# IPv6 Website - Metrics, Measurement, and Progress

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IPv6 User Availability and IPv6 Server Status

- Based on measurements from APNIC Lab, the global average IPv6 adoption rate among users has reached 40%, with approximately 27 economies exceeding the 50% threshold. This highlights that a substantial portion of users worldwide now rely on IPv6 as their primary connection method.

- However, assessing IPv6 support on the server side remains crucial and requires detailed data analysis to further accelerate IPv6 adoption.

- The availability of such data is currently limited, as most IPv6 website measurements historically depended on Alexa's "Top 1 Million Websites List," which was discontinued in May 2022, creating significant challenges for research in this domain.

CISCO 6lab - The place to monitor IPv6 adoption

- CISCO 6lab's IPv6 measurements for the global and individual CC's Top 500 websites are still ongoing, but they continue to rely on Alexa's list.

- Currently, the IPv6 adoption rate among the global Top 500 websites (not the global average) is approximately 225 out of 500, or 45%.

Ref: https://6lab.cisco.com/stats/cible.php?country=world&option=content
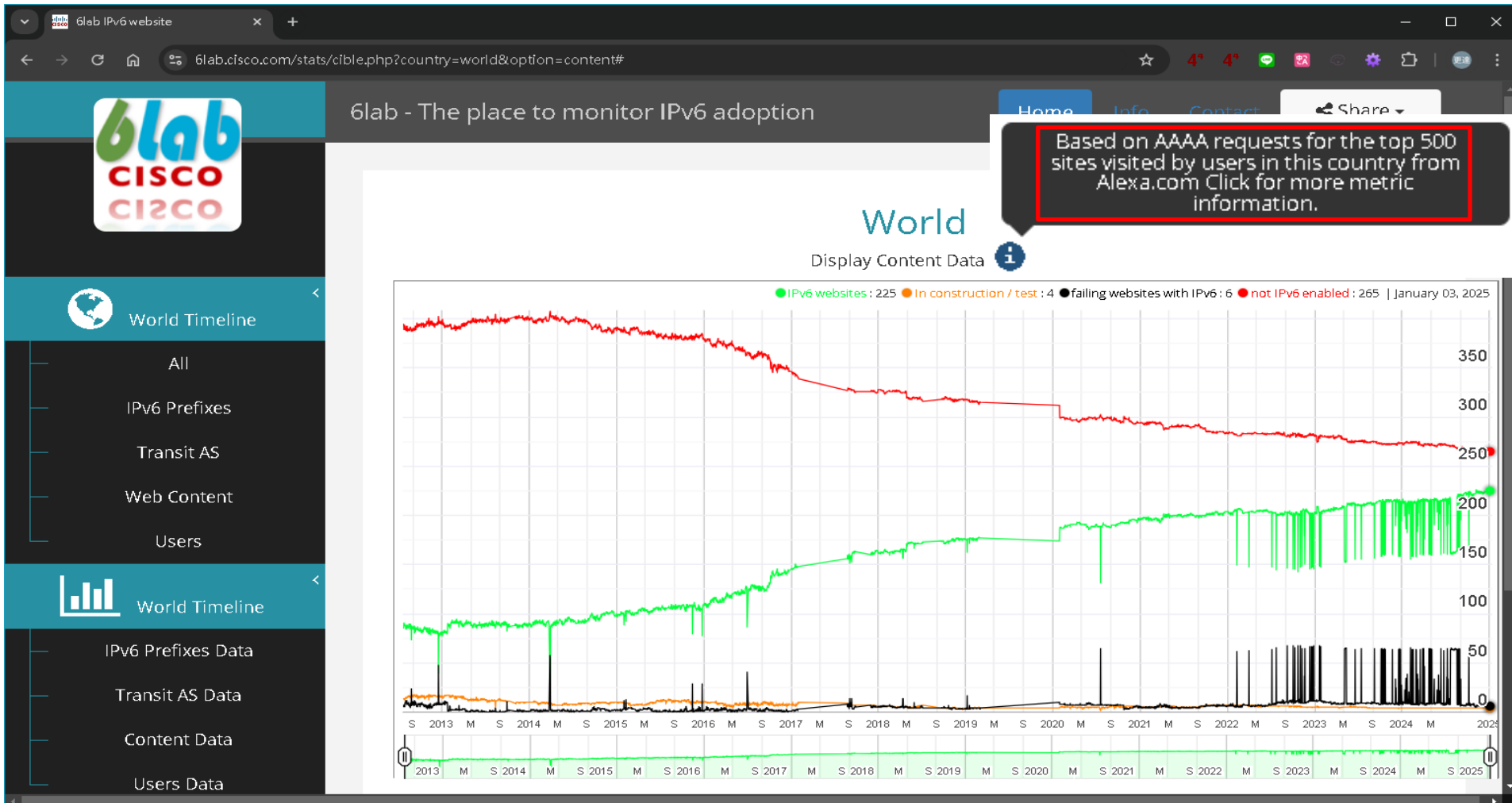
Vyncke IPv6 Deployment Aggregated Status

