RIPE Atlas for Network Operators

Vesna Manojlovic
BECHA@ripe.net

- Introduction to RIPE Atlas

- Integration with existing monitoring tools

- Real-time monitoring

- Routing and traffic optimisation
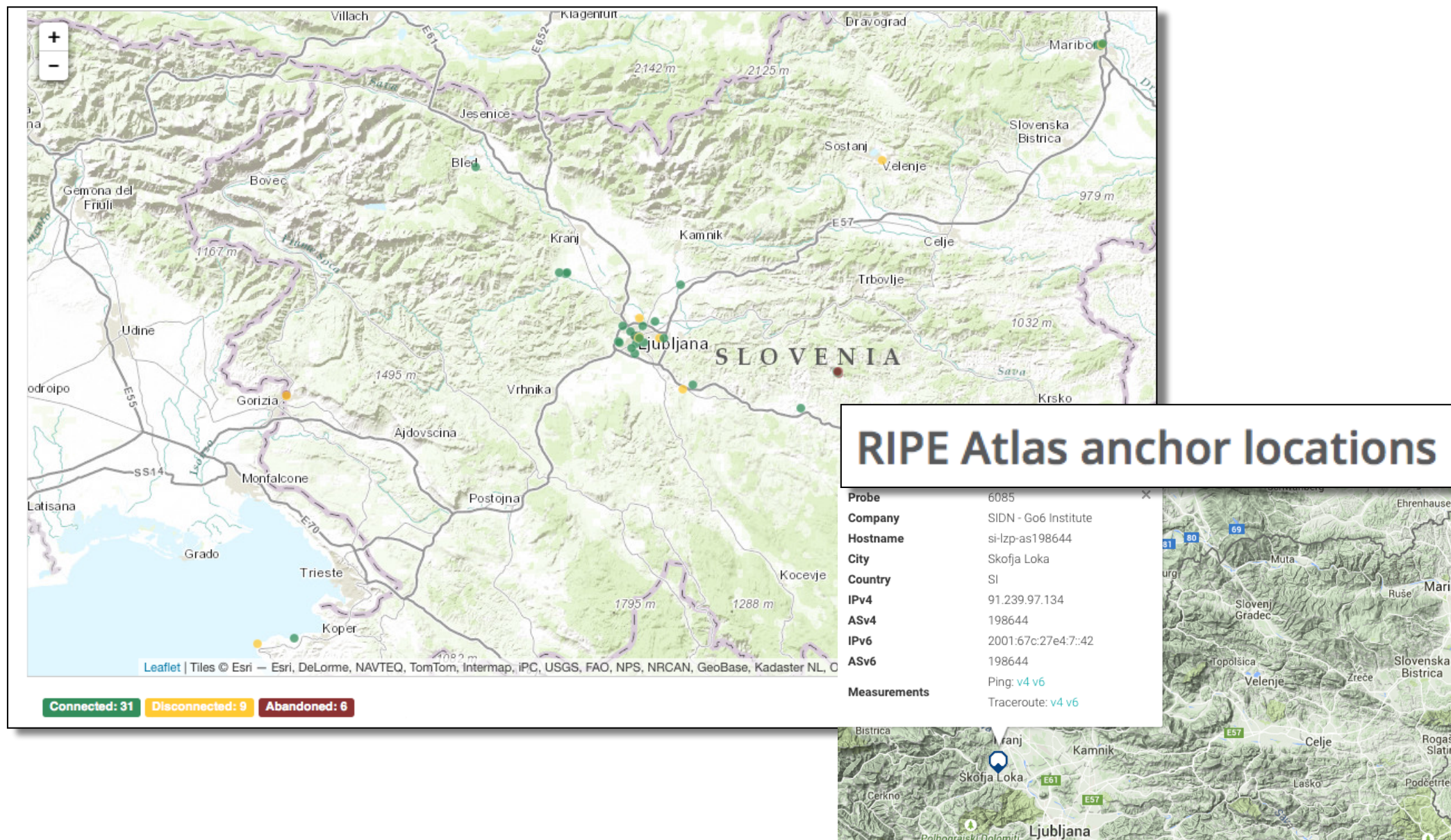
- Keep in touch

