Peering Loss Analysis
at London Internet Exchange (rrc01)

Cengiz Alaettinoglu

cengiz@packetdesign.com

Big Thanks to RIPE RIS Project

Slides: http://www.packetdesign.com/publications

rrc00 versus rrc01

- Our earlier work used data from at rrc00 at RIPE NCC in Amsterdam
  - → Multi-hop EBGP peers with 13 or so peers
    - – Some peers are across the globe
      - • Perhaps more subject to peering loss
  - → Peers pass full routing tables
    - – May skew some trends analysis, e.g. churn trends
      - • i.e. churn is amplified but trends still useful
  - → Has been running the longest
    - – Very valuable, particularly for prefix growth analysis

rrc01

- rrc01 is at London Internet Exchange
  - → All peerings are single hop EBGP
  - → Peers are asked to pass only their own peers
    - – Danger of not adding up to "global" routing table
  - → May provide more realistic data for churn & peering loss analysis
- September 2000 to November 2002
  - → Peered w/ 107 distinct IP addresses
  - → Analysis limited to peers in 195.66.224/24, 195.66.225/26, 195.66.226/24
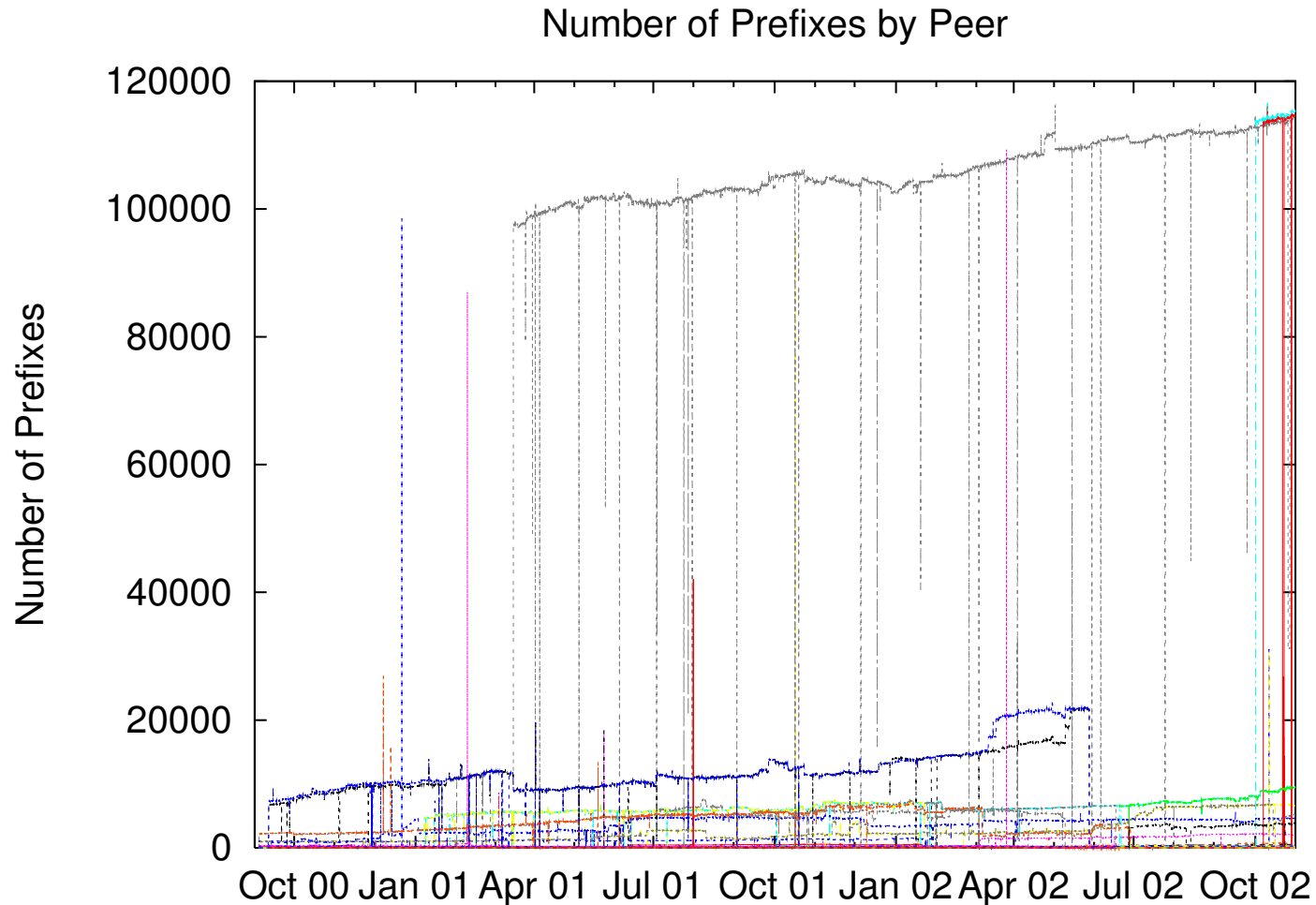   - – i.e. removed bogus peers' data

