Debugging Routing & Forwarding Using RIPE Atlas

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Debugging Routing and Connectivity with Visualisation

Example Problems

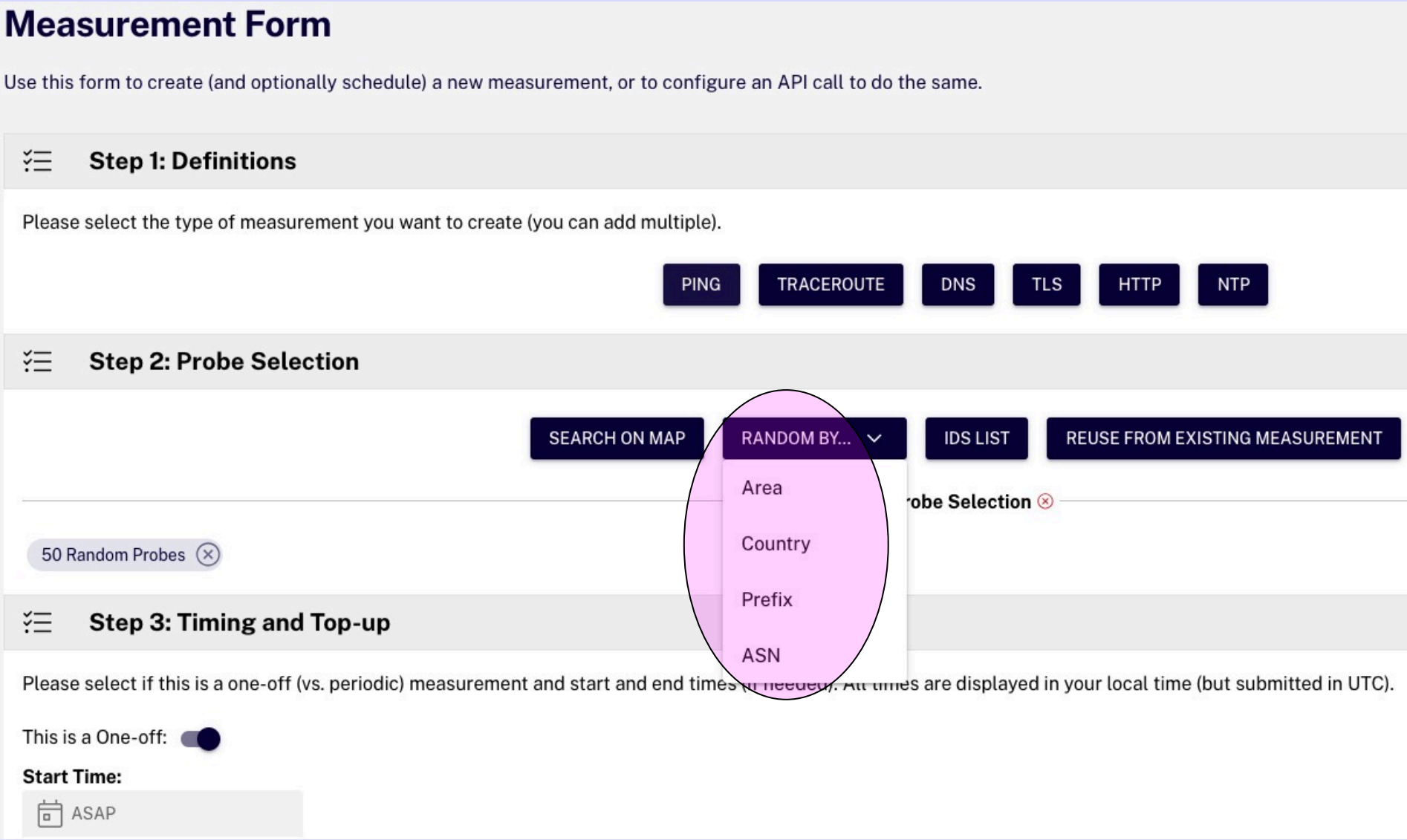
- My serial craft port server is on Colo provider LAN (generous of them). They make some changes and the server becomes unreachable. They debug for a week with no resolution.
- A friend, Tom, has SOHO IPv4/IPv6. The IPv6 seems not to be routed. The ISP NOC says everything is fine.

