2022 APNIC Survey Report

APNIC

survey matters.

Contents

Introduction & Methodology

As an open membership-driven organization, APNIC operates on continuous feedback and implementation cycles. Commissioned by the APNIC Executive Council (EC) and conducted every two years, the APNIC Survey is a valuable feedback tool, used to improve APNIC performance, target activities and inform APNIC's strategic planning. This is the twelfth iteration of the APNIC Survey program.

The survey is a comprehensive process, with consultations in the form of Individual Depth Interviews (IDIs) with Members and Stakeholders conducted first, followed by an online quantitative survey which is open for anyone with an interest in the Internet community to participate.

In 2022, the consultations were held via video conference during March and April and the online survey was open for participation by APNIC Members and other Stakeholders (Members of NIRs or others involved in the Internet community) from 13 June and 7 July 2022.

In 2020 the APNIC Survey was conducted at the onset of the COVID-19 pandemic, and as a result it was not included in any of the topics canvassed. Two years on, and with continued disruptions and restrictions prevalent, the effects of the pandemic on Members, organizations and economies were included in both the individual consultations and the online questionnaire to provide APNIC with information about the challenges and opportunities arising from the pandemic on different types of organizations and economies.

As in previous years, the survey also sought to understand the specific Internet related challenges facing the community, and ideas and suggestions for where APNIC may be able to assist with these, as well as testing experiences with APNIC services and activities.

The survey forms an integral part of APNIC's strategy and planning, and is used to guide decisions about where to focus efforts to provide maximum benefit to Members and the Internet community in the Asia Pacific region.

Survey Matters were again commissioned by the APNIC EC to conduct the survey, to ensure anonymity of responses and impartial evaluation of the results. Individual responses are not identified in this report; results are provided at an aggregate level only. To further protect participant anonymity, no organizations or locations are noted against the verbatim comments provided in this report. No identifying data has been provided to APNIC.

This report provides the full feedback from the online survey, and also draws on the feedback from the individual consultations. These consultations, along with the substantial verbatim comments provided within the online survey, add richness and depth to the quantitative findings.

Response Rates and Sample

Following a comprehensive communication and survey distribution program, 1,654 responses were received and, after data cleansing, 1,622 responses remained. The sample size provides 95% confidence that results are within +/- 3% of presented figures.

Of the responses received, 65% were received from APNIC Members or Account Holders, 16% from members of NIRs in the region, and the remaining 19% from other Stakeholders.

As in previous years, most responses (92%) were from the Asia Pacific economies served by APNIC, with 8% from economies outside the region.

The composition of the sub-region sample remained largely the same as in 2020, with 17% of responses from East Asia and Oceania, 28% from South East Asia and 30% from South Asia.

Please note that some segments contain small samples and so do not aim to be representative of the different segments. They do, however, provide directional feedback about the opinions of these respondents.

2022 Interview Locations	
Australia	Mongolia
Bangladesh	Nepal
Bhutan	New Zealand
Cambodia	Pakistan
China	Papua New Guinea
Fiji	Philippines
Hong Kong Special Administrative Region of China	Republic of Korea
India	Sri Lanka
Indonesia	Taiwan
Japan	Thailand
Kiribati	Vanuatu
Macau Special Administrative Region of China	Viet Nam
Malaysia	

Table 1 – Interview Locations

Interviews

Conducting qualitative research prior to undertaking an online survey is best practice in research of this kind, as it gathers perspectives directly from randomly selected Members that can be tested across the wider Member and Stakeholder base through the online survey instrument.

As in 2020, Individual Depth Interviews (IDIs) were conducted by video conference. A total of 37 IDIs were conducted spanning 25 economies. A majority of the Interviews were conducted with APNIC Members or Account Holders, with six conducted with Stakeholders within the region. All seven of the APNIC NIR Members were also consulted.

Please refer to Table 1 for the locations if the IDIs.

Online Survey

The quantitative survey was designed by Survey Matters in collaboration with APNIC and approved by the APNIC EC.

It was based on the feedback from the IDIs, and also included tracking or benchmarking questions to monitor APNIC performance over time.

The survey questionnaire also asked several new questions in 2022, largely to understand the impacts to Members and Stakeholders from the global coronavirus pandemic.

In addition, to understand the frequency Members and Stakeholders participate in the biennial APNIC Survey, a question was added to ask whether respondents had taken part in the survey previously.

The 2022 survey questionnaire was designed primarily as a quantitative instrument, but respondents were also given opportunities to provide feedback in their own words and in their own language if desired.

Translation

The survey questionnaire was translated into 10 languages in 2022, based on responses in languages other than English in the 2020 survey.

The languages offered in the online survey were Bengali (Bangladesh), Chinese (Simplified and Traditional), Indonesian, Japanese, Korean, Mongolian, Burmese (Myanmar), Thai, and Vietnamese.

A total of 441 surveys were completed in a language other than English, down from 568 in 2020. However, this still represents almost three in ten (29%) of all surveys completed.

Non-English verbatim feedback was translated back to English using Google translate, with a verification of translations undertaken by language specialists within APNIC. A breakdown of non-English language survey completions by economy is provided on page 14.

Communication and Distribution

The survey was designed as an anonymous online instrument, and hosted by Survey Matters. Promotion of the survey was done by the APNIC Secretariat.

Several prizes were offered throughout the communication schedule to encourage responses at different stages of the survey period.

Data Cleansing

At the conclusion of the online survey, Survey Matters undertook data cleansing following the standard protocols for market research. A total of 1,654 responses were reviewed and after interrogation, 32 were removed as they were either generally unreliable or found to be multiple responses from the same respondent.

The method used to clean the data was as follows:

- Removal of records where respondents answered too quickly or selected the same rating or score regardless of the question being asked throughout the survey.
- Removal of multiple responses where the information regarding the prize draw was the same.
- Removal of responses where the free text responses were the same, including grammar and wording, and phrases.

Survey Analysis

When analysing the survey data, results have been cross-tabulated by respondents' relationship with APNIC (Member or Stakeholder), APNIC sub-region (East Asia, Oceania, South East Asia and South Asia) and Classification of Economies (Developed, Developing and Least Developed Economies (LDEs) based on the current UN classifications.

Differences in the opinions and behaviours of respondents based on their APNIC relationship, sub-region and economy classification are presented throughout the report and highlighted where the findings are significant.

Differences in opinions have also been examined by organization type, organization size and role or position within the organization. While not presented for every question, where there are significant differences in the findings based on these groups, these are written in the report.

The results to survey questions are displayed as either a mean score (always out of a maximum score of seven) or as a percentage of respondents who selected a positive option. Where possible and appropriate, a full frequency distribution is shown. Comparisons to the 2018 and 2020 surveys are made where possible.

Where percentage ratings for agreement, satisfaction or importance are referred to throughout the body of the report, these have been classified as follows:

- Scores of 5, 6 or 7 out of 7 are positive
- Score of 4 out of 7 is neutral
- Scores of 1, 2 and 3 out of 7 are negative

We have also drawn on the qualitative comments and have referenced the feedback provided in the interviews conducted when reaching many of our conclusions. In many instances, the quantitative findings are used to validate the issues raised in the interviews. In others, the free text or interview feedback provides further insight into the quantitative findings.

Executive Summary

In the two years since the last APNIC Survey, the region has experienced a global pandemic, geo-political instability, economic turmoil and more frequent natural disasters. It is very pleasing, therefore, to report that throughout this period, APNIC has maintained its position as a provider of valuable Internet-related services and continues to be the trusted partner to Members and Stakeholders across the Asia Pacific region.

Although usage of all APNIC services was lower than in 2020, due to the global response to the COVID-19 pandemic, respondents' satisfaction with the services they use remain high, and largely consistent with the 2020 results.

Ratings of the value and quality of services and membership at an overall level also remain high, and have slightly improved on 2018 and 2020 results.

Positively, there has also been a significant increase in the proportion of respondents rating the quality of the APNIC services and the value of both services and membership as excellent.

In 2018 and 2020 respondents providing an 'excellent' rating of the quality of APNIC services was 35% and 39% respectively. In 2022, this has risen to 54%. Similarly, the proportion of respondents providing an excellent rating on the value of services has increased from 40% in 2020 to 54% this year, and those rating the value of membership as excellent is also up from 39% in 2020 to 51% in this survey.

These increases were evident across all APNIC regions. As in 2018 and 2020, South Asia (98%) report the highest levels of satisfaction with the value of membership, and while remaining high, those in Oceania report lower satisfaction at 83%.

Engagement with APNIC remains consistent with previous surveys, however use of individual services has declined this year.

More than seven in ten respondents had either used a service, contacted or interacted with APNIC in the past two years. This is the same proportion as 2020. Respondents from South East Asia (69%) and South Asia (66%) were less likely to have engaged with APNIC, as were those in LDEs (65%). Interaction with APNIC in some form is highest in Oceania, where over four in five have had at least one contact in the past two years, with 32% having used a service or contacted APNIC more than five times.

Despite contact frequency remaining the same as 2020, usage of individual APNIC services has generally declined from 2020, most likely due to the COVID-19 pandemic.

Usage of MyAPNIC declined from 69% in 2020 to 61% this year, and fewer visited the website or used the whois database. There were also fewer respondents who applied for IP addresses (down to 34% from 42%) and slightly fewer respondents report contact with the helpdesk (34%) or having read the blog (29%), down 3% and 4% respectively.

Interestingly, respondents indicating they had taken part in APNIC training increased from 41% in 2020 to 43% in 2022. Stakeholders were significantly more likely to use APNIC training services than Members at 54% and 38% respectively. Respondents from South East Asia (49%) report greater usage of training than their regional counterparts, with East Asia least likely to have engaged in any form of training, at 26%.

Despite lower usage of APNIC services and activities, satisfaction remains high, and largely consistent with prior years.

As in prior surveys, APNIC Academy training (97%) and resource certification (RPKI) (96%) are the most highly rated APNIC services. Routing security (ROA publication) was a new inclusion in the services question in 2022, and this also rated very highly, with 95% providing a rating of above average or higher. It is also worth noting that there were no negative ratings of these services.

In contrast, overall satisfaction with Special Interest Groups (SIGs) and APNIC reverse DNS services fell by 6% this year, to 88% and 87% respectively.

When asked if there were any new or different services APNIC could provide that would offer more value, a third of the verbatim comments indicated that they didn't know, or that they were "happy with the existing product and service".

However, and consistent with the individual Interview feedback, around one in five comments indicated that more advanced training in IPv6, Internet and network security and new technologies would be useful. Comments that "if you could offer customized technical trainings" or "if possible, APNIC should start certification programs in the field of cybersecurity, networking and other related field" would "help me build my skills and experiences as the Networking Engineer".

Consistent with feedback from the Interviews conducted with Members and Stakeholders, APNIC is very well regarded, with respondents highly likely to speak well about the organization.

When asked in Interviews how they would describe APNIC to others, many mentioned that APNIC is the "trusted, reliable partner in the region", and this strong endorsement was echoed in the quantitative survey.

A large majority of Members and Stakeholders (63%) speak highly of APNIC to others, with 19% doing so without being asked.

Similarly, most respondents (89%) agree that APNIC is sufficiently transparent in its activities, and that it is well respected in the Internet community (93%) with those in South Asia (94% and 95%) most likely to agree with these.

However, further examination of the ratings reveals that respondents who strongly agree that APNIC is sufficiently transparent has fallen from 30% in 2020 to 21% in 2022. Those who strongly agree that APNIC is respected in the Internet community has also dropped, from 43% in 2020 to 34% this year. This may be as a result of COVID-19, and should be monitored in future surveys.

Two new statements were also included this year measuring APNIC's responsiveness to the changing needs of the community and the extent to which it practices environmental sustainability in its service delivery.

Positively, almost nine in ten (88%) agree that APNIC responds to the changing needs of the community, and four in five (80%) are satisfied that APNIC practices environmental sustainability in delivery of its services.

While the COVID-19 pandemic has presented challenges and difficulties for business and organizations across the world, it has also provided opportunities for some.

After two years of upheaval and restrictions as a result of the coronavirus pandemic, it was appropriate to test the effects of COVID-19 on Members and Stakeholders, and the organizations they work for. Respondents were asked the primary business-related impacts from COVID-19, with three primary issues identified.

At 48%, the inability to travel and conduct business in-person had the greatest impact on respondents, and this was borne out in the verbatim comments provided. Mentions about the "inability to travel and meet up face to face of important contacts and relationships" or that it was "more difficult to accomplish projects that require face to face interaction or travel" were prevalent.

Managing people working from home was an issue for 47% of participants, with comments that "remote working and bandwidth requirements at the early part of the pandemic" was difficult, and that "remote working made collaboration across team more difficult, and reduced visibility of day-to-day activities".

Supply chain disruptions also affected organizations, with 43% selecting this as having the most impact on their business. This coincided with an increase in costs to provide services (32%), and was exacerbated by an increase in demand for Internet-related services for almost half of survey respondents (49%).

There were comments that "our business grew a lot due to being an Internet Service Provider, but due to rapid growth and supply chain issue our equipment was delayed and equipment capacities were throttled."

Despite the impacts of the pandemic, confidence in business continuity and growth in the future is high.

Over four in five (86%) survey participants have some level of confidence about the future of their businesses, with almost half reporting they are very confident about the future.

Respondents in Oceania are particularly bullish, with 90% either somewhat or very confident about the future. Those in East Asia (77%) are the least confident of the APNIC regions, with 16% having low or no confidence about business growth.

Perhaps unsurprisingly, Internet Service Providers are significantly more likely to be very confident about the future (53%) than other industry types.

Verbatim comments about the reasons for low levels of confidence reveal concerns about "political conflicts" or because "economic growth has slowed down", although others simply said their confidence was lower "because the future is uncertain".

Those more confident about business continuity and growth are buoyed by "overall demand of connectivity and service" and "the use of Internet is increased significantly … people can do anything in online like attend classes, meeting, seminar etc…" providing "opportunities to grow our operation".

With the proliferation of the Internet use during the pandemic, and demand for Internet-related services increasing, it is not surprising that the biggest strategic and operational challenges are workforce and skills shortages and Internet security.

Hiring and retaining skilled employees is the biggest strategic challenge for respondents in executive roles this year, with 15% ranking this as their most pressing issue, and almost two in five (38%) including it in their top three issues.

While not directly comparable to previous surveys because of the addition of three new options, hiring and keeping skilled staff was the fourth biggest strategic challenge in 2020, behind cost control, compliance with regulations and security risks affecting business.

Internet security risks (12% ranking this first, 34% ranking in the top three challenges) are also concerning to executives.

Two of the three new options included this year are the third and fourth most concerning issues. Ten percent (10%) of executives indicated that policymakers and regulators understanding of the Internet is a challenge, while 9% say that managing the unintended consequences of government regulations, both domestic and international, present problems for them. This rises to 27% and 26% when the top three challenges are considered.

It should be noted however, that there was a more even distribution in the ranking of the strategic challenges this year than in 2020. This may be because there were more issues to rank, or that COVID-19 has shifted executives focus and this should be monitored in future surveys.

Operationally, Internet security remains the biggest issue, with more respondents ranking this as their biggest challenge than in 2020 (30%, up from 23%). Large and corporate organizations (1,000-10,000 or over 10,000 employees) are significantly more likely to be concerned about Internet security than smaller organizations, with 34% and 36% respectively indicating Internet security is their biggest challenge.

Similarly, hardware and software vendors and IXPs (40%), enterprise businesses (41%) and those working in government or regulatory organizations (52%) are more concerned about security than those in other Internet-related industries.

Interviews conducted before the online survey, and verbatim comments, confirm that workforce and skills shortages and Internet security are top of mind for Members and Stakeholders. Comments that "having enough qualified technical staff to support the network" and a "shrinking pool of qualified engineering candidates to hire" are impacting organizations' ability to "ensure uninterrupted customer service" and business continuity.

Similarly, "increasing cyber threats" and "maintaining continuous service delivery with the increase of 'bad actors' on the Internet" mean that "monitoring and Security are very high on the agenda" for organizations.

As in previous surveys, DDoS attacks and phishing, spam, malware and ransomware remain the biggest Internet security issues for over two in five respondents. And while Members and Stakeholders continue to call for APNIC to increase security-focussed training courses (30%) and collaborate with others (28%) as a means of assisting with these issues, over one in five (21%) would like APNIC to maintain a security threat intelligence sharing service to help them monitor and act on cyber attacks.

Positively, IPv4 scarcity and deployment of IPv6 is not ranked as highly among the operational challenges facing APNIC Members and Stakeholders.

Only 7% of respondents ranked scarcity of IPv4 addresses as their top operational challenge this year, down from 13% in 2020.

Similarly, challenges with deployment of IPv6 in participant networks has fallen from 10% in 2020, to 5% this year.

When examined in more detail, the main challenge with the availability of IPv4 addresses is the cost of purchasing them, with three in ten selecting cost as an issue, up from 27% in 2020. However, in another indication that IPv6 deployment is becoming less of an issue, fewer respondents included implementation of IPv6 as an issue related to IPv4 scarcity than in 2020 (34% in 2020 compared to 28% this year).

Despite this, a lack of expertise and knowledge remains the biggest barrier to deployment of IPv6, with 45% of respondents citing scarcity of skills as the primary issue preventing more widespread deployment of IPv6 in the region.

Interestingly, fewer survey respondents (35%) say that a lack of demand from customers is preventing implementation of IPv6 in the region this year, down from 54% in 2020.

While provision of basic and advanced training remain the most important activity APNIC can offer to encourage deployment of IPv6 (29%), over a quarter of participants (26%) believe that promotion to hardware, software and content providers is important to encourage uptake of IPv6.

As part of its commitment to a global, open, stable and secure Internet that serves the Asia Pacific region, supporting and expanding Internet development activities in the region is also a core component of APNIC activities.

APNIC Members and Stakeholders were asked to rank what they considered to be the most important Internet development areas for the APNIC to invest in.

The two most important areas for APNIC Members are infrastructure investment (37%) and human resource capacity building (33%). These themes were also common in the Interviews conducted, with many mentioning that providing equal access to the Internet for all economies in the region would help to improve Internet stability and reliability and build capacity and knowledge.

The aspects of infrastructure development participants believe should be the main priority are investment in backbone networks, such as undersea or satellite to improve quality of access. Almost half of respondents who believe this is a priority (46%) support this, with a further 43% also saying that peering should be a priority.

Although there were no significant differences across Members or Stakeholders, or between the regions, significantly more ISPs (54%) indicated that peering was important to them.

To help build human resource capacity, nearly three in five (59%) support technical training for network engineers. Scholarships or internships at APNIC are also seen as important to 38% of participants, with South Asia respondents (46%) more likely to support this than those in East Asia (27%).

Over a third (35%) believe that fellowships supporting the next generation of Internet engineers should be the main priority for investment in human resource capacity building.

Conclusion

APNIC can be rightly proud of the 2022 survey results. In a difficult period marred by the COVID-19 pandemic and other global challenges, Members' and Stakeholders' satisfaction with the overall quality and value of APNIC services and membership has remained high, with ratings of 'excellent' significantly improving from the 2018 and 2020 surveys. These results are a testament to the focus of the APNIC Secretariat and EC on the needs of the region and Members during difficult times.

Despite this, it is clear that it has become increasingly difficult for Members and the wider Internet community to continue to provide quality services to their customers, and as a result, the requirements of Members of APNIC have become more complex, and often intertwined.

Although demand for Internet-related services has increased substantially during the COVID-19 pandemic for most Members, this resulted in difficulties maintaining quality of service because of capacity, bandwidth and access to reliable Internet. Transitioning to working from home was difficult for many, not only from managing staff, but also because access to reliable Internet in their economies was often problematic. For others, the collapse of hospitality, tourism and other industries meant reduced revenues, job losses and / or reduction of the workforce.

As the world emerges from COVID-19, other problems have surfaced. Rising inflation, increasing costs, continued supply chain problems and a critical lack of skilled resources are hampering business growth. In particular, the lack of skilled IT personnel, including network engineers and Internet security experts are concerning organization executives and operational employees. Cybersecurity concerns are also increasingly prevalent as a result of much greater use of the Internet from home.

Continued training, and development of more advanced training, remains the best way APNIC can assist the Internet community with these issues. If financial resources are available, Members want APNIC to expand training opportunities to the 'next generation' through technical training, collaboration with universities, scholarships, and internships, as well as continuing to provide in-person and online training.

Infrastructure development assistance is also important to Members and Stakeholders in the region. Support for backbone networks for smaller economies reliant on Internet access from others is encouraged, while peering and neutral IXPs would be welcomed by many.

As in previous APNIC Surveys, this survey continues to highlight the diversity in the needs and opinions across the Asia Pacific region. However, this diversity aside, APNIC is regarded highly by the vast majority of the Internet community, with many appreciating the work done through the APNIC Academy, the APNIC Foundation and other activities.

As always, the survey continues to elicit demand from survey participants for APNIC to support Members and other Stakeholders through training, knowledge building, collaboration and sharing of information, case studies and experiences.

Key Findings

1

Members' ratings of the quality and value of APNIC services and membership have improved

Fifty-four percent (54%) of Members rate the quality and value of APNIC services as excellent. This is a significant increase from previous years. Many more Members also rate the value of membership as excellent (51%). In a difficult two years, this is a significant achievement.

2

COVID-19 has had a significant impact on organizations, although confidence about the future is high

While demand for services increased for many, others experienced a reduced demand and loss of customers and revenue during COVID-19. Inability to conduct business and carry out service provision in-person hampered operations and managing staff working from home was also problematic. This was exacerbated by supply chain disruptions and increased costs of equipment.

