The RIPE Community and Ethical Considerations

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Content

- RIPE and the RIPE NCC

  - Community and membership

- RIPE NCC services and activities

  - IP address distribution

- Measurements and data sets

  - RIPE Atlas, RIPEstat, RIPE Labs

  - Ethical considerations

- How can you participate?

RIPE & the RIPE NCC

RIPE: Réseaux IP Européen

- 1989: RIPE started to promote TCP/IP

  - Against official government policy at the time

  - Mostly academics and researchers, later also ISPs

- Not a legal entity, no membership, no voting

- Operational coordination of IP networks

- Two meetings a year - open to anyone

- Various topical mailing lists - open to anyone

RIPE NCC

- 1992: RIPE NCC was founded

  - Based in Amsterdam (at the university)

  - As secretariat (Network Coordination Centre) for RIPE

  - Initially as part of another organisation

- 1995: RIPE NCC became independent

  - Membership association under Dutch law

  - Most RIPE participants became members (open to anyone)

RIPE NCC - Who Are We?

- Not-for-profit, independent association
  - Neutral and impartial
  - Membership organisation

- Over 15,000 members in more than 76 countries
  - Mostly ISPs and large enterprise networks

- Distributing IP addresses to members
  - And other related activities

RIPE NCC Services

- One of five Regional Internet Registries

  - Distribution of IPv4, IPv6 addresses and AS Numbers

- RIPE Whois Database

- Secretariat for RIPE community

  - organises meetings, operates mailing lists etc.

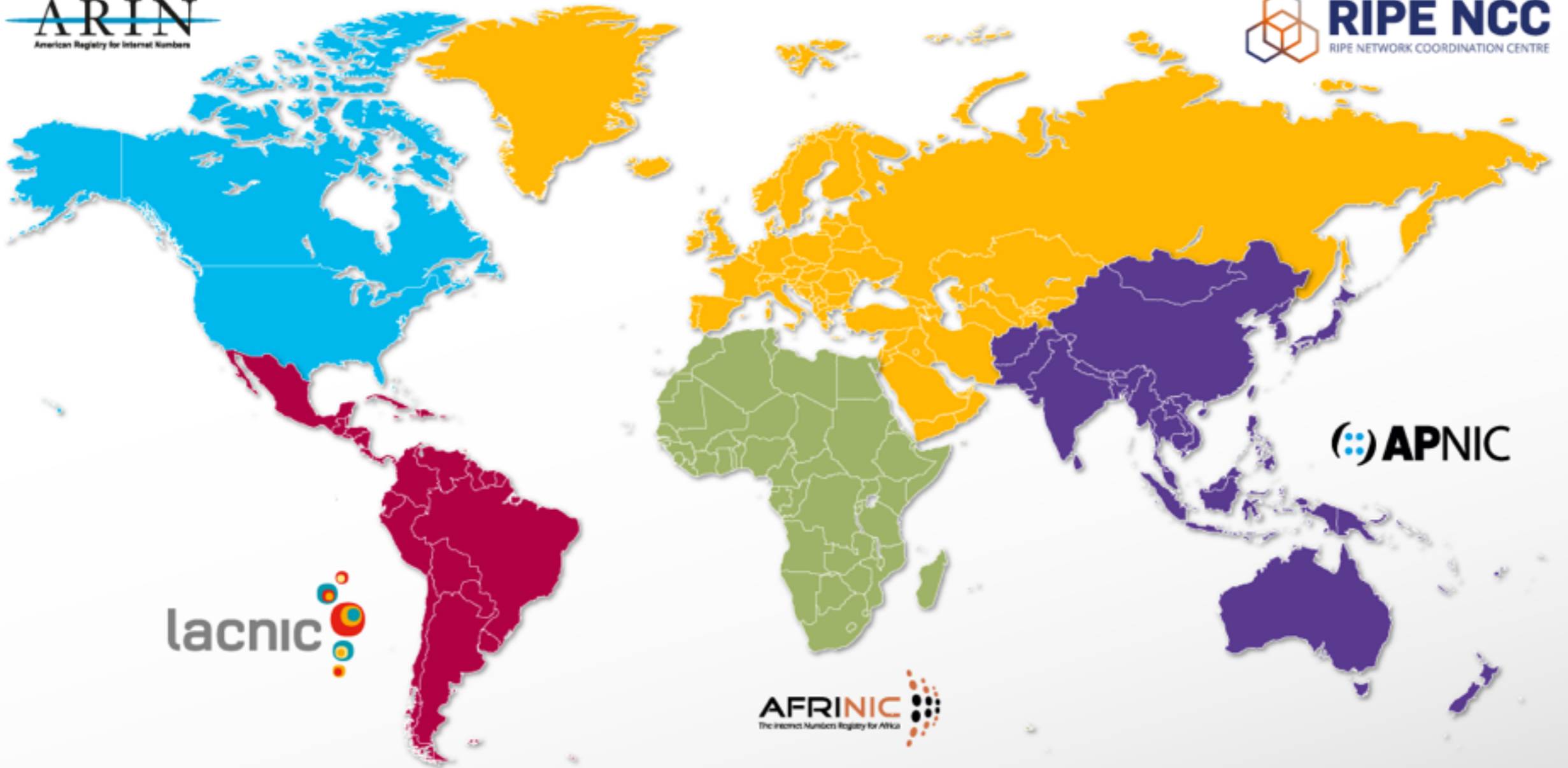- Outreach, training, K-root, measurements network, data and tools