- Optional: other views of Slovenia
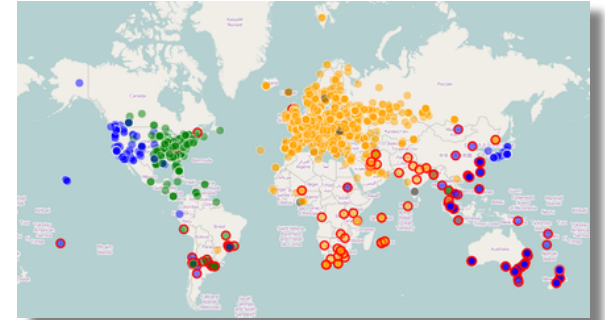
Introduction to RIPE Atlas

- RIPE Atlas = global active measurements platform

- Goal: View Internet reachability

- Probes hosted by volunteers

- Ongoing global measurements towards root name servers

  - Visualised as Internet traffic maps

- Ongoing regional measurements towards "anchors"

- Users can run customised measurements

  - Ping, traceroute, DNS, SSL / TLS and **NTP**

- Data publicly available

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RIPE Atlas coverage

RIPE Atlas anchor locations

Probe	6085
Company	SIDN - Go6 Institute
Hostname	si-lzp-as198644
City	Skofja Loka
Country	SI
IPv4	91.239.97.134
ASv4	198644
IPv6	2001:67c:27e4:7::42
ASv6	198644
Measurements	Ping: v4 v6
	Traceroute: v4 v6

Connected: 31   Disconnected: 9   Abandoned: 6

- **Global** Internet maps: from every probe, automatic

  - Targeting root nameservers

  - Latency to anycasted and fixed destinations

  - Comparing anycast instances

- RIPE Atlas **regional** anchoring measurements

  - Anchors mesh and from 300 probes to each anchor

  - Ping, traceroute, and soon **HTTP**

- Public user-defined measurements

  - From up to 500 probes to a target of users's choice

  - Visualisations provided

  - Raw data available for download

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- Blog posts on RIPE Labs:

  - Presentations at conferences

  - Scientific articles and research papers

  - Tutorials, workshops, academic curriculum

  - https://labs.ripe.net/atlas/user-experiences

- https://labs.ripe.net/Members/emileaben/how-ripe-atlas-helped-wikipedia-users

- https://labs.ripe.net/Members/emileaben/facebookdown-and-what-internet-data

- Individual volunteers hosting a probe in home or office

- Organisations hosting a RIPE Atlas **anchor**

- **Sponsor**ing organisations giving financial support, or hosting multiple probes in own network

- "Frequent flyer" individual **ambassadors** helping distribute probes at conferences, or give presentations

- **Developers** contributing free and open software

- Network operators conducting monitoring and troubleshooting measurements

- Researchers and **students** writing papers

Integration of RIPE Atlas measurements with network monitoring systems

- Operators use tools for monitoring network health
  - For example, Nagios and Icinga

- These tools can receive input from RIPE Atlas via the API

- Benefits:
  - Pings from 500 out of 8,000+ probes around the world
  - See your network from the outside
  - Plug into your existing practices

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1. Create a RIPE Atlas ping measurement

2. Go to "Status Checks" URL

3. Add your alerts in Icinga or Nagios

- Status checks work via RIPE Atlas' RESTful API

  - https://atlas.ripe.net/api/v1/status-checks/
    MEASUREMENT_ID/

- You define the alert parameters, for example:

  - Threshold for the percentage of probes that successfully received a reply

  - How many most recent measurements to base it on

  - What is the maximum packet loss acceptable

- Documentation:

  - https://atlas.ripe.net/docs/status-checks/

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- Operators contributed configuration code!
  - Making use of the built-in "check_http" plugin

- GitHub repo examples:
  - https://github.com/RIPE-Atlas-Community/ripe-atlas-community-contrib/blob/master/scripts_for_nagios_icinga_alerts


- Post on Icinga blog:
  - https://www.icinga.org/2014/03/05/monitoring-ripe-atlas-status-with-icinga-2/

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Real-time monitoring

- RIPE Atlas streaming is an architecture that allows users to receive the measurement results as soon as they are sent by the probes - in real time

  - Publish/subscribe through sockets

- There are two types of data

  - Measurements results

  - Probe connection status events

- Server and performance monitoring

- Visualising network outages

- March 2015: used by almost all hackathon teams:

  - https://labs.ripe.net/Members/becha/ripe-atlas-hackathon-results

- Documentation:

  - https://atlas.ripe.net/docs/result-streaming/

  - https://labs.ripe.net/Members/suzanne_taylor_muzzin/data-streaming-in-ripe-atlas

