



RIPE NCC
RIPE NETWORK COORDINATION CENTRE

The RIPE NCC, Internet Measurements and IXPs

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Overview

- The RIPE NCC and our services
- RIPE Atlas
 - How it works & use cases
 - Measurements in Norway
- RIPE Labs
 - Statistics
 - IPv6 deployment in Norway
- Membership information
- RIPE NCC Survey 2016



RIPE NCC Services

RIPE NCC Background



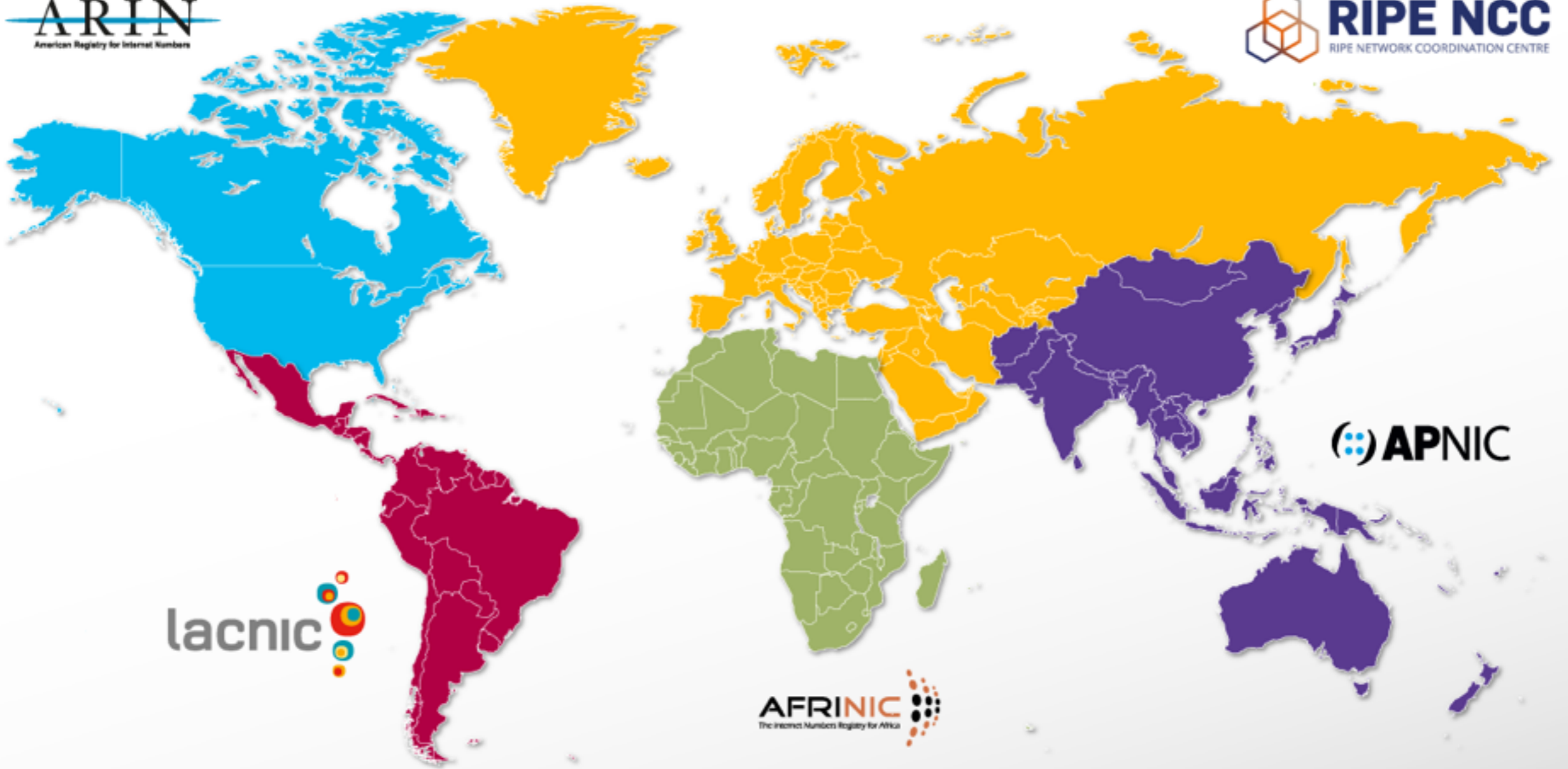
- Established in 1992 by the RIPE community
 - Initially part of academic network association
 - Since 1997 membership association under Dutch law
 - Not-for-profit, independent, neutral, open
- Funded by membership
 - 13,000 members, 76-country service region
 - Initially mostly ISPs and universities
 - Now various industries and sectors
- One of five Regional Internet Registries

RIR Regions



ARIN
American Registry for Internet Numbers

 **RIPE NCC**
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lacnic 

AFRINIC
The Internet Number Registry for Africa 

 **APNIC**

RIPE NCC Services



● Member Services

- Resource distribution (IPv4, IPv6, ASNs)
- Resource certification
- Training
- LIR Portal features
- Extra features in RIPE Atlas

● Public Services

- RIPE Database
- Reverse DNS
- Operating K-root server
- Operator tools
 - RIPE Atlas, RIPEstat, RIS, RIPE Labs
- Data sharing
- Open meetings



RIPE Atlas

Active Measurements Network

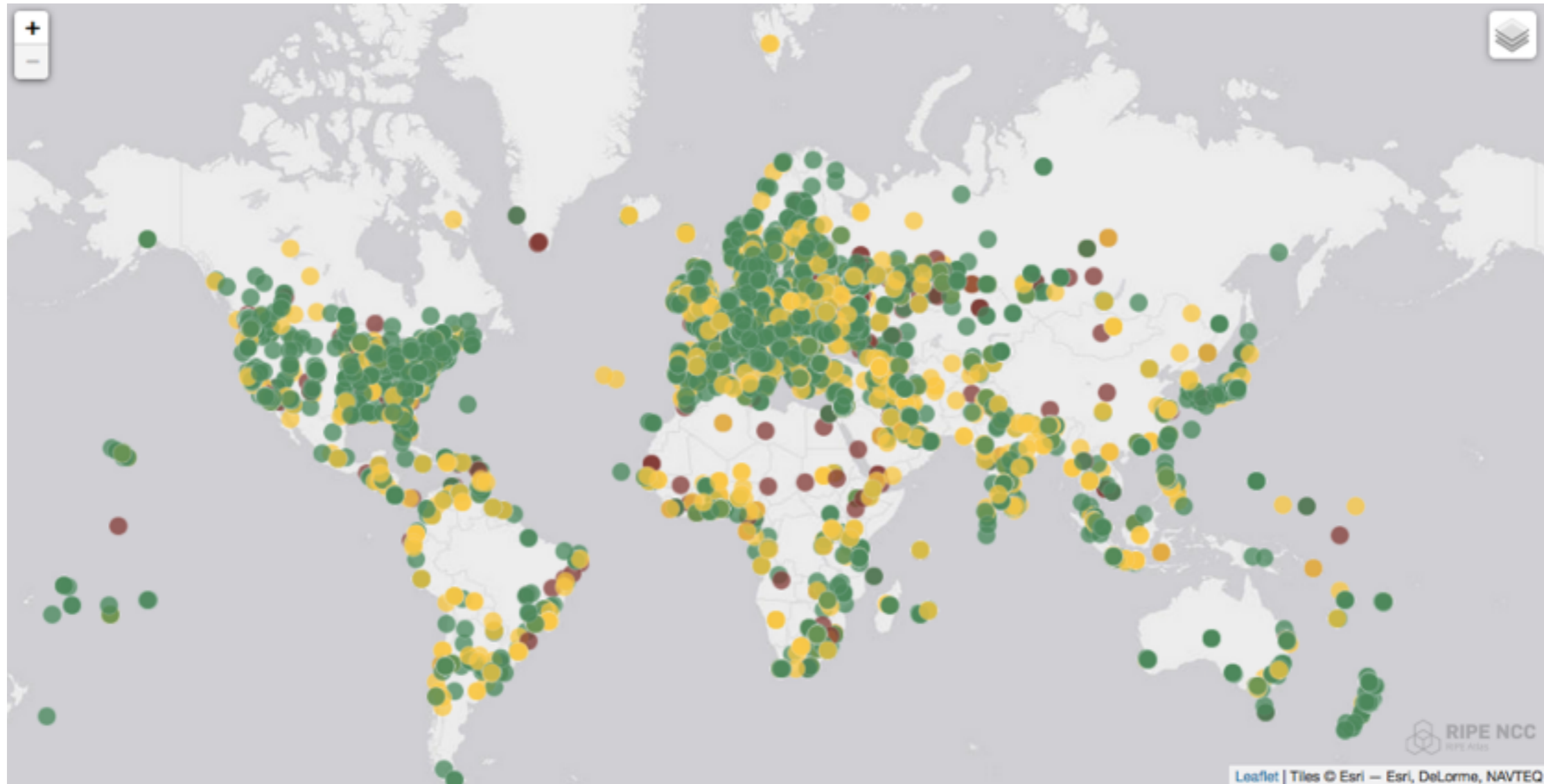


- Largest active measurements network
- Thousands of measurement nodes
- Probes run different measurements
 - ping, traceroute, DNS, SSLcert



