March 2024

Measuring the Health and Resilience of the Internet: Myanmar

Robbie Mitchell
mitchell@isoc.org

- Launched December 2020.
- We curate Internet measurement data from trusted sources to help everyone gain deeper, data-driven insight into the Internet.

Trusted data from multiple sources:

- **Benefit**: Helps to assess whether efforts to ensure that the Internet remains open, globally connected, secure, and trustworthy are working.
- **Benefit:** Allows policymakers, researchers, journalists, network operators, civil society groups, and others to better understand the health, availability, and evolution of the Internet.

pulse.internetsociety.org

Pulse Data Partners

- Data is provided by our trusted data partners

Pulse tracks

Shutdowns: Where do Internet Shutdowns take place and what is the economic cost?

Technologies: What is the state of deployment of technologies critical for the evolution of the Internet?

Concentration: How much are services concentrated in the hands of a few?

Resilience: How robust is the Internet ecosystem?

What I'll cover today

Shutdowns: Where do Internet Shutdowns take place and what is the economic cost?

Technologies: What is the state of deployment of technologies critical for the evolution of the Internet?

Concentration: How much are services concentrated in the hands of a few?

Resilience: How robust is the Internet ecosystem?

Country Reports: Consolidate and illustrate critical Internet health metrics

Internet Shutdowns

Across 2023, Pulse recorded

18

Countries experienced an intentional Internet shutdown

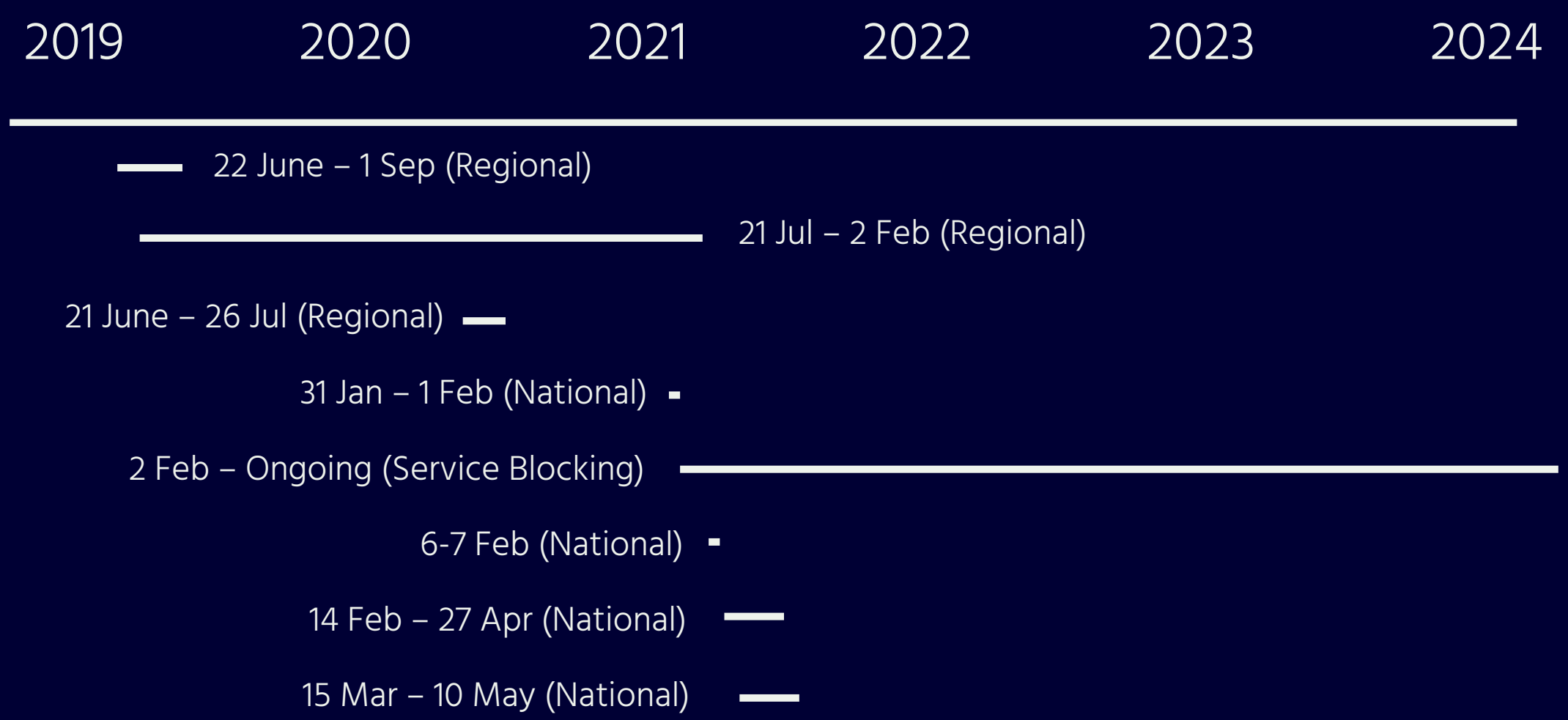
124

Shutdown events ranging from 2 hours to months

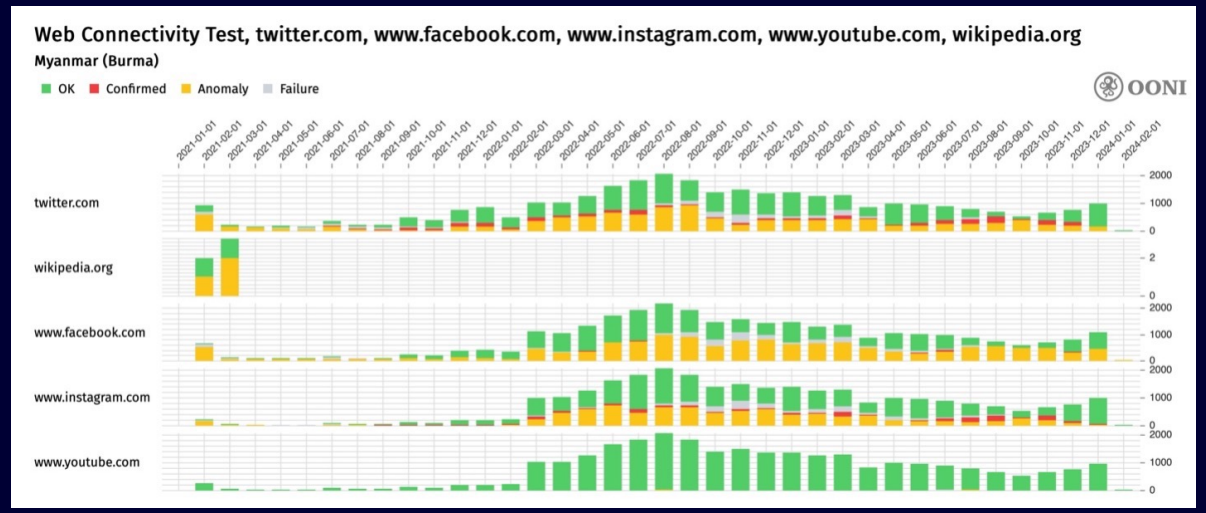
2370

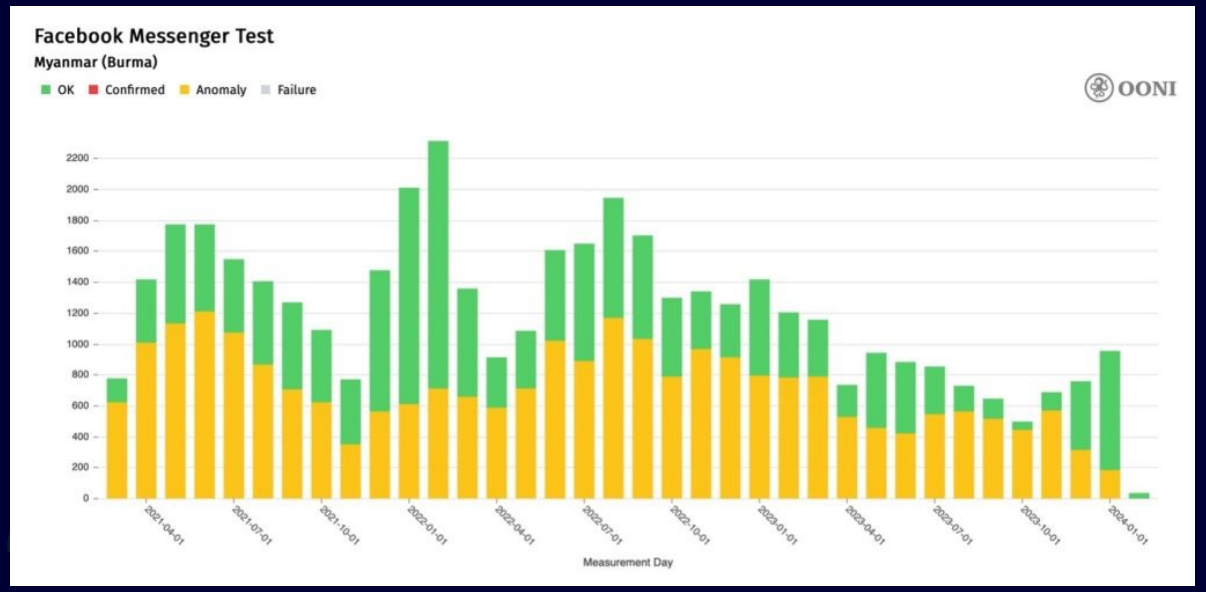
Total number of days of disruption

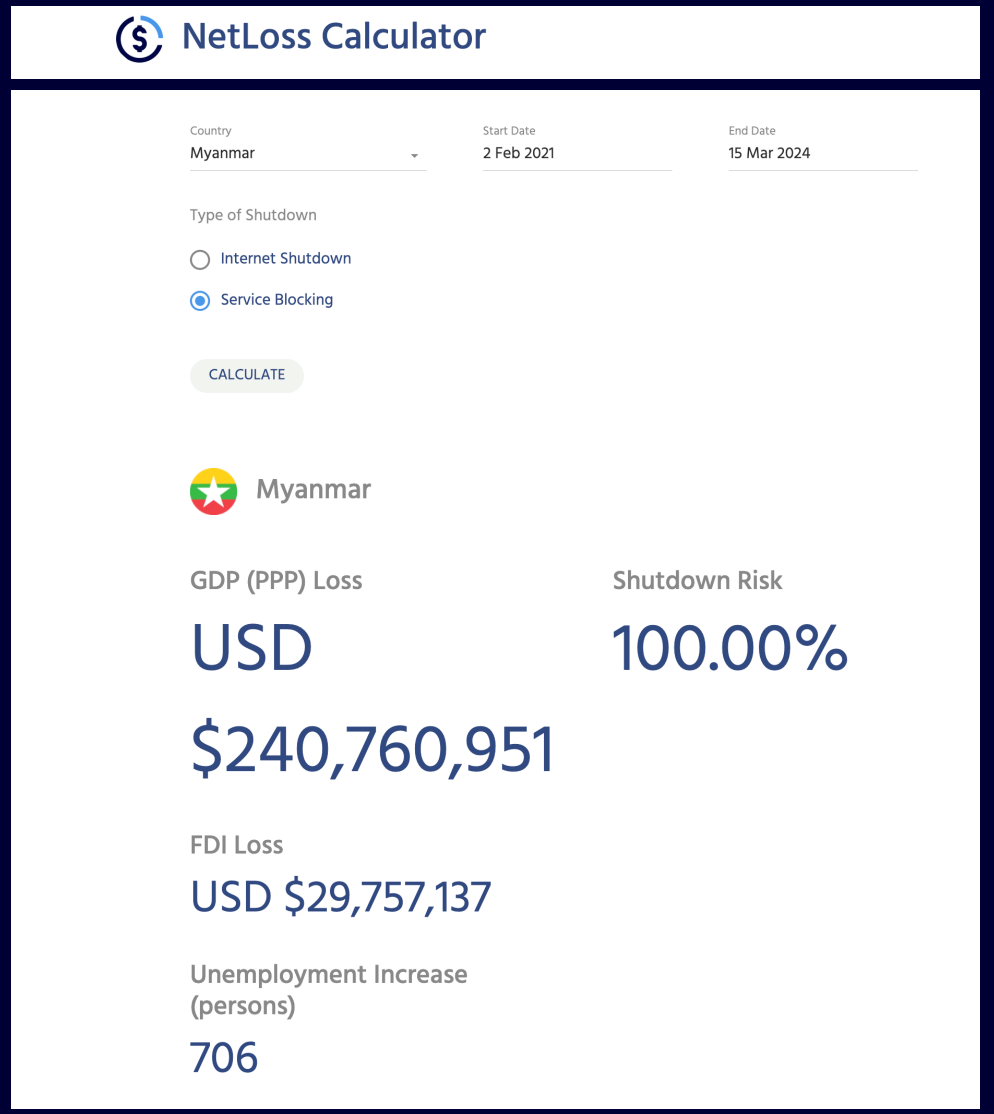
Internet Shutdowns in Myanmar



Internet Shutdowns in Myanmar







Technologies

Technologies Globally

HTTPS

96%

Current percentage of top 1000 websites globally that support HTTPS.

IPv6

48%

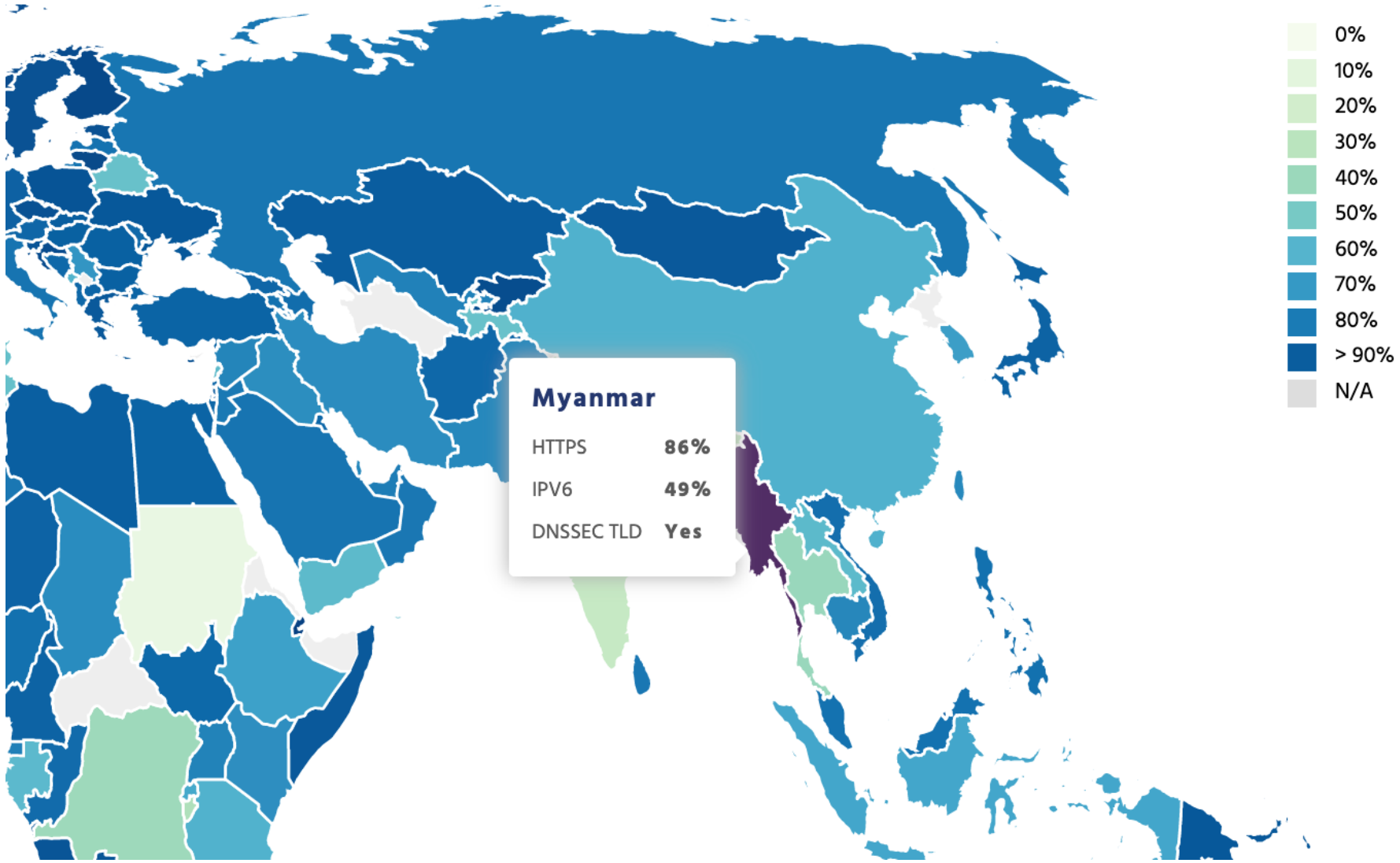
Current percentage of top 1000 websites globally that support IPv6.

