



RIPE NCC

RIPE NETWORK COORDINATION CENTRE

RIPE NCC Information Services for Network Operators



RIP ESTAT Update

New datasets and services

About RIPEstat



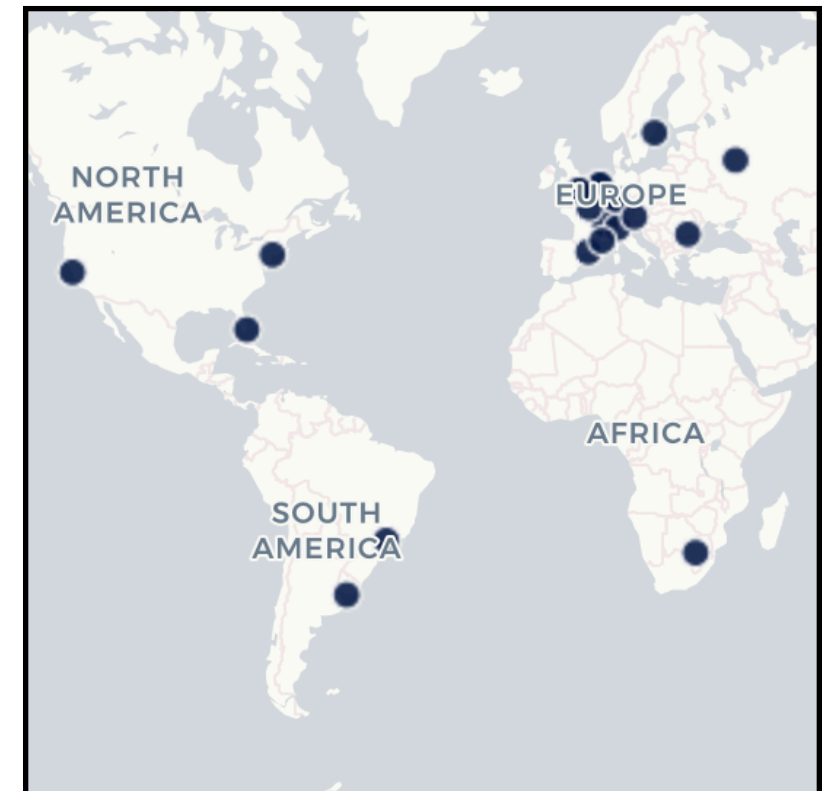
- stat.ripe.net
- RIPE NCC's **open data** service
- RIPE Database, **Routing Information Service (RIS)**, and RIPE Atlas
- 25 external backends
- Web, widgets, and Data API



About RIS



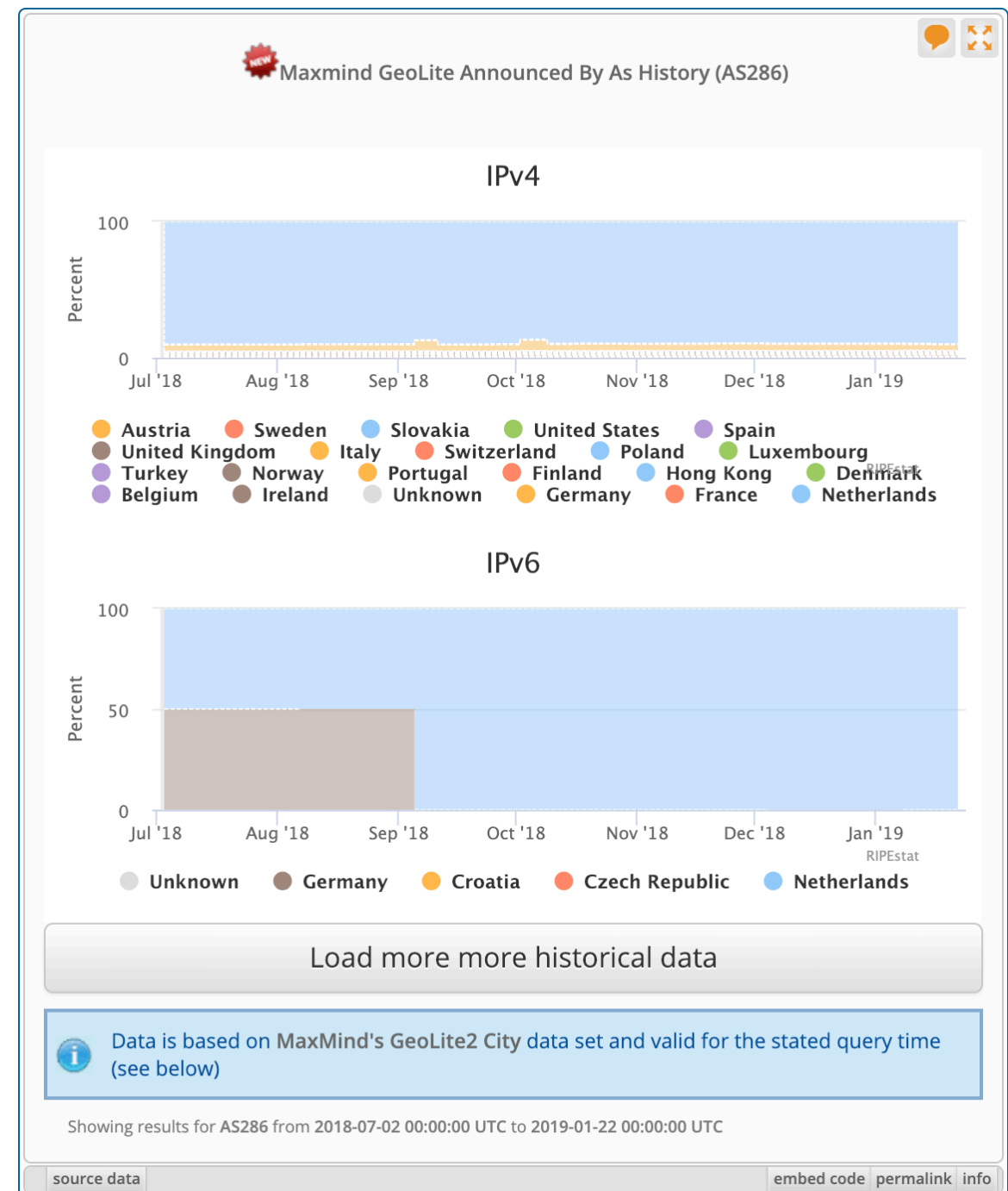
- Routing Information Service
- Running since 2001
- Data facilitated through widgets, dumps, and RIPEstat data APIs
- Last activated collector: RRC 24 @ Montevideo, hosted by LACNIC
- Please peer with RRC 24!
 - You just need to fill in our peering form



