RIPE NCC
RIPE NETWORK COORDINATION CENTRE

Three Easy Ways to Look at BGP Events
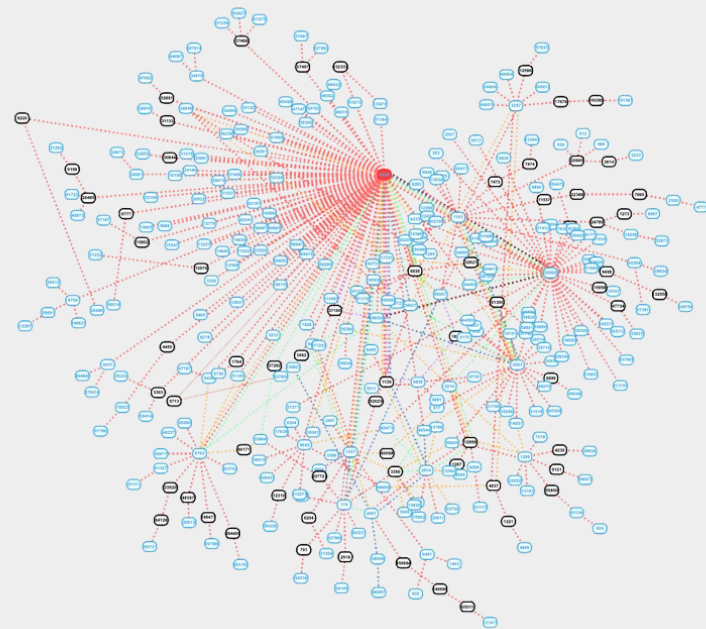
And Two Tough Ones

Ties de Kock | RIPE NCC | 26 September 2025

**Information service for
Internet-related data and analytics**

- **RIPEstat offers:**
    - Information on IP address space and
      Autonomous System Numbers (ASNs)
    - Statistics on specific hostnames and countries
    - Visualisations of Internet routing

- **All in a centralised place**

**RIPEstat**

How RIPEstat Works

RIPEstat pulls data from a variety of sources, including:

- The RIPE Database (for ownership and contact information)
- Routing registries (e.g., RIPE IRR)
- DNS and reverse DNS systems
- Live and historical BGP data (RIPE RIS)
- Regional Internet Registries and IANA

More details at:
stat.ripe.net/data-sources

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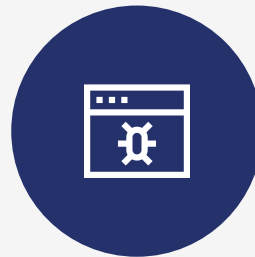
RIS Architecture
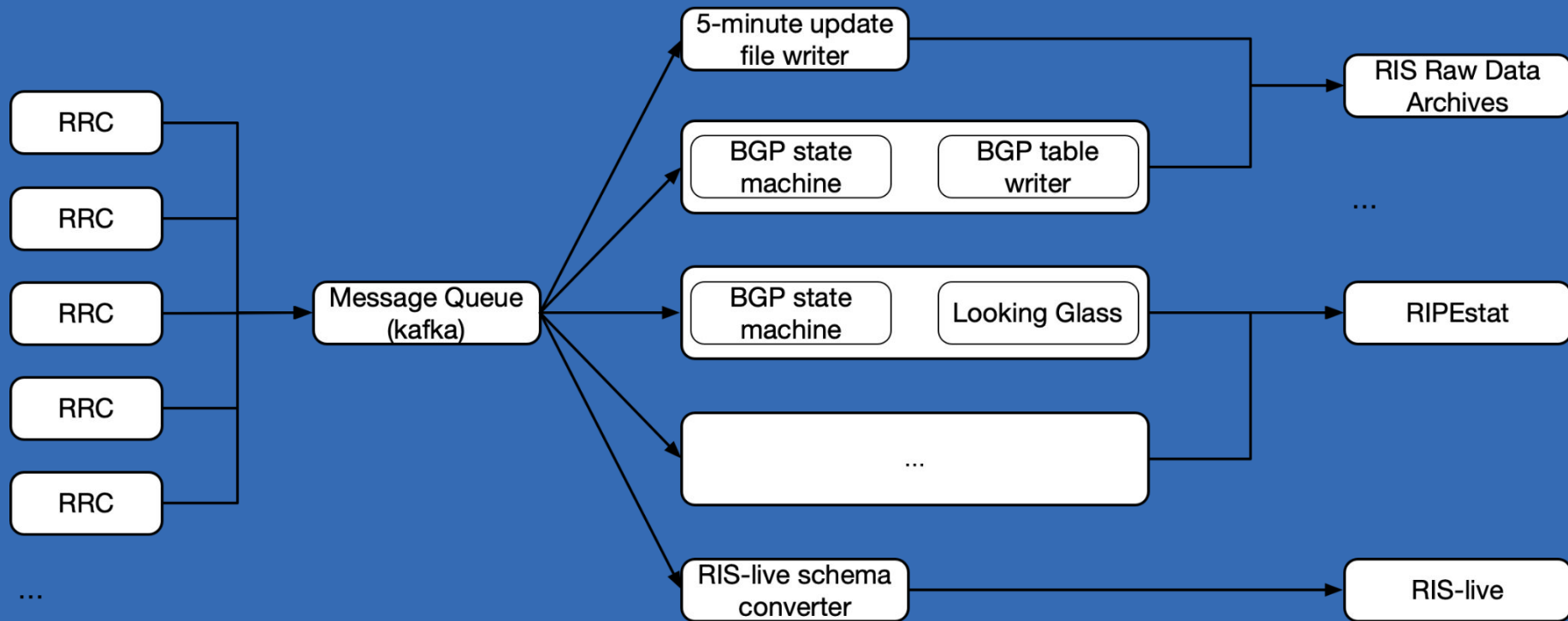
So, What About BGP Data?