IP Address Distribution

RIRs Around the World
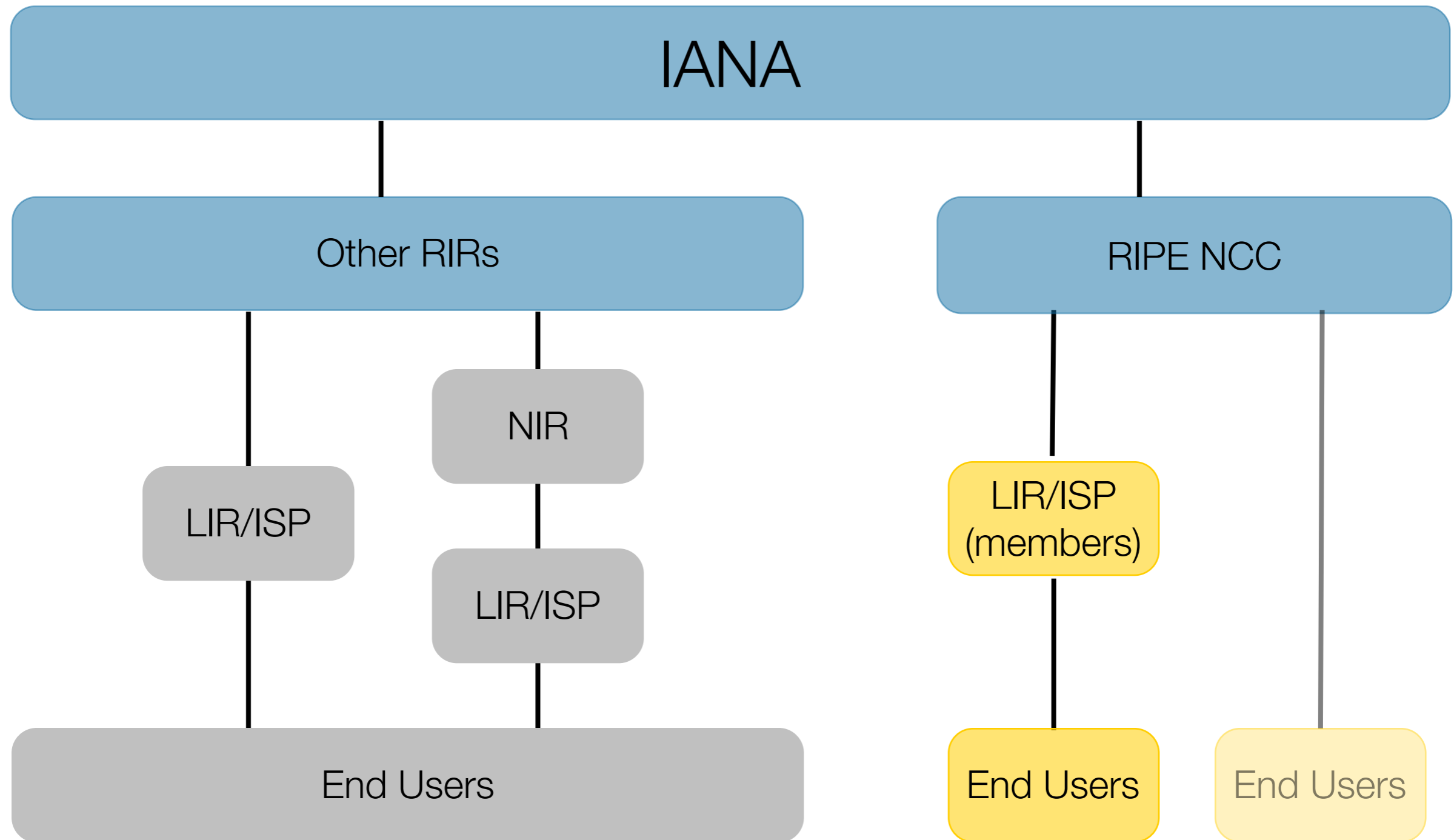
Regional Internet Registries

