



RIPE NCC
RIPE NETWORK COORDINATION CENTRE

RIPE NCC Routing Information Service (RIS)

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What is RIS?



What is RIS?

- Routing Information Service
- Worldwide network of BGP collectors
- Deployed at Internet Exchange Points
- Collects raw BGP data from peers
- Stores BGP updates and routing table dumps
- 15+ years of history
- Used by network operators and researchers every day

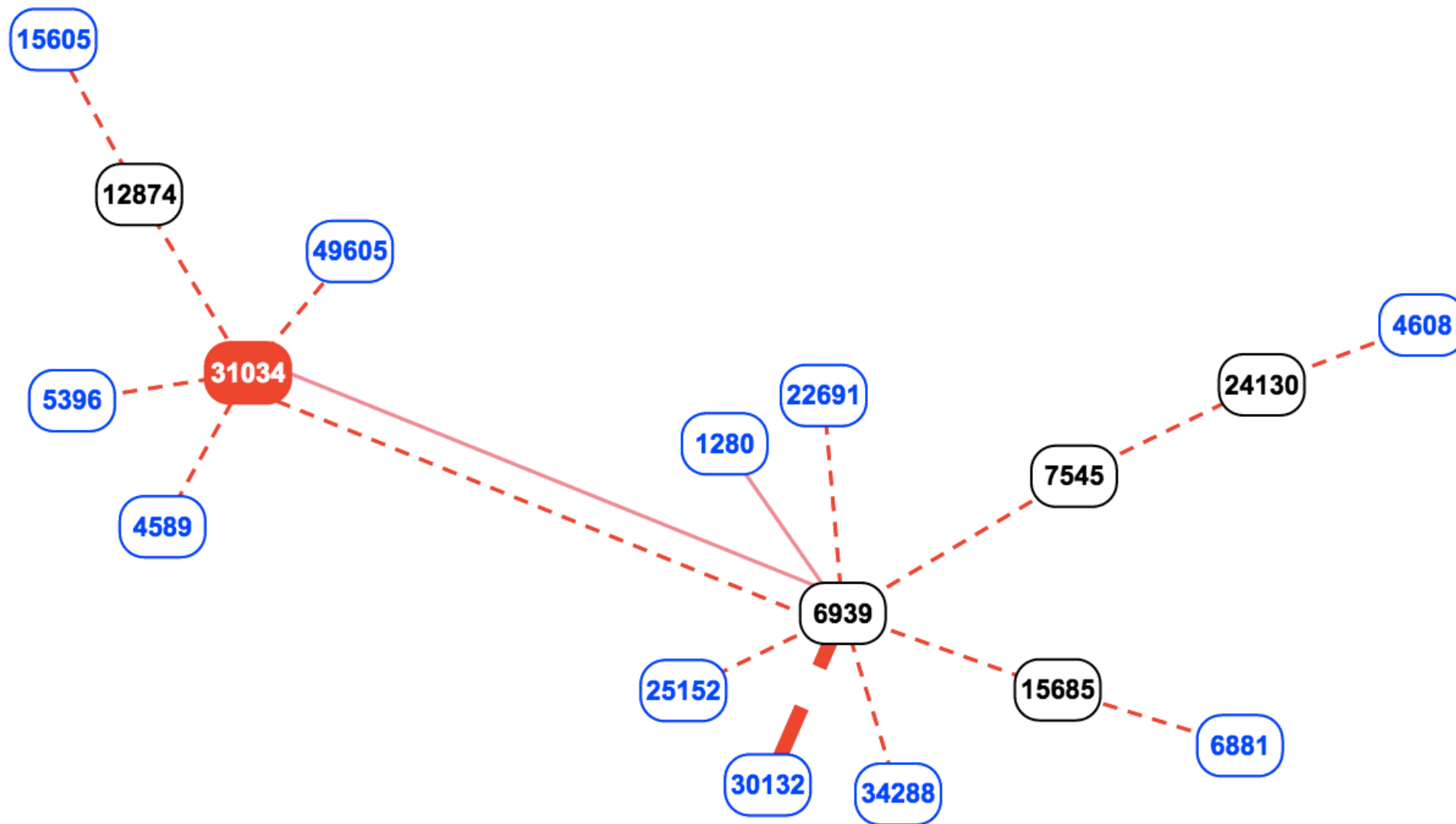
Collector locations



- 19 collectors and growing
- 600+ peers
- 150+ full-feed peers



What you can see





Why RIS?

Why are we doing this?
A bit of history

Why RIS?



- Original project was defined in 1999:
“In other words, it can be regarded as one integrated Looking-Glass for the entire Internet that includes history information”
- Looking glasses are instantaneous
- Routing problems are also instantaneous
- BGP history is recorded to track what is happening and what has happened
- Also to provide statistics and reporting on routing table metrics

Why the RIPE NCC RIS?



- RIPE NCC is a neutral body
- Experience running measurement and data collection platforms
 - Test Traffic Measurement project
 - RIPE Atlas (40k+ results on Google Scholar)
 - IPmap
 - RIPEstat (50M queries/day)
- Supporting operators and researchers around the world



RIS data access

What can you get?
And how do you get it?



Raw data!

- 15+ years of raw data (5.8 TB) available to download
 - <https://www.ripe.net/analyse/internet-measurements/routing-information-service-ris/ris-raw-data>
- Data stored in MRT (RFC6396) format
- Readable using BGPdump utility
 - open source, maintained by RIPE NCC
 - <https://bitbucket.org/ripenncc/bgpdump>
 - Other third party tools also available

RIPEstat (<https://stat.ripe.net>)



- RIPEstat is a portal that provides everything you ever wanted to know about IP address space, Autonomous System Numbers (ASNs), and countries with easy to use visualisations.