Looking Glass
Current visibility of a resource

Routing History
Historic routing of a resource

Upstream Visibility
Investigate AS path changes over time

BGPlay
Zoom into a BGP event at the message level

Use Case: Real-Time Data

A Looking Glass

- Near Real-Time Looking Glass from all RIS peers
- Also available as API

Example: K-root in Kazakhstan

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Use Case: Long term history

Routing History

- Long-term routing history
- Look back (far) in time

- See if behaviour is consistent
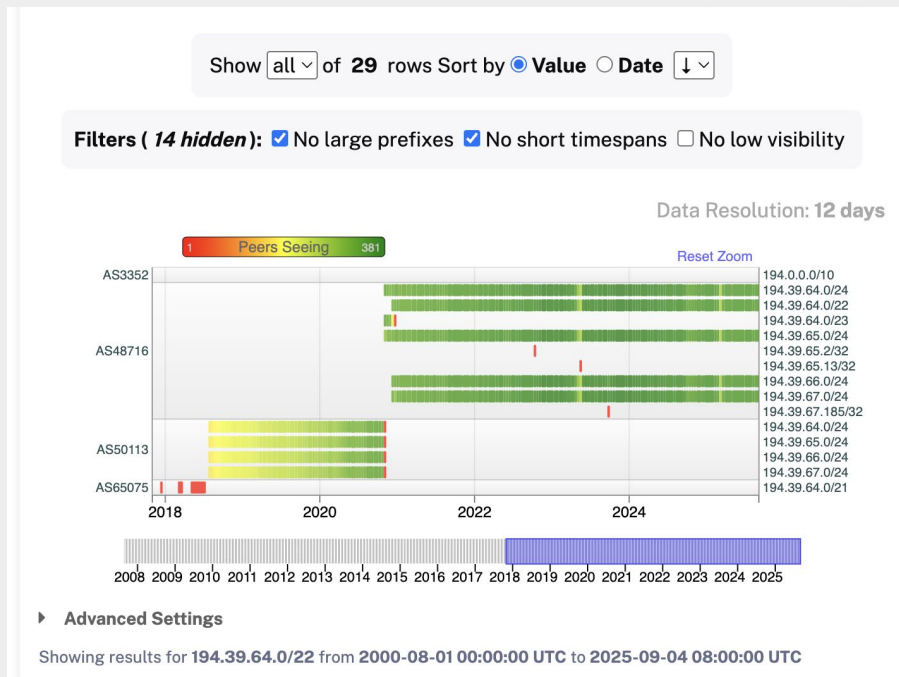
Use Case: Distribution over Time

Upstream Visibility

- Show the distribution over upstreams ASNs.
- *Very useful* when visibility changed.
- Example: prefix became RPKI invalid (AS 0 ROA)

Upstream Visibility

Distance from origin [1]   ✓ By ASN | By CP

17557

Showing results for **115.186.103.0/24** from **2025-09-02 00:00:00** to **2025-09-04 00:00:59**