Probe (dis)connection events
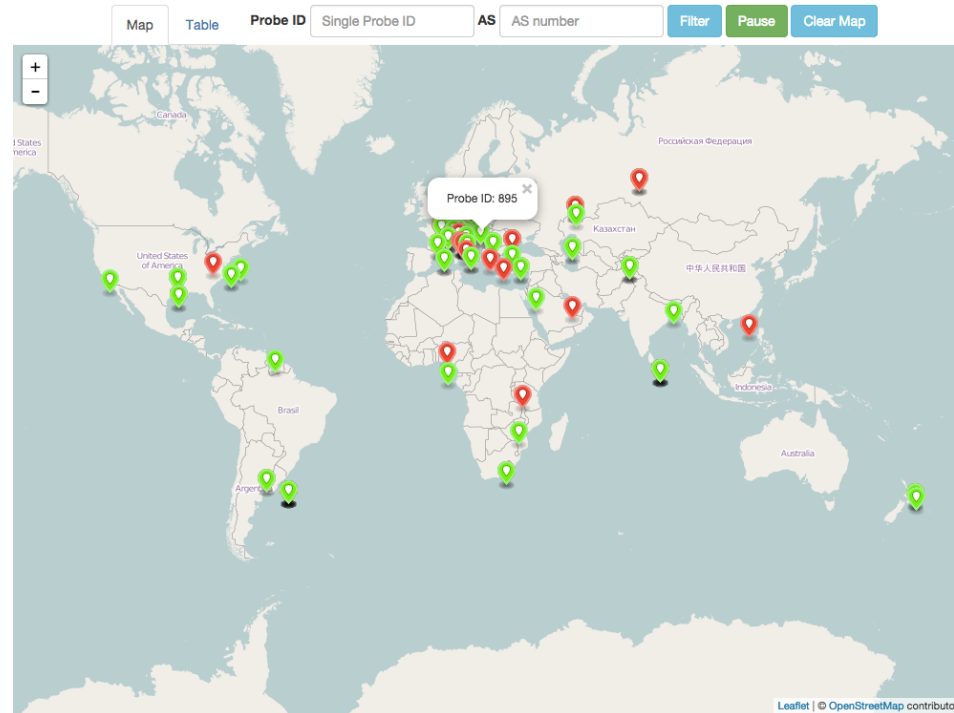
- https://labs.ripe.net/Members/andreas_strikos/amsterdam-power-outage-as-seen-by-ripe-atlas

- https://labs.ripe.net/Members/kistel/the-ams-ix-outage-as-seen-with-ripe-atlas

- Scenario: customers are complaining that it takes a long time to reach your service/server occasionally

- Action: ping your server from 500 probes
  - Decide what is acceptable latency threshold to apply
  - Notice and react when you start receiving samples