<https://atlas.ripe.net>

RIPE Atlas Coverage



Connected: 9278 Disconnected: 3548 Abandoned: 1635

RIPE Atlas Infrastructure



- Probe distribution
 - 14,000 RIPE Atlas probes distributed
 - 9,300 RIPE Atlas probes active
 - 120 active RIPE Atlas anchors
- Coverage
 - 176 countries covered
 - Originating ASes covered
 - 3,251 (IPv4), 1,187 (IPv6)

RIPE Atlas Probes & Anchors in NO

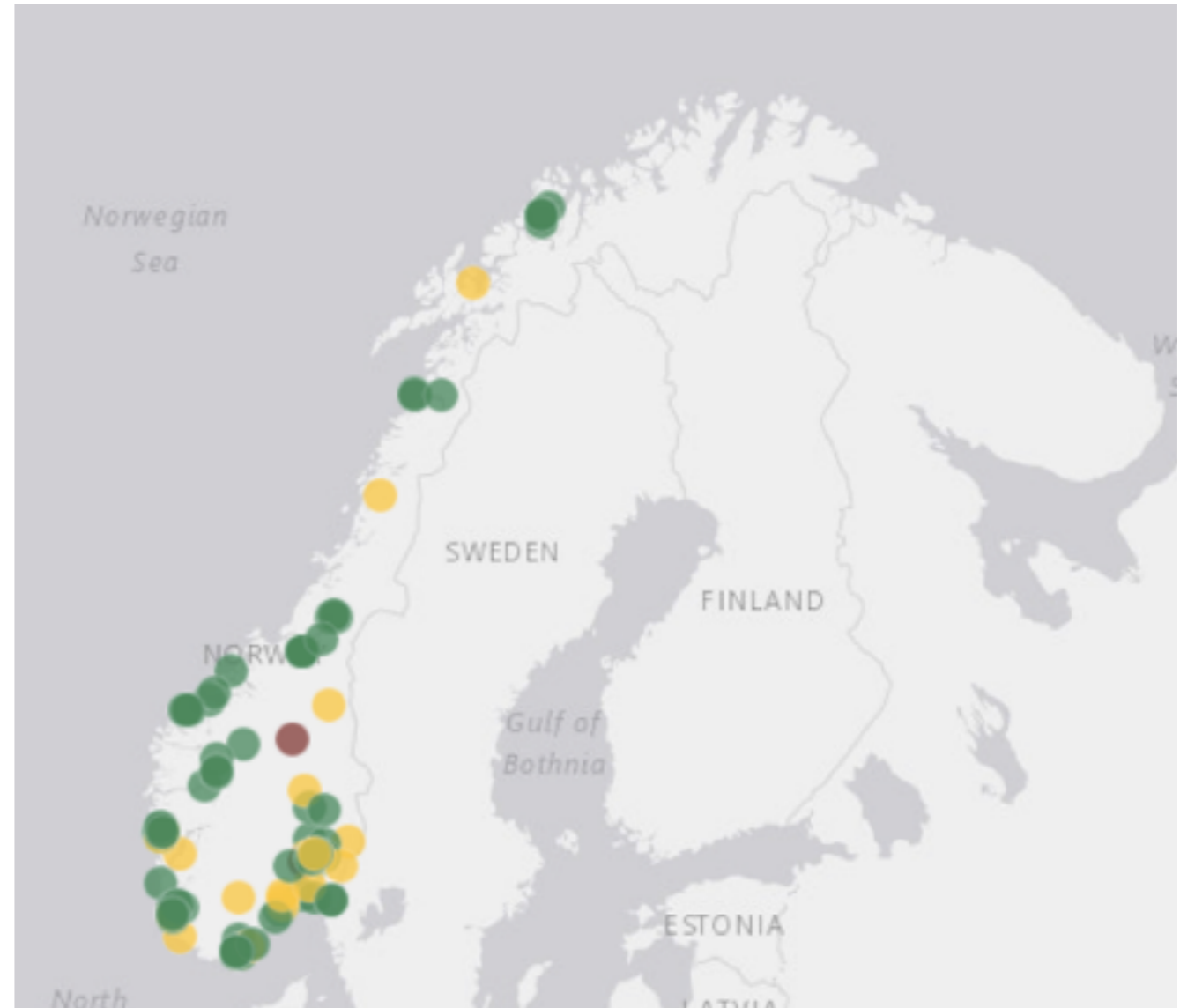


One RIPE Atlas Anchor

no-osl-
as39029

6002

Redpill Linpro



Connected: 119

Disconnected: 28

Abandoned: 16

RIPE Atlas IXP Country Jedi



- IXP-Country-jedi
 - Are the paths between ASes staying in the country?
 - What is the difference between IPv6 & IPv4?
 - How many paths go via a local IXP?
 - Which peer could you add to improve reachability?
- Experimental tool
 - Feature requests welcome!
 - Depends on probe distribution in a country

IXP Country Jedi

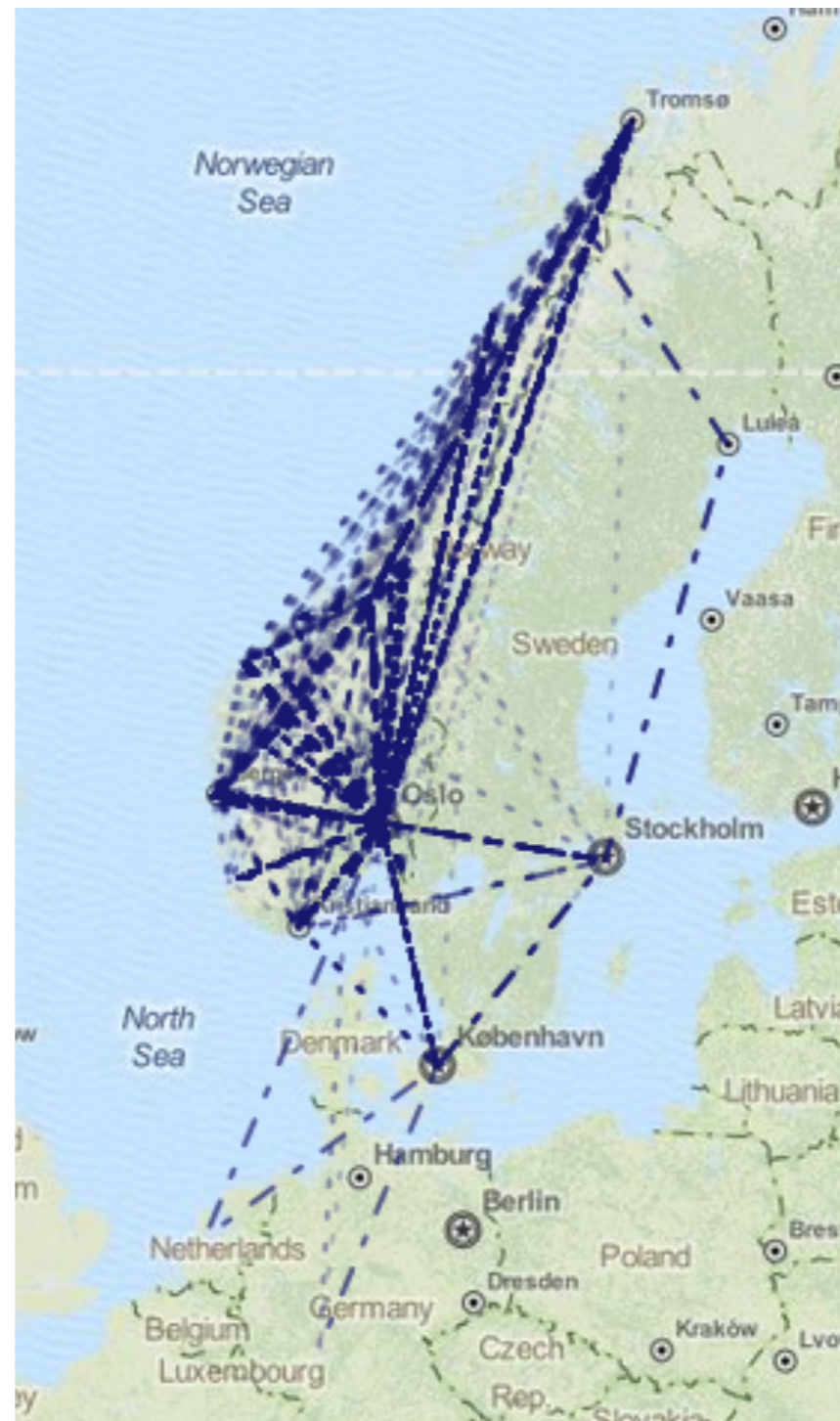


- Tool & concept by Emile Aben
 - <https://github.com/emileaben/ixp-country-jedi>
 - <https://labs.ripe.net/Members/emileaben/measuring-ixps-with-ripe-atlas>
- traceroute mesh between RIPE Atlas probes
 - Identify ASNs in the country using RIPEstat
 - Identify IXPs & IXP LANs using PeeringDB
 - Mesh: from a set of probes in a country to each other
 - Max 2 probes per ASN
 - Only “public” probes with “good” geolocation
 - Hops geolocated using “OpenIPMap” database

Do Paths Stay in the Country?



