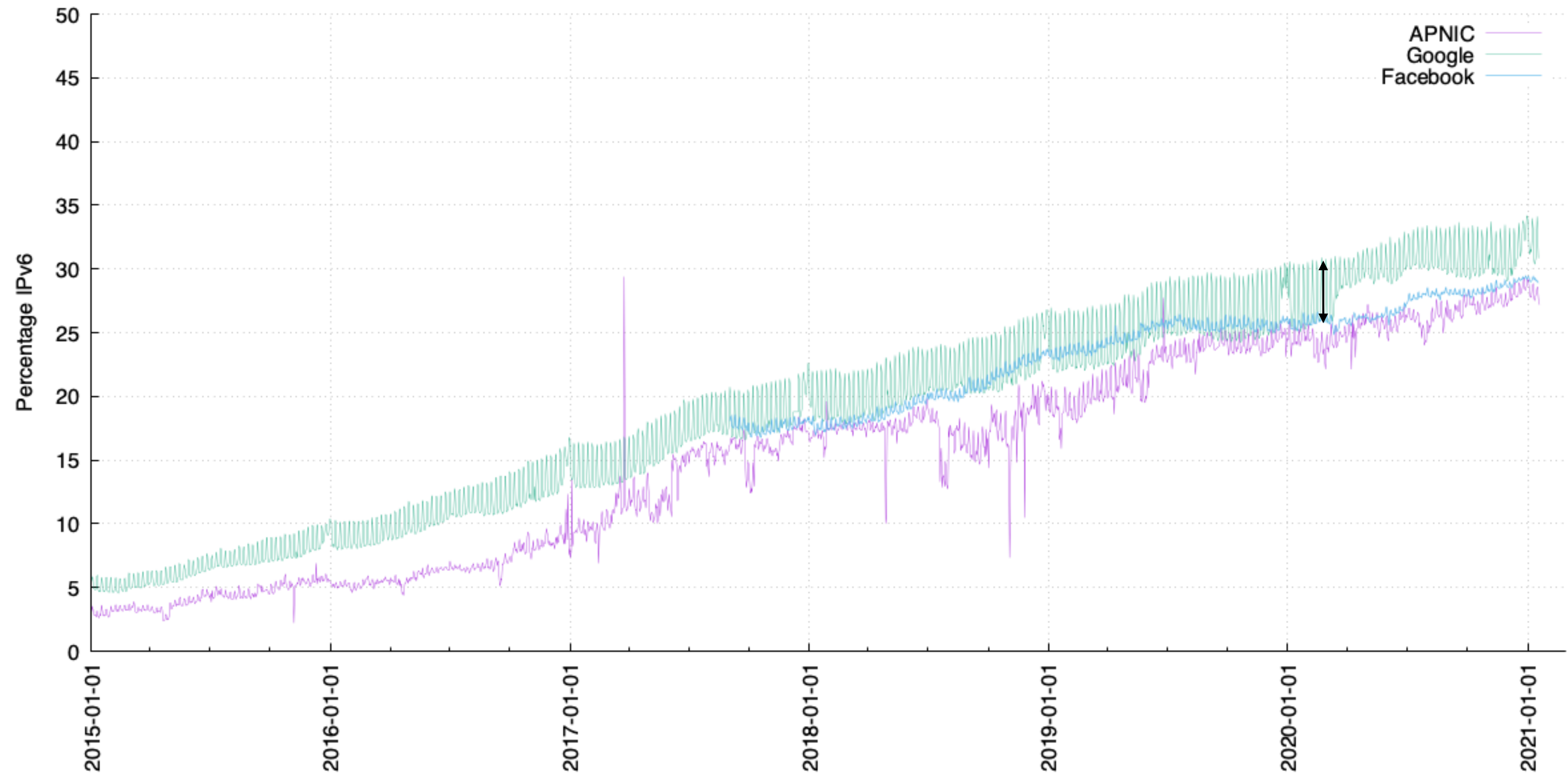# IPv6

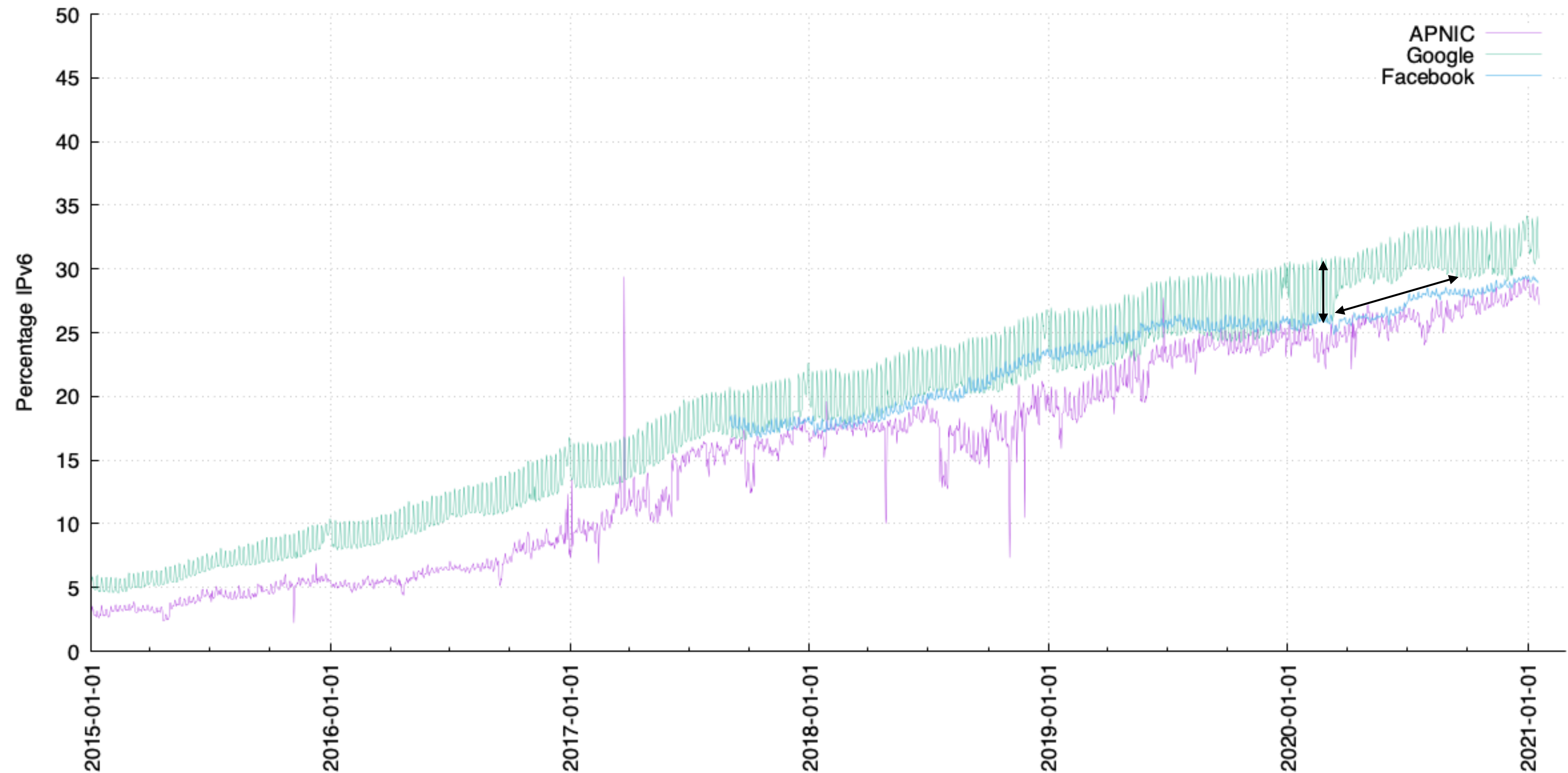Stephen Strowes <sds@ripe.net> | 2021-01-26 | Roundtable