Distribution of Prefixes to Peers
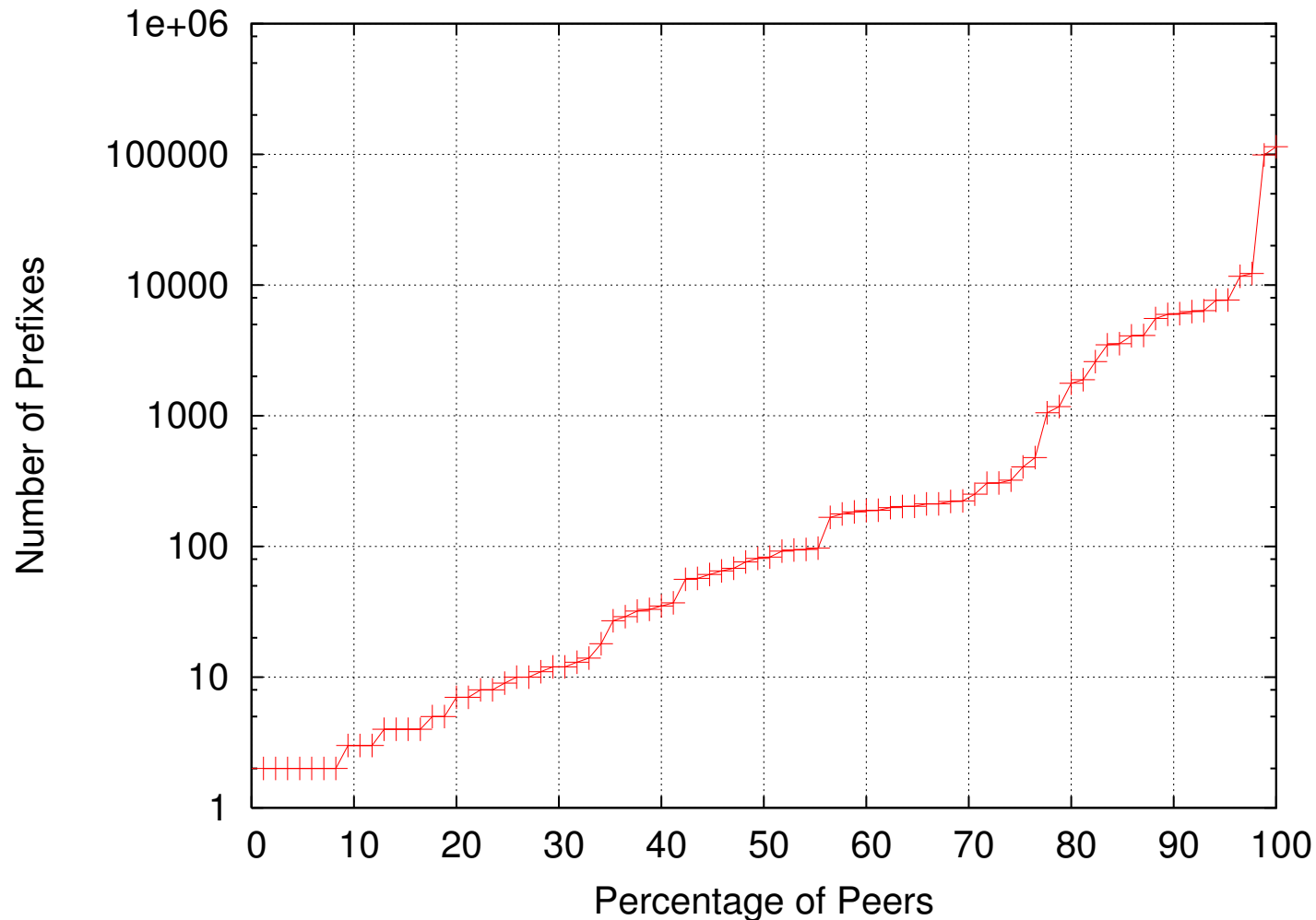
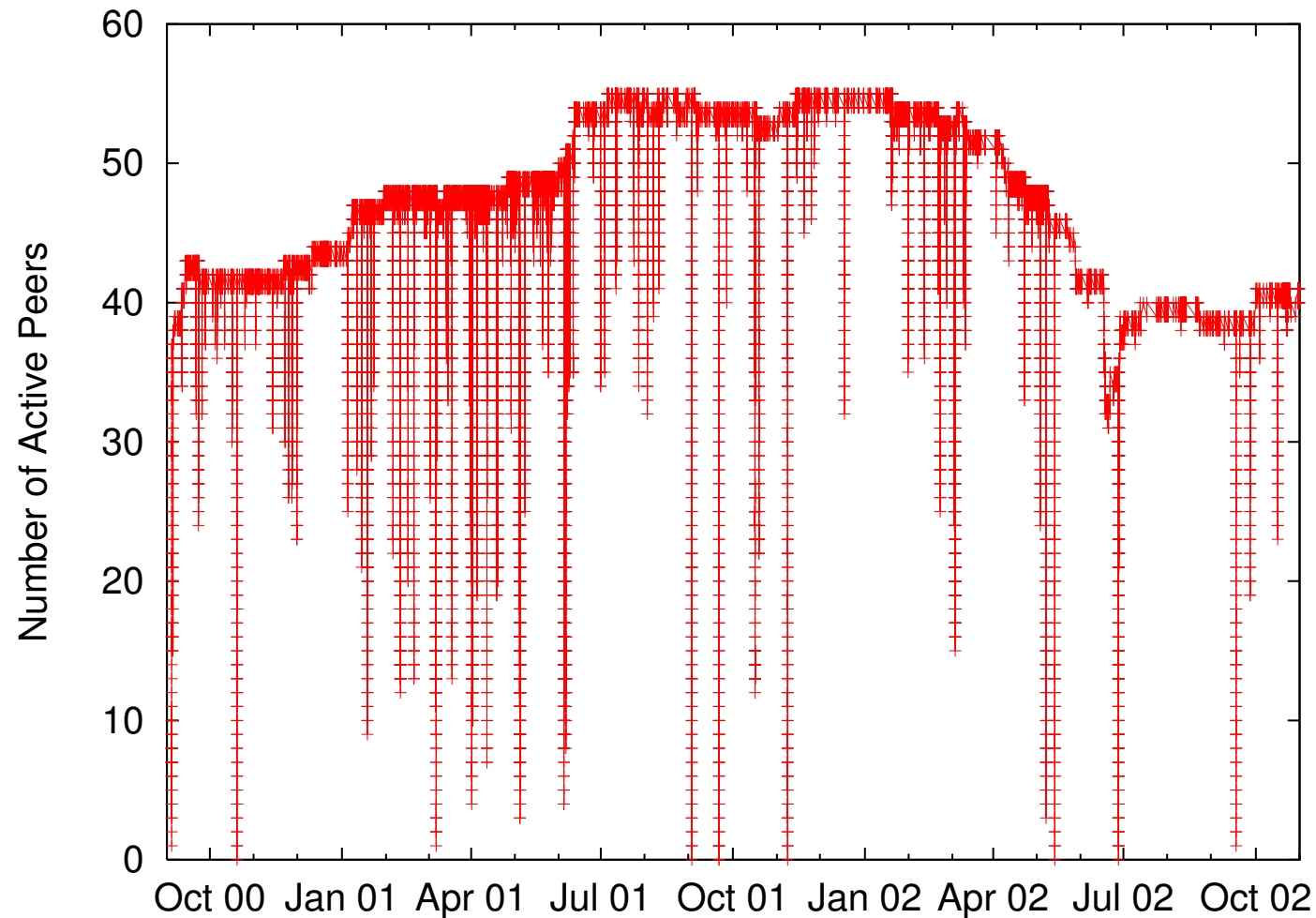
→ Most peers pass less than 100 prefixes