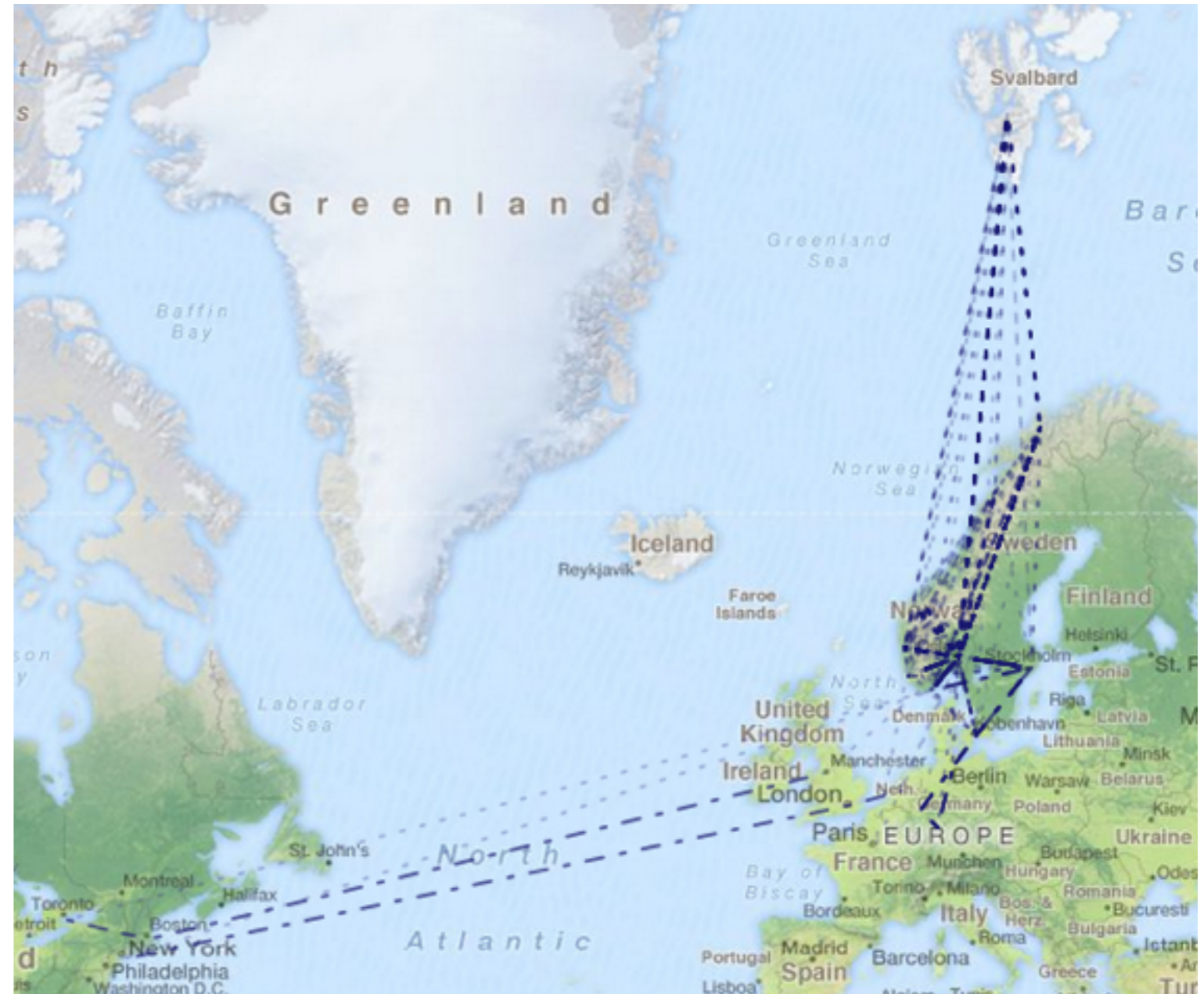
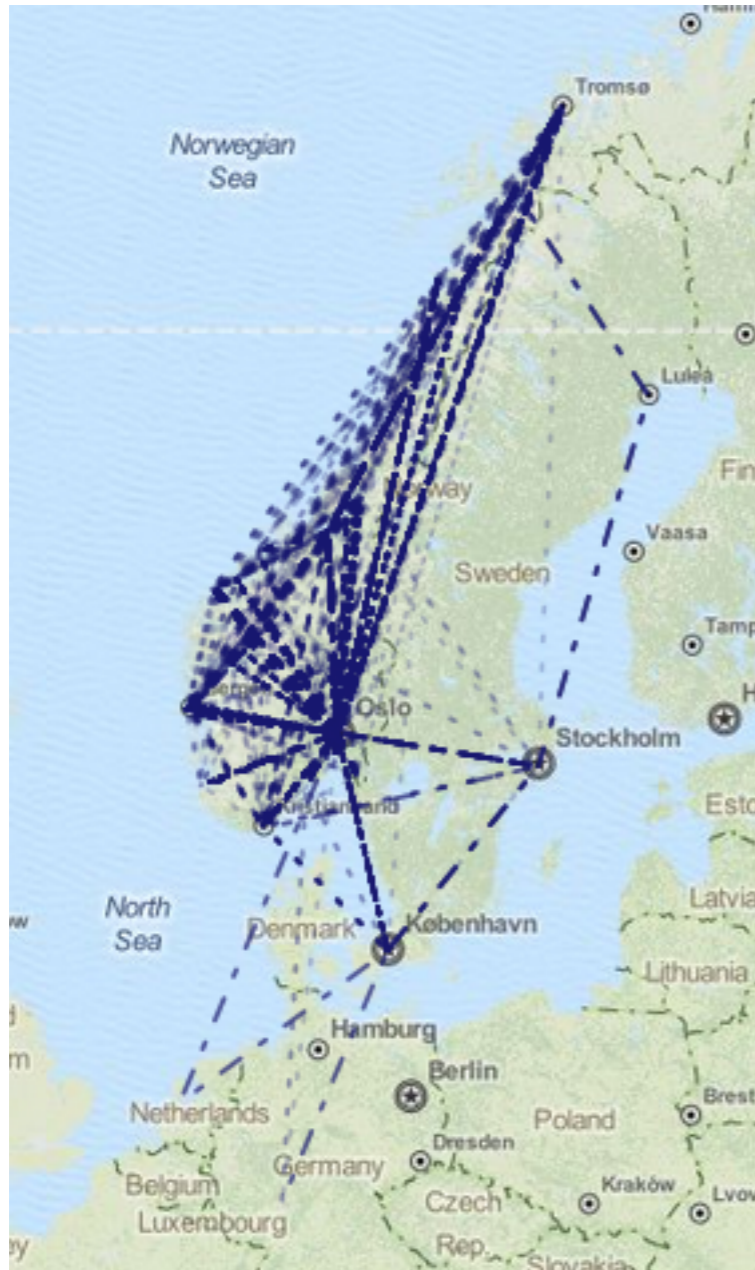
- Snapshot of the paths that do, or don't, stay local



Difference between IPv4 & IPv6



- Fewer RIPE Atlas probes support IPv6



How Many Paths Go Via Local IXP?



