



RIPE NCC

RIPE NETWORK COORDINATION CENTRE

RIPE Atlas

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Introduction

- [RIPE Atlas](#) is an active Internet measurement network
- Built and operated by the RIPE NCC
- Based on the community to deploy and host vantage points (“probes”)
- Operating since 2010 - almost 14 years now!
- World-wide presence, though the focus is our service region
- Primary objective: support network operations
- Secondary objectives:
 - Understanding the state of the Internet
 - Support research

Main Uses



- To measure a network “target” from virtually anywhere in the world
- Can use ping, traceroute, DNS, NTP, SSL/TLS, and limited HTTP
- Continuous monitoring, anomaly detection
 - When you want to establish a baseline
 - Or monitor planned or unplanned changes, improvements, anomalies, etc.
 - These measurements run periodically
- Ad hoc, immediate tests
 - When there’s a problem to be discovered or understood
 - Support pinpointing where a current problem is, thereby helping recovery

Concepts: Probes



- Variations: hardware (~8200), software (~3500), anchors (~800)
- Hardware
 - Limited supply, one needs to apply to get one
 - We aim to distribute new hardware probes to increase diversity
 - Plug-and-play: auto-configured, automatically updated, no maintenance needed
- Software
 - Same functionality but without the hardware
 - Installable on almost any Linux machine
 - Needs more expertise: run the underlying OS plus upgrade the probe every now and then





Concepts: Anchors

- An anchor is a probe *and* a willing measurement target
- Meant to be installed in the core network with stable connectivity
- Can be hardware or VM
- The OS, the services and the probe firmware is managed by the RIPE NCC
- Automatically measured by every other anchor in a full mesh
 - Ping, traceroute, HTTP
 - Therefore there's a constant data flow about connectivity to the anchor's network





Concepts: Hosts

- Each probe/anchor has a “host” who owns it
- The host is responsible to keep the probe connected
- The host role can be shared within the LIR/ISP
- Hosts earn credits proportionally to the uptime of the probe
- Anyone can host multiple probes
 - Including hardware, software and anchor

Concepts: Measurements



- All measurements have a single target and multiple vantage points
- Periodic measurements:
 - They have a predefined interval
 - The set of probes to use is set at the beginning, can be changed later
 - They can have a predefined start and stop time
 - Relevant use case: monitoring, determining a baseline, tracking changes
- One-off measurements
 - The only run once - most likely “immediately”
 - Response time is measured in seconds
 - Relevant use case: issue resolution, debugging, ad-hoc questions