Geolocation



- Added **IPv6**
- **ASNs**
- Historical data!
- *Geographic* tab
- Maxmind data



[Link to widget](#)

RPKI Status



- By prefix or **ASN**
 - 😊 **Valid** announcement
 - 😞 **Invalid** announcement (and the reason why!)
 - 👁️ **No ROA** found
- Data from RIPE NCC RPKI Validator v3
 - BGP information from RIS

AS Routing Consistency (AS28000)

Reload this widget by entering a resource here

Prefixes Imports Exports

Show 10 entries Search:

Prefix	In RIS	RIPE IRR	Other IRRs	RPKI
168.121.184.0/22	yes	yes	yes	😊
170.247.168.0/22	no	yes	yes	😊
179.0.156.0/22	yes	yes	yes	😊
190.112.52.0/22	no	no	no	😞
200.0.86.0/23	no	no	no	😞
200.0.88.0/22	no	no	yes	👁️
200.10.235.0/24	no	no	yes	👁️
200.10.60.0/22	no	no	yes	👁️
200.10.62.0/23	yes	yes	yes	😊
200.10.62.0/24	yes	no	no	😊

Showing 1 to 10 of 32 entries

Showing results for AS28000 as of 2019-05-02 00:00:00 UTC

source data embed code permalink info

INVALID_ASN - there is a ROA with the same (or covering) prefix, but with different ASN

[Link to widget](#)

RPKI Status Datacall



- Query by ASN and prefix combination
 - Needs both!
- Documentation

Request URL

```
stat.ripe.net /data/rpki-  
validation/data.json?  
resource=3333&prefix=193.0.0.0/21
```

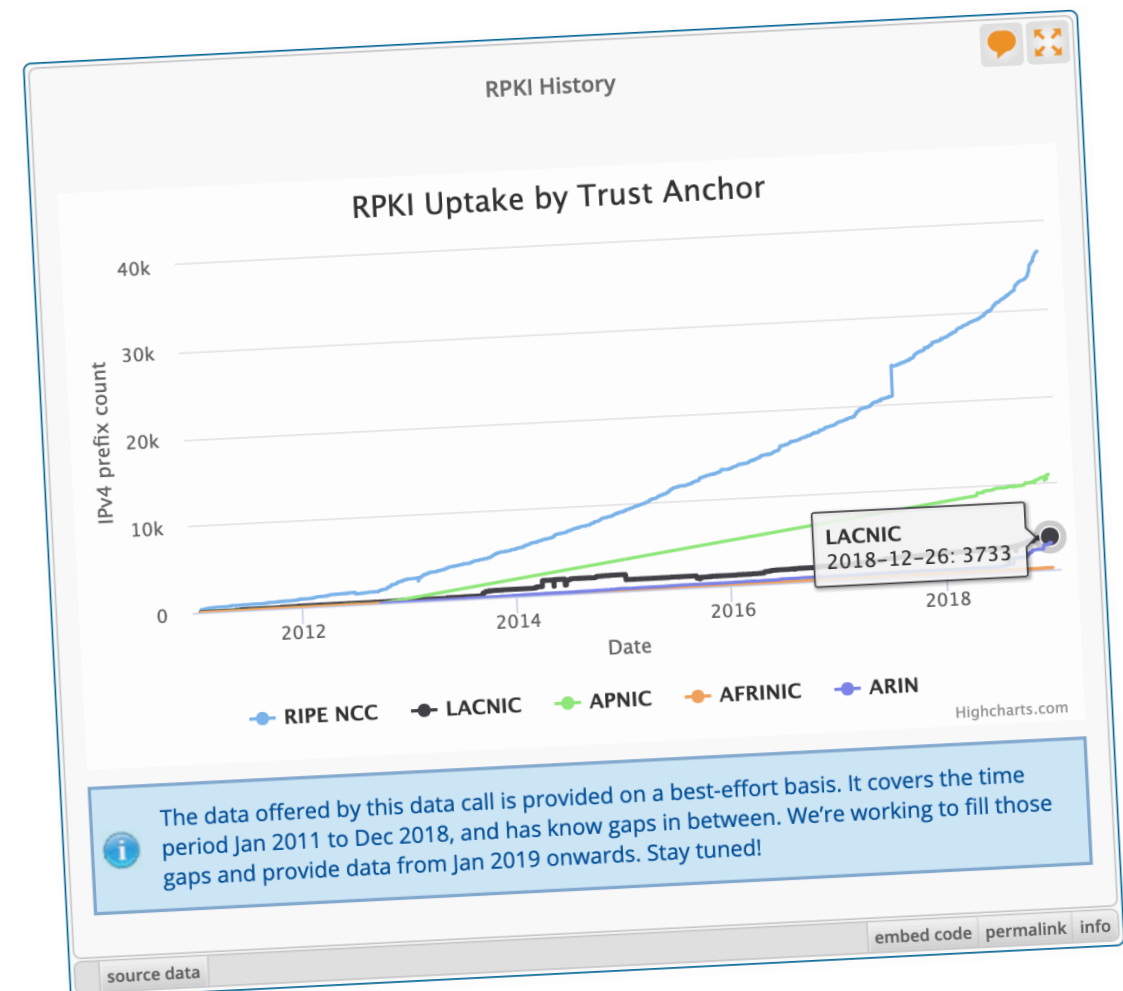
Response Body

```
"data": {  
  "validating_roas": [  
    {  
      "origin": "AS3333",  
      "source": "RIPE NCC ...",  
      "prefix": "193.0.0.0/21",  
      "max_length": 21,  
      "validity": "valid"  
    }  
  ],  
  "status": "valid",  
  "prefix": "193.0.0.0/21",  
  "resource": "3333"  
}
```