Global Trends: Daily traffic load
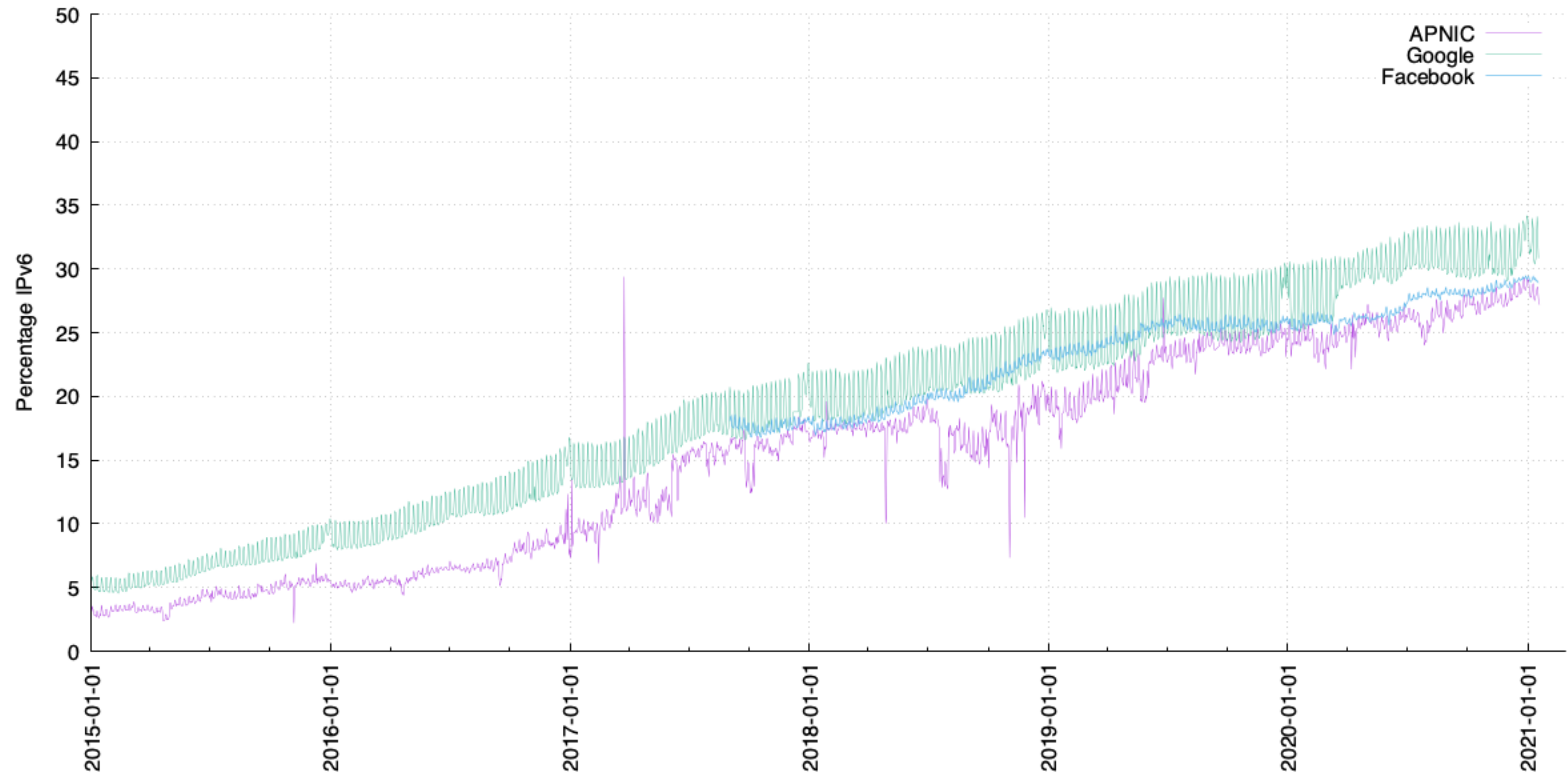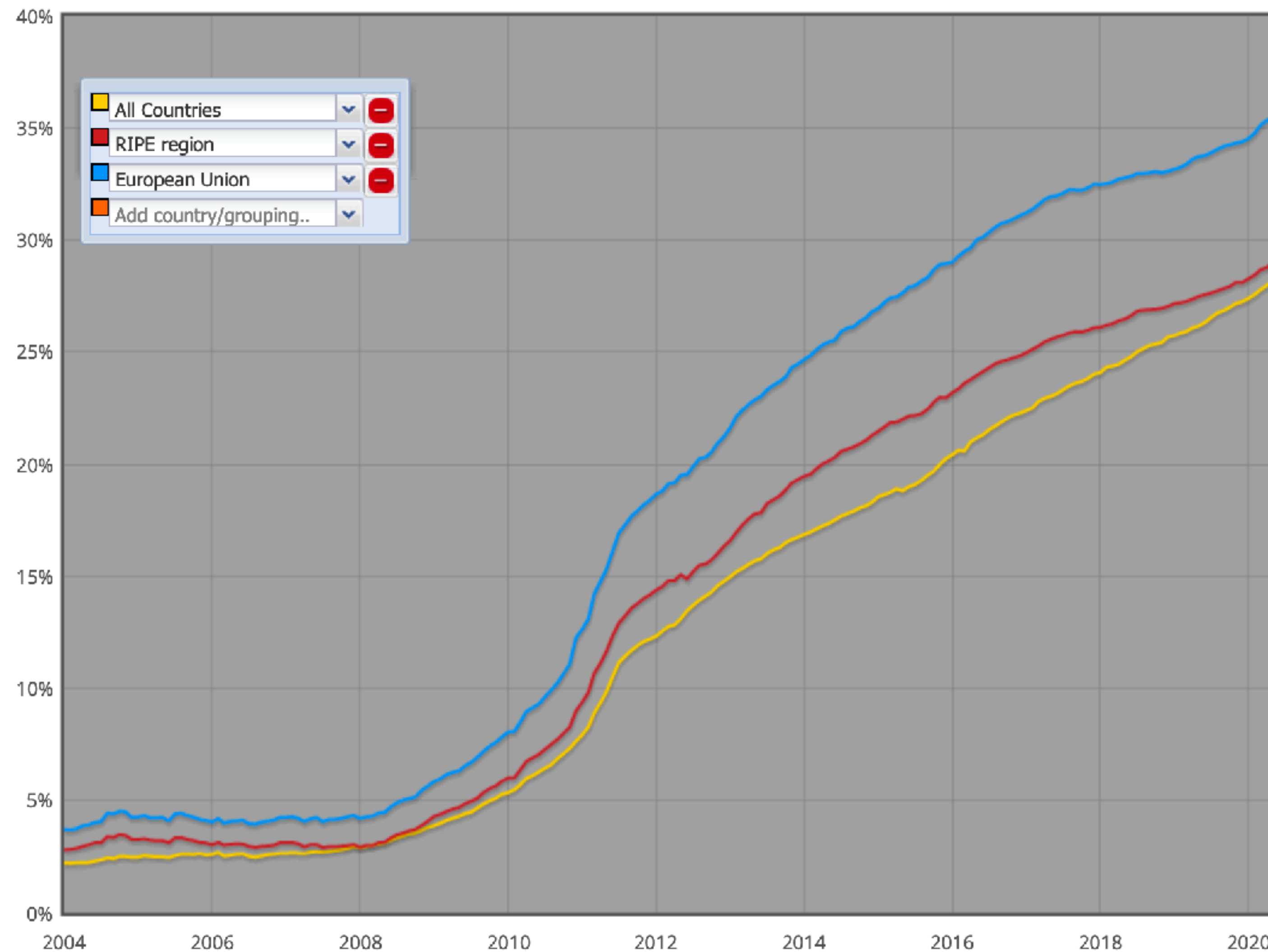
Global Trends: Daily traffic load

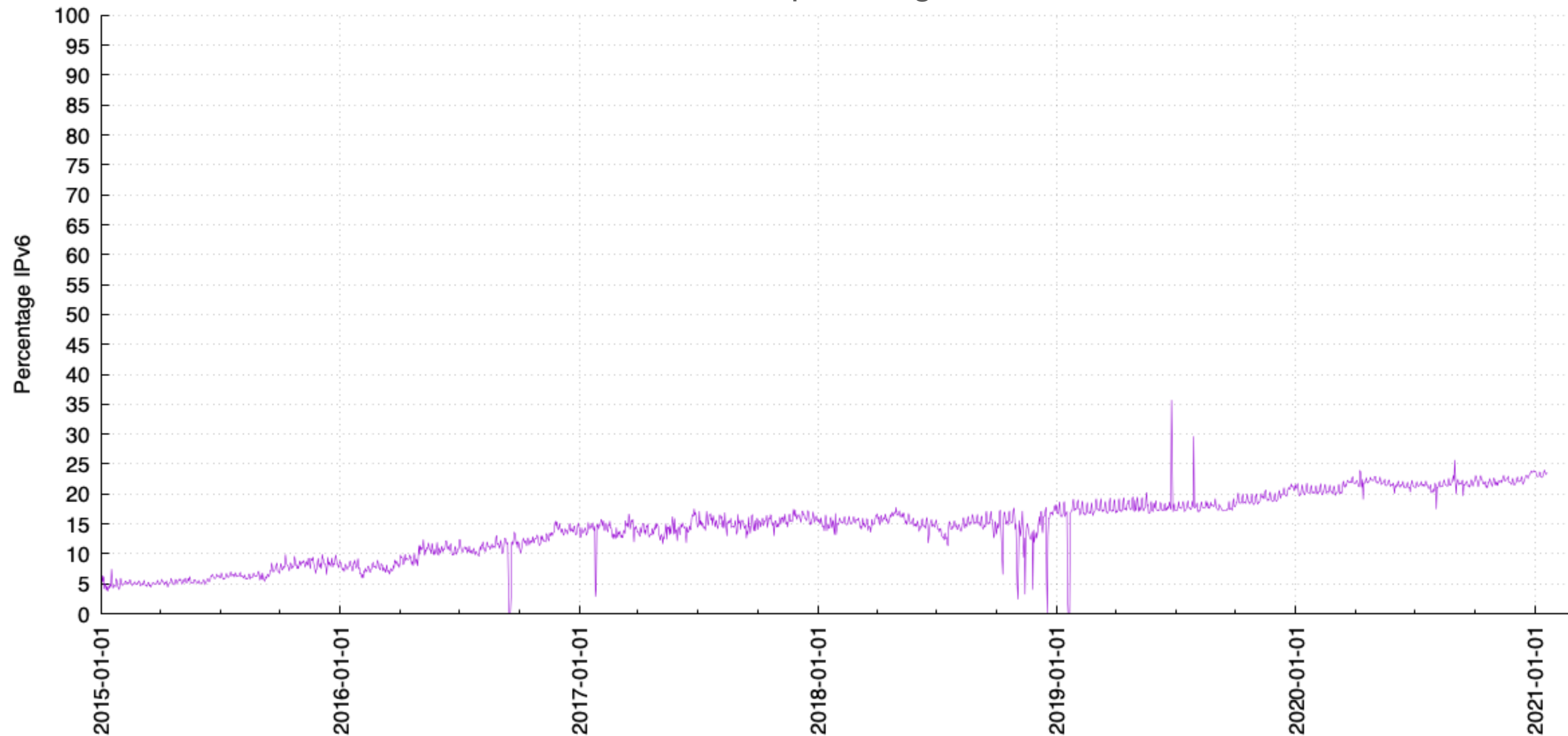# Global Trends: Daily traffic load

European Trends: Routable ASNs

European Trends: APNIC data

European region

Readiness (from good to bad)

- Generally good:
  - Content providers and CDNs
  - Backbone Internet transit providers
  - Local connectivity: IXPs

- Mixed:
  - Some* datacenter networks
  - Cloud providers
  - Subscriber networks: cellular, fixed-line

- Generally bad:
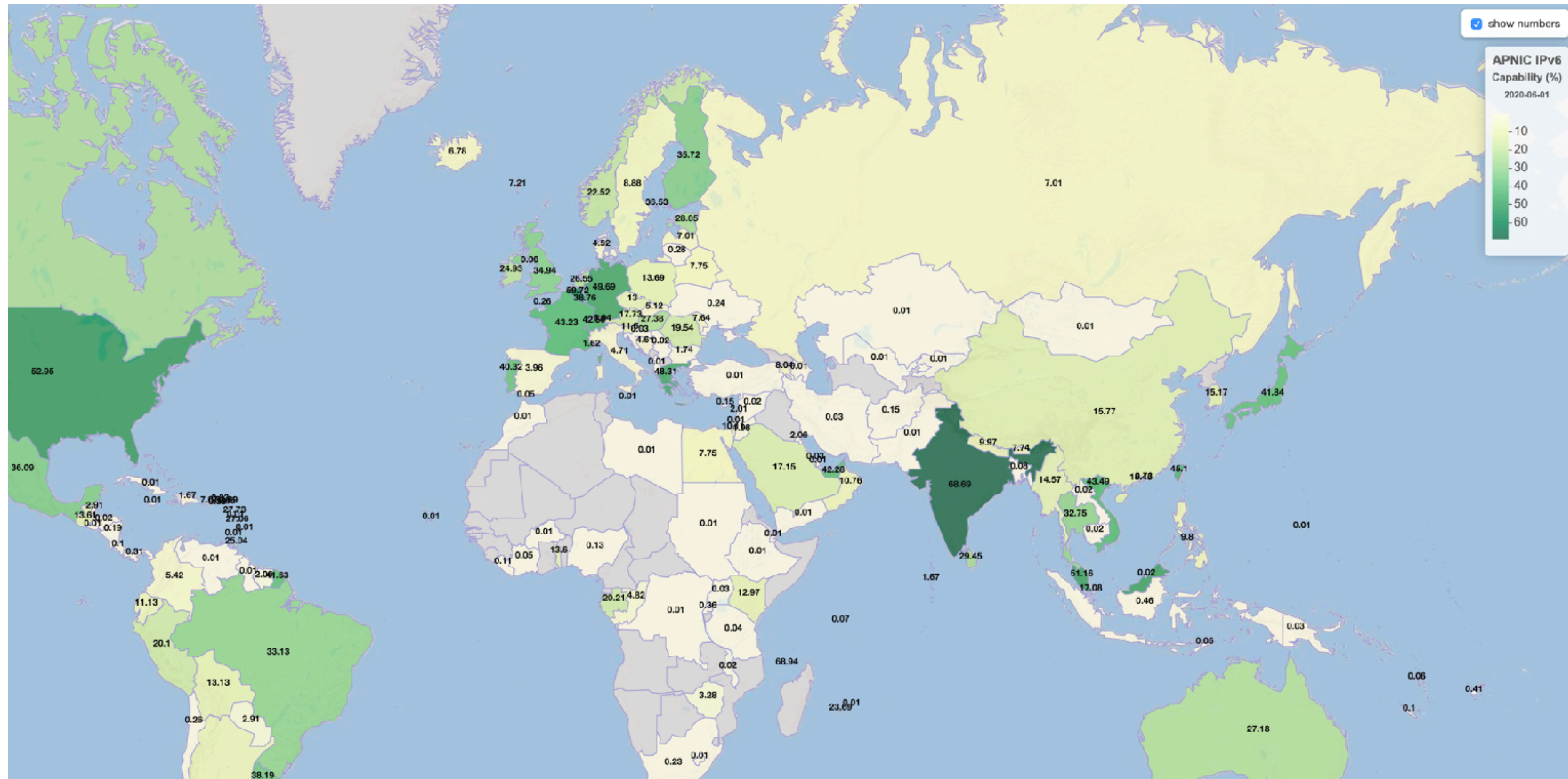 - Corporate nets; offices, VPN support, etc