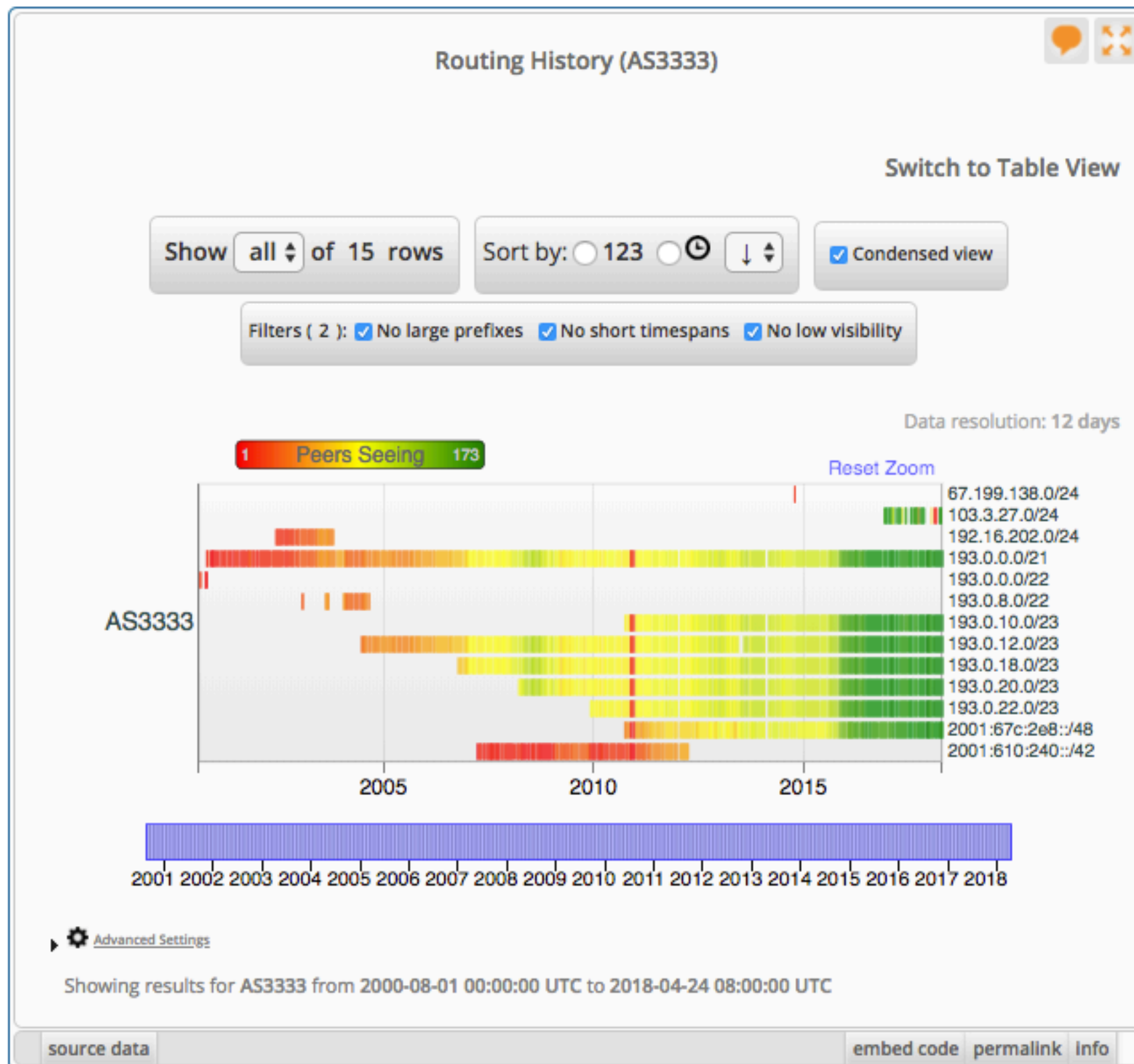
The screenshot displays the RIPEstat website interface. At the top, there is a search bar with the placeholder text "Enter an IP address/prefix, ASN, country code or hostname" and a "Search" button. Below the search bar, there is a "permalink" link. The main content area is divided into several sections:

- At a Glance (4)**: A sidebar menu with categories: Routing (9), DNS (2), Anti Abuse (1), Database (9), Geographic (2), Activity (2), and Suggestions (1). There is also a "+ MyView" button.
- Prefix Overview (2001:67c:2e8::/48)**: This section shows that the prefix is visible in RIS. It states "This prefix is announced by AS3333 RIPE-NCC-AS - Reseaux IP Europeens Network Coordination Centre (RIPE NCC)". Below this is a table with columns "Resource", "RIR", and "Country":

Resource	RIR	Country
2001:67c:2e8::/48	RIPE NCC	NL

A "Show IANA Registry Information" button is located below the table. Under "Advanced Settings", there is a checked checkbox for "Exclude low visibility routes". A message states: "Showing results for 2001:67c:2e8::/48 as of 2018-04-24 08:00:00 UTC. 1 routes were filtered due to low visibility (min peers:3)."
- Geoloc (2001:67c:2e8::/48)**: This section features a map of Europe showing the location of the IP prefix. It includes "Geoloc details" stating: "Data is based on MaxMind's GeoLite City data set and valid for the stated query time (see below)". It also shows "Showing results for 2001:67c:2e8::/48 as of 2018-04-23 00:00:00 UTC".
- Routing Status (2001:67c:2e8::/48)**: This section shows a green checkmark and states: "At 2018-04-24 08:00:00 UTC, 2001:67c:2e8::/48 was 99% visible (by 164 of 165 RIS full peers)."