However, most respondents (86%) are confident about business continuity and growth in the next two years.

3

Despite lower usage of almost all APNIC's services, satisfaction with these has been maintained

Except for training, usage of all other APNIC services has fallen, most likely because of the global response to the COVID-19 pandemic. However, satisfaction with the services used by Members and Stakeholders has largely been maintained from 2020 levels.

Key Findings

4

Lack of skilled Internet engineers and Internet security are the biggest challenges

In a shift from 2020, a lack of suitably skilled technical employees is the most concerning strategic challenge for organization executives. This is also evident from the 2022 Interviews, and frequently mentioned among verbatim comments in the survey.

Internet security is also an issue for both executives and operational staff, with concerns heightened by the proliferation of Internet use as a result of COVID-19.

5

Increased security-focused training courses, collaboration with others, and maintaining a security threat intelligence sharing service are the best ways APNIC can assist.

Training remains the most valuable way APNIC can assist with the challenges, with particular emphasis on DDoS prevention and security policy development favoured by respondents. Maintaining a security threat intelligence service, and collaboration with other technical security organizations are other activities the community believe APNIC can consider to assist them.

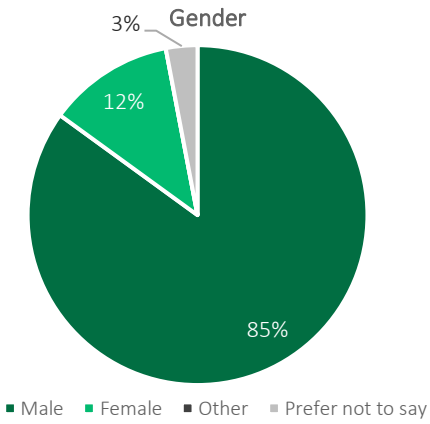
6

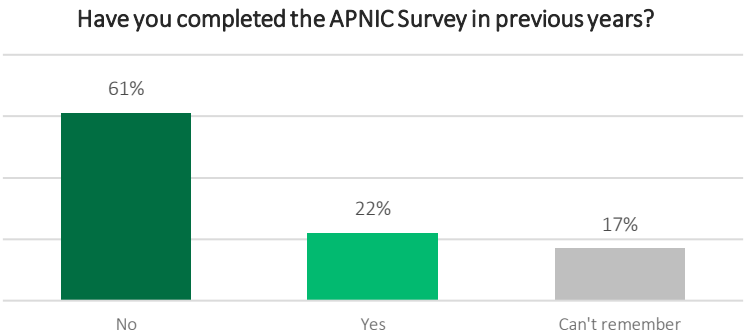
Investment in infrastructure and human resource capacity building are the priority areas for Internet development in the region.

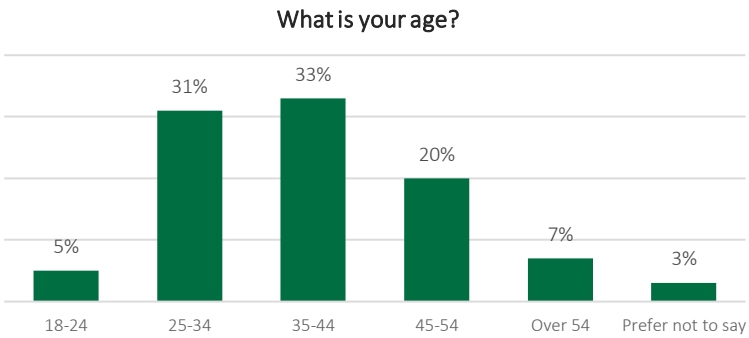
Consistent with the current challenges facing the Internet community, Members' and Stakeholders' priority areas for Internet development are investment in backbone networks to improve access and quality, peering and neutral IXPs.

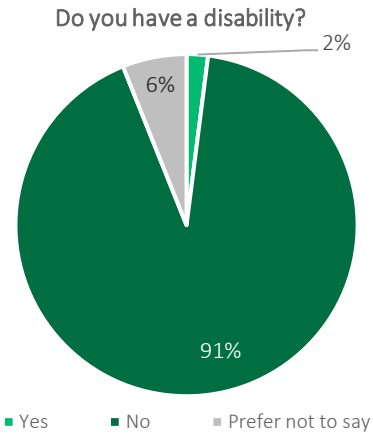
Technical training for network engineers, and internships or scholarships are the primary ways respondents think APNIC can invest to build human resource capability.

Sample

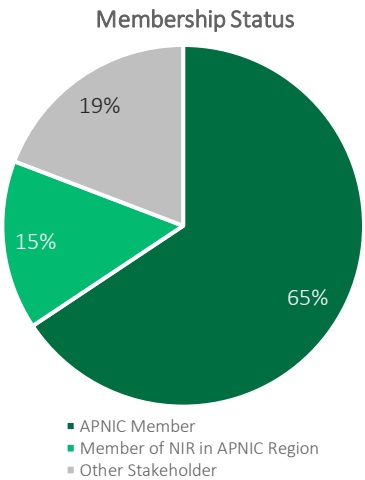








English Proficiency	Count	%
I am fluent in English	735	45%
I can understand most English and have English conversations comfortably	482	30%
I can understand some English and have basic English conversations	315	19%
I understand little English and need assistance	91	6%



Region	Count	%
East Asia	269	17%
Oceania	275	17%
South East Asia	454	28%
South Asia	486	30%
Non-APNIC Region	137	8%

Development Status	Count	%
Least Developed Economy (LDEs)	395	24%
Other (Developed or Developing)	1,226	76%

			2018		2020		2022	
Code	Name	Economic Classification	Count	%	Count	%	Count	%
East Asia								
CN	China	Developing	107	9%	68	4%	58	4%
HK	Hong Kong Special Administrative Region of China	Developing	53	4%	25	2%	38	2%
JP	Japan	Developed	63	5%	50	3%	61	4%
KR	Republic of Korea	Developing	11	1%	10	1%	12	1%
MN	Mongolia	Developing	71	6%	50	3%	53	3%
MO	Macao Special Administrative Region of China	Developing	2	0%	6	0%	3	0%
TW	Taiwan	Developing	30	2%	46	3%	44	3%
Sub-total			**337**	**27%**	**255**	**16%**	**269**	**17%**
Oceania								
AS	American Samoa	Developing	1	0%	-	-	3	0%
AU	Australia	Developed	132	11%	136	8%	128	8%
CK	Cook Islands	Developing	1	0%	2	0%	2	0%
FJ	Fiji	Developing	10	1%	23	1%	26	2%
FM	Micronesia	Developing	-	-	-	-	-	-
GU	Guam	Developing	1	0%	6	0%	2	0%
KI	Kiribati	LDE	1	0%	2	0%	-	-
MH	Marshall Islands	Developing	1	0%	2	0%	-	-
MP	Northern Mariana Islands	Developing	-	-	-	-	-	-
NC	New Caledonia	Developing	6	0%	4	0%	3	0%
NF	Norfolk Island	Developing	2	0%	-	-	-	-
NR	Nauru	Developing	2	0%	1	0%	-	-
NU	Niue	Developing	1	0%	-	-	-	-
NZ	New Zealand	Developed	42	3%	58	4%	49	3%
PG	Papua New Guinea	Developing	10	1%	30	2%	30	2%
PW	Palau	Developing	1	0%	-	-	1	0%
SB	Solomon Islands	LDE	22	2%	6	0%	10	1%
TK	Tokelau	Developing	1	0%	-	-	-	-
TO	Tonga	Developing	7	1%	7	0%	10	1%
TV	Tuvalu	LDE	1	0%	1	0%	-	-
VU	Vanuatu	LDE	4	0%	5	0%	3	0%
WF	Wallis & Fortuna Islands	Developing	1	0%	-	-	-	-
WS	Samoa	Developing	4	0%	13	1%	8	0%
Sub-total			**251**	**20%**	**296**	**17%**	**275**	**17%**
South East Asia								
BN	Brunei Darussalam	Developing	3	0%	5	0%	3	0%
ID	Indonesia	Developing	51	4%	74	5%	85	5%
KH	Cambodia	LDE	18	1%	18	1%	31	2%
LA	Lao People's Democratic Republic	LDE	4	0%	4	0%	8	0%
MM	Myanmar	LDE	24	2%	111	7%	55	3%
MY	Malaysia	Developing	36	3%	35	2%	41	3%
PH	Philippines	Developing	48	4%	114	7%	118	7%
SG	Singapore	Developing	27	2%	20	1%	40	2%
TH	Thailand	Developing	41	3%	39	2%	42	3%
TL	Timor-Leste	LDE	2	0%	4	0%	9	1%
VN	Viet Nam	Developing	5	0%	15	1%	22	1%
Sub-total			**259**	**21%**	**439**	**27%**	**454**	**28%**

			2018		2020		2022	
Code	Name	Economic Classification	Count	%	Count	%	Count	%
South Asia								
AF	Afghanistan	LDE	8	1%	9	1%	13	1%
BD	Bangladesh	LDE	138	11%	298	18%	199	12%
BT	Bhutan	LDE	7	1%	19	1%	23	1%
IN	India	Developing	82	7%	109	7%	123	8%
IO	British Indian Ocean Territory	Developing	-	-	-	-	1	0%
LK	Sri Lanka	Developing	16	1%	28	2%	40	2%
MV	Maldives	Developing	4	0%	3	0%	5	0%
NP	Nepal	LDE	65	5%	60	4%	44	3%
PK	Pakistan	Developing	36	3%	36	2%	38	2%
Sub-total			**356**	**29%**	**562**	**35%**	**486**	**30%**
Non-APNIC Region								
	Aland Islands		-	-	-	-	1	0%
	Albania		-	-	-	-	1	0%
	Algeria		1	0%	1	0%	1	0%
	Argentina		-	-	-	-	2	0%
	Austria		-	-	-	-	1	0%
	Belgium		-	-	-	-	2	0%
	Benin		-	-	2	0%	2	0%
	Brazil		-	-	-	-	5	0%
	Cameroon		-	-	-	-	1	0%
	Canada		-	-	3	0%	14	1%
	Chile		-	-	-	-	1	0%
	Colombia		-	-	-	-	1	0%
	Croatia		-	-	1	0%	-	-
	Cyprus		-	-	-	-	1	0%
	Democratic Republic of Congo		-	-	2	0%	-	-
	Denmark		-	-	2	0%	1	0%
	Egypt		-	-	1	0%	-	-
	Ecuador		-	-	-	-	2	0%
	Estonia		-	-	-	-	1	0%
	Ethiopia		-	-	1	0%	-	-
	France		-	-	1	0%	1	0%
	Finland		-	-	-	-	1	0%
	Georgia		-	-	-	-	1	0%
	Germany		1	0%	6	0%	2	0%
	Ghana		-	-	-	-	2	0%
	Greece		-	-	-	-	1	0%
	Haiti		-	-	1	0%	-	-
	Iran		-	-	-	-	2	0%
	Ireland		-	-	1	0%	-	-
	Israel		2	0%	1	0%	-	-
	Italy		1	0%	1	0%	4	0%
	Kenya		-	-	-	-	3	0%
	Kyrgyzstan		-	-	-	-	1	0%

* 2018 response subtotal for Non-APNIC Region includes responses from economies not listed as no responses were received in 2020 or 2022

			2018		2020		2022	
Code	Name	Economic Classification	Count	%	Count	%	Count	%
Non-APNIC Region (cont.)								
	Madagascar		-	-	-	-	1	0%
	Malawi		-	-	-	-	1	0%
	Mexico		-	-	3	0%	2	0%
	Morocco		-	-	-	-	1	0%
	Netherlands		2	0%	3	0%	5	0%
	Nicaragua		-	-	1	0%	-	-
	Niger		-	-	1	0%	-	-
	Nigeria		1	0%	1	0%	2	0%
	Oman		-	-	1	0%	-	-
	Panama		-	-	1	0%	-	-
	Poland		-	-	1	0%	1	0%
	Qatar		-	-	-	-	1	0%
	Romania		-	-	-	-	1	0%
	Russian Federation		-	-	-	-	2	0%
	Saudi Arabia		-	-	2	0%	2	0%
	Slovakia		-	-	-	-	1	0%
	Slovenia		1	0%	1	0%	-	-
	Spain		-	-	-	-	4	0%
	South Africa		-	-	-	-	1	0%
	Sweden		-	-	1	0%	1	0%
	Switzerland		-	-	-	-	1	0%
	Trinidad and Tobago		-	-	-	-	1	0%
	Uganda		-	-	-	-	1	0%
	United Arab Emirates		-	-	1	0%	1	0%
	United Kingdom		-	-	3	0%	4	0%
	United States of America		22	2%	26	2%	46	3%
	Zambia		-	-	1	0%	2	0%
Subtotal			***38**	***3%**	**73**	**4%**	**137**	**8%**
Total			**1,241**	**100%**	**1,624**	**100%**	**1,621**	**100%**

* 2018 response subtotal for Non-APNIC Region includes responses from economies not listed as no responses were received in 2020 or 2022

	2018	2020	2022
Language			
Bangladesh (Bengali)	41	157	53
Chinese Simplified	101	75	73
Chinese Traditional	56	59	54
Indonesian	43	62	74
Indian (Hindi)	-	3	-
Japanese	60	45	55
Korean	9	8	14
Mongolian	49	39	38
Malaysian	-	4	-
Myanmar (Burmese)	-	52	22
Nepali	-	10	-
Philippines (Tagalog)	-	7	-
Thai	30	29	38
Urdu	-	4	-
Vietnamese	-	14	20
Total	**389**	**568**	**441**

	2018	2020	2022
Organization Type			
Sample Size	**1,241**	**1,624**	**1,622**
Internet Service Provider (ISP)	34%	34%	28%
Academic/Educational/Research	11%	15%	17%
Telecommunications / Mobile Operator	13%	11%	11%
Other	7%	7%	7%
Government/Regulator/Municipality	6%	6%	7%
Hosting / Data Centre	7%	5%	6%
Banking/Financial	5%	4%	5%
Enterprise/Manufacturing/Retail	3%	4%	5%
Non-profit/NGO/Internet community	4%	3%	4%
Software Vendor	3%	3%	4%
Media / Entertainment	2%	2%	1%
Domain Name Registry / Registrar	1%	1%	1%
NREN/Research network	1%	1%	1%
Infrastructure (transport/hospital)	1%	1%	1%
Internet Exchange Point (IXP)	1%	1%	1%
Hardware Vendor	1%	1%	1%
Industrial (construction, mining, oil)	1%	1%	1%

	2020	2022
Position		
Sample Size	**1,624**	**1,622**
Network/Systems Operations Engineer/Manager	39%	35%
Network/Systems Planning Engineer/Manager	26%	28%
IT Support	16%	19%
Manager	13%	14%
Academic/Research	11%	10%
CEO/COO/CFO	9%	9%
CTO/CIO	8%	8%
Product/Peering/Interconnect Engineer/Manager	6%	8%
Project Manager	5%	6%
Trainer	4%	5%
Software Engineer	3%	4%
Sales / Marketing	2%	3%
Student	5%	3%
Applications Developer	2%	2%
Other	4%	7%

Detailed Results

Service Usage & Satisfaction

The first section of the survey asked respondents to indicate how often they had interacted with APNIC over the last two years, which services they had used and activities they had been involved with and how satisfied they were with each of the APNIC products, services and activities they had experienced.

After rating their experience using individual APNIC services, respondents were also asked to rate the overall quality and value of APNIC services and membership.

The last questions in the section of the survey asked about APNIC governance practices, and the propensity of Members and Stakeholders to speak well of APNIC to others in the Internet community.

APNIC Contact Frequency

In the 2022 survey, 71% of respondents indicated they had used APNIC services, or interacted with APNIC, over the past two years. This was consistent with 71% in 2020, and compares with 67% in 2018. The proportion of respondents having no contact with APNIC declined to 14% in 2022, down from 15% in 2020, and 21% in 2018.

At 80%, APNIC Members were more likely to have used APNIC services or contacted APNIC for support over the past two years than APNIC Stakeholders (55%). These figures compare with 79% and 54%, respectively, in 2020.

Member engagement has remained consistent since 2020. For APNIC Members, 46% stated they had interacted with APNIC between one and five times over the past two years, with 34% having more than five interactions. These figures were similar in 2020, at 45% and 34%, respectively.

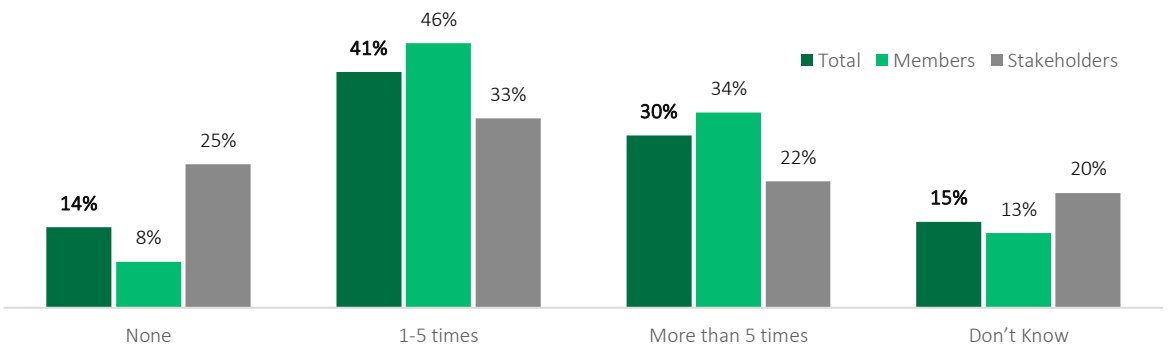
In contrast, only 33% of APNIC Stakeholders had between one and five interactions with APNIC, with around one in five (22%) having more than five interactions. In 2020, these figures were 37% and 17%, respectively.

By region, respondents from Oceania were more likely to have interacted with APNIC over the past two years than those in other regions, at 81% (84% in 2020). Only 8% of respondents in Oceania had no contact with APNIC.

Respondents from South East Asia and South Asia were less likely to have engaged with APNIC over the past two years, at 69% and 66%, respectively. These regions had a higher proportion of those with no interaction with APNIC, at 13% each.

Respondents from least developed economies (LDEs) were less likely to have interacted with APNIC over the past two years, at 65%. This compares with 74% of respondents from developed or developing economies (Others).

How many times have you used an APNIC service, contacted or interacted with APNIC in the last 2 years?
(All respondents: n=1,622)



	2018	2020	2022	East Asia	Oceania	SE Asia	South Asia	LDEs	Others
Sample size	1,241	1,624	1,622	269	275	454	486	395	1,089
None	21%	15%	14%	19%	8%	13%	13%	12%	14%
1-5 times	43%	42%	41%	42%	49%	41%	37%	39%	43%
More than 5 times	24%	29%	30%	32%	32%	28%	29%	27%	31%
Don't Know	12%	14%	15%	7%	10%	17%	22%	23%	13%

'Other' segment includes developed and developing economies in the APNIC Region

Significantly higher / lower than total

APNIC Service Usage

Survey participants were asked which APNIC products, services or initiatives they used, participated in or accessed over the past two years. Depending on the APNIC product, service or initiative, most response options were offered to both APNIC Members and APNIC Stakeholders, while some options were only offered to APNIC Members. Only one service option was solely offered to APNIC Stakeholders.

Use of almost all APNIC services was lower in 2022 than in 2020.

As with previous survey results, MyAPNIC was the most used APNIC service, with about three in five Members (61%) using this service over the past two years. This figure was, however, down from 69% in 2020. Further, almost three-quarters (73%) of Members in Oceania indicated they used MyAPNIC, compared with 62% in South Asia, 59% in East Asia, and 55% in South East Asia. By economic classification, 61% of Members in LDEs used MyAPNIC services, compared with 63% in Other economies.

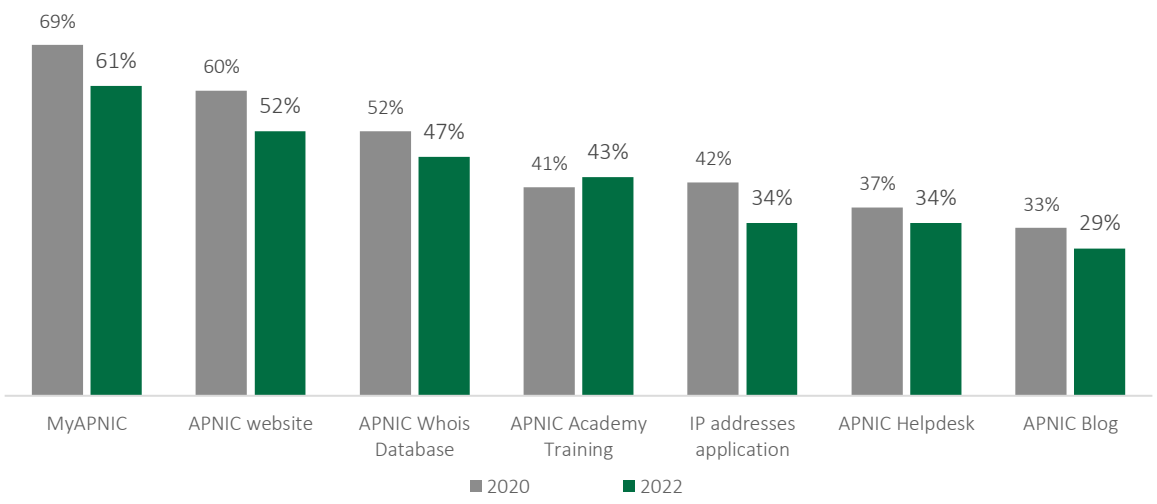
More than half of respondents (52%) visited the APNIC website in 2022, with this proportion consistent across Members and Stakeholders, as well across LDEs and Other economies. Respondents in South Asia were significantly more likely to use the APNIC website, at 58%, while those in South East Asia were less likely, at 46%.