- The Vyncke website continues to measure the IPv6 adoption rates for Web, Email, and DNS across various CCs, but the data source remains Alexa's list.

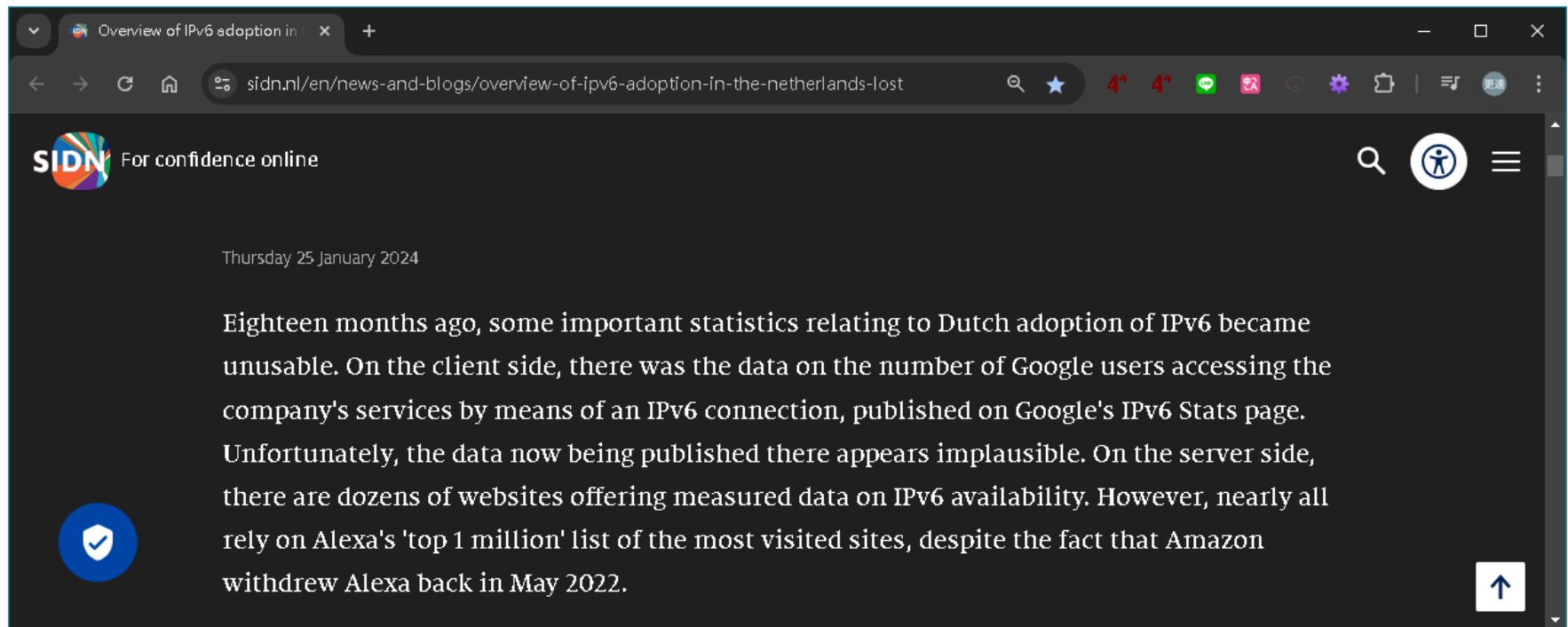Ref: https://www.vyncke.org/ipv6status/
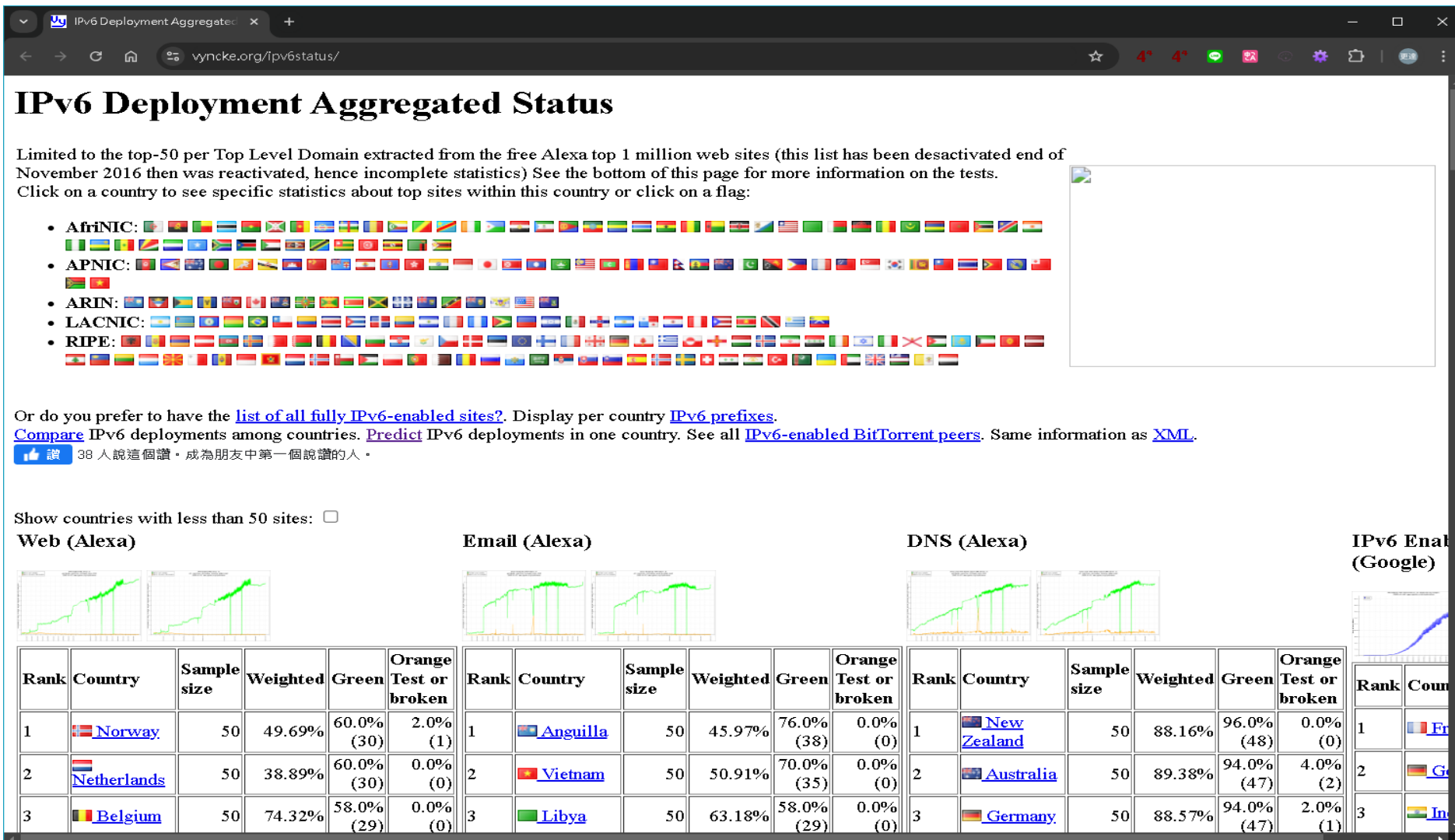
IPv6 Deployment Aggregated Status