Routing History



Routing History + Free Time

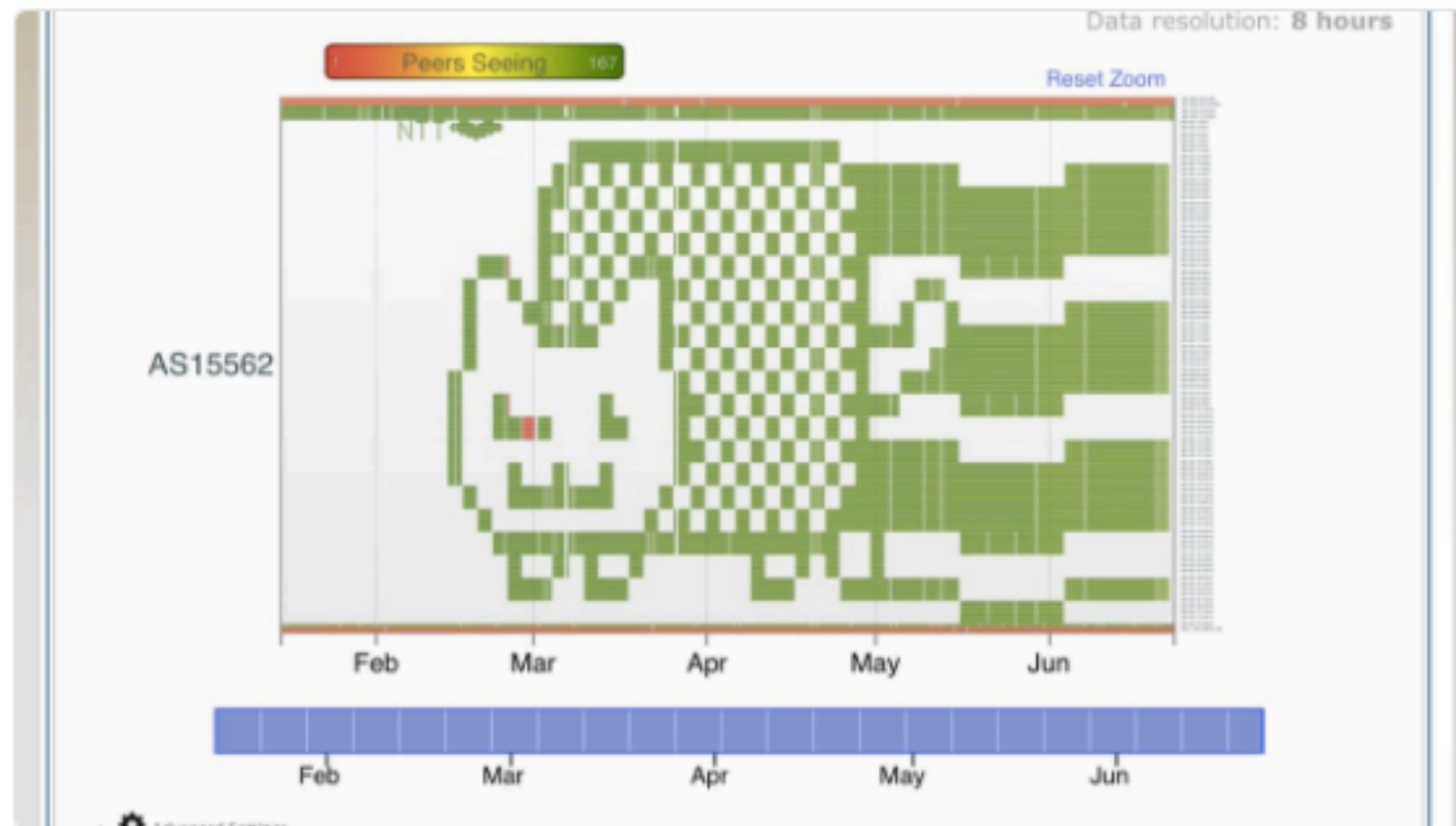


nixCraft
@nixcraft

Following



OMG. Ultimate Geek level unlocked 🧐. After 3072 hours of manipulating BGP, a Nyancat was drawn on this RIPE interface stat.ripe.net/widget/routing ...



Looking Glass



[EXPAND EVERYTHING]

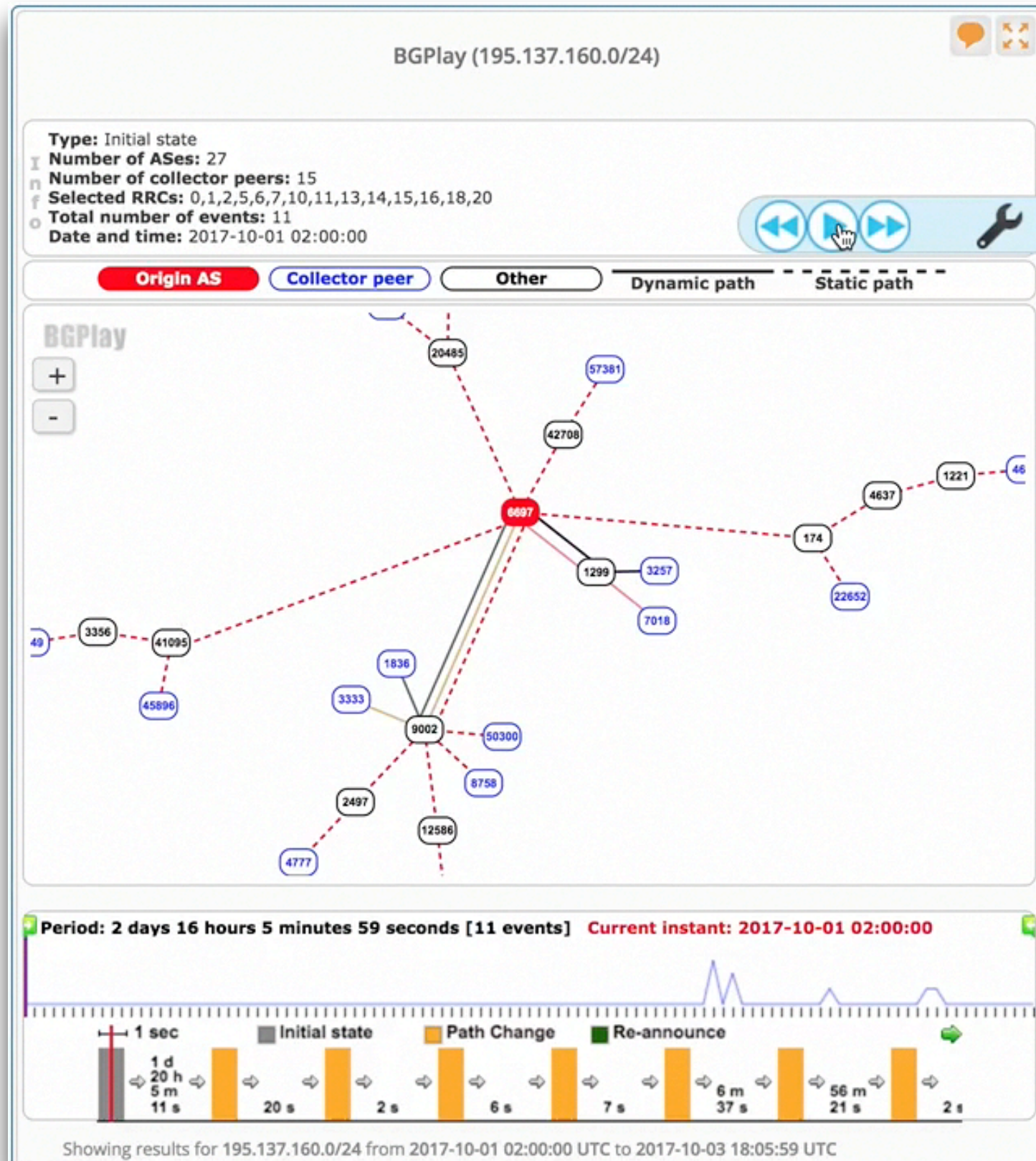
BGP Looking Glass (195.137.160.0/24)

- ▼ 14 RRCs see 115 peers announcing 195.137.160.0/24 originated by AS6697.
 - ▶ RRC11 in New York City, New York, US sees 1 ASN originating 195.137.160.0/24. (AS6697)
 - ▶ RRC10 in Milan, Italy sees 1 ASN originating 195.137.160.0/24. (AS6697)
 - ▶ RRC00 in Amsterdam, Netherlands sees 1 ASN originating 195.137.160.0/24. (AS6697)
 - ▶ RRC01 in London, United Kingdom sees 1 ASN originating 195.137.160.0/24. (AS6697)
- ▼ RRC15 in Sao Paulo, Brazil sees 1 ASN originating 195.137.160.0/24. (AS6697)
 - ▼ AS6697 is seen as the origin by 14 peers.
 - ▼ 187.16.217.48 is announcing route AS16735 AS41095 AS6697.

