NRO update

To be the flagship and global leader for collaborative Internet number resource management as a central element of an open, stable and secure Internet

ICANN 61
San Juan

Number Resource Organization

What is the NRO?

- Number Resource Organization
  - NRO MoU, 24 Oct 2003
- Mission
  - Coordinating the RIR system and joint RIR activities
  - Promote the multi-stakeholder model and bottom-up policy development
  - Fulfill the role of the ICANN ASO
- http://www.nro.net

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Structure (2018)

- Executive committee
  - Paul Wilson (Chair) - APNIC
  - Alan Barrett (Vice Chair and Secretary) - AFRINIC
  - Axel Pawlik (Treasurer) – RIPE NCC
  - Oscar Robles – LACNIC
  - John Curran - ARIN
- Secretariat
  - Hosted by APNIC
  - Executive Secretary: German Valdez
  - Consultant: Susannah Gray
- Coordination Groups
  - CCG (Communications), ECG (Engineering), RSCG (Registration Services)
- Informal Groups
  - Public Affairs, Policy, Financial Officers, Legal Staff

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Publications

- Internet Number Status Report
  - Updated quarterly.
  - Global stats on IPv4, IPv6, ASN
  - http://www.nro.net/statistics
- Comparative Policy Overview
  - Updated quarterly
  - New information on RIRs membership policy (access to delegation and registration services)
  - http://www.nro.net/comparative-policy
- Address Supporting Organization
  - http://aso.icann.org

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Finances 2017

- Budget allocations
  - AFRINIC 7.22%
  - APNIC 23.50%
  - ARIN 29.34%
  - LACNIC 10.42%
  - RIPE NCC 29.53%
- Expenses
  - General operations: USD $643,000
    - secretariat, communications, travel, meetings
    - IGF Contributions $200,000
  - Contribution to ICANN: USD $823,000
- Stability Fund
  - Joint RIR provision/pledge of over USD $2.1M
  - https://www.nro.net/joint-rir-stability-fund

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IANA Review Committee

- Advise and assist the NRO EC in its review of the service level of the IANA Numbering Services provided to the Internet Number Community.
- 3 members from each region
  - 2 community elected members, 1 RIR staff rep
- Public archives and minutes
  - https://www.nro.net/iana-numbering-services-review-committee/
- Call for Public Comments on the IANA Performance Matrix Summary Report
  - https://www.nro.net/call-for-public-comments-on-the-iana-performance-matrix-summary-report/

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Review Committee (2018)

- AFRINIC
  - Omo Oaiya, Noah Maina (Community)
  - Madhvi Gokool (staff)
- APNIC
  - **Bertrand Cherrier, Simon Sohel Baroi** (Community)
  - George Kuo (staff)
- ARIN
  - Louie Lee, Jason Schiller (Community)
  - Nate Davis (staff)
- LACNIC
  - Nicolas Antoniello, Esteban Lescano (Community)
  - Ernesto Majó (staff)
- RIPE NCC
  - Filiz Yilmaz, Nurani Nimpuno (Community)
  - Andrew de la Haye (staff)

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ICANN Empowered Community

- NRO EC adopted ASO empowered community procedures.
  - ASO Procedure for Empowered Community Approval Actions
  - ASO Procedure for Empowered Community Rejection Actions
  - ASO Procedure for Director Removal Actions
  - ASO Standard Practices for Empowered Community Activities

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ASO Review

- ASO MoU…
  - *"the NRO shall provide a periodic review of the ASO's effectiveness within ICANN"*
- 1st review conducted in 2011
- Timeline and announcements
  - https://www.nro.net/about-the-nro/aso-independent-review-2017/
- Final report published 8 August 2017
  - https://www.nro.net/aso-review-2017

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ASO Review

- NRO EC and ASO AC Joint Response to the 2017 Independent ASO Review Recommendations
  - https://www.nro.net/nro-ec-and-aso-ac-joint-response-to-the-2017-independent-aso-review-recommendations/

- RIR community consultation for the implementation of the recommendations
  - https://www.nro.net/aso-review-consultation-2018/

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Technical Projects

- RPKI “all resources” Trust Anchor
  - https://www.nro.net/regional-internet-registries-are-preparing-to-deploy-all-resources-rpki-service/
- IANA/PTI reporting requirements. Part of IANA SLA.
- Identifier Technology Health Indicators (ITHI) Consultation:
  - https://www.nro.net/ithi-consultation
- NRO Website Revamp.