TLS 1.3

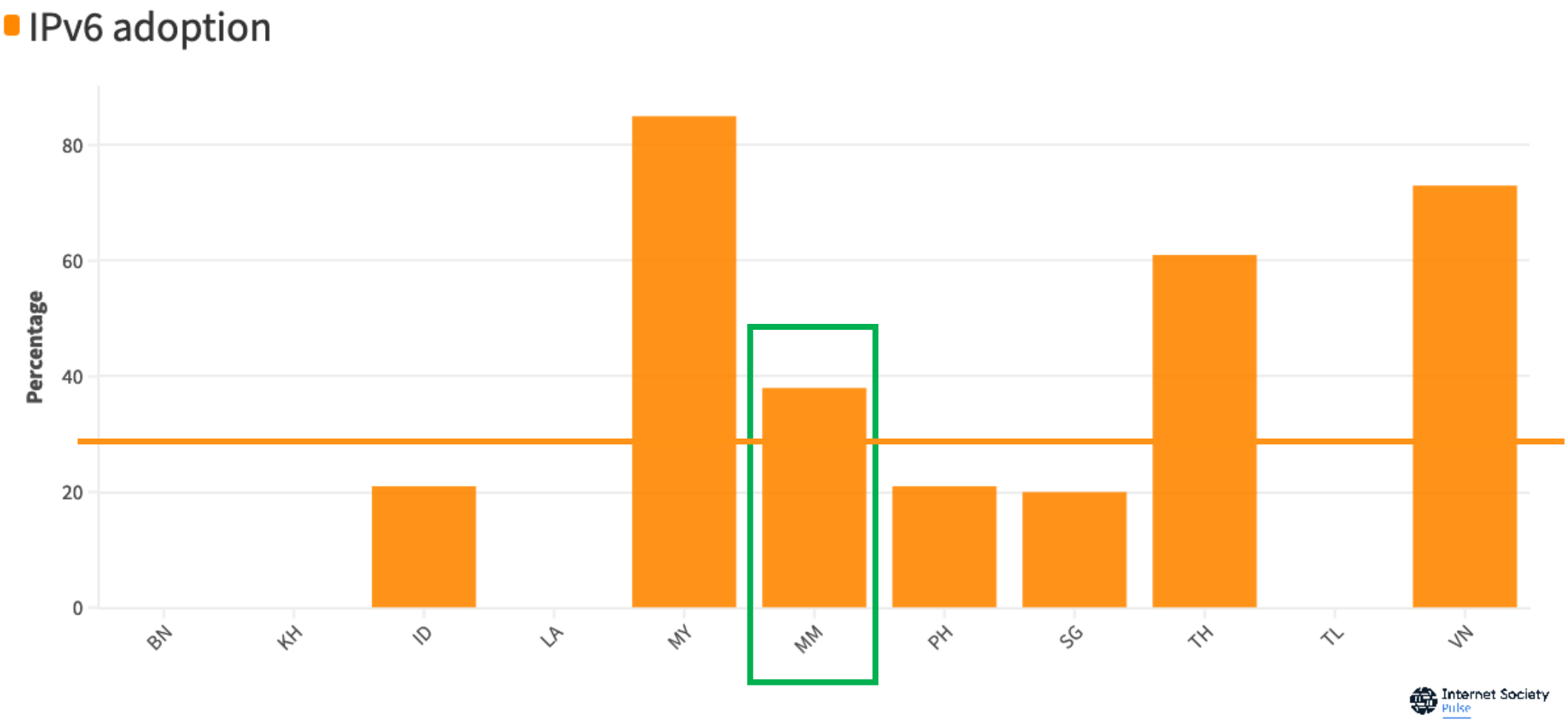
81%

Current percentage of top 1000 websites globally that support TLS 1.3.

Technologies Myanmar



IPv6 Adoption in SE Asia



Avg IPv6 Adoption = 29%

Resilience

The Internet Resiliency Index (IRI) pulse.internetsociety.org/resilience

The framework collates around 30 sets of public metric data that relate to **four pillars** of a resilient Internet:

.

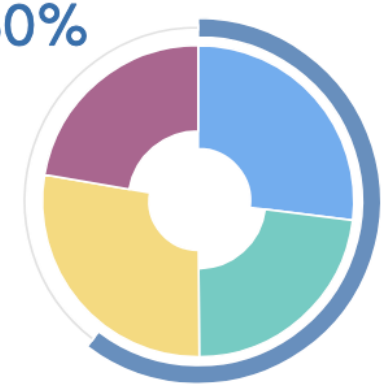
Infrastructure	Performance	Security	Market Readiness
The existence and availability of physical infrastructure that provides Internet connectivity.	The ability of the network to provide end-users with seamless and reliable access to Internet services.	The ability of the network to resist intentional or unintentional disruptions through the adoption of security technologies and best practices.	The ability of the market to self-regulate and provide affordable prices to end-users by maintaining a diverse and competitive market.

Methodology: https://pulse.internetsociety.org/wp-content/uploads/2023/07/Internet-Society-Pulse-IRI-Methodology-July-2023-v2.0-Final-EN.pdf