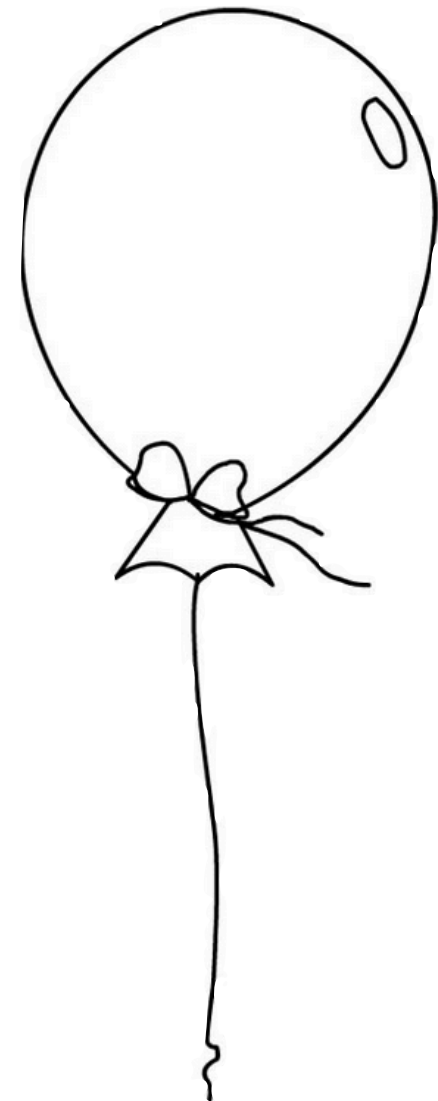
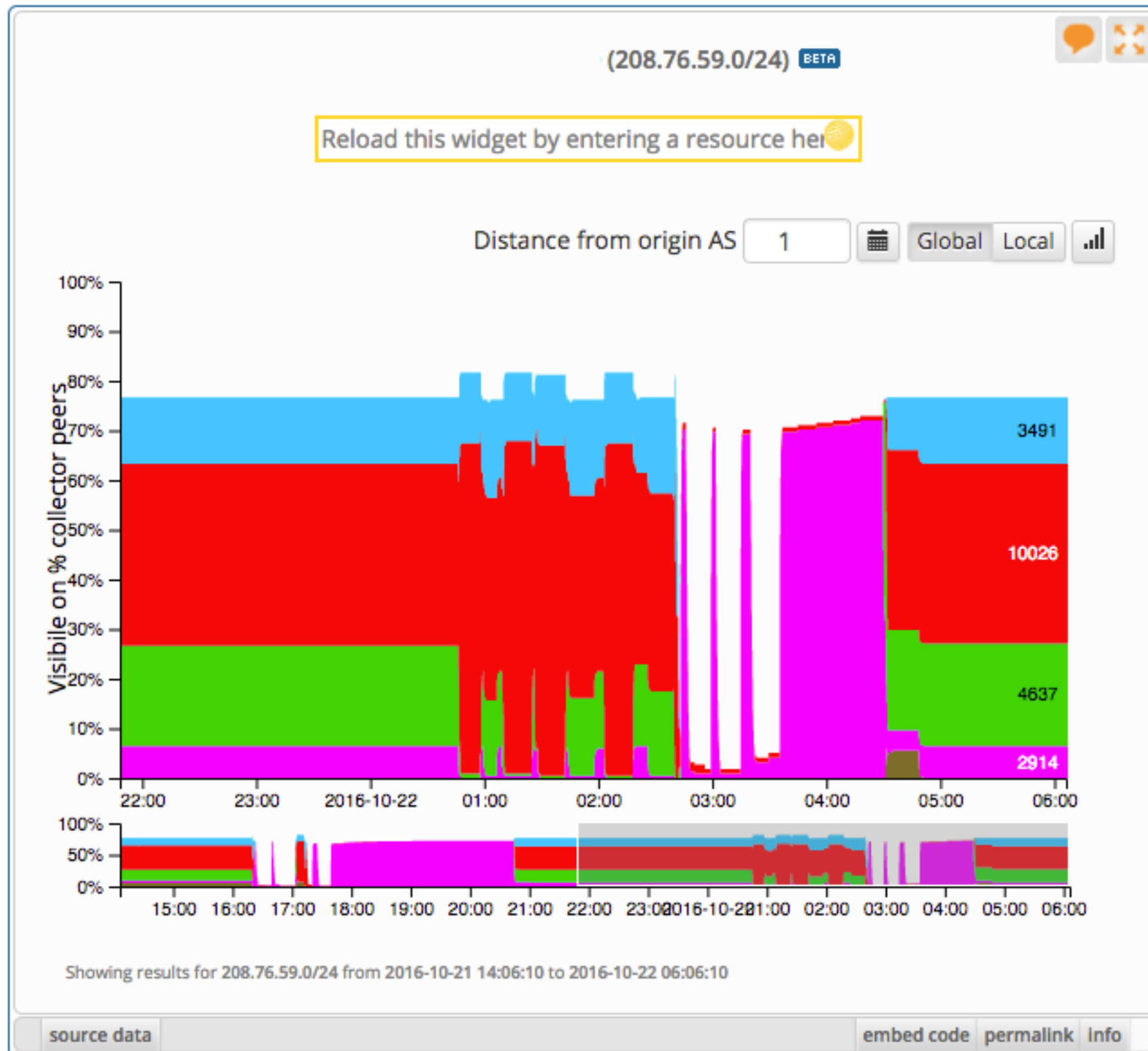
```
187.16.217.48 from 187.16.217.48 (200.225.196.252)
Origin IGP, localpref 100, valid, external, best
Community: 16735:5 16735:6101
Last update: Mon Sep 25 13:17:37 2017
```
 - ▼ 187.16.220.193 is announcing route AS263584 AS263321 AS7738 AS41095 AS6697.

```
187.16.220.193 from 187.16.220.193 (177.129.136.254)
Origin IGP, localpref 100, valid, external
Last update: Tue Oct 3 04:19:37 2017
```


BGPlay



Preview of something new!



RIPEstat Data API



- All these queries are available through an API
- Actually, all those shiny web interfaces use the API anyway
- You can use it too!! Write your own scripts, etc.
- https://stat.ripe.net/docs/data_api
- There are also some extra API calls which are not yet visualised

Live stream (prototype)



[show/hide javascript example](#)

Host:

Peer:

Prefix:

Originating ASN:

Type:

More specific:

Less specific:

Include raw body (hex):