- The Vyncke website measures the global average IPv6 adoption rate for websites across CCs at approximately 31.5%.
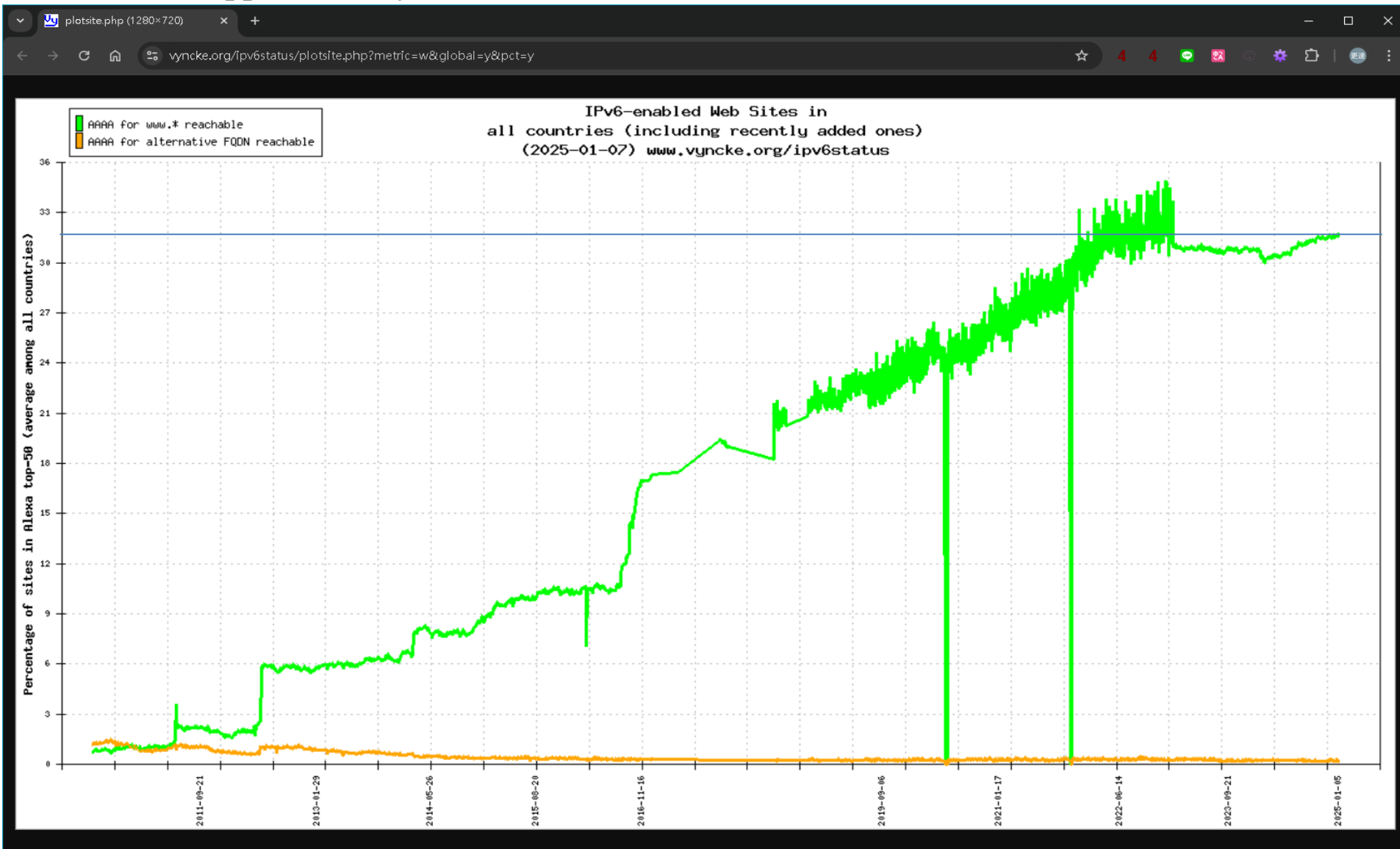
Any other IPv6 website measurement?

- The Netherlands' .nl Registry, SIDN(Stichting Internet Domeinregistratie Nederland), faces similar challenges and has identified another platform for measurements.

- Difficulty in quantifying IPv6 adoption complicates policymaking and enforcement, while the lack of a responsible entity for promotion risks harming internet accessibility, investment, and the Netherlands' infrastructure leadership.

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Eighteen months ago, some important statistics relating to Dutch adoption of IPv6 became unusable. On the client side, there was the data on the number of Google users accessing the company's services by means of an IPv6 connection, published on Google's IPv6 Stats page. Unfortunately, the data now being published there appears implausible. On the server side, there are dozens of websites offering measured data on IPv6 availability. However, nearly all rely on Alexa's 'top 1 million' list of the most visited sites, despite the fact that Amazon withdrew Alexa back in May 2022.

