

#### Using RIPE Atlas and RIPEstat to detect network outage events

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Vesna Manojlovic | 25 January 2016 | SANOG27

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#### **RIPE** Atlas

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**RIPE Atlas** Atlas Riper 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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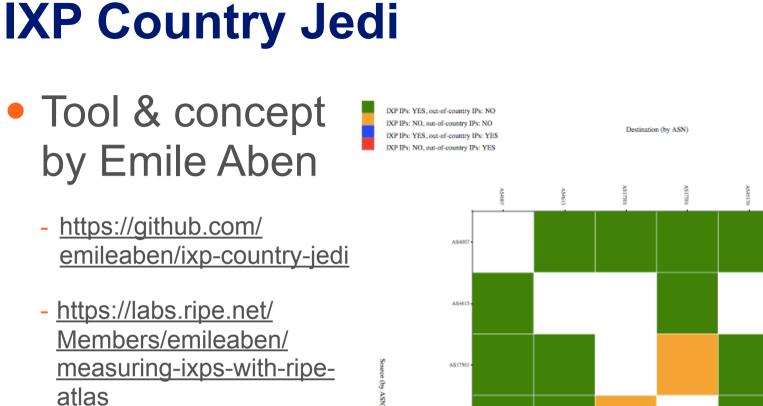
## **RIPE Atlas in Nepal**

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Connected: 10 Disconnected: 7 Abandoned: 0

#### by Emile Aben

- https://github.com/ emileaben/ixp-country-jedi
- https://labs.ripe.net/ Members/emileaben/ measuring-ixps-with-ripeatlas
- traceroute mesh between RIPE Atlas probes



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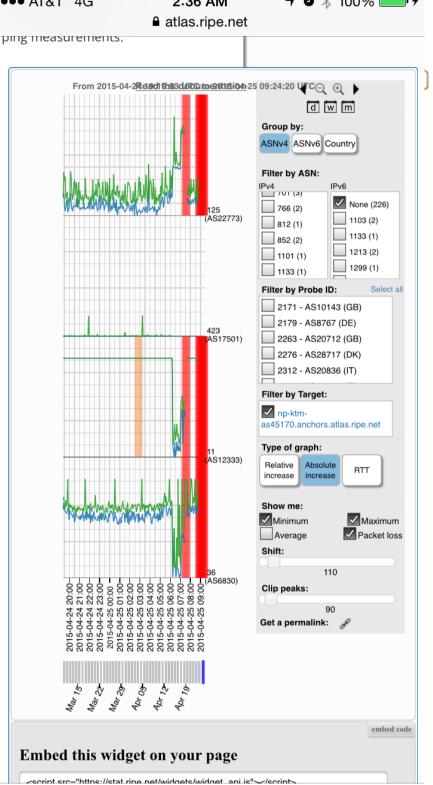