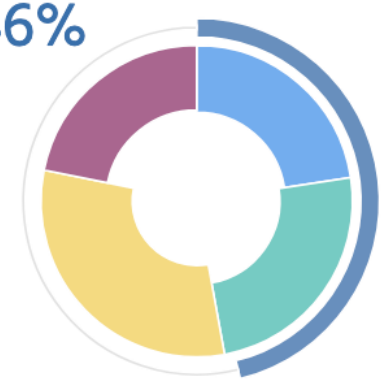
Overall Internet Resilience — By Region

Overall Resilience | Infrastructure | Performance | Security | Market Readiness

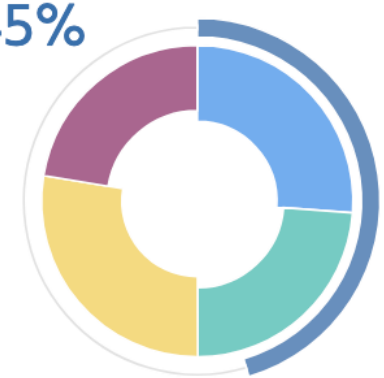
Europe
60%



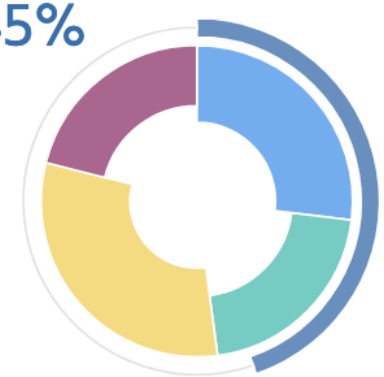
Asia
46%



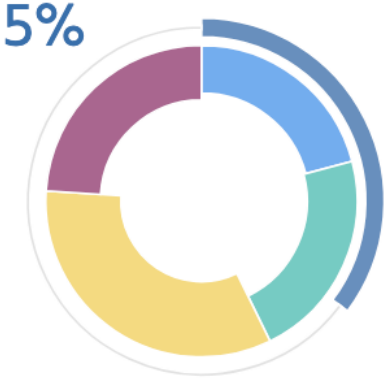
Americas
45%



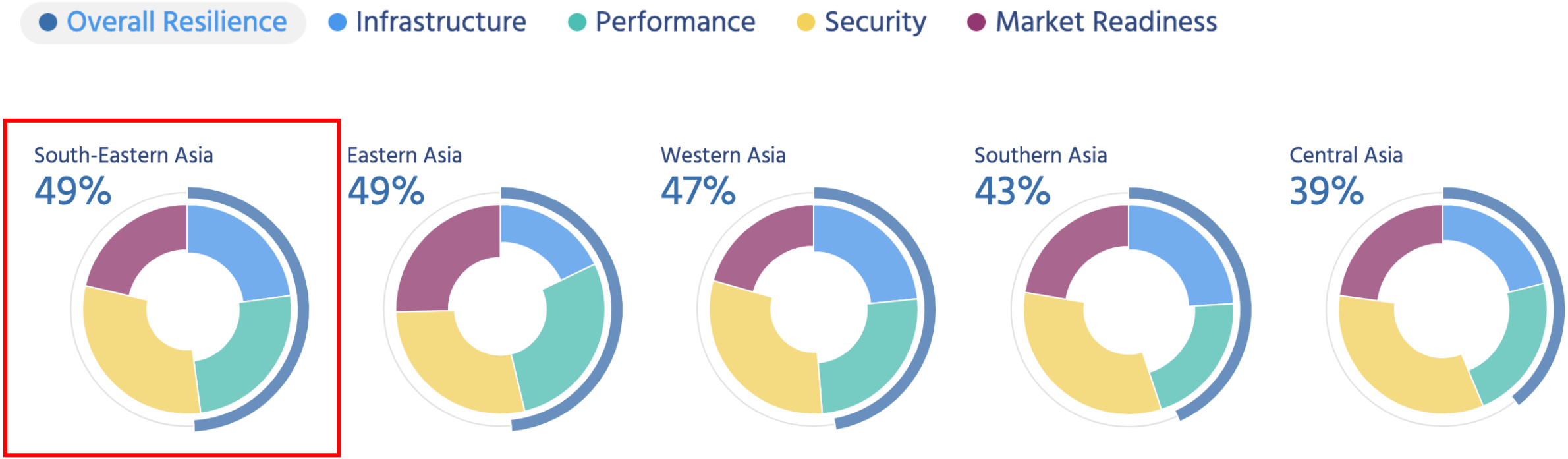
Oceania
45%



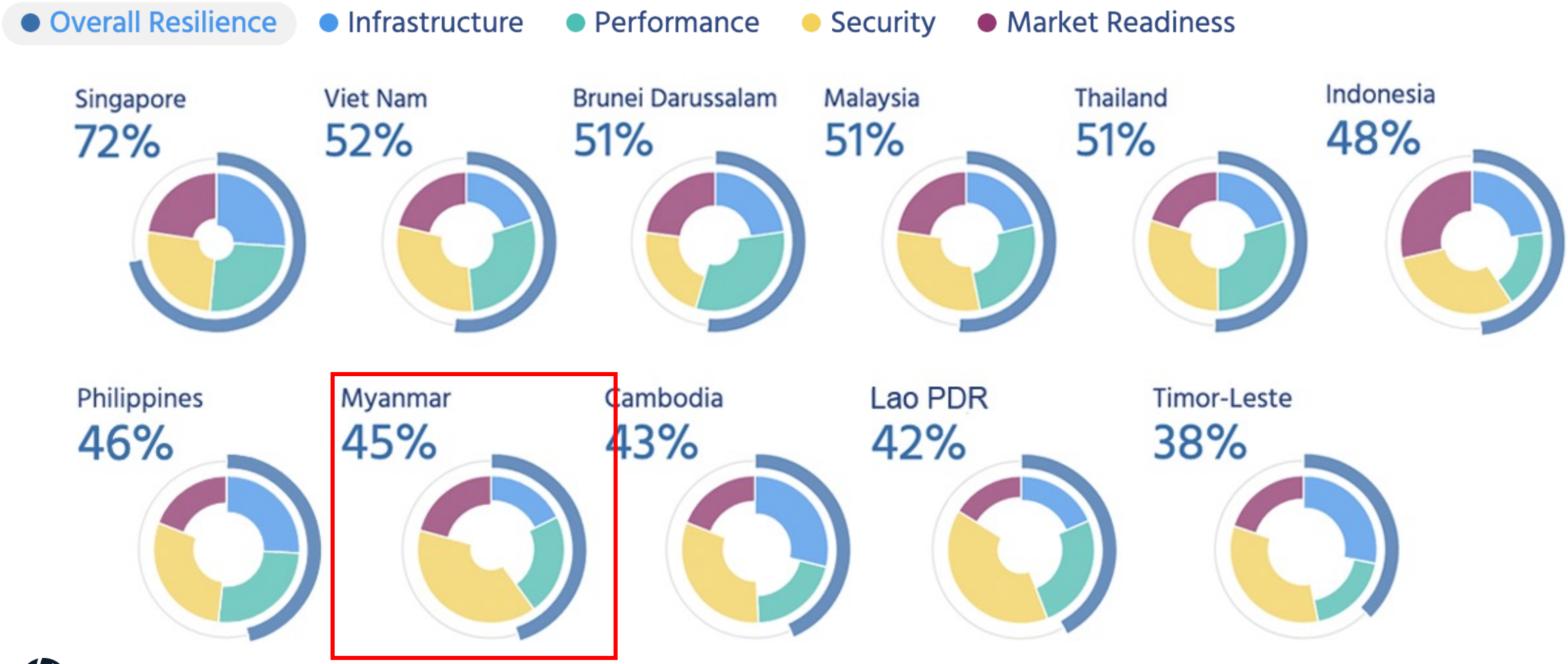
Africa
35%



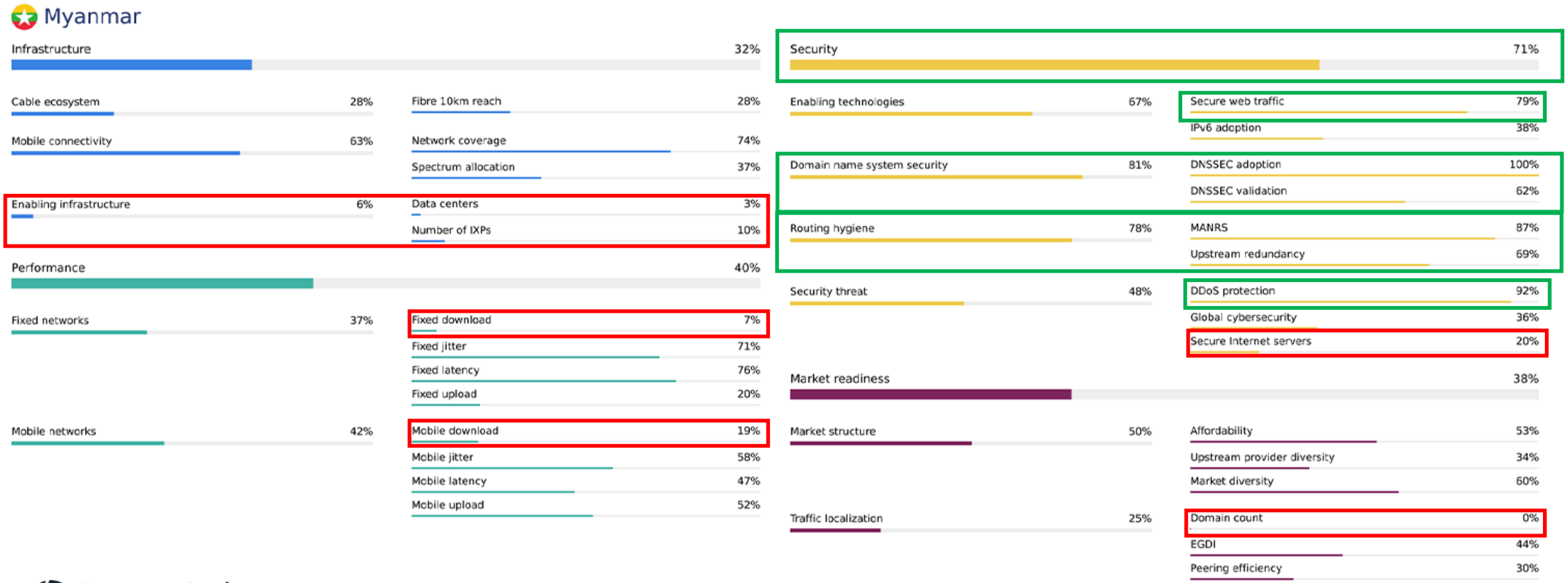
Overall Internet Resilience — Asia