Almost half (47%) of respondents used the whois database over the prior two years, down from 52% in 2020. Those in LDEs were less likely to use the Whois database, at 40%, compared with 51% in Other economies. Further, respondents in Oceania and East Asia were significantly likely to use this resource, at 57% and 55%, respectively. In contrast, respondents in South East Asia were less likely to use the whois database, at 40%.

APNIC training services were used by 43% of respondents over the past two years, compared with 41% in 2020. Stakeholders were significantly more likely to use these services, at 54%, while Members were significantly less likely, at 38%. Further, respondents in South East Asia were more likely to undertake APNIC training, at 49%, while those in East Asia were less likely, at 26%. Percentages were consistent across both LDEs and Other economies, at 43%.

Most Used APNIC Services

Over the last two years, which of the following APNIC products, services or initiatives have you used, participated in or accessed:
(Base n=1,403)



APNIC Services used by respondents over the last 2 years.

(Have used, interacted or contacted APNIC in the last 2 years: Base n=1,405

	2018			2020			2022			
	Total	Members	Stakeholder	Total	Member	Stakeholder	Total	Member	Stakeholder	Change 2020-2022
Sample Size	1,241	905	336	1,378	1,007	372	1,403	980	423	
* MyAPNIC	62%	62%	-	69%	69%	-	61%	61%	-	-8%
APNIC website	76%	77%	70%	60%	56%	70%	52%	52%	52%	-8%
APNIC Whois Database	56%	56%	54%	52%	55%	44%	47%	49%	43%	-5%
APNIC training (face-to-face or online)	27%	26%	32%	41%	39%	45%	43%	38%	54%	2%
* APNIC Helpdesk	38%	38%	-	37%	37%	-	34%	34%	-	-3%
* IP address / AS number resource application	41%	41%	-	42%	42%	-	34%	34%	-	-8%
APNIC Blog	44%	43%	48%	33%	31%	37%	29%	27%	32%	-4%
* Routing security (ROA publication)	NA	NA	NA	NA	NA	NA	24%	24%	-	NA
* Resource certification (RPKI)	10%	10%	-	27%	27%	-	23%	23%	-	-4%
APNIC conference, APRICOT /other event	25%	24%	30%	27%	24%	34%	23%	20%	29%	-4%
* New membership account	45%	45%	-	25%	25%	-	21%	21%	-	-4%
*APNIC EC Election	NA	NA	NA	20%	20%	-	16%	16%	-	-4%
* IPv4 address transfer	13%	13%	-	16%	16%	-	15%	15%	-	-1%
* APNIC reverse DNS	20%	20%	-	18%	18%	-	15%	15%	-	-3%
Online presentation by APNIC	18%	16%	23%	16%	12%	25%	12%	11%	14%	-4%
APNIC Labs reports/measurement statistics	NA	NA	NA	NA	NA	NA	12%	10%	15%	NA
** Contacted APNIC with a query	16%	-	16%	13%	-	13%	10%	-	10%	-3%
Online meeting with APNIC representative	21%	21%	23%	22%	19%	28%	10%	8%	15%	-12%
Special Interest Group (SIGs)	9%	7%	14%	8%	6%	13%	7%	5%	12%	-1%
*APNIC Annual Report	NA	NA	NA	10%	10%	-	7%	7%	-	-3%
DASH (Dashboard for AS Health)	NA	NA	NA	NA	NA	NA	6%	8%	3%	NA
APNIC Policy Development Process	6%	5%	9%	6%	5%	9%	6%	4%	9%	0%
APNIC NetOX	NA	NA	NA	2%	2%	2%	6%	6%	4%	4%
PING Podcast	NA	NA	NA	NA	NA	NA	4%	3%	5%	NA
*APNIC RDAP service	NA	NA	NA	4%	4%	-	4%	4%	-	0%
REx (Resource Explorer)	NA	NA	NA	NA	NA	NA	2%	2%	1%	NA
None of these	3%	1%	7%	2%	1%	5%	4%	3%	5%	2%

* Option not offered to Stakeholder respondents
** Option not offered to Member respondents

Significantly higher / lower than total

APNIC services used by respondents over the last 2 years by classification and region for 2022.
(% have used, interacted or contacted APNIC in the last 2 years: Base N=1,405; n-various)
(See previous page for breakdown by relationship with APNIC)

	Total	East Asia	Oceania	SE Asia	South Asia	LDEs	Other
Sample size	1,403	218	252	393	425	348	940
* MyAPNIC	61%	59%	73%	55%	62%	61%	63%
APNIC website	52%	53%	55%	46%	58%	53%	53%
APNIC Whois Database	47%	55%	57%	40%	45%	40%	51%
APNIC training (face-to-face or online)	43%	26%	42%	49%	47%	43%	43%
* APNIC Helpdesk	34%	34%	37%	28%	42%	38%	34%
* IP address or AS number resource application	34%	32%	35%	28%	43%	41%	33%
APNIC Blog	29%	26%	30%	21%	35%	27%	29%
* Routing security (ROA publication)	24%	24%	29%	16%	30%	27%	24%
* Resource certification (RPKI)	23%	18%	29%	16%	28%	25%	22%
APNIC conference, APRICOT or another event	23%	28%	25%	20%	23%	21%	24%
* New membership application	21%	19%	22%	19%	24%	26%	19%
*APNIC EC Election	16%	14%	7%	8%	30%	29%	11%
* IPv4 address transfer (as source or recipient)	15%	19%	18%	11%	17%	14%	17%
* APNIC reverse DNS	15%	19%	19%	8%	17%	14%	16%
Online presentation by APNIC representative	12%	6%	17%	9%	14%	11%	12%
APNIC Labs reports and/or measurement statistics	12%	14%	9%	10%	11%	10%	11%
** Contacted APNIC with a query	10%	7%	11%	8%	13%	3%	12%
Online meeting with APNIC representative	10%	11%	11%	9%	11%	7%	12%
Special Interest Group (SIGs)	7%	8%	9%	4%	9%	5%	8%
*APNIC Annual Report	7%	10%	6%	3%	8%	8%	6%
DASH (Dashboard for AS Health)	6%	4%	8%	7%	8%	7%	6%
APNIC Policy Development Process	6%	7%	4%	4%	8%	6%	6%
APNIC NetOX	6%	5%	5%	5%	7%	5%	5%
PING Podcast	4%	5%	4%	1%	5%	3%	3%
*APNIC RDAP service	4%	5%	3%	2%	3%	1%	4%
REx (Resource Explorer)	2%	0%	2%	2%	2%	2%	1%
None of these	4%	4%	2%	5%	3%	4%	3%

* Option not offered to Stakeholder respondents
** Option not offered to Member respondents

Significantly higher / lower than total

Note: Segments exclude respondents from non-APNIC regions included in the 'Total';
'Other' segment includes developed and developing economies in the APNIC region

Assessment of APNIC Services

Survey respondents were next asked to assess their level of satisfaction with the APNIC services they have used over the last two years, using a seven-point scale ranging from very poor (1) to excellent (7). The results show the proportion of respondents rating APNIC services as a 5, 6 or 7, as well as the mean, or average, score. As several new service options were asked about in the 2022 survey, these were not able to be compared with previous years.

Overall, satisfaction with individual APNIC services was high in 2022, with about half showing improvements or being consistent with 2020 using the Top 3 Satisfaction Scores, and the other half being lower.

Respondent satisfaction was highest with APNIC Academy training, with 97% rating this as positive in 2022 (including 53% that stated it was excellent), consistent with 2020. These high ratings were relatively consistent across geographic region and economy type, while the mean score increased to 6.40 in 2022, from 6.38 in 2020.

Satisfaction with resource certification (RPKI) was second-highest at 96% in 2022, compared with 94% in 2020. In South East Asia, satisfaction was at 99% in 2022. Satisfaction was also 99% in LDEs. Further, the mean score for resource certification (RPKI) in 2022 was 6.28, up from 6.26 in 2020.

As a new survey option in 2022, satisfaction with routing security (ROA publication) had the third-highest satisfaction score, at 95%, and a mean score of 6.32. Satisfaction was 98% in South East Asia, and 97% in South Asia. Other new survey options in 2022 that scored highly were DASH (Dashboard for AS Health), at 94%, the PING Podcast (94%), and APNIC Lab reports and/or measurement statistics (94%).

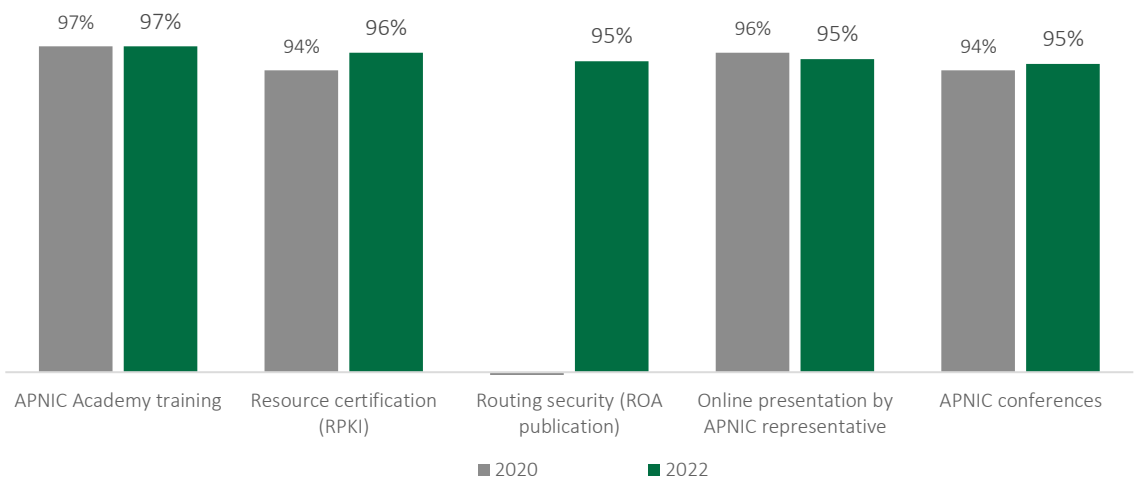
Online presentations by APNIC representatives scored highly, with 95% satisfaction overall, and 100% in South East Asia. Satisfaction was also high for APNIC conferences, at 95%.

By region, satisfaction was significantly higher in South Asia for the APNIC Whois Database (99%), MyAPNIC (98%), and IP address or AS number resource applications (96%).

In contrast, satisfaction was significantly lower in East Asia with the APNIC Whois Database (83%), and in Oceania with IPv4 address transfers (69%).

Top Rated APNIC Services

Thinking about the APNIC services and activities you have used or undertaken, how would you rate your experience?
(Have Used APNIC Service. Top 3 Box Score Base n=1,405, n=various)



Thinking about the APNIC services and activities you have used or undertaken, how would you rate your experience?

(Have Used APNIC Service. Top 3 Box Score (% Above Average, Good, Excellent) (Base n= 1, 405, n=various)

	Top 3 Box Satisfaction Scores				Mean Scores			
	2018	2020	2022	Change 2020-2022	2018	2020	2022	Change 2020-2022
APNIC training (face-to-face or online)	94%	97%	97%	0%	6.18	6.38	6.40	0.02
*Resource certification (RPKI)	89%	94%	96%	2%	5.94	6.26	6.28	0.02
* Routing security (ROA publication)	NA	NA	95%	NA	NA	NA	6.32	NA
Presentation by APNIC representative (online)	97%	96%	95%	-1%	6.31	6.37	6.30	-0.07
APNIC conference, APRICOT or other APNIC event	98%	94%	95%	1%	6.35	6.33	6.29	-0.04
DASH (Dashboard for AS Health)	NA	NA	94%	NA	NA	NA	6.18	NA
PING Podcast	NA	NA	94%	NA	NA	NA	6.15	NA
APNIC Blog	90%	93%	94%	1%	5.98	6.16	6.16	0.00
APNIC Lab reports and/or measurement statistics	NA	NA	94%	NA	NA	NA	6.15	NA
APNIC Policy Development Process	95%	92%	94%	2%	6.13	5.98	6.16	0.18
Met with an APNIC representative (online)	97%	97%	94%	-3%	6.43	6.51	6.25	-0.26
APNIC Whois Database	91%	93%	93%	0%	6.06	6.16	6.17	0.01
*APNIC Helpdesk	93%	95%	93%	-2%	6.16	6.33	6.18	-0.15
APNIC website	90%	93%	93%	0%	5.92	6.16	6.08	-0.08
*MyAPNIC	92%	93%	93%	0%	6.06	6.14	6.15	0.01
*APNICs EC Election	NA	89%	91%	2%	NA	6.03	6.14	0.11
*IP address or AS number resource application	90%	89%	89%	0%	6.05	6.12	6.07	-0.05
APNIC NetOX	NA	93%	89%	-4%	NA	6.21	6.06	-0.15
Special Interest Groups (SIGs)	97%	94%	88%	-6%	6.06	6.05	6.00	-0.05
* IPv4 address transfer (as source or recipient)	86%	92%	88%	-4%	5.78	6.04	5.93	-0.11
*New membership application	NA	NA	87%	NA	NA	NA	6.02	NA
* APNIC reverse DNS service (as an address holder)	91%	93%	87%	-6%	6.03	6.13	6.09	-0.04
*APNIC RDAP service	NA	86%	86%	0%	NA	6.08	5.75	-0.33
* APNIC Annual Report	NA	87%	86%	-1%	NA	6.04	5.84	-0.20
** Contact with APNIC	90%	94%	83%	-11%	6.26	6.31	6.00	-0.31
REx (Resource Explorer)	NA	NA	76%	NA	NA	NA	5.84	NA

Thinking about the APNIC services and activities you have used or undertaken, how would you rate your experience?

(Have Used APNIC Service. Top 3 Box Score (% Above Average, Good, Excellent) (Base n= 1,405, n=various)

	Total	East Asia	Oceania	SE Asia	South Asia	LDEs	Other
APNIC training (face-to-face or online)	97%	98%	96%	96%	97%	98%	96%
*Resource certification (RPKI)	96%	89%	93%	98%	99%	99%	94%
* Routing security (ROA publication)	95%	89%	95%	98%	97%	96%	95%
Presentation by APNIC representative (online)	95%	92%	95%	100%	97%	95%	97%
APNIC conference, APRICOT or another APNIC event	95%	90%	95%	99%	94%	95%	95%
DASH (Dashboard for AS Health)	94%	WH	100%	93%	94%	92%	97%
PING Podcast	94%	WH	WH	WH	90%	92%	94%
APNIC Blog	94%	95%	93%	94%	94%	91%	95%
APNIC Lab reports and/or measurement statistics	94%	93%	95%	95%	90%	88%	94%
APNIC Policy Development Process	94%	100%	91%	93%	94%	85%	98%
Met with an APNIC representative (online)	94%	92%	93%	97%	93%	92%	95%
APNIC Whois Database	93%	83%	92%	95%	99%	99%	92%
*APNIC Helpdesk	93%	92%	92%	91%	95%	96%	91%
APNIC website	93%	88%	91%	93%	96%	91%	93%
*MyAPNIC	93%	89%	90%	91%	98%	96%	91%
*APNICs EC Election	91%	86%	WH	100%	92%	94%	87%
*IP address or AS number resource application	89%	85%	79%	86%	96%	91%	88%
APNIC NetOX	89%	WH	92%	100%	83%	84%	92%
Special Interest Groups (SIGs)	88%	WH	78%	100%	95%	89%	90%
*IPv4 address transfer (as source or recipient)	88%	93%	69%	90%	96%	92%	86%
*New membership application	87%	79%	76%	90%	93%	95%	82%
APNIC reverse DNS service (as an address holder)	87%	83%	84%	86%	94%	89%	88%
*APNIC RDAP service	86%	WH	WH	WH	WH	WH	96%
*APNIC Annual Report	86%	100%	83%	WH	91%	86%	94%
**Contact with APNIC	83%	WH	WH	WH	WH	WH	83%
REx (Resource Explorer)	76%	WH	WH	WH	WH	57%	100%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total
WH = Withheld, sample less than 10

There were only 32 comments from those who had rated their experience very poor, poor or somewhat poor, and only a few suggestions to improve. However, there were several mentions that the "APNIC Members portal is hard to use and non-intuitive" and that "the portal is very hard to work through. Documentation isn't easy to understand for first time users. Not very user friendly to use." Others commented that "APNIC resource administration is quite cumbersome compared to other RIRs (RIPE, ARIN)".

Overall Satisfaction

As well as satisfaction with individual services, APNIC Members were asked to rate the overall quality and value of APNIC services and membership. Ratings were provided on a seven point scale from very poor (1) to excellent (7), with results showing the percentage of respondents rating service quality, service value, and membership value as a 5, 6 or 7.

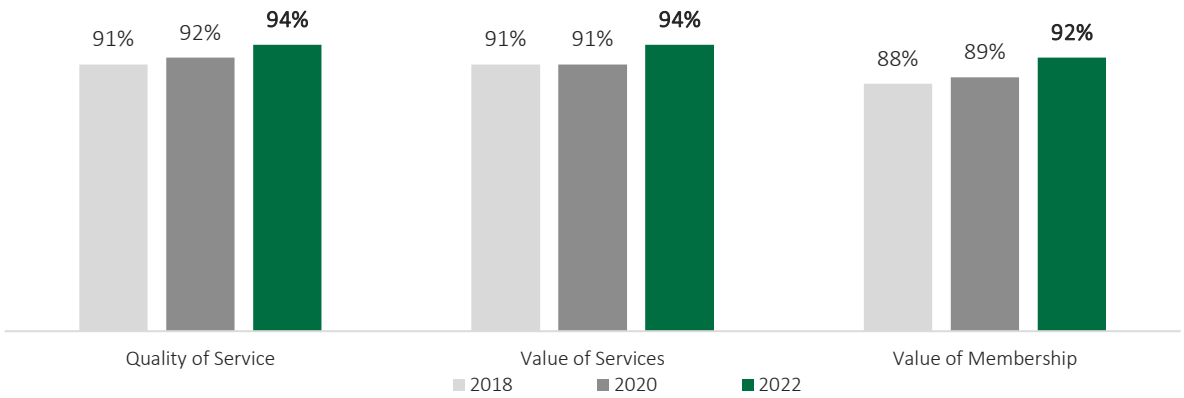
Positively, overall satisfaction ratings for service quality, service value and membership value all increased. In particular, while not evident in the top three satisfaction scores, the proportion of Members rating all three as excellent improved significantly.

As in previous years, APNIC Members rated quality of service very highly in 2022, at 94%. Further, 54% of Members rated service quality as excellent, up from 39% in 2020. Further, Members in South Asia were significantly more likely to rate service quality highly, at 98%, compared with Oceania at 92%.

Members also rated APNIC's value of services very highly, at 94% in 2022. The proportion of those stating service value was excellent increased to 54% in 2022, up from 40% in 2020. Again, Members in South Asia were significantly more likely to rate service value highly, at 98%, while Members in Oceania were significantly more likely to rate this lower, at 88%.

More than nine out of 10 (92%) Members rated membership value as high, including over half (51%) who indicated they believe membership provides excellent value. This included 95% of Members in LDEs rating membership value highly, compared with 90% in Other economies. As with other satisfaction measures, Members in South Asia were significantly more likely to rate membership value highly, at 97%. Members in Oceania were significantly less likely to rate value of membership highly, at 83%.