→ Few actually pass full routes
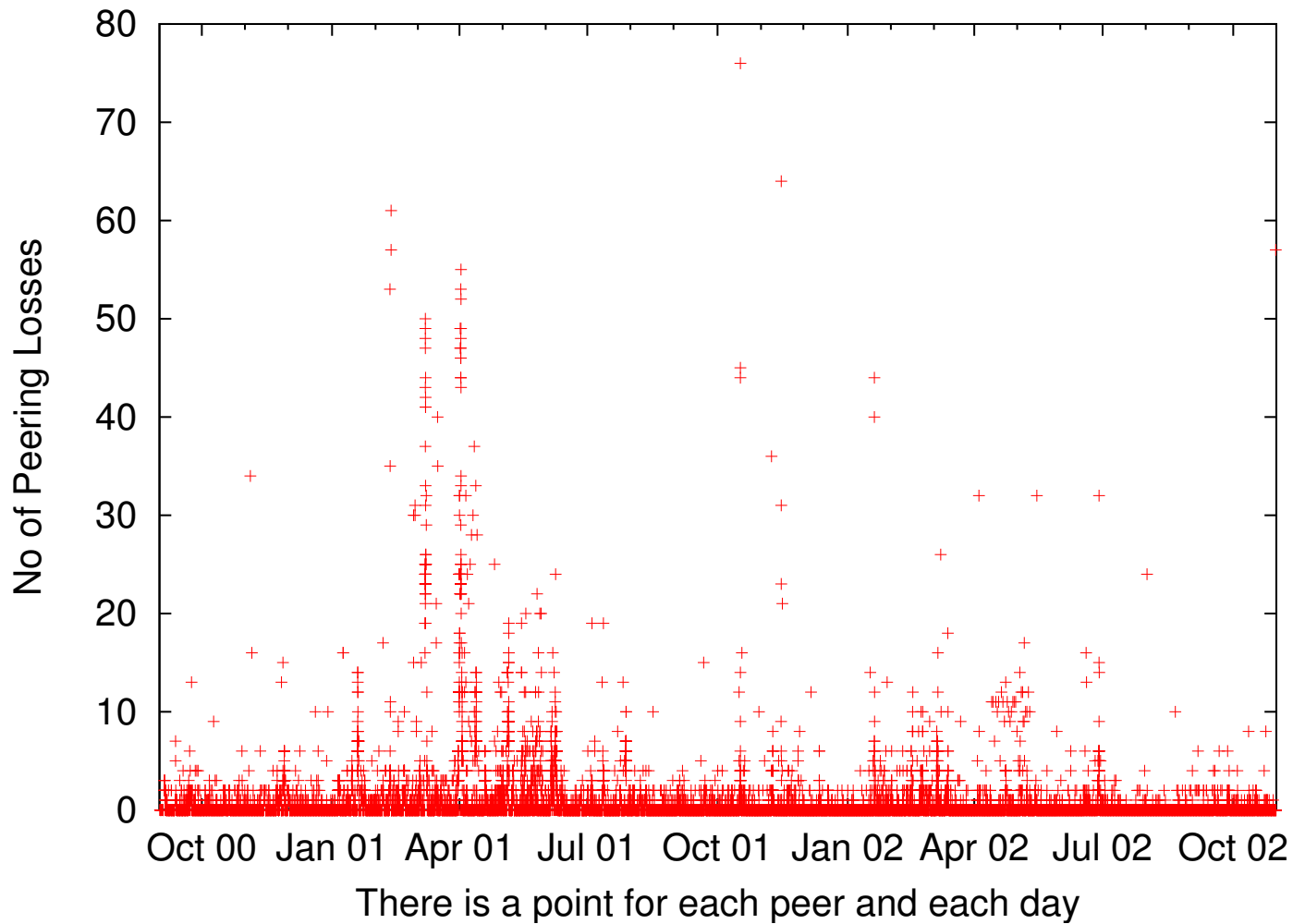
Prefixes per peer

