A Longitude Study of
BGP Data Collection Session Failures

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Why longitude study of RV/RIPE session resets?

- Two best known BGP monitoring projects
  - RIPE: Since 1999, now 16 collectors
  - RouteViews: Since 1998, now 10 collectors
- Valuable data source
  - Operators check data in real/recent time
  - Research people use both real time and archive data
- The quality of collected data varies, due to a few factors
  - Changes of monitors over time
  - Session resets
  - Collector failures
  - Other outages
- This work: quantify the above factors
- Learn a few things about BGP session stability in general
  - Need to improve stability of monitoring sessions
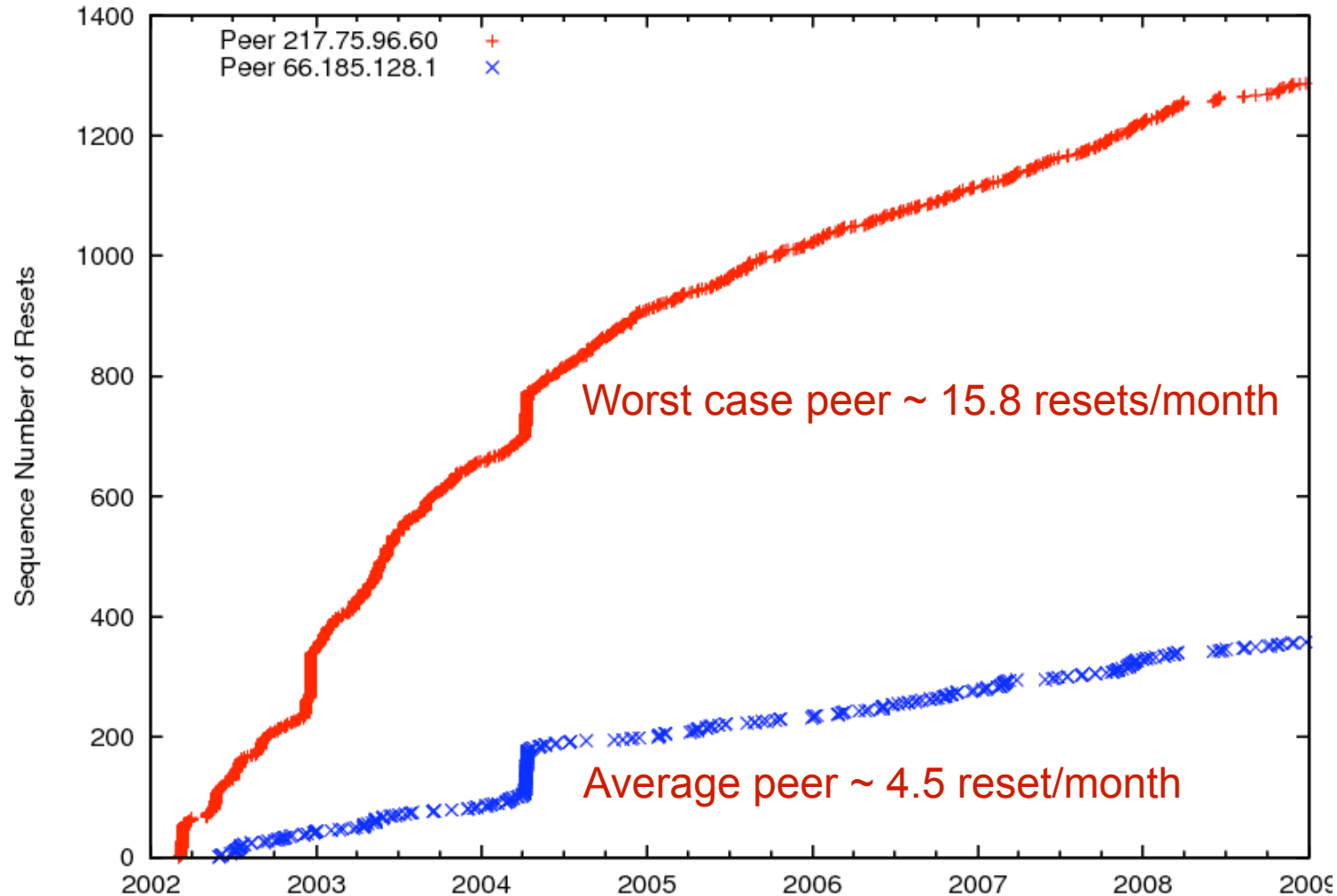 - Lessons may be applicable to operational sessions