Road Map



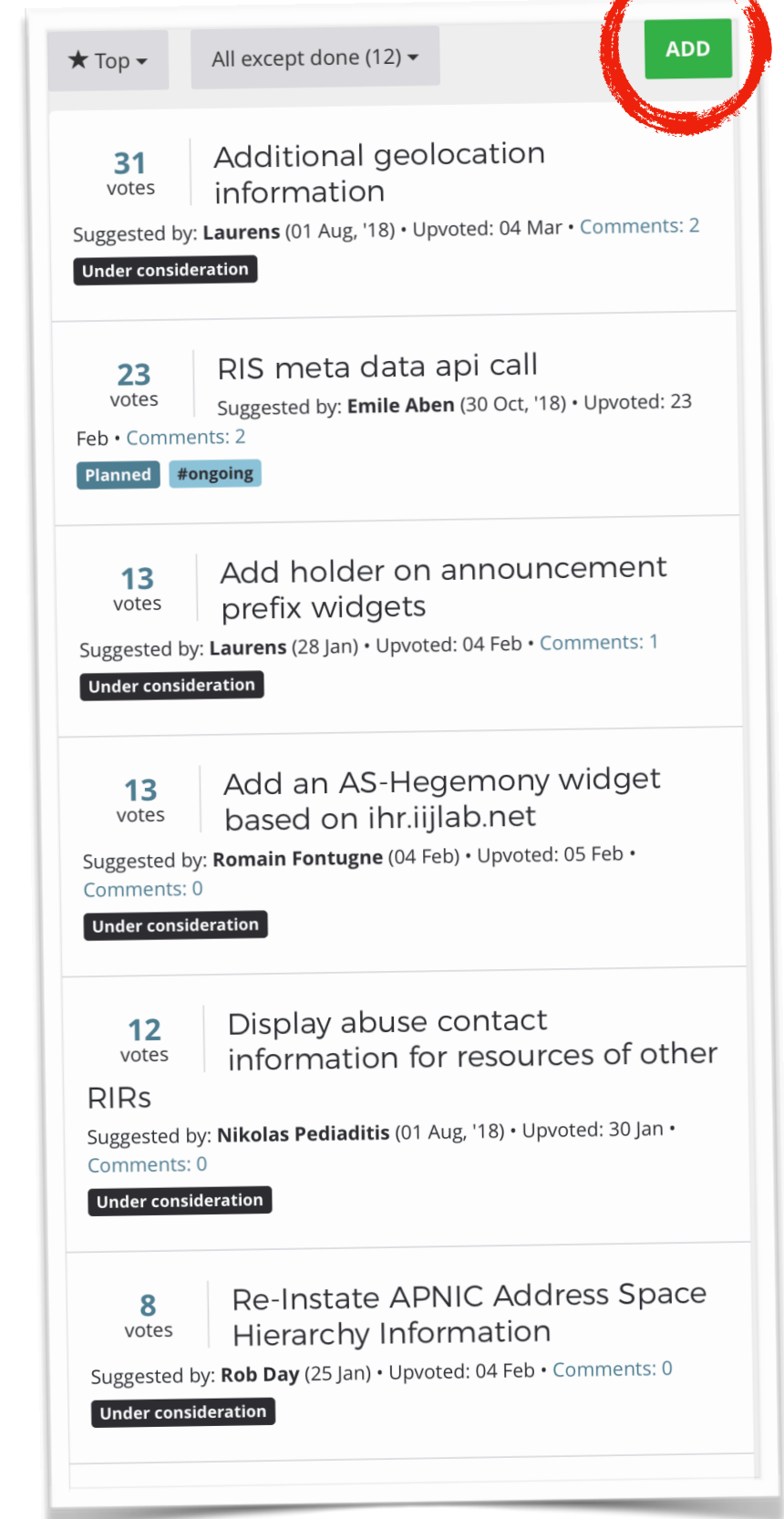
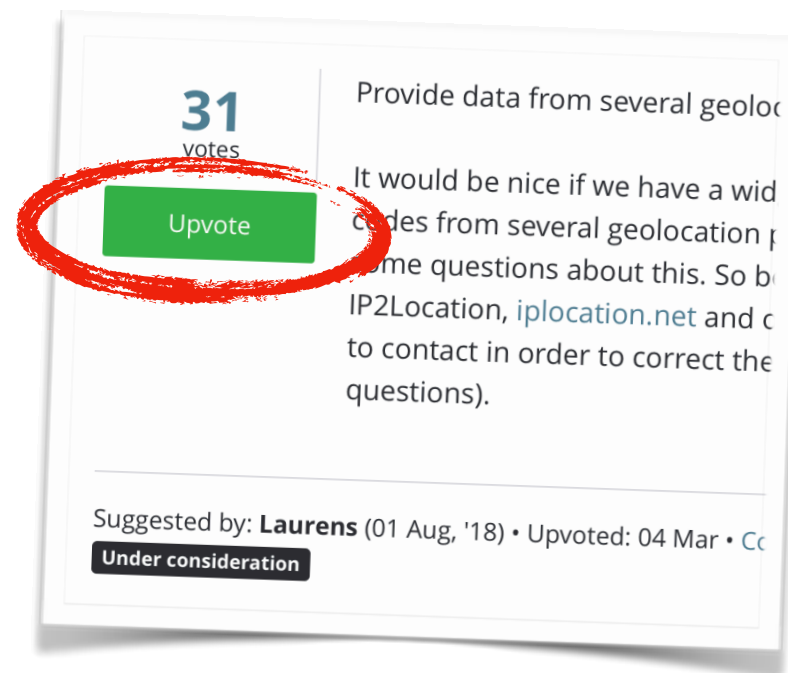
- RPKI
 - Other validators!
 - History: coverage by RIR, filters by prefix, ASN, and country
- Geolocation
 - RIPE IPmap, delegated-extended files
- New UI
- RIPEstat Rollout to the LAC region