- Use web sockets to catch and visualise results

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IXP-Country-Jedi

Benefits (part 1)
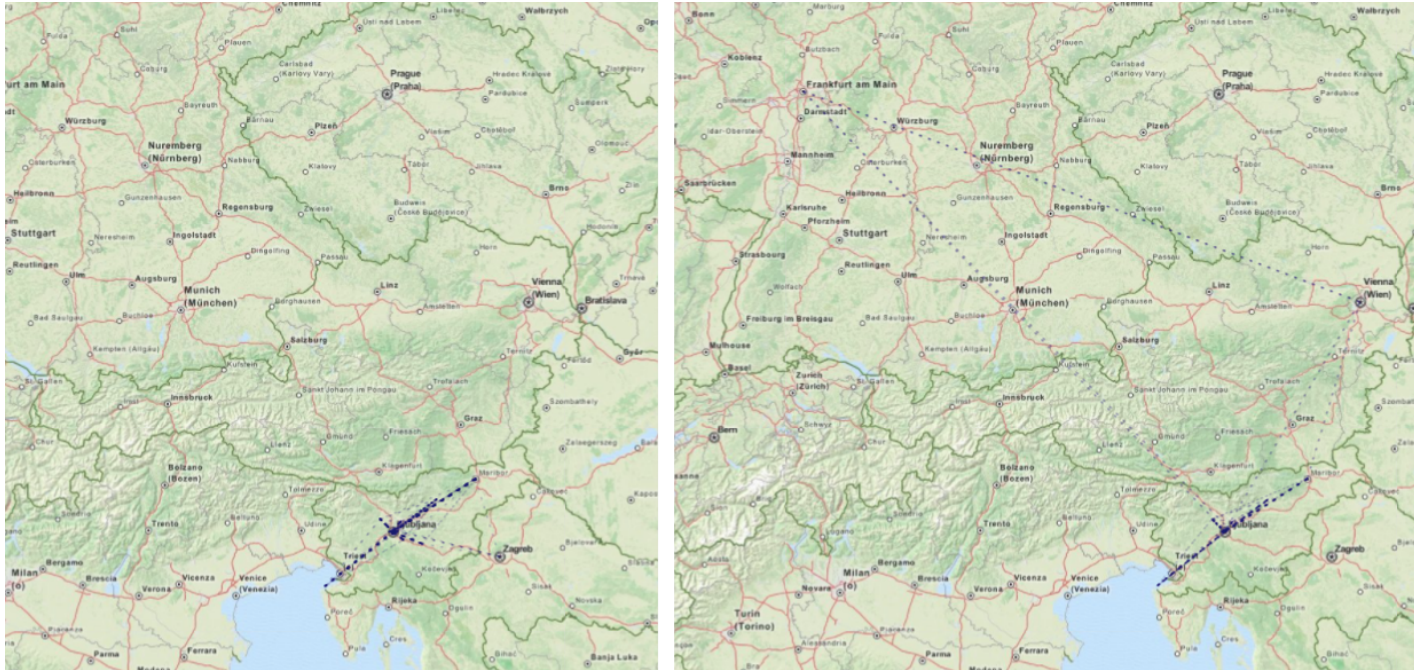
- Operators

  - Routing and traffic optimisation

- IXP operators

  - Shows how IXPs help to keep traffic local and regional

- IPv6 advocates

  - Comparing IPv4 and IPv6 paths

- Country level: regulators, politicians, cyber-security…

  - How much traffic stays within the country? where do the paths go?