- Five RIRs worldwide

  - Not-for-profit organisations

  - Funded by membership fees

  - Distributing Internet resources & coordinating related activities

  - Policies decided by regional communities

  - Neutral, Impartial, Open, Transparent

The Internet Registry System

IPv4 Addresses - 32 bits

An IPv4 address (dotted-decimal notation)

172 . 16 . 254 . 1

10101100 . 00010000 . 11111110 . 00000001

One byte = Eight bits

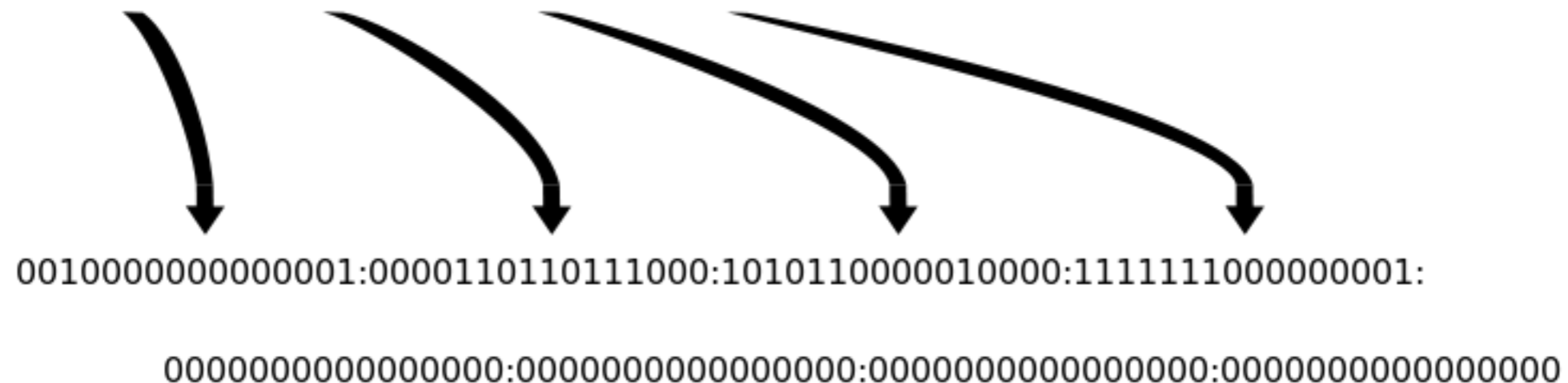Thirty-two bits (4 x 8), or 4 bytes

IPv6 Addresses - 128 bits

An IPv6 address   (in hexadecimal)

2001:0DB8:AC10:FE01:0000:0000:0000:0000

⬇   ⬇   ⬇   ⬇

2001:0DB8:AC10:FE01::   Zeroes can be omitted

0010000000000001:0000110110111000:1010110000010000:1111111000000001:

0000000000000000:0000000000000000:0000000000000000:0000000000000000

Who Makes the Rules?