Widget under development

Road Map

- You can be part of this
- Suggest new features
- Upvote existing ones!
- ripestat.featureupvote.com





RIS Live Trial

Real time BGP information

RIS Live



- RIS data served as a **stream**
 - JSON WebSocket
 - Server-side data filtering
 - Prefix
 - Route Collector
 - ...and others
 - Do you find it useful?
- Give us your feedback!

Live RIS BGP messages



Connected

13915 matching messages ~435 kbit/s ⓘ

```
// Received at 09:58:45 (-0.1 second delay)
{
  "timestamp": 1554191925.12,
  "peer": "37.49.236.228",
  "peer_asn": "24482",
  "id": "37.49.236.228-1554191925.12-91482917",
  "host": "rrc21",
  "type": "UPDATE",
  "path": [24482, 6453, 6762],
  "community": [[6453, 86], [6453, 2000], [6453, 2200], [6453, 2202], [24482, 1],
[24482, 12010], [24482, 12011], [24482, 20200], [24482, 20202], [24482, 64601]],
  "origin": "igp",
  "announcements": [
    {
      "next_hop": "37.49.236.228",
      "prefixes": [
        "92.123.208.0/22",
        "95.101.156.0/22"
      ]
    }
  ]
}
```

```
// Received at 09:58:45 (-0.1 second delay)
{
  "timestamp": 1554191925.12,
  "peer": "2001:7f8:54::228",
  "peer_asn": "24482",
  "id": "2001:7f8:54::228-1554191925.12-47058494",
```

