What is the RIPE NCC?

(Hopefully) useful information about our tools, data and services

Suzanne Taylor | 16 July 2019 | ATNOG
What is the RIPE NCC?

• One of five Regional Internet Registries (RIRs)
  - Distribute and maintain registry of Internet address space for Europe, the Middle East and parts of Central Asia
  - Members include ISPs and other large network operators

• Not-for-profit membership association based in Amsterdam
Membership Growth in Austria

20% increase in 2019!
What do we do?

- Secretariat for the **RIPE community**
  - Open to anyone interested in Internet number resources
  - Community develops policies; RIPE NCC implements them
  - Organise events, develop tools and services to support community
- Provide **technical services and tools**, including K-root
- Source of **technical expertise** for a range of stakeholders
- Participate in **Internet governance** processes
- Follow Internet **regulation** developments
RIPE Atlas

- Global Internet measurement platform
- More than 10,000 probes collecting nearly 8,000 results/sec
- Active measurements:
  - Ping
  - Traceroute
  - DNS
  - SSL/TLS
  - NTP
  - HTTP(S)

https://atlas.ripe.net
RIPE Atlas

• You can:
  - Monitor network reachability from thousands of global vantage points
  - Troubleshoot network issues with quick connectivity checks
  - Create alarms that work with your own monitoring tools
  - Check responsiveness of DNS infrastructure, such as root name servers
  - Test IPv6 connectivity
RIPE Atlas

• Check out RIPE Labs for ideas:
  - https://labs.ripe.net/atlas

• Apply for a probe!
  - https://atlas.ripe.net/get-involved/become-a-host/
RIPE Atlas

**General Information**

<table>
<thead>
<tr>
<th>Probe</th>
<th>ASN (IPv4)</th>
<th>ASN (IPv6)</th>
<th>Time (UTC)</th>
<th>RTT</th>
<th>Hops</th>
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<tbody>
<tr>
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<td></td>
<td>2016-11-18 10:50</td>
<td>9.719</td>
<td>14</td>
</tr>
</tbody>
</table>

**Traceroute measurement to s3.vodevent1.lvt.hls.eu.aiv-cdn.net**

- **General Information**
- **Probes**
- **Map**
- **LatencyMON**
- **OpenIPMap Prototype**
- **Results**
- **Modification Log**
Internet Maps

DNS Root Instances

Comparative DNS Root RTT

Root Server Performance

RTT to Fixed Destinations

Reachability of Fixed Destinations
Tools Based on RIPE Atlas

- **DNSMON**: Overview of quality of service offered by all DNS root and many TLD name servers

- **DomainMON**: Monitor DNS name servers for your own domain names
Tools Based on RIPE Atlas

- **LatencyMON**: Visualise and compare latency trends
  - Performance comparisons reaching a service or website from different countries or providers
  - Comparing multiple ISPs or hosting providers at the same time, from vantage points with characteristics similar to those at the user or customer end
  - Measuring the spread of a network outage

https://labs.ripe.net/Members/massimo_candela/new-ripe-atlas-tool-latencymon
Tools Based on RIPE Atlas

• TraceMON: Investigate reachability and performance of targets in a network
  - Aggregates data from many sources (resource holder contacts, latency, Whois, BGP visibility, IP geolocation, IXP detection, reverse DNS lookup)
  - Provides information about each resource along the path
  - Detects IXPs traversed

https://labs.ripe.net/Members/massimo_candela/tracemon-traceroute-visualisation-network-debugging-tool
RIPEstat

• Everything you want to know about Internet number resources

RIPEstat

Enter an IP address/prefix, ASN, country code or hostname

RIPEstat

Available data:

- Registry data
- Routing data
- DNS data
- Geolocation data
- Abuse contacts

https://stat.ripe.net
RIPEstat

Country Routing Statistics (Austria)

Current data point resolution in graph: per 1 week

No more specific found.

Status of Address Block

ASSIGNED PA

ALLOCATED PA

database: RIPE NCC

Showing results as of 2019-07-15 09:38:00 UTC

IP address 62.178.175.134 has been assigned to the closest encomprising prefix range 62.178.84.16-62.178.198.7 found in the registry of RIPE NCC.

Support for APNIC database resources in this widget has been stopped.

Showing results for Austria from 2004-01-01 00:00:00 UTC to 2019-07-15 05:59:59 UTC

source data | embed code | permalink | info

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RIPE IPmap

- Open, crowdsourced mapping of Internet infrastructure
  - There is an infrastructure gap in commercial geolocation products

https://imap.ripe.net

https://labs.ripe.net/Members/massimo_candela/ripe-ipmap-whats-under-the-hood
IXP Country Jedi

http://sg-pub.ripe.net/emile/ixp-country-jedi/history/2019-06-01/AT/
IXP Country Jedi

Local IXP found: YES, out-of-country IPs: NO
Local IXP found: YES, out-of-country IPs: YES
Local IXP found: NO, out-of-country IPs: NO
Local IXP found: NO, out-of-country IPs: YES

Peer-to-Peer Connections

http://sg-pub.ripe.net/ixp-country-jedi/
RPKI

• **Resource Public Key Infrastructure**
• Community solution to inaccuracies in (or lack of) IRRs
• Operated by RIRs since 2008
• Uses digital certificates to verify who holds IPs/ASNs
  - Route Origin Authorisations (ROAs)
  - Members can create a ROA for each of their IP address ranges
  - Can create multiple ROAs that overlap