When enabled,

- At worst, devices have a 50/50 chance of selecting IPv6
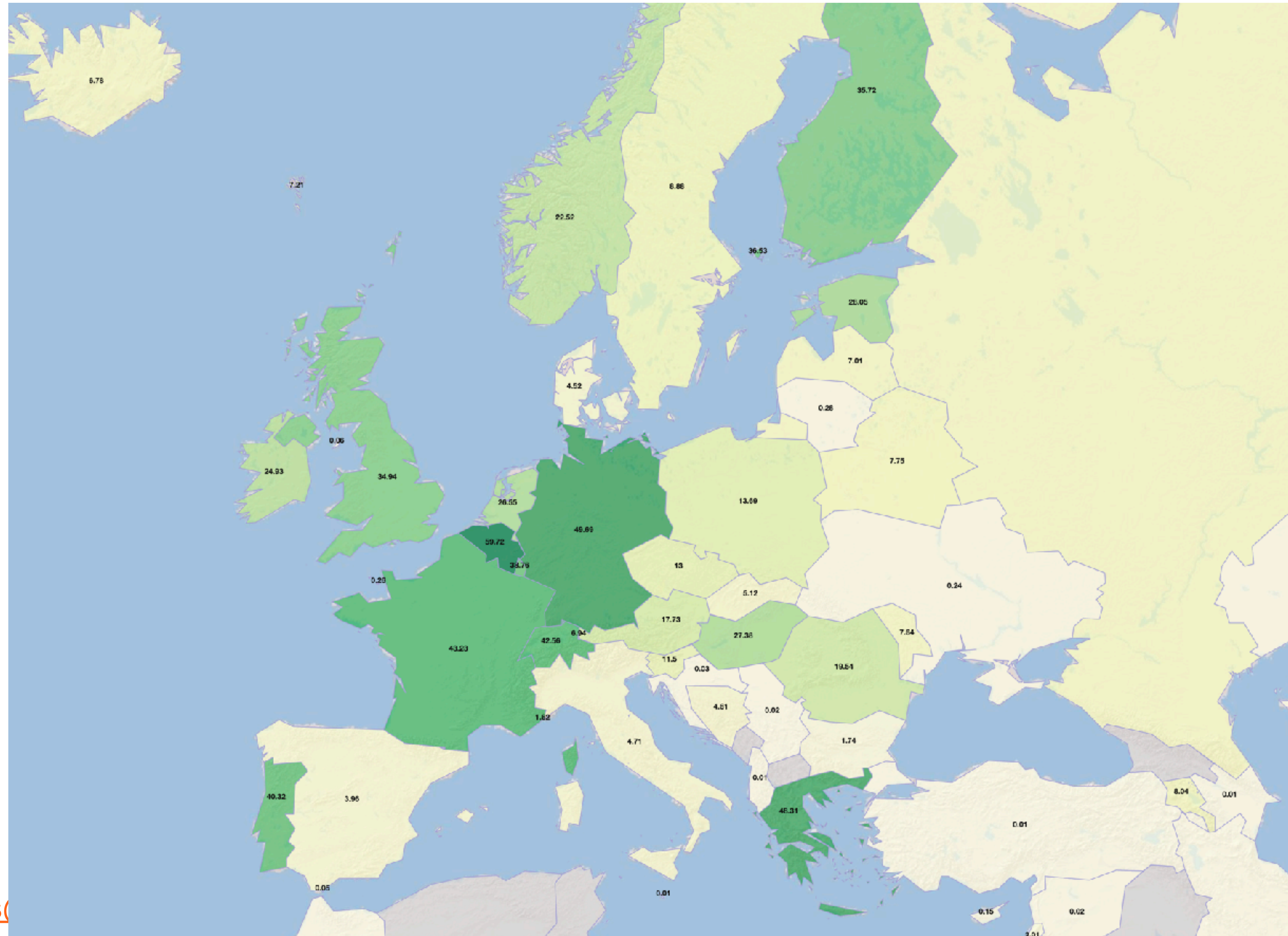
- More likely, a >90% chance of selecting IPv6, when available