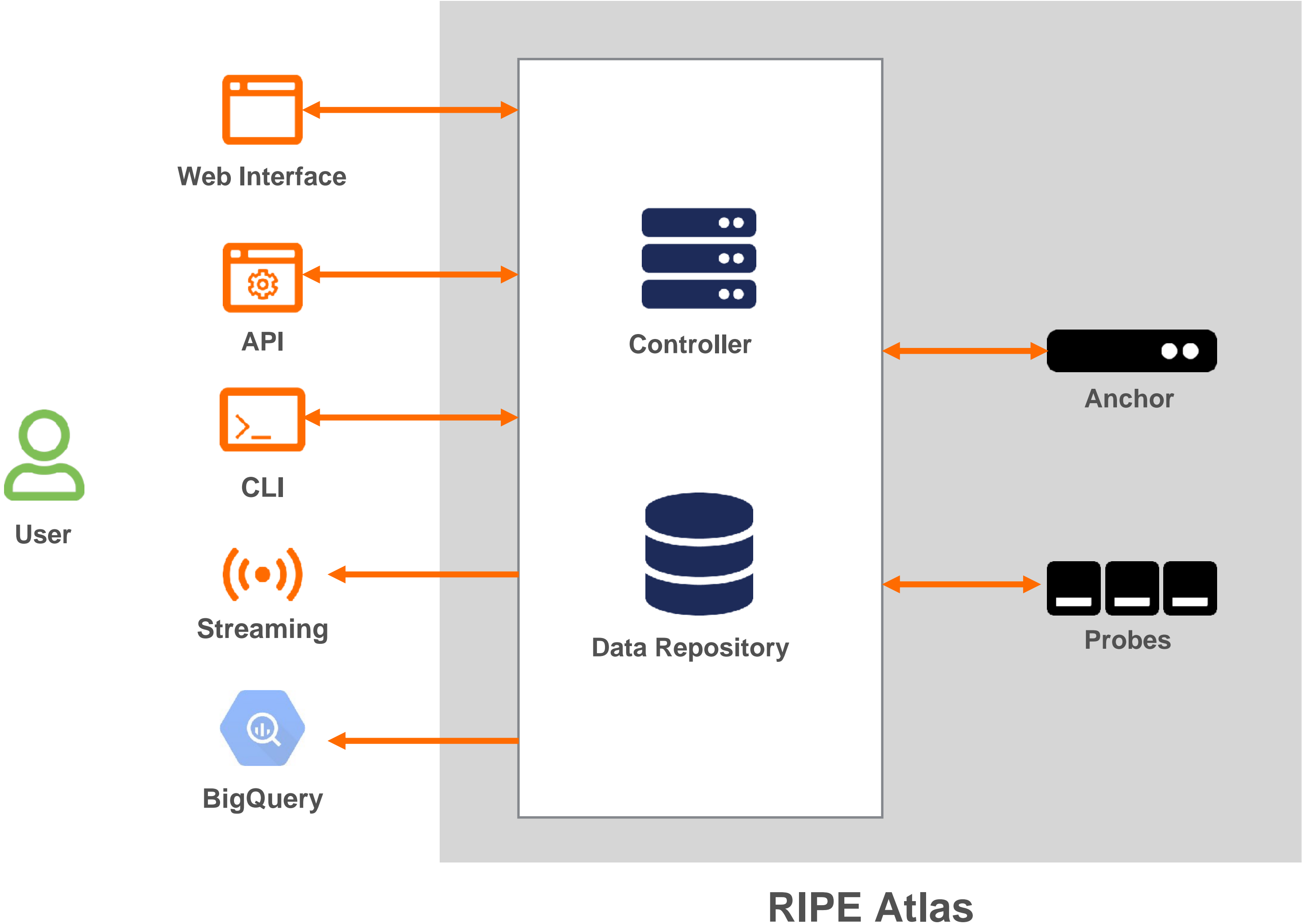
Concepts: Credits



- Measurements cost credits
 - Proportional to the number of results and measurement type
- Credits can be earned:
 - By hosting a probe or anchor
 - By being a RIPE NCC member
 - By being a sponsor
 - By getting a transfer from another user
- Credits can be pooled, given access to, ...



Concepts: Data



Concepts: Ambassadors & Sponsors



- Ambassadors: individuals or institutions
 - Help with the distribution of hardware probes
 - Help spreading the word and supporting (local) users
- Sponsors
 - They provide monetary support for RIPE Atlas. [In return they get:](#)
 - Recognition and visibility in the system
 - A number of hardware probes
 - Becoming time-limited sponsors for other probes - and credits income from that
 - One-off credits
 - Ability to run many anchors

Current Status



you are here



Measurements: Quick Look



QuickLook Measurement

[i](#)
[+](#)

+
-

Last QL: ping to nos.nl on 2024-05-30 10:34

<10ms: 39
<20ms: 26
<30ms: 8
<40ms: 2
<50ms: 1
<100ms: 4
<200ms: 16

<300ms: 1
>300ms: 0
No Data: 0
No Reply: 0
Total: 97

[See Measurement Details](#)

New QuickLook Measurement

Target (IP/Domain)

IPv4

IPv6

Ping

Traceroute

Local

World-wide

CREATE QUICKLOOK

Cost: 600 credits

My Measurements

[+](#)
[i](#)
[+](#)