selector

rate limit /s

[14:15:45] connection alive

323 messages dropped

RRC time	Delay (s)	JSON message
14:15:44	0.77	{"origin":"igp","med":1000,"timestamp":1524572143.96,"community":[[8218,102],[8218,20000],[8218,20110]],"host":"rrc21","next_hop":"37.49.232.7","peer":"37.49.232.7","path":[8218,174,3491,9498,18229,132751],"id":"JTHoBw-237f2879bc-2778ea","prefix":"43.246.240.0/24","type":"A","peer_asn":"8218"}
14:15:44	0.77	{"origin":"igp","med":1000,"timestamp":1524572143.96,"community":[[8218,102],[8218,20000],[8218,20110]],"host":"rrc21","next_hop":"37.49.232.7","peer":"37.49.232.7","path":[8218,174,3491,9498,18229,132751],"id":"JTHoBw-237f2879bc-2778ea","prefix":"43.246.240.0/24","type":"A","peer_asn":"8218"}
14:15:44	0.77	{"origin":"igp","med":1003,"timestamp":1524572143.96,"community":[[8218,102],[8218,20000],[8218,20110]],"host":"rrc21","next_hop":"37.49.232.7","peer":"37.49.232.7","path":[8218,6939,52320,23106,23106,23106,23106,262673],"id":"JTHoBw-237f2879bc-2778e9","prefix":"186.235.201.0/24","type":"A","peer_asn":"8218"}
14:15:44	0.77	{"origin":"igp","med":1003,"timestamp":1524572143.96,"community":[[8218,102],[8218,20000],[8218,20110]],"host":"rrc21","next_hop":"37.49.232.7","peer":"37.49.232.7","path":[8218,6939,52320,23106,23106,23106,23106,262673],"id":"JTHoBw-237f2879bc-2778e9","prefix":"186.235.201.0/24","type":"A","peer_asn":"8218"}
14:15:44	0.77	{"host":"rrc21","peer":"37.49.232.7","timestamp":1524572143.96,"prefix":"186.235.201.0/24","type":"W","id":"JTHoBw-237f2879bc-2778e8","peer_asn":"8218"}
14:15:44	0.77	{"host":"rrc21","peer":"37.49.232.7","timestamp":1524572143.96,"prefix":"186.235.201.0/24","type":"W","id":"JTHoBw-237f2879bc-2778e8","peer_asn":"8218"}
14:15:44	0.77	{"origin":"igp","med":1000,"timestamp":1524572143.96,"community":[[8218,103],[8218,20000],[8218,20110]],"host":"rrc21","next_hop":"37.49.232.7","peer":"37.49.232.7","path":[8218,6461,174,10026,9498,18229,132751],"id":"JTHoBw-237f2879bc-2778e7","prefix":"103.25.152.0/24","type":"A","peer_asn":"8218"}
14:15:44	0.77	{"origin":"igp","med":1000,"timestamp":1524572143.96,"community":[[8218,103],[8218,20000],[8218,20110]],"host":"rrc21","next_hop":"37.49.232.7","peer":"37.49.232.7","path":[8218,6461,174,10026,9498,18229,132751],"id":"JTHoBw-237f2879bc-2778e7","prefix":"103.25.152.0/24","type":"A","peer_asn":"8218"}
14:15:44	0.77	{"origin":"igp","med":1000,"timestamp":1524572143.96,"community":[[8218,103],[8218,20000],[8218,20110]],"host":"rrc21","next_hop":"37.49.232.7","peer":"37.49.232.7","path":[8218,6461,174,10026,9498,18229,132751],"id":"JTHoBw-237f2879bc-2778e7","prefix":"103.25.152.0/24","type":"A","peer_asn":"8218"}
14:15:44	0.77	{"origin":"igp","med":1000,"timestamp":1524572143.96,"community":[[8218,103],[8218,20000],[8218,20110]],"host":"rrc21","next_hop":"37.49.232.7","peer":"37.49.232.7","path":[8218,6461,174,10026,9498,18229,132751],"id":"JTHoBw-237f2879bc-2778e7","prefix":"103.25.152.0/24","type":"A","peer_asn":"8218"}
14:15:44	0.77	{"origin":"igp","med":1000,"timestamp":1524572143.96,"community":[[8218,103],[8218,20000],[8218,20110]],"host":"rrc21","next_hop":"37.49.232.7","peer":"37.49.232.7","path":[8218,6461,174,10026,9498,18229,132751],"id":"JTHoBw-237f2879bc-2778e7","prefix":"103.25.152.0/24","type":"A","peer_asn":"8218"}
14:15:44	0.77	{"origin":"igp","med":1000,"timestamp":1524572143.96,"community":[[8218,103],[8218,20000],[8218,20110]],"host":"rrc21","next_hop":"37.49.232.7","peer":"37.49.232.7","path":[8218,6461,174,10026,9498,18229,132751],"id":"JTHoBw-237f2879bc-2778e7","prefix":"103.25.152.0/24","type":"A","peer_asn":"8218"}
14:15:44	0.77	{"origin":"igp","med":0,"timestamp":1524572143.96,"community":[[8218,102],[8218,20000]]}

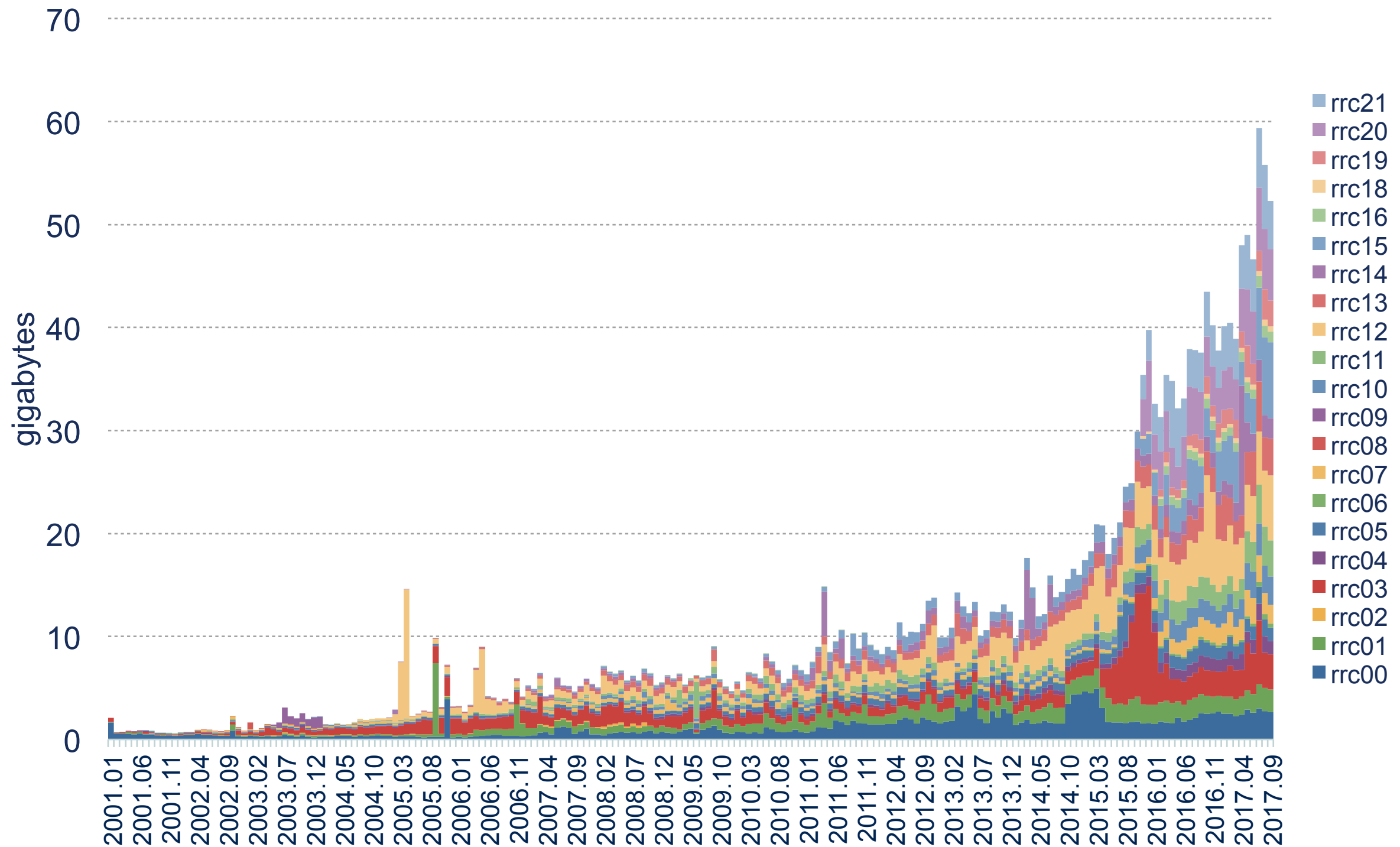
- <http://stream-dev.ris.ripe.net/demo>
- Live stream enables new applications
 - Real time anomaly analysis and BGP hijack detection
 - Live dashboards (live BGPlay!)