My Tool of Choice

RIPE Atlas

- 12,000+ small devices called *probes* (or a software VM or RPi) collect data on Internet connectivity around the world. Anyone can plug a probe in at home, in DataCenter, wherever.

Create Measurements



Colo Serial Server

- Colo folk were very cooperative but could not find the cause
- Four days of debugging email, the kinds so many of us have seen for decades
- It took me four days to think of RIPE Atlas <blush>
- Used global/random traceroute

Traceroute to Serial Srv

Measurement 70370611

Traceroute measurement to 206.223.132.86

ONE-OFF TRACEROUTE measurement to **206.223.132.86** via **IPv4** initiated by **YOU**.

TROUBLESHOOTING

OVERVIEW | RESULTS | DETAILS

Result summary (latest, as of 2024-04-27 19:15:59 UTC) :

0 probes reached their target. (why?)

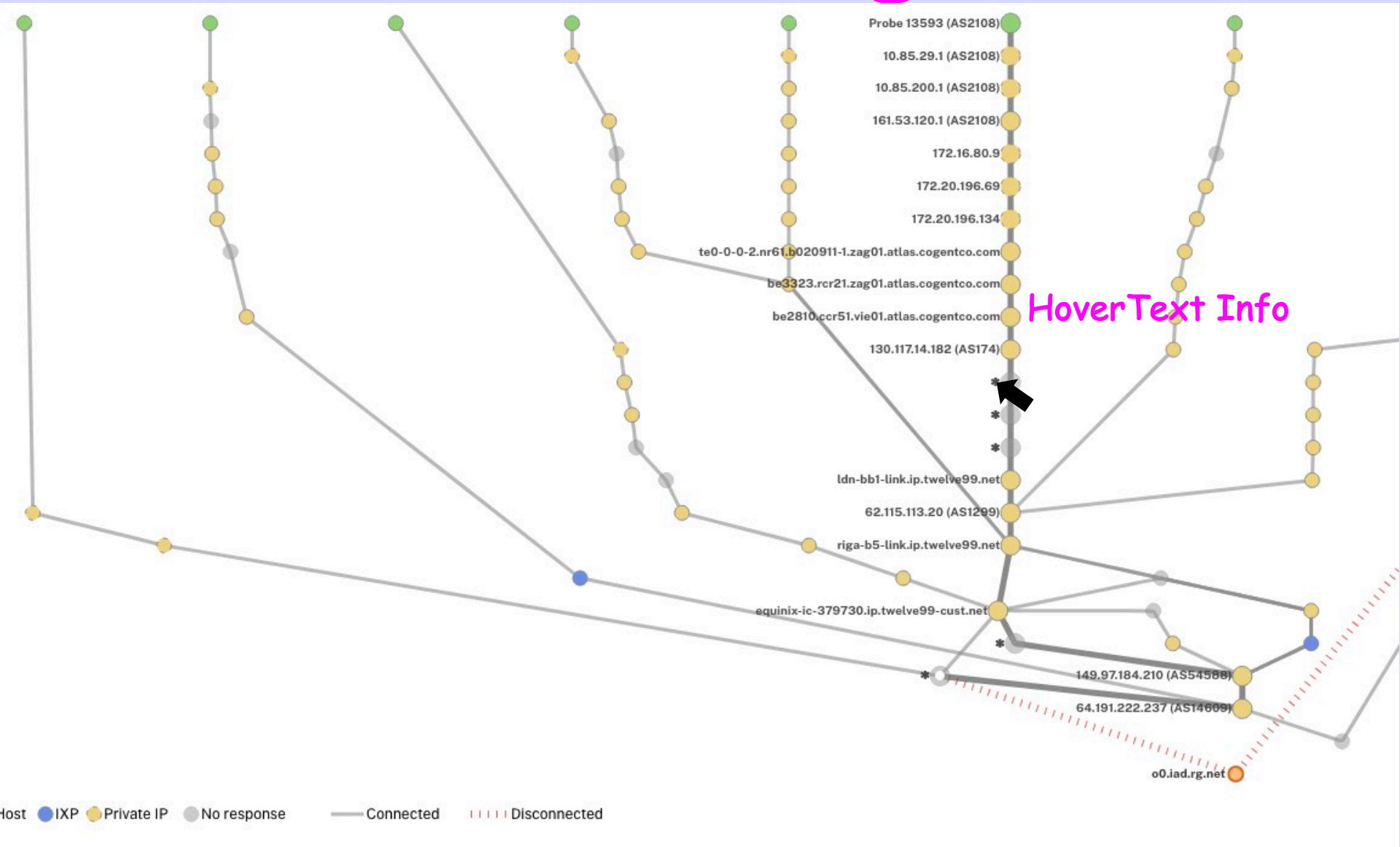
48 probes did not.