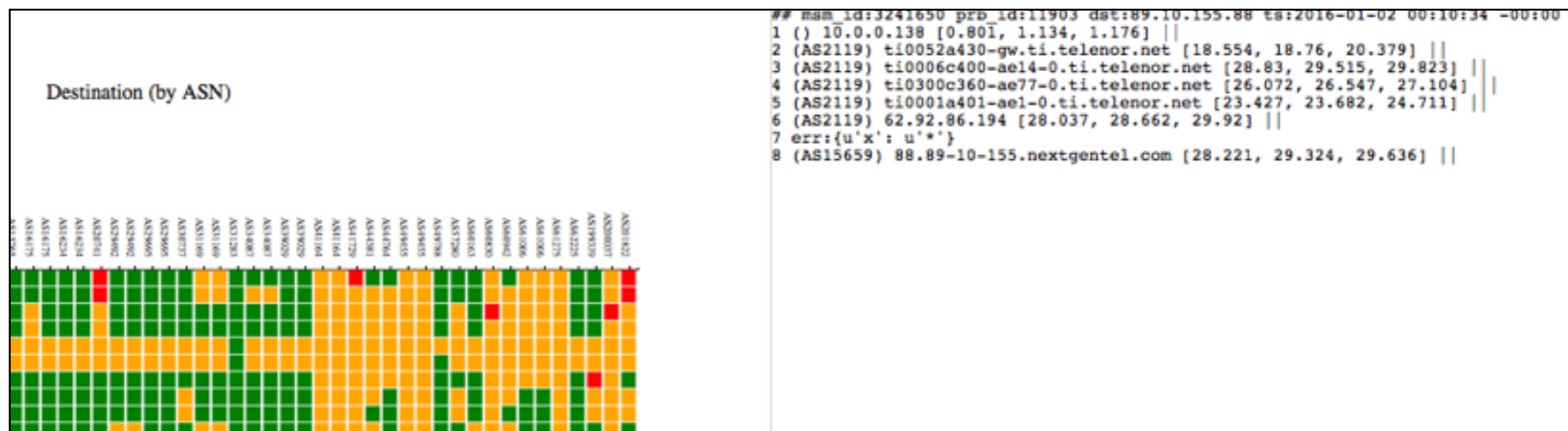
IXP IPs: YES, out-of-country IPs: NO
IXP IPs: NO, out-of-country IPs: NO
IXP IPs: YES, out-of-country IPs: YES
IXP IPs: NO, out-of-country IPs: YES



Potential Routing Optimisation



- Interactive diagnosis tool (hover over the cell)
 - <http://sg-pub.ripe.net/emile/ixp-country-jedi/latest/JP/ixpcountry>



- Red or blue: the path is going out of country
 - If this is a surprise, talk to your upstream(s)
- Yellow: the path is not going via a local IXP
 - If this is undesired, make a new peering agreement

Benefits (1)



- Country: regulators, politicians, cyber-security
 - How many paths stay within the country? Where do they go?
- Operators
 - Routing & traffic optimisation
- IPv6 advocates
 - Comparing IPv4 and IPv6 paths

Benefits (2)



- IXP operators
 - Shows how IXPs help to keep traffic local & regional
- RIPE Atlas community
 - More probes in more networks and ASes = higher-quality measurements data
- Geolocation data community
 - Use case for improving the data quality

Actions



- Use this tool to find possible suboptimal routing
 - Find your ASN in the mesh, find the person from another ASN, have tea :)
- To improve accuracy of this diagnostic tool
 - If your ASN is not on the graph, **apply for a RIPE Atlas probe**
 - If you move, remember to update your probe's geolocation
- Re-use & re-write the code: it is free & open source software
- Improve infrastructure geolocation: contribute data to OpenIPMap!



RIPE Labs

What is RIPE Labs?



- It's a blog, a community platform for sharing ideas, and a tool to try out new ideas
- You can
 - Test and evaluate new tools and prototypes
 - Contribute new ideas and research results
 - Provide feedback and discuss with others
- Many articles from the RIPE NCC *but* its for the whole community and we want your input

<https://labs.ripe.net>

This Is What It Looks Like



RIPE Labs <<

- Data Repository
- Security
- RIPE NCC Statistics
- RIPE Database
- RIPE Atlas
- RIPEstat
- About

Your IP address is:
2001:67c:2e8:9::c100:14e6

Statistics

12,971
Number of LIRs

912,384
Number of IPv4 addresses transferred last month

9,857
LIRs with IPv6

View more statistics

TagCloud

BGP allocation api ases atlas certification country cpe database datarepository dns dnsmon dnssec geolocation ipv4 ipv6

RIPE Labs

INNOVATIVE INTERNET TOOLS AND IDEAS
SHARE EXPERIENCE | SHOWCASE TOOLS | PRESENT RESEARCH

Contents **View** Edit Syndication Sharing

Display ▾ Add new... ▾

RSS

Measuring More Internet with RIPE Atlas

Emile Aben — Jan 27, 2016 01:20 PM

RIPE Atlas collects a lot of measurements. But how much of the Internet are we actually measuring? We had a sense that with a limited amount of extra load on the system, we could dramatically increase the number of router IPs seen on a given day in RIPE Atlas - and that means measuring more of the Internet.

Tags: atlas measurements visualisation

[Read more →](#)

[Tweet](#) 0 comments

Behind the Curtain: Making IPv6 Work

George Michaelson — Jan 26, 2016 12:55 PM

Wouldn't it be nice if turning on IPv6 really was 'press one button and the rest is magic' easy?

Tags: ipv6

[Read more →](#)

[Tweet](#) 0 comments

RIPE Atlas WiFi Measurements - Part 2

Suzanne Taylor Muzzin — Jan 25, 2016 02:41 PM

A little while ago, we asked what you thought about the idea of conducting WiFi measurements in RIPE Atlas. After some consideration and community feedback

[Read more →](#)

[Tweet](#) 1 comment

RIPE Labs Content



- Statistics and measurements
 - Routing, IPv4, IPv6, DNS, traffic
- Tools
 - RIPE Atlas, RIPEstat, RIPE DB
- Research and analysis
 - Also many external contributors

TagCloud

BGP allocation api ases
atlas certification
country cpe database
datarepository dns dnsmon
dnssec geolocation ipv4
ipv6 ipv6day ipv6launch ixp
k-root lirs
measurements meetings
members operational
policy reputation rex
ripestat root-servers
routing security
statistics syria tools
transfers visualisation

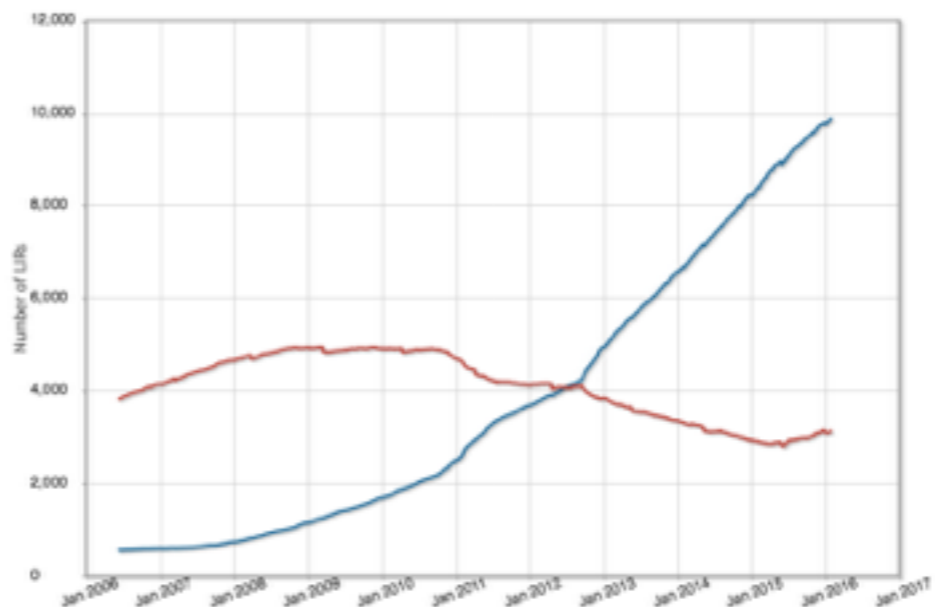
RIPE Labs Statistics Dashboard



Tags

allocation ases atlas
 certification country
 database ipv4 ipv6
 k-root lirs meetings
 ripestat routing syria
 transfers

LIRs With and Without IPv6



Statistics

12,971

Number of LIRs



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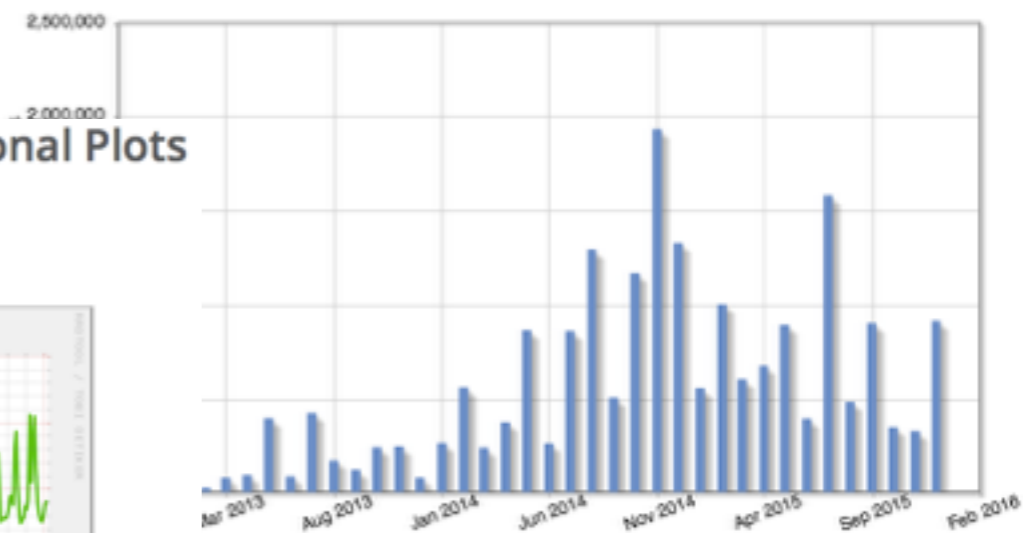
LIRs with IPv6