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Some Stats...

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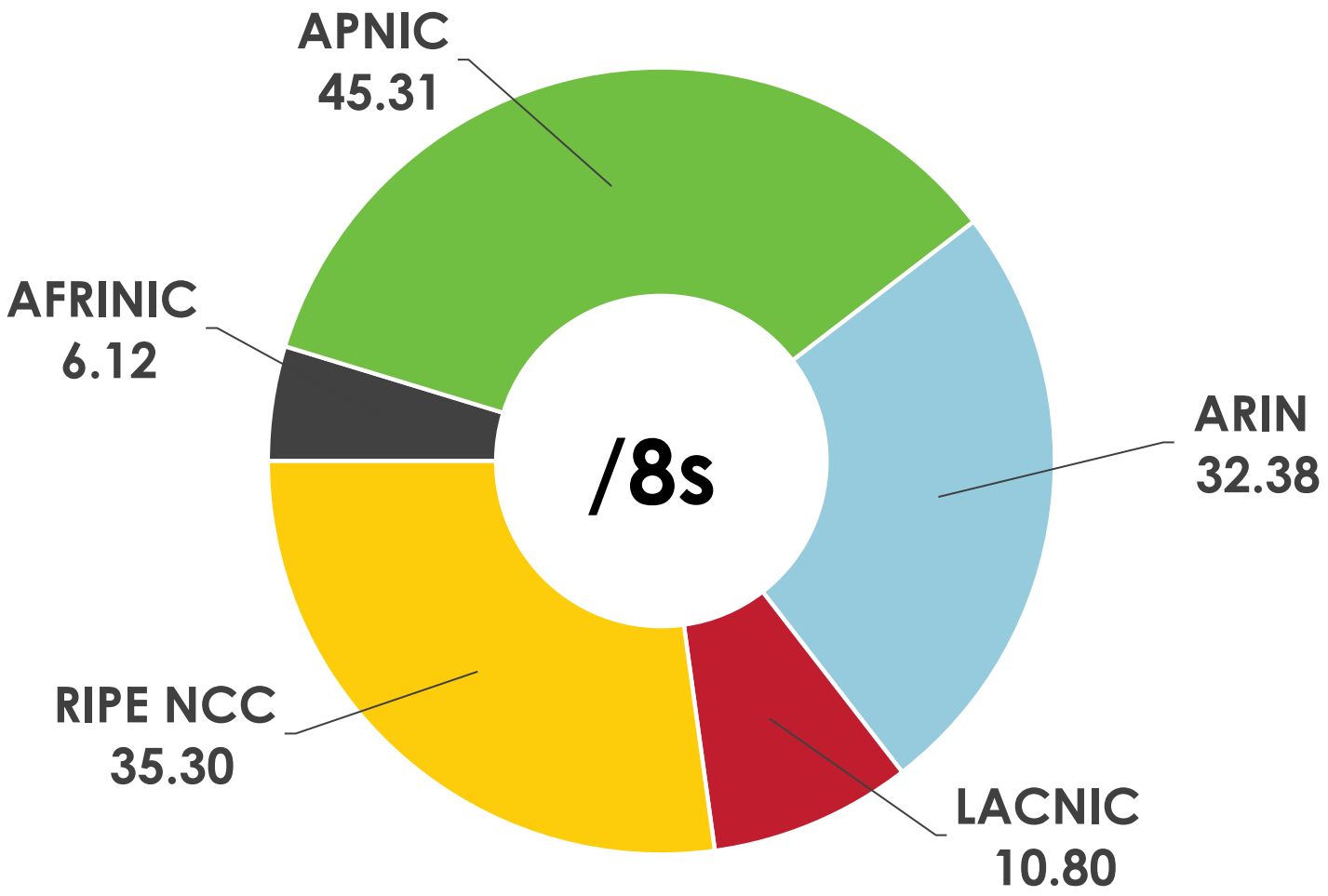
IPv4 ADDRESS SPACE ISSUED
(RIRs TO CUSTOMERS)
In terms of /8s, how much total space has each RIR issued?
(Jan 1999 – Dec 2017)