- RIPE community discusses and agrees on proposal

- RIPE Policy Development Process

- RIPE NCC membership decides about budget and activities

RIPE Atlas

RIPE Atlas Definition

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

RIPE Atlas Numbers

- 9,400 RIPE Atlas probes connected worldwide

- 4,100 Measurements collected per second

- 35,000 user-defined measurements per week

RIPE Atlas - atlas.ripe.net

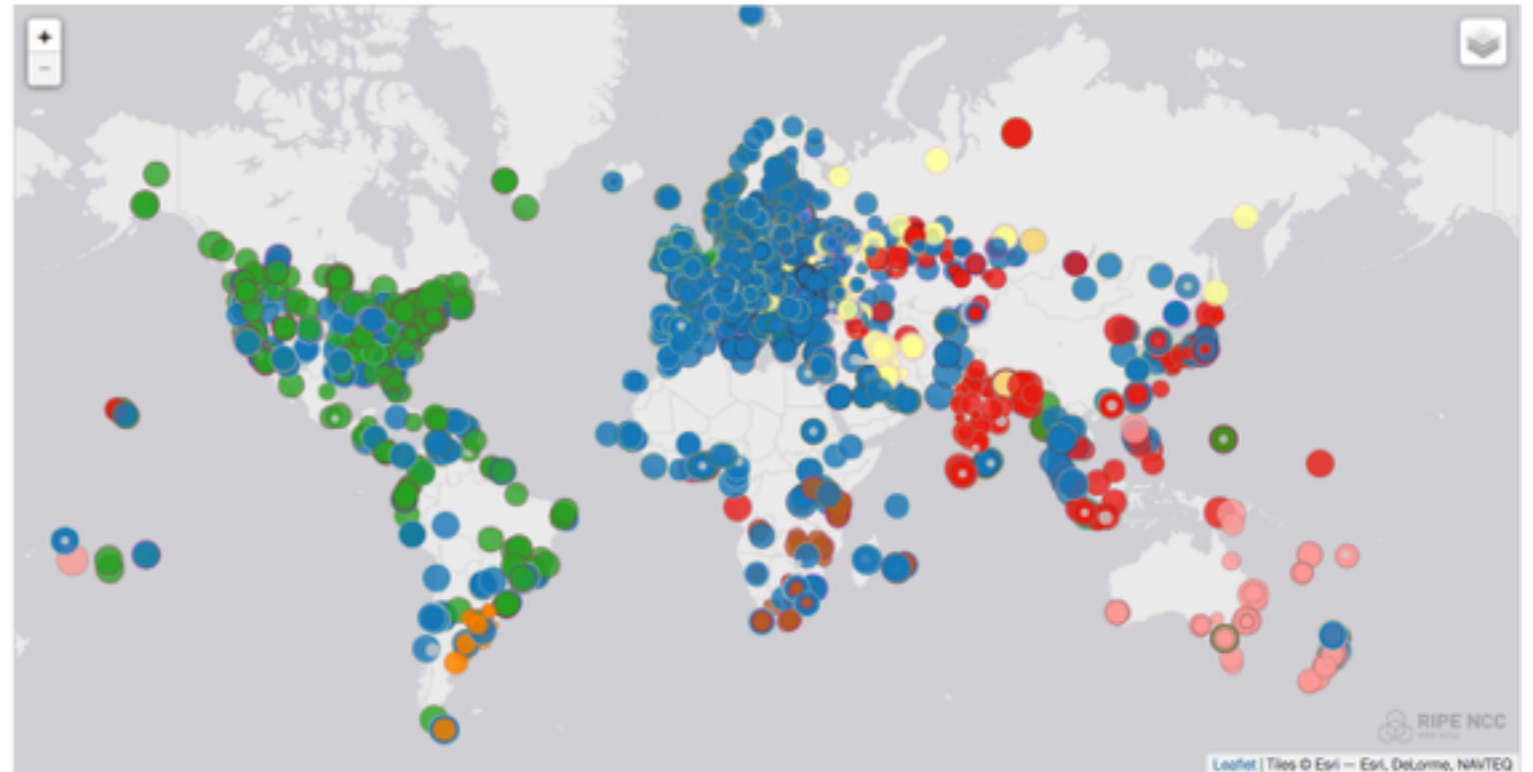- Probes are hosted by volunteers

- Data is publicly available

"RIPE Atlas: A Global Internet Measurement Network" (PDF). Internet Protocol Journal 18. September 2015. ISSN 1944-1134.

RIPE Atlas Measurements