View more statistics



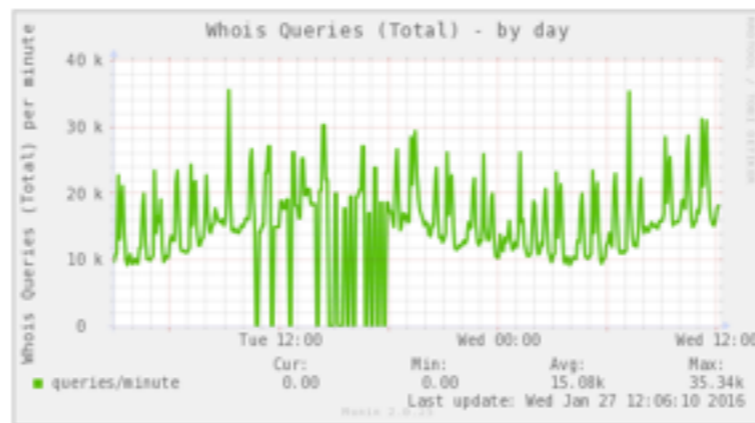
IPv4 Addresses Transferred



RIPE Database Server - Operational Plots

Query rate:

The number of RIPE Database queries we serve in total



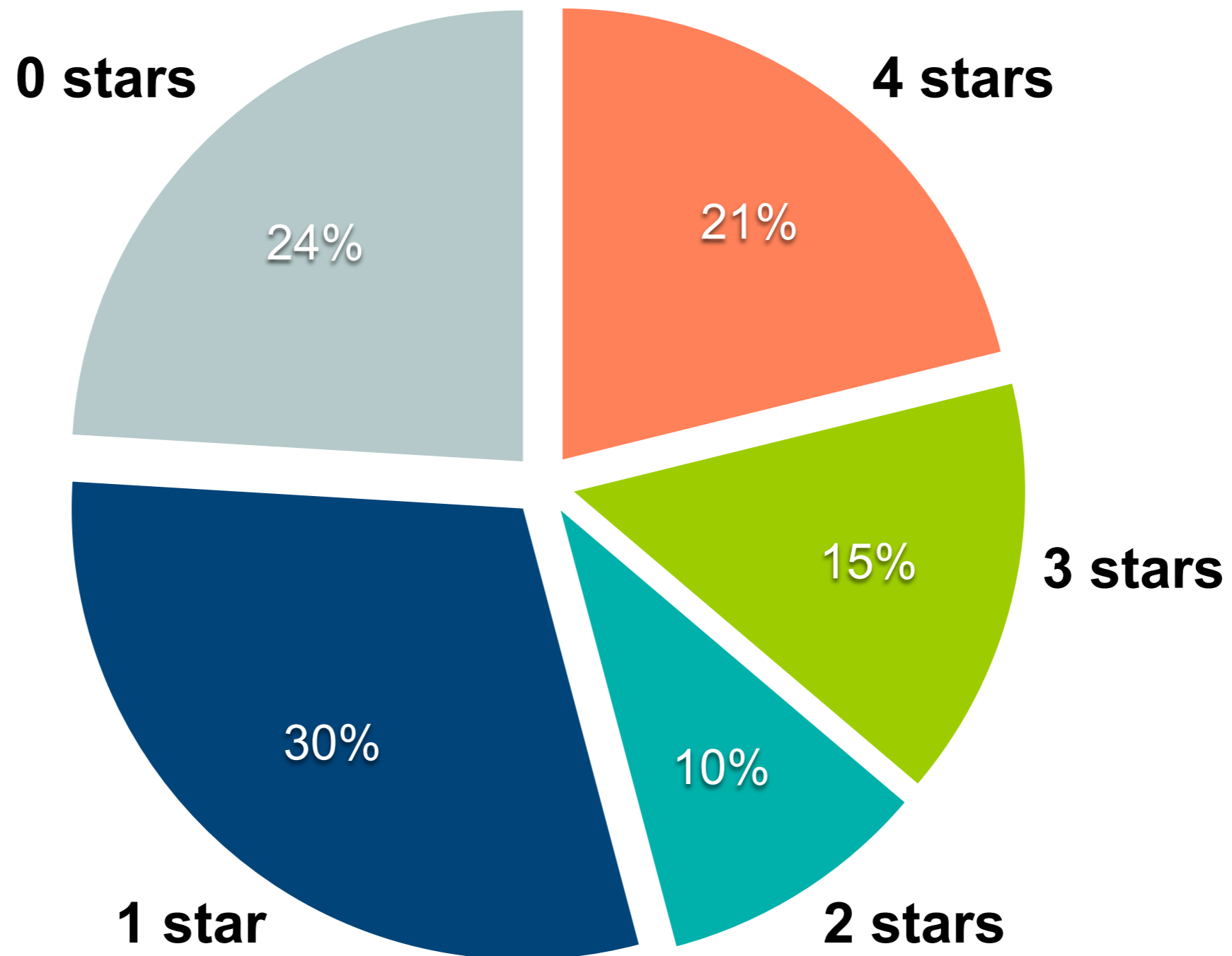
IPv6 RIPEness



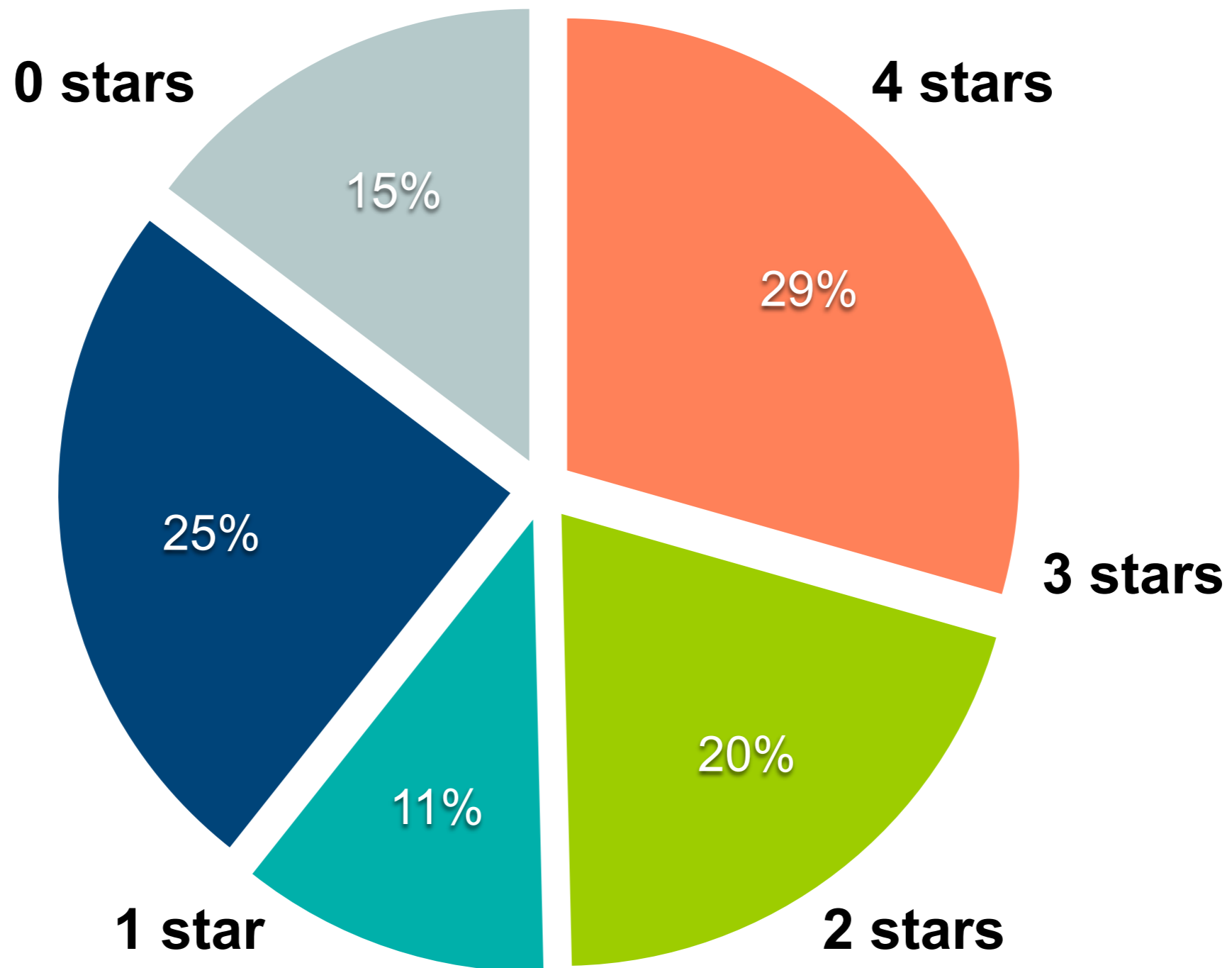
- Rating system to monitor IPv6 deployment among RIPE NCC members
- Stars are awarded for:
 - Obtaining an IPv6 address (allocation)
 - Visibility in global routing table
 - Setting up routing registry entries
 - Setting up reverse DNS
- Per country statistics published daily

