

Debugging Routing & Forwarding Using RIPE Atlas

APRICOT 2026

2026.02.10

Randy Bush <randy@psg.com>

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

Measurement Form

Use this form to create (and optionally schedule) a new measurement, or to configure an API call to do the same.

☰ Step 1: Definitions

Please select the type of measurement you want to create (you can add multiple).

PING

TRACEROUTE

DNS

TLS

HTTP

NTP

☰ Step 2: Probe Selection

SEARCH ON MAP

RANDOM BY... ▾

IDS LIST

REUSE FROM EXISTING MEASUREMENT

50 Random Probes (x)

Area

Country

Prefix

ASN

Probe Selection (x)

☰ Step 3: Timing and Top-up

Please select if this is a one-off (vs. periodic) measurement and start and end times (if needed). All times are displayed in your local time (but submitted in UTC).

This is a One-off:

Start Time:

📅 ASAP

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?

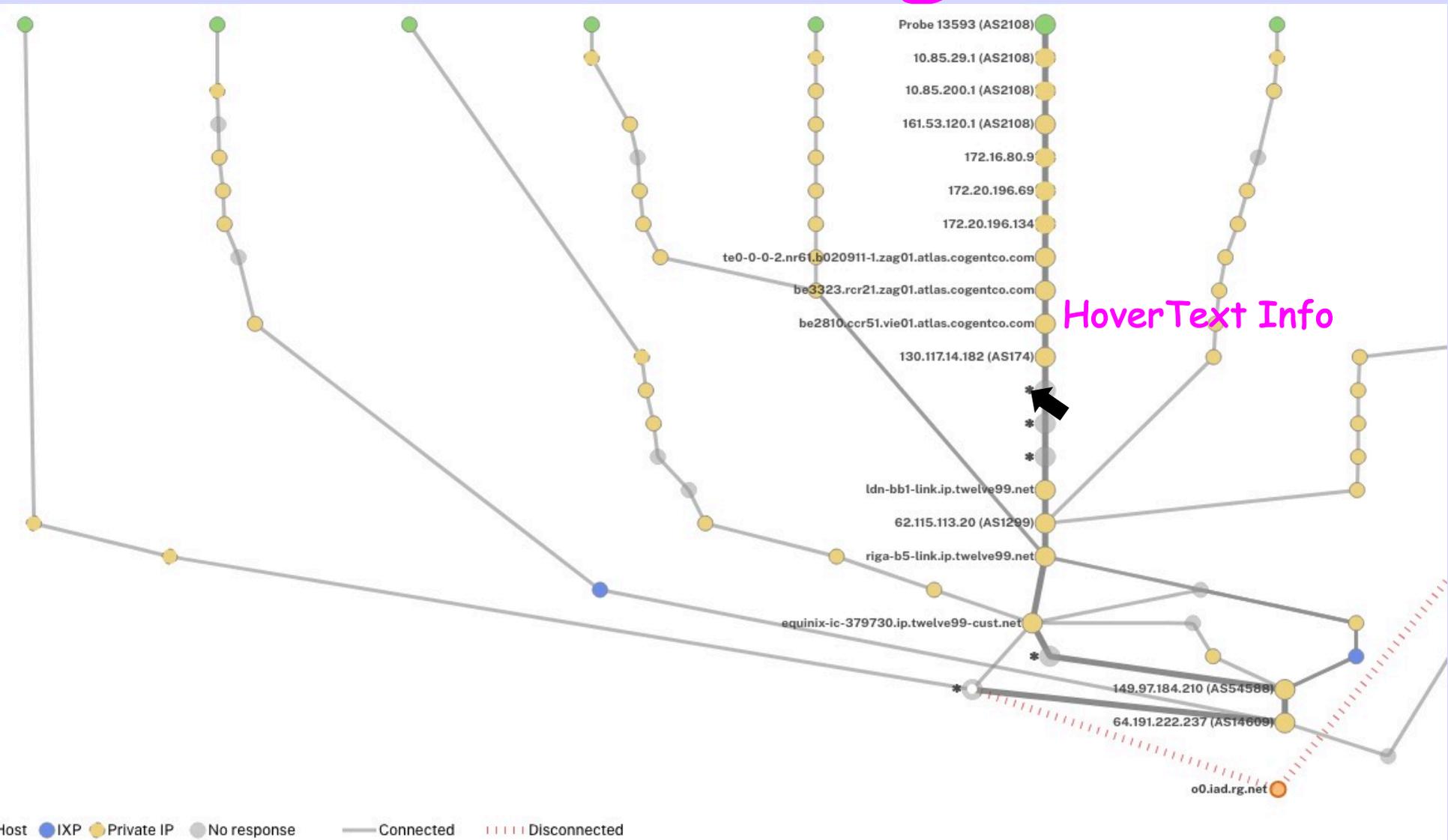
48 probes did not.