Detecting Session Resets

- Data Sources: 8 years of data form 6 collectors
  - RIPE
    - rrc00 (multi-hop),
    - rrc01, rrc02 (single-hop)
  - RouteViews
    - oreg (multi-hop)
    - linx, eqix (single hop)
- Method: MCT + Session messages

http://www.cs.arizona.edu/~bzhang/paper/05-minenet-mct.pdf
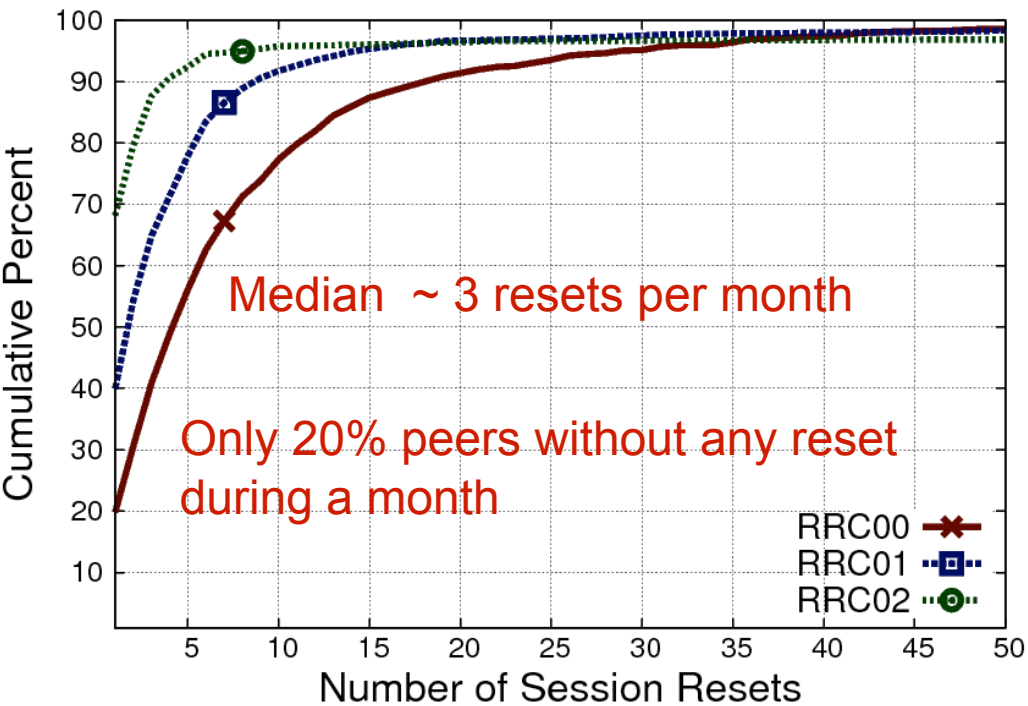
(an extended version is being submitted to journal)

