RIPE NCC
RIPE NETWORK COORDINATION CENTRE

minRTT

Latency Into Networks As Seen From RIPE Atlas

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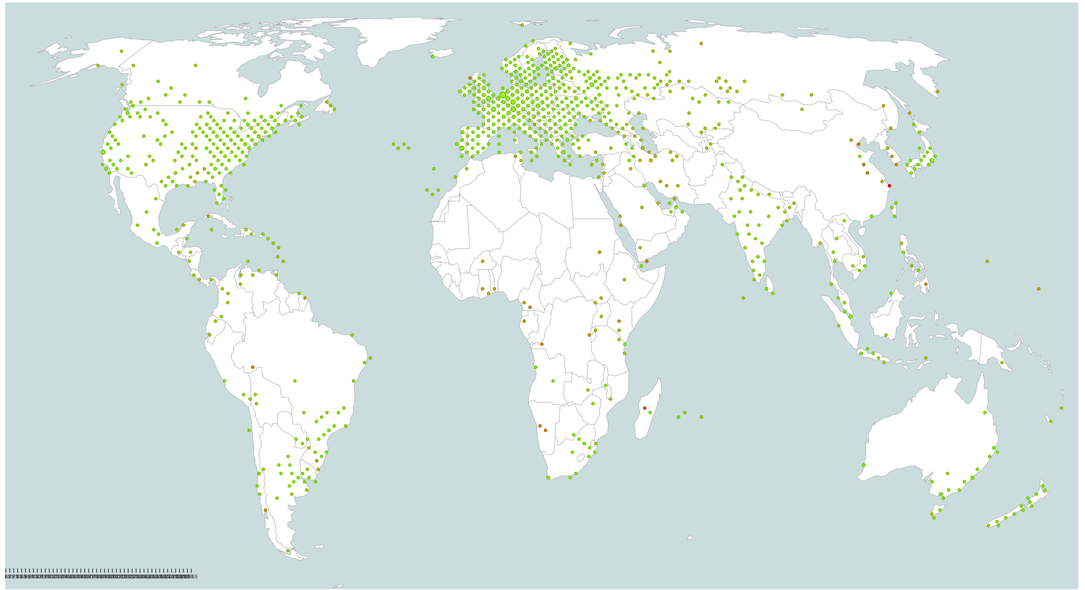
Problem(s)

- Geolocation information about networks is spotty
  - Maxmind? Geolocates well where end-users are
  - RIR-stats: Geolocates country of head-quarters for a network
  - PeeringDB: Geolocates where people want to peer (for those who want to peer in the first place)

- What can we do to improve?
  - IPMap for IPs

Potential improvements

- How can we use RIPE Atlas to augment our understanding?
- RIPE Atlas is widely deployed across the globe

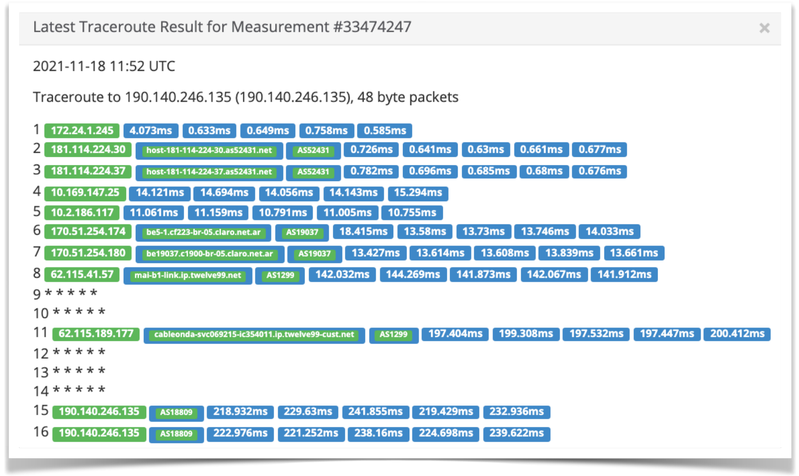


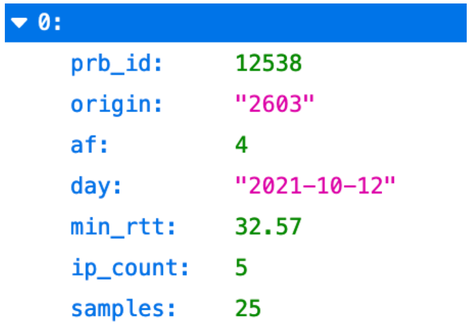
Dataset we Explore

- Daily minimum RTT for each probe/origin combination found in traceroutes
  - Hot potato routing should make you see first possible hand-off to next network