Deployment is not uniform

Deployment is not uniform

Europe: top 5?
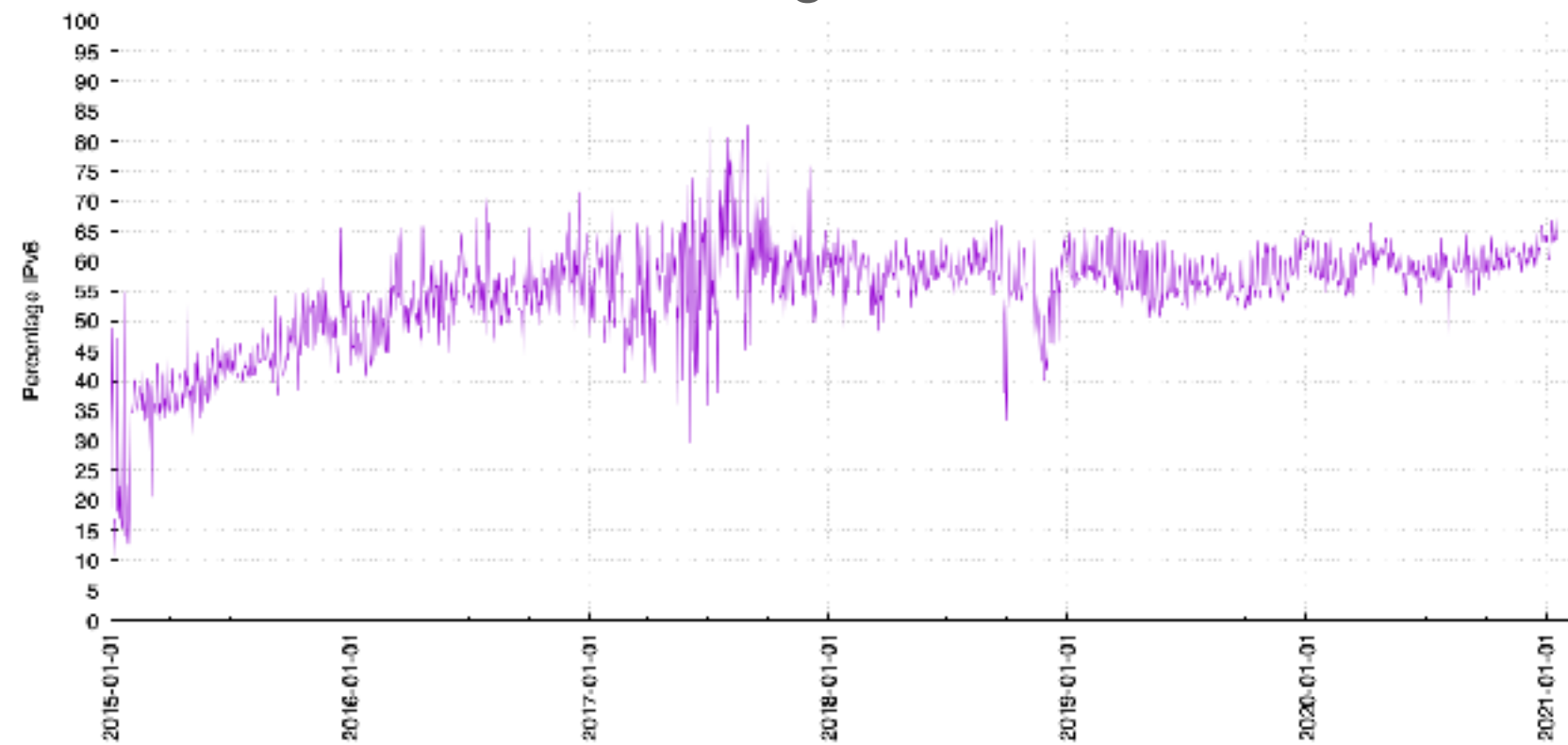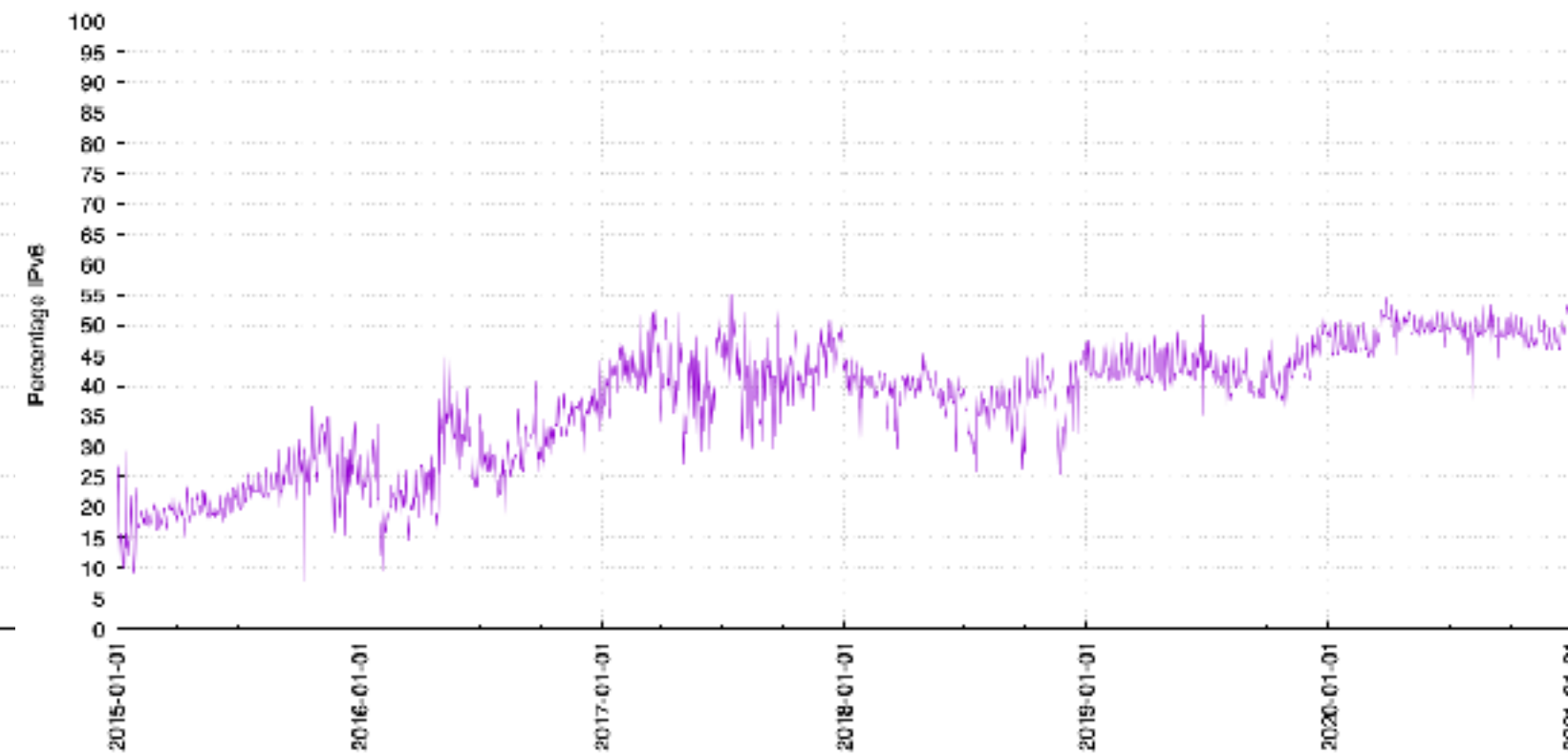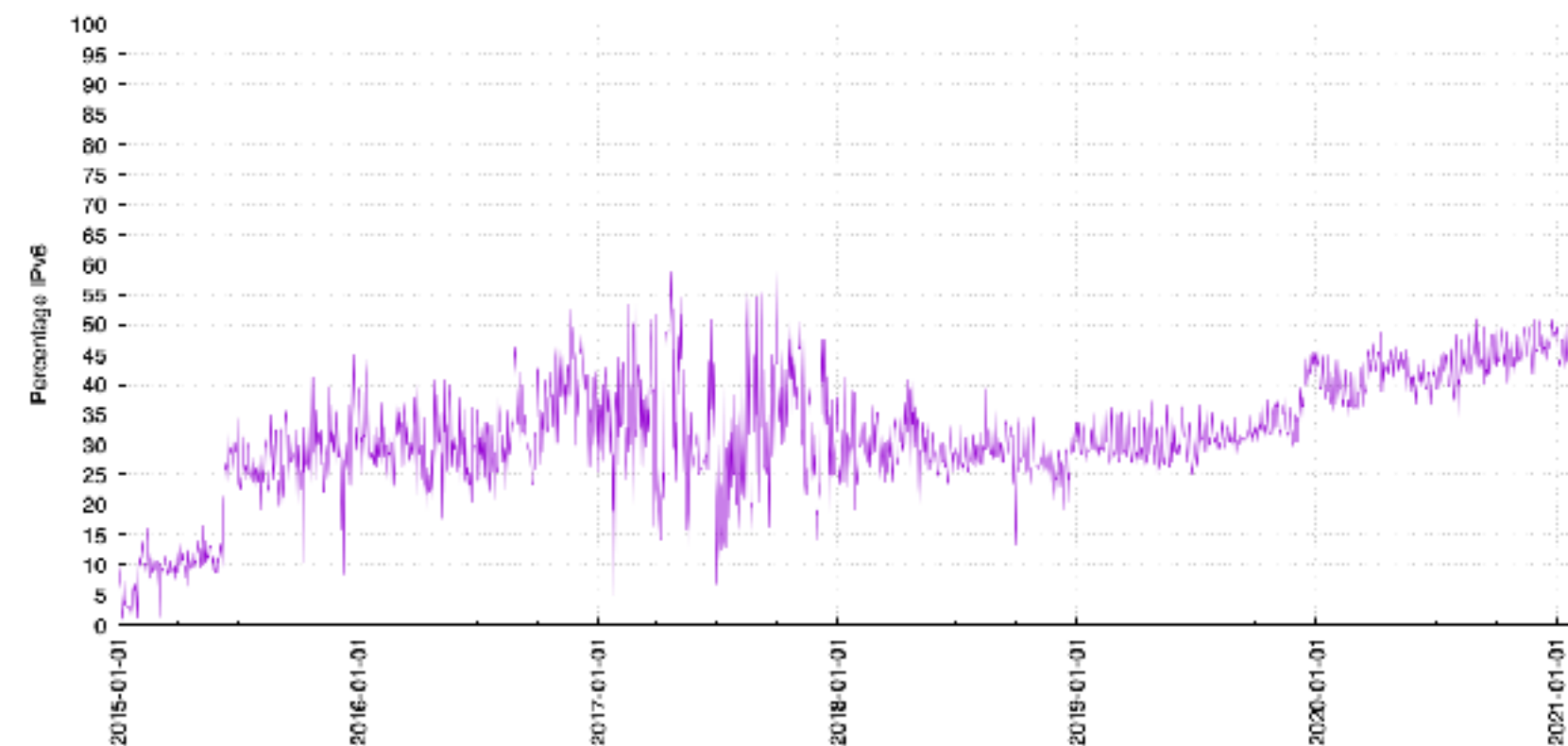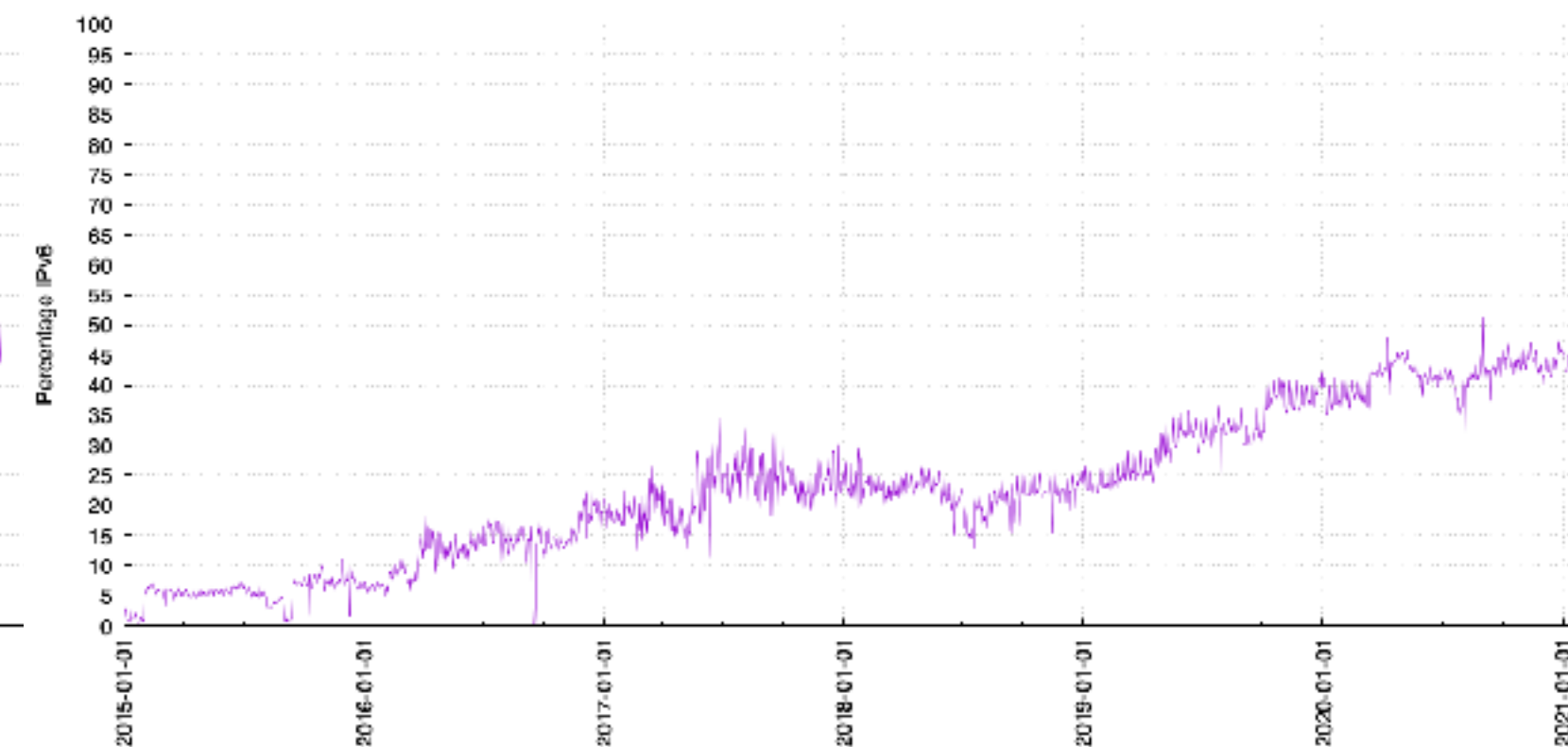
Europe: flat-lining