<http://ipv6ripeness.ripe.net/>

IPv6 RIPEness total (12,981 LIRs)



IPv6 RIPEness in NO (271 LIRs)



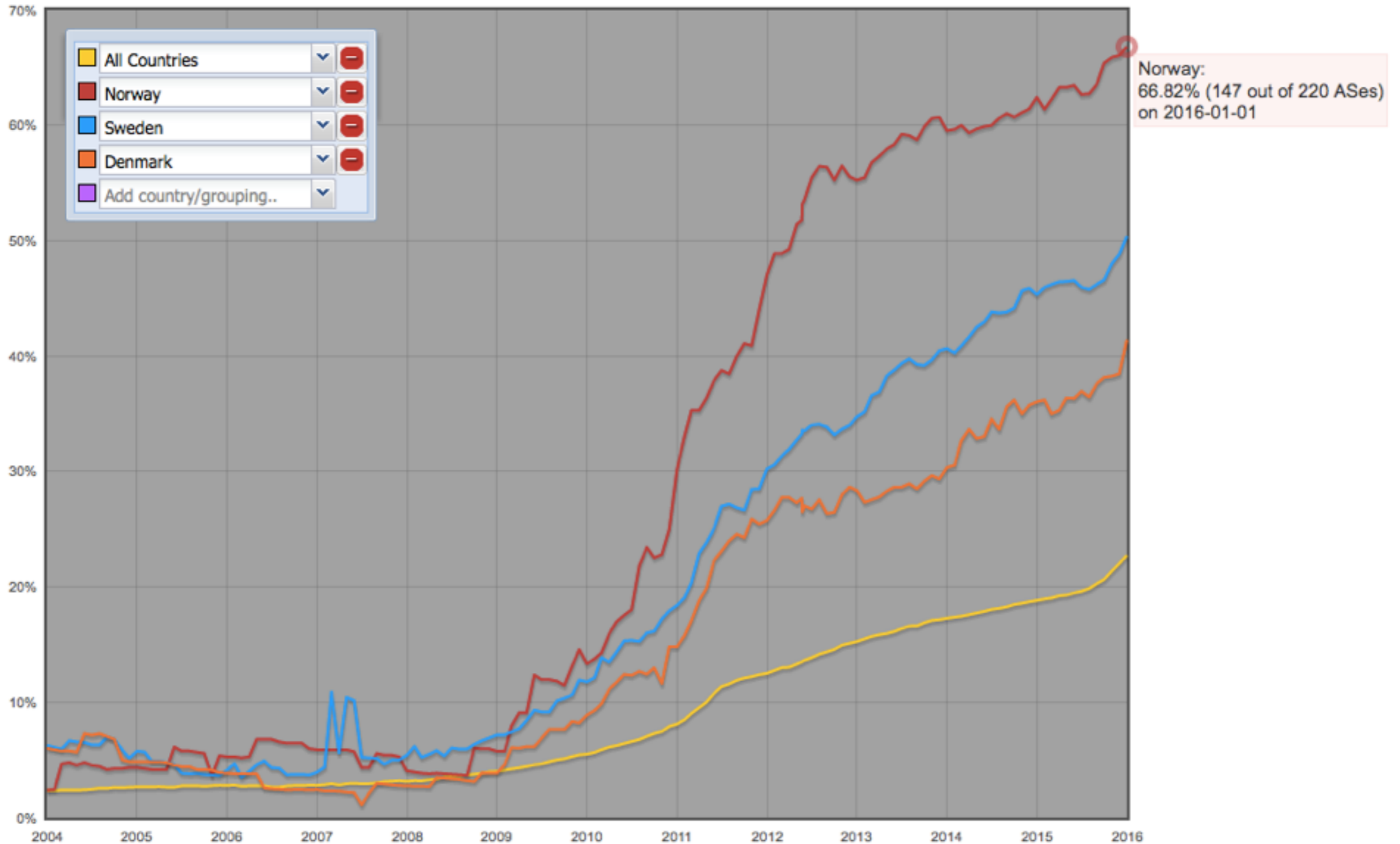
IPv6 RIPEness - Fifth Star



- Members can qualify for a fifth star
- This measures IPv6 deployment at the edge and looks at:
 - **Content** - 16% of content must be accessible over IPv6; or
 - **Access** - 16% of your customers are IPv6-capable
- The threshold doubles every year
- Get a new 5-star RIPEness t-shirt every year!