- **Built-in** Global measurements towards root name servers

  - Internet traffic maps
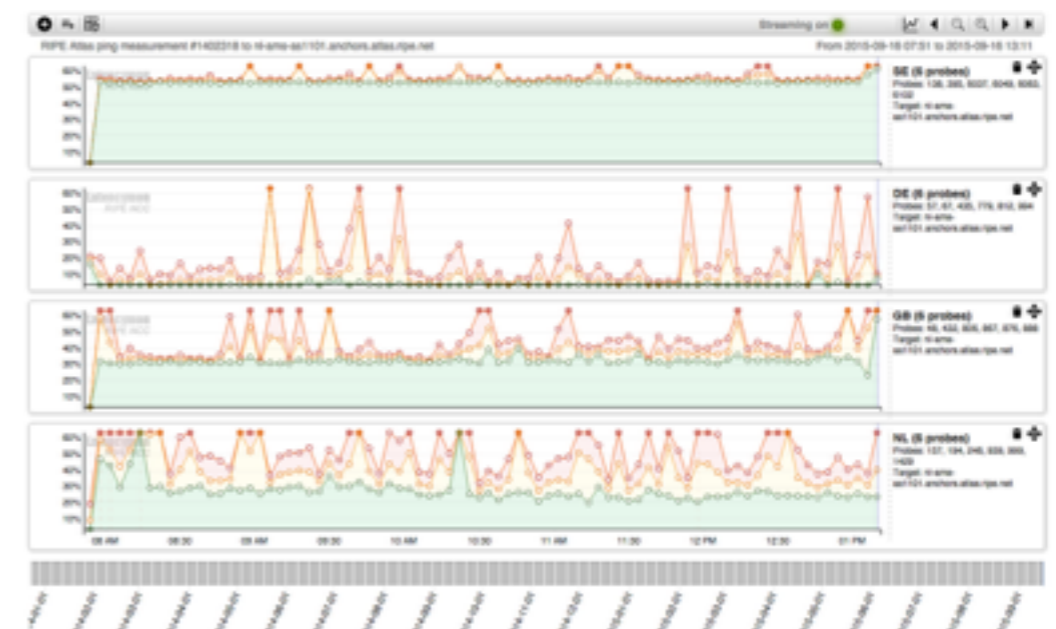

- **Users** can run customised measurements

  - ping, traceroute, DNS, SSL/TLS, NTP and HTTP (only towards RIPE Atlas anchors)

Available Visualisations: ping

- List of probes:
  sortable by RTT

- Map:
  colour-coded by RTT

- LatencyMon:
  compares multiple
  latency trends

RIPE Atlas Use Cases (1)

- Measuring Internet Access Disruptions

  - Internet Access Disruptions in Turkey

  - Internet Access Disruption in Gambia

- Measuring DNS Censorship and Hijacking

  - Using DNS Servers in Iran

  - DNS Censorship

RIPE Atlas Use Cases (2)