#### After the quake

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

https://atlas.ripe.net/ measurements/1891019/#! seismograph

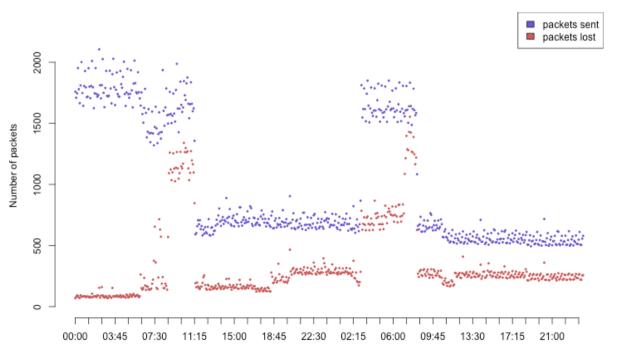
How to use this tool



#### Lessons from ping analysis

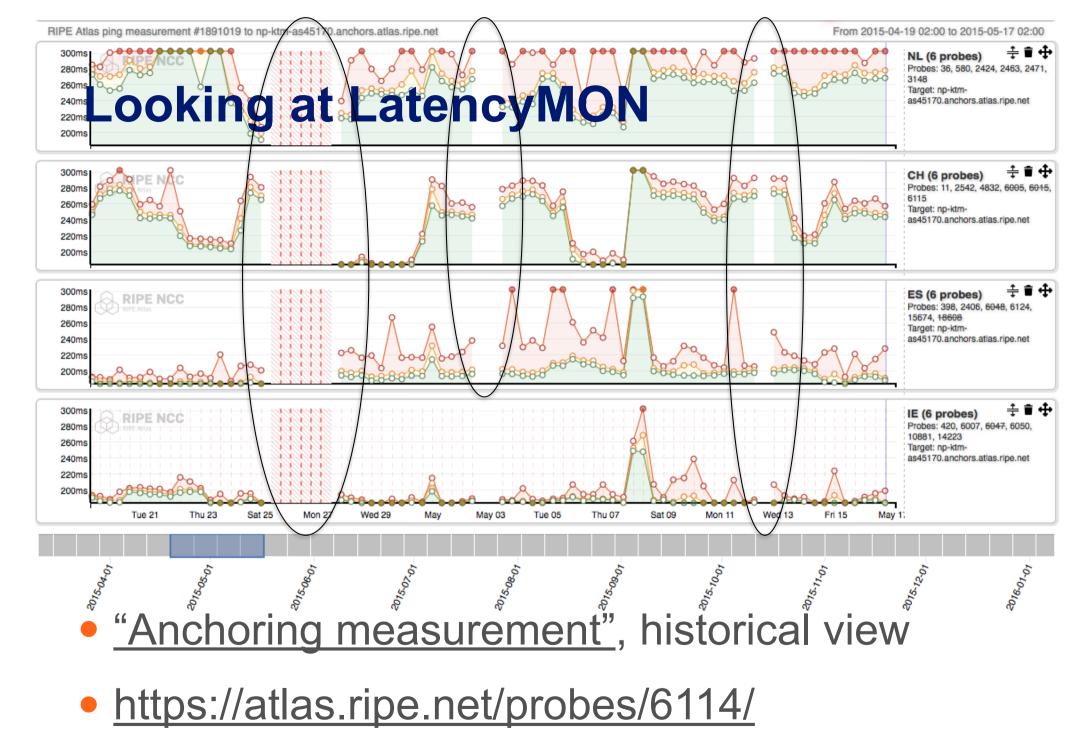


- Two big dips, then recovery
- Conclusion: some probes were offline or lost internet connectivity, others stayed up most of the time and had at least partial connectivity
  - Analysis by



Ping results from Nepalese Atlas probes 25-26 April 2015

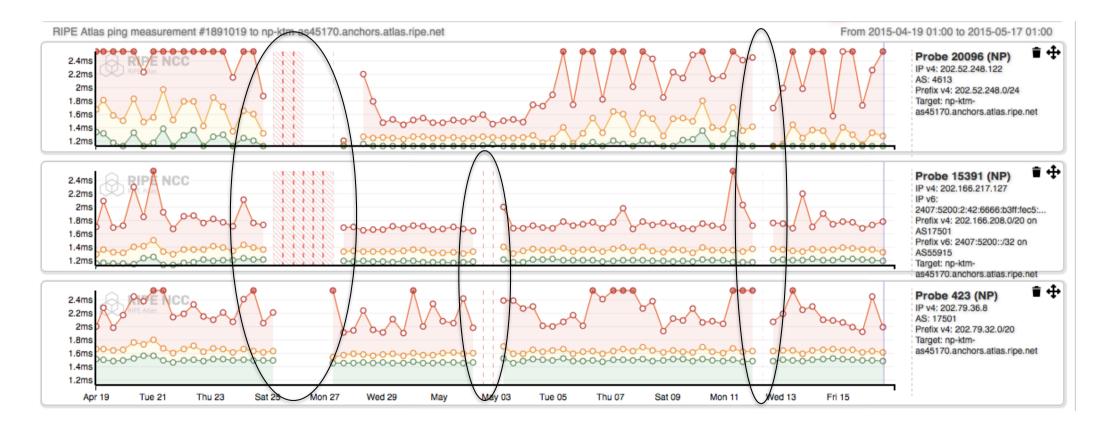
Rene Wilhelm



#### **Three outages & recoveries**



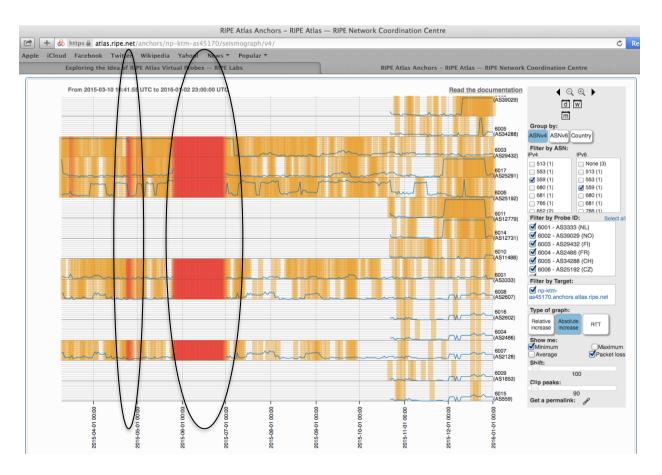
 Looking at measurements from local probes to the anchor gives more detailed picture