  - Comparing countries performance with each other

- RIPE Atlas community

  - More probes in more networks = higher quality of measurements data

- Geolocation data community

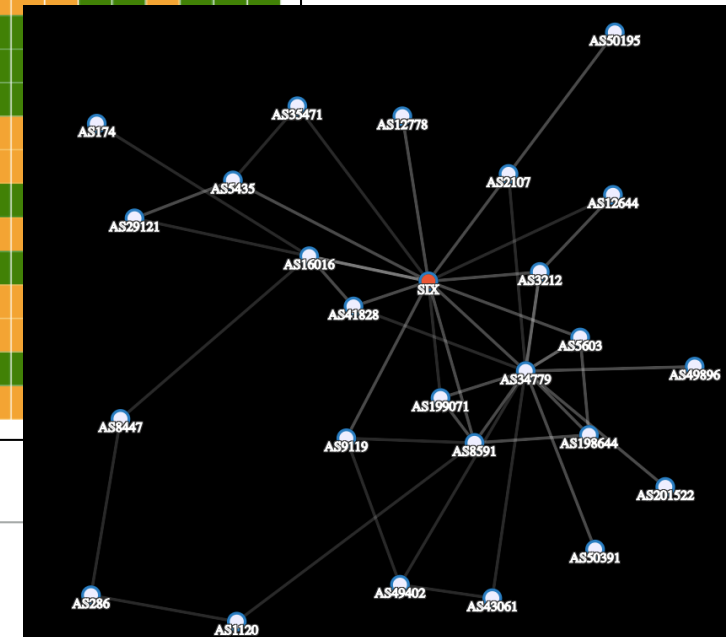 - Use case for improving the data quality
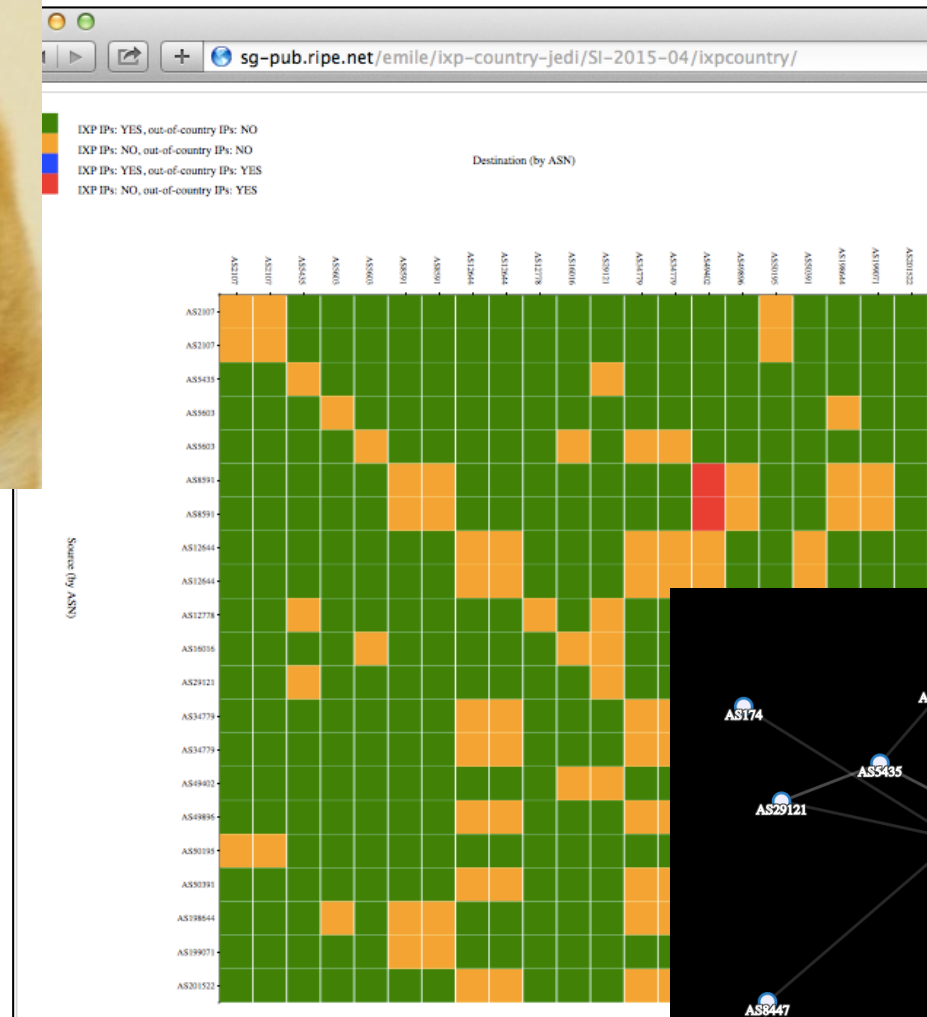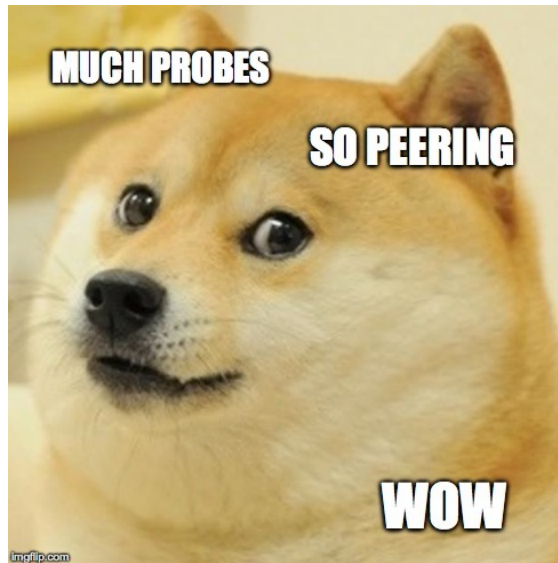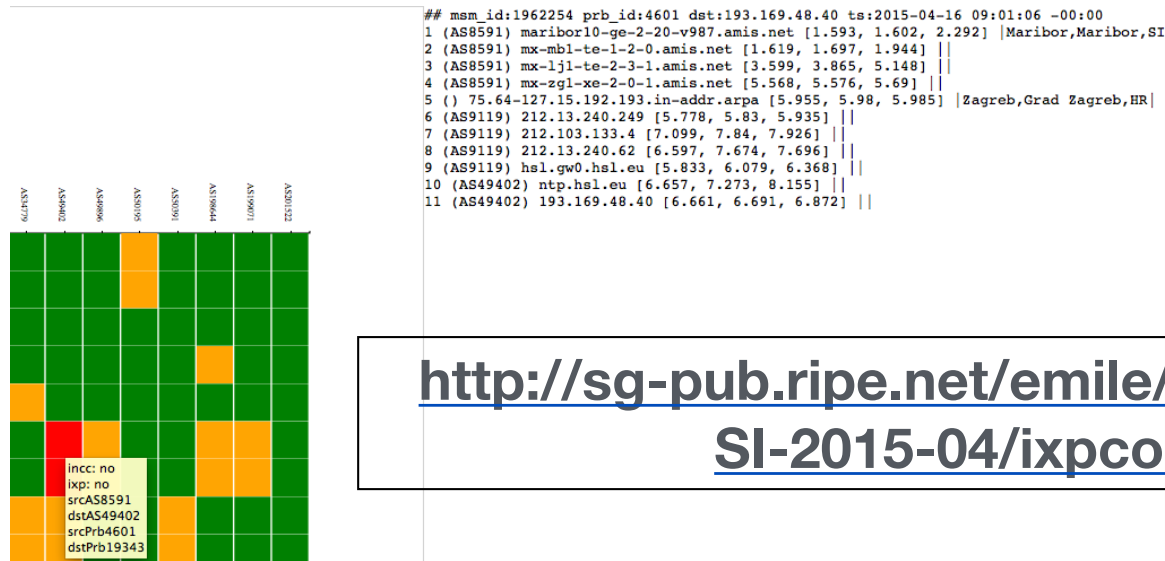
- Difference between IPv4 and IPv6 paths