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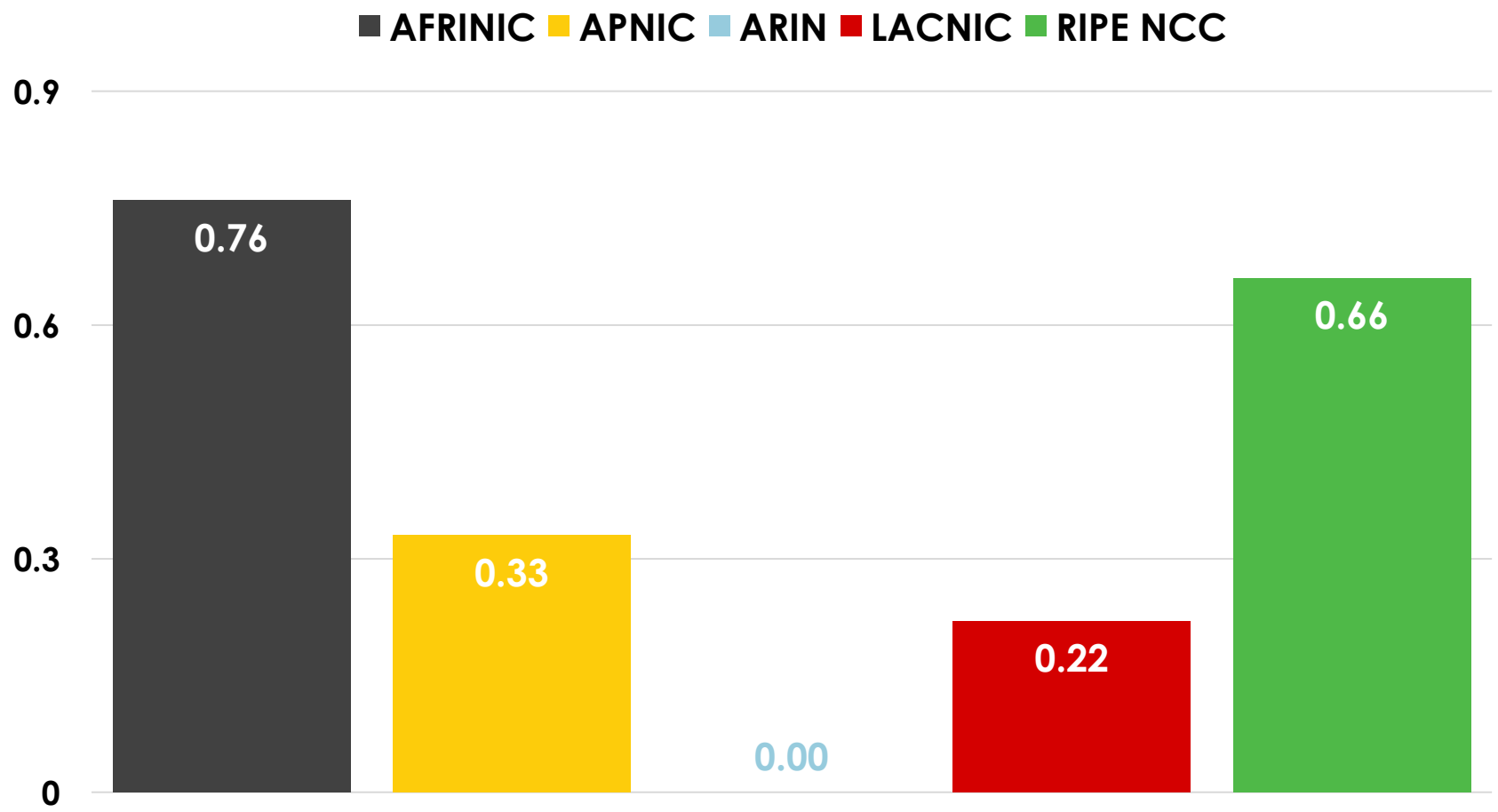
Available IPv4 /8s In Each RIR