- Origin = ASN or IXP peering LAN
  - Mapping:
    - IXP peering LANs from peeringDB (can be looked up by peeringDB IXP ID
      - ie. AMS-IX is “ix-26” (see https://www.peeringdb.com/ix/26)
    - IP2ASN from BGP data in RIS (just looking at originator from this)

What Does This Look Like?





...

3.4GB/day

180M traces

Complex

...

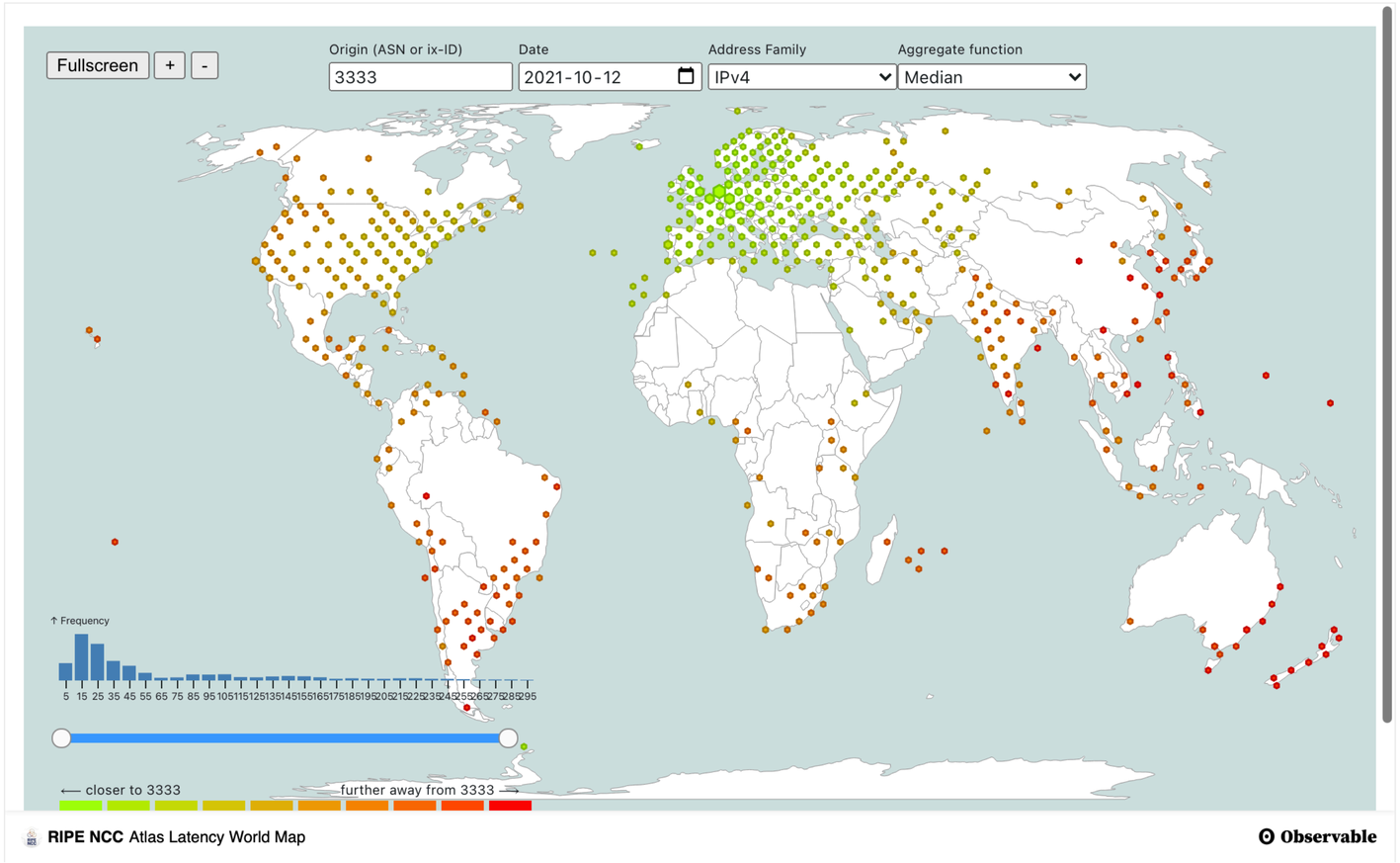
36MB/day

4.8M tuples

Simple

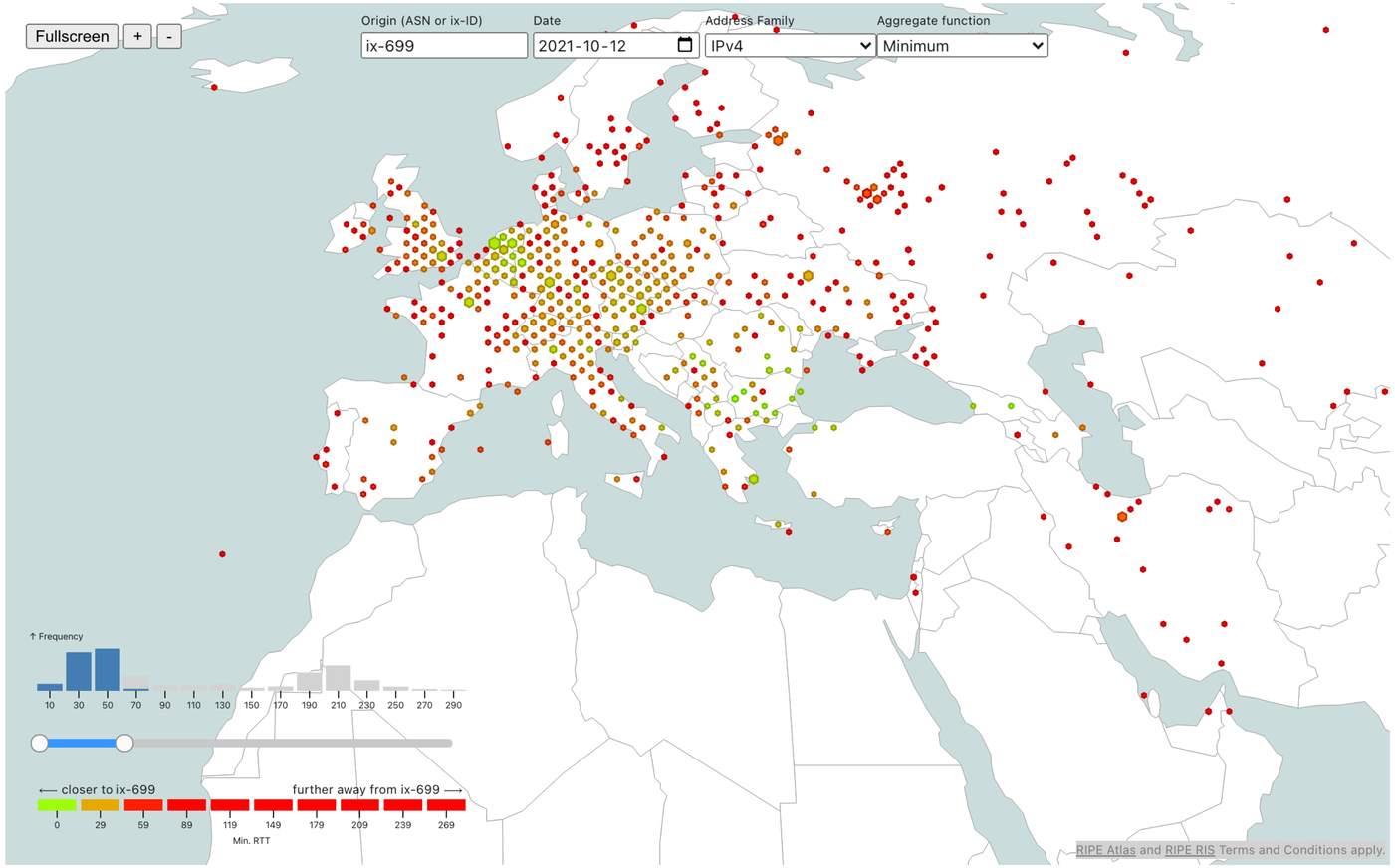
Example Viz: World Map

https://observablehq.com/@ripencc/atlas-latency-worldmap