Session Resets
for Two Example Peers

=> Reset is norm, across different time and peers

Number of Session Resets*

- RIPE

Median ~ 3 resets per month

Only 20% peers without any reset during a month

Legend: RRC00, RRC01, RRC02

- RouteViews

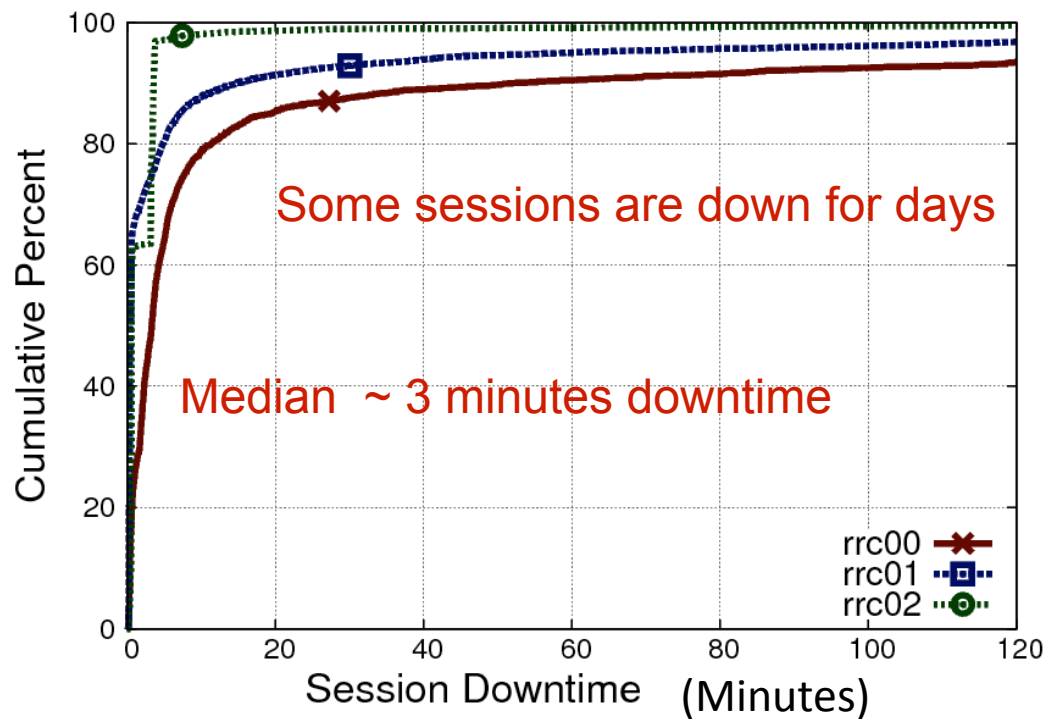Only 35% peers without any reset during a month