Number of Prefixes by Peer

→ Upward spike is a configuration mistake

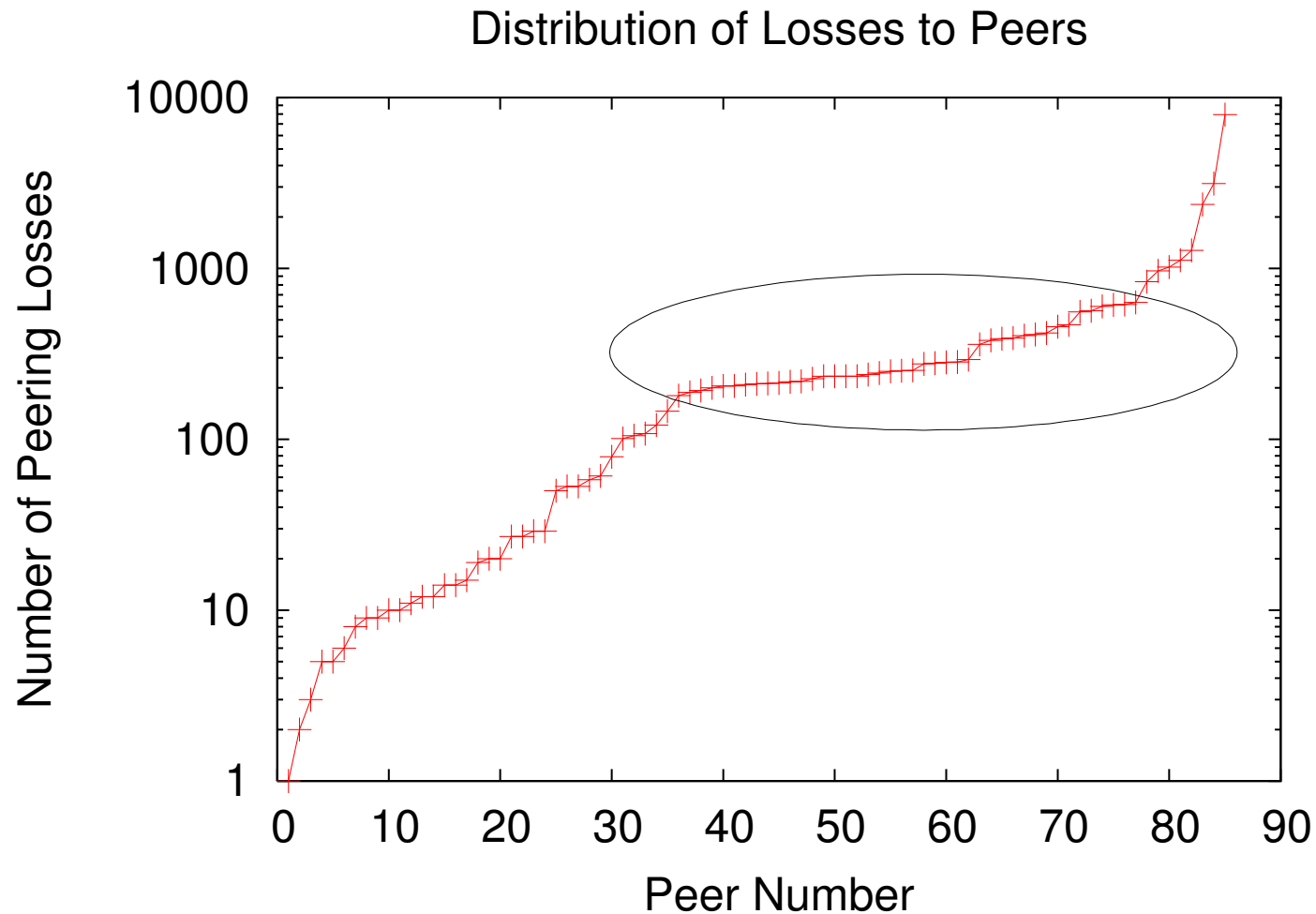→ Downward spike is a peering loss

Number of Active Peers

- 33,441 peering losses, 42 a day, ~ 1 per peer per day