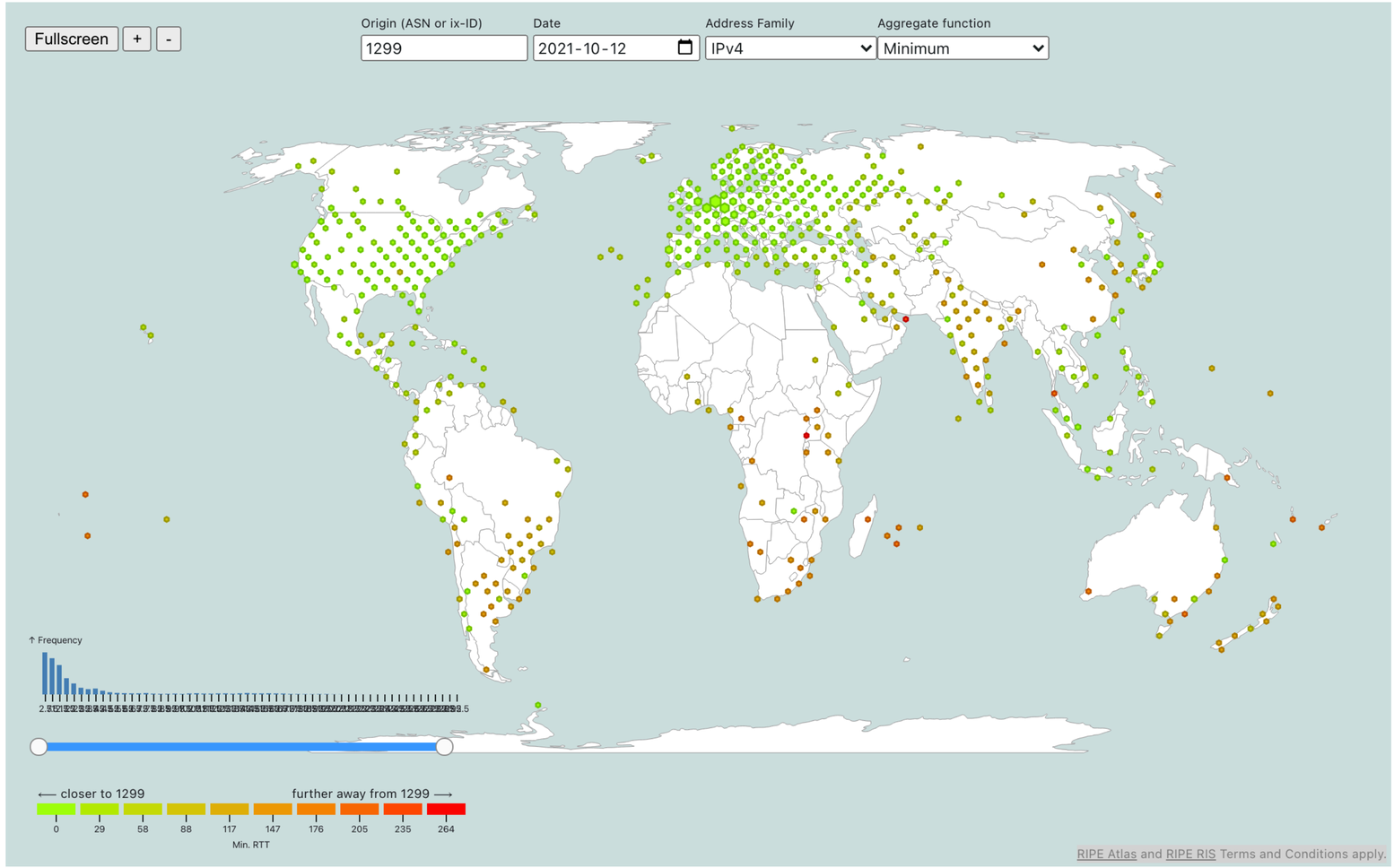
Example Viz: Distributed IXP

https://observablehq.com/@ripencc/atlas-latency-worldmap



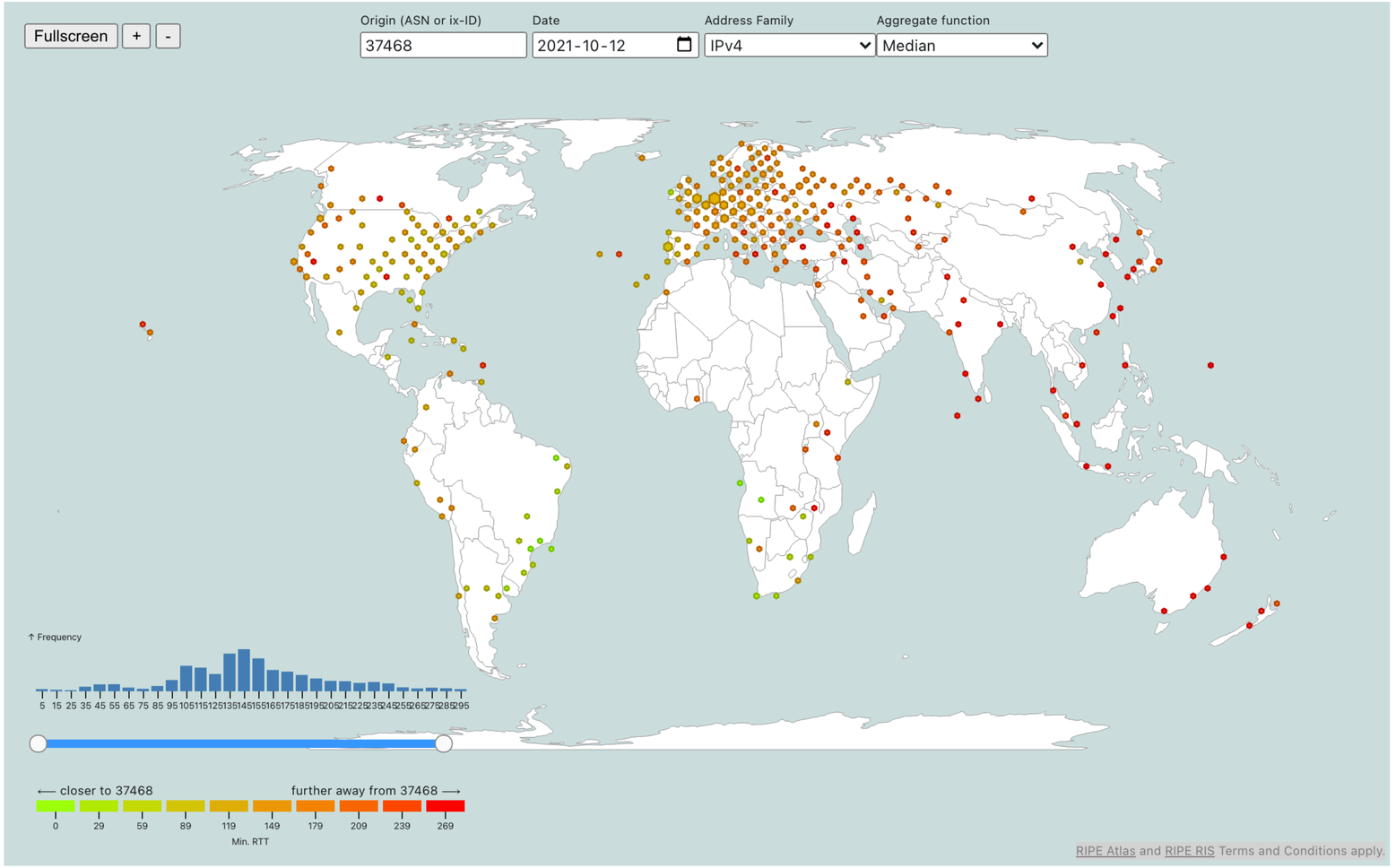