Use Case: Distribution over Time

Upstream Visibility

- Show the distribution over upstreams ASNs.
- *Very useful* when visibility changed.
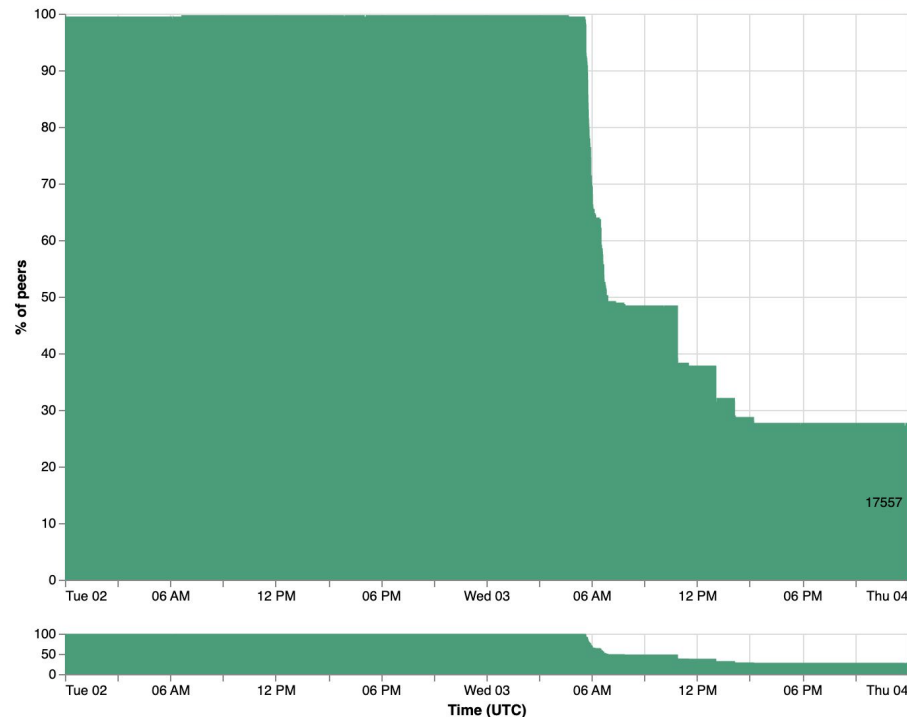- Example: prefix became RPKI invalid (AS 0 ROA)
  - Most upstreams of 17557 filtered, some stayed.

Use Case: In Depth - BGPlay
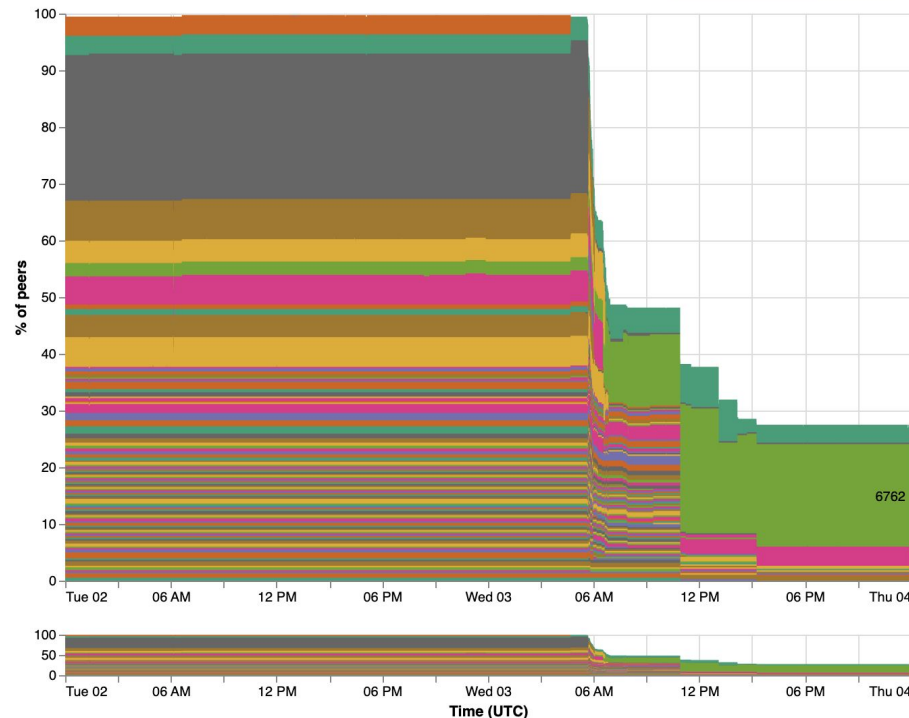
BGPlay

- Look at BGP messages in detail
- See how routes adjust over time
- This shows all events received.