Thinking about APNIC overall, how would you rate:
(Members only: n=980)



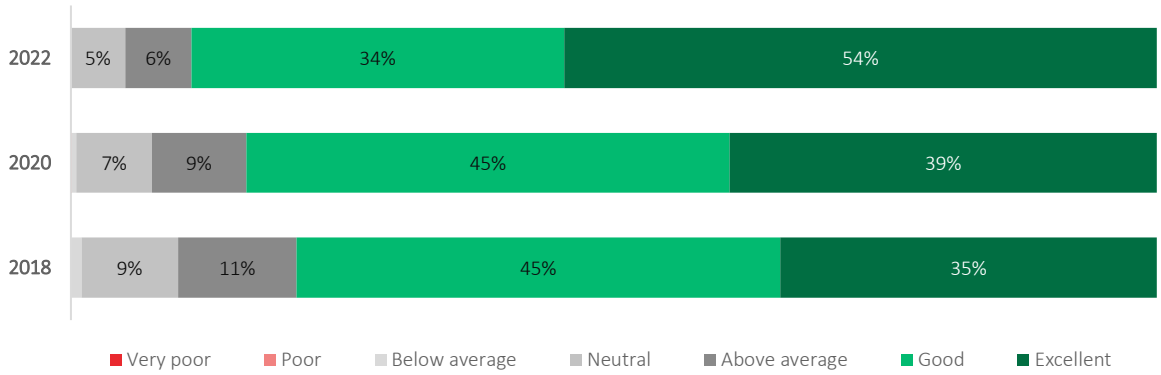
	Total	East Asia	Oceania	SE Asia	South Asia	LDE	Others
Sample Size	926	138	182	254	295	270	599
Quality of Service	94%	93%	92%	93%	98%	94%	94%
Value of Services	94%	91%	88%	94%	98%	96%	93%
Value of membership	92%	89%	83%	93%	97%	95%	90%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region; 'Don't know' responses have been excluded

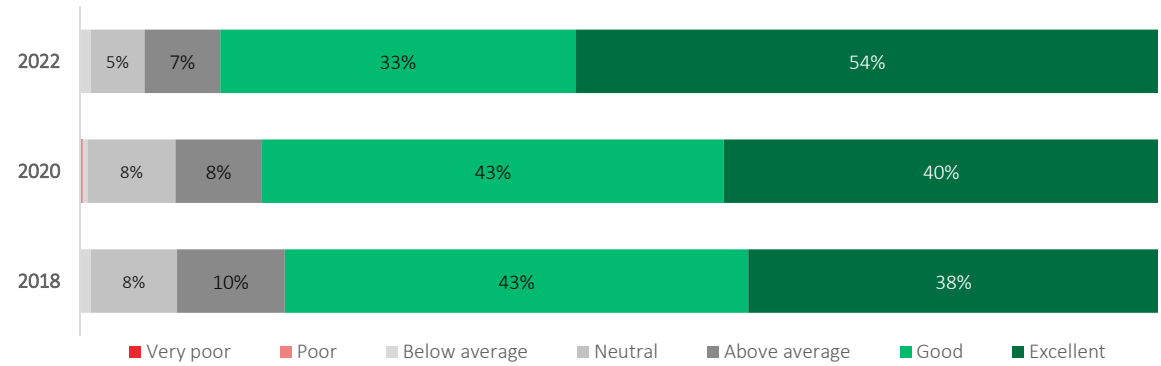
Significantly higher / lower than total

Thinking about APNIC overall, how would you rate:
(Members only: n=942, excludes Don't know responses)

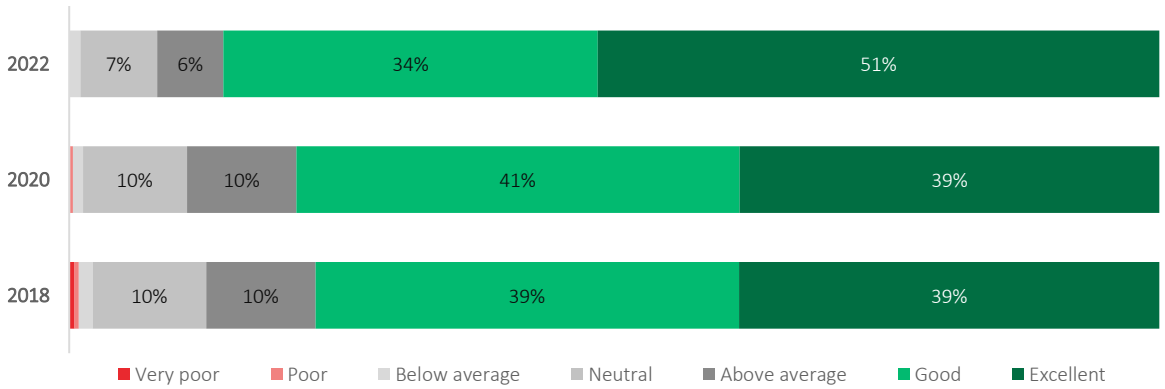
Quality of Services



Value of Services



Value of membership



By region, APNIC Members in South Asia had the highest levels of satisfaction for each of service quality, service value, and membership value. Members in this region were also significantly more likely to rate each of these as excellent. Satisfaction was lowest in East Asia, with a lower percentage of Members in this region rating the provision of APNIC services as excellent.

In 2022, 98% of Members in South Asia rated the quality of services provided by APNIC positively, including 64% that indicated that service quality is excellent. In comparison, 93% of Members in East Asia positively rated service quality, including 42% indicating service quality is excellent.

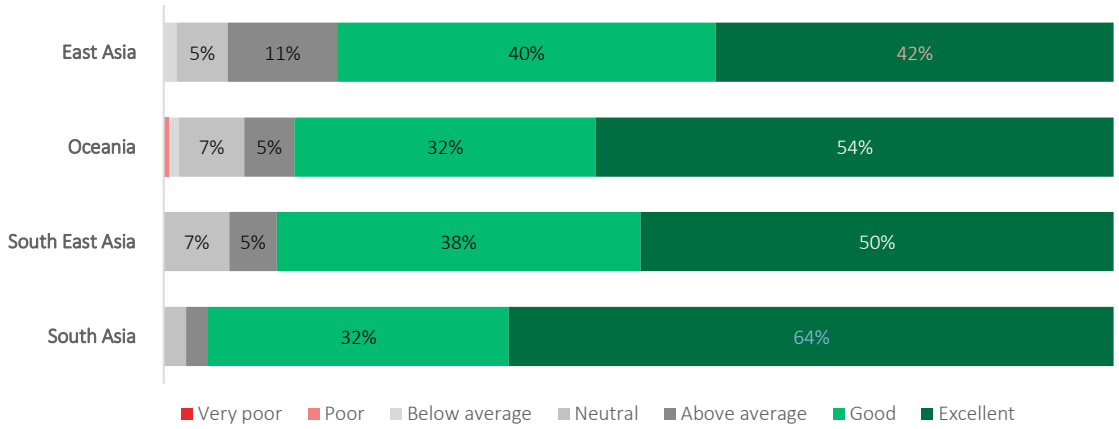
At 98%, a significantly higher proportion of Members in South Asia also rated the value of APNIC services highly, including 67% rating the value as excellent. This compares with 88% of Members in Oceania rating service value positively.

South Asia Members also rated the value of membership more positively than Members in other regions, at 97%, including 64% saying the value of membership is excellent. A significantly lower proportion of Oceania Members positively rated APNIC's membership value, at 83%.

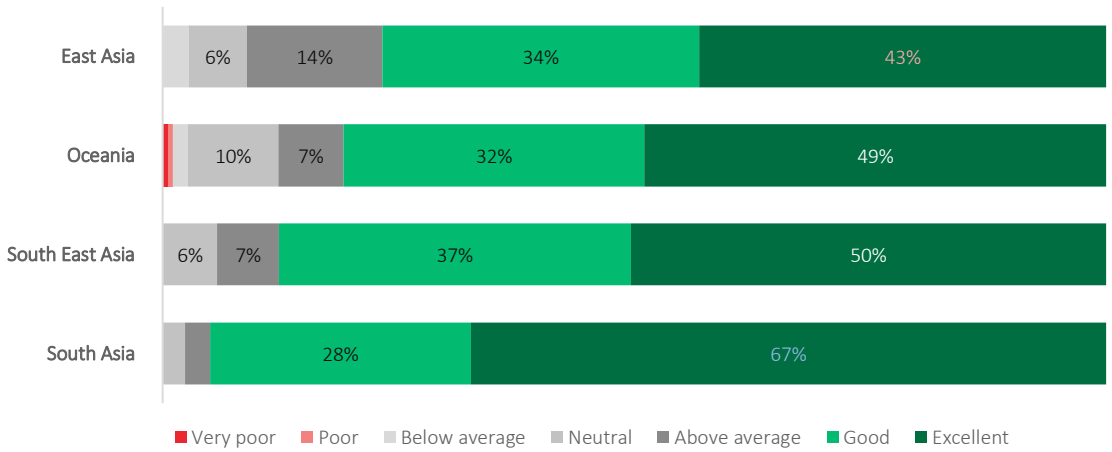
"APNIC Virtual Labs have been extremely useful for our organization. Having more such labs would be highly useful. Moreover, allowing multiple people to access one common lab (maybe by spinning off a new container / VM for every user) would also help. Thank you!"

South Asia

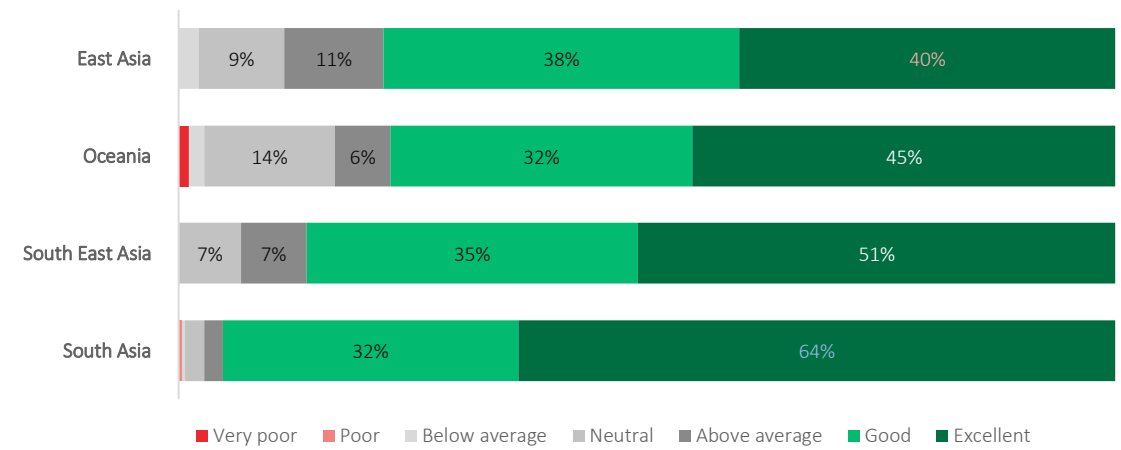
Quality of Service Delivery



Value of Services



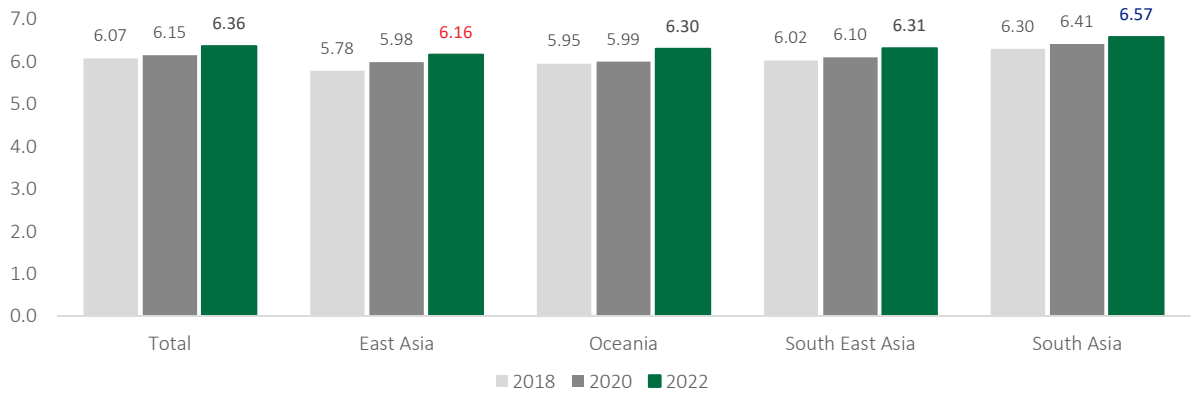
Value of membership



Respondents' ratings of the quality and value of APNIC services and membership, by region 2022.
(Members who have used APNIC services only: n=980)

Service Quality

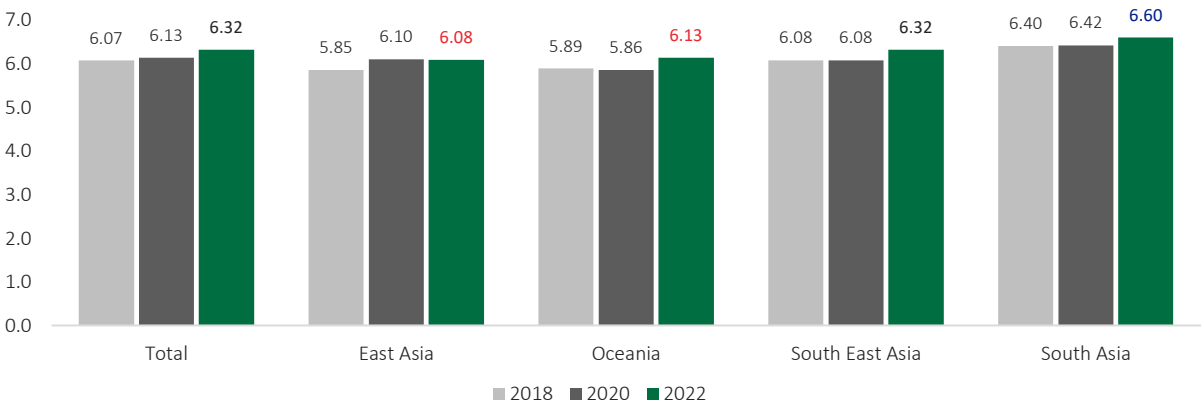
In 2022, the mean rating of service quality by APNIC Members increased to 6.36, up from 6.15 in 2020. Higher average ratings were provided across each region, continuing the growth trend from 2020. The highest service quality rating was from Members in South Asia, while the largest rise was seen in Oceania, up from 5.99 in 2020 to 6.30 in 2022, a rise of 0.31.



Service Value

Member satisfaction with the value of APNIC services also improved in 2022, to 6.32. This was up from 6.13 in 2020, and continued the growth trend from 2018. Member satisfaction with service value was highest in South Asia, at 6.60 in 2022, up from 6.42 in 2020. As with service quality, the strongest growth in service value was from Oceania, up 0.27 to 6.13 in 2022.

There was, however, a small decline in Member satisfaction for service value in East Asia. This dipped slightly to 6.08 in 2022, from 6.10 in 2020.



Respondents ratings of the quality and value of APNIC services, 2018 to 2022
(Mean scores of Members who have used APNIC services only: 2018: n=788, 2020: n=1,119, 2022: n=953

Stakeholder Satisfaction

Members of NIRs or other Stakeholders were also asked to rate their experience dealing with APNIC. Ratings were provided on a seven point scale, from very poor (1) to excellent (7).

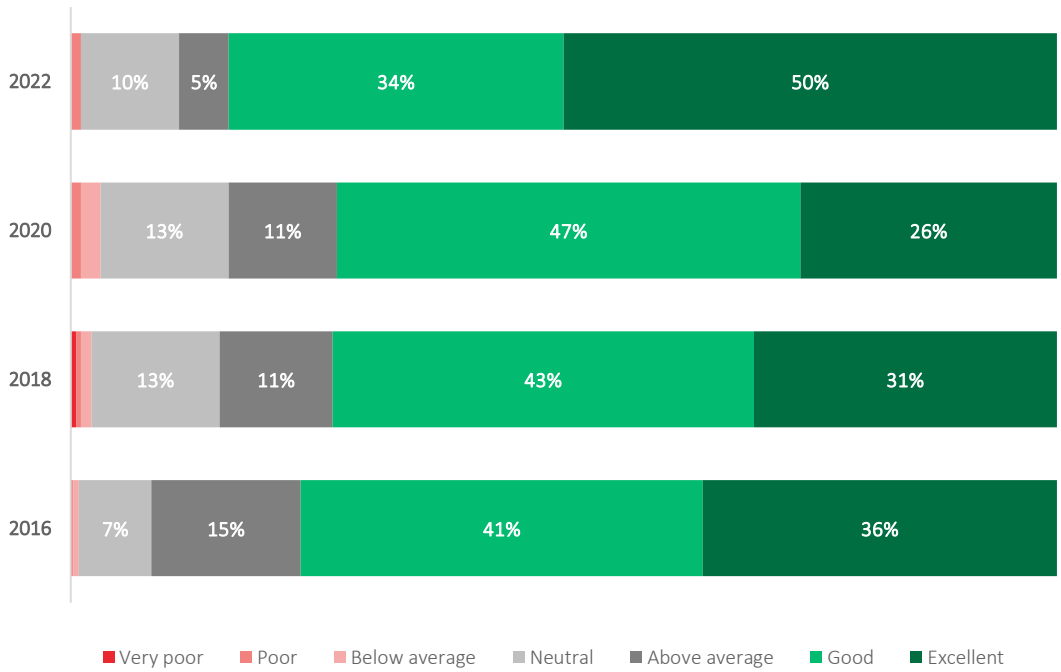
Positively, the proportion of members of NIRs or other Stakeholders rating their experience dealing with APNIC as positive was up from 84% to 89% in 2022. The proportion rating their experience as excellent almost doubled to 50%, from 26% in the last survey.

Respondents from South Asia provided the most positive feedback. Ninety four percent (94%) of respondents from South Asia provided positive ratings. At 65%, Stakeholders from South Asia were also significantly more likely than respondents from other regions to rate their experiences with APNIC as excellent.

This compares to 83% in East Asia, 84% in Oceania and 88% in South East Asia. Notably, satisfaction amongst Stakeholders in Oceania fell from 90% in both 2020 and 2018, to 84% in 2022.

There were no differences between Stakeholders from developed or developing economies and LDEs.

Overall, how would you rate your experience dealing with APNIC?
(Stakeholders who have used APNIC services only: 2016 n=292; 2018 n=192, 2020 n=502, 2022=398)



Governance

Survey respondents were asked to assess APNIC governance processes. As in previous years, respondents were asked whether they believed APNIC was sufficiently open and transparent, and whether it was respected in the Internet community. In 2022, respondents were asked for the first time whether APNIC was responsive to the changing needs of its community, and whether APNIC practices environmental sustainability in its service delivery.

Transparency

APNIC aims to be transparent across its business practices and dealings with Members. As transparency is one of APNIC's core values, it is important that Members feel satisfied with the openness and transparency of its activities.

As seen over past years, a high proportion of Members agreed that APNIC was sufficiently open and transparent. Almost nine out of 10 (89%) Members stated they were satisfied with APNIC's openness and transparency in 2022. This included 21% that strongly agreed, and 57% that agreed.

Agreement was highest in South Asia at 94%, followed by South East Asia at 92%. While still high, agreement was lowest in Oceania, at 83%. These percentages across those regions were fairly consistent with 2020.

Also similar with 2020, LDEs were more likely to agree that APNIC is open and transparent, at 93%, compared with 88% in Other economies.

	Total	East Asia	Oceania	SE Asia	South Asia	LDE	Others
Sample Size	1,060	168	206	287	334	302	693
Top 3 Satisfaction	89%	85%	83%	92%	94%	93%	88%

Q: Thinking about APNIC, please indicate how much you agree that APNIC is sufficiently open and transparent in its activities

Significantly higher / lower than total

Respect

Members were asked how well APNIC was respected in the Internet community. Similar to previous years, more than nine out of 10 (93%) of respondents in 2022 indicated that APNIC was very well regarded. This figure was 92% in 2020.

Agreement that APNIC is respected in the Internet community was highest in South Asia, at 97% in 2022. This is consistent with 2020, when agreement was also highest in South Asia, at 95%.

Agreement was second-highest in South East Asia, at 94% in 2022, followed by Oceania, at 91%. These percentages were also similar in the previous survey.

At 95% in 2022, Members in LDEs had a slightly higher level of agreement that APNIC is well respected than those in Other economies, at 93%.

	Total	East Asia	Oceania	SE Asia	South Asia	LDE	Others
Sample Size	1,060	168	206	287	334	302	693
Top 3 Satisfaction	93%	88%	91%	94%	97%	95%	93%

Q: Thinking about APNIC, please indicate how much you agree that APNIC is respected in the Internet community

Significantly higher / lower than total

Responsiveness

It is important that APNIC remains responsive to the changing needs of the community. In 2022, Members were asked for the first time how responsive they felt APNIC is to their changing needs.

Pleasingly, almost nine out of 10 (88%) of Members agreed that APNIC was responsive to the changing needs of the Internet community. This included 19% that strongly agreed, 56% that agreed, and 13% that slightly agreed.

At 91%, Members in South Asia and South East Asia were significantly more likely to agree that APNIC is responsive, compared with 82% for Oceania, and 83% for East Asia. Further, 91% Members in LDEs agreed that APNIC is responsive to the changing needs of the Internet community, compared with 87% of Members in Other economies.

	Total	East Asia	Oceania	SE Asia	South Asia	LDE	Others
Sample Size	1,060	168	206	287	334	302	693
Top 3 Satisfaction	88%	83%	82%	91%	91%	91%	87%

Q: Thinking about APNIC, please indicate how much you agree that APNIC is responsive to the changing needs of the community

Significantly higher / lower than total

Environmental Sustainability

APNIC strives to ensure its service delivery practices are environmentally sustainable. As such, Members were asked for the first time in 2022 whether they agreed that APNIC satisfies these principles.

Four out of five (80%) Members were satisfied that APNIC practices environmental sustainability in its service delivery, including 19% that strongly agreed, 51% that agreed, and 9% that slightly agreed.

Agreement was highest in South Asia and South East Asia, at 91% and 88%, respectively. Members in Oceania were significantly less likely to agree that APNIC's service delivery is environmentally sustainable, at 54%. As a result, Members in other economies were also significantly less likely to agree, at 77%, compared with Members in LDEs, at 89%.

