Using RIPE Atlas and RIPEstat to detect network outage events

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RIPE Atlas

From Wikipedia, the free encyclopedia

RIPE Atlas is a global, open, distributed Internet measurement platform, consisting of thousands of measurement devices that measure Internet connectivity in real time.

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RIPE Atlas in Nepal

Anchor Details
Hostname: np-ktm-as45170
Contact details in RIPE Database: AA28929-RIPE

<table>
<thead>
<tr>
<th>Anchoring Measurements</th>
<th>IPv4</th>
<th>IPv6</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ping</td>
<td>1891019</td>
<td>1891021</td>
<td>Compare v4/v6</td>
</tr>
<tr>
<td>Traceroute</td>
<td>1891018</td>
<td>1891020</td>
<td>Compare v4/v6</td>
</tr>
<tr>
<td>HTTP</td>
<td>2841552</td>
<td>2841553</td>
<td>Compare v4/v6</td>
</tr>
</tbody>
</table>

Hosted by: NPIX

Sponsored by: APNIC
**IXP Country Jedi**

- Tool & concept by Emile Aben
  - [https://github.com/emileaben/ixp-country-jedi](https://github.com/emileaben/ixp-country-jedi)
  - [https://labs.ripe.net/Members/emileaben/measuring-ixps-with-ripe-atlas](https://labs.ripe.net/Members/emileaben/measuring-ixps-with-ripe-atlas)

- traceroute mesh between RIPE Atlas probes
After the quake

- Immediately after the earthquake, Martin Levy looked at the RIPE Atlas anchor in Nepal:

- [https://atlas.ripe.net/measurements/1891019/#!seismograph](https://atlas.ripe.net/measurements/1891019/#!seismograph)

- How to use this tool
Lessons from ping analysis

• Two big dips, then recovery

• Conclusion: some probes were offline or lost internet connectivity, others stayed up most of the time and had at least partial connectivity

- Analysis by

Rene Wilhelm
Looking at LatencyMON

• “Anchoring measurement”, historical view

• https://atlas.ripe.net/probes/6114/
Three outages & recoveries

- Looking at measurements from local probes to the anchor gives more detailed picture
Historical view, big picture

- Same anchoring msm., different visualization
- 25.May - 1.July, anchor was down?
CartoDB visualization

- https://astrikos.cartodb.com/viz/cb71d3d6-b841-11e5-9f13-0e31c9be1b51/public_map
Own service monitoring: Icinga

1. Create a RIPE Atlas ping measurement

2. Go to “Status Checks” URL
   - [https://atlas.ripe.net/api/v1/status-checks/MEASUREMENT_ID/](https://atlas.ripe.net/api/v1/status-checks/MEASUREMENT_ID/)
   - configure alert parameters (RESTful API)
   - [https://atlas.ripe.net/docs/status-checks/](https://atlas.ripe.net/docs/status-checks/)

3. Add your alerts in Nagios or Icinga
   - Making use of the built-in “check_http” plugin
   - [Examples on GitHub](https://github.com/Rose-Hill/Icinga-Examples)
Looking at the routing (RIPEstat)
Routing history (RIPEstat)
BGPlay

- Part of RIPEstat
- Based on RIS
- Video of route announcements and withdrawals
- Historical view!
- Link
Conclusions

• You too can do the outage monitoring!
• Global and regional results available to all registered users, free of charge
• Powerful visualizations available

• For customized RIPE Atlas measurements: spend “credits”
  - earning credits by hosting a probe or an anchor
RIPE Atlas news
During 2015

- Active probes increased from 7,500 to 9,200
- Probes shipped: 3,500
- RIPE Atlas anchors grew from 100 to 162
- Active users: 10,000 last year, 5,000 last quarter
- Measurements: on average 150,000 per month
RIPE Atlas Coverage

- Countries covered: 181
- Originating ASNs covered:
  - 3,333 (IPv4) = 6.33%
  - 1,212 (IPv6) = 11.22%

<table>
<thead>
<tr>
<th>Country</th>
<th>Probes</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States of America</td>
<td>1032</td>
</tr>
<tr>
<td>Germany</td>
<td>966</td>
</tr>
<tr>
<td>France</td>
<td>772</td>
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<td>United Kingdom</td>
<td>610</td>
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<td>Netherlands</td>
<td>514</td>
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<td>Russia</td>
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<tr>
<td>Czech Republic</td>
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<td>Italy</td>
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<tr>
<td>Switzerland</td>
<td>256</td>
</tr>
<tr>
<td>Ukraine</td>
<td>220</td>
</tr>
</tbody>
</table>
Community News for 2015