- Monitoring connectivity and connectivity problems

  - Monitoring Game Service Connectivity

  - Measuring Cloud Connectivity

  - Debugging Network Connectivity Problems

Ethics of Measurements

Ethical Design Decisions

- Low, cheap barrier of entry

- Active measurements only

  - No passive measurements

  - Probes do not observe user traffic

- Data, API, source code, tools: **free and open**

- Set of measurement types limited

  - In order to prevent putting probe hosts at risk

https://fosdem.org/2017/interviews/vesna-manojlovic/

Ongoing Moral Dilemmas

- 2013: Opening-up source code

- 2014: Keeping "non-public" measurements

- 2015: Not allowing HTTP measurements to random targets

- 2016: Security audit and pen-testing

Strong Community Involvement

- Active mailing list (ripe-atlas@ripe.net)

  - Passionate discussions

- HTTP measurements only towards RIPE Atlas anchors

  - https://labs.ripe.net/Members/kistel/ethics-of-ripe-atlas-measurements

- Responsible disclosure (bug reports)
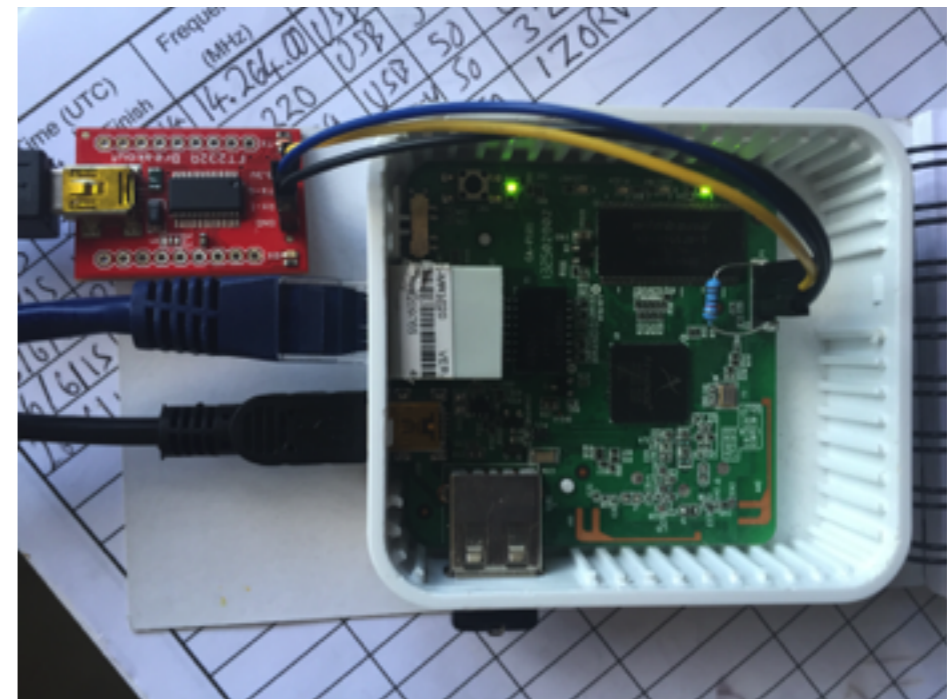
Other Data Sets and Statistics

- **RIPEstat:** a lot of info about IP addresses and other network data (stat.ripe.net)

Search RIPEstat

	Search
Your network: AS3333, 2001:67c:2e8::/48	e.g.: IPv4 prefix/range, IPv6, ASN

- **RIS:** Routing Information Service

- **RIPE Labs** - https://labs.ripe.net

  - Lots of statistics and more

More Information

RIPE NCC Hackathons

AUTOMATE ALL THE THINGS

IXP HACKATHON RIPE73

memegenerator.net

RIPE ATLAS HACKATHON:

MOST FUN I HAD AT RIPE SINCE CANALS FROZE

memes.com

https://labs.ripe.net/hackathons

RACI
RIPE Academic Cooperation Initiative

- Students and researchers:

  - Present your Internet-related research at RIPE Meetings

  - Complimentary tickets, travel and accommodation

  - Topics: network measurement and analysis, security, IPv6 deployment, BGP routing, Internet governance, peering and interconnectivity

- https://www.ripe.net/raci

- Publish your research or use case

- Reach out to RIPE Community

- Read about latest analysis or conferences

https://labs.ripe.net