Overall Internet Resilience — South East Asia



Singapore– Internet Resilience Index



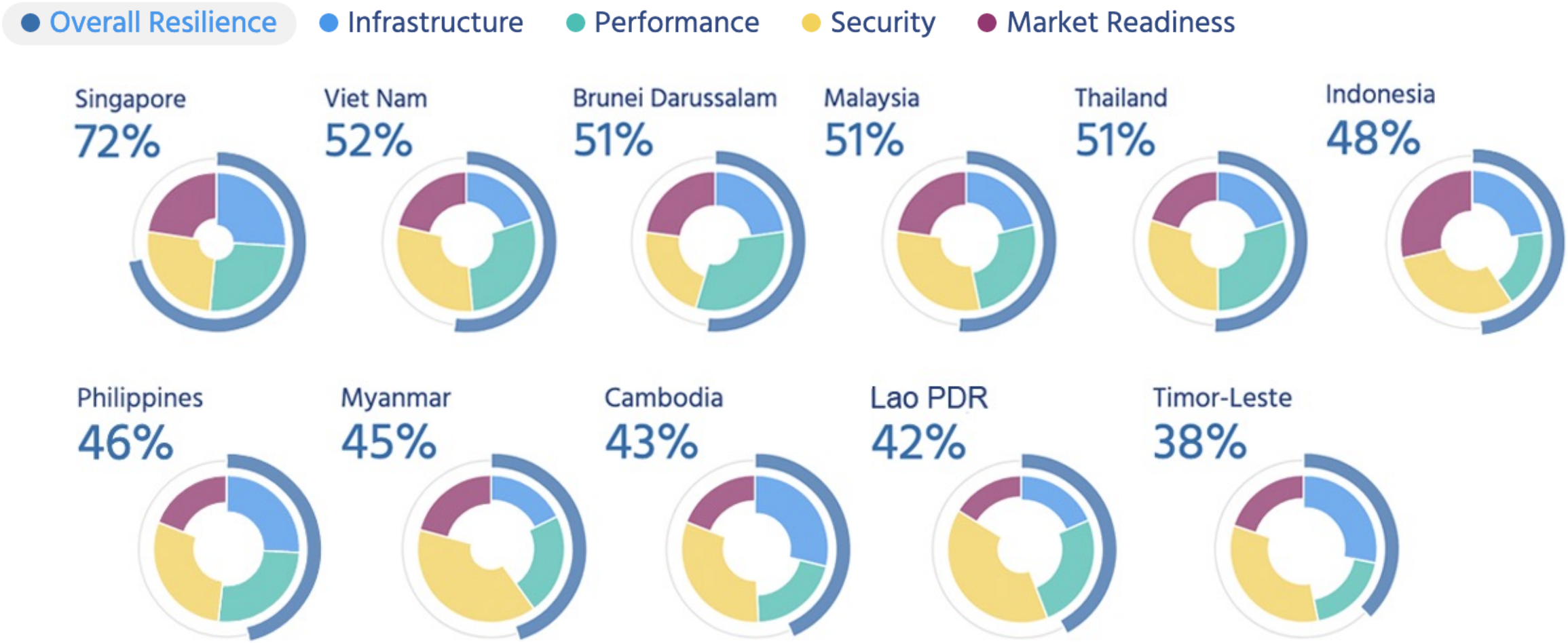
Internet Society Pulse

Internet Resilience

pulse.internetsociety.org

data source: Pulse Internet Resilience Index

Overall Internet Resilience — South East Asia



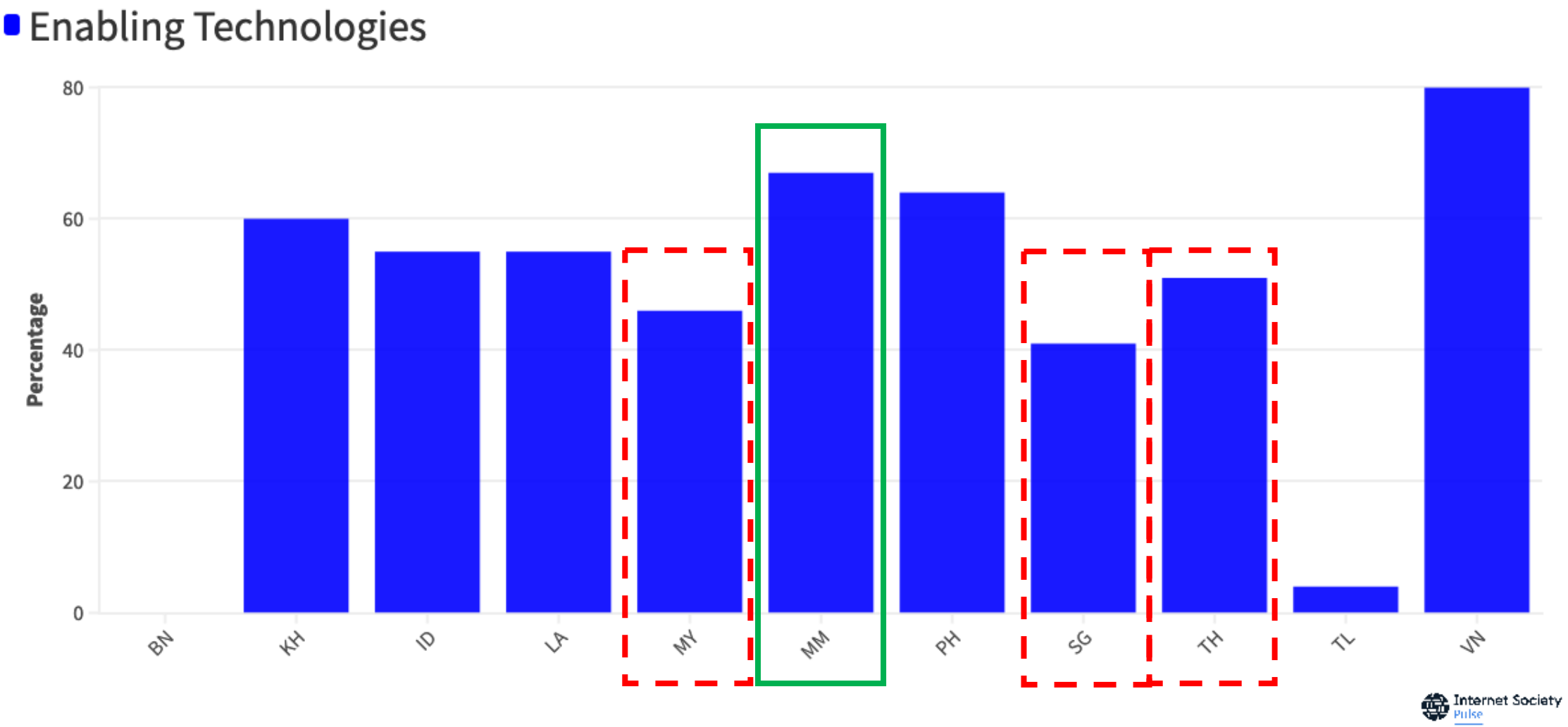
Security Resilience — South East Asia

The Internet Resiliency Index — Security

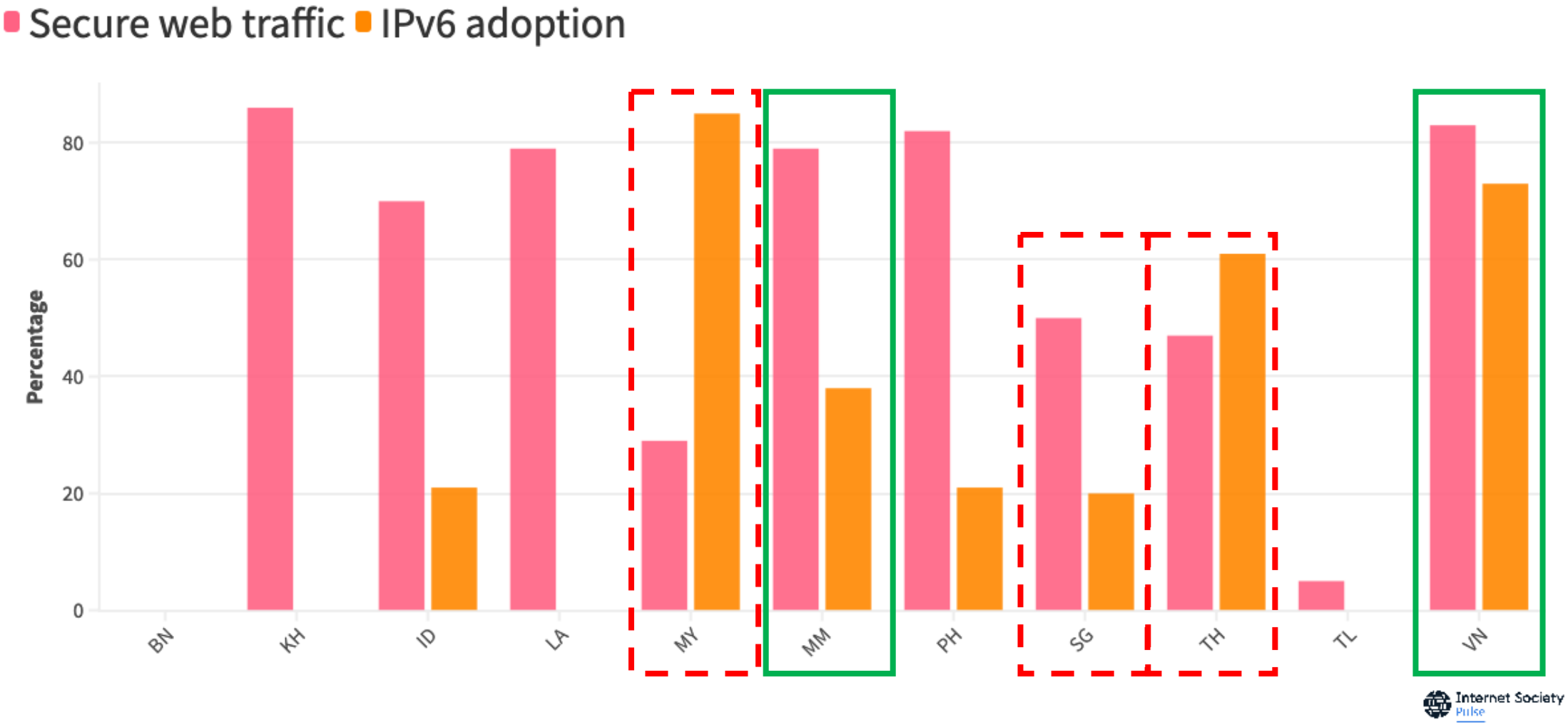
- Infrastructure
- Performance
- Security
- Market Readiness