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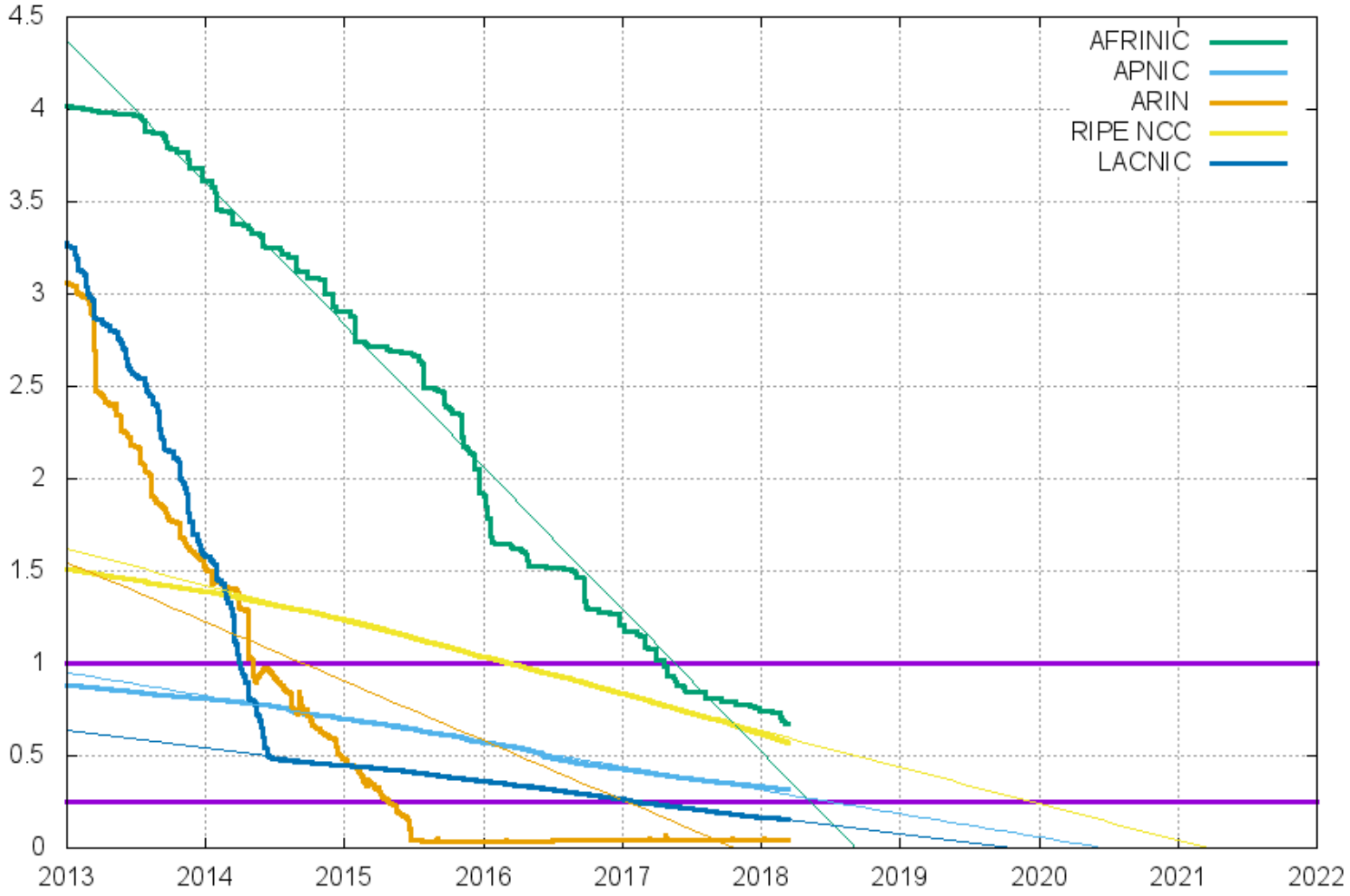
Available IPv4 /8s In Each RIR