Legend: OREG, LINX, EQIX
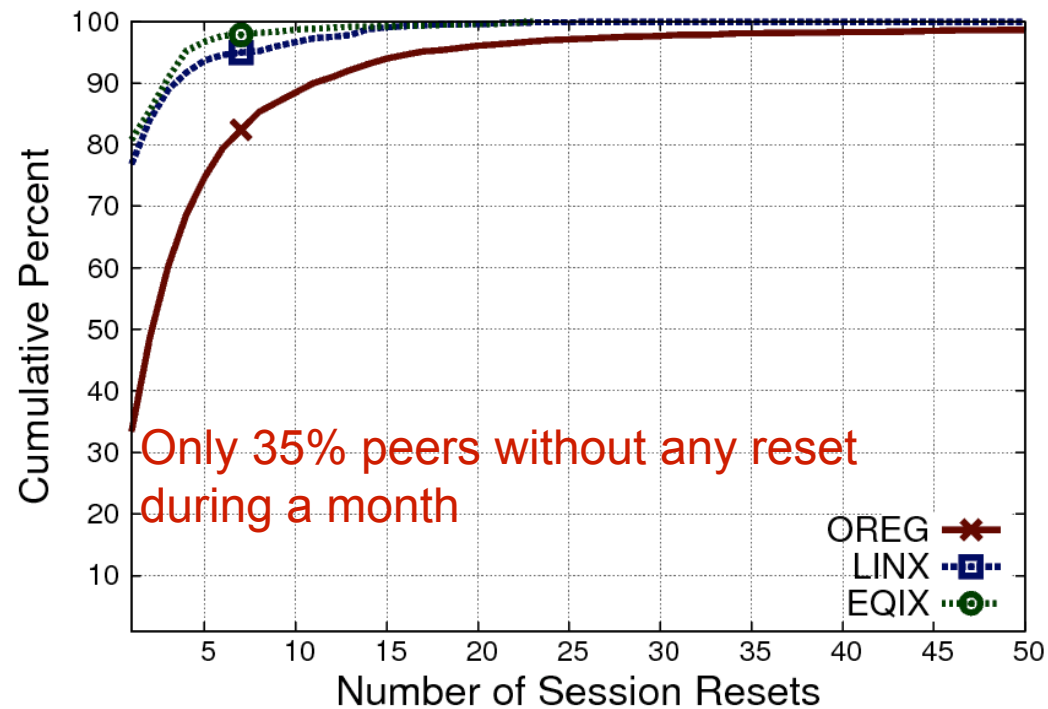
What not shown here: synchronized session resets (multiple sessions on the same collector going down at the same time)
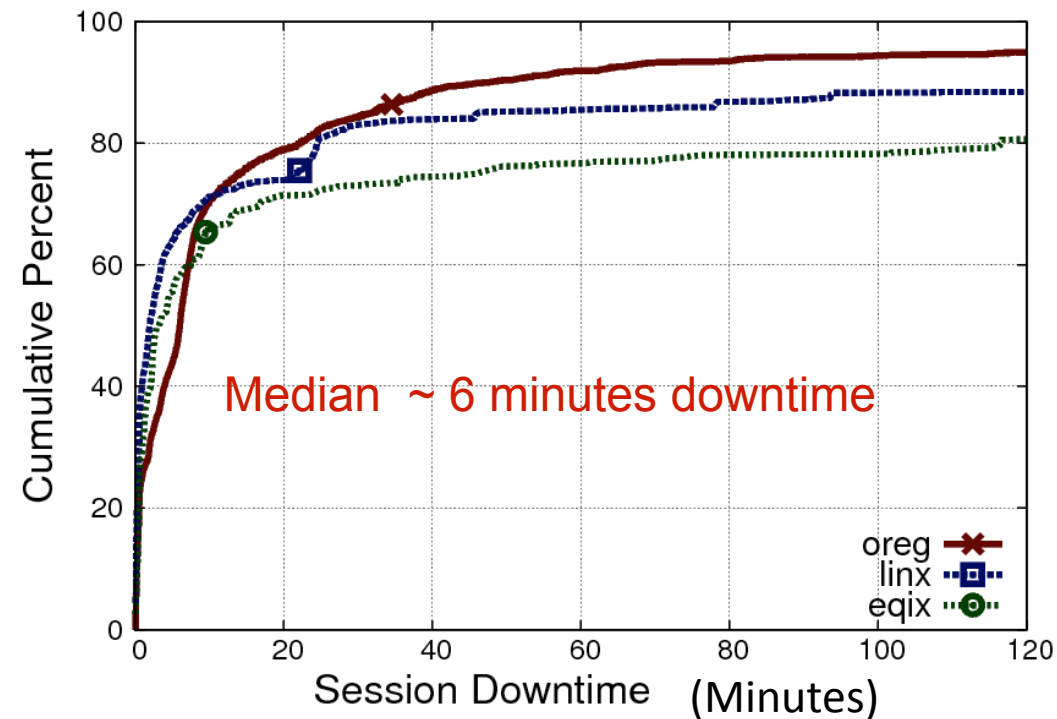
*cdf of number of resets per peer per month

Session Downtime

RIPE

RouteViews

Collector Stability

- Collector stability is critical to the quality of archived BGP data

- Possible causes of unstable collectors
  - Hardware defects
  - Software bugs
  - Administrative maintenance

- There are no complete records on when collector fails

Number of Detected Collector Restarts

collector	no. restarts	no. session resets (%)
RRC00	105	1154 (14%)
RRC01	112	1999 (26%)
RRC02	-	-
OREG	178	6370 (37%)
LINX	29	673 (30%)
EQIX	9	69 (14%)

Collector failures/restarts resulted in hundreds of holes in the BGP data

Responsible for large number (percentage) of session resets

Need to make BGP session

Conclusion

- Failures of BGP monitoring sessions are relatively frequent

- Failures/Restarts of the collectors also happen frequently

- A website is coming online to provide automated updates of all BGP session resets with occurring time and duration for all RV/RIPE collectors

- A better BGP data collector package: **BGPmon**

  http://bgpmon.netsec.colostate.edu/