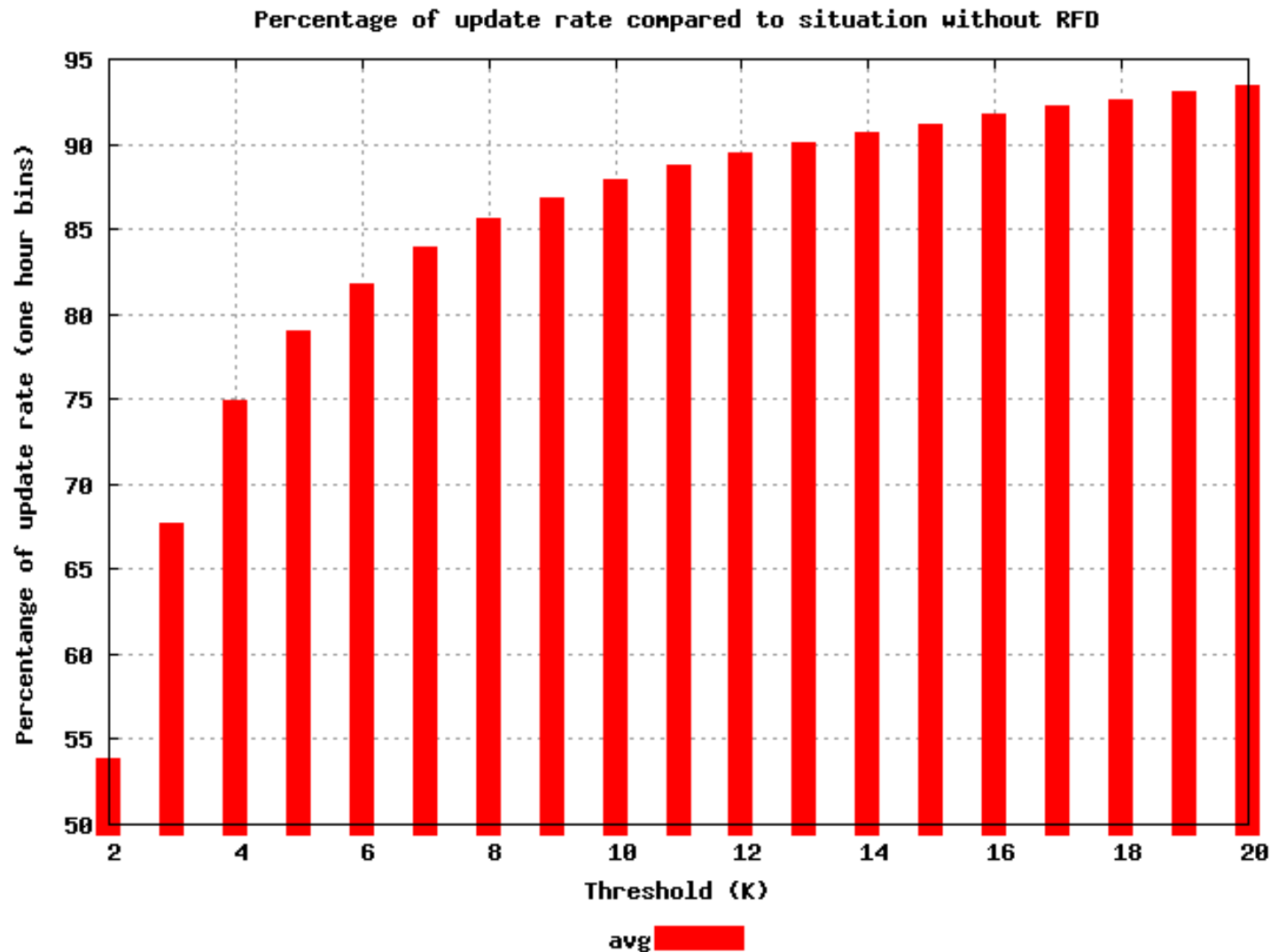
Update rate is reduced by more than 20 % with [4K-5K], compared to no suppress threshold

Summary

- Current RFD settings are too aggressive
- As a consequence RFD is often turned off

- We propose to raise the suppress threshold
  - Churn is reduced compared to without RFD
  - Mice's convergence is not affected as with currents default
  - Very simple modification to router implementations