Example Viz: Tier1

https://observablehq.com/@ripencc/atlas-latency-worldmap



Example Viz: Regional Deployment

https://observablehq.com/@ripencc/atlas-latency-worldmap



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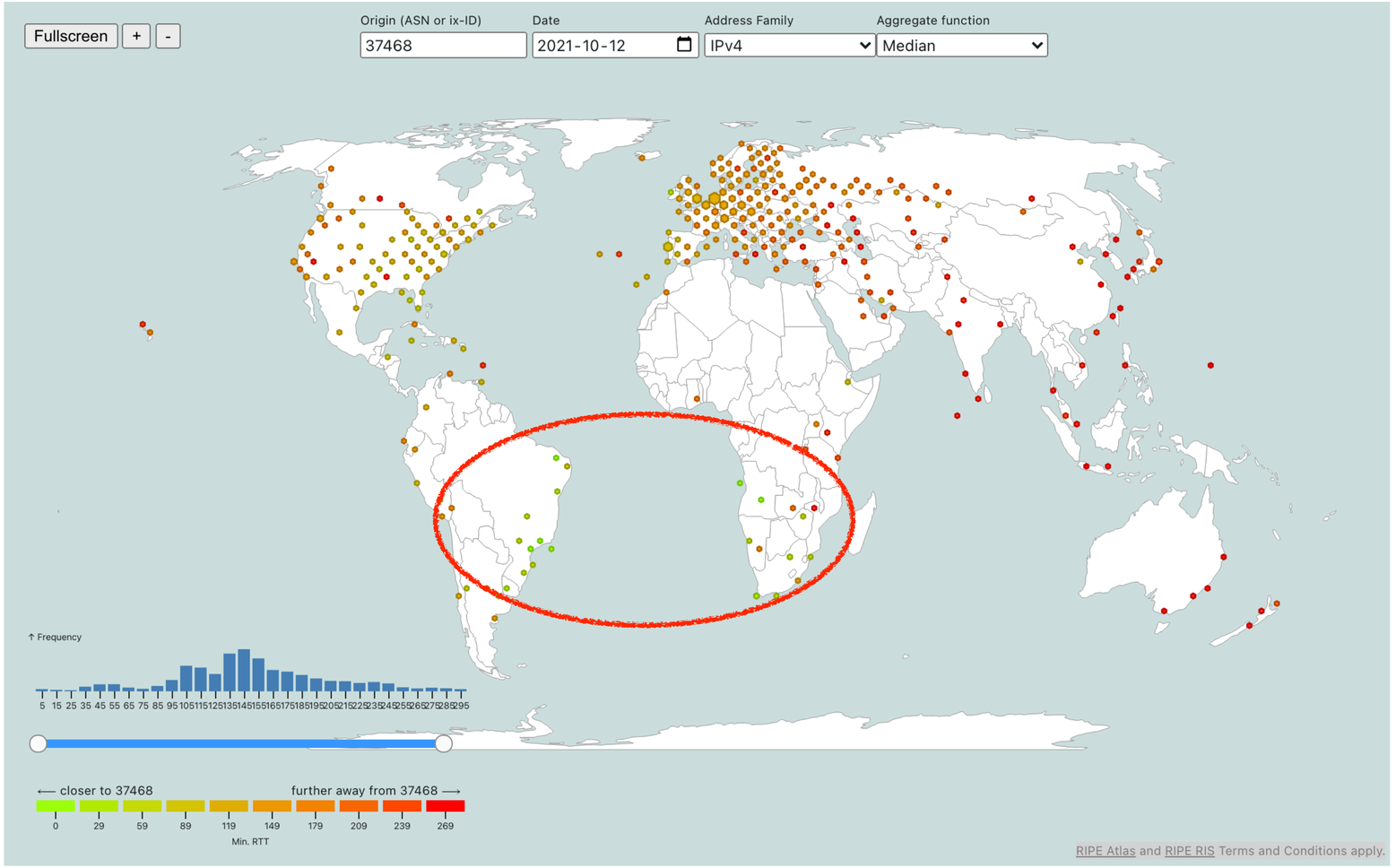
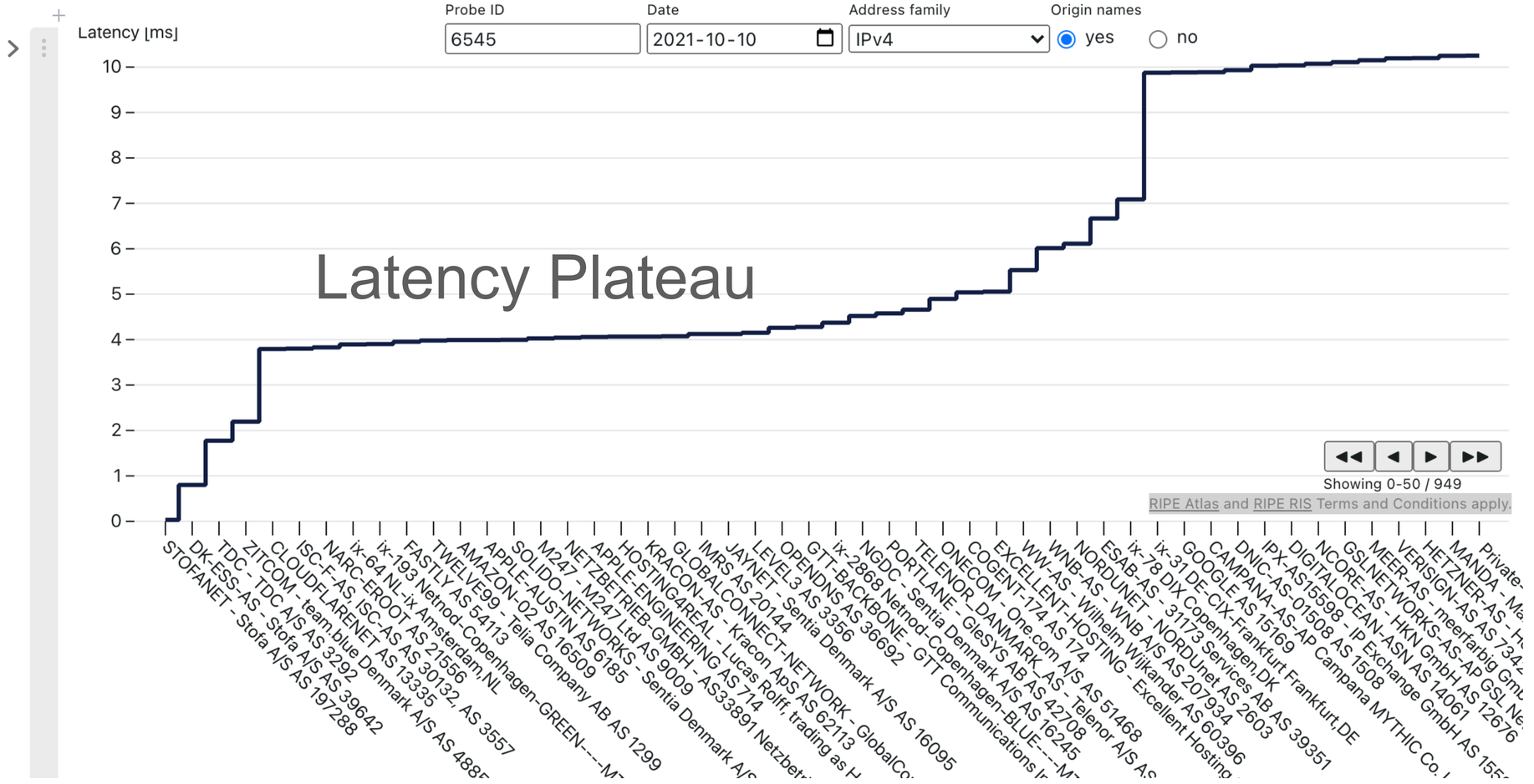
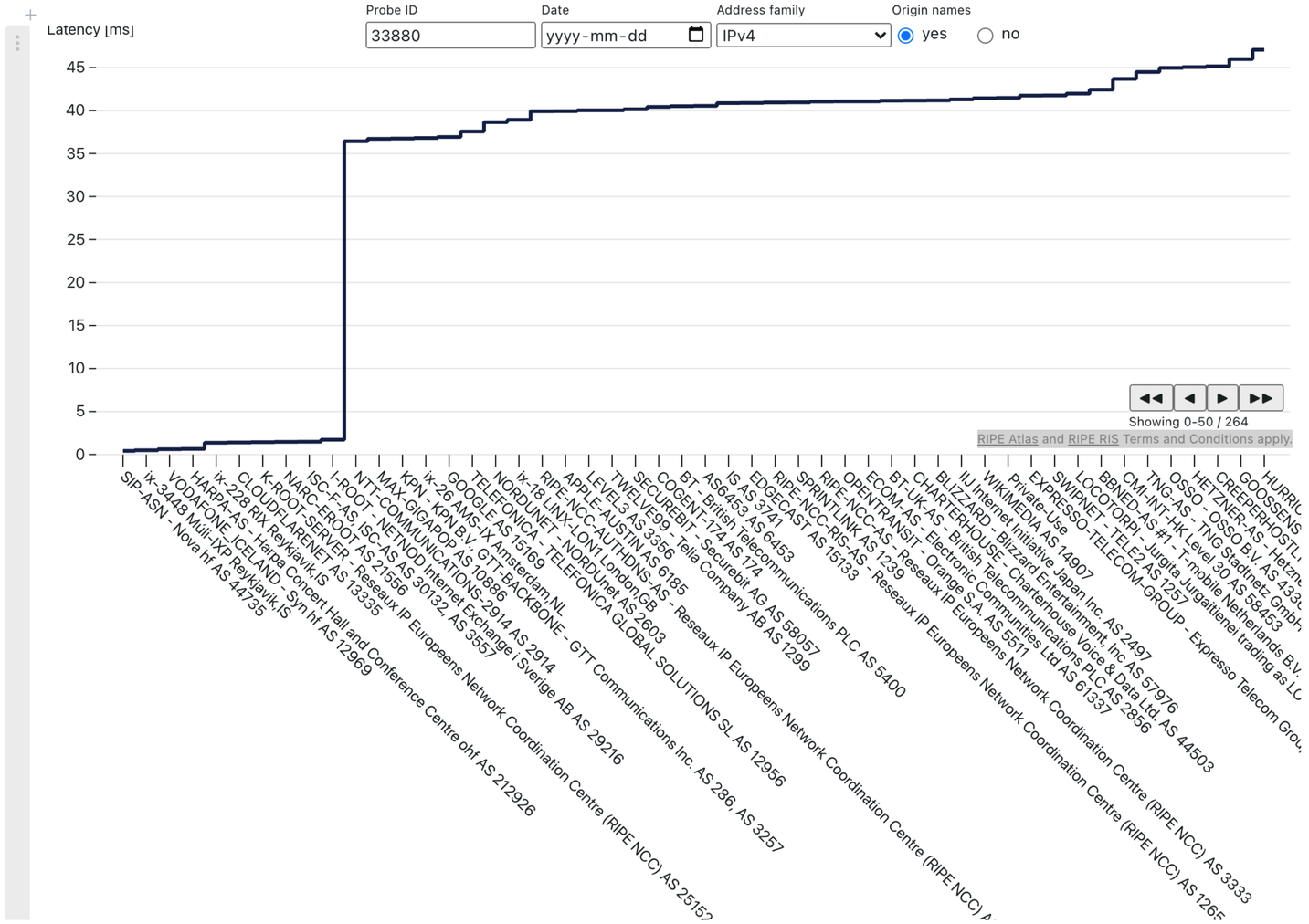