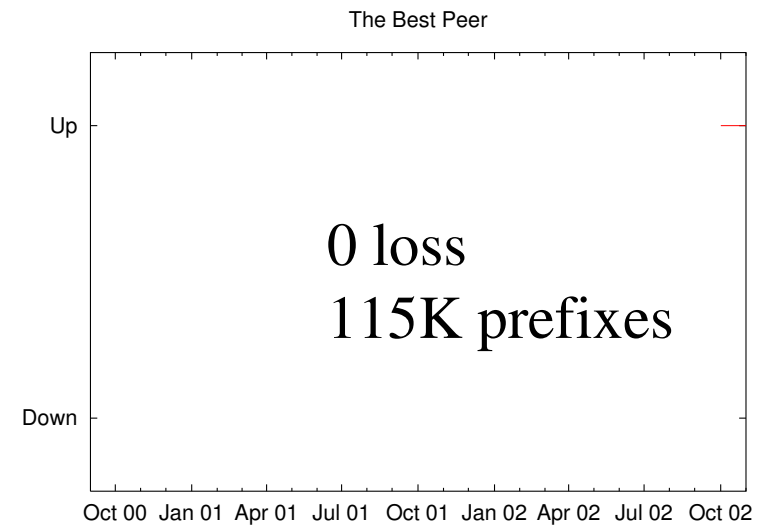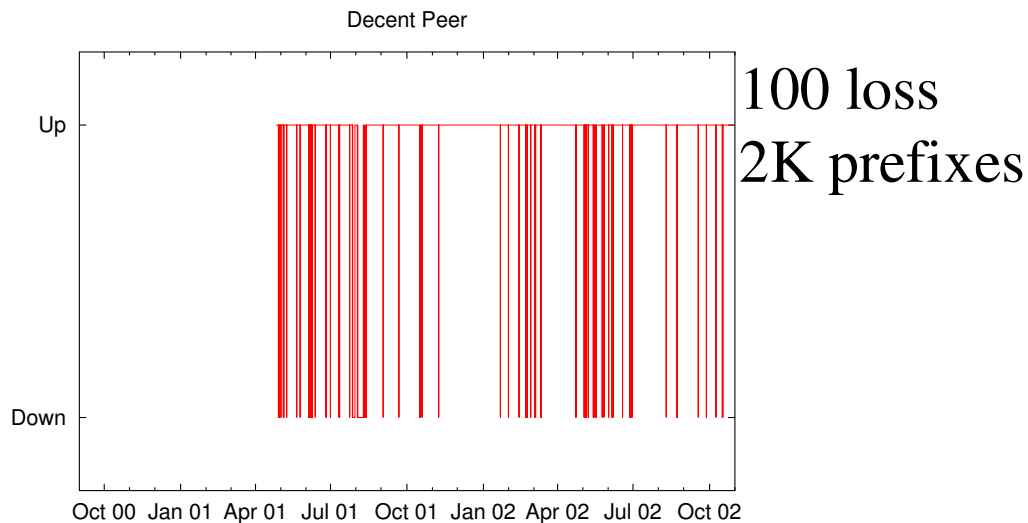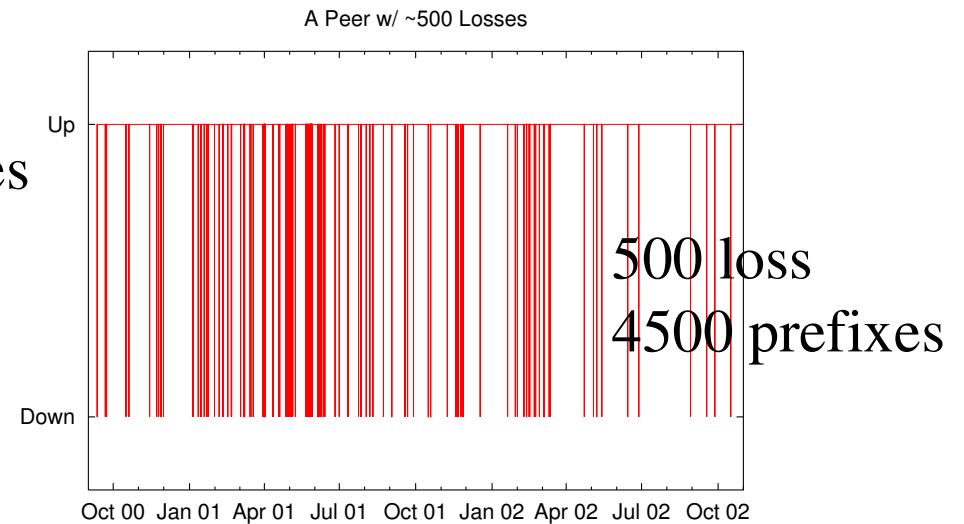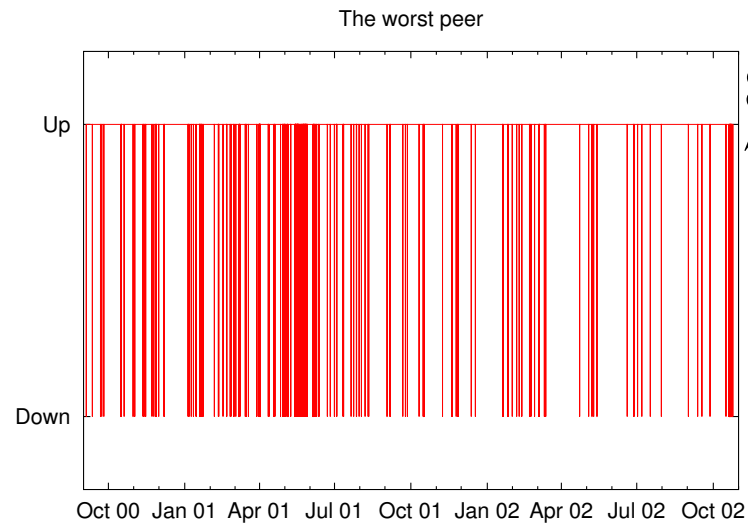
Peering Loss per Peer per Day