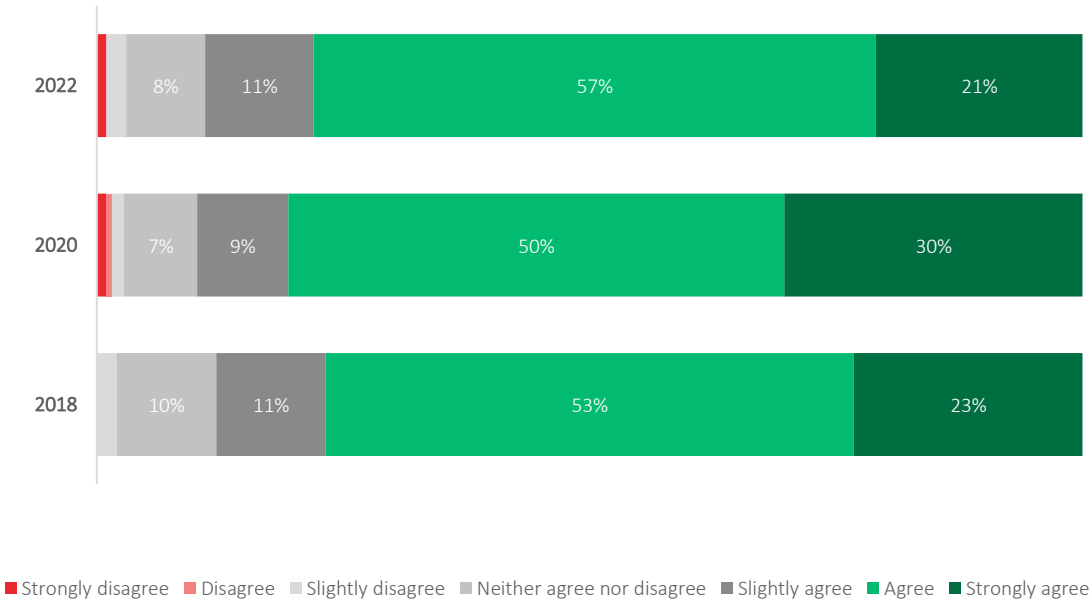
	Total	East Asia	Oceania	SE Asia	South Asia	LDE	Others
Sample Size	1,060	168	206	287	334	302	693
Top 3 Satisfaction	80%	81%	54%	88%	91%	89%	77%

Q: Thinking about APNIC, please indicate how much you agree that APNIC practices environmental sustainability in its service delivery

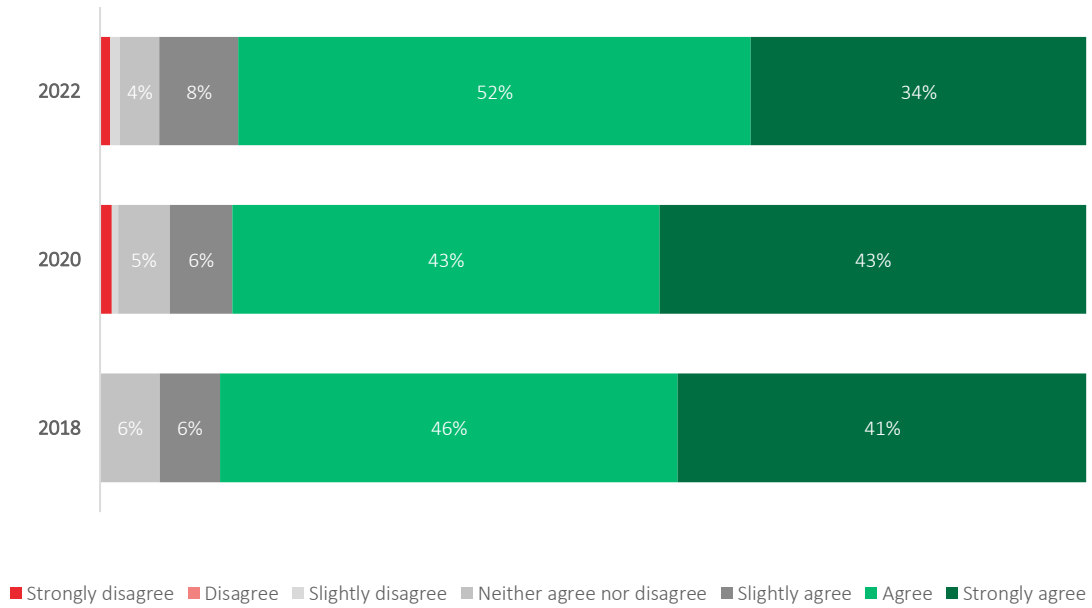
Significantly higher / lower than total

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Thinking about your membership of APNIC, how much do you AGREE that APNIC is sufficiently transparent in its activities?
(Members only. 2016 n=733; 2018 n=903, 2020 n=1,118, 2022 n=1,061)



Thinking about your membership of APNIC, how much do you AGREE that APNIC is respected in the Internet community?
(Members only. 2016 n=733; 2018 n=903, 2020 n = 1,118, 2022 n=1,061)



Endorsement

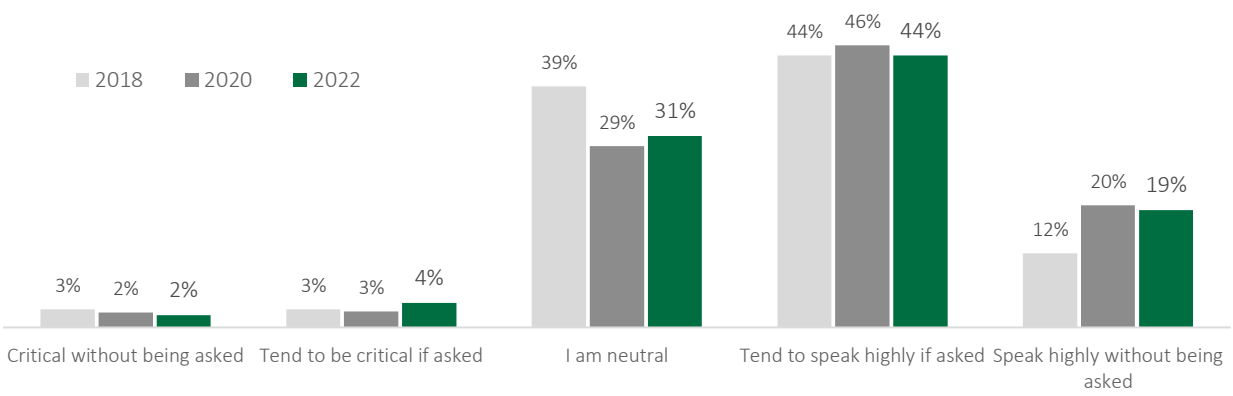
In addition to understanding how satisfied Members and Stakeholders are with APNIC services, the survey asked respondents to indicate how they speak about APNIC to others. As also highlighted through Interview feedback, APNIC is highly regarded by Members and Stakeholders.

Consistent with 2020 results, a large majority of Members and Stakeholders (63%) either speak well of APNIC when asked, or speak highly without being asked. There is little difference in opinion between Members and Stakeholders, although Stakeholders (66%) are slightly more likely to speak highly of APNIC than Members (64%).

Those in South Asia (24%) are significantly more likely to speak highly about APNIC without being asked than those in other regions. Conversely those in Oceania (13%) are significantly less likely to speak well of APNIC without being asked than their regional counterparts.

There are no significant differences in endorsement of APNIC across organization size and type, although those in management positions (25%) are much more likely to say they speak highly of APNIC than those in technical roles (17%).

Which of these phrases best describes the way you speak about APNIC to others?
(All respondents: 2018: n=1,241; 2020: n=1,624, 2022: n=1,623)



	Members	Stakeholders	East Asia	Oceania	SE Asia	South Asia	LDEs	Other
Sample Size	1,061	561	269	275	454	486	395	1,089
Critical without being asked	1%	2%	1%	1%	1%	3%	4%	1%
Tend to be critical if asked	4%	4%	3%	2%	4%	4%	4%	3%
I am neutral	31%	33%	40%	30%	37%	24%	29%	33%
Tend to speak highly if asked	46%	40%	39%	44%	45%	45%	45%	43%
Speak highly without being asked	18%	21%	17%	23%	13%	24%	18%	19%
Mean Score	3.76	3.73	3.68	3.86	3.65	6.83	3.71	3.77
Standard Deviation	0.8	0.9	0.8	0.8	0.8	0.9	0.9	0.8

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Segment mean significantly higher / lower than total mean score

New or different products or services APNIC could offer to provide more value.

The survey also sought to understand if there were any new or different services that APNIC could consider that would offer more value to Members.

While one in five respondents said they could not think of anything, and a further 11% indicated that the current services were sufficient, nearly a quarter indicated that more advanced technical training offerings would be welcome. There were suggestions that APNIC could "accommodate more training like Advance network technologies like virtualization, AWS, IoT, data analysis" or "include more in-depth tutorials/labs with real world scenarios to help with ISPs to keep up with the industry standards and best practices."

Others called for training in network and cybersecurity, saying "online trainings in Cybersecurity with certifications for its Members/ fellows with special discount" would be valuable to them.

A few mentioned that tools to help them prevent or identify DDoS attacks would be helpful, saying "I think APNIC can create central IP reputation database and control its suspicious traffic." or "a downloadable table of AS numbers, IP blocks and ABUSE emails."

"APNIC technical expertise and support on addressing our PPPoE dual stack (IPV4/IPv6) and RPKI enablement." (South East Asia)

"More IPV6 in depth training materials to enable IPV6 ready students' (East Asia)

"More IPv6 training and modern SDDC techniques, big iron vs compute etc." (Oceania)

"Training for Security, Virtual Environment, Virtual Machines." (South Asia)

"Penetration Testing and Cyber Attack Trends" (Oceania)

"Cyber security and data privacy." (South East Asia)

"Can you explore on having a Threat intelligence or Abuse IP address tracking. It could be a more reputable DB that we can refer to." (South East Asia)

"Cannot think of anything now that APNIC is not offering." (East Asia)

COVID-19 Impacts

While the COVID-19 pandemic has presented challenges and difficulties for many businesses and organizations around the world, it has also provided opportunities for others.

To measure the impact of the COVID-19 pandemic on Members and Stakeholders, survey respondents were asked how they or their business have been affected by the outbreak.

Respondents answered questions on how demand for their services was affected by the COVID-19 pandemic, which issues had the most impact on their organization, and how confident they felt about the continuity and growth of their organization over the next two years.

To understand the propensity to travel and participate in face-to-face activities and events, the survey also asked about future participation intentions once restrictions have eased, as well as the benefits, if any, of in-person events over virtual or online activities.

Business-related impacts of the COVID-19 pandemic.

Given the global pandemic during the past two years, the survey included a section about the impacts to APNIC Members and Stakeholders. The first question asked respondents to talk about the effects on businesses in their own words, to provide a 'top of mind' indication of the pandemic impacts.

There were a wide variety of issues described by participants, with over 20 separate topics identified. The two primary ones however, were difficulties in conducting business and meetings virtually and problems setting up and managing people working from home. There were mentions that "… employees were less productive unlike when you're in the workplace where they easily collaborate and meeting with clients" and that "… working remotely, especially on selling that has no face to face discussion with the customer" impacted businesses.

Others faced problems with capacity, bandwidth and continuing to deliver the service quality expected from their customers, saying "suddenly, our government declared lock-down and we couldn't able to optimize our network to operate and maintain it remotely where traffic demand become increased rapidly". Others said that "increased demand for services and customer stress levels higher and expect higher level of services." were issues for them.

Many mentioned that they lost business when their customers were forced to close their businesses and consequently lost revenue themselves. Comments that "business were stopped at the time of lock down. Revenue down to almost zero" or "customer retention due to lose of business and we lost 50% revenue as our main clients are hotels and tourism industries" were common.

For others however, demand increased, sometimes substantially, while issues in the global supply chain meant they struggled to keep up. Respondents indicated that "high demand of the ICT equipment from the client side, shortage of the ICT products in the market" and that "our business grew a lot due to being an Internet Service Provider but due to rapid growth and supply chain issues our equipment was delayed and equipment capacities were throttled."

"As we are developing country, here people were losing their job, staying in house along other people during pandemic. We faced huge pressure on Internet usage during these time. It consumed almost double Internet comparing to regular times usage but a good number of people was failing to pay the monthly bill in these times too..."

South Asia

Pandemic Impacts

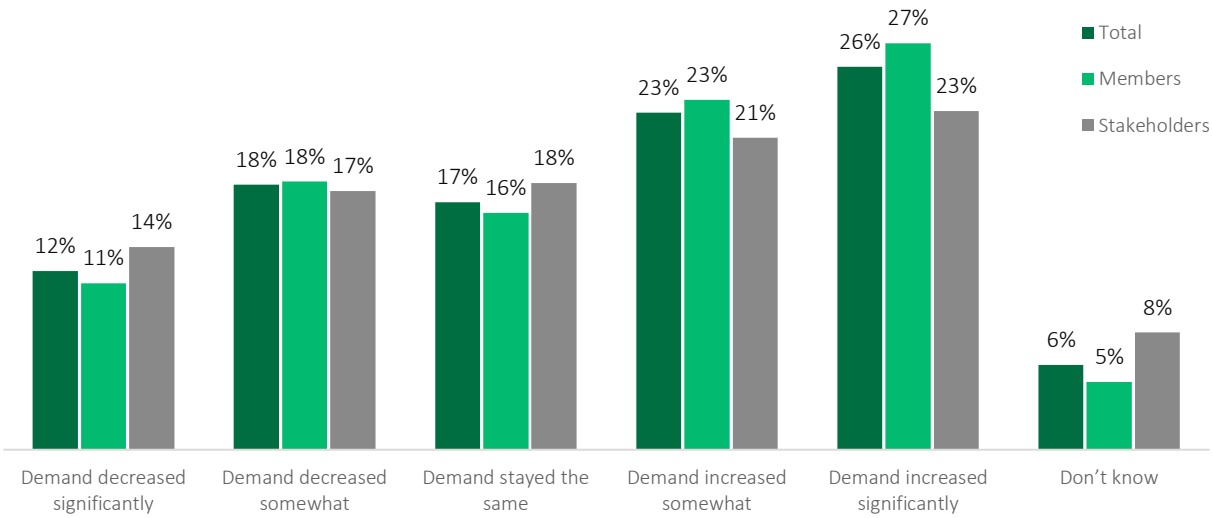
Despite the negative effects of the COVID-19 pandemic on a range of businesses and industry sectors around the world since early 2020, almost half (49%) of respondents indicated demand for their services increased during the COVID-19 pandemic.

This includes 26% that stated demand had risen significantly, and 23% indicating demand had risen somewhat. Demand increased for 50% of Members, and 44% for Stakeholders. Further, demand rose for 48% of respondents in LDEs, and 49% for those in Other economies.

In both South Asia and Oceania, 58% of respondents stated that demand had increased, compared with 38% for those in South East Asia.

In contrast, 30% of respondents reported a decline in demand, with consistent percentages for Members and Stakeholders, and those in LDEs and Other economies. In South East Asia, 36% of respondents indicated demand had declined due to the COVID-19 pandemic, compared with 23% in Oceania.

During COVID-19, what were the impacts on demand for your services?
(All respondents: n=1,621)



	East Asia	Oceania	SE Asia	South Asia	LDEs	Others
Sample size	269	275	454	485	394	1,089
Demand decreased significantly	6%	11%	13%	14%	17%	9%
Demand decreased somewhat	24%	12%	23%	12%	13%	19%
Demand stayed the same	24%	15%	19%	12%	13%	18%
Demand increased somewhat	30%	27%	19%	21%	20%	24%
Demand increased significantly	14%	31%	19%	37%	28%	25%
Don't know	3%	5%	7%	5%	8%	5%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total

Greatest impact on business

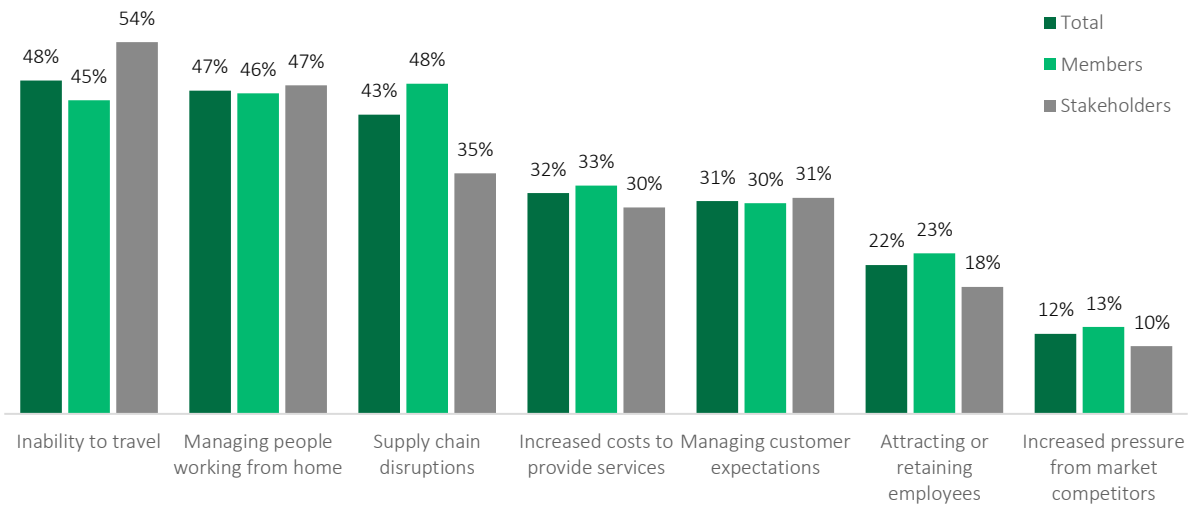
Survey respondents were asked which issues and impacts related to the COVID-19 pandemic were most significant to their organization. The three main issues were the inability to travel (48%), managing people working from home (47%), and supply chain disruptions (43%).

While the inability to travel was highlighted as the main issue for 54% of respondents in both East Asia and South East Asia, this issue was highlighted by just 41% of those in South Asia. Similarly, 42% of those in LDEs identified this issues, compared with 51% in Other economies.

Managing people working from home was stated as an important issue for respondents in South Asia (55%) compared with 35% in East Asia. Further, 55% of those in LDEs stated this as a main issue, compared with 44% in Other economies.

Supply chain disruptions were a main impact for 48% of Members, compared with 35% of Stakeholders. Similarly, 62% of those in Oceania identified this issue, compared with only 34% in South East Asia.

Thinking again about the issues and impacts of COVID-19, which of the following had the MOST impact on you or your organization?
(All respondents: n=1,621)



	East Asia	Oceania	SE Asia	South Asia	LDEs	Others
Sample size	269	275	454	486	395	1089
Inability to travel	54%	46%	54%	41%	42%	51%
Managing people working from home	35%	38%	51%	55%	55%	44%
Supply chain disruptions	44%	62%	34%	41%	40%	44%
Increased costs to provide services	34%	29%	28%	38%	39%	30%
Managing customer expectations	25%	31%	34%	32%	30%	31%
Attracting or retaining employees	19%	26%	22%	20%	20%	22%
Increased pressure from market competitors	11%	7%	15%	11%	12%	11%
Other	3%	3%	2%	2%	2%	2%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total

Confidence in the future

Confidence about business continuity and growth over the next two years is relatively high. Almost half (47%) of respondents stated they are very confident about the future, with a further 39% being somewhat confident.

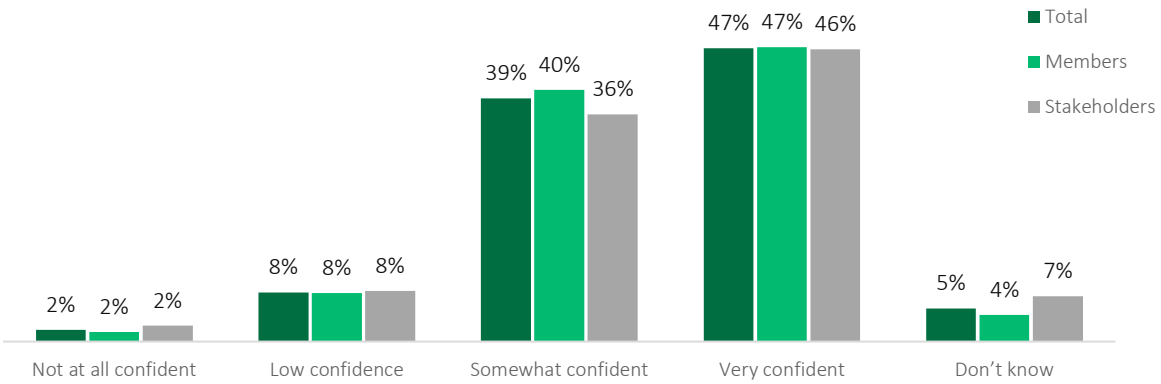
Future confidence is highest in South Asia, with 57% being very confident, compared with 30% in East Asia. Just over half (51%) of respondents in Oceania say they are very confident about business continuity and the growth prospects for their organization over the next two years. In South East Asia, the proportion is slightly lower at 43%.

Across economies, there was relative consistency, with 49% indicating they are confident about business continuity and growth in LDEs, and 46% in Other economies.

Only 2% of respondents are not at all confident about business continuity and growth within their organization over the next two years. This low percentage was relatively consistent across Members and Stakeholders, and similar across regions and economies.

Internet Services Providers (ISPs) were the most likely to indicate that they are very confident about the prospects for their business over the next two years, at 53%.

Thinking about business continuity and growth of your organization in the next two years, how confident are you about the future?
(All respondents: n=1,621)



	Total	East Asia	Oceania	SE Asia	South Asia	LDEs	Others
Sample size	1621	269	275	454	486	395	1089
Not at all confident	2%	3%	1%	2%	2%	3%	1%
Low confidence	8%	13%	5%	8%	6%	9%	7%
Somewhat confident	39%	47%	39%	41%	31%	32%	41%
Very confident	47%	30%	51%	43%	57%	49%	46%
Don't know	5%	7%	4%	6%	5%	7%	5%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total

What is impacting confidence?