#### Historical view, big picture



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



#### **CartoDB** visualization



## <u>https://astrikos.cartodb.com/viz/cb71d3d6-</u> <u>b841-11e5-9f13-0e31c9be1b51/public\_map</u>

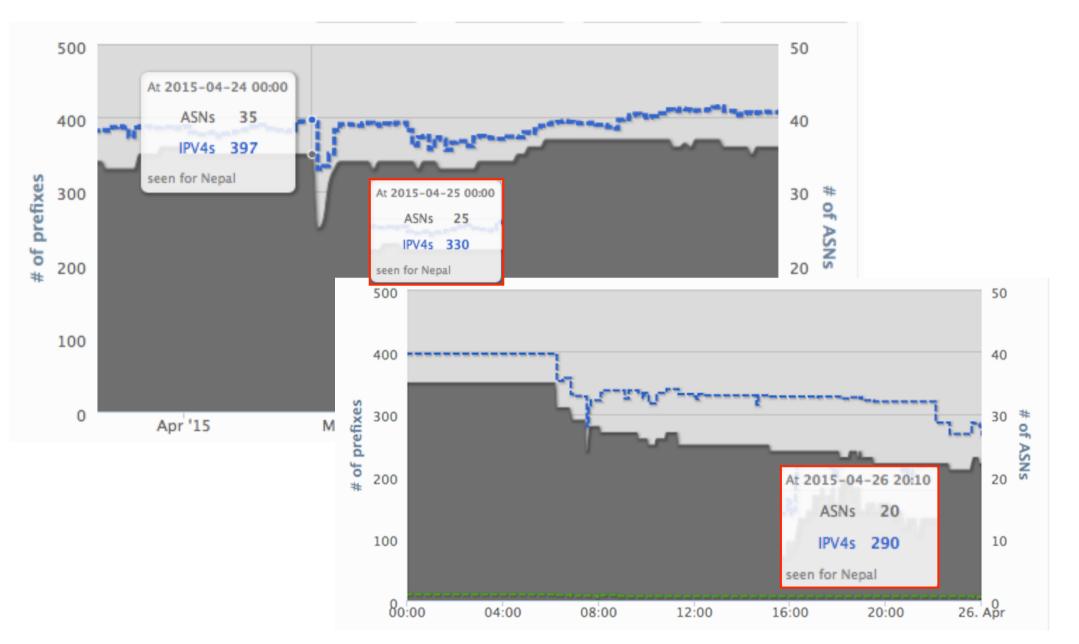
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#### **Own service monitoring: Icinga**



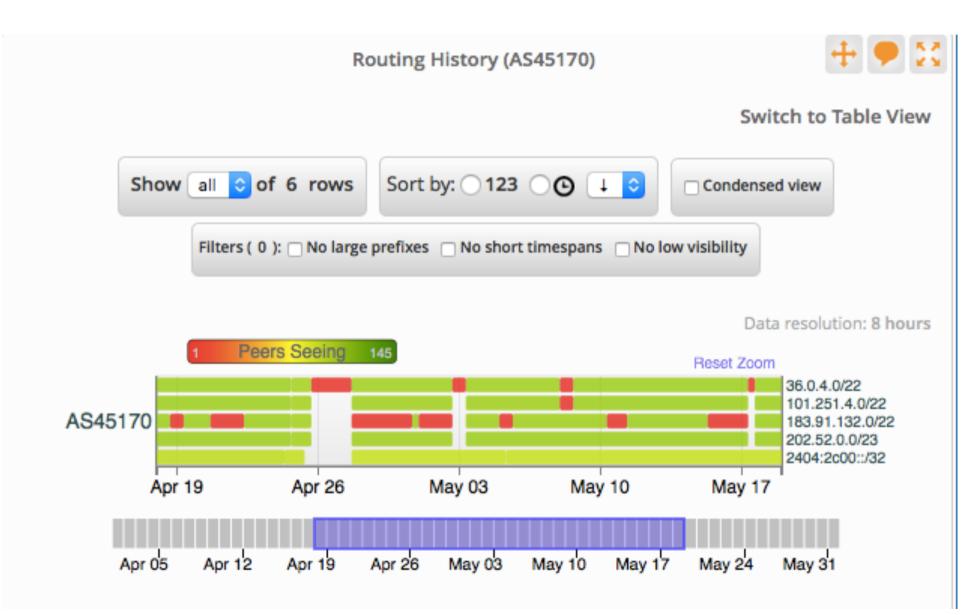
- 1. Create a RIPE Atlas ping measurement
- 2. Go to "Status Checks" URL
  - <u>https://atlas.ripe.net/api/v1/status-checks/MEASUREMENT\_ID/</u>
  - configure alert parameters (RESTful API)
  - <u>https://atlas.ripe.net/docs/status-checks/</u>
- 3. Add your alerts in Nagios or Icinga
  - Making use of the built-in "check\_http" plugin
  - Examples on GitHub