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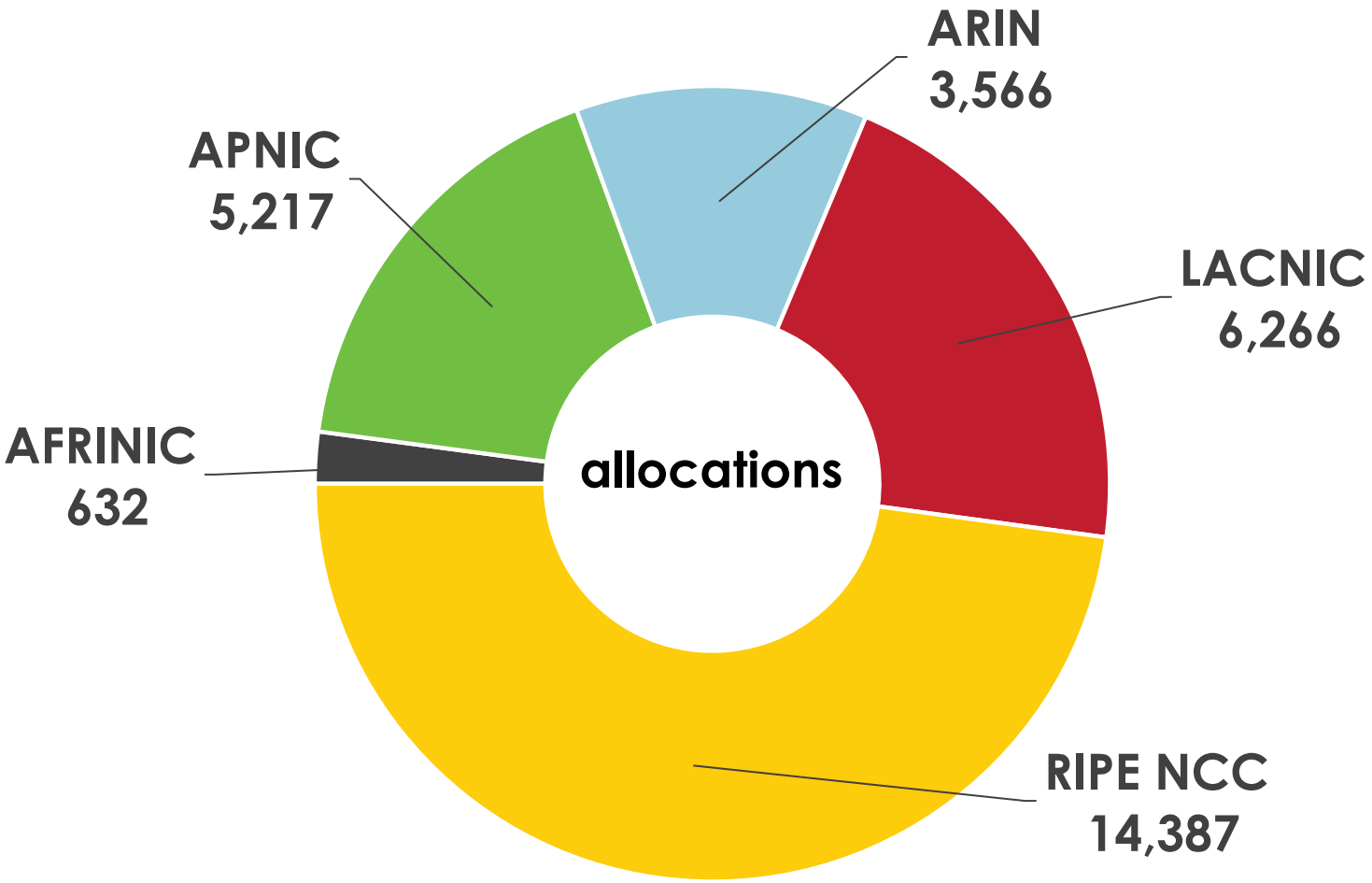
IPv6 ALLOCATIONS

(RIRs TO LIRs/ISPs)

How many total allocations have been made by each RIR?

(Jan 1999 – Dec 2017)