1 probe did not report (yet).

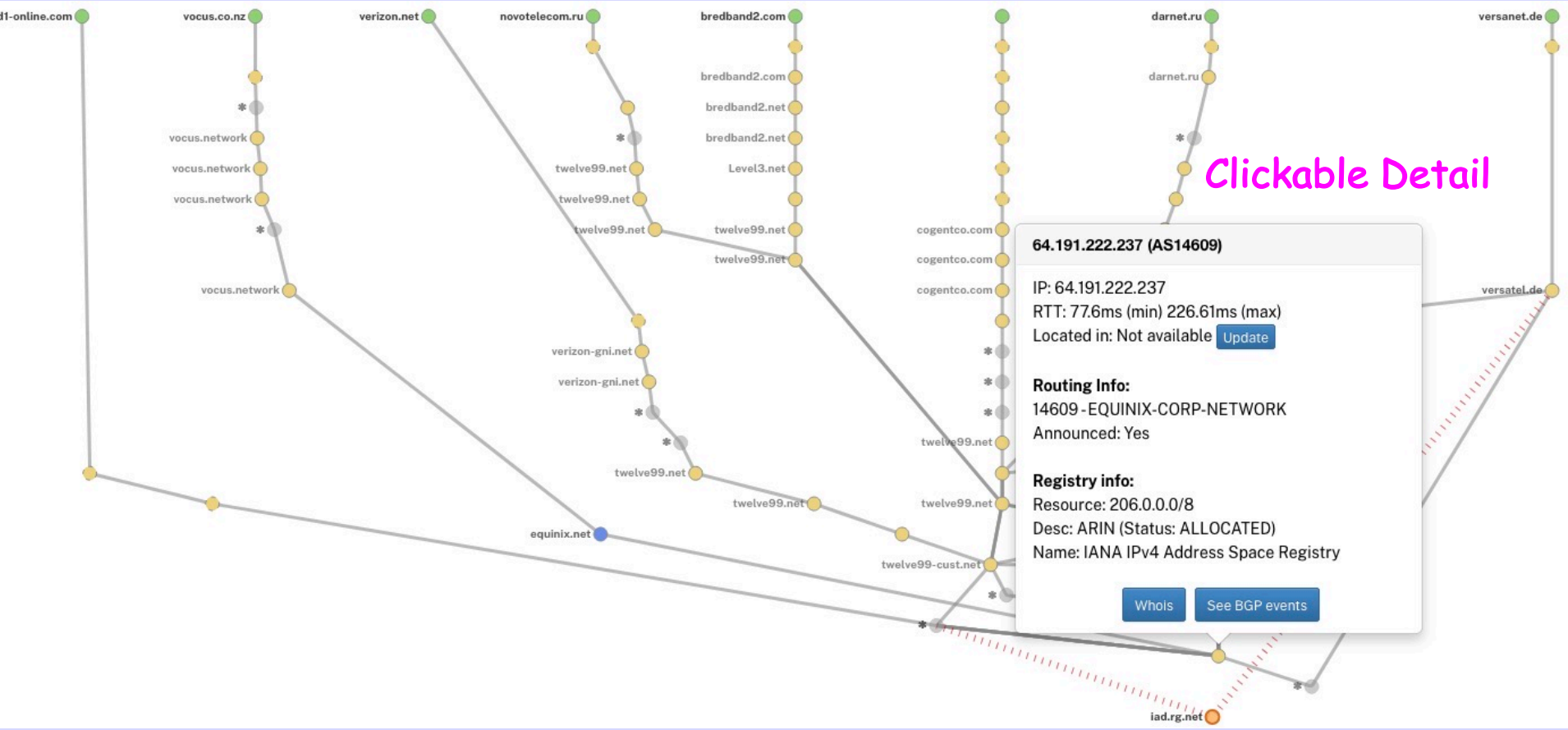
Min RTT: N/A

Mean RTT: N/A

The "Smoking Gun"