The survey asked participants to provide their reasons for their confidence rating in their own words.

For those who had little or no confidence about business continuity and growth, most expressed a general feeling of uncertainty, saying "because the future is uncertain", or they were "unsure what the future will bring". One commented that "seems to me that we are in unprecedented times", while others were concerned about "too many international and domestic uncertainty."

Others with low confidence levels cited geo-political issues within their economy and around the world, or economic issues as their reason for little or no confidence. There was mention that "we are still not seeing the end of COVID nor the Russian-Ukraine wars", or that "because Taliban here … don't think that we will have better growth in the future". Another respondent suggested that "… the current political climate in Myanmar, high unemployment and the economic downturn could hurt Internet subscribers". Economically, issues such as "disruption of economic of my country" and "the worst economic crisis of my country and the global inflation" are damaging business growth and recovery, and therefore impacting levels of confidence.

Those who were more optimistic, expressing some or high levels of confidence in the future were either continuing to experience growth and high demand for their services, or believe that the pandemic had brought about a 'new era' in technology and Internet use, and as a result, they were positive about the future. There were many mentions that "we are a space where our services/products are still in high demand" and "the market is the mean reason. We are working in the web hosting industry which is a growing industry here. The market is huge!".

"The rapid development of the Internet" and "the rise in the development of new networking technologies" were frequently cited as reasons to be confident, as were comments that "technology is evolving, things get smarter, more devices get connected to the Internet …" and so "demand for network equipment is continuously increasing and people are becoming more interested in the latest technology in this day and age".

Others believed that their organizations had worked hard and learned to become more agile, thus positioning themselves well for the future, saying "we have successfully navigated a very difficult period, and as other organizations catch up to speed with us we believe we are heading in the right direction."

"Technology is evolving day by day and most of the things were done by Internet. As we are in technical environment, people are more dependent on technology. So, I believe that we can make better environment for the people in future."

South East Asia

Future participation in face-to-face events

Survey participants were also asked about their or their organization's intentions to attend face-to-face events when travel restrictions associated with the COVID-19 pandemic are eased. While results were highly consistent across Members and Stakeholders, there were some differences across regions and economies.

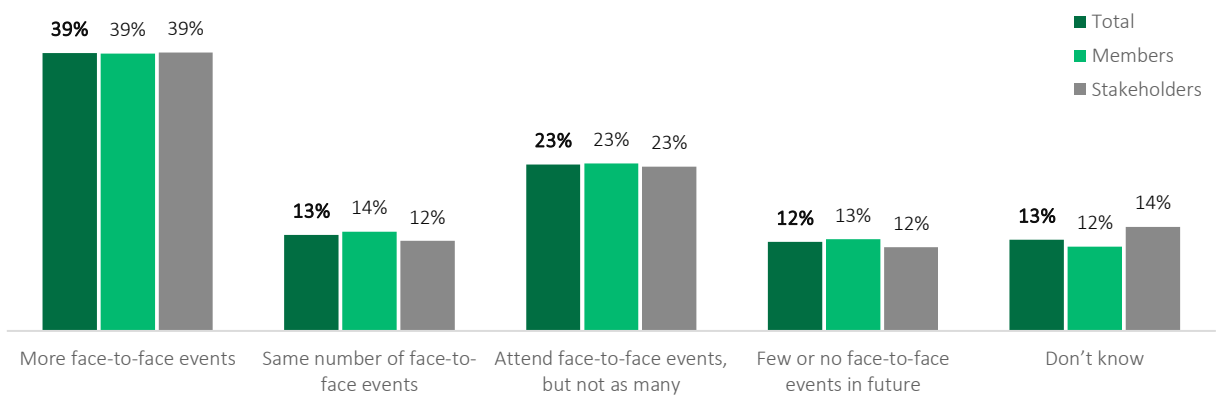
Approximately two out of five (39%) respondents stated they would be likely to attend more face-to-face events when travel returns. This was the same percentage for Members and Stakeholders.

Respondents in LDEs were more likely to attend face-to-face events, at 54%, while those in Other economies were less likely, at 34%. Further, about half (51%) of respondents in South Asia expect to travel more for face-to-face events, compared with 30% in Oceania and 31% in East Asia.

About one-quarter (23%) of Member and Stakeholder respondents indicated they would likely continue to some attend face-to-face events, but not as many, when travel restrictions ease. Respondents in Other economies were more likely to say that they would attend fewer face-to-face events than they had previously, at 26%. The highest percentage of respondents indicating they will attend fewer face-to-face events were from East Asia, at 31%.

Only 12% of respondents indicated that they would attend few or no face-to-face events when travel restrictions ease, with little difference across regions.

When travel restrictions across the region are eased and travel becomes more common, do you think you or your organization will attend face-to-face events as you did before the COVID-19 pandemic?
(All respondents: n=1,623)



	Total	East Asia	Oceania	South East Asia	South Asia	LDEs	Others
Sample size	1,621	269	275	454	485	395	1,089
More face-to-face events	39%	31%	30%	37%	51%	54%	34%
Same number of face-to-face events	13%	17%	14%	11%	12%	10%	14%
Attend face-to-face events, but not as many	23%	31%	21%	28%	16%	15%	26%
Few or no face-to-face events in future	12%	12%	15%	12%	11%	10%	13%
Don't know	13%	9%	20%	12%	10%	10%	13%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total

Benefits of in-person events

Survey respondents were asked what they considered to be the main benefits of attending APNIC events in-person. The main benefits identified were networking with other attendees (75%), meeting new people (56%), and ease of participation in discussions or sessions (49%). Only 5% of respondents preferred online events. Each of these percentages was similar for both Members and Stakeholders.

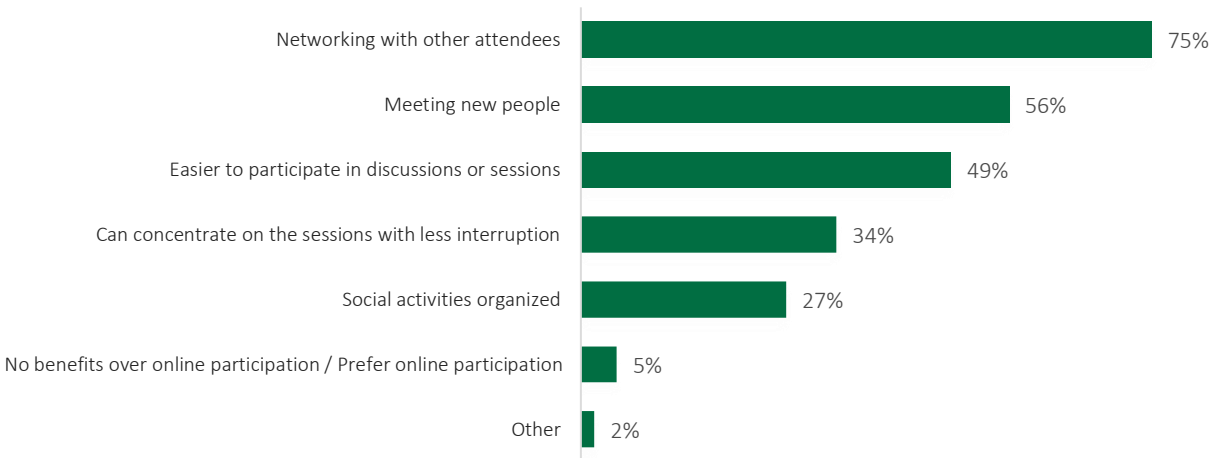
Four out of five (80%) of respondents in South Asia stated that networking with other attendees was the main benefit of attending APNIC events in person, compared with 70% in East Asia. This was also the main benefit for respondents in LDEs, at 79%, compared with those in Other economies, at 74%.

Respondents in Oceania were less likely to indicate that meeting new people was a main benefit, at 46%, compared with 60% in South East Asia, and 59% in South Asia. Further, 61% of those in LDEs chose this benefit, compared with 55% in Other economies.

Across respondents, approximately half (49%) stated face-to-face APNIC events made it easier to participate in discussions or sessions. This percentage was similar across each geographic region and economy.

About one-third (34%) of respondents indicated in-person APNIC events enabled them to concentrate on sessions with fewer interruptions, while 27% stated organized social activities were a main benefit.

What do you think are the MAIN benefits of attending APNIC events in-person?
(All respondents: n=1,623)



	Members	Stakeholders	East Asia	Oceania	SE Asia	South Asia	LDEs	Others
Sample size	1,061	561	269	275	454	485	395	1,089
Networking with other attendees	76%	73%	70%	73%	75%	80%	79%	74%
Meeting new people	56%	57%	56%	46%	60%	59%	61%	55%
Easier to participate	49%	48%	48%	48%	49%	51%	50%	49%
Can concentrate on the sessions with less interruption	32%	37%	30%	38%	32%	35%	31%	35%
Social activities organized	27%	28%	25%	22%	28%	30%	27%	27%
No benefits / Prefer online	5%	4%	5%	8%	5%	3%	3%	6%
Other	2%	2%	1%	2%	2%	1%	2%	1%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total

Internet-related Challenges

To test feedback from Interviews and understand how APNIC can best support the Internet community, the survey always includes a section about the strategic and operational challenges respondents face in providing products and services.

More detailed information about the challenges organizations face in relation to managing network security and scarcity of IPv4 addresses, as well as how respondents believe APNIC can help in these areas, was also canvassed by the survey.

What is the main challenge for you / your organisation in providing Internet-related products, services and activities?

To provide an understanding of the issues faced by Members and other Stakeholders in the Internet community, the survey first asked respondents to identify, in their own words, the main challenge for them or their organization in providing Internet-related products, services and activities.

Many issues were raised, however the most prominent amongst the verbatim comments were related to being able to provide stable Internet services and maintaining quality of service with so many people requiring Internet connectivity to work from home. Respondents talked about "the main challenge is to be able to supply Internet connectivity to everyone and also to assure continuity of service hosted locally to Internet", or that "in Internet services, Up-time is most important but recently customers are focusing more on latency and speed which is challenging to maintain the KPI."

Challenges with rising costs were also frequently mentioned, with comments that "the biggest challenge we have is rising costs and delay in shipments".

Internet security was also top of mind for many, with mentions that "securing our data / services while users are all over the place" and "our main challenge is Cyber Security and mitigating DDOS attack" were concerning for them.

"Quality Assurance. How to ensure the quality of the existing network while supporting massive delivery of services." (East Asia)

"Ensuring uninterrupted customer service" (South Asia)

"Higher communication quality (broadband, low latency, low loss, high availability) and improved security" (East Asia)

"COST- Being a landlock country, we have to rely on parties in India to provide us either IPLC or IP Transit service which is indeed very expensive. This has a ripple effect on the customer…" (South East Asia)

"Increasing complexity and costs to deliver services." (Oceania)

"Improving Internet network security so that it is more balanced with the progress or speed of the Internet to maintain trust and provide the best service in the community." (South East Asia)

"Maintaining continuous service delivery with the increase of 'bad actors' on the Internet. Monitoring and Security are very high on the agenda." (Oceania)

What are the main challenges for your organization in providing Internet related products, services & activities?
Reliability and Internet service quality
“Internet quality problems. Ensuring the quality of sensitive services such as Internet electronic games” South East Asia
“Last-mile connectivity and connection stability” South Asia
“Limitation of bandwidth to outer islands due to Cable Cut in Tonga causing by the Volcanic Eruptions.” Oceania
“Retain the Quality of services at the competitive market.” South Asia
“Since Internet peaks its demand, bandwidth congestion is the issue considering some of our employees are living to provinces.” South East Asia
Increasing costs
“Nowadays Internet bandwidth rate is too high.” South Asia
“Our main challenge is rising costs” East Asia
“Regarding the product price and competition” South Asia
“Supply chain. Competition from other players entering the market or the very large corporate (inflexible) players with big marketing budgets.” Oceania
“The main challenge of us is the expensive data packages for going over the activities for the engagement.” South East Asia
Internet security
“Detecting piracy programs from corporate devices, employee devices/outsource/guest BYOD.” South East Asia
“Database integrity, ensuring legitimate registrations are made by the legitimate organization.” Oceania
“Abuse is an ongoing issue, particularly denial of service and spam attacks” Oceania
“Major problem is with security issues. As the financial organization are the most targeted organization by the hacker. And the challenges to combat the vulnerability is somewhat challenging” South Asia
“In my opinion, the biggest challenge in Internet service is Security, DDOS attack / data theft” South Asia
Competition
“There is a price war between ISPs” South East Asia
“The challenge today to the competitive market and demand from customers.” South East Asia
“Competition with multiple oversea providers. Weak in local currency, which causing us lost a lot of talent to foreign company” South Asia
“Illegal competition in local market and weak telecom policy by government.” South Asia
Staff shortages, lack of skilled people
“Access to adequate resources” South Asia
“Finding and keeping skilled staff especially in IT / networking and security areas” Oceania
“Time to hire and onboard highly qualified employees” South East Asia
“Developing the HR capital and not being able to retain them” South East Asia
“HR issue, unavailability of skilled workers here in this city, and lack of facilities people does not come from other cities.” South Asia

"Its been a challenge to maintain network stability when node replacements are taking 6 months to be delivered.

In addition, the no jab no job has negatively affected the human resources required to fully support the network & client demands. Client confidence in us providing support & network stability has decreased. We've lost some major clients during this pandemic period, hence loss of revenue.

The expenses in providing a telco service keeps increasing whilst revenue is decreasing. Another main challenge is managing teams working from home, sometimes they're not available as expected, as the Network isn't stable at their place of residence…"

APNIC Member, Oceania

Strategic Challenges

In keeping with previous surveys, and to understand how APNIC can best support the Internet community, a section was included about the challenges organizations face in providing Internet-related services. To better understand the differences between strategic and operational challenges, those in executive positions were first asked the main strategic challenges facing their organizations, and to rank their top three from a list of 12 items.

This year, changes were made to the statements to better reflect the environment after two years of COVID-19, and as a result of the interviews conducted with Members before the online survey. While direct comparisons cannot be made because of this, there has been some shifts in the strategic issues facing organizations.

In 2020, cost control of hardware, software and network investments was the dominant issue for executives, with 17% of respondents rating it as their biggest issue. This year, cost control has dropped to 9%, and the single largest issue is hiring and / or keeping skilled employees (15%). Internet security risks are the second largest strategic challenge, with policymakers and regulators' understanding of the Internet the third most pressing issue.

It should be noted, however, that there was a more even distribution in the ranking of strategic challenges this year than in 2020. This may be because there were three more issues to rank, or that the COVID-19 pandemic has shifted executive's focus, and this should be monitored over time.

Workforce

As with the problems associated with COVID-19, recruiting and maintaining a skilled workforce is the biggest concern for executives, with 15% ranking this as their most pressing issue, and almost one in four (38%) including it within their top three challenges. This is most apparent in Oceania and South East Asia, where 27% and 20% respectively ranked attracting and keeping skilled employees as their main strategic issue.

Staffing issues were also frequently mentioned across the verbatim comments about the effects of COVID-19, and the main challenges organizations faced.

Internet Security Risks

Security risks associated with providing Internet services is the largest challenge for 12% of respondents, and although this is down from 15% in the 2020 survey, it remains in the top three issues for over a third of executives in organizations.

While there are no evident differences between the APNIC regions, those Members running enterprise businesses (19%), in Academia or Research (26%), hardware or software vendors and IXP's (17%) are more concerned about security risks than other industries.

Understanding the Internet

In 2022, two new statements were added to the list of strategic challenges to test opinions about whether policymakers and regulators understand the Internet, and if managing the unintended consequences of regulations were impacting organizations at a strategic level. These two challenges ranked third and fourth in the main strategic issues by executives, at 10% and 9% respectively. Respondents in South East Asia and South Asia (both 13%) were most likely to say this is an issue they face.

There were many calls in the verbatim comments for APNIC to engage more with governments in the region to provide "more education and probably influence to the policy maker".

Cost Control & Capacity to Meet Demand

Cost control of hardware, software and network investments, and scaling capacity to meet demand were both the top ranked challenge by 9% of executives, with ISPs more concerned than other industry types at 14% and 12% respectively.

Thinking about your Internet-related services, products or activities, what are the MAIN STRATEGIC challenges facing your organization?

(Ranking Question. Respondents holding executive roles asked to rank at least top 3 items, n=291) (% Ranked 1)

	Member	Stakeholder	East Asia	Oceania	South East Asia	South Asia	LDEs	Other
Sample size	219	72	45	64	66	90	72	193
Hiring and/or keeping skilled employees	17%	10%	11%	27%	20%	9%	13%	18%
Internet security risks	12%	13%	7%	13%	14%	14%	8%	14%
Policymakers and regulators' understanding of the Internet	8%	18%	9%	8%	11%	12%	13%	9%
Managing the unintended consequences of government regulations	11%	6%	13%	8%	6%	13%	17%	8%
Cost control of hardware, software, and network investments	11%	6%	7%	8%	8%	14%	14%	8%
Scaling capacity to meet market demand	11%	4%	11%	14%	8%	4%	4%	10%
Introduction of new products and services to improve our business and stay competitive	6%	14%	18%	5%	6%	4%	4%	8%
Costs of Internet security	8%	7%	9%	5%	9%	8%	11%	6%
Compliance with regulatory requirements	6%	7%	4%	5%	6%	10%	10%	6%
Keeping pace with new technologies	5%	7%	9%	2%	8%	1%	3%	5%
Adapting business model to meet market changes	5%	3%	2%	5%	2%	8%	4%	5%
Adapting our organization to meet environmental sustainability goals	1%	7%	0%	3%	5%	1%	0%	3%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significance tests not performed on ranking questions

Operational Challenges

The next question was designed to test the operational challenges organizations face in providing Internet-related services. The question asked respondents to identify the challenges facing their organization, and to rank at least three in order of priority, from a list of 11 items.

This year, the top three operational challenges facing organizations have changed slightly. Internet security remains the major issue for three in ten organizations, up from 23% in 2020. Managing the cost of systems, operations and security is also a challenge, however this has dropped from 18%, ranking this as their biggest issue in 2020, to 14% this year.

Skills shortages and a lack of suitably qualified technical people is the third most ranked issue at 12%. This statement was not asked in in 2020, however, is obviously of concern to many as it was also mentioned frequently in the Interviews conducted before the online survey.

Perhaps positively, while IPv4 scarcity was in the top three most important issues in 2020, it dropped to sixth position this year, with only 7% indicating this was their biggest problem. In addition, despite mentions that deployment of IPv6 was challenging to smaller or LDEs in the qualitative Interviews, this was not ranked highly among survey participants' operational challenges.

Internet Security

Internet security was the most frequently mentioned challenge in the Interviews conducted prior to this survey, and in verbatim feedback from the online survey, and it remains the single biggest issue by respondents in the 2022 survey. Three in ten (30%) participants rank Internet security as their main operational challenge, and this rises to over half (54%) rating it as one of their top three issues.

While there are no major differences in the ranking of Internet security across the APNIC regions, or in economic classification, those working for hardware and software vendors and IXPs (40%), enterprise businesses (41%) or in government or regulatory authorities (52%) are more likely than other business types to be concerned about Internet security. Similarly, there are differences between organizations of different size, with large and corporate organizations (1,000-10,000 or over 10,000 employees) more likely to rank Internet security as their top challenge than smaller organizations (34% and 36% respectively)

Managing the Costs of Systems, Network Operation and Security

From an operational perspective, cost control is of concern for 14% of participants, although this has dropped from 18% in 2020. When examined by the top three operational challenges, over two in five (41%) respondents rank costs of systems, networks and security as one, two or three. Those in LDEs are more concerned about cost control than their counterparts, with 17% ranking this their top priority, compared to 13% in developed or developing economies.

At 17%, the costs of systems, networks and security are also of greater concern to ISPs and telecommunication or mobile providers than other industry sectors. Micro organizations with less than 100 employees are also more likely to say this is their biggest issue (17%).