Example Viz: Probe Neighbourhood

https://observablehq.com/@ripencc/atlas-probe-neighbourhood

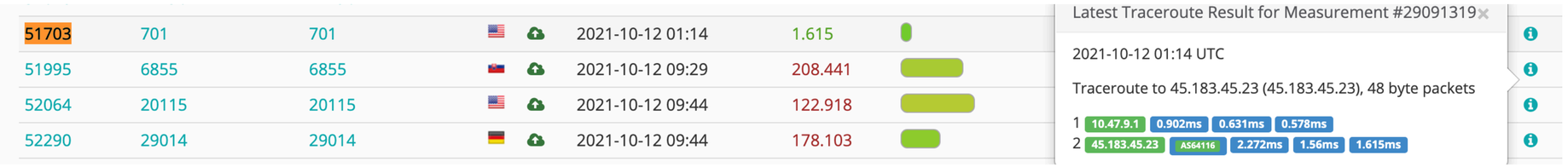


Latency Islands: Iceland!



Caveats

- Limited by where RIPE Atlas is deployed
  - And accuracy of probe geolocation
- Limited by where RIPE Atlas measures to
- Limited by ICMP blocking
- Limited by RTT lies
  - Some probes have a device close to them that responds with low latency and a fake src address (= destination of measurements)!



Future Work

- Mechanisms to select probes close to IXPs
  - Can help in debugging problems around IXPs
  - Which IXPs are well covered with RIPE Atlas probes?

    https://observablehq.com/d/13ba91347b0774c7
- Country minRTT
  - How do probes in a country see the latency into networks that are important to them?
- Compare IPv4 and IPv6
- <Your idea here>
  - Or implement it yourself using ObservableHQ

Questions

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https://labs.ripe.net/author/emileaben/latency-into-your-network-as-seen-from-ripe-atlas/