Ukraine

Croatia

Spain
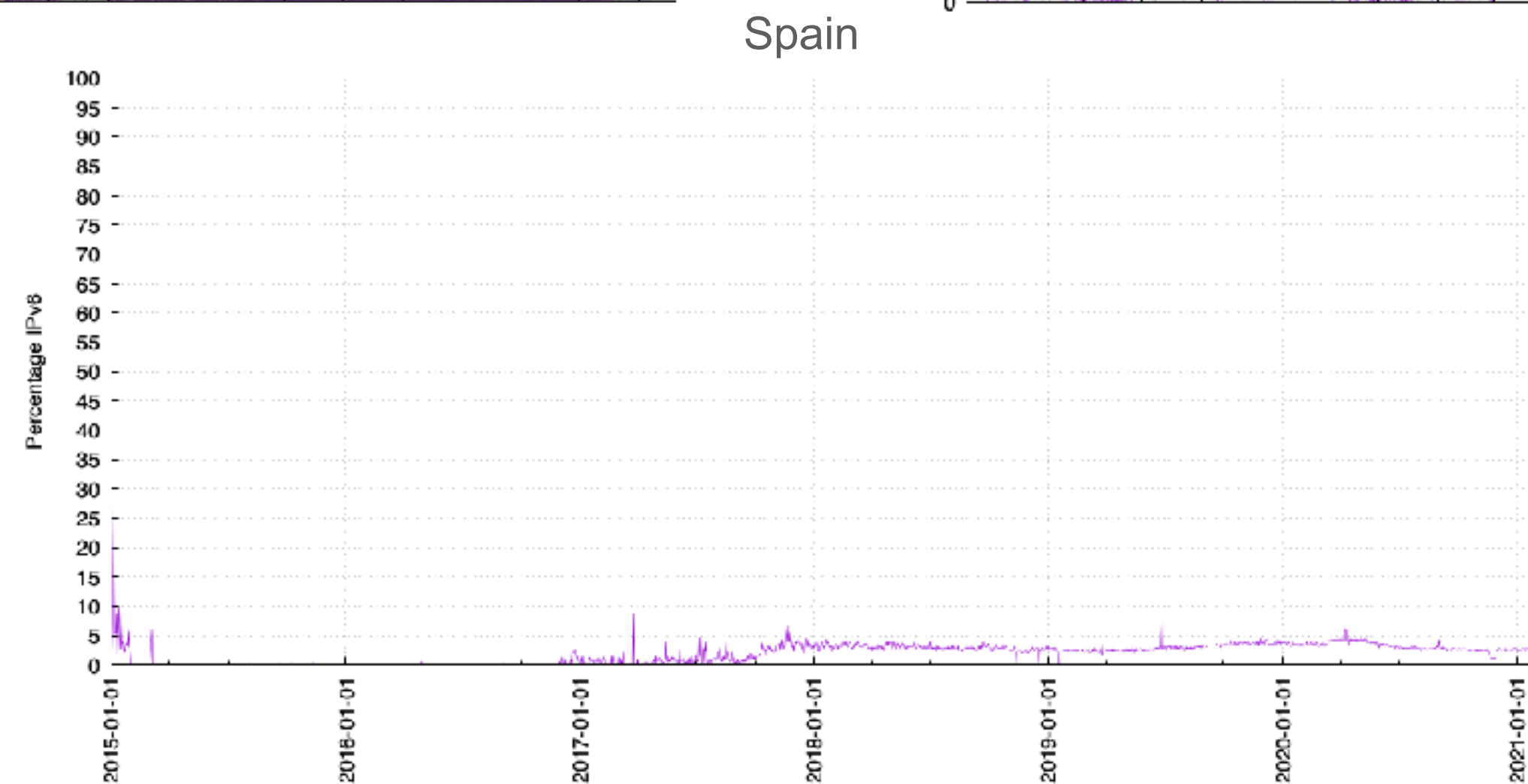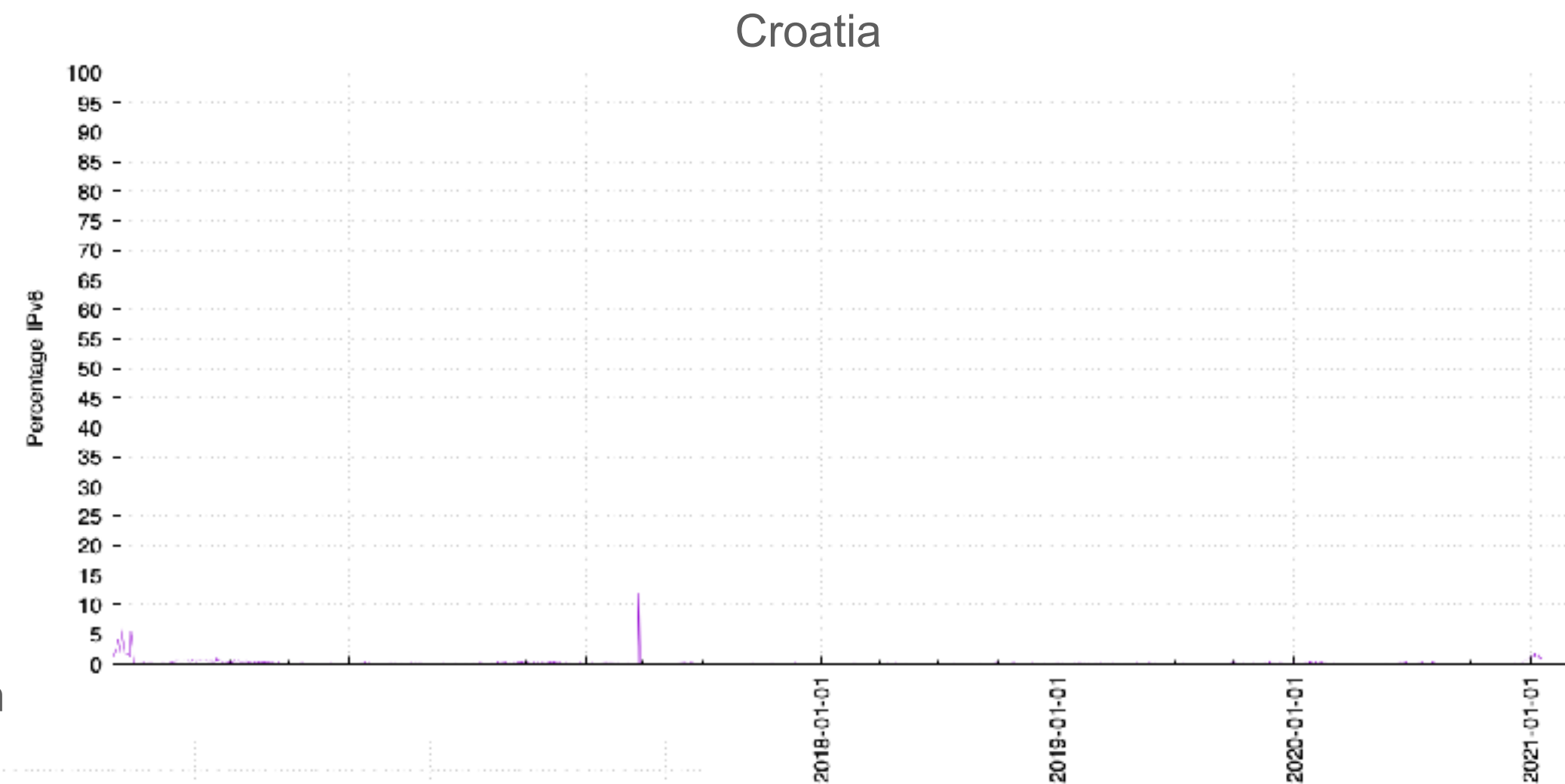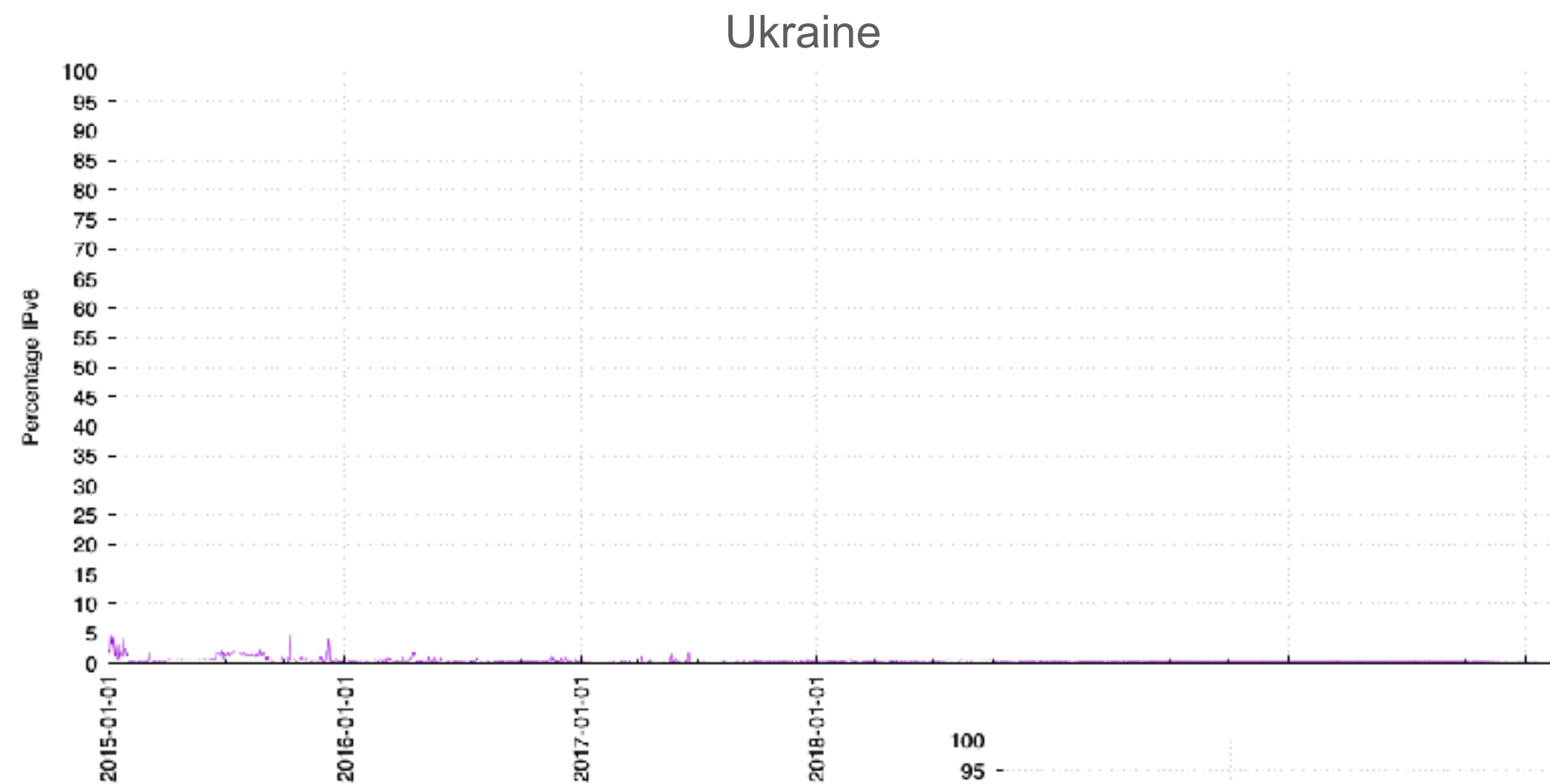
Europe: signs of life?