<http://ipv6ripeness.ripe.net/5star/NO.html>

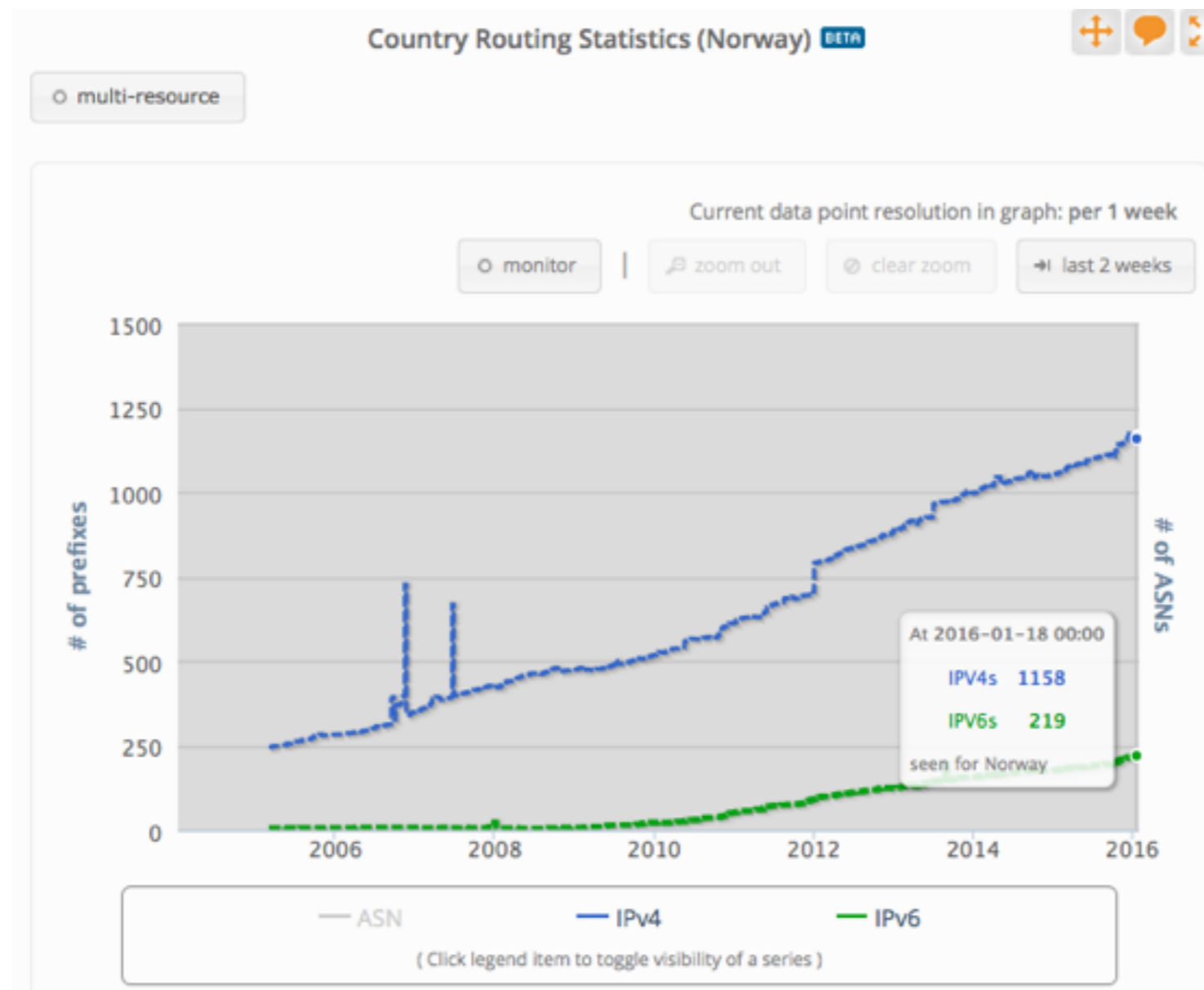
ASes Announcing IPv6 Prefixes



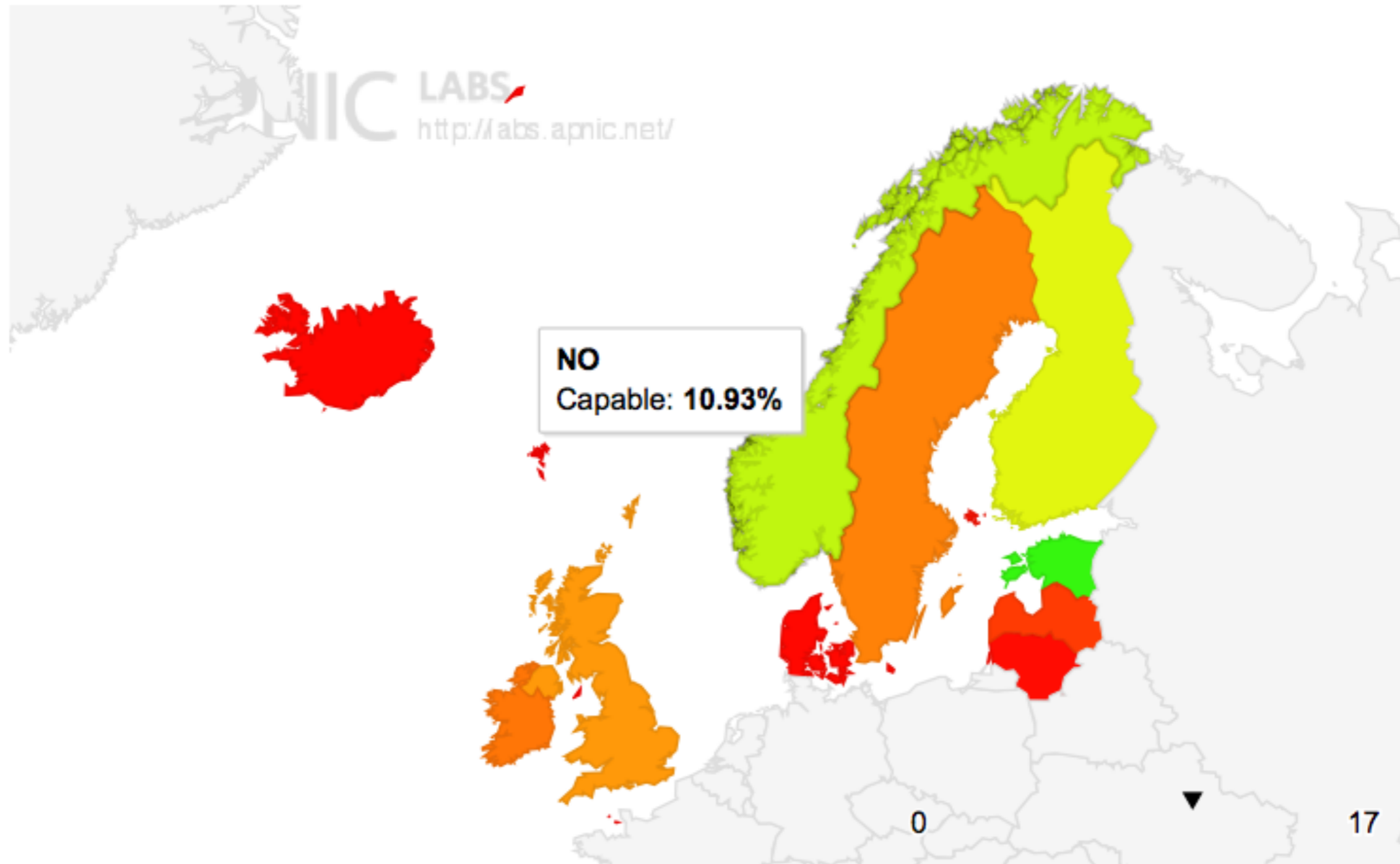
Country Statistics in RIPEstat



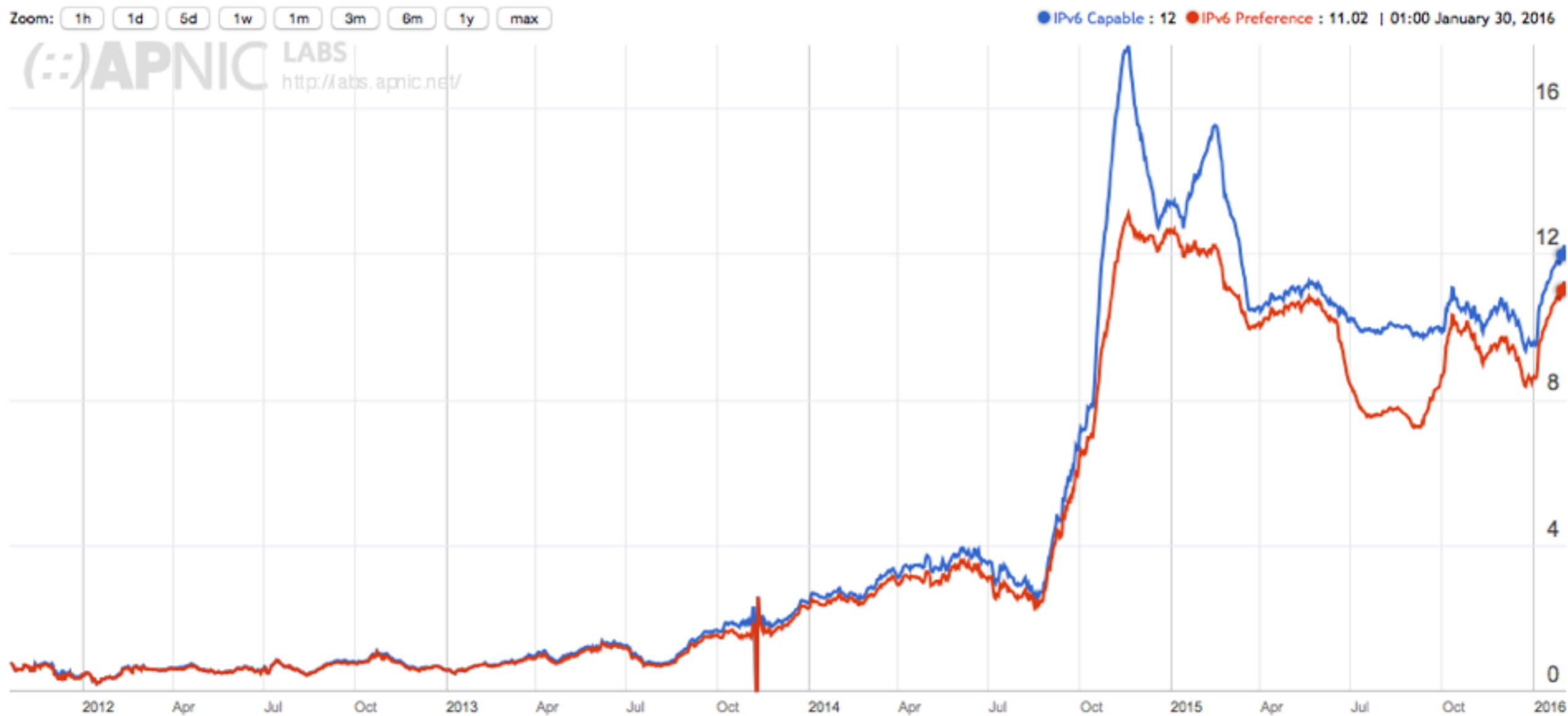
- RIPEstat shows statistics on resources and bandwidth
- check out: <https://stats.ripe.net>