ris-live.ripe.net



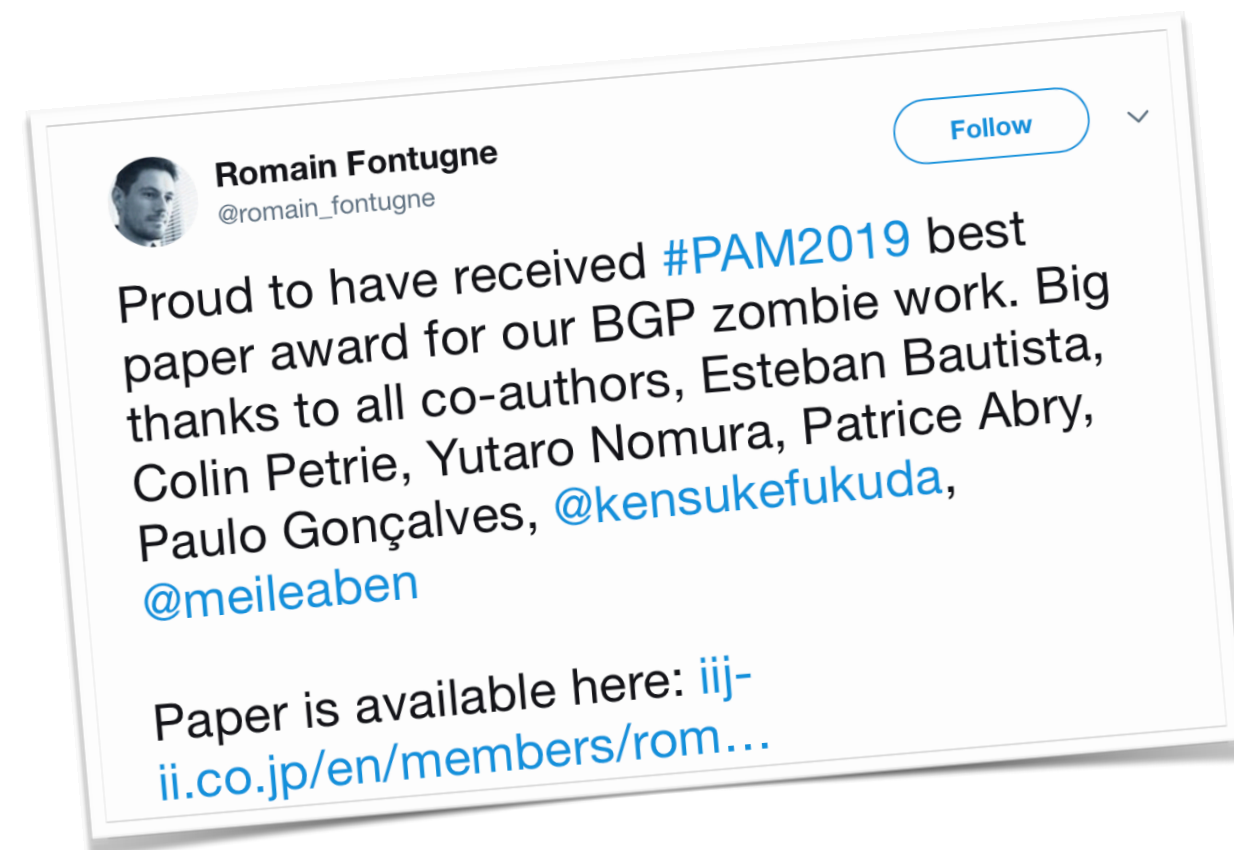
BGP Zombies

Academic Paper presented at PAM
2019 by
Romain Fontugne (IJ Research Lab),
Emile Aben (RIPE NCC),
and more collaborators

What are zombies?



- BGP Zombie Routes
- “Stuck routes”,
or “ghost routes”
- Origin withdrew prefix
but route still visible by
RIS peers
- PAM 2019 best paper
award
- RIPE Labs article

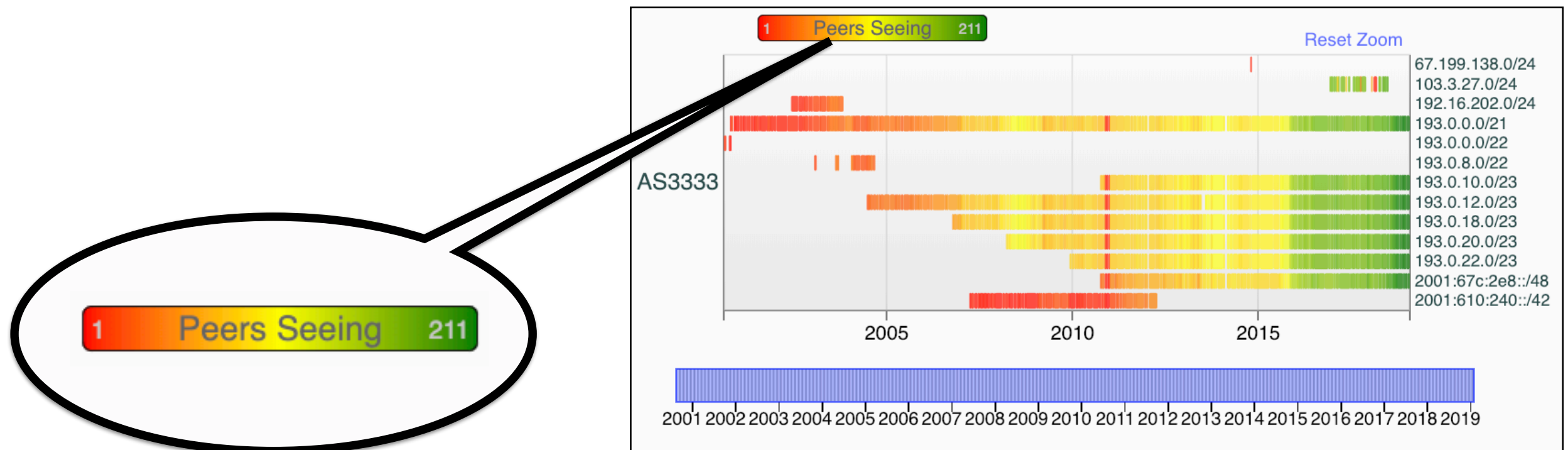


[Link to Tweet](#)