The Bullet

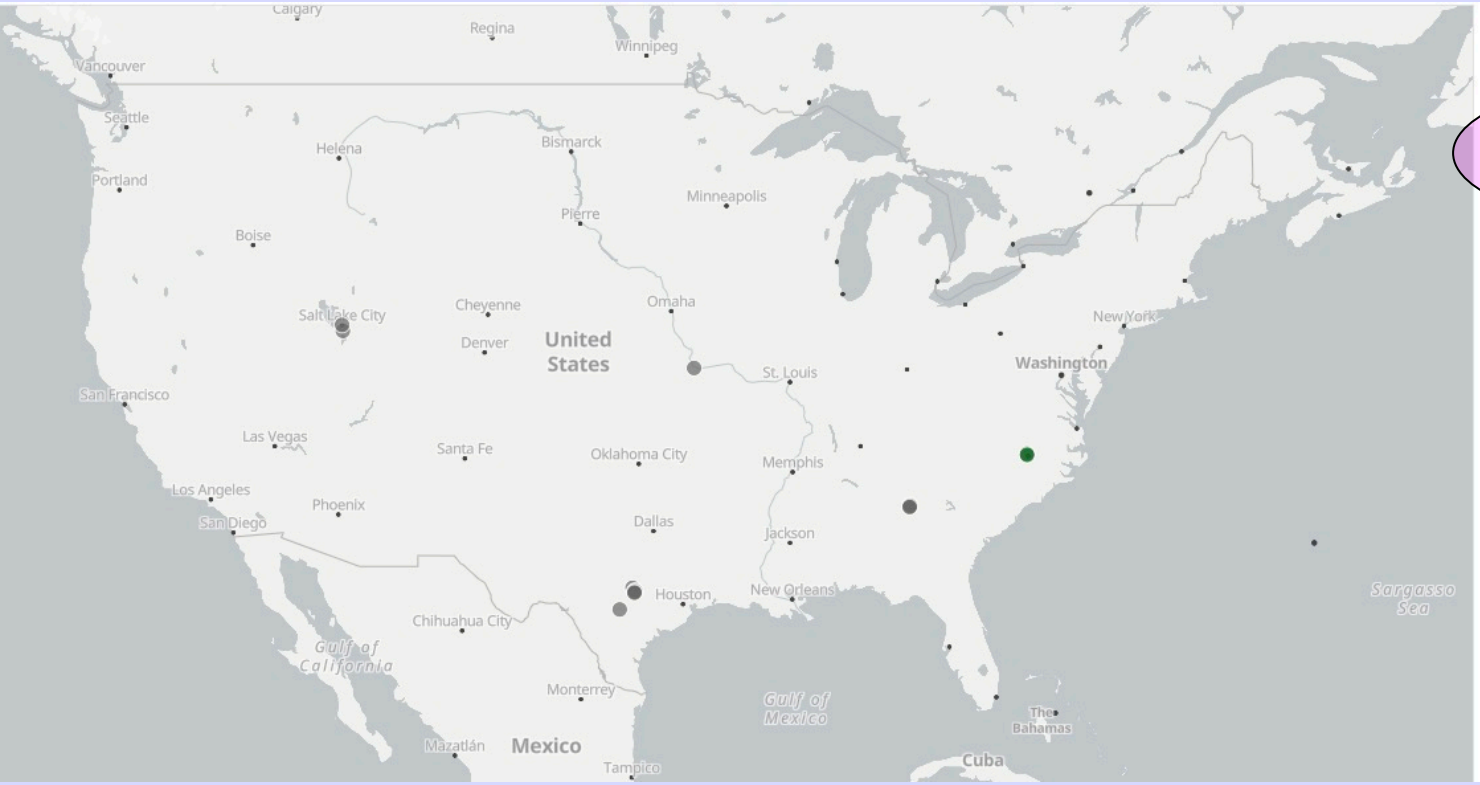


They Fixed it in an Hour

Remember Tom's IPv6

- NOC could not see any problem
- Went on for months!
- So I posted to NANOG list
- Someone on same ISP could not reach Tom over IPv6
- So we did an Atlas trace from 15 probes within that ISP

Trace to Tom from Probes in Same AS



Result summary (latest, as of 2025-09-12 23:46:37 UTC) :

2 probes reached their target.