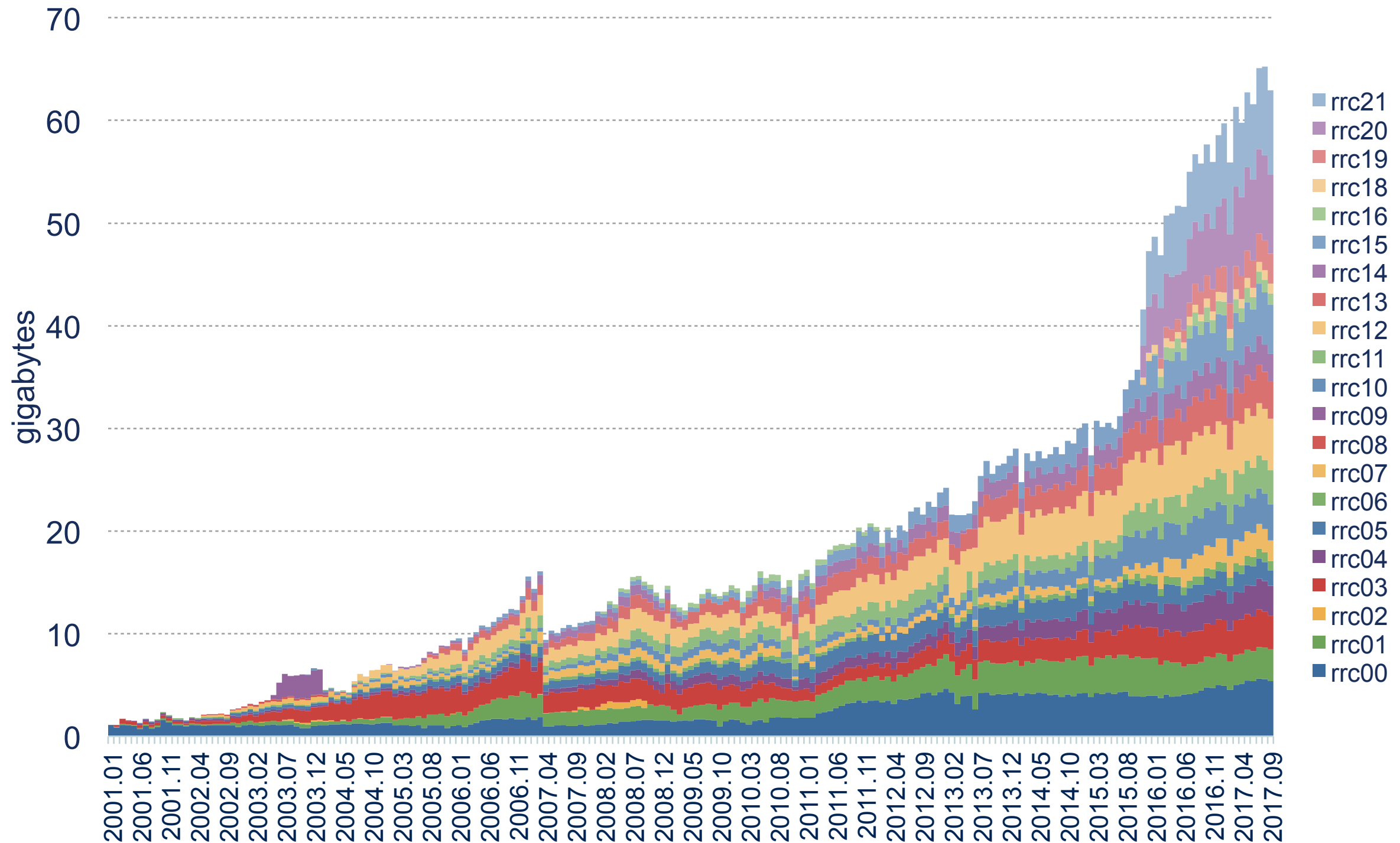
RIS growth

Because the internet keeps growing

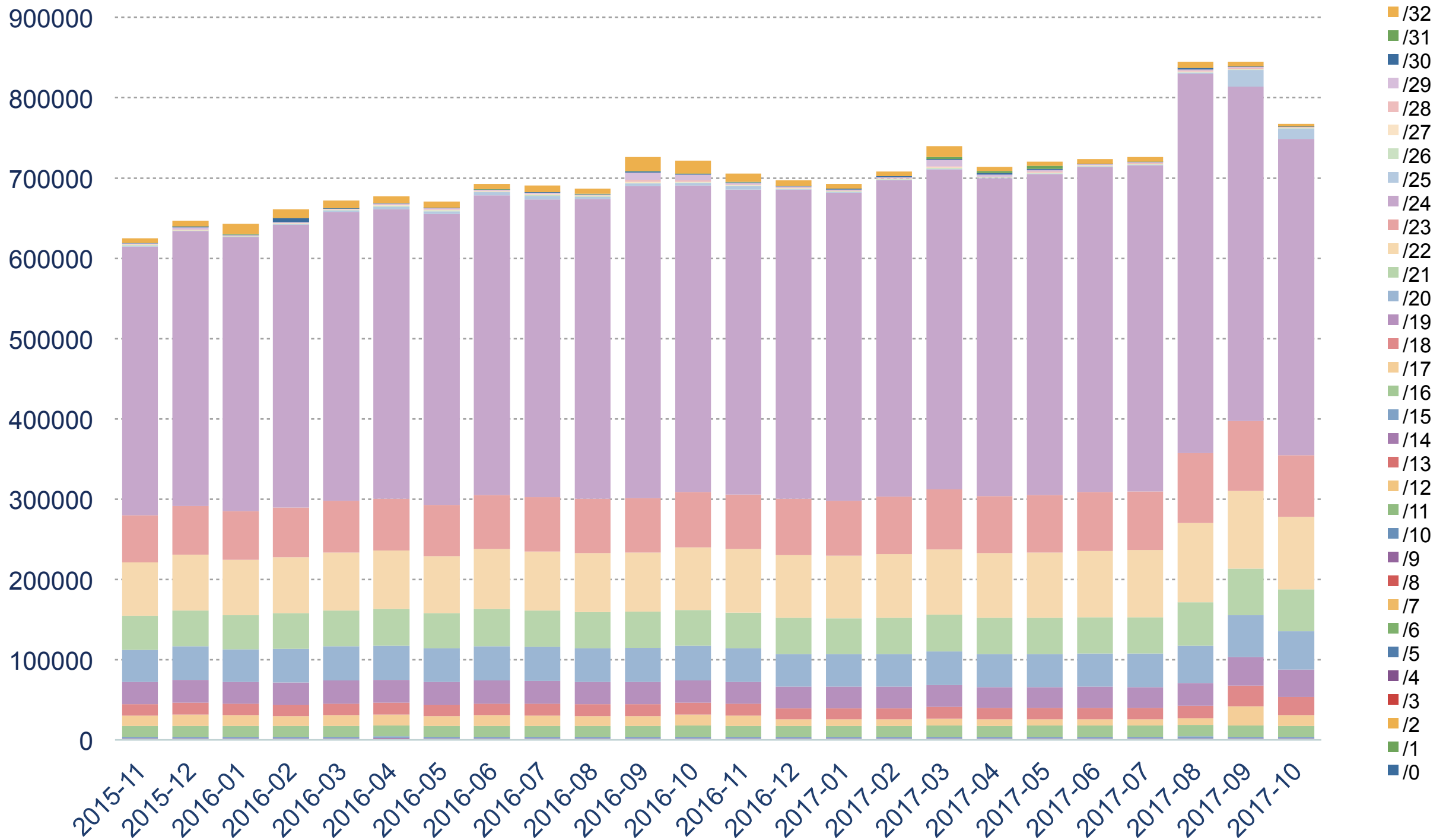
Size of compressed raw BGP updates per month