- http://sg-pub.ripe.net/emile/ixp-country-jedi/**SI**-2015-04/
geopath/s/**SI**/{RO, BG, HR, BA, ME, AL, GR}/

- http://sg-pub.ripe.net/emile/ixp-country-jedi/SI-2015-04/ixpcountry/

Interactive diagnostic tool

```
## msm_id:1962254 prb_id:4601 dst:193.169.48.40 ts:2015-04-16 09:01:06 -00:00
1 (AS8591) maribor10-ge-2-20-v987.amis.net [1.593, 1.602, 2.292] |Maribor,Maribor,SI
2 (AS8591) mx-mb1-te-1-2-0.amis.net [1.619, 1.697, 1.944] ||
3 (AS8591) mx-lj1-te-2-3-1.amis.net [3.599, 3.865, 5.148] ||
4 (AS8591) mx-zg1-xe-2-0-1.amis.net [5.568, 5.576, 5.69] ||
5 () 75.64-127.15.192.193.in-addr.arpa [5.955, 5.98, 5.985] |Zagreb,Grad Zagreb,HR|
6 (AS9119) 212.13.240.249 [5.778, 5.83, 5.935] ||
7 (AS9119) 212.103.133.4 [7.099, 7.84, 7.926] ||
8 (AS9119) 212.13.240.62 [6.597, 7.674, 7.696] ||
9 (AS9119) hsl.gw0.hsl.eu [5.833, 6.079, 6.368] ||
10 (AS49402) ntp.hsl.eu [6.657, 7.273, 8.155] ||
11 (AS49402) 193.169.48.40 [6.661, 6.691, 6.872] ||
```

http://sg-pub.ripe.net/emile/ixp-country-jedi/
SI-2015-04/ixpcountry/

incc: no
ixp: no
srcAS8591
dstAS49402
srcPrb4601
dstPrb19343

- Green is "good" - as far as we can see it

  - Not a judgment, only one way of visualising data

- Red or blue field: the path is going out of country

  - If this is a surprise: talk to your upstream(s)

- Yellow field: the path that is not going via a local IXP

  - If this is undesired: make a new peering agreement

- traceroute measurements using RIPE Atlas probes

- Steps:

  - Identify ASNs in the country using RIPEstat

  - Identify IXPs and IXP LANs using PeeringDB

  - Construct mesh: from all (*) country probes to each other

    - (*) Max. two probes per ANS; only "public" probes with "good" GeoLoc

- Hops geolocated using "OpenIPMap" database

- Use this tool to find possible suboptimal routing and fix it

  - Find your ASN in the mesh

  - Find the person from another ASN

  - Take them out for tea :)

- To improve accuracy of this diagnostic tool

  - If your ASN is not on the graph, apply for RIPE Atlas probe

  - Add more probes to your country to increase "resolution"

  - If you move, remember to update your probe's geolocation

- Re-use and re-write all the code: it is free and open source software

  - https://github.com/emileaben/ixp-country-jedi

- Improve infrastructure geolocation: contribute data to OpenIPMap!

  - https://marmot.ripe.net/openipmap/

  - https://github.com/RIPE-Atlas-Community/openipmap

Take part and keep in touch

- New measurement types

  - HTTP measurements towards anchors

  - WiFi probe

- APIs for anchors, anchoring measurements

- Data streaming access to historical data

- Security review

- Webinar coming up: 2nd July!

- Expansion goals: 150 anchors, 10,000 active probes

- http://roadmap.ripe.net/ripe-atlas/

- For individuals: host a probe (one per ASN!)