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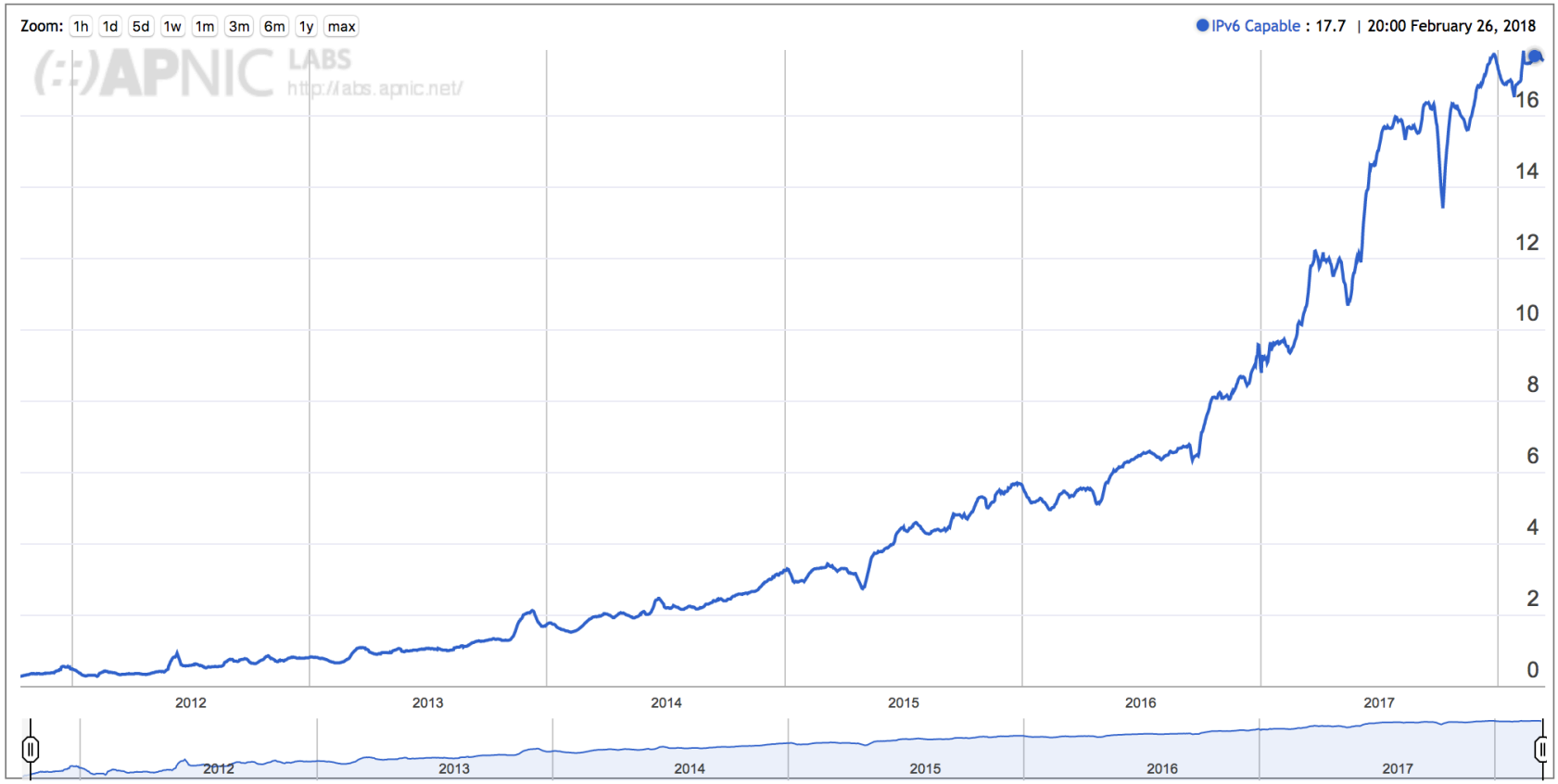
IPv6 Global Capability