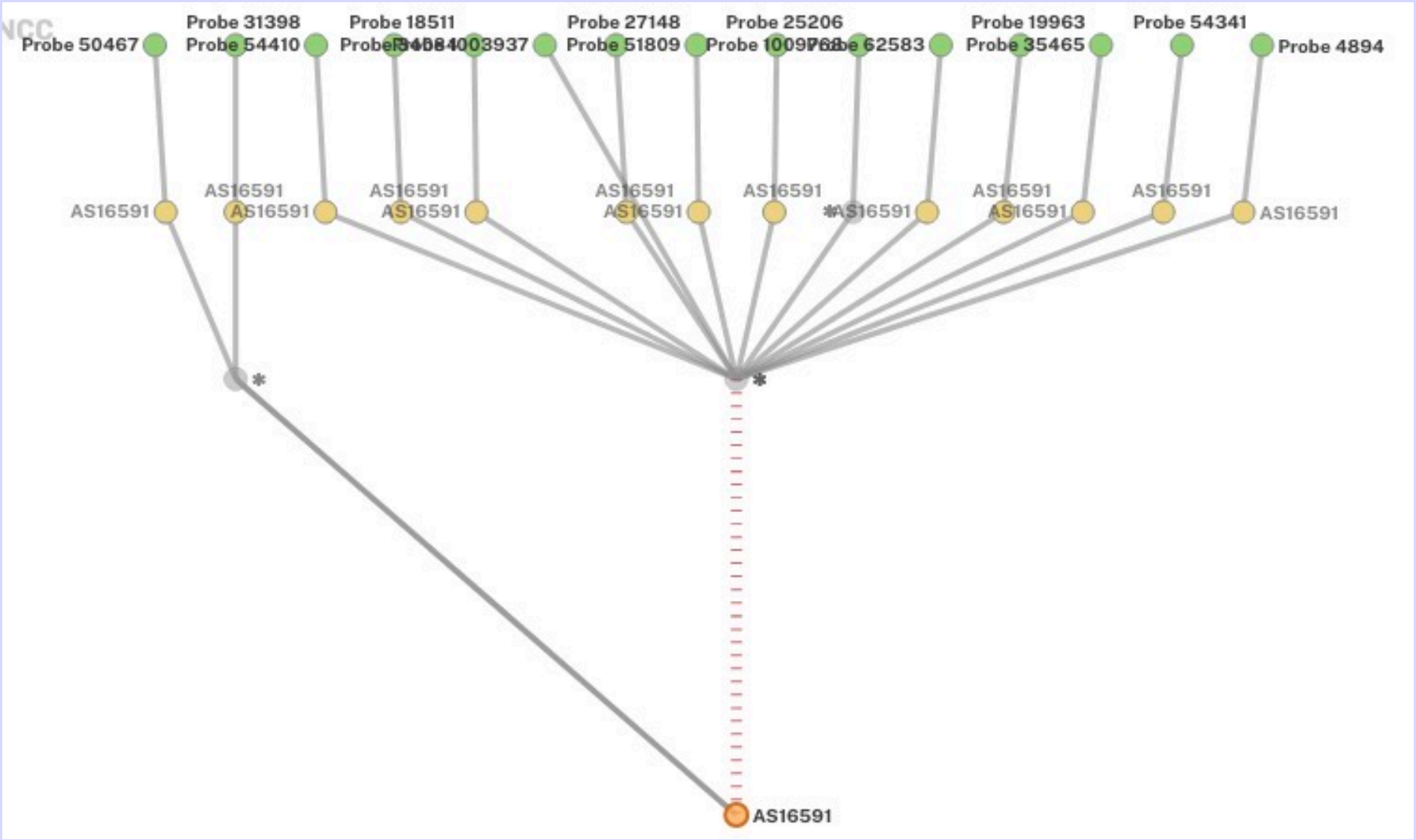
13 probes did not.

0 probes did not report (yet).