Search Measurements

✕

| ID | Target | Description | Interval |
|--------------------------|------------|------------------------------|----------|
| 72649614 | nos.nl | QuickLook ping to nos.nl | one-off |
| 72648650 | klarna.com | QuickLook ping to klarna.com | one-off |
| 72130821 | mango.com | QuickLook ping to mango.com | one-off |
| 72091589 | york.ac.uk | QuickLook ping to york.ac.uk | one-off |
| 71841729 | klarna.com | QuickLook ping to klarna.com | one-off |

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Measurement 72649614

QuickLook ping to nos.nl

ONE-OFF PING measurement to nos.nl via IPv4 initiated by YOU.

OVERVIEW
RESULTS
DETAILS

Search Results

[DOWNLOAD RESULTS](#)

| Probe | ASN | Country | Time (UTC) | Min RTT ↑ | Packet Loss |
|-------------------------|-----------------------|---------|---------------------|-----------|-------------|
| 1006184 | 47692 | | No report available | | |
| 1000364 | 38182 | | No report available | | |
| 53025 | 8251 | | 2024-05-30 08:34 | 1.184 ms | 0.00% |
| 1007542 | 24940 | | 2024-05-30 08:34 | 1.204 ms | 0.00% |
| 62645 | 1888 | | 2024-05-30 08:34 | 1.545 ms | 0.00% |
| 51868 | 701 | | 2024-05-30 08:34 | 1.963 ms | 0.00% |
| 1006864 | 3243 | | 2024-05-30 08:34 | 2.064 ms | 0.00% |
| 62748 | 1241 | | 2024-05-30 08:34 | 2.104 ms | 0.00% |
| 53200 | 51661 | | 2024-05-30 08:34 | 2.37 ms | 0.00% |
| 62764 | 1103 | | 2024-05-30 08:34 | 2.664 ms | 0.00% |
| 60237 | 56478 | | 2024-05-30 08:34 | 3.489 ms | 0.00% |
| 1006454 | 3269 | | 2024-05-30 08:34 | 3.746 ms | 0.00% |
| 51053 | 7018 | | 2024-05-30 08:34 | 3.813 ms | 0.00% |
| 62732 | 3320 | | 2024-05-30 08:34 | 3.992 ms | 0.00% |

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Measurements: Specification



Step 1: Definitions

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

PING TRACEROUTE DNS TLS HTTP NTP

PING Configuration

IPv4 IPv6 PING to

Description
Ping measurement to

+ MORE OPTIONS

Common Fields

Tags Frequency 240

Spread Skip DNS Check Resolve on Probe

Ping Specific

Packets 3 Size 48 Packet Interval

Include Probe ID

Measurements: Specification



☰ Step 2: Probe Selection

SEARCH RANDOM BY... ▾ IDS LIST REUSE FROM EXISTING MEASUREMENT

Probe Selection

50 Random Probes AREA: Worldwide (x)

☰ Step 3: Timing

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:

Measurements: Specification



{ } API Spec

WITH CURL COMMAND JSON OBJECT

```
curl -H "Authorization: Key YOURKEY" -H "Content-Type: application/json" -X POST -d '{
"definitions": [
{
"type": "ping",
"af": 4,
"resolve_on_probe": true,
"description": "Ping measurement to ",
"packets": 3,
"size": 48,
"skip_dns_check": false,
"include_probe_id": false,
"interval": 240
}
}
'
```

COPY TO CLIPBOARD

Measurement(s) created! [64841204](#) DISMISS

Measurements: Results



Measurement 21972436
 PERIODIC PING measurement to nl-ams-as286.anchors.atlas.ripe.net via IPv4 initiated by YOU.