- For organisations:

  - Host an anchor

  - Sponsor RIPE Atlas

- Help us distribute probes: become an ambassador

- For developers:

  - Contribute to community code on GitHub

  - https://github.com/emileaben/ixp-country-jedi

- Network operators:

  - Use RIPE Atlas and let us know your feedback

- https://atlas.ripe.net

- Mailing list for active users: ripe-atlas@ripe.net

- Articles and updates: https://labs.ripe.net/atlas

- Questions: atlas@ripe.net

- Twitter: @RIPE_Atlas and #RIPEAtlas

Vesna Manojlovic - SINOG 2 - 10 June 2015

Other views of Slovenia

- http://ipv6ripeness.ripe.net/4star/SI.html (21 LIRs)

- http://ipv6ripeness.ripe.net/5star/SI.html (7 LIRs)

Slovenia (59 LIRs)
- 4 stars: 21 (35%)
- 3 stars: 13 (22%)
- no IPv6: 4 (6%)
- 2 stars: 7 (11%)
- 1 star: 14 (23%)

Spain (509 LIRs)
- 2 stars: 64 (12%)
- 3 stars: 54 (10%)
- 4 stars: 48 (9%)
- 1 star: 199 (39%)
- no IPv6: 144 (28%)

Switzerland (415 LIRs)
- 3 stars: 89 (21%)
- 4 stars: 109 (26%)
- 2 stars: 36 (8%)
- no IPv6: 82 (19%)
- 1 star: 99 (23%)