Ref: https://www.sidn.nl/en/news-and-blogs/overview-of-ipv6-adoption-in-the-netherlands-lost
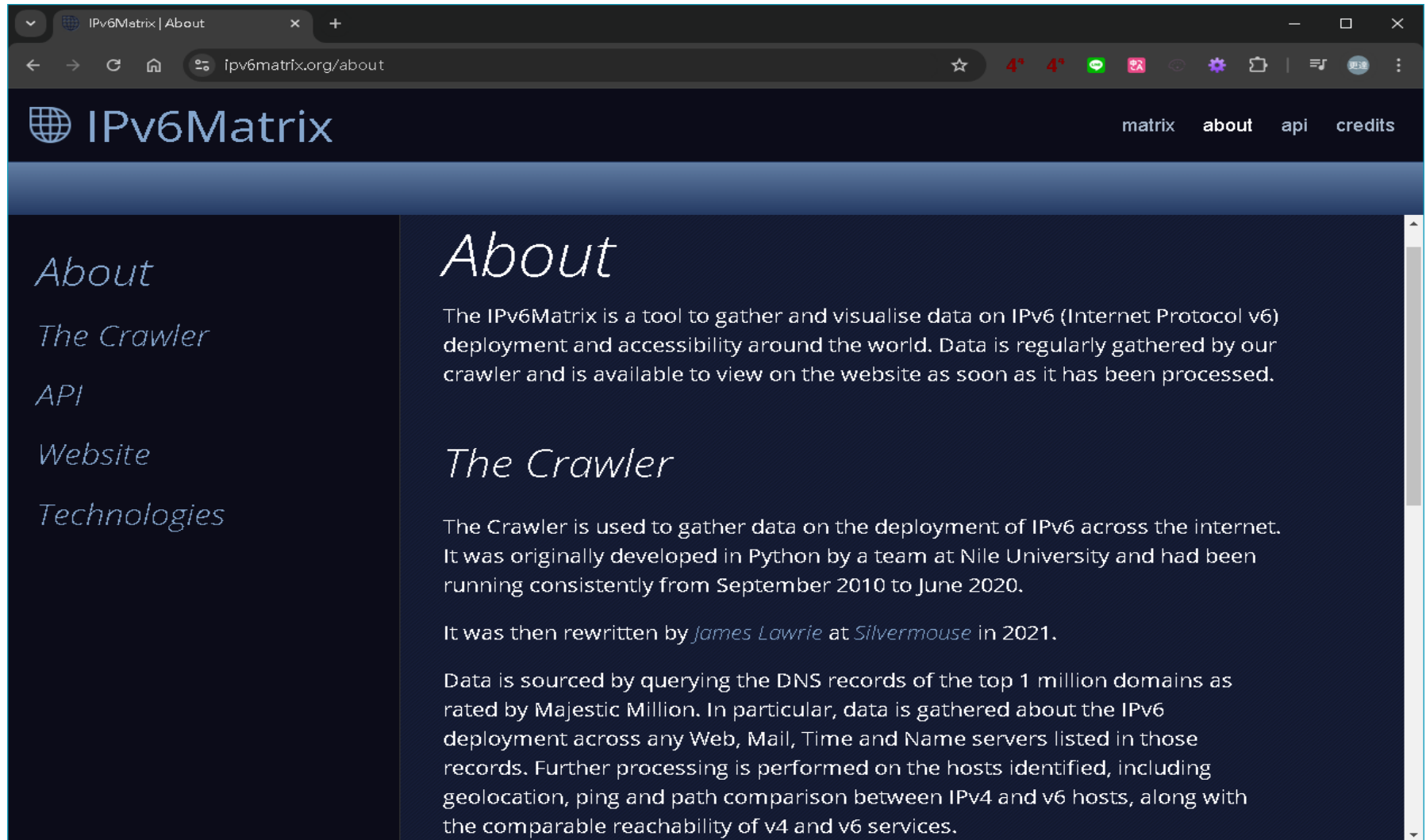
Any other IPv6 website measurement?