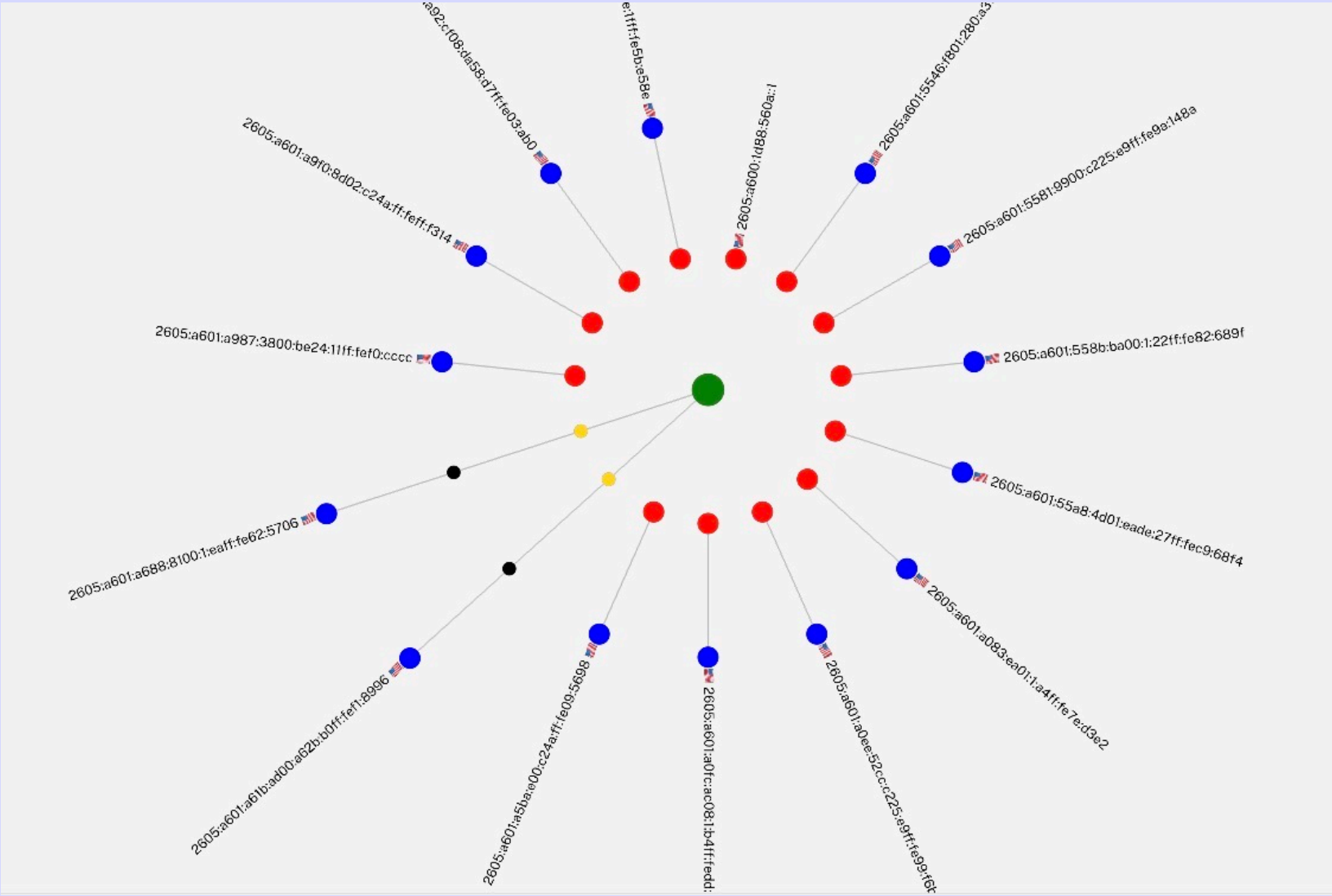
Min RTT: 2.712

Mean RTT: 4.5

IPv6 Trace to Tom



Newer Visualisation

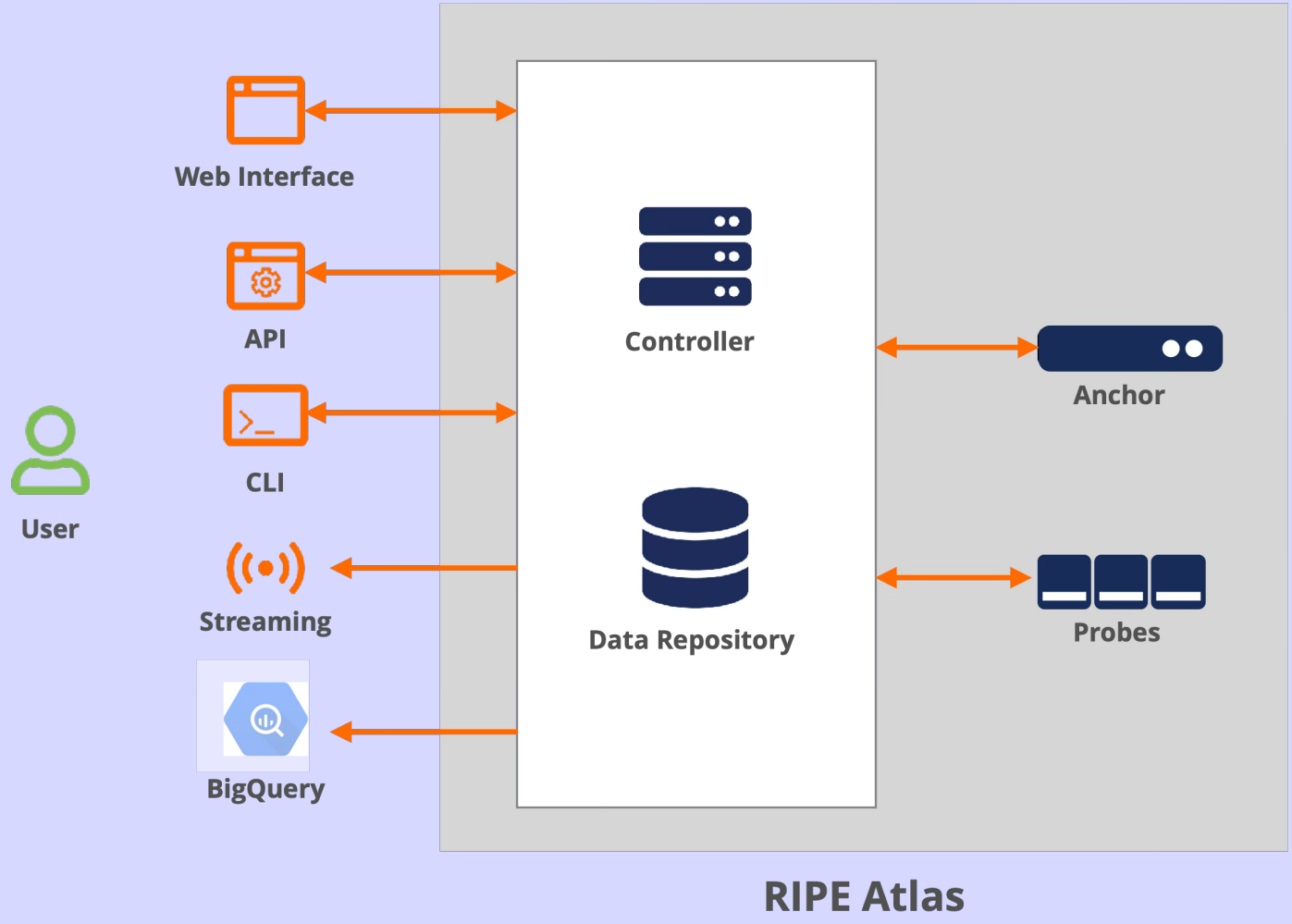


ISP Senior Engineer Saw it and Found Their Internal Routing Problem in a Few Hours

The Senior Engineer Also Had a "Little Talk" with Their NOC

There's an API!!