Want to Dive Deeper? MRT
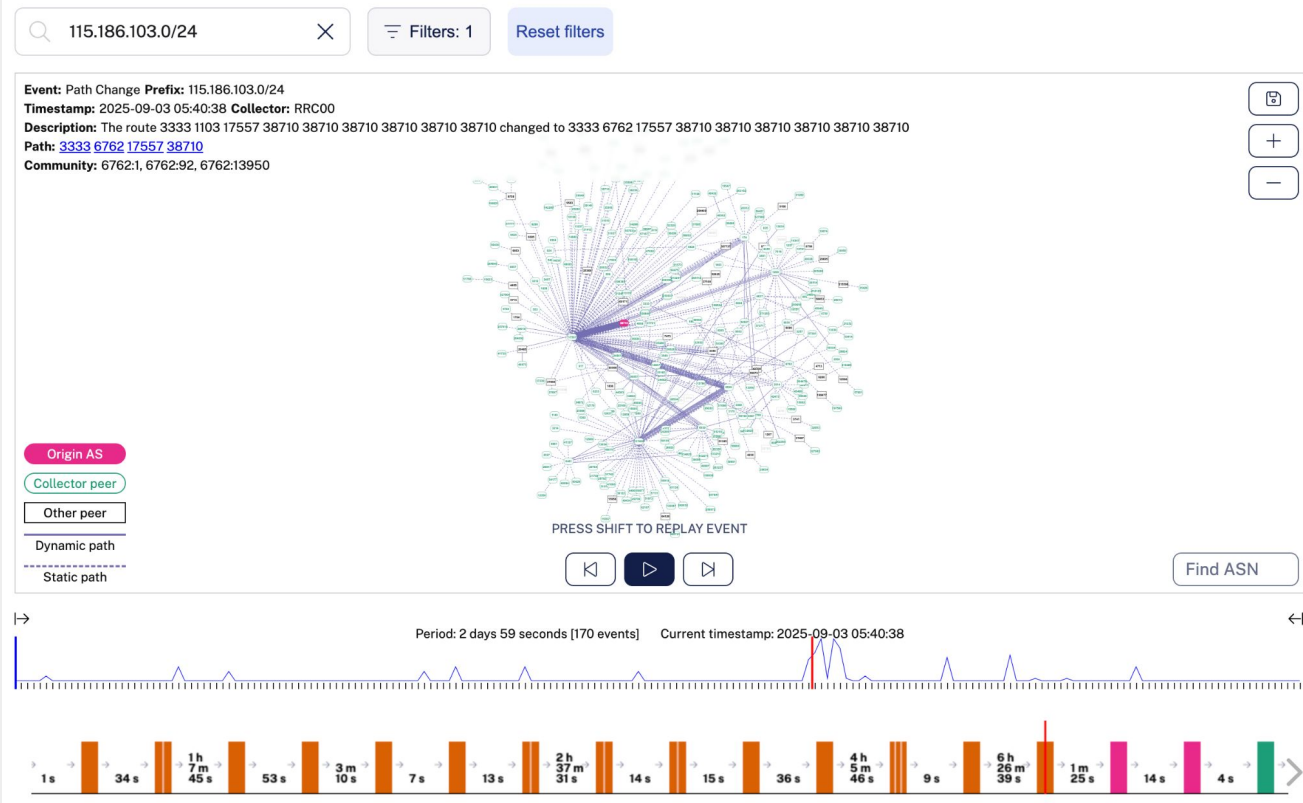
The raw data is available

- The BGP archives are available at https://ris.ripe.net/docs/mrt/
- Can be parsed with CLI tools (monocle from bgpkit, bgpreader from bgpstream/caida)
- Custom tools
  - Scripts
  - Custom programmes
  - …
- Can even put it in a database:
  - Used by analysts (e.g. Anurag Bhatia's blog)
  - Short clickhouse tutorial (QR code). On RIPE labs soon.

Want to Dive Deeper? MRT

You - and LLMs - understand SQL:

```sql
SELECT
    prefix,
    splitByChar(' ', as_path)[-2] AS first_upstream,
    count(*) AS cnt
FROM rib
WHERE prefix = '193.0.14.0/24'
GROUP BY ALL
ORDER BY cnt DESC
LIMIT 5

Query id: 02917ea2-4239-45cb-b21a-df41a04f9410

    prefix          first_upstream   cnt
1.  193.0.14.0/24   6939              70
2.  193.0.14.0/24   513               20
3.  193.0.14.0/24   20612             20
4.  193.0.14.0/24   28186             15
5.  193.0.14.0/24   1103              13

5 rows in set. Elapsed: 0.019 sec. Processed 4.64 million rows, 157.65 MB (250.59 million rows/s., 8.52 GB/s.)
Peak memory usage: 249.23 KiB.
```

Conclusion

You can use this BGP data

I hope I showed:

- Three ways to look at BGP using RIPEstat that are easy
- One method – BGPlay – that allows you to look in detail
- And, finally, that the data can be versatile (SQL)

Questions
& Comments ?

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