Italy
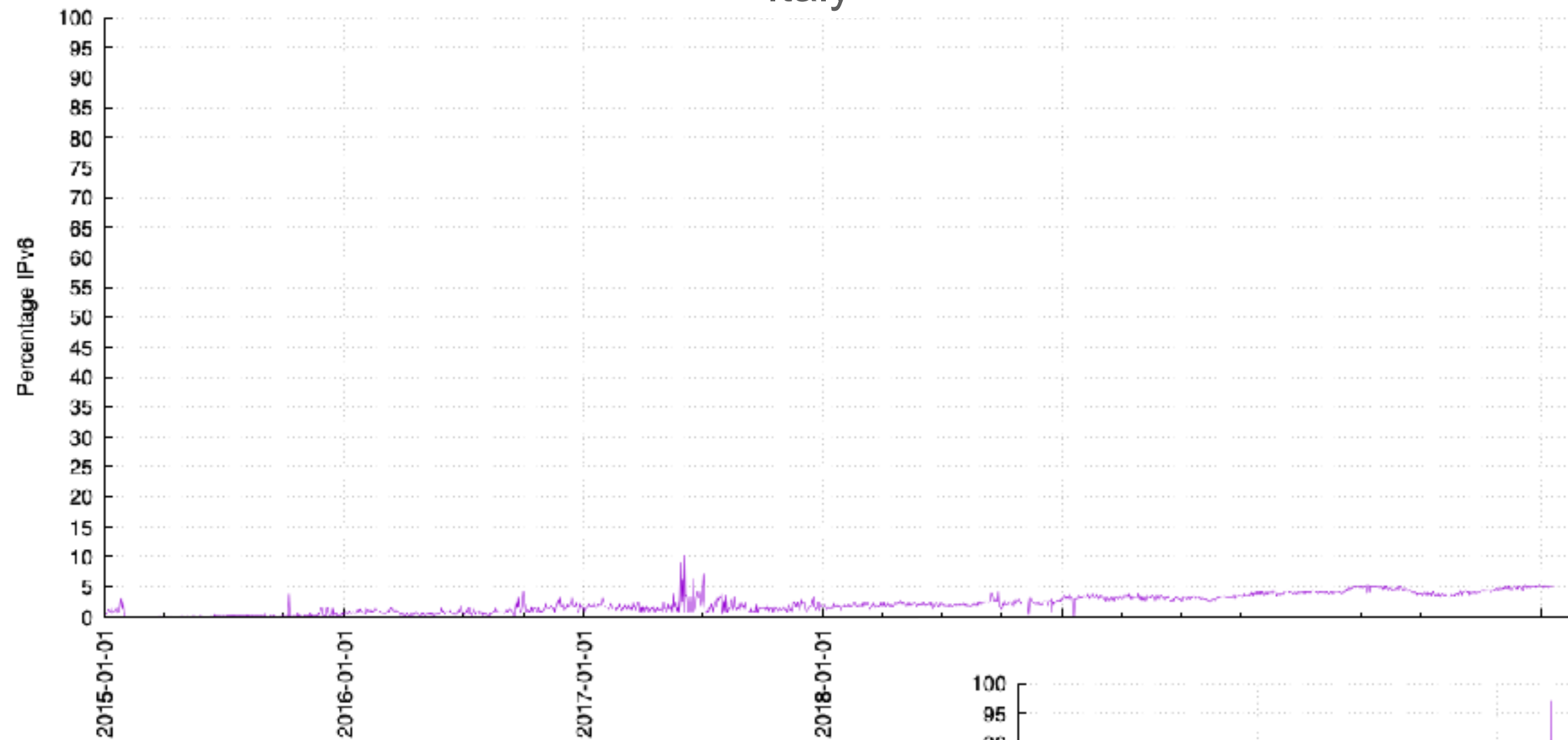
Slovakia
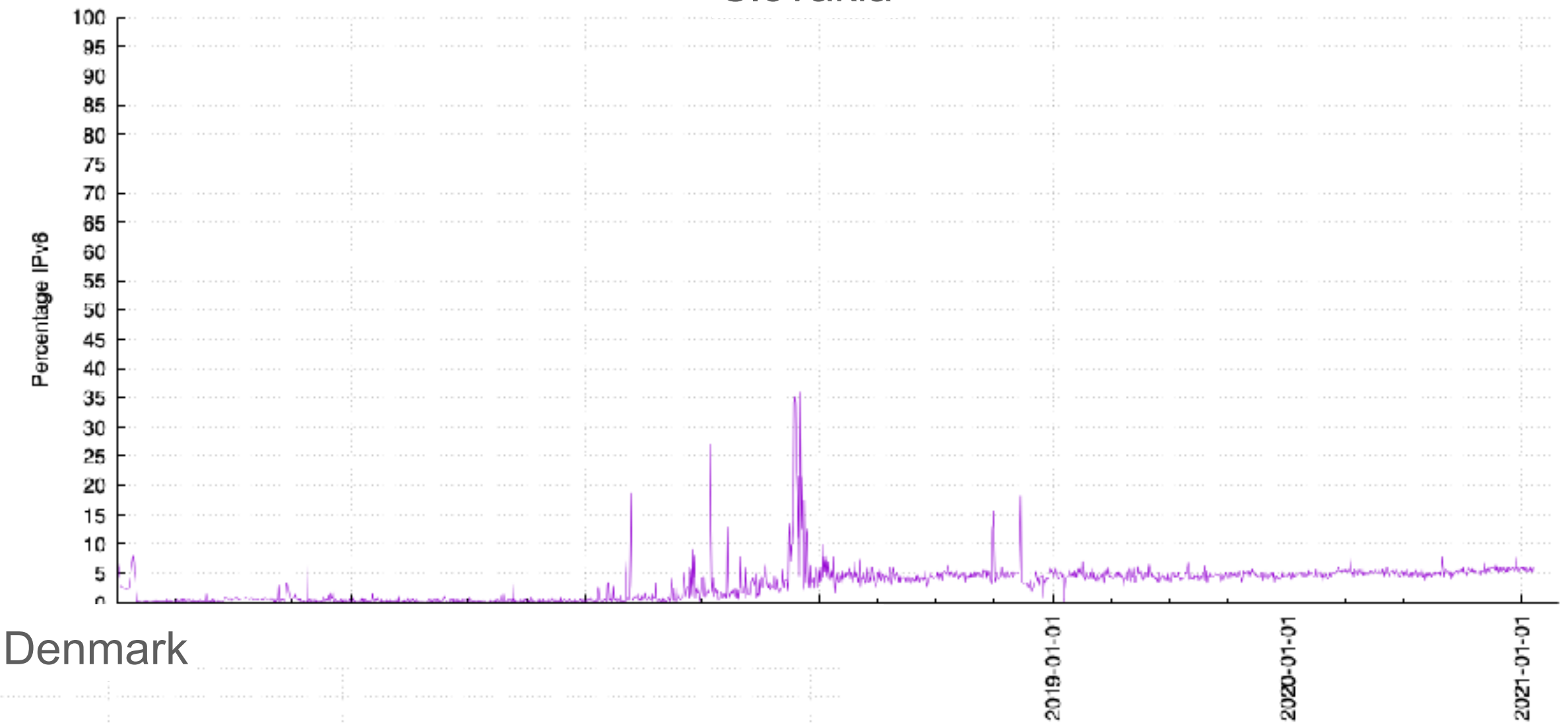
Denmark
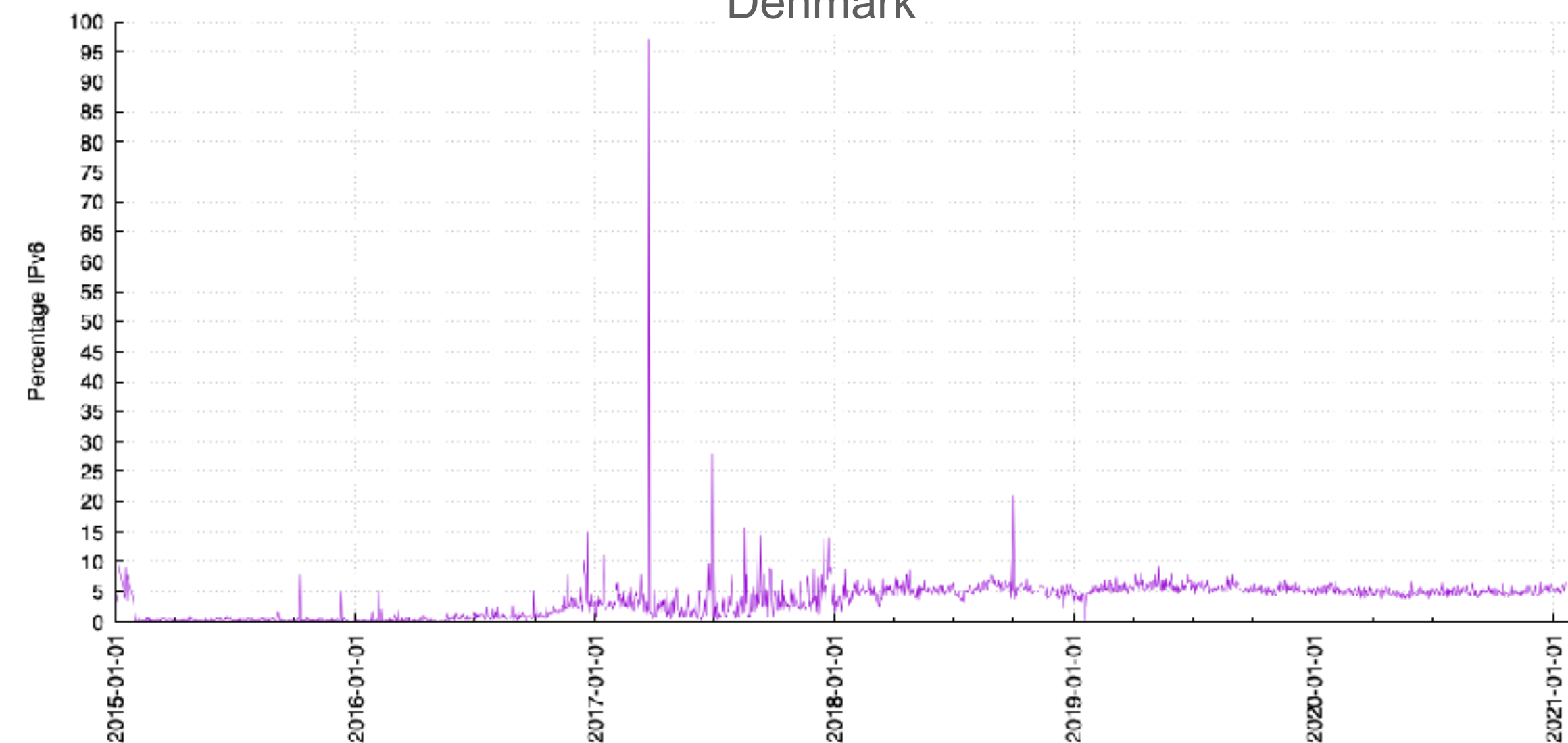
Signs of life?