Visualising routing



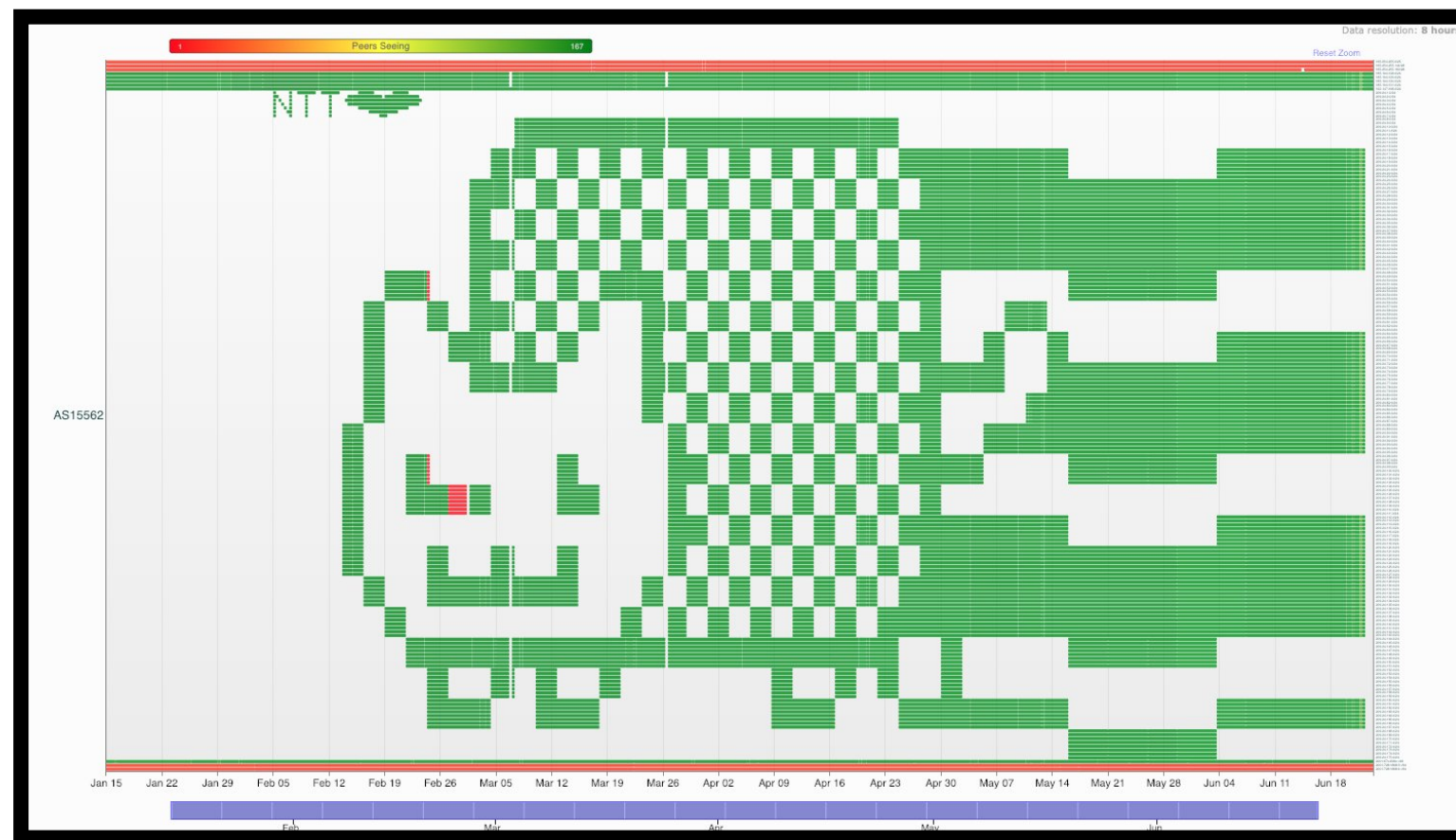
- RIPEstat's *Routing History* widget
 - Prefix visibility over time
- Data from RIS