Serbia (82 LIRs)
- 2 stars: 5 (6%)
- 3 stars: 8 (9%)
- 1 star: 25 (30%)
- 4 stars: 13 (15%)
- no IPv6: 31 (37%)
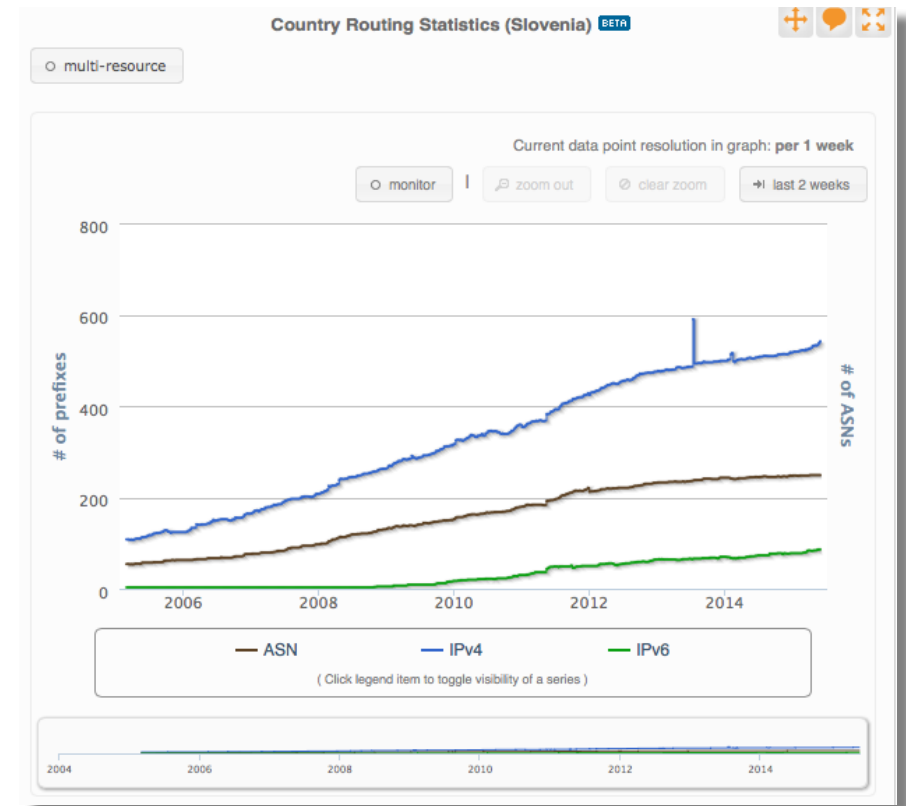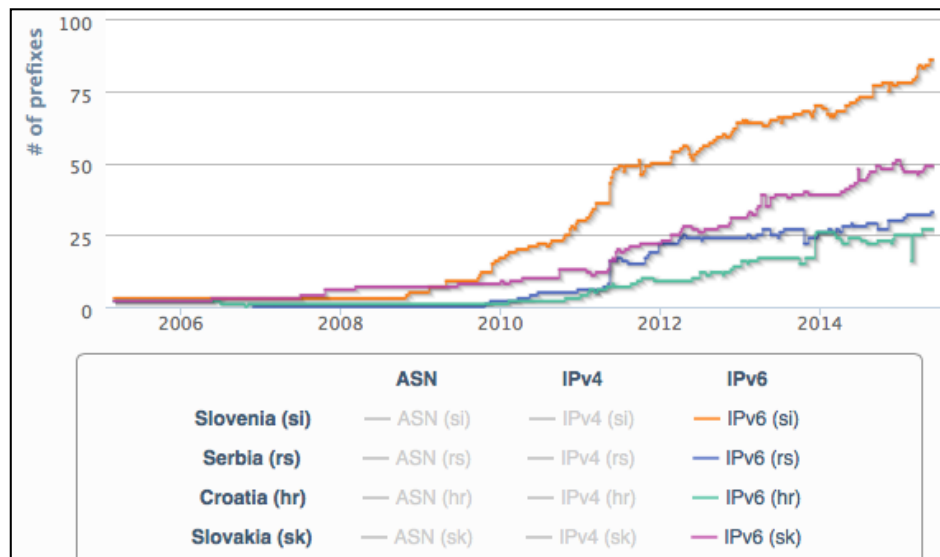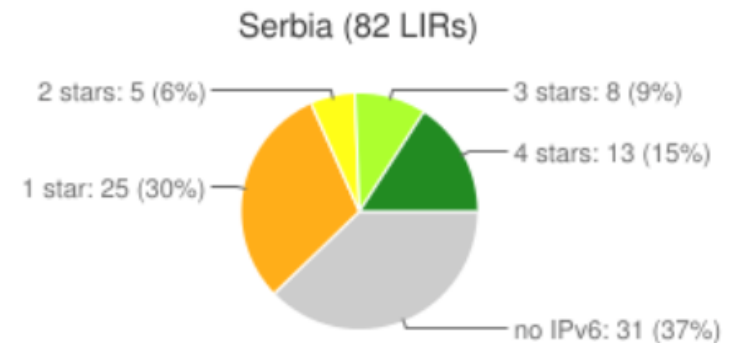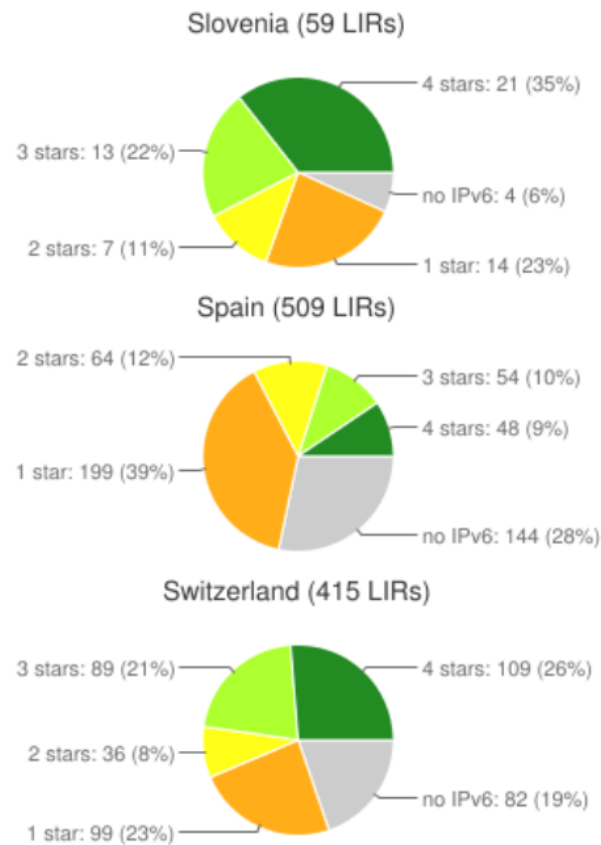
Access (last 6 months)	Access (last month)	ContentLIR	
23.6 %	27.9 %	43.2 %	ARNES
		100.0 %	RTV Slovenija
		28.2 %	SGN d.o.o.
		14.5 %	TUSMOBIL D.O.O.
		35.4 %	Telekom Slovenije d.d.
		100.0 %	Telekom Slovenije, d.d.
100.0 %		100.0 %	Univerza v Mariboru

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