RIPE Atlas Interfaces



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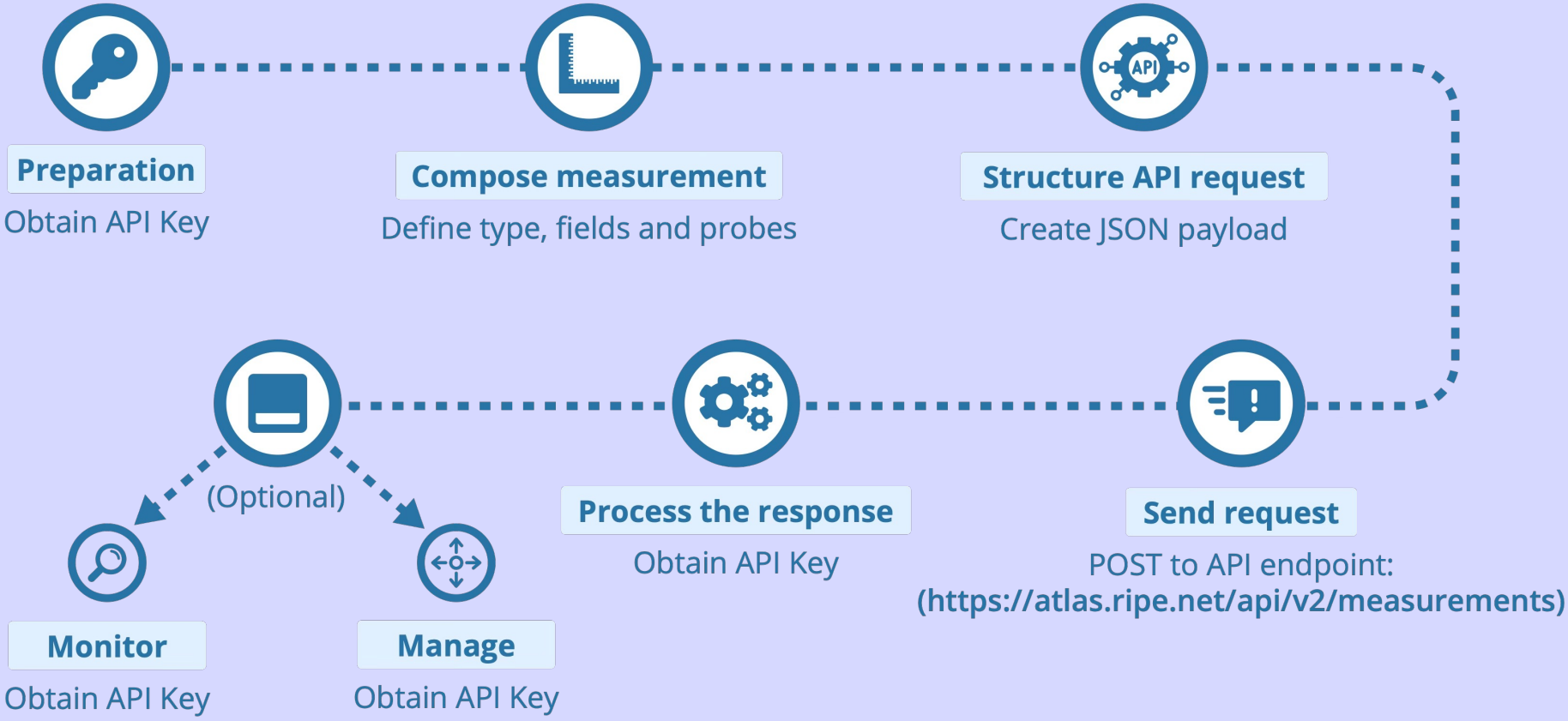
Using the RIPE Atlas API



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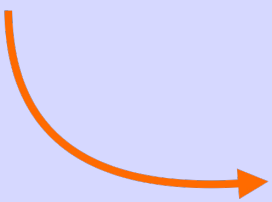
A Simple Example

```
curl --location 'https://atlas.ripe.net/api/v2/measurements/' \
  --header 'Authorization: Key ********-****-****-****-************' \
  --data @filename_of_JSON_payload
```



```
{
  "definitions": [
    {
      "target": "ripe.net",
      "description": "My First Measurement",
      "type": "ping",
      "af": 4
    }
  ],
  "probes": [
    {
      "requested": 50,
      "type": "area",
      "value": "WW"
    }
  ]
}
```

JSON Payload with measurement definition

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Challenge!

A Fine Dinner if You Create an AI Front End which Takes a Problem Description and Drives the API to Diagnose it

https://atlas.ripe.net/

RIR Member €uros at Work

You do Not Have to be a Member to Use RIPE Atlas

You Just Need to Host a Probe

Old v3 Atlas Probes Get a Disease of Sick USB Keys

A Hack