Visualising routing

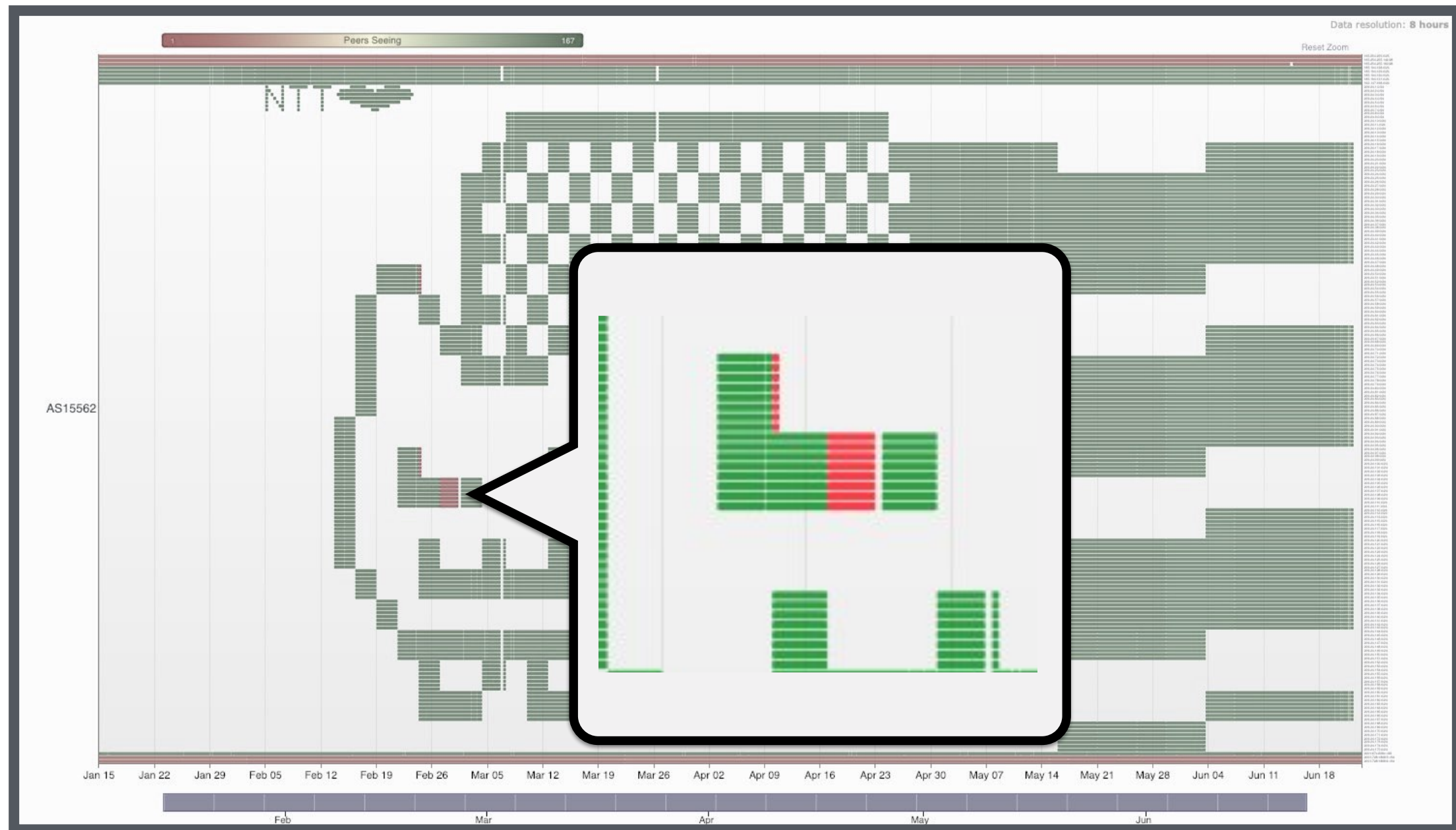


- BGP Meets Cat RIPE Labs post
- Routing history widget for AS15562



↑
prefixes
↓

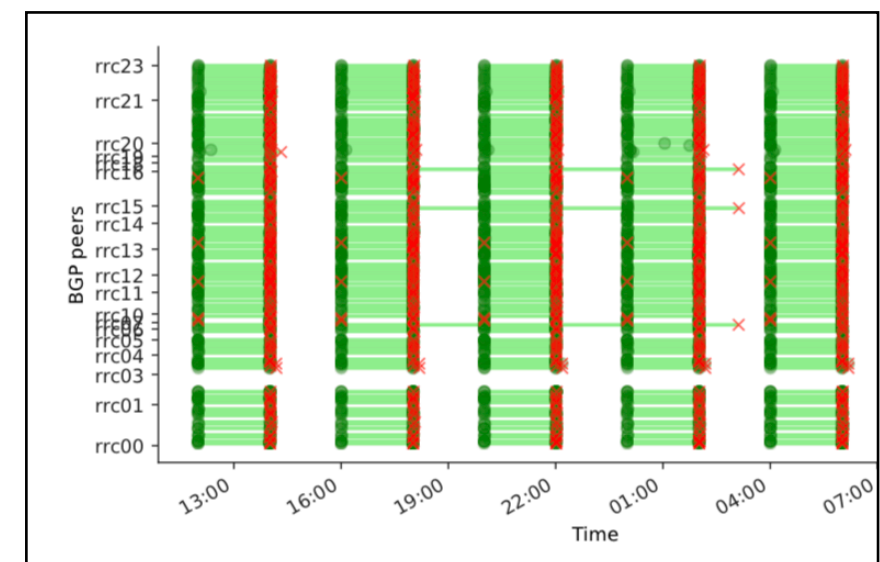
Visualising routing



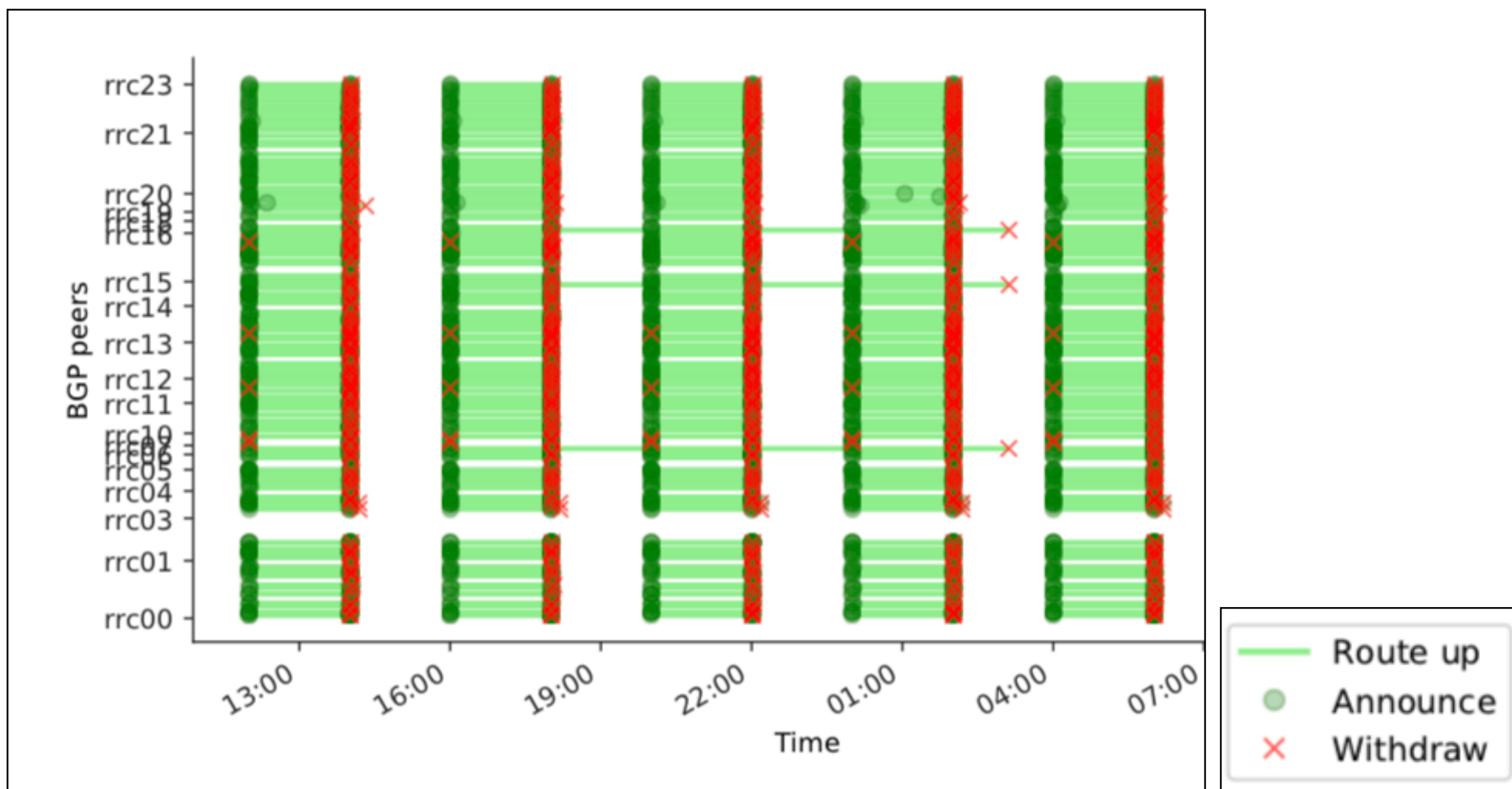
The experiment



- 27 routing beacons (IPv4 and IPv6)
- Announced every 4 hours, withdrawn 2 hours later.
 - Announcements at 00:00, 04:00, 08:00, 12:00, 16:00, 20:00 (UTC)
 - Withdrawals at 02:00, 06:00, 10:00, 14:00, 18:00, 22:00 (UTC)
- Some routes **still seen hours after** the withdrawal



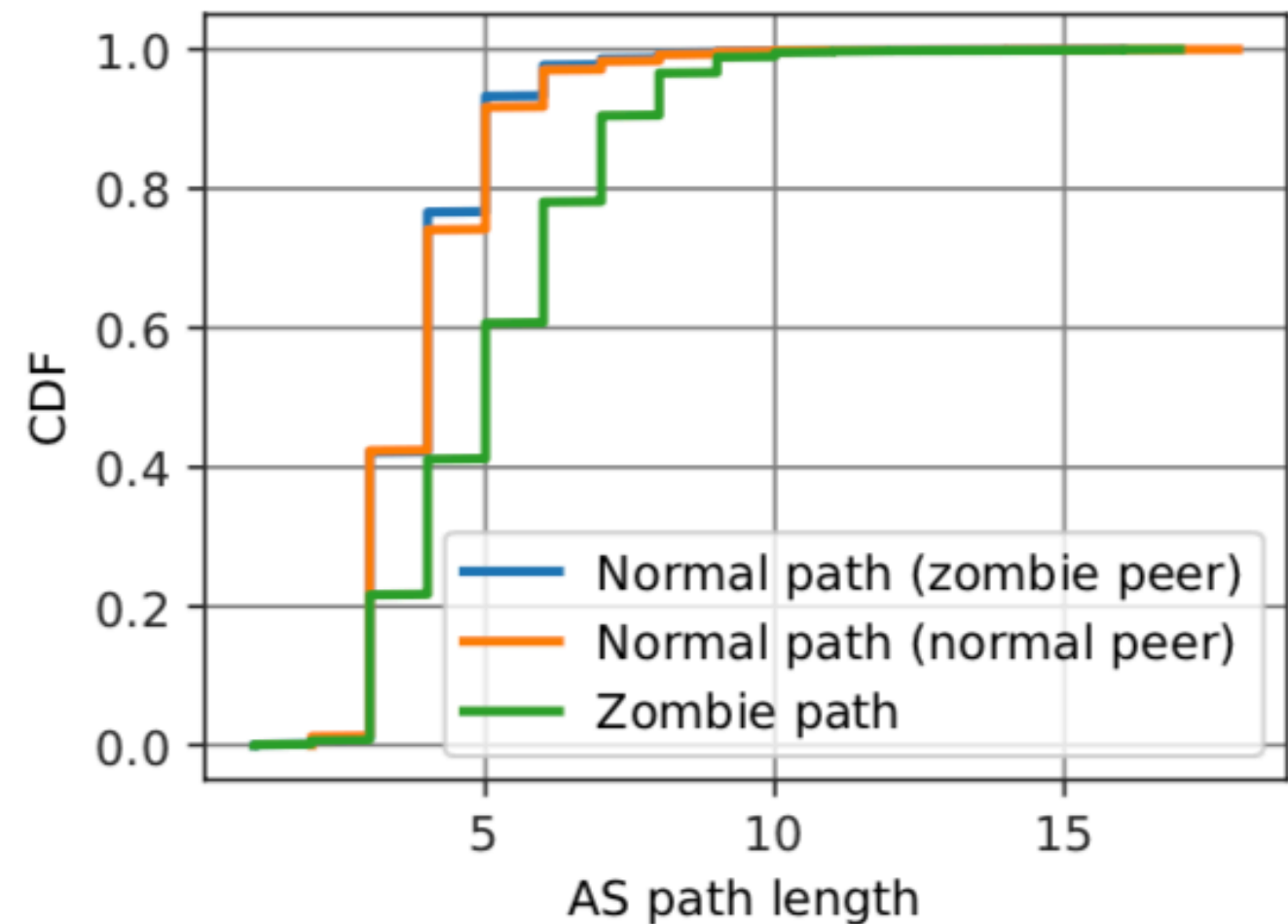
What do they look like?



What do they look like?



- Chances of a RIS peer seeing a zombie route?
 - IPv4 1.8% , IPv6 2.8%
- Zombie AS paths are **longer**
- Mitigate by re-announce + withdraw



Possible Causes



- Routers
- BGP optimisers
- Route reflectors setup
- ~~Route collector system~~
 - Similar results in Routeviews and Isolario
 - Zombies come back after bouncing sessions*

** Not for RIS beacon prefixes*

Some questions for *you*!



- Does this happen in your network?
 - Yes: Router brand and model, Bird Route Server?
 - No: Would you like to know if it happens??
- Would you be interested in...?
 - Alerting
 - Integration into BGPlay

Next Steps



- Awareness
 - Especially into academia
- Feedback
 - Especially from operators
- Zombies in the wild
 - Not only from RIS beacons

RIPE NCC @ LACNIC 31



BoF

Jueves 18.00



Questions



aformoso@ripe.net
@aguformoso