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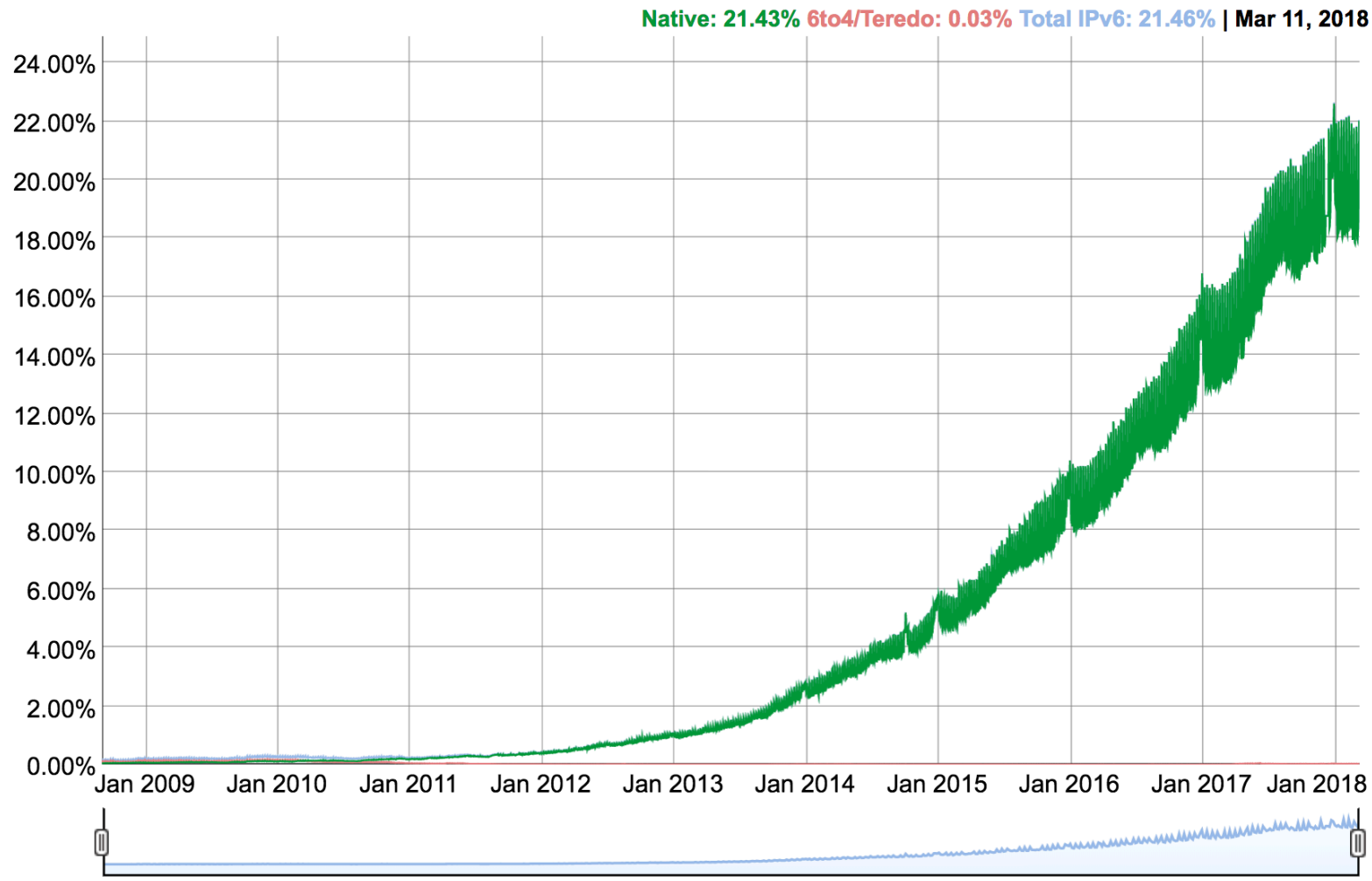
IPv6 at Google



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IPv6 Leaderboard – Top 25

CC	Country	IPv6 Capable	IPv6 Preferred	Samples	Weight	Weighted Samples
BE	Belgium, Western Europe, Europe	59.22%	56.28%	3,070,049	0.92	2,826,614
IN	India, Southern Asia, Asia	58.29%	57.15%	103,706,512	1.26	130,887,308
UY	Uruguay, South America, Americas	44.03%	43.51%	2,703,724	0.23	626,424
US	United States of America, Northern America, Americas	43.81%	41.80%	176,798,924	0.45	80,327,254
DE	Germany, Western Europe, Europe	41.70%	40.38%	9,022,850	2.23	20,115,444
GR	Greece, Southern Europe, Europe	38.93%	37.41%	8,317,179	0.24	2,005,514
LU	Luxembourg, Western Europe, Europe	30.59%	29.73%	165,179	0.95	156,101
CH	Switzerland, Western Europe, Europe	30.30%	28.26%	987,730	2.1	2,069,481
JP	Japan, Eastern Asia, Asia	27.84%	24.56%	3,118,436	10.32	32,183,788
MY	Malaysia, South-Eastern Asia, Asia	25.93%	25.21%	14,281,349	0.43	6,105,648
GB	United Kingdom of Great Britain and Northern Ireland, Northern Europe, Europe	25.82%	24.62%	12,772,492	1.34	17,123,610
TT	Trinidad and Tobago, Caribbean, Americas	25.57%	25.01%	916,155	0.29	263,453
FR	France, Western Europe, Europe	23.99%	22.71%	7,990,642	1.96	15,655,395
BR	Brazil, South America, Americas	23.22%	22.64%	30,008,522	1.3	38,892,009
IE	Ireland, Northern Europe, Europe	23.10%	22.46%	1,817,880	0.59	1,080,800
AX	Aland Islands, Northern Europe, Europe	23.01%	22.23%	2,807	0	0
FI	Finland, Northern Europe, Europe	22.70%	20.92%	520,217	2.74	1,424,066
PT	Portugal, Southern Europe, Europe	21.36%	20.87%	2,939,078	0.65	1,923,812
CA	Canada, Northern America, Americas	21.08%	20.17%	8,316,727	1.09	9,084,144
NZ	New Zealand, Australia and New Zealand, Oceania	19.47%	17.25%	1,085,435	1.09	1,179,440
PE	Peru, South America, Americas	19.44%	18.14%	3,955,786	0.94	3,707,159
EE	Estonia, Northern Europe, Europe	18.38%	17.80%	267,712	1.24	331,767
AU	Australia, Australia and New Zealand, Oceania	16.40%	15.55%	3,630,146	1.61	5,855,674
EC	Ecuador, South America, Americas	15.95%	15.18%	1,404,941	1.44	2,018,851
KR	Republic of Korea, Eastern Asia, Asia	15.40%	12.49%	16,368,401	0.74	12,179,533