There is a point for each peer and each day

Distribution Across Peers

Distribution of Losses to Peers

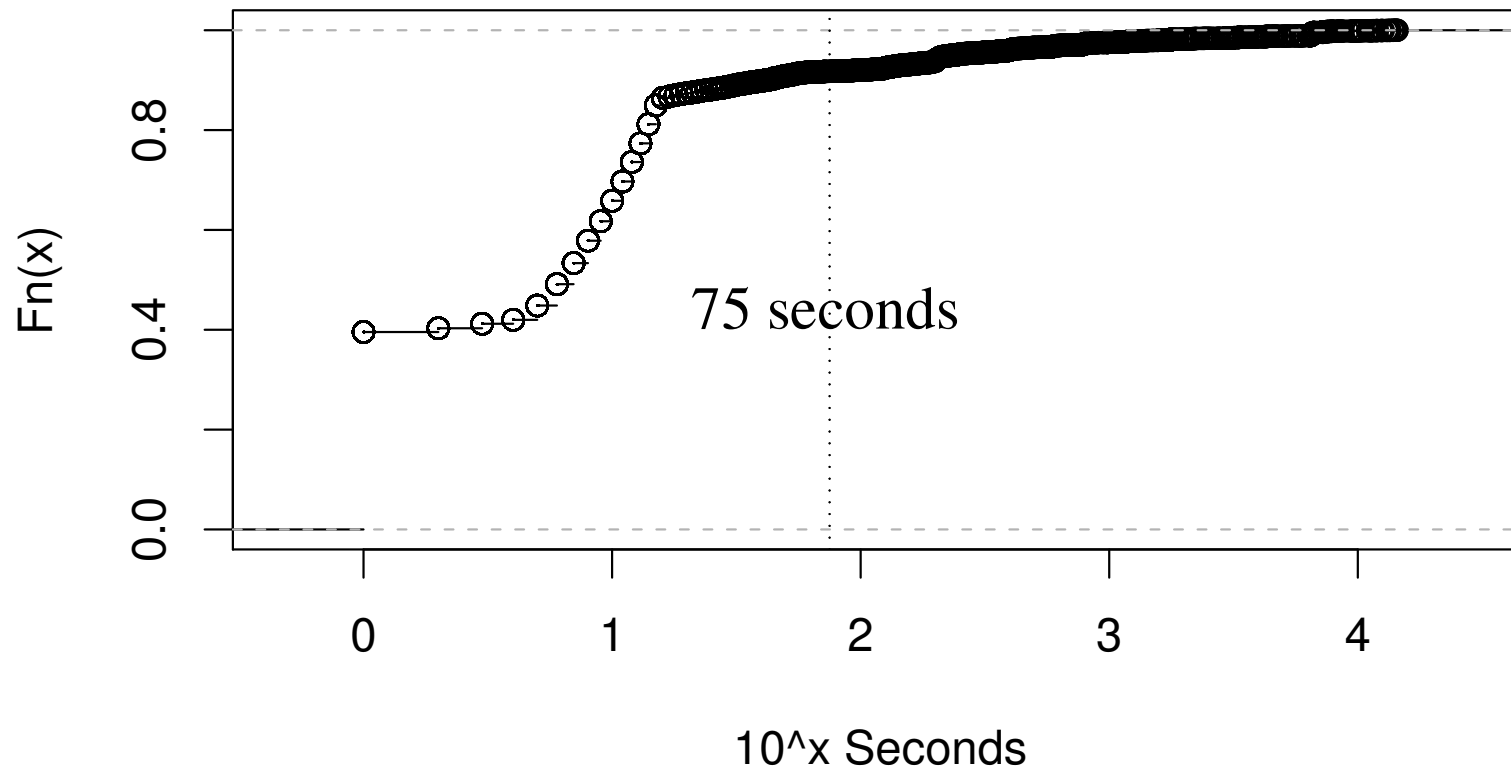→ The middle cluster at 200-500 losses (1 loss every two days)