- Sky Italia is rolling a fully dual-stacked product from day 1

Approaches to Success

Gradual Rollout vs Big-Bang

IPv6 Per-Country Deployment for AS2856: BT (UK)
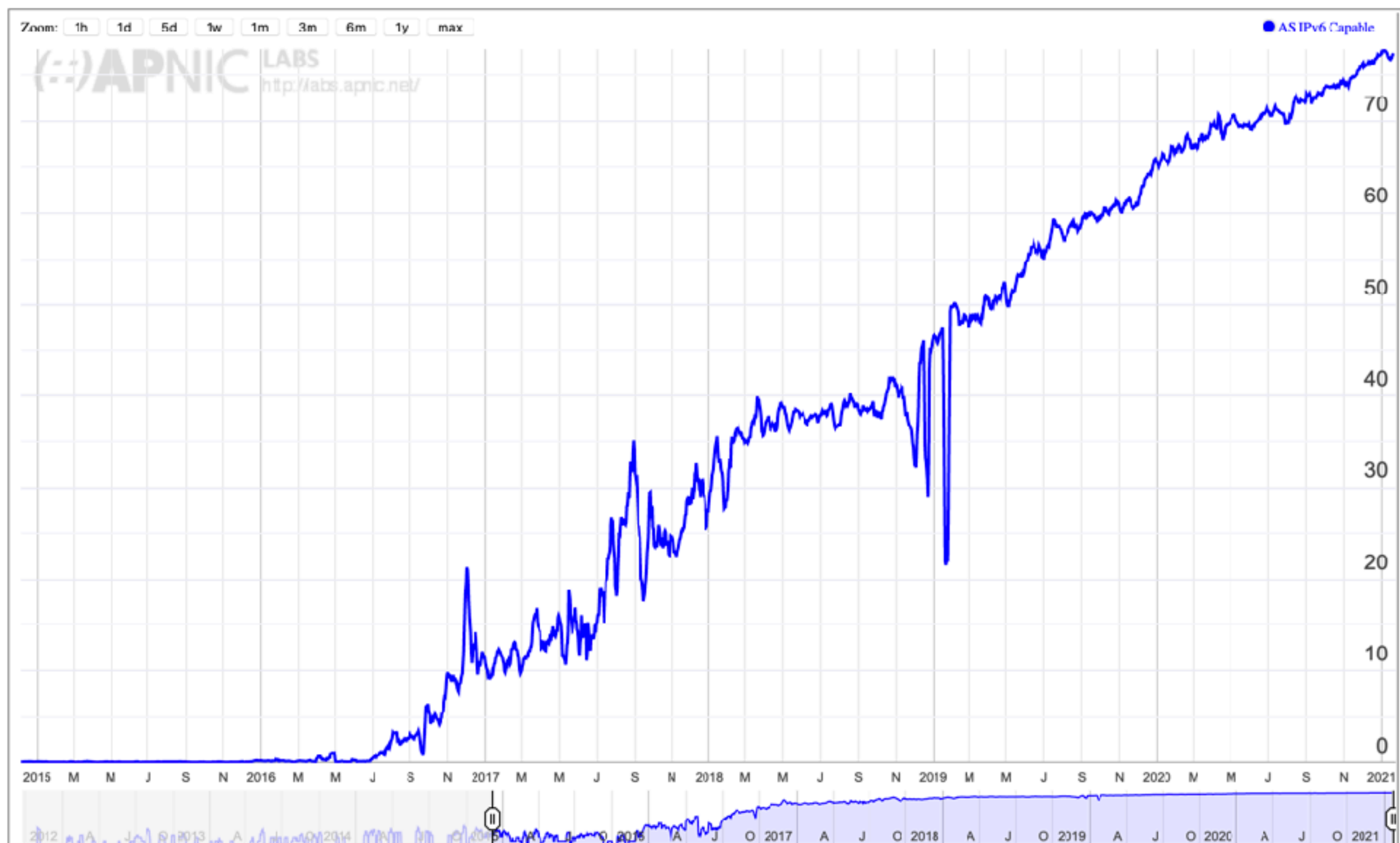
IPv6 Per-Country Deployment for AS5607: Sky Broadband (UK)
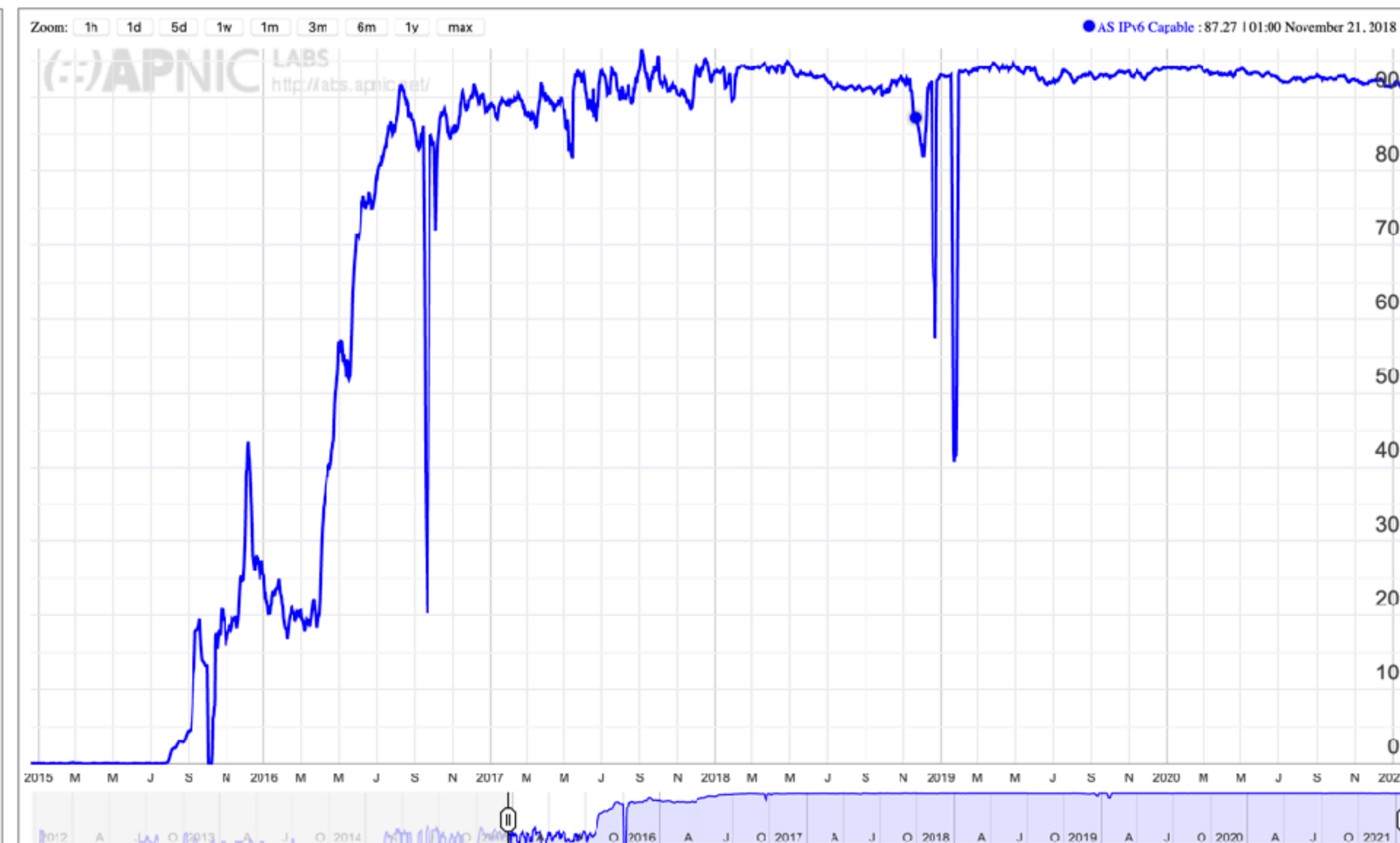
Keeping the lights on

- Some users read bad advice on the internet

  - "disable IPv6"

- Some device classes are stubborn

  - old home electronics: "smart TVs"

  - numerous IoT

- Nudges:

  - e.g. offer DNS services over IPv6 only

  - can still be circumvented, but it adds resistance

Some networks have an easier time

- On a technical level, at least.

  - Cellular

    - tight control of the network and high device turnover

  - Fixed-line ISP

    - control up to the CPE

  - Enterprises/offices

    - a real mixed bag of vendor products, ageing equipment, custom internal tools

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    - a real

ASN	AS Name	IPv6 Capable
AS55836	RELIANCEJIO-IN Reliance Jio Infocomm Limited	94.83%
AS45609	BHARTI-MOBILITY-AS-AP Bharti Airtel Ltd. AS for GPRS Service	72.15%
AS38266	VODAFONE-IN Vodafone India Ltd.	74.43%
AS45271	ICLNET-AS-AP Idea Cellular Limited	72.57%
AS9829	BSNL-NIB National Internet Backbone	0.24%
AS24560	AIRTELBROADBAND-AS-AP Bharti Airtel Ltd., Telemedia Services	1.24%
AS24309	CABLELITE-AS-AP Atria Convergence Technologies Pvt. Ltd. Broadband Internet Service Provider INDIA	2.48%
AS17488	HATHWAY-NET-AP Hathway IP Over Cable Internet	0.16%
AS133982	EXCITEL-AS-IN Excitel Broadband Private Limited	0.08%

Coordinated launch events

- World IPv6 Launch helped coordinate across industry:

    - https://www.worldipv6launch.org/

- In 2015, Finland organised a launch day:

    - https://www.internetsociety.org/blog/2015/06/ipv6-in-finland-finally/

- Coordinated events help share risk and pool expertise

    - everybody is in the same boat

Coordinated launch events

- World IPv6 Lau...

  - https://www.worl...

- In 2015, Finlar...

  - https://www.interr...

- Coordinated ev...

  - everybody is in th...

Use of IPv6 for Finland (FI)
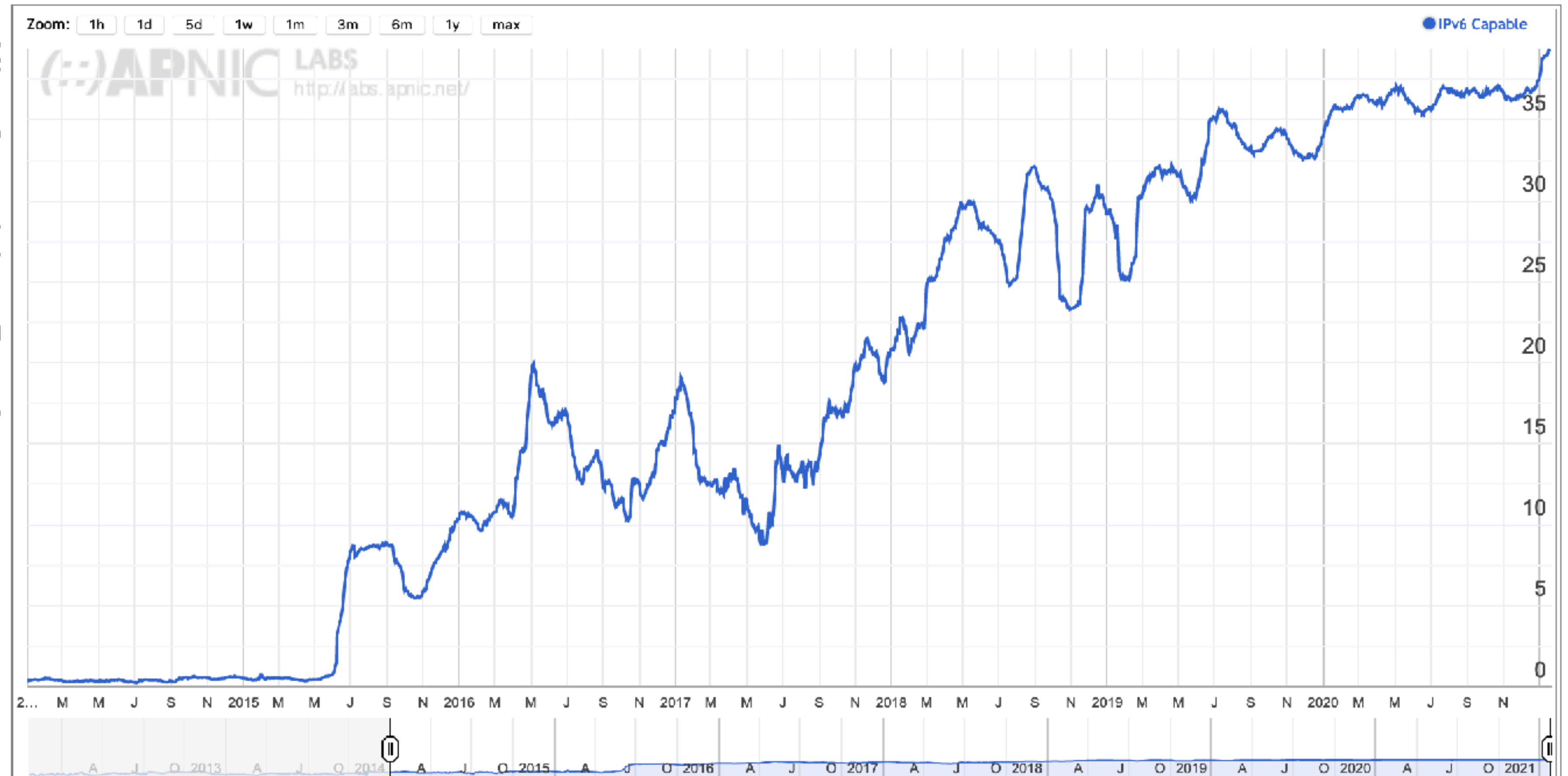
Just buy IPv4?