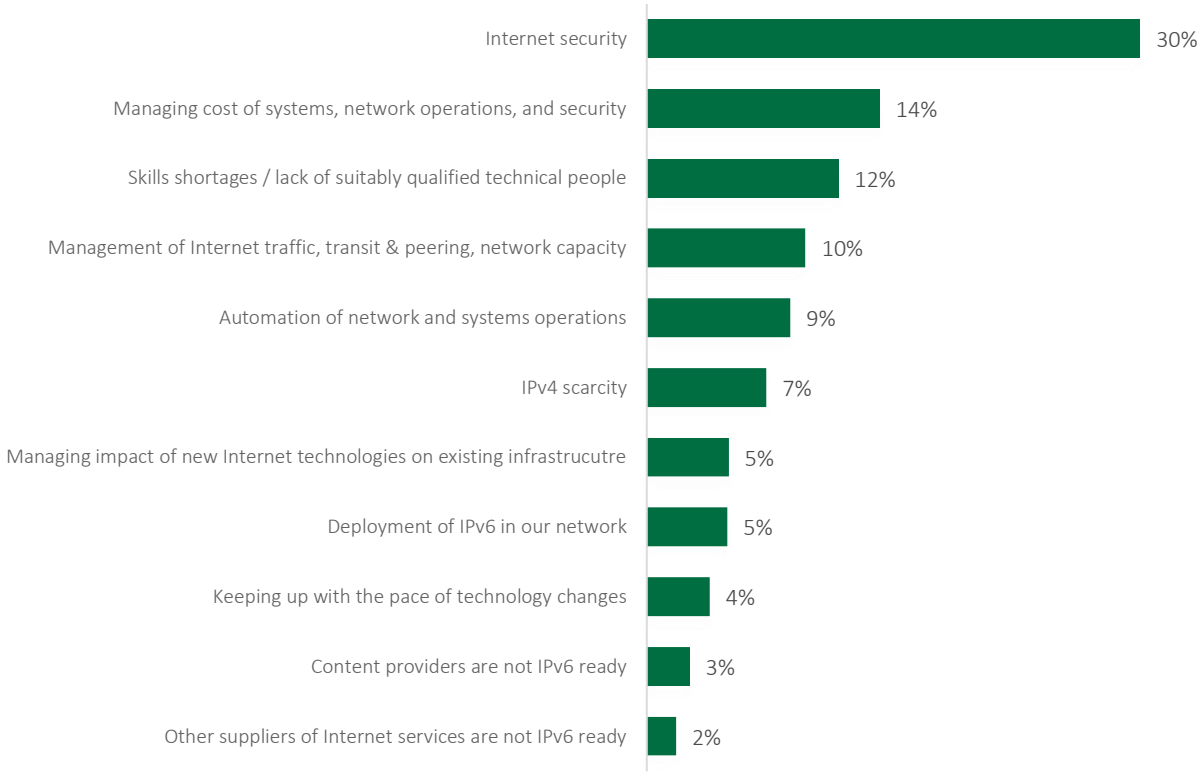
Skills Shortages

This year, based on feedback from the Interviews conducted prior to this survey, skills shortages or a lack of suitably qualified technical people was included in the list of operational challenges facing Members and Stakeholders. The top ranked strategic issue for executives, it is also the third highest operational issue. Twelve percent (12%) of participants ranked this their biggest challenge, while over a third (35%) rated this as one of their top three operational issues.

Verbatim comments also reflect issues with finding and keeping skilled technical people, with comments that "retaining and hiring qualified employees" and "a lack of engineers" or "unavailability of skilled workers here in this city" are causing problems for them.

Thinking about your Internet-related services, products or activities, what are the MAIN operational challenges facing your organization?

(Ranking Question. All Respondents asked to rank at least top 3 items, n=1,300) (% Ranked 1)



	Member	Stakeholder	East Asia	Oceania	SE Asia	South Asia	LDEs	Other
Sample size	1,052	248	223	228	366	399	340	876
Internet security	29%	37%	31%	29%	31%	28%	29%	30%
Managing cost of systems, network operations, and security	15%	12%	10%	15%	15%	16%	17%	13%
Skills shortages / lack of suitably qualified technical people	12%	10%	11%	17%	11%	10%	9%	13%
Management of Internet traffic, transit and peering, and network capacity	11%	6%	13%	12%	8%	8%	10%	10%
Automation of network and systems operations	10%	6%	5%	12%	10%	8%	9%	9%
IPv4 scarcity	7%	9%	9%	4%	8%	7%	6%	8%
Managing the impact of new Internet technologies (for example 5G, Internet of Things (IoT)) on existing infrastructure	5%	6%	6%	4%	5%	6%	4%	5%
Deployment of IPv6 in our network	4%	7%	4%	1%	4%	8%	6%	4%
Keeping up with the pace of technology changes (for example, SDN, NFV, blockchain)	4%	4%	4%	3%	5%	3%	3%	4%
Content providers are not IPv6 ready	3%	2%	3%	1%	3%	4%	4%	2%
Other suppliers of Internet services are not IPv6 ready	2%	1%	3%	1%	1%	3%	3%	1%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significance tests not performed on ranking questions

> "The continued services of APNIC particularly on new technology trainings, IPv4/IPv6 resource management, plus online and face to face events helps operators manage their challenges."
>
> South Asia

How can APNIC best assist with these challenges, if at all?

As in previous surveys, when asked how APNIC can assist with their challenges, overwhelmingly Members talked about continued provision of training and education, from simply 'training' to more advanced content on IPv6 and Internet security. Over two in five comments mentioned these as the best form of assistance.

There were also calls for information on best practice, including case studies, videos and in blog posts.

With travel restrictions easing, many want a return to face-to-face meetings, including training, and also for training to be provided in the local language.

Others however, think APNIC is doing all it can already to support with their challenges, or believe that their issues are not within APNIC's control.

"Expand the content of the APNIC Academy. Offer low-cost but recognised certifications through APNIC Academy. Conduct webinars frequently". (South Asia)

"APNIC can focus more on Architecture of networks with automation to be put in place. For example, how ISPs build or migrate to include automation in Networks." (South Asia)

"Continue to offer training material on-line in the form of live presentations but also as self-paced training material. Keep Members informed of new features and facilities available through APNIC. Perhaps partner with major players in the region to provide further insights into future technologies." (Oceania)

"Providing more detailed material about the Internet" (South East Asia)

How might APNIC best assist you or others with these challenges?

Training, advanced training, Internet security and IPv6 training

"APNIC could first provide some targeted training to our staff Members in overcoming the technical issues in ensuring uninterrupted networking services." South Asia

"Carrying out more trainings and certifications to ensure skillset of the employees are up to a standard." Oceania

"Continuous Product Knowledge/ Services transfer, awareness through informative literature/ used cases...etc. On-demand also very helpful for related webinars." South East Asia

"Hold more online training courses" East Asia

"IPv6 deployment - trainings and seminars" South East Asia

"Internet security, Technical skill development, recourse share etc." South Asia

"Focussed training on IPv6 and related security for not only our organization, but for all companies to increase the knowledge out there" Oceania

"Cyber security training seminar/course is needed." East Asia

"Can help us by providing DDoS protection guidelines, documents and training for further network stability" South Asia

Best practice information, case studies, video's, blog posts

"Provide more video materials that are basic and can be used for introductory IT courses." South East Asia

"Provide dashboard stats and awareness seminars" South East Asia

"It would be very helpful if APNIC can periodically publish some Best Current Practices from Members which we can learn from." East Asia

"Low cost, effective high end devices (firewalls, core network nodes, edge devices) can be discussed on APNIC community, on which would be the best cost effective devices to deploy within telco networks…" Oceania

"More forums for people to share war stories, especially over firewall and security challenges" Oceania

"On Security side, it would be great if APNIC can provide more training / best of practice examples for mid/small companies to follow." East Asia

"Share more blogs and following new plans and procedures." South Asia

Education and collaboration with governments and the community

"To promote rural Internet and sustainable development of Internet-related workforce I think APNIC can sit with BTRC or Telecommunication Regulatory Body to ensure special incentives for rural/regional/territorial companies." South Asia

"More non-technical training to support the education of non-technical resources (such as managers, administration, product managers, marketing staff, accountants, etc) in our industry." Oceania

"Providing regulators and authority bodies information/knowledge on the use/capabilities of the Internet" Oceania

"APNIC can assist with training in cybersecurity knowledge, can lobby the government for a number of cybersecurity policies so that users can be more open to Internet services as well as some other freedoms." South East Asia

"APNIC can act as a bridge in b/w organization like us and govt authorities so that there is a common platform where in all ISP can share their feedback to APNIC regarding challenges in terms of govt policies and APNIC can further raise concern with concern govt authority. South Asia

APNIC is doing all it can

"APNIC doing great so far." South Asia

"I think APNIC does what it does well through its services and provides excellent thought leadership in the realm of Internet engineering." Oceania

"None, APNIC is already doing a lot" South East Asia

Internet Security

As in previous years, the survey next asked respondents to select the main Internet security challenges facing their organization. This provides a better understanding of the specific issues concerning the Internet community.

While the results are not directly comparable due to the addition of one statement in 2022, comparison to the 2020 results are shown below.

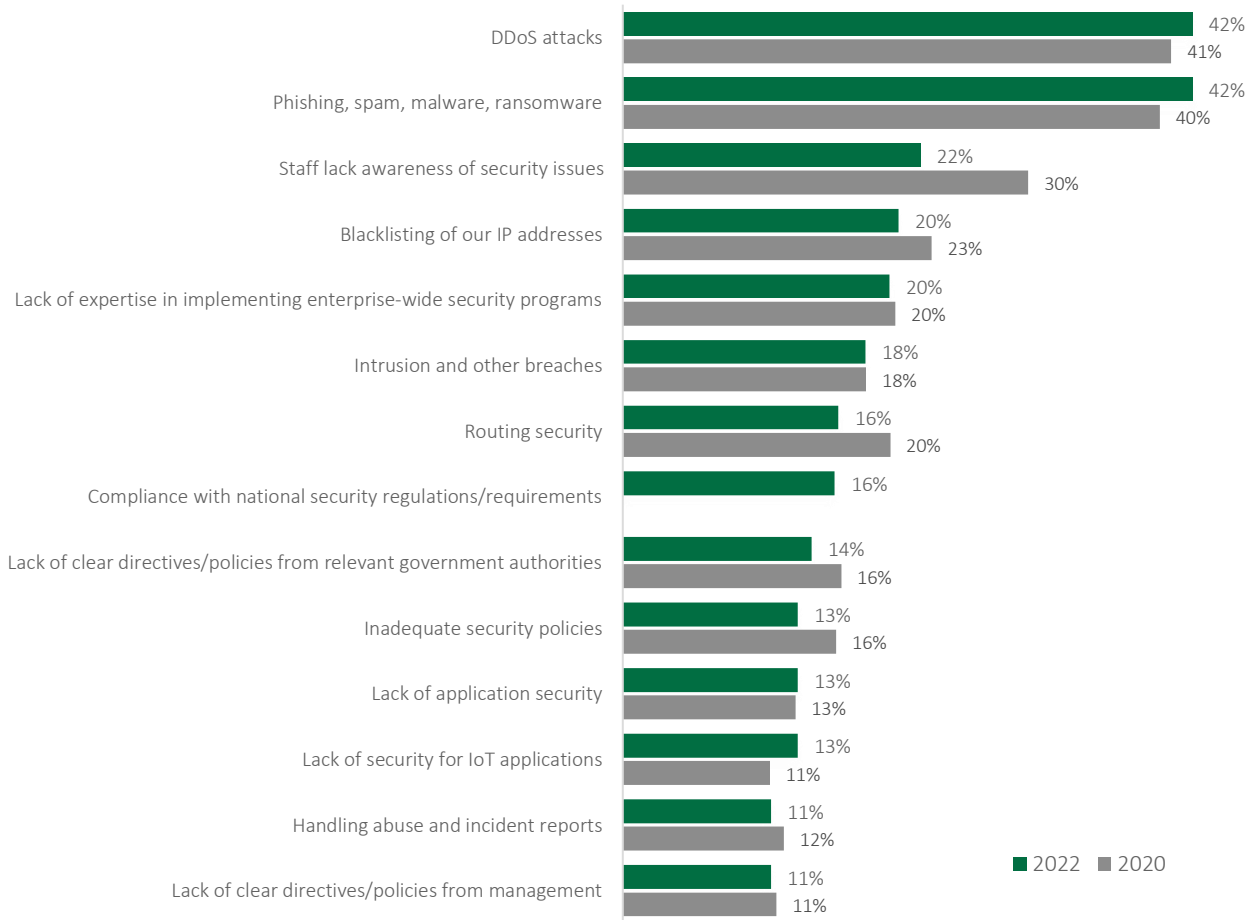
Overall, there is little change in the Internet security challenges faced by Members. As in 2020 and 2018, DDoS attacks, phishing, spam, malware and ransomware remain the major challenges in dealing with Internet security, with over two in five participants indicating these are concerning.

This is consistent with feedback in the qualitative Interviews, where almost half of participants mentioned Internet or network security as the biggest challenge they are facing, including one in three mentioning that the rise of cybercrime, and in particular ransomware, was concerning for them.

Staff lacking awareness of security issues is still the third biggest challenge, however, this has fallen from three in ten (30%) respondents in 2020 to 22% in 2022.

Compliance with national security regulations or requirements is a new issue in the 2022 survey, and 16% of respondents included this among the three main challenges they face.

Thinking about Internet security, what are the MAIN challenges facing your organization?
(All Respondents. Select up to 3. Base n=1,310,)



When examined across regions, it appears DDoS attacks are a greater issue in South Asia with half of respondents in this area including this within their three main challenges. DDoS attacks are also a much greater problem for those in ISPs, with 56% identifying this as a challenge for their organization. Conversely, those in Oceania (32%) and in Academia and Research (30%) perceive this to be less of an issue for their organization.

Blacklisting of IP addresses are also a bigger issue in South Asia (26%) and ISPs (32%) than for other regions or organizations, with those in East Asia significantly less likely to include blacklisting of IP addresses as a concern. In South East Asia, a lack of expertise in implementing enterprise-wide security (25%) and handling abuse and incident reports (15%) are more challenging for respondents than for their regional counterparts.

A lack of clear directives or policies from governments (22%) is the fourth most concerning Internet security challenge for LDEs, however this is of much lower concern to developed or developing economies, where just over one in ten indicate lack of direction as a problem. On the other hand, developing and developed economies are more concerned about intrusion and other security breaches (22%) than those in LDEs (11%).

Similarly, Infrastructure organizations (60%) are significantly more concerned about intrusion or other breaches than other organization types.

Thinking about Internet security, what are the MAIN challenges facing your organization?
(All Respondents. Select up to 3. Base n=1,310)

	Members	Stakeholders	East Asia	Oceania	SE Asia	South Asia	LDEs	Other
Sample size	1,061	249	228	228	370	400	345	881
DDoS attacks	44%	33%	49%	32%	37%	50%	47%	40%
Phishing, spam, malware, ransomware	43%	38%	43%	46%	38%	45%	37%	45%
Staff lack awareness of security issues	22%	23%	18%	26%	24%	21%	20%	23%
Blacklisting of our IP addresses	22%	16%	13%	15%	24%	26%	26%	19%
Lack of expertise in implementing enterprise-wide security programs	18%	26%	17%	20%	25%	17%	20%	20%
Intrusion and other breaches	18%	20%	21%	25%	17%	15%	11%	22%
Routing security	17%	15%	19%	14%	17%	14%	18%	15%
Compliance with national security regulations/requirements	16%	16%	18%	20%	16%	13%	15%	16%
Lack of clear directives/policies from relevant government authorities	14%	15%	11%	10%	17%	17%	22%	11%
Lack of security for IoT devices/applications	13%	15%	12%	12%	11%	15%	12%	13%
Inadequate security policies	12%	17%	16%	15%	11%	12%	14%	12%
Lack of application security	12%	14%	10%	11%	13%	15%	15%	12%
Handling abuse and incident reports	11%	10%	11%	9%	15%	8%	9%	12%
Lack of clear directives/policies from management	10%	12%	9%	14%	10%	11%	13%	10%
Other	2%	2%	2%	4%	1%	1%	1%	2%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total

The survey then asked how APNIC could assist with the Internet security issues. This year three additional activities were included for respondents to consider, so there is no direct comparison to the 2020 or 2018 results, however increased security-focussed training (30%) and collaboration with others (28%) remain the most useful APNIC activities to help with Internet security issues.

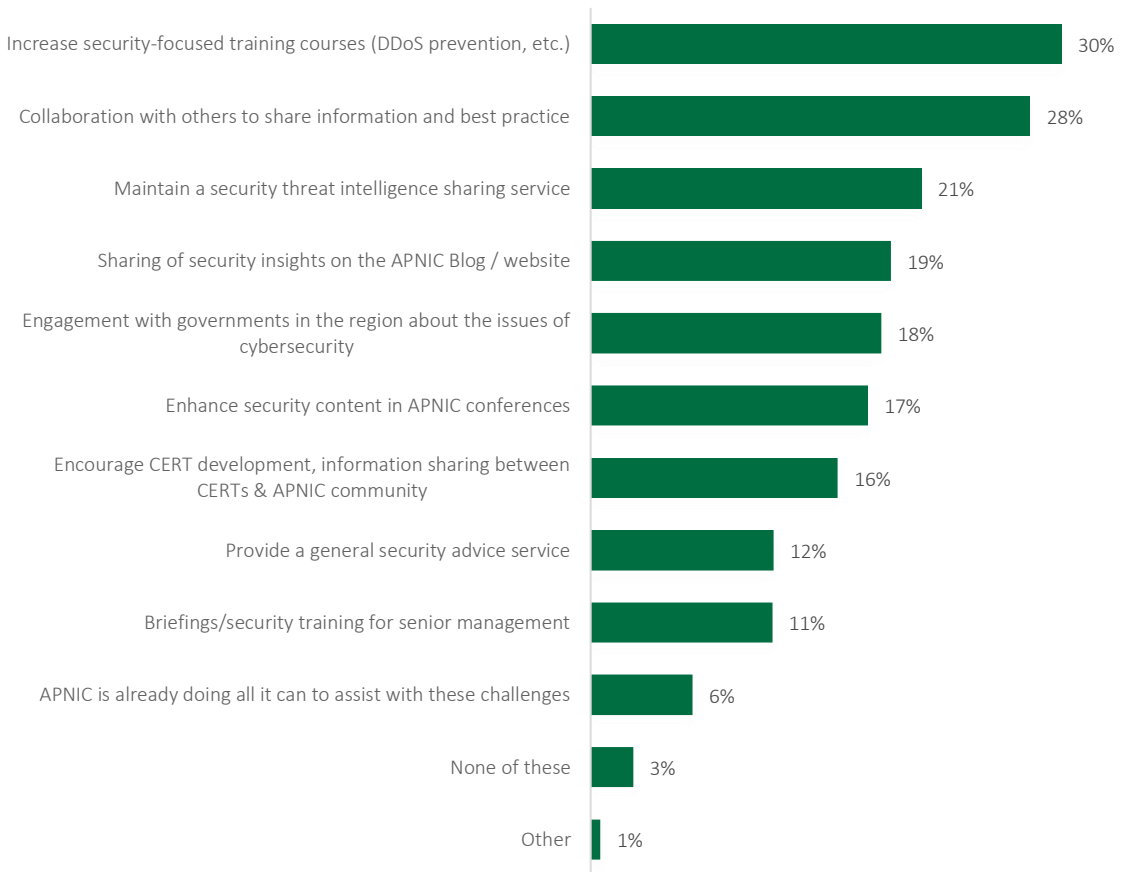
This is also evident in the verbatim comments provided, with many mentioning "training and more online resources on network and Internet security challenges" or "collaboration and security sessions" are the best forms of assistance.

Although there are no differences across regions or economy types, ISPs (37%) were significantly more likely than other organization types to identify increased security-focused training courses like DDoS prevention and security policy development as useful to them.

Maintaining security threat intelligence sharing services was one of the additional activities included in the 2022 survey, and 21% of respondents believe this would also help them manage their Internet security issues. Sharing experiences and issues was also mentioned in the verbatim comments, with some calling for APNIC to "start a separate SIG (for Internet Security) , and this group can work on various points, including starting threat intelligence sharing program among APNIC Members".

Sharing security experiences and insights on the APNIC Blog and website is also appealing to around one in five respondents, and this was also apparent in the verbatim comments with mentions for APNIC to "provide information on the blog about Internet security" or to "create a Open Source tools review blog for security related tools".

How could APNIC assist with these Internet security issues?
(All Respondents. Select up to 2. Base n=1,310:)



"I definitely think that sharing security-related information is the most important thing. As IoT or network equipment (switches, routers) is vulnerable to security threats and the botnet continues to grow, it would be great if you could receive guidance on how to respond to DDoS attacks using botnets."

East Asia

How might APNIC best assist you or others with network security challenges?
(All Respondents. Select up to 2. Base n=1,310:)

	Members	Stakeholders	East Asia	Oceania	SE Asia	South Asia	LDEs	Other
Sample size	1,061	249	228	228	370	400	345	881
Increase security-focused training courses (DDoS prevention, security policy development and so forth)	30%	30%	29%	24%	26%	35%	35%	27%
Collaboration with other technical security organizations to share information and best practice	28%	26%	29%	27%	30%	27%	30%	28%
Maintain a security threat intelligence sharing service	21%	20%	27%	20%	19%	19%	16%	23%
Sharing of security insights on the APNIC Blog and website	20%	14%	18%	19%	19%	18%	18%	19%
Engagement with governments in the region about the issues of cybersecurity	18%	20%	19%	18%	14%	22%	22%	17%
Enhance security content in APNIC conferences	17%	18%	17%	11%	17%	20%	20%	16%
Encourage CERT development and information sharing between CERTs and the APNIC community	14%	23%	14%	17%	19%	14%	12%	18%
Provide a general security advice service	12%	10%	11%	10%	14%	11%	10%	12%
Briefings/security training for senior management	11%	15%	9%	12%	13%	13%	13%	11%
APNIC is already doing all it can to assist with these challenges	7%	4%	6%	8%	7%	6%	6%	7%
None of these	3%	2%	1%	7%	2%	2%	1%	3%
Other (Please specify)	1%	0%	0%	1%	1%	0%	0%	1%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region
*Translated

Significantly higher / lower than total

Do you have any other ideas about how APNIC can assist with network and Internet security challenges?

Around a quarter of respondents either did not know how APNIC could assist with security challenges, or thought that APNIC couldn't do anything.

Of those who did have suggestions, most continued to call for training, particularly on Internet and cybersecurity.

As with assistance with Internet-related challenges, some also mentioned greater education of government, authorities and the community about Internet security to help them understand the risks.

Others called for an app or community forum where they could share information and ideas about Internet security and ways to mitigate the security breaches and intrusion.

A few wanted information about open-source tools or technologies to help them manage Internet security.