LATEST GO

OVERVIEW RESULTS DETAILS MANAGE

Search Results DOWNLOAD RESULTS

| Probe | ASN | Country | Time (UTC) | Min RTT | Packet Loss |
|-------|-------|---------|---------------------|------------|-------------|
| 13907 | 60288 | Hungary | 2024-05-10 12:46:30 | 13.453 ms | 0.00% |
| 22109 | 553 | Germany | 2024-05-10 12:46:26 | 11.774 ms | 0.00% |
| 22706 | 31148 | Ukraine | No report available | | |
| 29658 | 51207 | France | No report available | | |
| 34397 | 42003 | Hungary | No report available | | |
| 50144 | 1136 | Hungary | 2024-05-10 12:46:32 | 19.925 ms | |
| 50543 | 8881 | Germany | 2024-05-10 12:46:38 | 20.200 ms | |
| 50926 | 12083 | USA | 2024-05-10 12:46:29 | 106.172 ms | |
| 51215 | 39083 | Germany | 2024-05-10 12:46:37 | 21.086 ms | |

Measurement 21972436
 PERIODIC PING measurement to nl-ams-as286.anchors.atlas.ripe.net via IPv4 initiated by YOU.

LATEST GO

OVERVIEW RESULTS DETAILS MANAGE

Result summary (latest, as of 2024-05-10 12:46 UTC):
 6 probes reached their target.
 4 probes did not.
 Min RTT: 11.774
 Mean RTT: 32.102

Legend: <10ms: 0, <20ms: 3, <30ms: 2, <40ms: 0, <50ms: 0, <100ms: 0, >200ms: 1, >300ms: 0, >300ms: 0, No Data: 4, No Reply: 0, Total: 10

Measurement 21972436
 PERIODIC PING measurement to nl-ams-as286.anchors.atlas.ripe.net via IPv4 initiated by YOU.

LATEST GO

OVERVIEW RESULTS DETAILS MANAGE

OVERVIEW

- Description: Ping measurement to nl-ams-as286.anchors.atlas.ripe.net
- Family and Type: IPv4 ping
- Target: nl-ams-as286.anchors.atlas.ripe.net
- Resolved on Probe?: No
- Periodic: Yes
- Public or Non-Public: Public

PING SETTINGS

- INCLUDE PROBE ID: false (default)
- PACKET INTERVAL: 1000
- Packets: 3
- Size: 48

STATUS & TIMING

- Requested Start Time: 2019-06-11 09:34
- Current Status: Ongoing
- System Creation Time: 2019-06-11 09:34
- Interval: 240 seconds

OWNERSHIP

- User That Gets Billed: robert@ripe.net
- Measurement Owner: robert@ripe.net
- Editable: true

Measurement 21972436
 PERIODIC PING measurement to nl-ams-as286.anchors.atlas.ripe.net via IPv4 initiated by YOU.

LATEST GO

OVERVIEW RESULTS DETAILS MANAGE

STOP MEASUREMENT **REMOVE PROBES** **ADD PROBES**

Remove all abandoned
 Select probes

Participation Requests

| ID | Created | Type | Value |
|----------|-------------|------|---------|
| 35031632 | 4 years ago | add | area WW |

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LatencyMON



Using the CLIs

- RIPE NCC's Python based tools have been available for some time now:
 - [RIPE Atlas Sagan](#): raw result parser
 - [RIPE Atlas Cousteau](#): API wrapper
 - [RIPE Atlas Magellan](#): command line tools
- New:
 - [goat](#), a Go implementation of an API wrapper / result parser / CLI
 - CLI binaries are available if you don't want to compile
- All these are open source

But Wait, There's More!



- APIs
- LatencyMON, TraceMON
- Data analysis
 - Daily dumps
 - BigQuery
- Related services
 - DNSMON / DomainMON
 - IPmap



Who Knows What The Future Brings?



- Current activities:
 - Renewing the UI and the infrastructure
 - Easier use (packaging) of the probe software package
 - ...
- In 2025:
 - Improve support and simpler access to known use cases
 - Increasing RIPE NCC members' benefits



Questions



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