#### Looking at the routing (RIPEstat)



#### **Routing history (RIPEstat)**

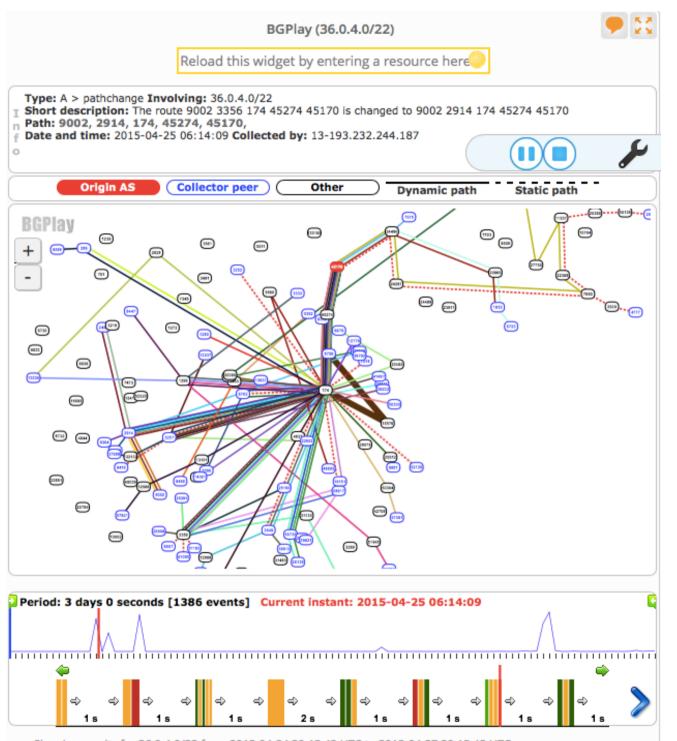




#### **BGPlay**

- <u>Part of</u>
  <u>RIPEstat</u>
- Based on RIS
- Video of route announcements and withdrawals
- Historical view!

Link



#### DNS responses for np.







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#### 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%



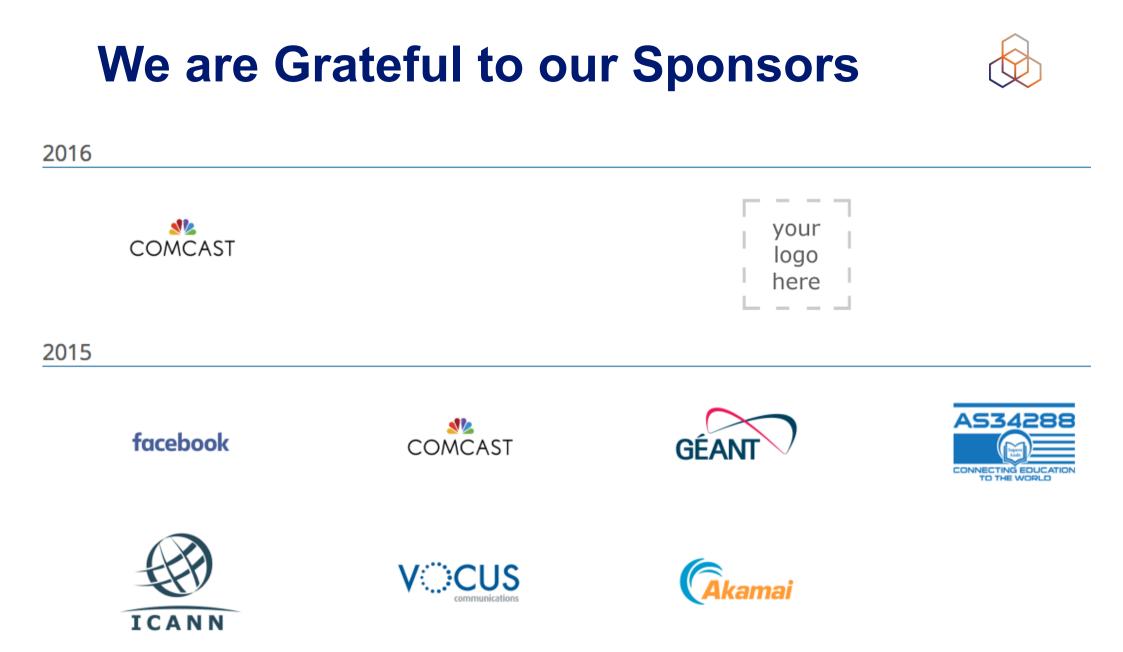
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Country	Probes
United States of America	1032
Germany	966
France	772
United Kingdom	610
Netherlands	514
Russia	481
Czech Republic	262
Italy	260
Switzerland	256
Ukraine	220