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ITHI

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What's ITHI

- A project initiated by ICANN
  - https://www.icann.org/ithi-faqs
- The goal is to improve the security, stability and resiliency of the Internet's unique identifier system, by developing metrics to measure the health of the unique identifier systems
- The RIRs agree to facilitate development of metrics for the Internet Number Registry System
  - www.nro.net/ithi-project/
- The NRO Registration Services Coordination (RSCG) and Engineering Coordination Groups (ECG) have collaborated to develop initial set of metric definitions as a basis for community consultation

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RIRs work on ITHI

- Initial draft document on definition and risk – completed Dec 2016
- Prepare indicators draft ITHI document – completed Q 1 2017
- Release discussion draft for community consultation via NRO website – completed Q4 2017
- Prepare draft ITHI document to include feedback from community consultation – completed Feb 2018
- Prepare final draft of ITHI document – work in progress – Feb 2018

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Global consultation

- Draft ITHI document published on 11 Sep 2017 on NRO website and ITHI-consult mailing list
  - https://www.nro.net/global-consultation-on-identifier-technical-health-indicators-ithi-project/
- 90 day comment period ended 12 Dec 2017
- Two comments received have been considered in the final draft of ITHI metrics document
  - “measurement should be daily”
  - “official source” mentioned in the metrics is wide and ample

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ITHI metrics for INRs

- What are measured?
  - All Internet Number Resources (INRs) administered by each RIR and included in the NRO extended delegated statistics
- What are excluded?
  - Internet number resources reserved by IANA for the technical community, special purposes, and future delegations
- Accurate data is defined as being
  - ‘Comprehensive’,
  - ‘Correct’ and
  - ‘Current’

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ITHI measurement metrics

	Definition	Measurement	Measurement Unit
Comprehensive	Complete (all required data is available)	All INRs administered by each RIR are accounted for in the NRO extended delegation statistics	• X number of INRs administered missing out of total INRs in the NRO extended stats file • Percentage of completeness translated by number above
		INRs registration / holdership data is available for all INRs accounted for in the NRO extended delegation statistics [1]	• Legal Name and address = 50%, POC Information = 50% [2] • Required holdership data: Legal name and associated legal address, point of contact (email, phone any of these)
	Unique (no duplicated data)	INRs administerd by each RIR are not duplicated in the NRO extended delegation statistics	• X number of INRs administered overlapping out of total INRs in the NRO extended stats file • Percentage of completeness translated by number above
Correct	Matching official sources [4] for legal name and address	The required registration / holdership data listed for the INRs holder matches official sources	• Legal name and address • 50% of total correctness
	Functioning and reaching a relevant party	The required registration/holdership contact data listed for the INR holder is a functioning and reachable relevant party	• Point of contact: email / phone • 50% of total correctness
Current	Confirmed to be up to date or *recently* updated [5]	The required holdership data listed for the INR holder is confirmed to be up-to-date or updated [1]	Give a weight to each data point to reach a total score out of 100% • 50% legal name and address • 50% point of contact

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Reference

- More information on the NRO website
  - www.nro.net/ithi-project/
- More information on ICANN website
  - https://www.icann.org/ithi-faqs

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Thank You

http://www.nro.net

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