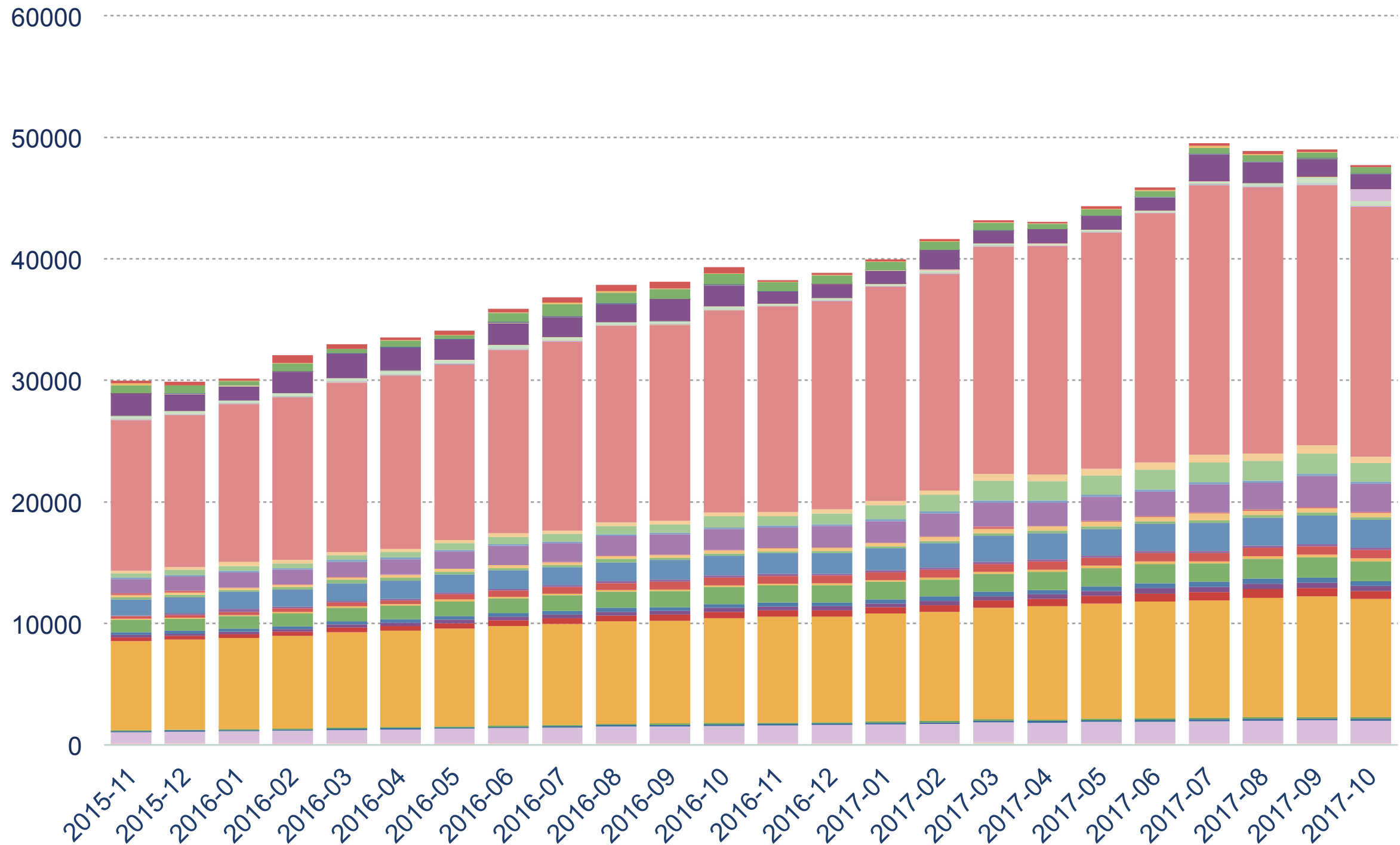
Size of compressed BGP dumps per month



Number of IPv4 prefixes seen



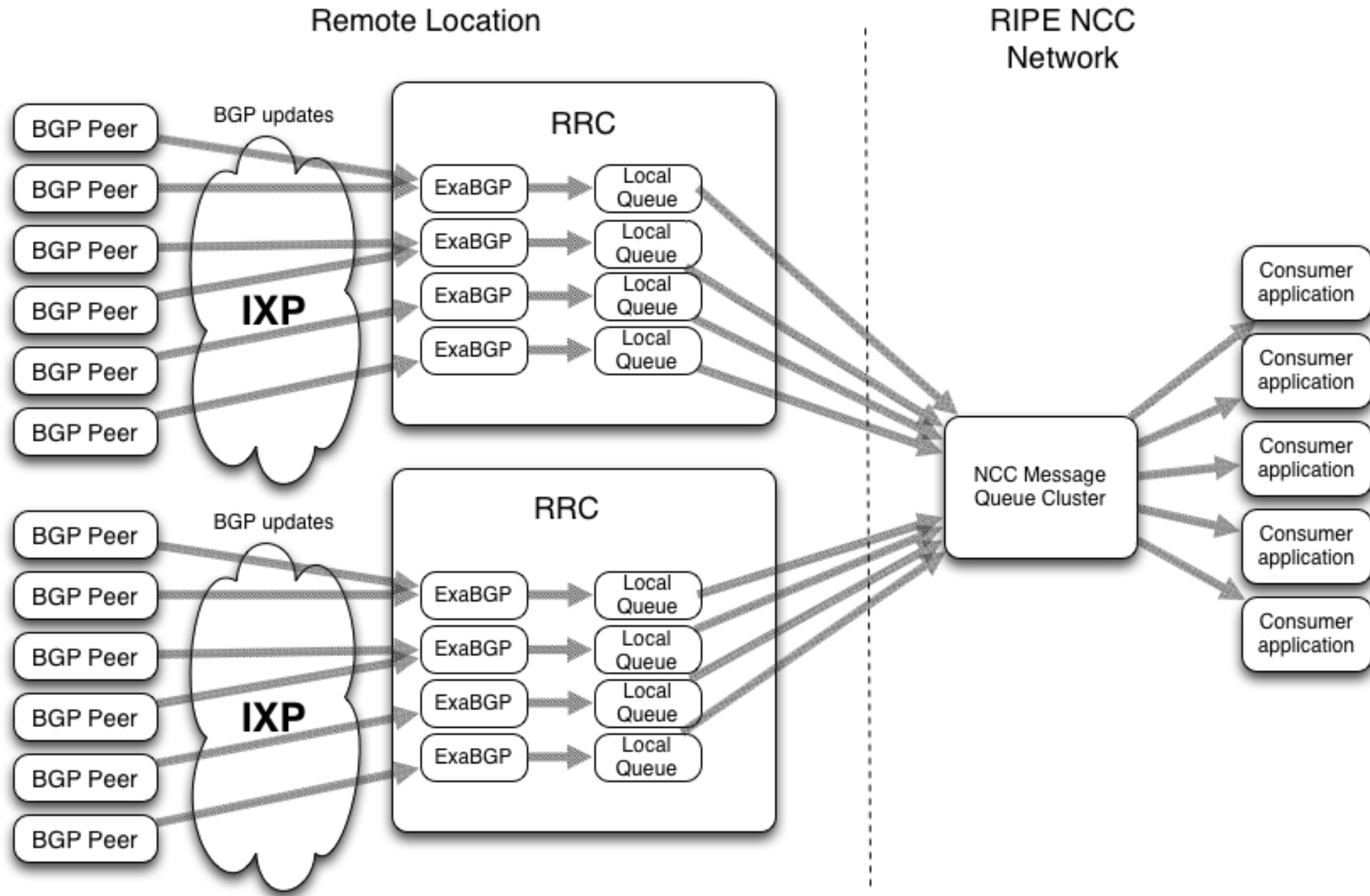
Number of IPv6 prefixes seen



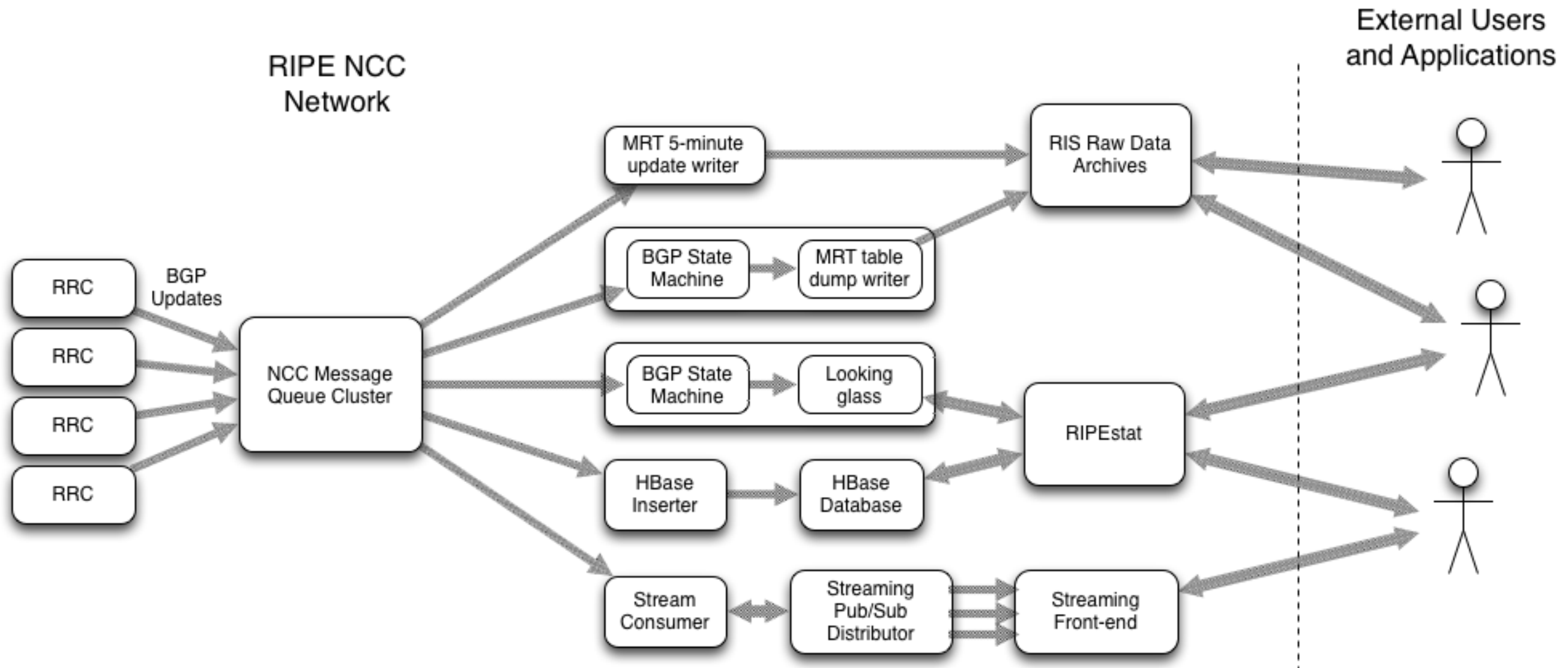


RIS Architecture

Data collection



Back-end data distribution





How can you help?

How can you help?



- Peer with us!!!
 - AS12654
 - <http://www.ris.ripe.net/cgi-bin/peerreg.cgi>
- Send us your routes
 - If you can send us your full BGP table, please do!
 - If not, send us what you can!
 - We will be recording them forever ;-)

CIXP, Geneva (RRC04)

DIX-IE, Tokyo (RRC06)

Netnod, Stockholm (RRC07)

MIX, Milan (RRC10)

NYIIX, New York City (RRC11)

MSK-IX, Moscow (RRC13)

PAIX, Palo Alto (RRC14)

PTTMetro, Sao Paulo (RRC15)

NOTA, Miami (RRC16)

Catnix, Barcelona (RRC18)

NAP Africa JB, Johannesburg (RRC19)

SwissIX, Zurich (RRC20)

France-IX, Paris (RRC21)

Interested in hosting an RRC?





Questions



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