- The Netherlands' SIDN has found another platform for continuous IPv6 website measurements to monitor the adoption of IPv6 on websites.
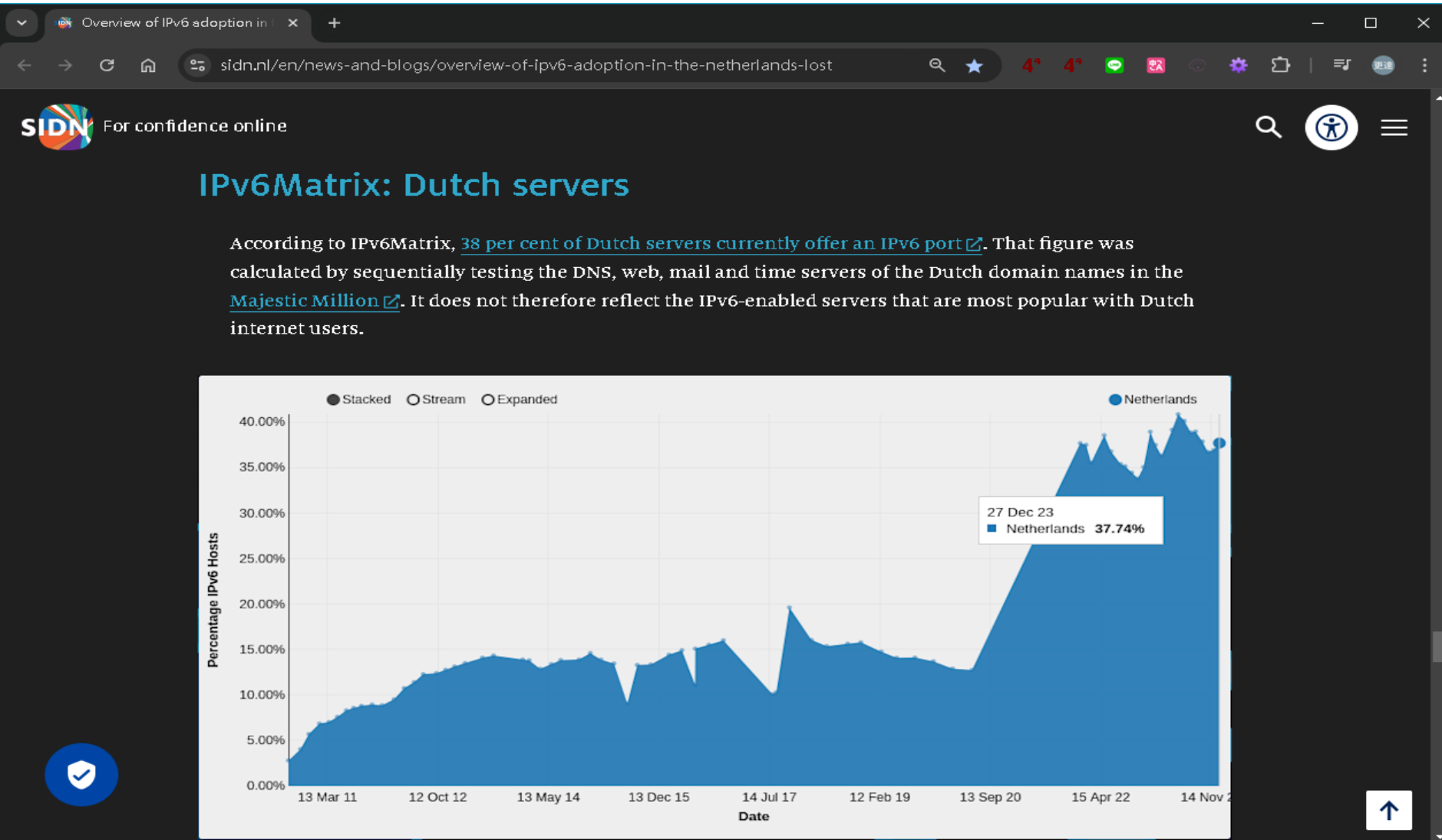
IPv6Matrix

- This platform uses the Majestic Million top websites list for IPv6 measurements.

Ref1: https://ipv6matrix.org/about
Ref2: https://majestic.com/reports/majestic-million

IPv6Matrix

- The platform provides a convenient table sorting feature.

Ref: https://ipv6matrix.org/hosts

IPv6Matrix

- The platform also provides an IPv6 adoption trend chart, making it easy to observe.