1 probe did not report (yet).

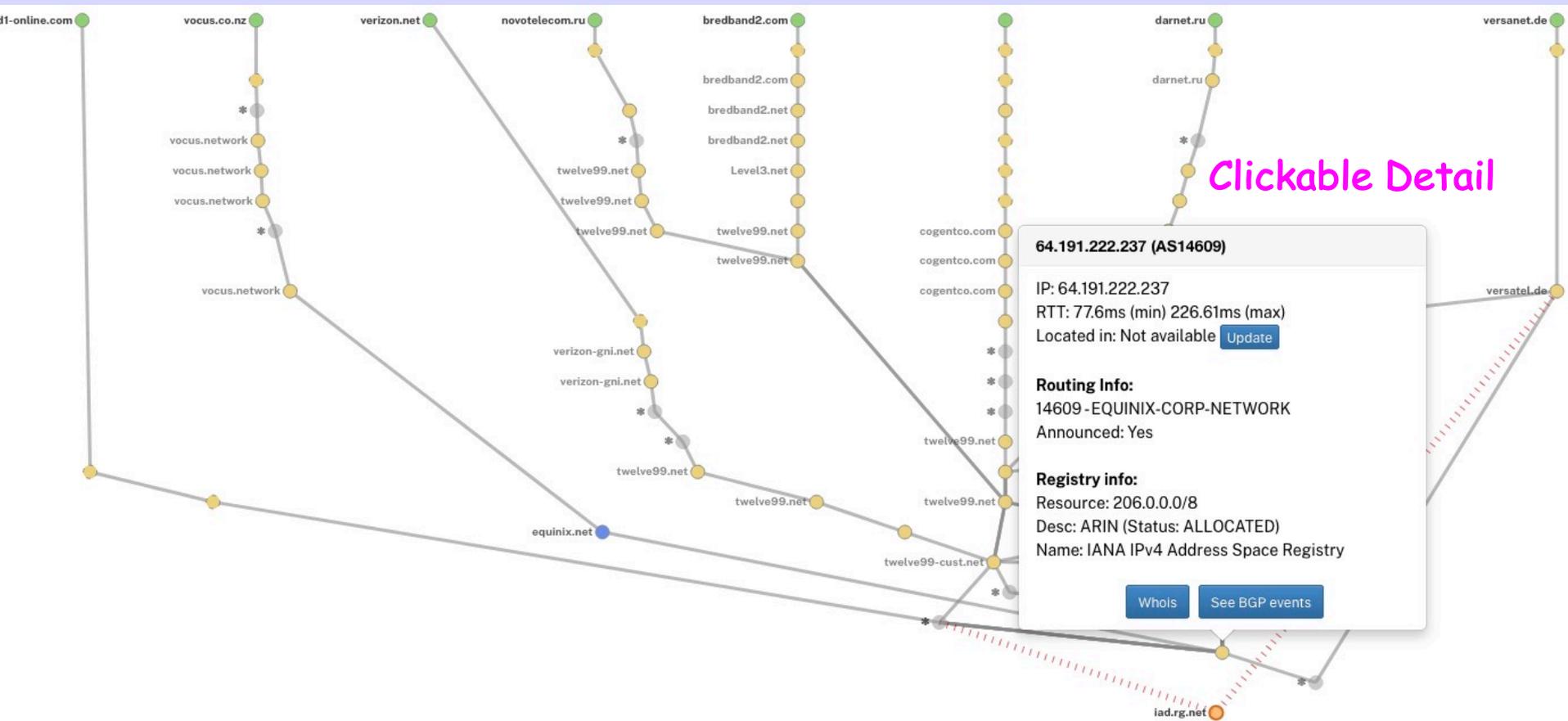
Min RTT: N/A

Mean RTT: N/A

The "Smoking Gun"