The Best, the Worst and Two Other

The worst peer
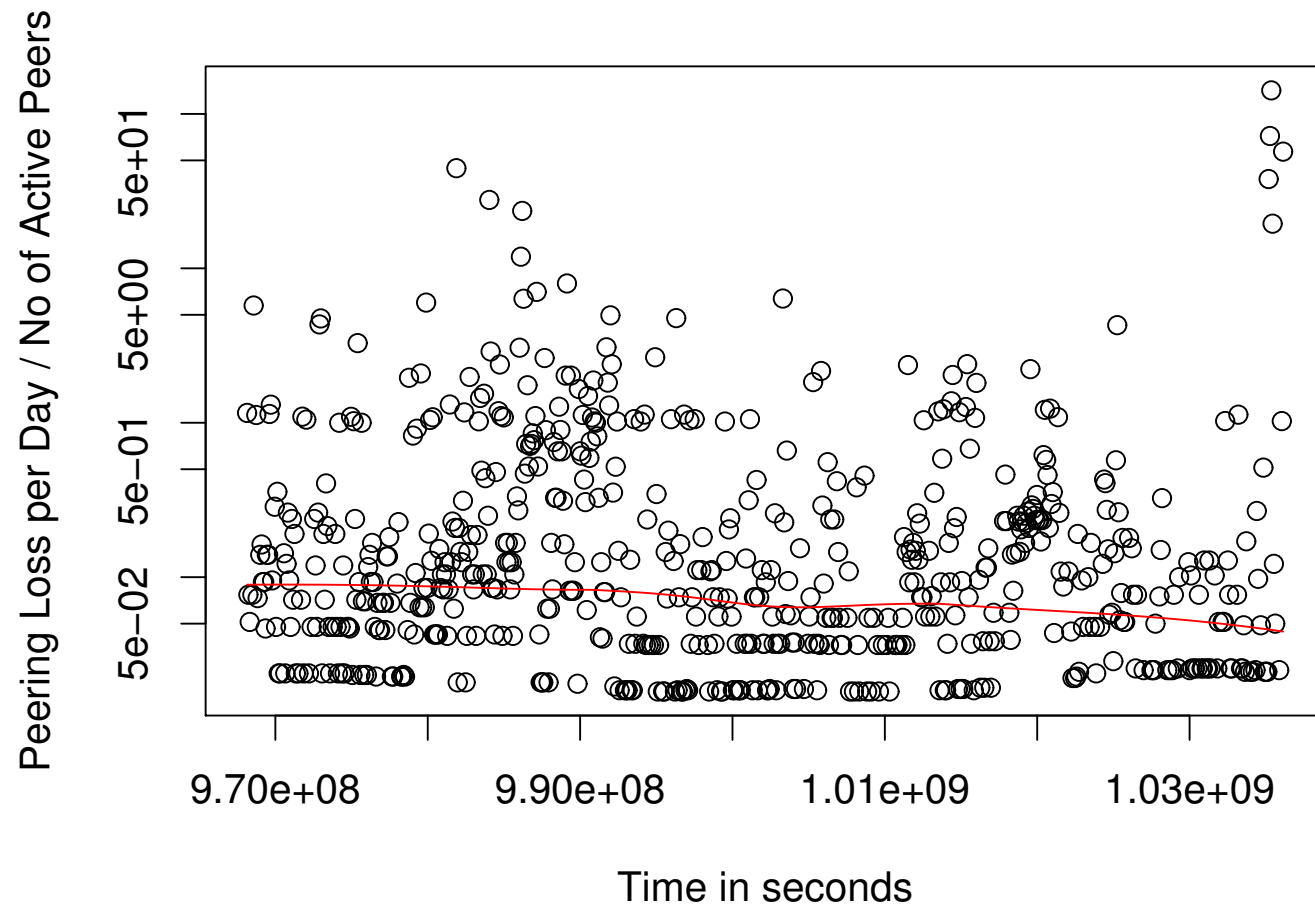

8K loss
700 prefixes

A Peer w/ ~500 Losses

500 loss
4500 prefixes

Decent Peer

100 loss
2K prefixes

The Best Peer

0 loss
115K prefixes

Graceful Restart will Help

Down Time Distribution

75 seconds

Fn(x) vs 10^x Seconds

→ 92% of peerings are reestablished in less than 3 KeepAlives
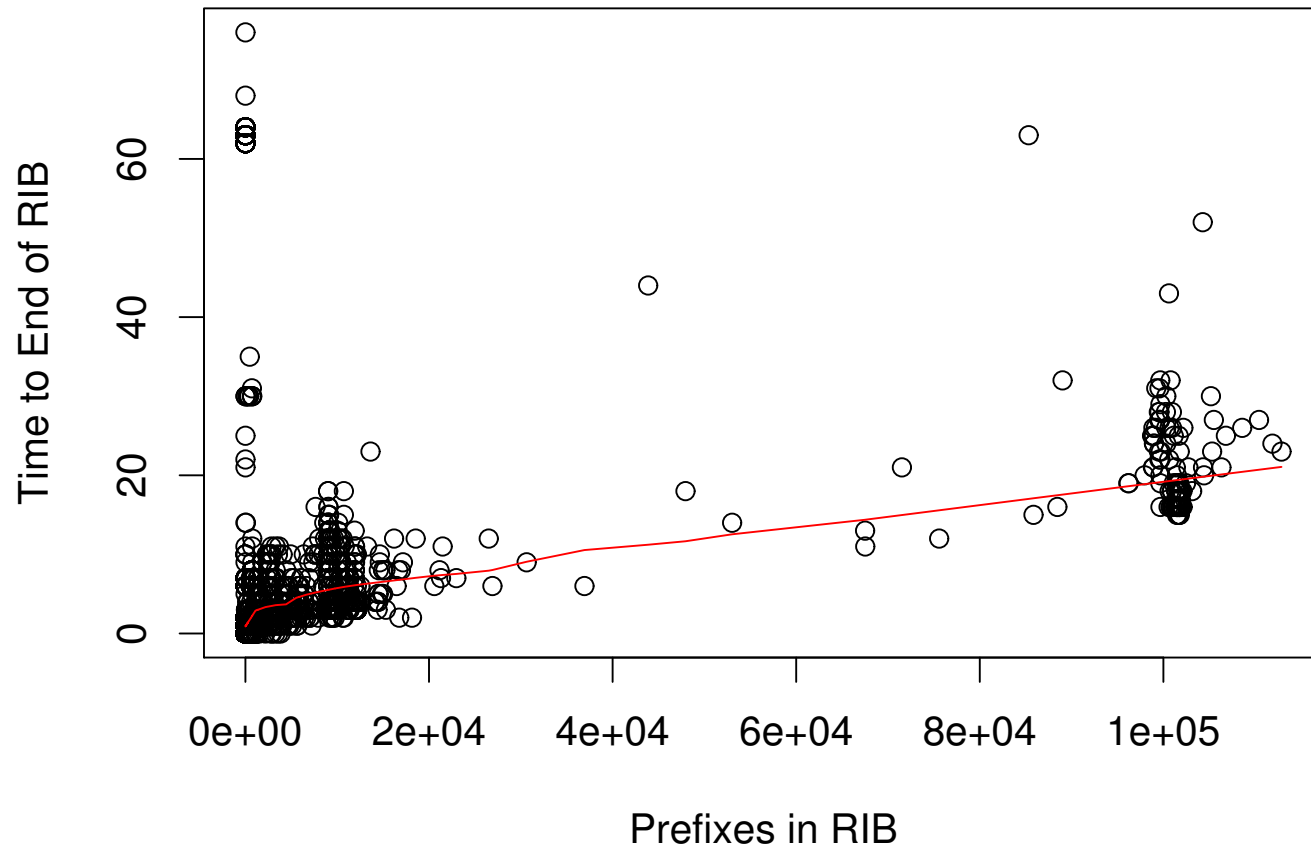
BGP Peerings are Getting More Stable
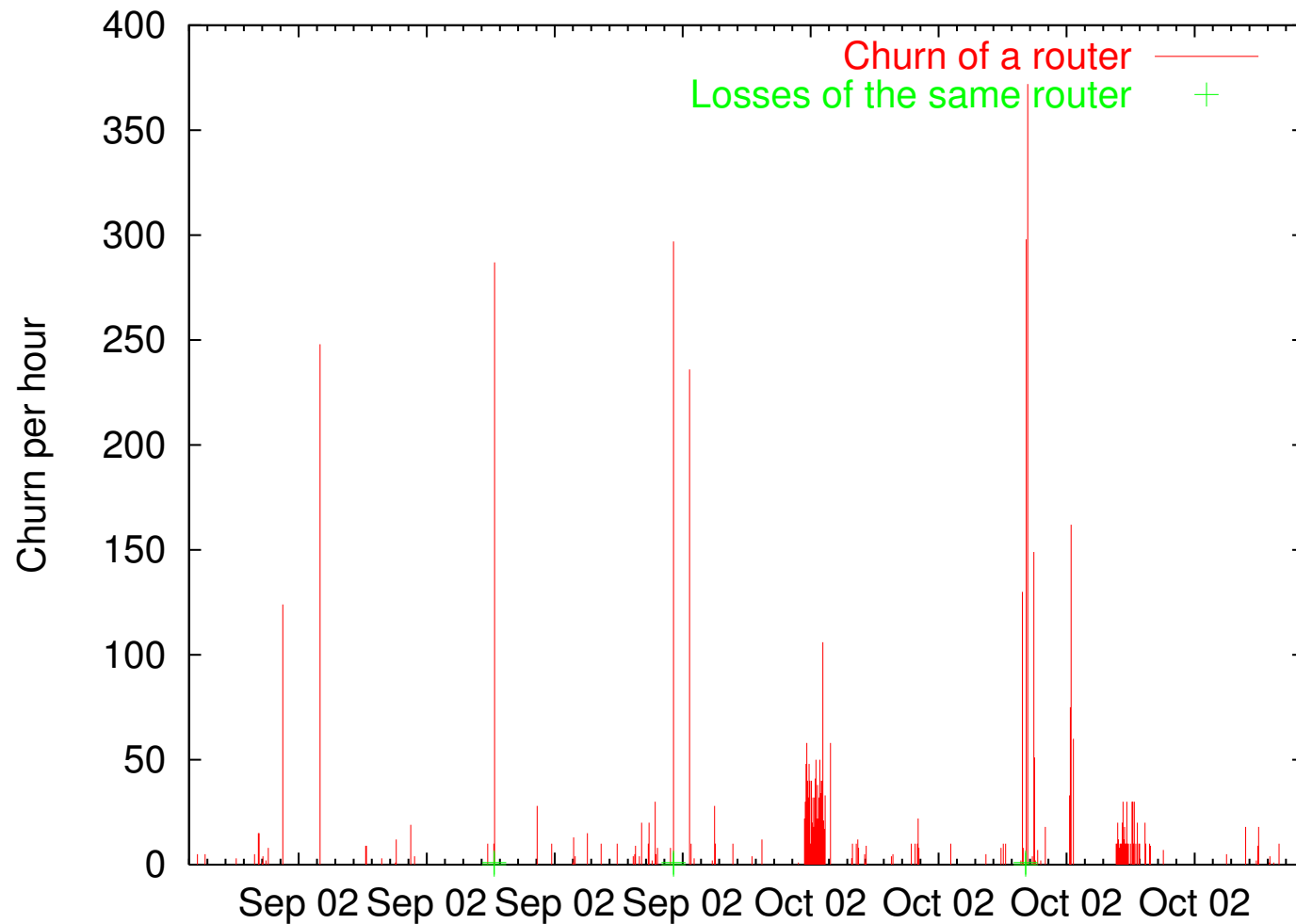
Time to End of RIB

- End of RIB marker
  - → none seen
- First Keep Alive
  - → 88%
- Quiescence > 1sec
  - → 4% (average 18seconds, 60% < 2 seconds)
- Peering lost after seeing some prefixes
  - → 8%
  - → Not included (for now)
- Peering lost before any prefixes

Time to End of RIB

For the same number of prefixes, time varies a lot!

Peering Losses Elsewhere

→ Spikes are most likely peering losses with other routers

Remarks

- Peering loss is significant and causing lots of churn
  - → Data from Amsterdam IX is consistent
  - → Can this still be an artifact of measurement? Perhaps...
  - → Perhaps small peers do not care about fixing their routers?
- Graceful restart will help
  - → Assuming the conditions are satisfied