Measuring the route collector eco system

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Beware!!

Originally this presentation should have been on the RIPE79 plenary. Due to short notice data inconsistency we withdrew the presentation. This talk is a summary of the project idea, some numbers and results which are preliminary and lack accuracy.

What's interesting about route collectors?

- Multiple projects: RIPE/RIS, RouteViews, Isolario, PCH, …
- Multiple collectors in different geographical regions
- Different peers at each collector
- Different peering strategies per project
  (e.g. multi-hop BGP sessions vs. directly attached peers)

Our question: Does the selection of collectors impact the result of an analysis?

Side effect: Survey of the state of the route collector eco system…

Findings: Route Collector Projects

**Differences between collector projects**

- Do all collectors resp. projects share the same view?
    - In terms of IP address space
    - In terms of inter AS links
- Does geographical location of collectors change the view?
- How do features like multi-hop BGP sessions or BGP ADD-PATH change the picture?
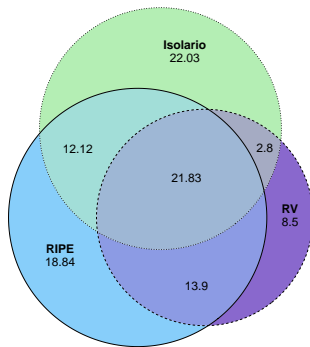
Visibility: ASes and IP prefixes

Project	#AS	#Prefixes IPv4	#Prefixes IPv6
RIPE	63575	966K	83K
RV	63400	1,5M	72K
Isolario	63798	1.1M	87K
Union	64108	1.8M	101K

Dataset based on a union of all announcements as of May 2018

Project Comparison: AS links[1]
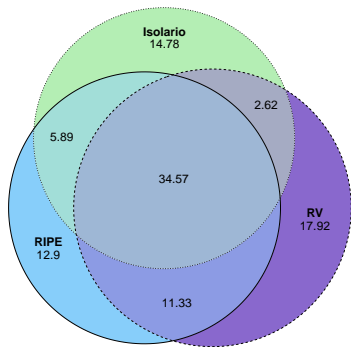
Figure 1: % AS links as seen per route collector project (IPv4).

Figure 2: % AS links as seen per route collector project (IPv6).

[1] 100% = Links discovered by RIPE+RV+Isolario

Regional Comparison: AS links[2]

Is it worth the effort to place additional route collectors to less covered regions?

South America
- 4 collectors
- Additional AS links: 51.4K (14.8%)

Asia
- 4 collectors
- Additional AS links: 4.1K (1.19%)

Africa
- 4 collectors
- Additional AS links: 10.6K (3%)

Australia
- 2 collectors
- Additional AS links: 4K (1.17%)

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[2] 100% = Links discovered by all non-multiform collectors

Misc: BGP ADD-PATH offered by Isolario

- Sends all available paths
- Uncovers additional paths as currently "inactive" paths are visible even if they are never the best path
- ADDPATH announcement: Impossible to tell what the best path of an AS currently is

40.6% of all Isolario's unique paths are learned only via add-path

Are partial feeds of any use?

- Even though route collector projects are asking for full BGP views some ASes only send partial feeds
- About 45% of all observed feeds send only a partial view
- 5.7% (26K) of all uncovered AS links are only visible due to partial feeds

Concluding Remarks

Recommendations for data users

- Expect all kinds of weirdness in real life BGP data
- Pay attention to effects which can skew your results: multi-hop collectors, BGP ADD-PATH, operators feeding weird stuff into the collectors for $reason
- Check data quality and expect unavailable time-frames
- Don't hesitate to discuss results with operators - they're a friendly crowd

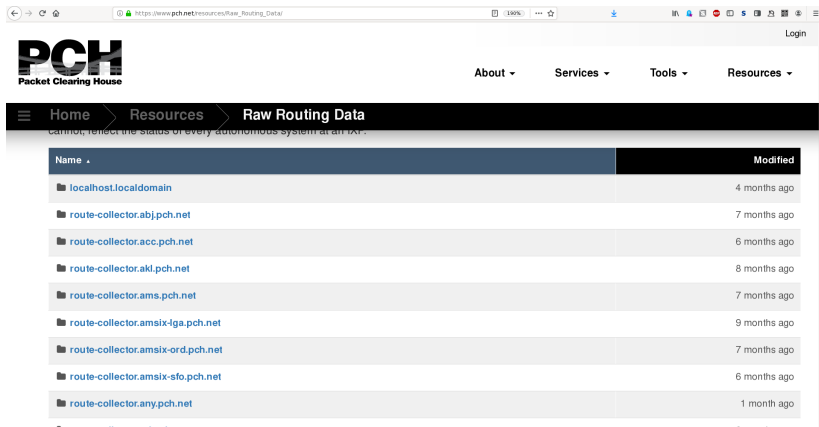## Recommendations for route collector operators and peers[3]

Please document your collectors! Data users care about meta data, e.g., location, peering options, number of peers,...

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[3]Humble wishes from a sometimes humble data user...

Recommendations for route collector operators and peers[3]

Please document your collectors! Data users care about meta data, e.g., location, peering options, number of peers,...

[3]Humble wishes from a sometimes humble data user...

Recommendations for route collector operators and peers[3]

Provide BGP Updates and RIBs.

Some long lived routes really get missed when only updates are considered!

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[3]Humble wishes from a sometimes humble data user...

Document collector outages!

It is really hard to guess what a bunch of missing files mean.

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[3]Humble wishes from a sometimes humble data user...

Place collectors in sparsely covered regions. In case you are a BGP speaker in a sparsely covered region, try reaching out to collector projects - your feeds matter.

It really changes the picture we draw of the Internet!

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[3]Humble wishes from a sometimes humble data user...