The Bullet



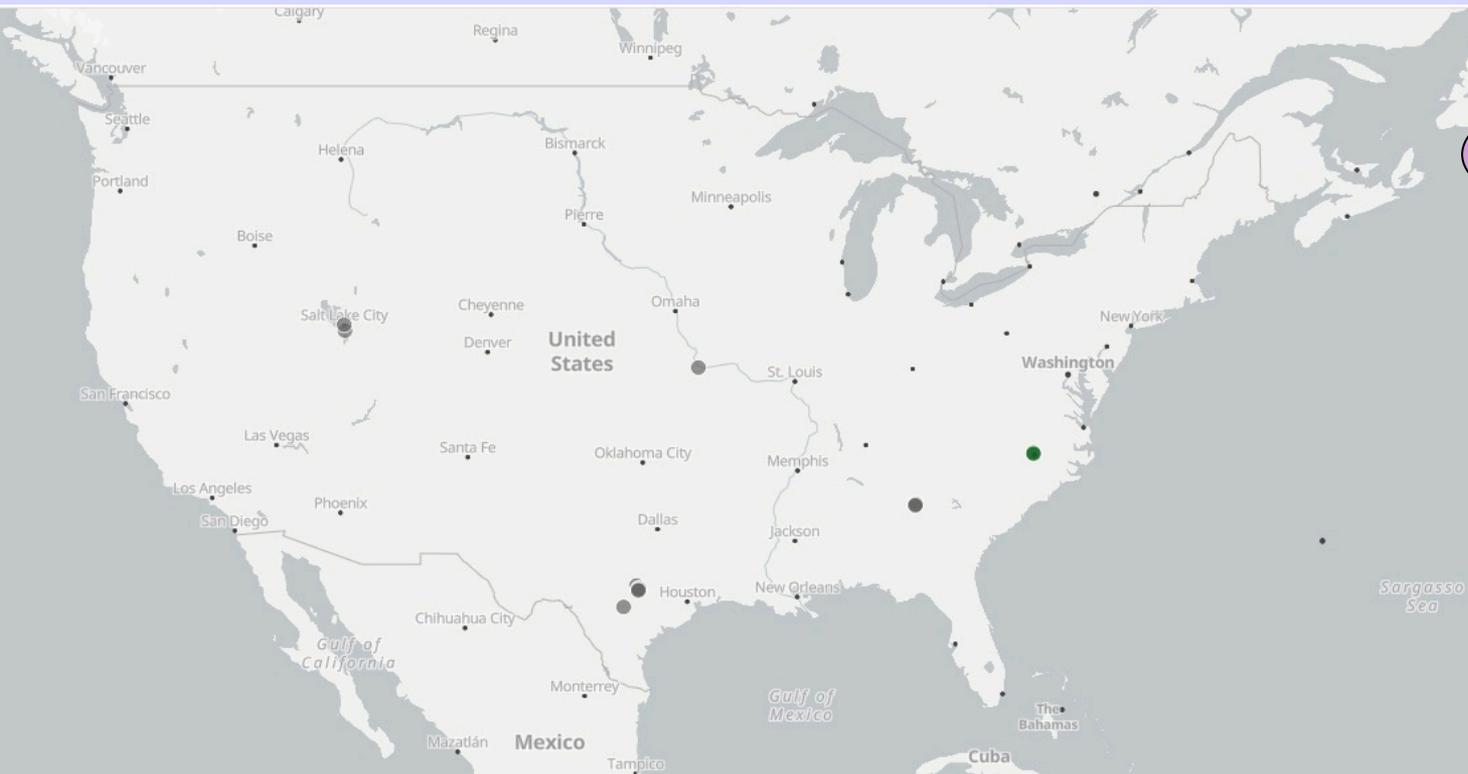
Clickable Detail

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.