Enabling technologies	**Secure web traffic** (Webpage loads using HTTPS. Source Mozilla
	IPv6 adoption. Source APNIC Labs
DNSSEC	**DNSSEC adoption**, i.e., is ccTLD signed. Source: ICANN
	DNSSEC validation, i.e., Users validating DNSSEC. Source: APNIC Labs
Routing hygiene	**MANRS score.**. Source: MANRS
	Upstream redundancy i.e., Avg # of upstream providers. Source: CAIDA
Security Threat	**DDoS Protection.**. Source: Cybergreen
	Global cybersecurity index score. Source: ITU
	Secure Internet Servers Source: World Bank

Enabling Technologies



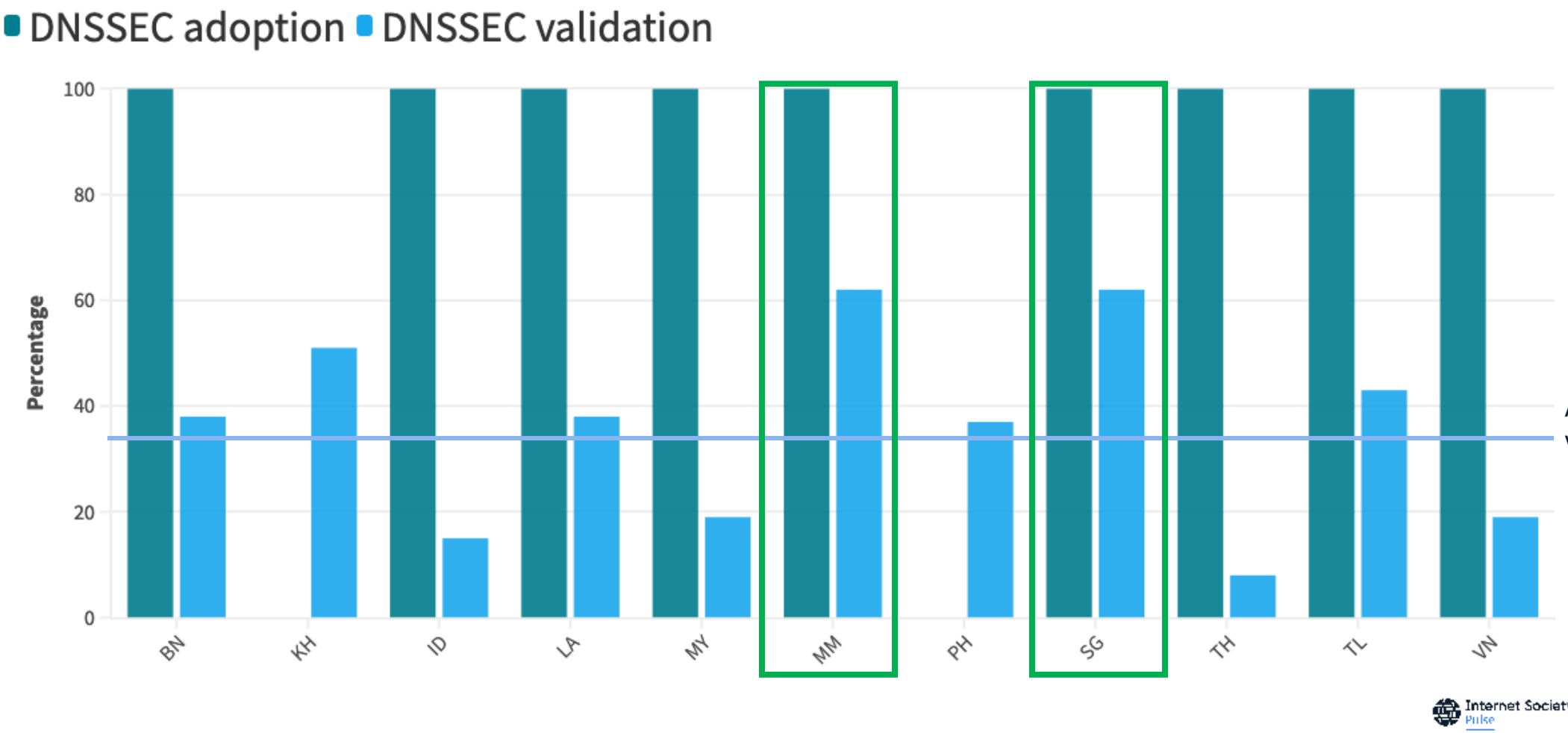
Enabling Technologies



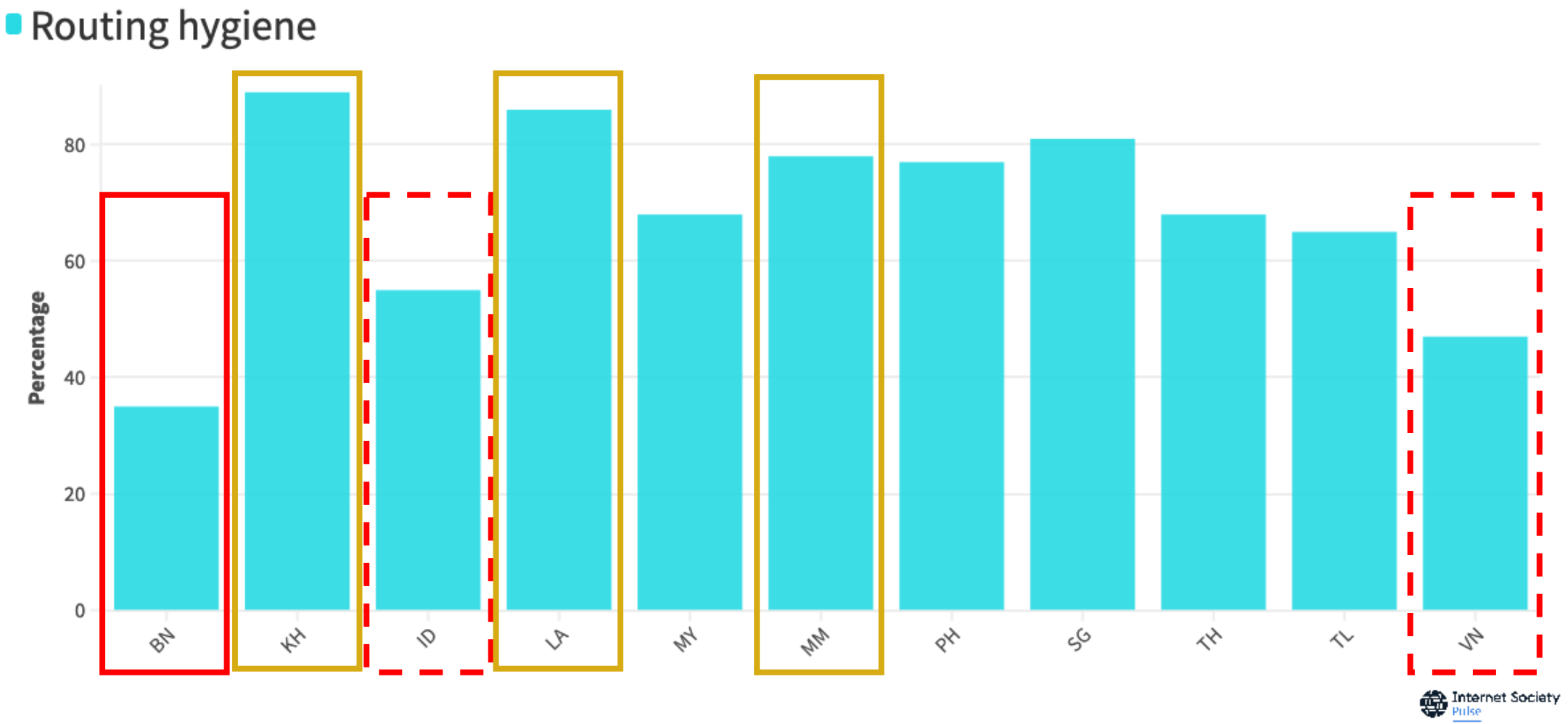
DNSSEC


DNSSEC
Percentage
80
60
40
20
0
BN
KH
ID
LA
MY
MM
PH
SG
TH
TL
VN
Internet Society
Pulse

