



RIPE NCC
RIPE NETWORK COORDINATION CENTRE

Infrastructure Geolocation & Openness vs. Security

Robert Kistelevi | CAIDA AIMS 2019



Part I

RIPE IPmap

RIPE IPmap



- **We now have a first production version of our infrastructure geolocation service**
 - **<https://ipmap.ripe.net/>**
 - **It's in a very early stage, needs more work to really make it useful**
 - **Focus was on getting API basics done**
 - **Comes with a UI (separate and included in RIPE Atlas)**

RIPE IPmap



Settings & Status | Latest Results | Map | Tracemon | **IPMap** | Downloads

RIPE IPmap Geolocating Internet Infrastructure

⋮ 212.147.63.218

About | API reference | Manual

● 146.66.232.10	Jönköping,SE-08 Sweden	▼
● 2a01:488:bb::103	Frankfurt am Main,DE-05 Germany	▼
● 212.147.63.218	Zürich,CH-ZH Switzerland	▼

RIPE IPmap



- It can combine multiple inputs to calculate geolocation probabilities
- It can provide the “single best answer” and all alternatives as well
- Current engines include:
 - “single radius”: “triangulation” with RIPE Atlas probes
 - “simple anycast”: anycast detection from anchors
 - “crowdsourced”: user supplied input

RIPE IPmap



- **Plans for future engines include:**
 - **Reverse DNS**
 - **Alias resolution?**
 - **Proximity?**
 - **maybe more**
- **Also, support for “more specific” queries**
- **Perhaps a “visualise this trace” feature**



Part II

Openness vs. Security

Inspiration



From “topics of interest”:

- **Future measurement infrastructure architectures**
 - **resolving tensions between openness and security of measurement platforms**

RIPE Atlas Software Probes



- **There's demand to support this**
- **It allows growth in networks that are otherwise unreachable by physical probe installation**
- **But it has challenges too**
 - **Clients are unverifiable, increased risk of malicious probe — needs more attention to detect bad behaviour**
 - **What's the value of having more probes in already saturated networks?**

RIPE Atlas Software Probes



- **How to steer deployment of new probes into desired networks?**
- **Should there be a vetting procedure for new hosts?**
- **Need to void “fast flux probes”**
- **How do we need to deal with client platform differences?**

Fair Share



- **RIPE Atlas is a multi-user network, we need to enforce reasonable use**
- **Probes can deal with thousands of measurements running, but the hosts' networks may be affected**
- **Each measurement has a cost on the infrastructure too**
- **Therefore there are quotas defined on number of measurements and involved probes, per user**
- **Ultimately we want to use a metric based on “total strain” on the network**

Ethical Considerations



- One also needs to protect the hosts from misuse
 - See enforcing quotas before
 - Also, what kind of measurements are available from the probes is limited
 - E.g. HTTP is available but only towards anchors
 - There is probably more risk higher up in the network stack - but it's getting fuzzier by the day (DoT, DoH, QUIC, ...)
 - We published guidelines for ethical considerations



Questions