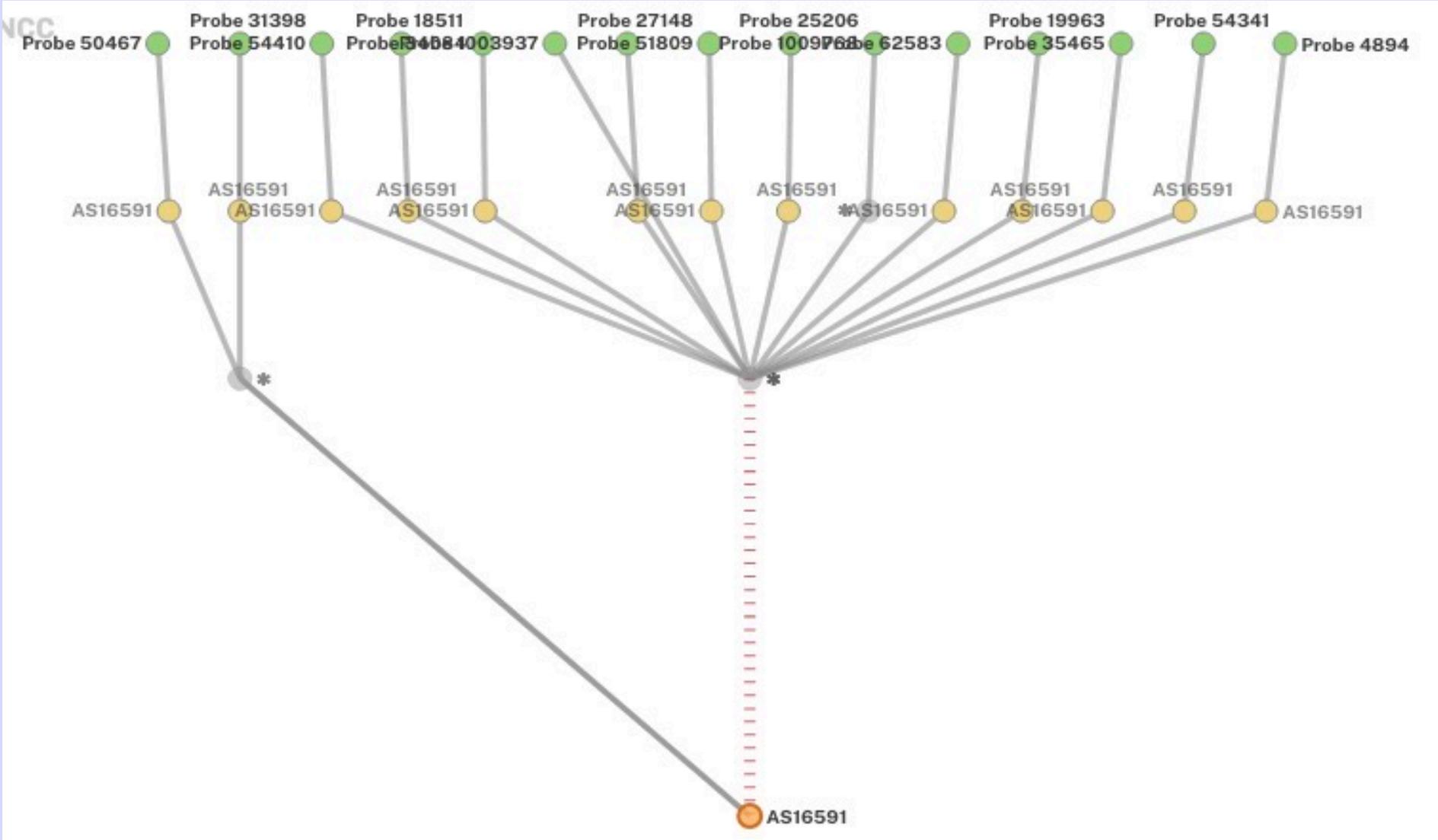
13 probes did not.