Ref: https://ipv6matrix.org/country-TW
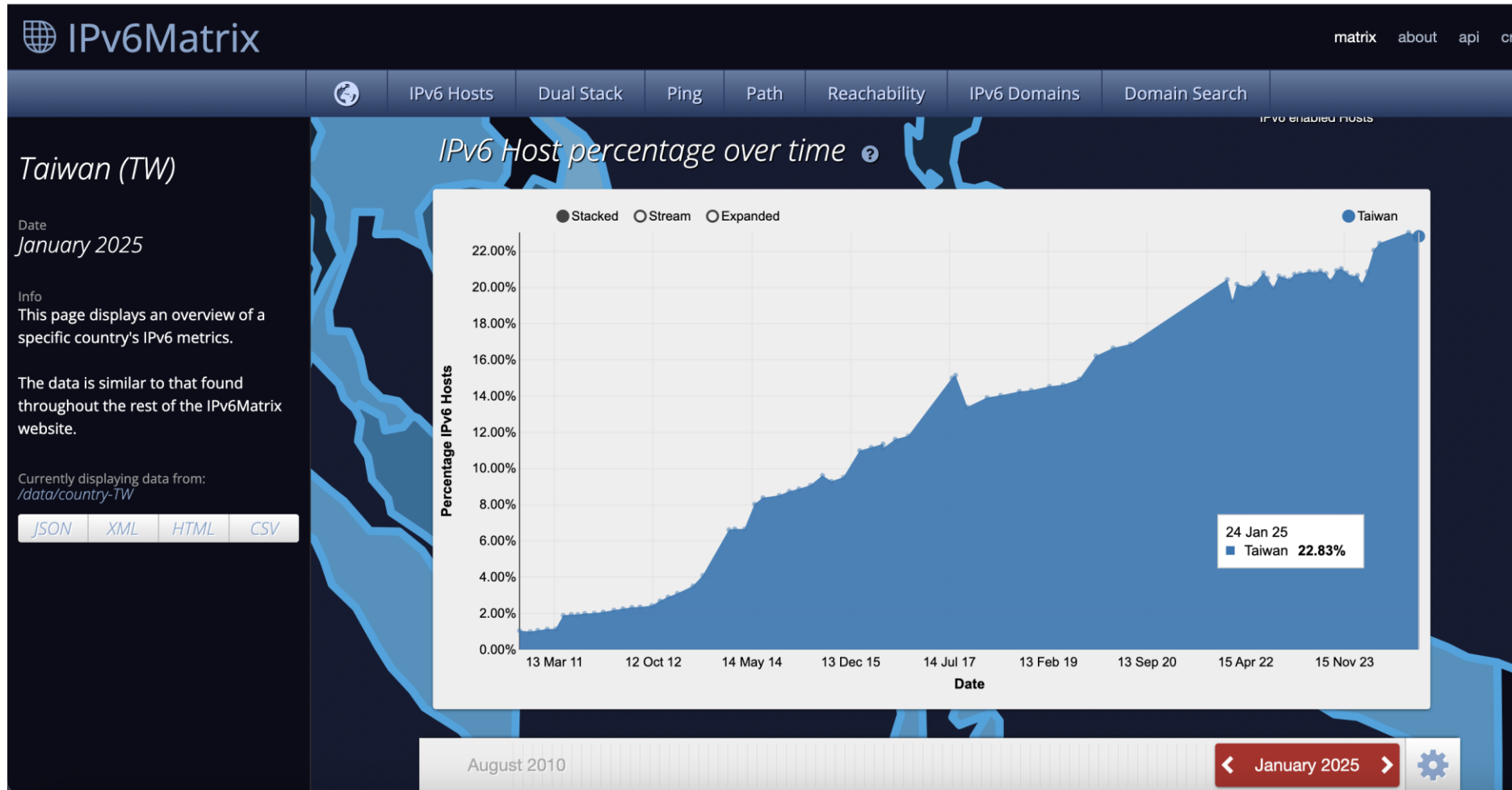
IPv6Matrix(Server) and APNIC IPv6 Lab(User)

- Through the raw data on the website, one can clearly see the measurement dates, quantities, and percentages of each CC in the Majestic Million top websites (Hosts) and IPv6-supported websites (Hosts6).

- In the final column, we have added the 7-day average IPv6 user update from APNIC Lab (as of 2025/2/7) to simultaneously observe and compare the IPv6 usage on both the server side and the user side.