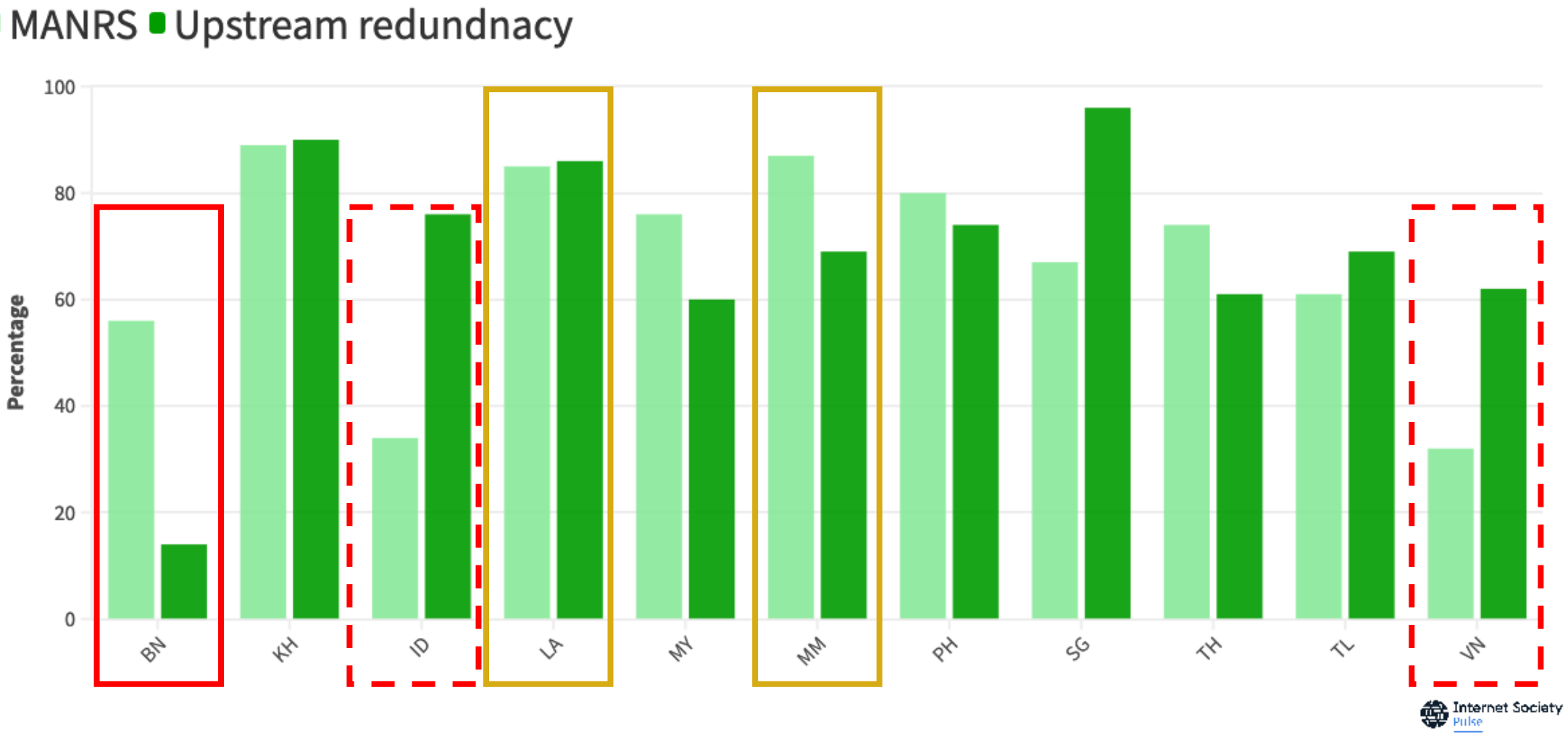
DNSSEC


DNSSEC adoption
DNSSEC validation
Percentage
100
80
60
40
20
0
BN
KH
ID
LA
MY
MM
PH
SG
TH
TL
VN
Avg DNSSEC Validation = 35.6%
Internet Society Pulse