0 probes did not report (yet).

Min RTT: 2.712

Mean RTT: 4.5

IPv6 Trace to Tom

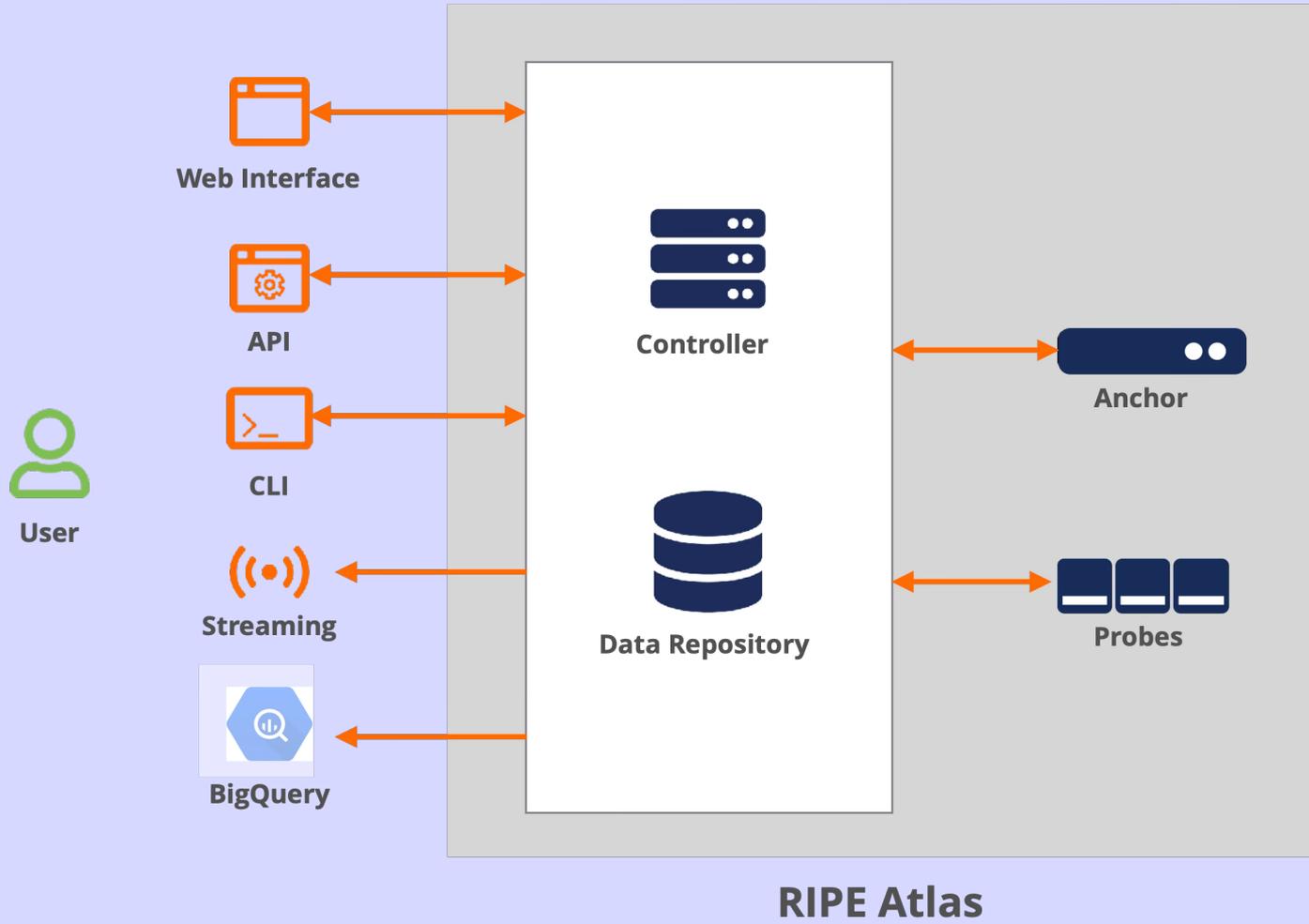


ISP Senior Engineer
Saw it and Found Their
Internal Routing Problem
in a Few Hours