# RPKI: Creating ROAs

## RPKI Dashboard

<table>
<thead>
<tr>
<th>BGP Announcements</th>
<th>ROAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>4</td>
</tr>
<tr>
<td>Valid</td>
<td>4</td>
</tr>
<tr>
<td>Invalid</td>
<td>1</td>
</tr>
<tr>
<td>Unknown</td>
<td>36</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>3 OK</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Causing problems</td>
<td></td>
</tr>
</tbody>
</table>

### BGP Announcements

<table>
<thead>
<tr>
<th>Origin AS</th>
<th>Prefix</th>
<th>Current Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>AS12654</td>
<td>2001:7fb:fe01::/48</td>
<td>UNKNOWN</td>
</tr>
<tr>
<td>AS12654</td>
<td>2001:7fb:fe0c::/48</td>
<td>UNKNOWN</td>
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<tr>
<td>AS12654</td>
<td>2001:7fb:fe0f::/48</td>
<td>UNKNOWN</td>
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<td>AS12654</td>
<td>2001:7fb:ff00::/48</td>
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<td>2001:7fb:ff02::/48</td>
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</tr>
<tr>
<td>AS12654</td>
<td>2001:7fb:ff03::/48</td>
<td>UNKNOWN</td>
</tr>
</tbody>
</table>
RPKI: Reviewing Changes

[Image of RPKI Dashboard showing 41 BGP Announcements and 4 ROAs, with status details for each announcement.

- 41 BGP Announcements
  - 4 Valid
  - 1 Invalid
  - 36 Unknown

- 4 ROAs
  - 3 OK
  - 1 Causing problems

[Button: Create ROAs for selected BGP Announcements]

[Button: Review and publish changes]
RPKI: Checking the Effects
Help Us Help You

• Keep RIPE Database records up-to-date

• Help us maintain our datasets:
  - Keep PeeringDB records up-to-date
  - Add and maintain data to RIPE IPMap
  - TraceMON contains a number of update buttons
Services
RIPE Community Projects Fund

- The RIPE NCC has a long history of supporting projects and innovative ideas
- €250,000 a year to support non-commercial projects supporting the operation and resilience of the Internet
- Preference given to projects from our service region

https://www.ripe.net/support/cpf
Assisted Registry Check

- Help our members to keep their data up-to-date
- Identify inconsistencies between Routing Registry entries and BGP announcements
- Assist with locating and fixing lame reverse DNS delegations

https://www.ripe.net/manage-ips-and-asns/resource-management/assisted-registry-check
Training Courses

• Face-to-face training courses
  - RIPE Database / IPv6 / BGP / Measurement tools
  - Course material available online

• Online learning
  - RIPE NCC Academy
  - RIPE NCC::Educa online events

https://www.ripe.net/support/training
Where we went in 2018
Events: RIPE Meetings

- Two RIPE Meetings per year
  - Working Groups and plenary sessions
  - Remote participation
- New members get free tickets
- Fellowship program available
## Events: RIPE Meetings

### Tuesday, 21 May 09:00 - 10:30

<table>
<thead>
<tr>
<th>Event</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Next Gen Blackholing to Counter DDoS</td>
<td>Matthias Wichthuber, DE-CIX Management GmbH</td>
</tr>
<tr>
<td>A First Joint Look at DoS Attacks and BGP Blackholing in the Wild</td>
<td>Mattijs Jonker, University of Twente</td>
</tr>
<tr>
<td>DDoS Clearing House: Solving DDoS Attacks in the Netherlands, Europe, and Beyond by Facilitating Bridging Solutions and Stakeholders</td>
<td>Koen van Hove, University of Twente</td>
</tr>
</tbody>
</table>

### Tuesday, 21 May 11:00 - 12:30

<table>
<thead>
<tr>
<th>Event</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revisiting the Root</td>
<td>David Huberman, ICANN</td>
</tr>
<tr>
<td>OpenINTEL: Long-Term Active Measurements for DNS Research</td>
<td>Roland van Rijswijk, NLnet Labs</td>
</tr>
<tr>
<td>That KSK Roll</td>
<td>Geoff Huston, APNIC</td>
</tr>
</tbody>
</table>
Join us at RIPE 79
Rotterdam, Netherlands
14 - 18 October, 2019
Events

• Regional Meetings
  - SEE (South East Europe)
  - ENOG (Eurasia)
  - MENOG (Middle East)
  - Fellowships available

• Member Lunches

• Hackathons
  - IoT hackathon in Rotterdam: 12-13 October
  - [https://www.ripe.net/participate/forms/apply/iot-hackathon-rotterdam/](https://www.ripe.net/participate/forms/apply/iot-hackathon-rotterdam/)
Get Involved
Get Involved

• Participate in a RIPE Working Group
  - Address Policy, DNS, RIPE Database, Routing, IPv6, IoT, Anti-Abuse and more
  - Join the mailing lists

• Attend a training course, webinar or take a course online

• Attend a RIPE or RIPE NCC Regional Meeting

• Apply for a RIPE Fellowship

• Host a RIPE Atlas probe

• Apply for a RIPE NCC Community Projects Fund grant
Today’s biggest takeaway

• The RIPE NCC is here for you!
  - Training
  - NOG support

• Tell us what tools and data you need
  - We rely on your feedback for improvement
  - Tell us what’s good and what isn’t
  - Suggest new features

• We live for your feedback :)

Suzanne Taylor | ATNOG | 16 July 2019