#### **Community News for 2015**



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



#### Thank You, 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: <u>code on GitHub</u>
- Documentation: <u>https://ripe-atlas-tools.readthedocs.org/</u>
- Included in the Linux / \*BSD distributions: OpenBSD, FreeBSD, Gentoo & Arch
  - in progress: Debian & Fedora
  - join & contribute!

#### **More New Features**



- HTTP measurements to anchors
- <u>"Time Travel"</u>
- LatencyMON
- DomainMON
- Sharing your probe with a group
- Whitelisting and blacklisting targets, on request
- Other recent features: <u>RIPE Labs article</u>

#### **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 (<u>F-root</u>, <u>K-root</u>)
- Monitoring <u>ccTLDs</u> (DSNMON)
- <u>Censorship</u>
- Visualising impact of IXP on localising paths
- Evidence: peering at IXP improves performance
- <u>Checking connectivity</u> using anchors
- ...and many, many <u>research papers</u>

#### **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:
  - <u>https://atlas.ripe.net/docs/roadmap/</u>

#### **Take Part!**



- Use RIPE Atlas for your operations: monitoring, troubleshooting
- Do scientific <u>research</u>
- Contribute to the code
- Participate in a webinar
- Become an <u>ambassador</u> or a <u>sponsor</u>
- Host a <u>RIPE Atlas anchor</u>, or place a probe in a new exotic location

#### Moar Hackathons!!!1



- Join the hackahtons 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**

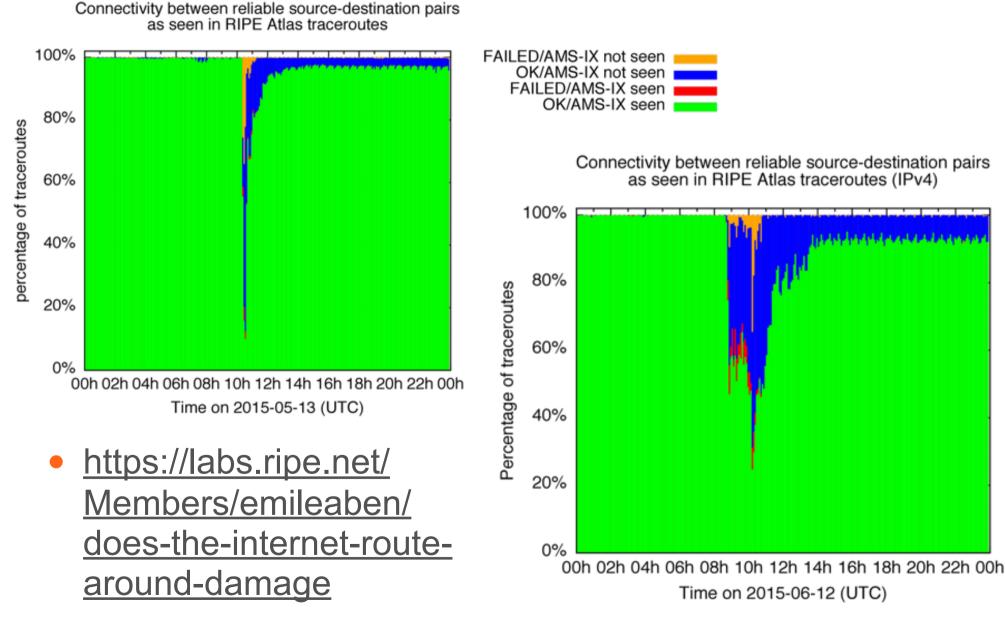


- Mailing list: <u>ripe-atlas@ripe.net</u>
- Blog: <u>https://labs.ripe.net/atlas</u>
- Questions: <u>atlas@ripe.net</u>
- Twitter: @RIPE\_Atlas / #RIPEAtlas
- https://atlas.ripe.net