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

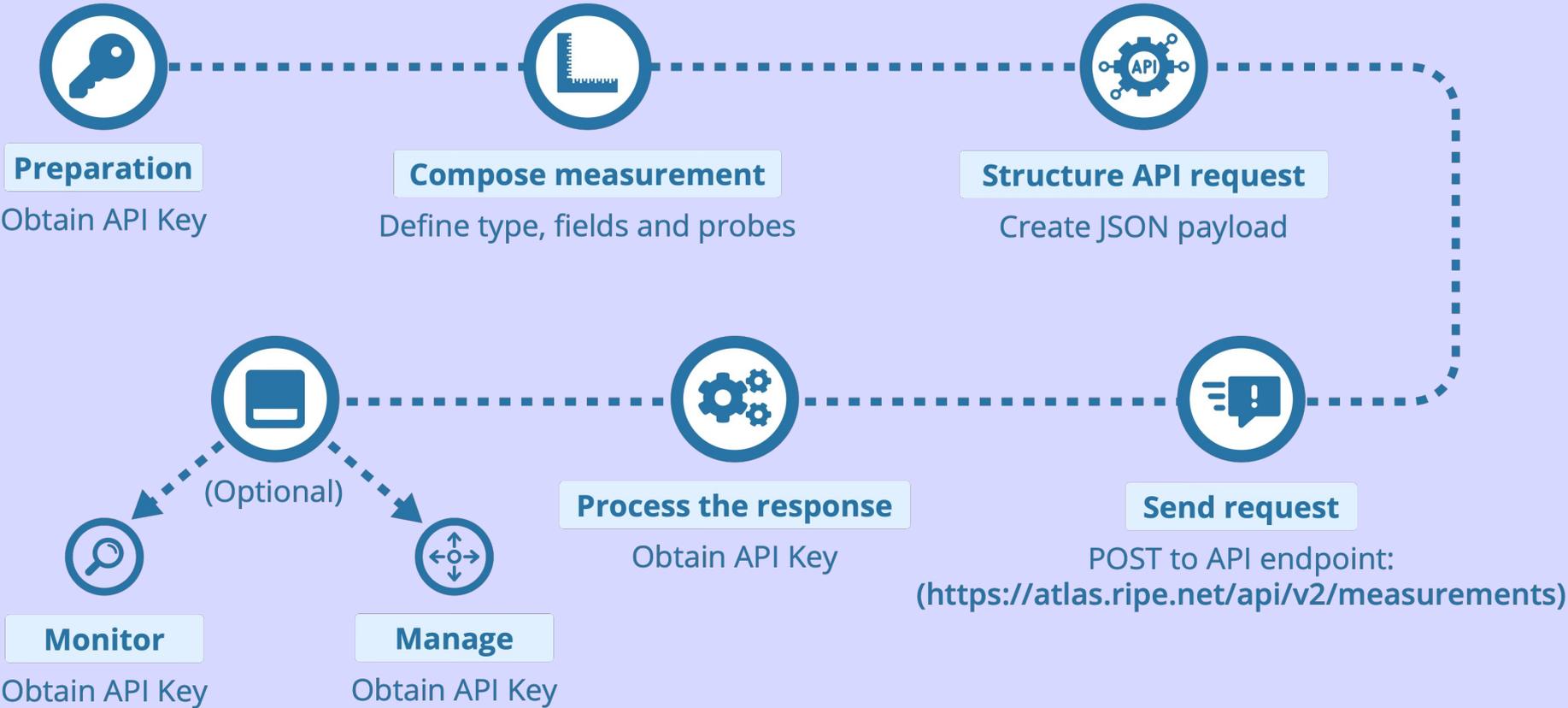
There's an API!!

RIPE Atlas Interfaces



This Slide Stolen from RIPE

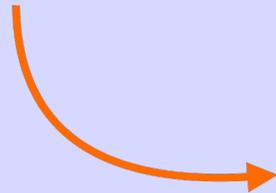
Using the RIPE Atlas API



This Slide Stolen from RIPE

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

This Slide Stolen from RIPE

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 Euros 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