CC	Population	IPv4 Addresses	Date3	Hosts	Hosts6	IPv6 %	APNIC IPv6 %
AU	26,735,965	46,232,832	20250128	47,832	4,057	8.48%	44.66%
CN	1,425,066,348	343,159,296	20250128	132,282	73,490	55.56%	43.53%
ID	280,109,342	19,014,400	20250128	4,673	924	19.77%	15.08%
IN	1,443,538,136	41,660,416	20250128	16,768	599	3.57%	78.73%
JP	122,536,753	188,696,832	20250128	138,738	25,160	18.13%	58.09%
KR	51,734,698	112,504,320	20250128	19,583	100	0.51%	22.10%
TW	23,953,574	35,712,256	20250128	7,557	1,735	22.96%	61.35%
VN	99,583,226	16,429,056	20250128	12,864	4,210	32.73%	63.60%

Ref1: https://ipv6matrix.org/hosts
Ref2: https://stats.labs.apnic.net/ipv6/?s=IPv6+Capable&d=Auto&w=7&t=Auto

Observation and Discovery

- IPv6Matrix is currently the only known domain list that is regularly updated and continues to conduct IPv6 website measurements. (If you know of any other IPv6 server measurement platforms, please let us know.)

- The IPv6 user availability and the IPv6-enabled website rate are not necessarily directly correlated.

- The proportion of IPv6-enabled websites in CN is significantly leading and continues to rise.

Items: 8			20240505	20240608	20241125	Columns ▼
CC△	Population	IPv4 Addresses	IPv6 %	IPv6 %	IPv6 %	APNIC IPv6 %
AU	26,735,965	46,381,312	7.29%	7.71%	8.30%	44.94%
CN	1,425,066,348	343,161,344	43.95%	44.48%	55.22%	43.48%
ID	280,109,342	19,008,768	18.09%	19.87%	19.18%	14.53%
IN	1,443,538,136	41,660,416	3.70%	3.58%	3.70%	78.46%
JP	122,536,753	188,984,576	13.03%	12.91%	12.84%	58.28%
KR	51,734,698	112,504,320	0.50%	0.51%	0.52%	22.92%
TW	23,953,574	35,712,256	22.06%	22.45%	23.04%	61.97%
VN	99,583,226	16,422,912	28.98%	31.53%	33.28%	60.87%

Ref: https://ipv6matrix.org/hosts

Conclusion

- Global IPv6 user adoption has risen significantly, but server-side IPv6 support data remains unclear.

- Data collection is challenging due to limited tools and resources, especially after Alexa discontinued its "Top 1 Million Websites List" in 2022.

- **IPv6Matrix Advantages:**
  - The only known free IPv6 detection and statistics platform that is regularly updated.
  - Covers a wide range of CCs (132 CCs) and provides trend charts, making it easier to track IPv6 website trends.

- **IPv6Matrix Limitations:**
  - The detection interval is irregular, ranging from 1 to 5 months.
  - The specific website list and ASN used (cloud or local networks) cannot be clearly identified from the webpage.

- **Future work**：
  - We will focus on using the Tranco List(*) to provide the Top websites list, categorized by ccTLDs, for each country, and analyze whether these websites support IPv6.
  - Increase ASN measurement to understand IPv6 deployment patterns, including ISPs, cloud services, and CC distribution.

Appendix: Why we prefer using the Tranco List as a source for website data

- **Stable and Continuously Updated Data**
  - Tranco List is a research-oriented, regularly updated ranking of websites, providing a reliable source for IPv6 support detection.

- **Customizable List Size**
  - Users can select different list sizes (e.g., top 100,000 or 1 million websites), offering flexibility for measurement and in-depth analysis.

- **Research-Focused and Transparent**
  - Tranco is designed for academic research, with a transparent list generation process, suitable for analyzing IPv6 trends and providing reliable data.

- **Enhanced Accuracy with Multiple Ranking Sources**
  - Tranco combines multiple ranking sources (e.g., Majestic, Umbrella) to improve accuracy and avoid biases.

- **Filling the Alexa Gap**
  - After Alexa ceased its service, Tranco provides a stable alternative, effectively filling the data gap for IPv6 measurement.

※ Tranco List: A Research-Oriented Top Sites Ranking Hardened Against Manipulation. To use the lists from five providers: Cisco Umbrella, Majestic, Farsight, Chrome (CrUX), and Cloudflare Radar. Tranco is not affiliated with any of these providers.

Ref: https://tranco-list.eu/

Thank you