Know Your Network

Why every network operator should host a RIPE Atlas probe

Lia Hestina | MYNOG 11 | Kuala Lumpur
## 11 Things Network Operators Do

<table>
<thead>
<tr>
<th>Network Infrastructure Management</th>
<th>Security Management</th>
<th>Configuration and Optimisation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity Planning</td>
<td><strong>Network Monitoring</strong></td>
<td>Troubleshooting</td>
</tr>
<tr>
<td>Software Updates and Patch Management</td>
<td></td>
<td>8 to 11</td>
</tr>
</tbody>
</table>
No News Is Good News

What’s Known

- Your infrastructure
- System & Software
- Your People
- Monitoring Tools
- Security Measures

The Unknown

- Threats/ Unpredictability
- What our competitor do
- Everchanging Technology
- Hijacks/ Natural Disaster
- Opportunity
RIPE Atlas

- RIPE Atlas is a global active measurements platform, funded by RIPE NCC members and sponsors
- Goal: view Internet reachability
- Probes hosted by volunteers, using a credits system
- Data is publicly available
- [atlas.ripe.net](https://atlas.ripe.net)
- [www.ripe.net/ripe-atlas/](https://www.ripe.net/ripe-atlas/)
# RIPE Atlas

## Measurement Types

<table>
<thead>
<tr>
<th>Measurement Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>PING</td>
</tr>
<tr>
<td>TRACEROUTE</td>
</tr>
<tr>
<td>DNS</td>
</tr>
<tr>
<td>NTP</td>
</tr>
<tr>
<td>SSL/TLS</td>
</tr>
<tr>
<td>HTTP (anchors)</td>
</tr>
</tbody>
</table>

## Accessible via

- GUI
- API
- CLI TOOL
Run RIPE Atlas tests

- More than 12,000 probes connected
- More than 3,000 ASNs globally
- 347 in South East Asia
Some Problems

- High latency - impatient gamers
- Gamers from different networks
- Realtime application is unpredictable

Mbappe
- Online gaming company
- Runs own LAN
- Users from around the world
Issues Spotted!

High latency Identified

Talk to your peers, ISP or anyone who can help improve RTT

Lower latency after debugging

Issues Spotted!

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Lower latency after debugging
Hooray Moments!

Improve Performance
Shorter path is selected, better latency, reliability and security

Control and Flexibility
Repeat tests as much as you need!

Service desk ❤ RIPE Atlas + GUI
To validate findings
What it Isn’t

Traffic Volume
Bandwidth
Wi-Fi
Making your Coffee
Dare to Take a Risk?

Try it Wisely

- Who uses the platform?
- What do people say?
- Search for BAD reviews/BAD experiences online
- What's the source? Trusted?
- Is it NEW?

Convinced?
Security and Privacy

Probes
- Trust Material (regular server address, keys)
- NO open Ports/initiate connection/ NAT is OK
- Doesn’t listen to local traffic/ No snooping

Measurements
- No passive measurements
- Probes initiate SSH connections from probe to server
- Code of measurements publicly available
A View Into Malaysia
Probes in South East Asia

<table>
<thead>
<tr>
<th>Country</th>
<th>RIPE Atlas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vietnam</td>
<td>7</td>
</tr>
<tr>
<td>Timor Leste</td>
<td>1</td>
</tr>
<tr>
<td>Thailand</td>
<td>27</td>
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<tr>
<td>Singapore</td>
<td>117</td>
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<tr>
<td>Philippines</td>
<td>60</td>
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<tr>
<td>Myanmar</td>
<td>2</td>
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<tr>
<td><strong>Malaysia</strong></td>
<td><strong>28</strong></td>
</tr>
<tr>
<td>Laos</td>
<td>1</td>
</tr>
<tr>
<td>Indonesia</td>
<td>99</td>
</tr>
<tr>
<td>Cambodia</td>
<td>2</td>
</tr>
<tr>
<td>Brunei</td>
<td>3</td>
</tr>
</tbody>
</table>

* Data from 20 May 2024

What about East Coast and other islands?
RIPE NCC Tools and Services

South East Asia

<table>
<thead>
<tr>
<th>Country</th>
<th>Anchor</th>
<th>K-Root</th>
<th>AuthDNS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vietnam</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
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<td></td>
</tr>
<tr>
<td>Philippines</td>
<td>3</td>
<td>2</td>
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</tr>
<tr>
<td>Malaysia</td>
<td>4</td>
<td>1</td>
<td></td>
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<td>Cambodia</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Indonesia</td>
<td>12</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Brunei</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Let's Cover These Networks in South East Asia

RIPE Atlas probe coverage
Showing ASNs covering at least 1% of the country's population (2024-05-21)
- ASN is not covered
- ASN has at least 2 probes

Prototype Tool

Lia Hestina | MYNOG 11 | Kuala Lumpur
Did my Paths Go Out of the Country?