- You can do that, but

    - not always a fast transaction

    - issues with geolocation, reputation
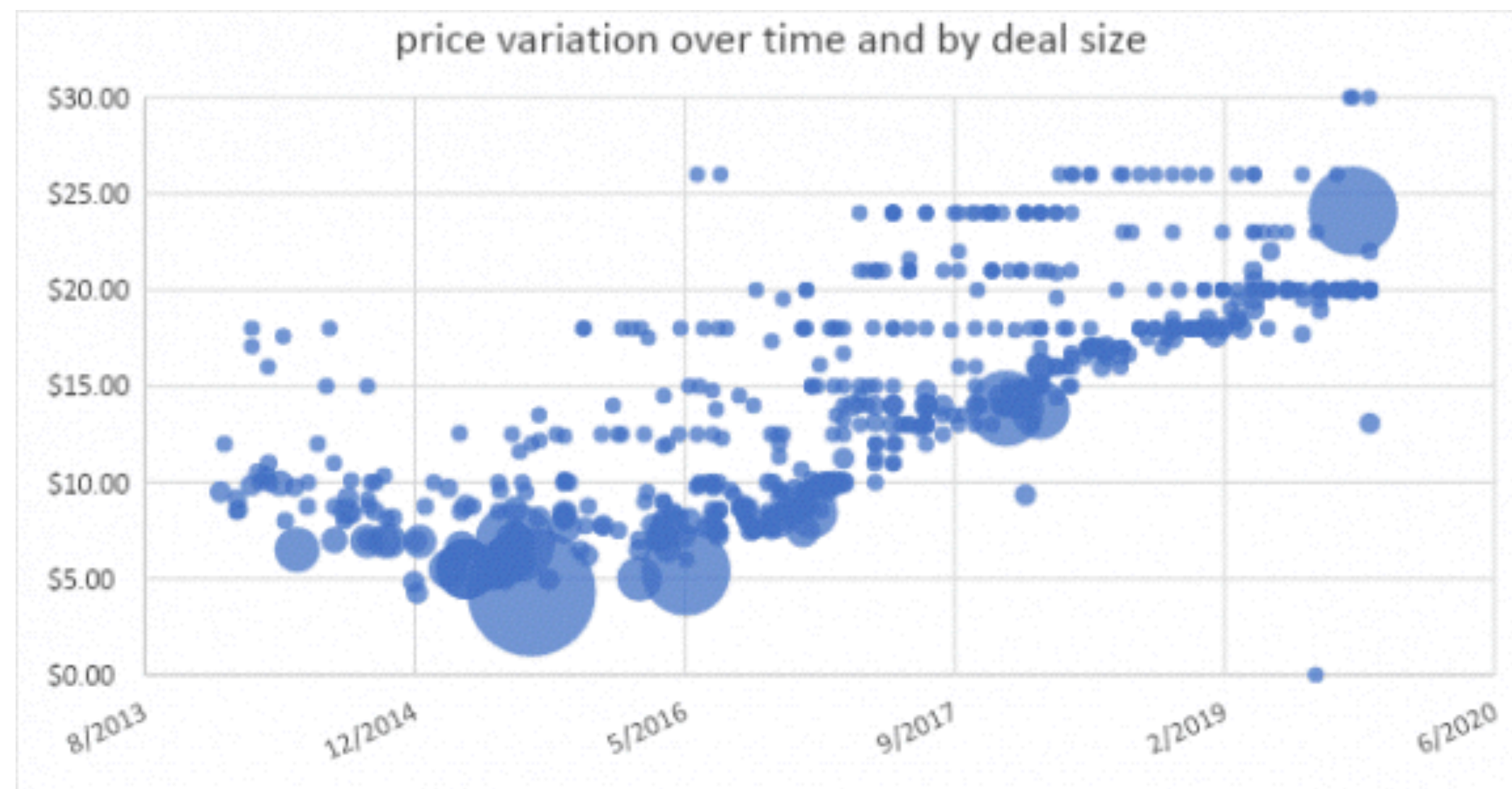
    - and costs are rising

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price variation over time and by deal size

https://ipv4marketgroup.com/ipv4-pricing/

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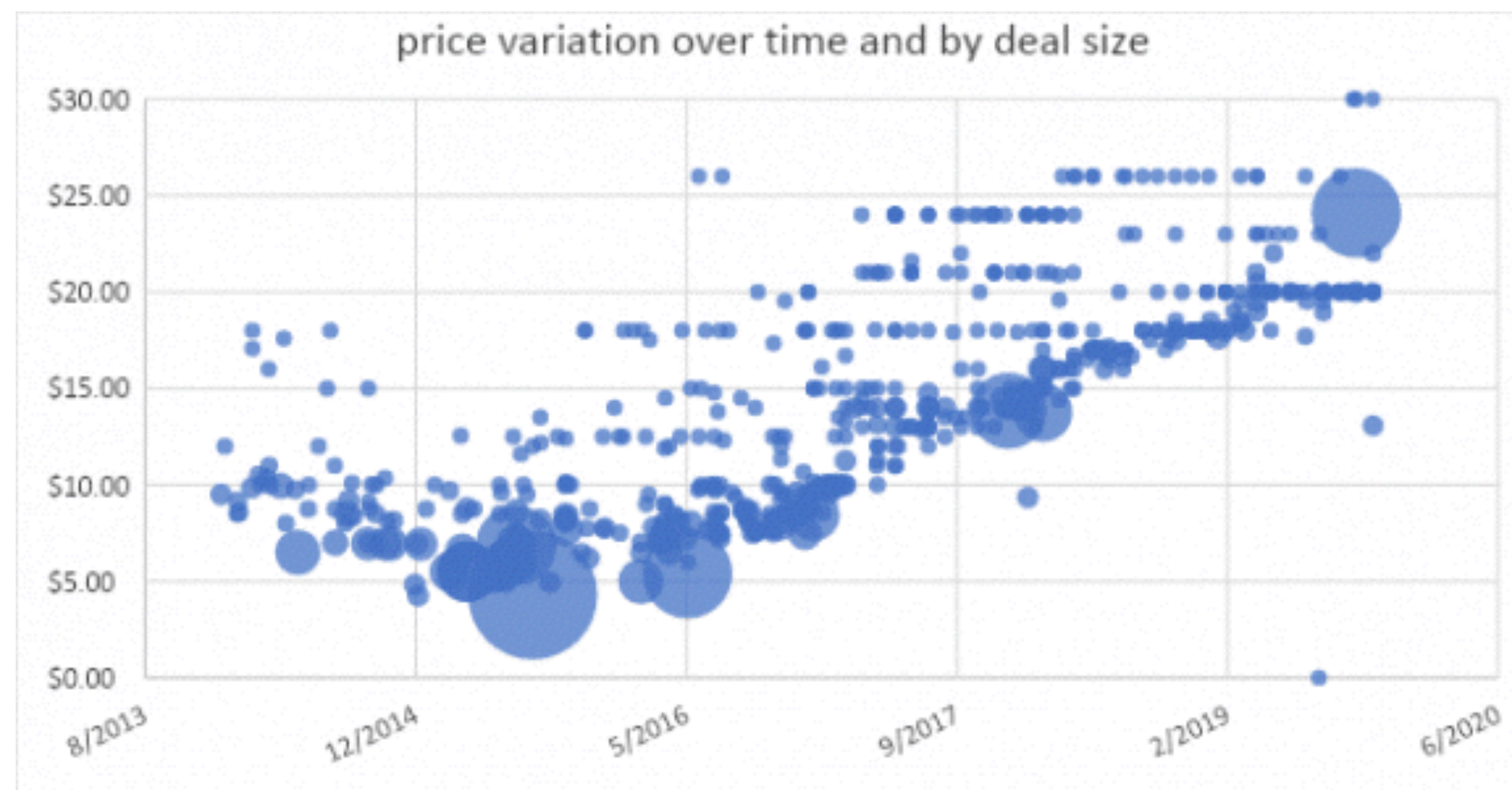
price variation over time and by deal size

https://ipv4marketgroup.com/ipv4-pricing/

IPv4 Market Prices by Size
Data from IPv4.Global/auctions

https://ipv4.global/2019-ipv4-address-market-roundup/
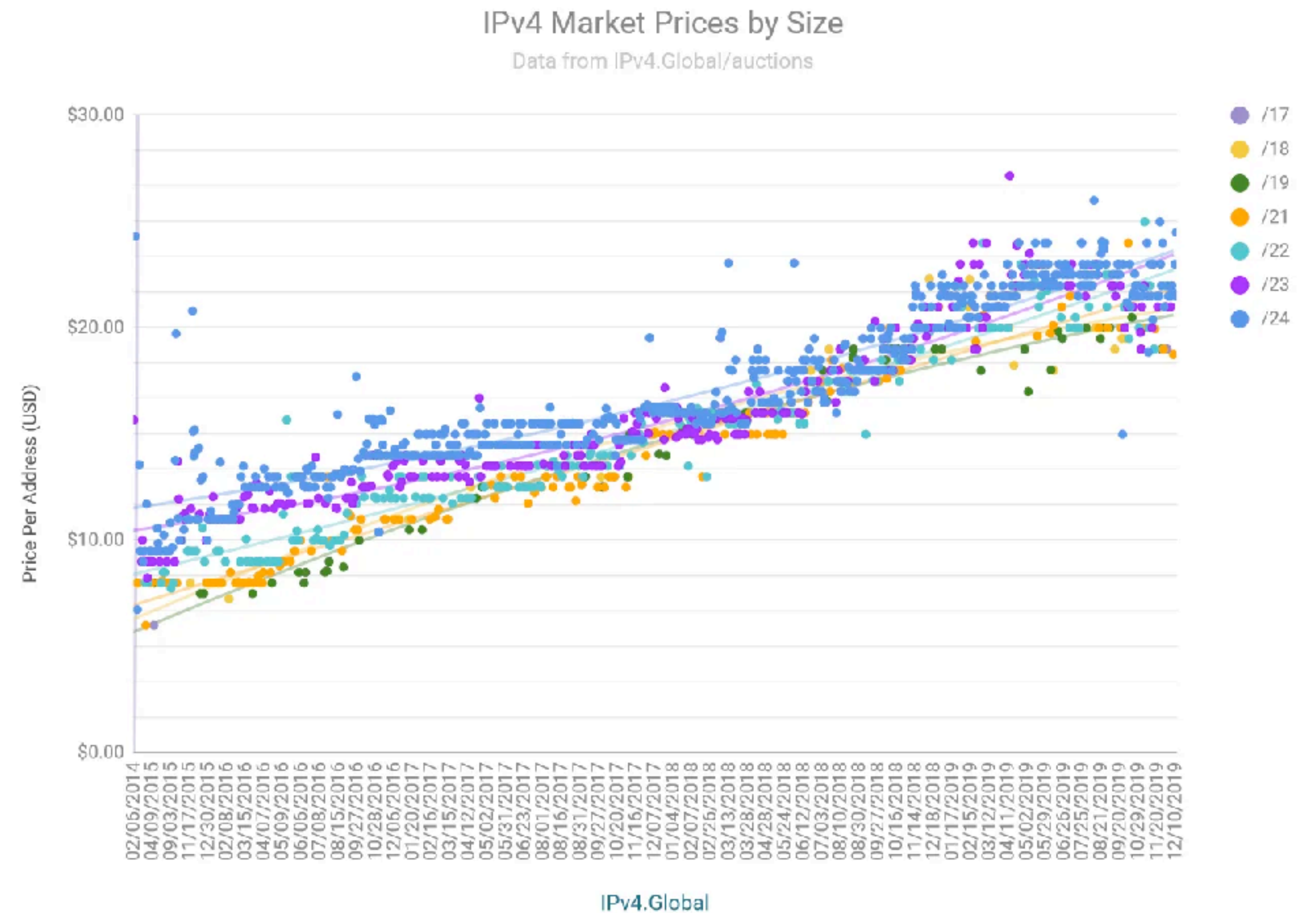
Moving to IPv6-only?

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- Why run IPv4 on the backend at all?

    - limits expansion

    - increases moving parts for operators to maintain/test

    - increases threat surface

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- IPv6 only backends

  - Facebook datacenters:
    https://atscaleconference.com/videos/a-history-of-ipv6-challenges-in-facebook-data-centers/

  - Google corporate sites:
    https://ripe81.ripe.net/wp-content/uploads/presentations/12-RIPE81-The-Day-I-Broke-All-The-Treadmills.pdf

  - Microsoft corporate sites:
    https://teamarin.net/2019/04/03/microsoft-works-toward-ipv6-only-single-stack-network/

  - US Federal govt: https://www.whitehouse.gov/wp-content/uploads/2020/11/M-21-07.pdf

Resources

- Measurements

  - https://stats.labs.apnic.net/ipv6/

  - https://www.google.com/ipv6

  - https://www.facebook.com/ipv6/

  - https://6lab.cisco.com/stats/index.php

  - https://www.worldipv6launch.org/measurements/

  - http://v6asns.ripe.net/v/6

Questions ?

sds@ripe.net