Actual Use of IPv6 in Norway



Capable and Preferred IPv6 Use





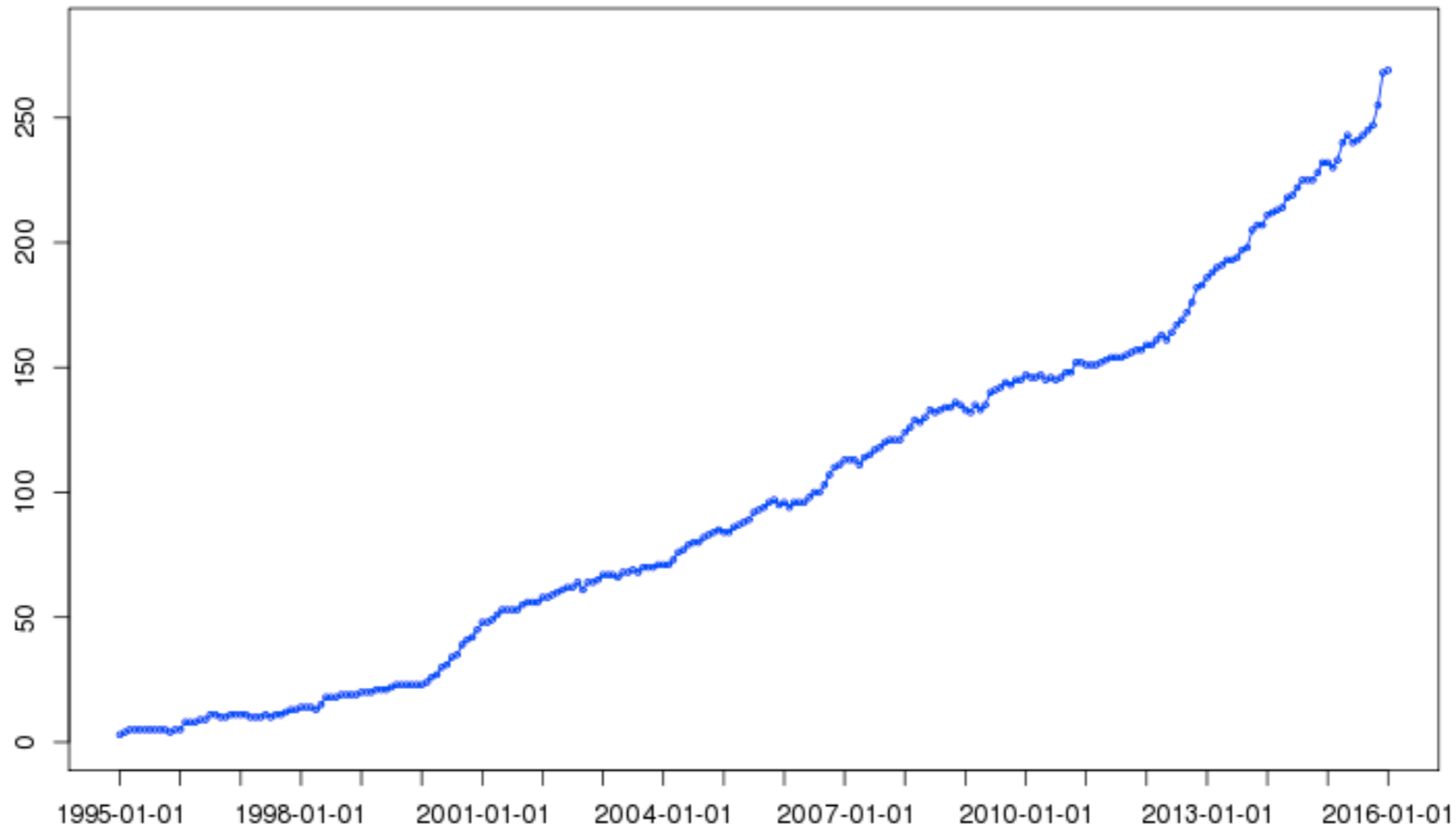
RIPE NCC Membership

RIPE NCC Members in Norway



- 271 members in Norway today - a 15% increase over the past year

Number of no.* provider registries over time



Last RIPE NCC General Meeting



- Redistribution of 2015 surplus to the membership
- Board resolution after last GM to suspend members' ability to add additional LIRs
 - Board will ask for members' opinion on this on members-discuss mailing list soon
- Presented Activity Plan and Budget 2016:
 - Details everything the RIPE NCC will work on this year, outlines all services (incl. benefits for members), and gives the cost of each activity

Next General Meeting - 25 May 2016

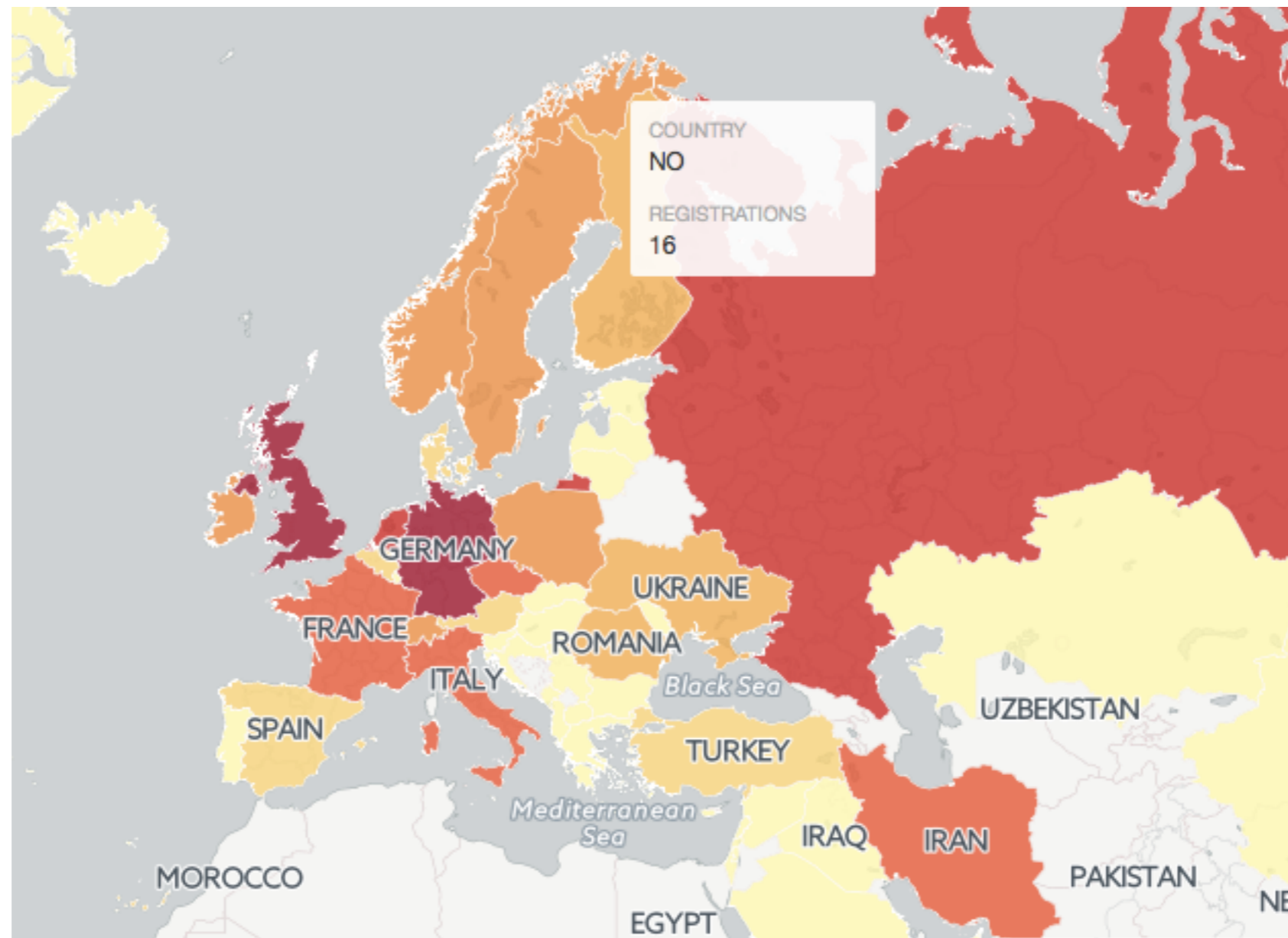


- Takes place alongside RIPE 72
- Charging Scheme for 2017 will be voted on
- Annual/Financial reports presented
- There will be an Executive Board election:
 - Two seats available
 - Will be making call for candidates this month
- Members should register for the GM
 - Remote participation and electronic voting available

Voting at the GM



- 16 of 691 registrations from Norway at last GM



RIPE NCC Survey 2016



- Large-scale survey conducted every 3 years
- In 2013, over 3,000 responses that we used to create 48 actions that we implemented
- The 2016 process began here in Oslo at NIX
- Consultations around service region to find out how people think we can improve
- Launches at RIPE 72 - please take part!

RIPE NCC Survey 2016



- If not to help the RIPE NCC provide better services for members, then to win a nice prize....



Meet Us at RIPE 72 in Copenhagen



RIPE Meetings:
connecting the Internet
community.

ripe72.ripe.net



Questions



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