Malaysia

Indonesia

Prototype Tool

Data from 01 Jan 2024

IXP Country Jedi

Lia Hestina | MYNOG 11 | Kuala Lumpur
Latency within 50ms

MinRTT
Prototype Tool
World Latency to AS4788
TM TECHNOLOGY SERVICES SDN. BHD
Atlas Latency World Map
Let’s zoom in

Are these networks with higher latency important to you?

Prototype Tool

Probe ID 62827
Singapore

RIPE Atlas probes
Why is AS4788 Seen in Reunion in Africa?

Prototype Tool

Let's zoom in

Why is AS4788 Seen in Reunion in Africa?

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Why is AS4788 Seen in Reunion in Africa?
Which DNS Root Instances answer to the query from probes in Malaysia (f, e, m & d)
MRTT Measurements to f-root in Malaysia (4)

- 4 f-root in Malaysia:
  - 2 in Kuala Lumpur
  - 2 in Johor Baru

- MRTT 0-50ms
- 18 probes got answers from f-root in Kuala Lumpur, and 4 from Singapore
- None from Johor Baru
MRTT Measurements to e-root in Malaysia (4)

Which e-root responds to the query?

- 4 e-root in Malaysia
  - 2 in Kuala Lumpur
  - 2 in Johor Baru

- MRTT 0-40ms

- 26 probes received answers from e-root in Kuala Lumpur

RTT Map Result

DNS Root Instances

Lia Hestina | MYNOG 11 | Kuala Lumpur
MRTT Measurements to m-root in Malaysia (1)

Which m-root responds to the query?

- 1 m-root in Kuala Lumpur
- MRTT 0-150ms
- 11 probes got an answer from m-root in Japan IX
- 1 probe got an answer from Singapore

RTT Map Result

DNS Root Instances
MRTT Measurements to d-root in Malaysia (3)

Which d-root responds to the query?

- 3 d-root in Malaysia
- MRTT 0-300ms
- 12 probes got an answer from d-root London, UK

RTT Map Results

DNS Root Instances
Authoritative DNS (AuthDNS)

• We’re seeking a partner to host AuthDNS in an interconnected location in Malaysia.

• Reduced dependency on external DNS Services
  - Minimise exposure to potential disruptions from international events
  - Greater control over Internet infrastructure

• Enhanced local Internet infrastructure
  - Hosting AuthDNS servers locally can improve the overall reliability and performance of DNS services for local users.
Install SW Probes Now in These Platforms

- Software packages that work like regular probes
- Most installation instructions are available in 8 languages

<table>
<thead>
<tr>
<th>Platform</th>
<th>Support</th>
<th>Installation Videos</th>
<th>Installation Manuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>CentOS 7 (binary)</td>
<td>RIPE NCC</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>CentOS 8 (binary)</td>
<td>RIPE NCC</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>CentOS 7 &amp; 8 (source)</td>
<td>RIPE NCC</td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>Debian 9 (source)</td>
<td>Community</td>
<td></td>
<td>✔️</td>
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<td>Debian 10 (source)</td>
<td>Community</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Raspbian (source)</td>
<td>Community</td>
<td>✔️</td>
<td>✔️</td>
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<td>Docker</td>
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<tr>
<td>OpenWRT</td>
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<td></td>
<td>✔️</td>
</tr>
<tr>
<td>Turris</td>
<td>Vendor (NIC.CZ)</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

RIPE Atlas Software probe

- Open Source (GPL 3.0) - https://github.com/RIPE-NCC/ripe-atlas-software-probe
- CentOS 7 and CentOS 8 - Binary packages
- CentOS 7 and CentOS 8 - Install from source
- Ubuntu / Debian / Raspberry Pi OS (previously called Raspbian) - Install from source
- Docker - Not provided and maintained by RIPE NCC
  https://github.com/Jamesits/docker-ripe-atlas - Actively maintained
  https://github.com/Knight1/ripe-atlas_dockerized - Hasn’t been updated for a few months
- OpenWrt - Looks like it’s coming soon!

YouTube Video: Install the RIPE Atlas Software Probe

How to: RIPE Atlas Software Probes
Reasons to Love RIPE Atlas

- Global Coverage
- Non-profit organisation
- Volunteers: End Users
- Regular third-party security review
- Measurement results open to all
- By the community for the community
- 12,000 Probes
- Trusted Source
- Safe & Secure
- Open Data
- Community Driven
What’s Next?

Create a RIPE NCC Access ACCOUNT
INSTALL RIPE Atlas strategically
Start testing, MONITOR your network performance
Did your probe disconnect? Reconnect it!

Redeem This Voucher
MYNOG11
Thank you!

- Within Asia Pacific (APAC) region we work closely with APNIC, ISOC, NSRC and many local ambassadors.
- Interested in a webinar?
- Contact: [https://academy.apnic.net/en/contact](https://academy.apnic.net/en/contact)
Questions

lhestina@ripe.net
atlas@ripe.net
Use Cases

A distributed view of the Internet

The Kazakhstan outage as seen from RIPE Atlas

Detecting DNS root manipulation

DNS vulnerability, configuration errors that can cause DDoS