• Nine sponsors, one already for 2016
• 300 active ambassadors, at many conferences
• Using GitHub for multilingual documentation
• Introduced webinars: four in total
• IP Journal issue describing RIPE Atlas published
• RIPE Atlas Wikipedia article
• Two hackathons, impressive results
  - https://labs.ripe.net/ Members/becha/ripe-atlas-tools-hackathon-results
We are Grateful to our Sponsors

2016

COMCAST

2015

facebook  COMCAST  GÉANT

ICANN  VOCUS  Akamai
Thank You, RIPE Atlas Anchor Hosts!

We appreciate the support of the following RIPE Atlas anchor hosts:
Newest Feature: CLI Tools

- Command-line interface to RIPE Atlas API
  - Simple, familiar usage from the terminal
  - Human-readable results

- Open-source development: [code on GitHub](https://ripe-atlas-tools.readthedocs.org/)

- Documentation: [https://ripe-atlas-tools.readthedocs.org/](https://ripe-atlas-tools.readthedocs.org/)

- Included in the Linux / *BSD distributions: OpenBSD, FreeBSD, Gentoo & Arch
  - in progress: Debian & Fedora
  - join & contribute!
More New Features

- HTTP measurements to anchors
- “Time Travel”
- LatencyMON
- DomainMON
- Sharing your probe with a group
- Whitelisting and blacklisting targets, on request
- Other recent features: RIPE Labs article
Most Popular Features

• Six types of measurements: ping, traceroute, DNS, SSL/TLS, NTP and HTTP
• Streaming data: real-time results available
• Compressed data download available
• APIs for getting results & starting measurements
• Powerful & informative visualizations provided
Famous Use Cases

• DNS
  - Root nameservers performance analysis (F-root, K-root)
  - Monitoring ccTLDs (DSNMON)
  - Censorship

• Visualising impact of IXP on localising paths

• Evidence: peering at IXP improves performance

• Checking connectivity using anchors

• …and many, many research papers
Upcoming New Features

• Adding more DNSMON zones
• Sharing credits with colleagues
• WiFi measurements
• Testing VM probe
• OpenIPMap-as-a-service
• Roadmap has a new home:
  - https://atlas.ripe.net/docs/roadmap/
Take Part!

• Use RIPE Atlas for your operations: monitoring, troubleshooting

• Do scientific research

• Contribute to the code

• Participate in a webinar

• Become an ambassador or a sponsor

• Host a RIPE Atlas anchor, or place a probe in a new exotic location
Moar Hackathons!!!

• Join the hackathons in 2016
  - Before each RIPE Meeting - save the dates!
  - 21-22 May, Copenhagen
  - 22-23 October, Madrid
• Students & researchers:
  - present your Internet-related research at RIPE Meetings
  - complimentary tickets, travel and accommodation provided
  - topics: network measurement and analysis, security, IPv6 deployment, BGP routing, Internet governance, peering and interconnectivity

• ripe.net/raci
Stay in Touch with RIPE Atlas

• Mailing list: ripe-atlas@ripe.net
• Blog: https://labs.ripe.net/atlas
• Questions: atlas@ripe.net
• Twitter: @RIPE_Atlas / #RIPEAtlas
• https://atlas.ripe.net
Other outages visualizations
Outages at the core: AMS-IX, Level3

- https://labs.ripe.net/Members/emileaben/does-the-internet-route-around-damage
Countries: .TR, .KP, .IR

https://labs.ripe.net/Members/emileaben/iran-and-k-root-the-rest-of-the-story
https://labs.ripe.net/Members/emileaben/a-ripe-atlas-view-of-internet-meddling-in-turkey
Power outage in Amsterdam

https://labs.ripe.net/Members/andreas_strikos/amsterdam-power-outage-as-seen-by-ripe-atlas

https://cartodb-basemaps-2.global.ssl.fastly.net/light_all/9/261/168.png

https://www.youtube.com/watch?v=AEje32hQFnU&feature=youtu.be
TWC, ASM-IX & Facebook outages

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

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

https://labs.ripe.net/Members/emileaben/time-warner-cable-outage
Natural disasters: Haiyan, Sandy, Pam

https://labs.ripe.net/Members/emileaben/ripe-atlas-hurricane-sandy-global-effects

https://labs.ripe.net/Members/emileaben/typhoon-haiyan-what-we-see-in-ripestat-and-ripe-atlas