# Other outages visualizations

#### Outages at the core: AMS-IX, Level3



Vesna Manojlovic I SANOG 27 I January 2016

#### Countries: .TR, .KP, .IR



latency towards K-root from Iran <other> 700 Latency to 8.8.8.8 from RIPE Atlas probes in Turkey 250 600 200 in-del RTT (ms) 150 500 100 Latency (ms) de-fra 400 50 300 2014.03.24 2018-03.23 2018-03.25 2014.03.26 2018-03.58 2014-03.59 2014-03.30 2014-03.31 2014-03.21 2018-03.22 2014.03.23 2018 gb-lon 200 KP Service availability (authoritative DNS and BGP) around 10 August 2015 Time (UTC) Service availability (authoritative DNS and BGP) 100% 100 80% 0 26Feb 26Mar 09Apr 12Mar 60% 40% 20% ns1 ns2 BGP prefixes 0% 10Aug 11Aug 09Aug 09Aug 09Aug 09Aug 10Aug 10Aug 10Aug 00h 06h 12h 18h 00h 06h 12h 18h 00h Time (UTC) https://labs.ripe.net/Members/emileaben/the-internet-in-north-korea-hanging-by-a-single-thread

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-outageas-seen-by-ripe-atlas

https://cartodbbasemaps-2.global.ssl.fastly.net/light\_all/ 9/261/168.png

https://www.youtube.com/watch? v=AEje32hQFnU&feature=youtu.be



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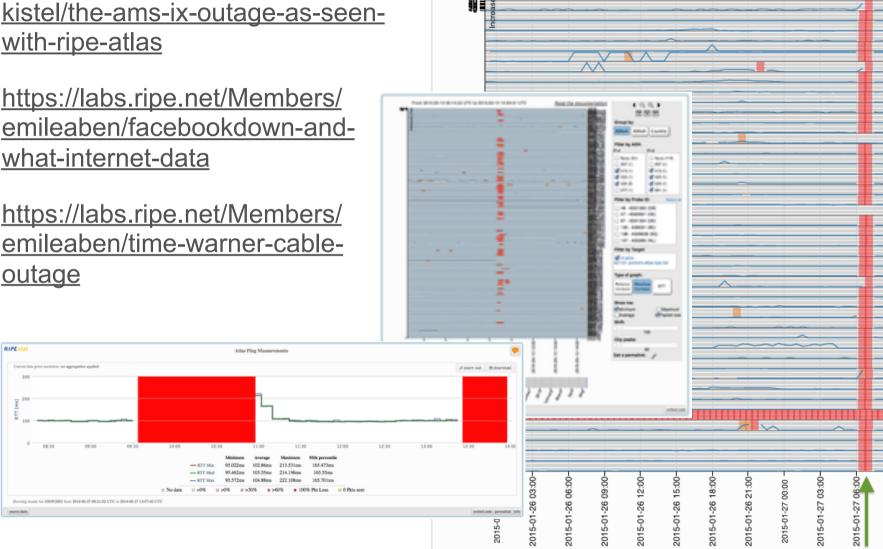
#### with-ripe-atlas

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

https://labs.ripe.net/Members/

https://labs.ripe.net/Members/ emileaben/time-warner-cableoutage

RIPEsta



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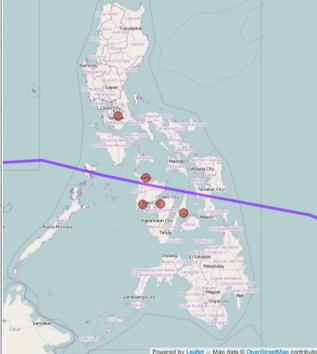
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#### Natural disasters:Haiyan,Sandy,Pam



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

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

https://labs.ripe.net/Members/wilhelm/cyclone-pam-and-theinternet-in-vanuatu