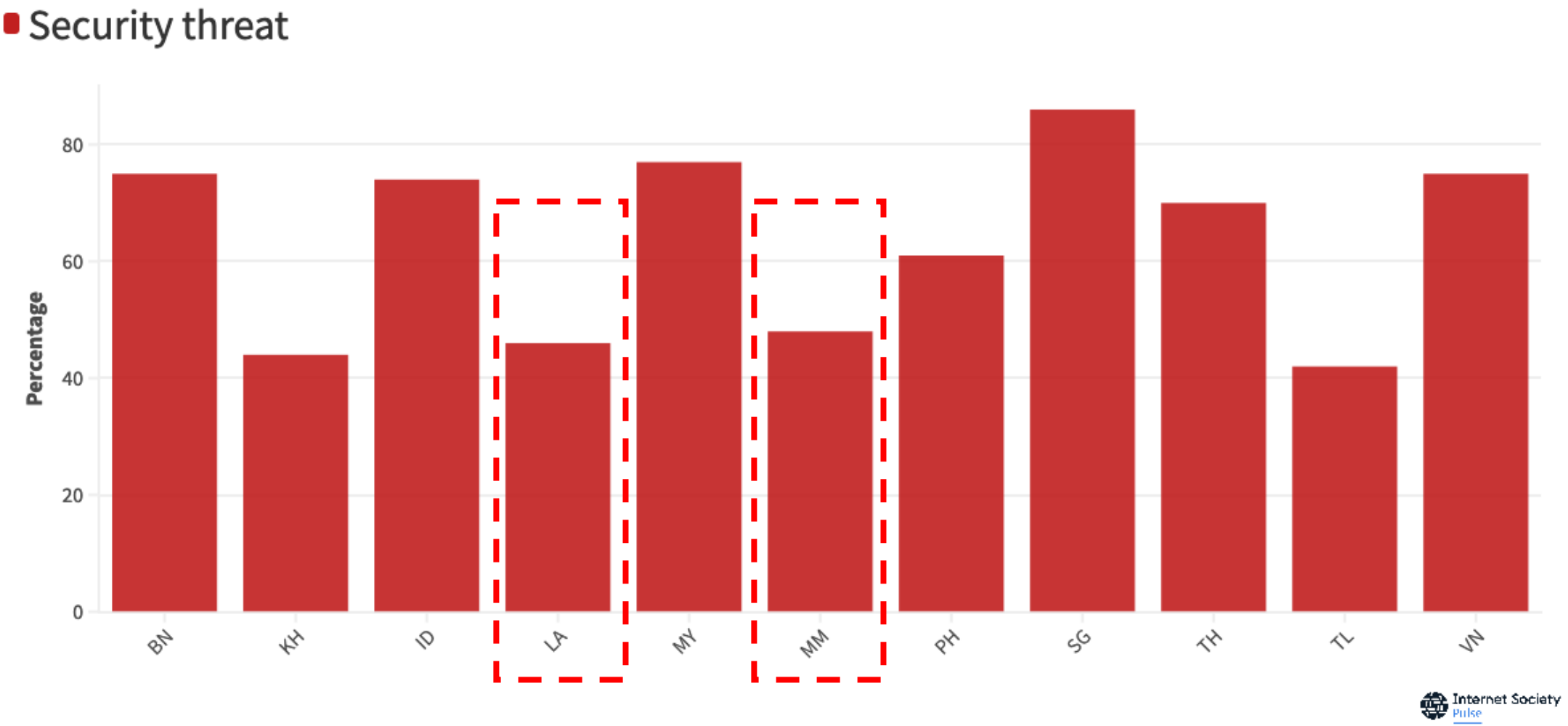
Routing Hygiene



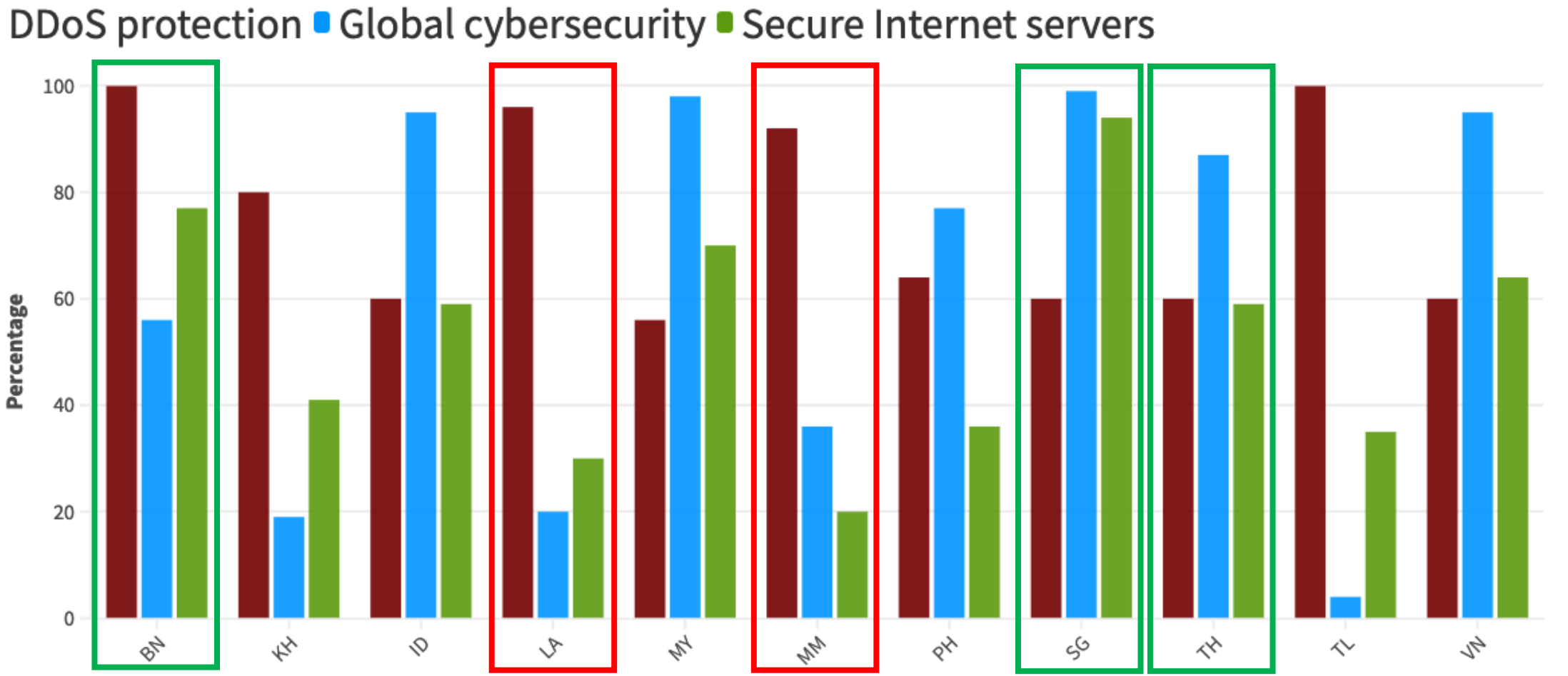
Routing Hygiene



Security Threats



Security Threats



Internet Society Pulse

Country Reports

Open Internet Environment

Internet Use

Individuals using the Internet as a percentage of the total population

44%

Regional
Rank: 41

71%
Asia avg.

Internet Shutdowns

Intentional disruptions of Internet communications, making them unavailable for a specific population, location, or type of access

1
Ongoing

0
Last 12 month

Read more about Internet Shutdowns

Internet Resilience Score

A resilient Internet connection is one that maintains an acceptable level of service in the face of faults and challenges to normal operation

45%

Regional
Rank: 32

46%
Asia avg.

See details

IXP Operator Market

A measure of the diversity and concentration of the local market for Internet Exchange Point operations

Retail ISP Diversity

Diversity of retail Internet providers improves resilience and user choice

Very Good

Transit Provider Diversity

More diversity in routes to the global Internet improves connection resilience

Poor

Internet Freedom

Freedom on the Net measures Internet freedom in 70 countries

Not Free

See details on freedomhouse.org

Open Internet Environment

Internet Use

Individuals using the Internet as a percentage of the total population

44%

Regional
Rank: 41

71%
Asia avg.

Internet Shutdowns

Intentional disruptions of Internet communications, making them unavailable for a specific population, location, or type of access

1
Ongoing

0
Last 12 month

Read more about Internet Shutdowns

Internet Resilience Score

A resilient Internet connection is one that maintains an acceptable level of service in the face of faults and challenges to normal operation

45%

Regional
Rank: 32

46%
Asia avg.

See details

IXP Operator Market

A measure of the diversity and concentration of the local market for Internet Exchange Point operations

Retail ISP Diversity

Diversity of retail Internet providers improves resilience and user choice

Very Good

Transit Provider Diversity

More diversity in routes to the global Internet improves connection resilience

Poor

Internet Freedom

Freedom on the Net measures Internet freedom in 70 countries

Not Free

See details on freedomhouse.org

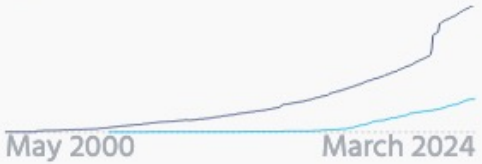
Globally Connected Infrastructure

Networks Assigned

A measure of how many Internet networks are active here

157
Regional Rank: 22

597
Asia avg.



Addresses Assigned IPv6

A measure of how many Internet addresses are assigned here

4.5M
Regional Rank: 36

152.2M
Asia avg.

IPv6 Adoption

Enabling the Internet to support more users and more uses

34%
Regional Rank: 12

19%
Asia avg.

Internet Exchange Points

IXPs help strengthen local Internet connectivity, develop local Internet industry, improve competitiveness, and serve as a hub for technical activity

2
Regional Rank: 21

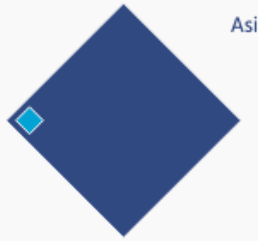
6
Asia avg.

Addresses Assigned IPv4

A measure of how many legacy addresses are assigned here

233.2k
Regional Rank: 39

17.6M
Asia avg.



Peering Networks

Peering networks help to keep Internet traffic local, provide faster connections, and improve the experience of the people relying on them

27
Regional Rank: 18

120
Asia avg.

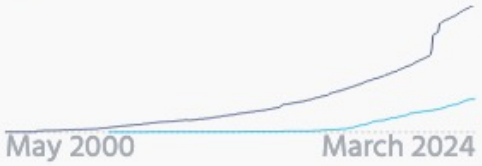
Globally Connected Infrastructure

Networks Assigned

A measure of how many Internet networks are active here

157
Regional Rank: 22

597
Asia avg.



Addresses Assigned IPv6

A measure of how many Internet addresses are assigned here

4.5M
Regional Rank: 36

152.2M
Asia avg.

IPv6 Adoption

Enabling the Internet to support more users and more uses

34%
Regional Rank: 12

19%
Asia avg.

Internet Exchange Points

IXPs help strengthen local Internet connectivity, develop local Internet industry, improve competitiveness, and serve as a hub for technical activity

2
Regional Rank: 21

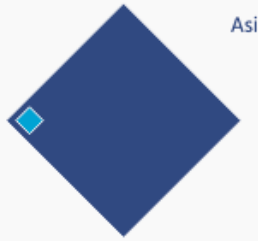
6
Asia avg.

Addresses Assigned IPv4

A measure of how many legacy addresses are assigned here

233.2k
Regional Rank: 39

17.6M
Asia avg.



Peering Networks

Peering networks help to keep Internet traffic local, provide faster connections, and improve the experience of the people relying on them

27
Regional Rank: 18

120
Asia avg.

Secure and Trustworthy Internet

Routing Security Coverage IPv4

One measure of how much local Internet network providers are securing their infrastructure

88%

Regional
Rank: 23

73%
Asia avg.

Routing Security Coverage IPv6

One measure of how much local Internet network providers are securing their infrastructure

83%

Regional
Rank: 20

73%
Asia avg.

Routing Security Adoption

A measure of how much local Internet providers are checking validity of connectivity information they receive from other networks

37%

Regional
Rank: 7

15%
Asia avg.

Naming Security Status

Adopting DNSSEC improves trustworthiness of Internet communications

.mm

Active

Naming Security Adoption

A measure of how much local Internet users are protected by DNSSEC

67%

Regional
Rank: 11

37%
Asia avg.

Secure and Trustworthy Internet

Routing Security Coverage IPv4

One measure of how much local Internet network providers are securing their infrastructure

88%

Regional
Rank: 23

73%
Asia avg.

Routing Security Coverage IPv6

One measure of how much local Internet network providers are securing their infrastructure

83%

Regional
Rank: 20

73%
Asia avg.

Routing Security Adoption

A measure of how much local Internet providers are checking validity of connectivity information they receive from other networks

37%

Regional
Rank: 7

15%
Asia avg.

Naming Security Status

Adopting DNSSEC improves trustworthiness of Internet communications

.mm

Active

Naming Security Adoption

A measure of how much local Internet users are protected by DNSSEC

67%

Regional
Rank: 11

37%
Asia avg.

Limitations

Limitations

- The data is pulled from external public sources, not always up-to-date.
  - An indicator is not included if data is missing on more than 25% of countries in the Index.
- Without in-country measurements, it's difficult to validate the data.
  - RIPE Atlas and OONI are doing great work in this area, but more is needed.
- Some of the data undergoes processing, normalization, and weighing, we use a methodology that is reproducible.
  - You can see raw numbers via API. Email us for access pulse@isoc.org
- Ultimately, the Index benchmarks countries with one another and helps decision makers recognize gaps and weaknesses to conduct further study into validating these and work towards addressing them.

We all have a role to play

Take aways

- Understanding what’s happening upstream and beyond your shores is equally important as knowing your network’s health.

- Having an insightful national measurement system in place improves the resolution of the health of the edge.

- Your network's health and the health of the whole of Asia Pacific's Internet are interconnected. We all have a role to play to make sure it is robust and secure.

Subscribe, Review, Contribute

Subscribe to the Pulse newsletter

Contribute to Pulse

pulse@isoc.org

Review the Pulse IRI methodology

Thank you

Robbie Mitchell
mitchell@isoc.org