"I am not sure what other network security APNIC would provide." South East Asia

"I have no clear idea; maybe more offline and online training is needed" South Asia

"APNIC can assist with network and Internet security challenges by providing more training, providing information of the latest security threat and advise how to prevent those threats..." South Asia

"Provide more webinar/training on network security" East Asia

"Specific sector related security training and discussion would help" South Asia

"We need advice & skillset assistance on how to identify and correct the abuse flagged against our IP addresses. The abuse has been continuous for quite some time and has not been addressed." Oceania

"Yes, making senior management aware of security affecting business." South Asia

"Local governments should be required to pay attention to information security issues, and local enterprises should be required to obtain iso2700 series." East Asia

Do you have any other ideas about how APNIC can help with Intenet security issues in the region?
Training
“Advance hands-on training on Security topics.” South Asia
“DNS SEC related seminars and webinars” East Asia
“More APNIC training concerning security and actions.” East Asia
“Telecom Operator Security Framework and security best practices will help. Training will also help.” South East Asia
“Yes, I want APNIC to help us to fight against cyber security by providing training and implementation of various open-source products.” South Asia
“Yes, It can assist by providing in depth training on Internet security for Network Engineers in [Economy]” Oceania
Information sharing
“Provide online discussion forum and more and more local face to face meetings” South Asia
“More discussions on what operators are encountering” South East Asia
“Sharing of regular security incidents and network failure issues” East Asia
“I am happy to feed APNIC with IDS/IPS information. And shared it among the industries.” South East Asia
“For APNIC member, providing special centre and portal where threat intel are shared and member can aware to protect themself with suitable solution.” South Asia
Working with government and the wider community
“MOU with educational institutions to develop or align existing teaching and learning materials. Accreditation of program so that students qualification are work ready.” Oceania
“Regularly conduct Internet security training for the customers. Liaison with local regulators and engage large service providers and start awareness on the Internet security, best practices to manage Internet security infrastructure, etc.” South Asia
“Conduct more training for staff government and private sector organizations so all are aware of the real security threats as the technologies are evolving” Oceania
“Cooperation with the ministry that has jurisdiction over communications, as it may be through the NIR of each country.” East Asia
“Increase engagement with governments to spread awareness of cybersecurity.” South East Asia
Tools or reports
“Apnic give their Members free DDOS Protection” South Asia
“APNIC and NIR need to work together to provide Anti DDOS that can be used together, so users don't have to invest expensively” South East Asia
“Developing open source tool to monitor end to end IT infrastructure and security issues.” South Asia
“A general analysis and report across all APNIC address space might highlight some general practices that aren't being undertaken very well at present (with the particular address space anonymised) but the results shared everywhere with tips on how to check for yourself (ROA and RPKI for instance).” Oceania
“I'm not sure if APNIC already have a security check and vulnerability list on certain make/model firmware etc...? And broadcast out monthly report to all groups?” Oceania

IPv4 Scarcity

As in previous years, the survey also asked about the challenges relating to the availability of IPv4 addresses, with a list of seven potential challenges for respondents to select from.

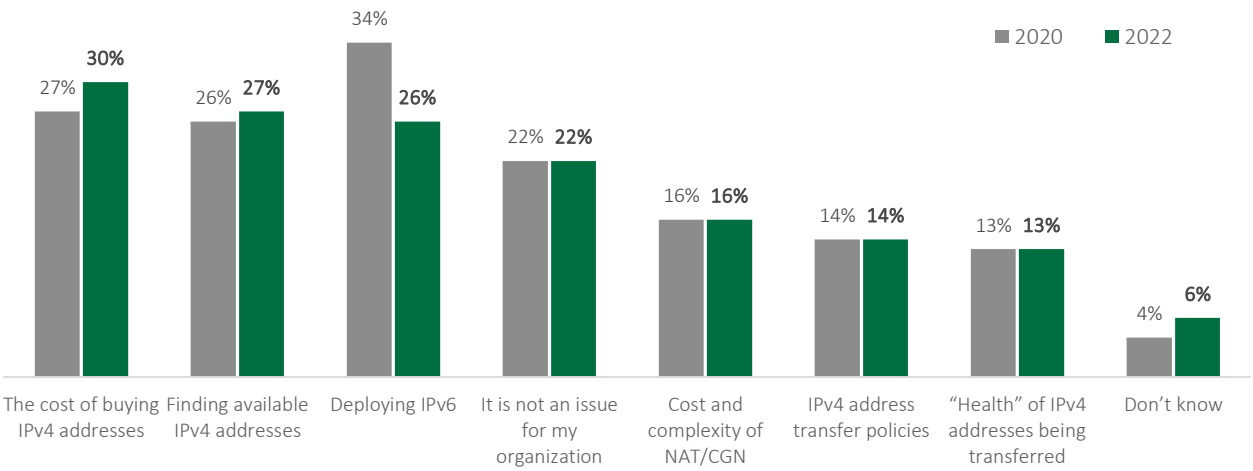
As in 2018 and 2020, the cost of buying IPv4 addresses, finding available IPv4 addresses and deployment of IPv6 remain the three most pressing issues, although the order of these has changed slightly.

In 2020, deploying IPv6 was the main challenge for 34% of respondents, however this year, the cost of purchasing IPv4 is the biggest issue, with three in ten (30%) including cost in their top two challenges. Deploying IPv6 remains an issue for 26% of participants, with finding available IPv4 (26%) the third largest concern.

As in 2020, those in Oceania or from developing or developed economies are significantly more likely than other regions or LDEs to indicate that IPv4 availability is not an issue for their organization, at 38% and 24% respectively.

ISPs are significantly more likely that other organization types to say that the cost of IPv4 (37%) and finding available addresses (33%) are issues for them. For Members and Stakeholders in management roles the cost of addresses (38%) is their biggest challenge, while those in technical positions are more likely to say that deploying IPv6 is an issue for them, at 29%.

Thinking about the availability of IPv4 addresses, what are the MAIN challenges facing your organization?
(Members only: Select up to 2. Base n=1,061)



	East Asia	Oceania	SE Asia	South Asia	LDEs	Others
Sample size	168	206	287	334	302	693
The cost of buying IPv4 addresses	32%	22%	31%	33%	33%	29%
Finding available IPv4 addresses	22%	18%	30%	31%	30%	25%
Deploying IPv6	23%	19%	31%	26%	29%	24%
It is not an issue for my organization	18%	38%	18%	16%	16%	24%
Cost and complexity of NATs	18%	13%	14%	16%	15%	15%
IPv4 address transfer policies	17%	6%	15%	14%	18%	12%
"Health" of IPv4 addresses being transferred	13%	12%	13%	16%	13%	14%
Don't know	7%	7%	6%	5%	6%	6%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total

IPv4 Historical Resources

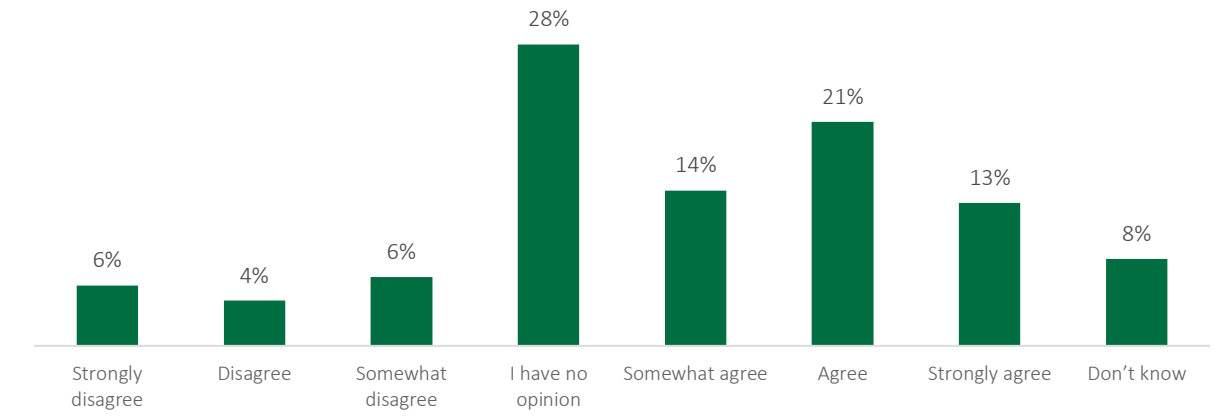
Recently, the APNIC EC announced changes to APNIC's fee structure, related to historical IPv4 resources that were delegated before to the establishment of APNIC. The changes are designed to improve the fairness of APNIC's fee structure, and also to help identify unused resources and return them to the free pool of addresses for reallocation.

APNIC wanted to test Members, agreement that historical addresses should be subject to the same fees as current resources allocated by APNIC.

Overall, Members appear largely in favour of the changes, with 48% indicating some form of agreement that historical addresses should be subject to the same fees, and only 16% disagreeing. Of note, 28% have no opinion, and a further 8% don't know if they agree or not.

Members in Oceania (23%) and those in management positions (25%) are significantly more likely than other regions or roles to strongly agree that historical addresses should be treated the same as current resources.

How much do you agree that historical addresses should be subject to the same fees as current resources (that is, those resources allocated by APNIC)?
(Members only: n=1,061)



	Total	East Asia	Oceania	SE Asia	South Asia	LDE	Others
Sample Size	1,060	168	206	287	334	302	693
Strongly disagree	6%	2%	6%	5%	7%	8%	5%
Disagree	4%	8%	2%	4%	4%	4%	4%
Somewhat disagree	6%	8%	4%	6%	6%	5%	6%
I have no opinion	28%	33%	22%	29%	28%	29%	27%
Somewhat agree	14%	12%	12%	16%	14%	12%	15%
Agree	21%	20%	22%	22%	19%	22%	20%
Strongly agree	13%	8%	23%	10%	13%	13%	13%
Don't know	8%	9%	9%	7%	8%	7%	9%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total

Technology Adoption

More detailed information about the challenges organizations face in deploying IPv6, as well as the activities APNIC could offer that might encourage IPv6 adoption across the region was canvassed in the survey.

This section also tested deployment of Resource Public Key Infrastructure (RPKI) or Route Origin Validation (ROV) among Members, and the biggest barriers facing organizations in implementation of RPKI or ROV. It also highlights what APNIC can do to assist with implementation of these technologies for routing security.

IPv6 Deployment

To understand the ongoing issues preventing organizations deploying IPv6 across the region, the survey asked about the barriers to implementing IPv6.

As a result of the feedback in the qualitative Interviews, the wording of the question was changed this year from 2020 and 2018, and two of the options were also worded slightly differently, so direct comparison cannot be made to previous surveys.

Overall, the main issue preventing deployment of IPv6 in the region is a lack of knowledge and expertise, with 45% indicating this is a barrier to implementation. Little or no customer demand for IPv6 (35%) or a perceived lack of business or technical advantages or reasons to adopt IPv6 (26%) round out the three biggest issues in IPv6 deployment.

Although not directly comparable, it is interesting to note that in 2020, 53% of respondents said that the lack of customer demand was preventing deployment, while only 31% cited a lack or knowledge and expertise on IPv6. This should be monitored in future to assess if these current results remain consistent.

Lack of support in network management and security systems and a lack of CPE that supports IPv6 (both 18%), and a lack of IPv6-enabled content in the economy or a lack of support among content providers (both 14%), are other reasons preventing implementation.

Thinking about IPv6, in your opinion, what are the main issues preventing IPv6 deployment across the region?
(All respondents : n= 1,060)

When the issues preventing IPv6 deployment are examined by region and economic development status, there are some differences.

Respondents in South Asia (54%) are significantly more likely than others to indicate a lack of knowledge and expertise on IPv6 is the biggest barrier to deployment. Those in East Asia (32%), however, are significantly less likely to cite lack of expertise as the main issue in IPv6 deployment.

Similarly, LDEs are much more likely to identify a lack of skills and expertise as the main issue in deployment of IPv6 than other economy types. This reflects the feedback from the qualitative Interviews, where smaller economies and those in LDEs mentioned that transitioning to IPv6 was a challenge because of a lack of skilled resources.

Respondents from Oceania (37%) or in developed or developing economies (30%) are significantly more likely than others to say that there are no advantages or good business or technical reasons to adopt IPv6.

There was little difference in opinions between organization type or size, although ISPs were more likely than others to indicate that content providers in their economy do not offer any or enough IPv6 enabled content.

Thinking about IPv6, in your opinion, what are the main issues preventing IPv6 deployment across the region?
(All : n= 1,061)

	East Asia	Oceania	SE Asia	South Asia	LDEs	Other
Sample size	168	206	287	334	302	693
Lack of knowledge and expertise on IPv6	32%	43%	43%	54%	56%	39%
Lack of demand for IPv6 from customers	33%	36%	39%	31%	33%	35%
Lack of business/technical advantages/reasons to adopt IPv6	33%	37%	26%	17%	17%	30%
Lack of IPv6 support in network management/security systems	20%	17%	16%	21%	22%	18%
Lack of CPE (customer equipment) that supports IPv6	17%	14%	14%	25%	22%	16%
Lack of support for IPv6 among content providers	20%	16%	14%	11%	12%	15%
Content providers do not offer any/enough content on IPv6 in our economy	19%	4%	12%	19%	15%	14%
None of the above	2%	5%	7%	4%	3%	6%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total

Encouraging IPv6 Deployment

As in 2020, the survey next asked the most important activities APNIC could undertake to encourage greater IPv6 adoption in the region.

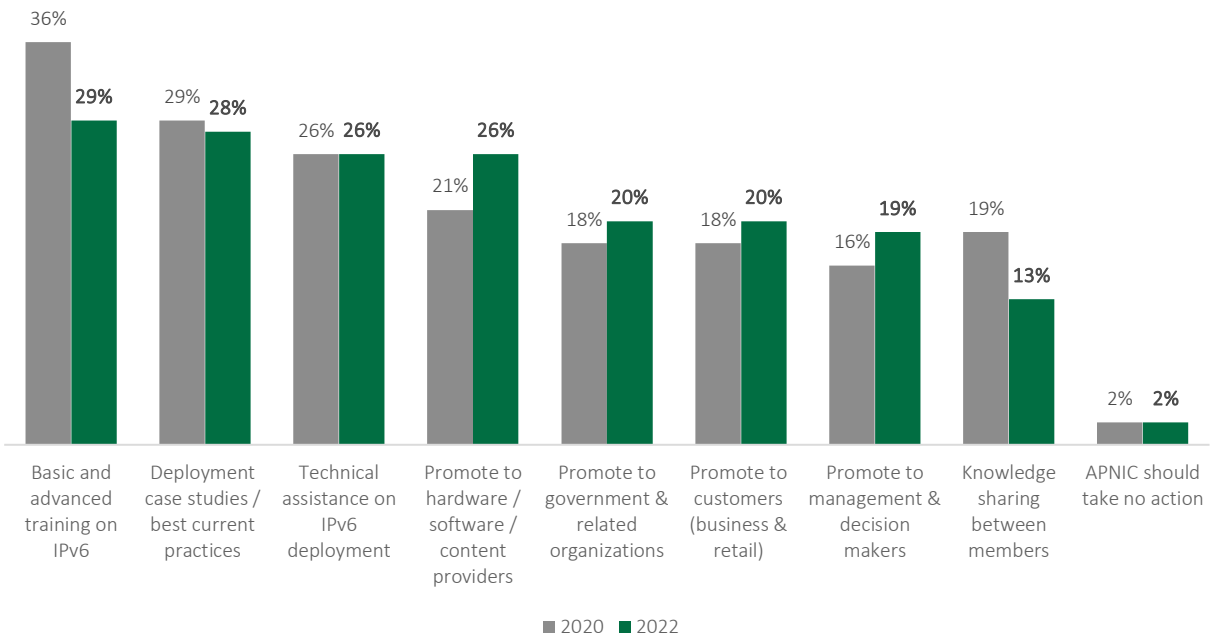
Perhaps surprisingly, fewer selected basic and advanced training this year, with almost three in ten (29%) indicating this was the most important activity, compared to 36% in 2020. This is despite many calls for training on IPv6 deployment among the verbatim comments.

Slightly more respondents indicate that promotion of IPv6 to hardware, software and content providers is important this year, with just over a quarter (up 5% from 21%) including this among the main activities that would encourage IPv6 adoption.

This is consistent with the qualitative Interviews, where there were more comments that content providers and/or CDNs are not motivated to provide content via IPv6. They suggested that "APNIC will need to create more awareness on these areas to try to encourage the vendors to move on to supporting IPv6 as part of the standard features …". In the verbatim comments in the survey, there was also mention that "some large content provider should take the plunge and offer content only on IPv6" as a way to encourage greater uptake.

Case studies, best current practices and technical assistance from APNIC are the other primary activities respondents feel would assist to encourage IPv6 adoption.

Which of the following APNIC activities do you believe are the most important to encouraging IPv6 adoption in the APNIC region?
(Members only: Select up to 2. Base n= 1,060



While there is little differences between regions and economies about the activities APNIC could consider to encourage adoption of IPv6 in the region, those in East Asia (30%) are more likely to support promotion to government and other related organizations than their regional counterparts.

LDEs are also significantly more likely than other economy types to believe that facilitating knowledge sharing between Member organizations on IPv6 deployment experiences is most important to encouraging IPv6 adoption.

There were no differences in the opinions of different organization types or roles.

Which of the following APNIC activities do you believe are the most important to encouraging IPv6 adoption in the APNIC region?
(Members only. Select up to 2. Base n= 1,060)

	East Asia	Oceania	SE Asia	South Asia	LDEs	Other
Sample size	168	206	287	334	302	693
Providing basic and advanced training on IPv6	21%	31%	32%	31%	32%	28%
Sharing deployment case studies and best current practices about IPv6	34%	22%	28%	28%	24%	29%
Providing technical assistance on IPv6 deployment	26%	25%	28%	27%	29%	26%
Promoting IPv6 to hardware, software and/or content providers	24%	24%	23%	30%	30%	24%
Promoting IPv6 to government and related organizations	30%	20%	17%	19%	19%	21%
Promoting IPv6 to customers (business and retail)	21%	19%	20%	20%	17%	21%
Promoting IPv6 to management and/or decision makers	15%	17%	21%	19%	20%	18%
Facilitating knowledge sharing between Member organizations on IPv6 deployment experiences	12%	14%	15%	12%	19%	11%
APNIC should take no action to promote or assist with the deployment of IPv6	2%	3%	1%	2%	1%	3%
Other	2%	3%	2%	0%	1%	2%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total''; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total

RPKI/ROV

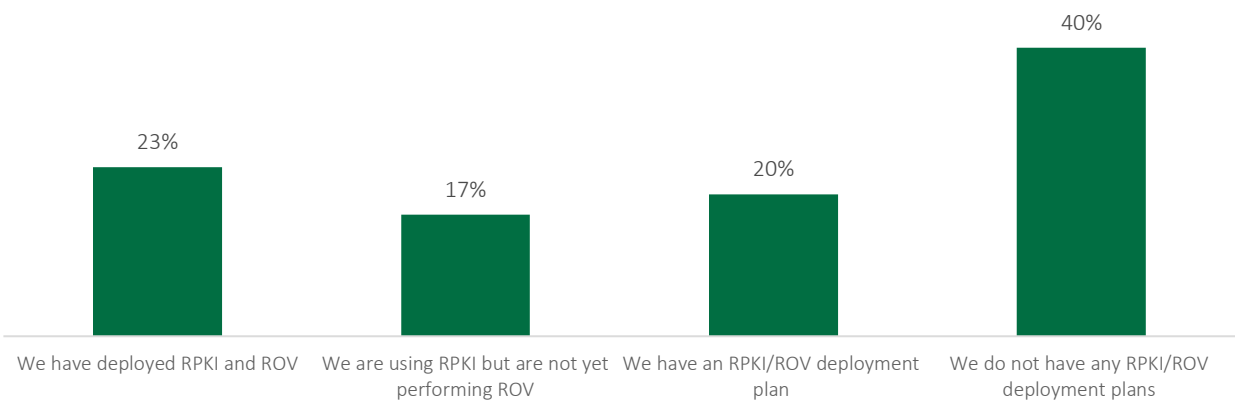
In 2022, Members and Stakeholders were asked whether their organization had already deployed, or is ready for deployment of RPKI or ROV.

Almost one-quarter (23%) of respondents indicated their organization had already deployed RPKI and ROV, with a fairly even split across Members and Stakeholders. At 29%, respondents in South Asia were significantly more likely to have already deployed RPKI and ROV, while those in Oceania were less likely to have deployed, at 16%.

A further 17% of respondents indicated their organization was already using RPKI, but not yet performing ROV, while 20% have an RPKI/ROV deployment plan.

In contrast, 40% of both Members and Stakeholders stated their organization did not have any RPKI/ROV deployment plans, with 48% of Oceania respondents and 46% of South East Asia respondents being significantly more likely to have selected this category. Further, respondents in South Asia were significantly less likely to have chosen this option, at 33%.

Has your organization already deployed or are you ready for deployment of RPKI or ROV?
(All respondents. Base n= 1,310)



	Member	Stakeholder	East Asia	Oceania	South East Asia	South Asia	LDE	Others
Sample Size	1,061	249	228	228	370	400	345	881
We have deployed RPKI and ROV	23%	25%	23%	16%	22%	29%	27%	22%
We are using RPKI but are not yet performing ROV	17%	15%	19%	21%	14%	15%	14%	17%
We have an RPKI/ROV deployment plan	20%	20%	21%	16%	17%	23%	24%	18%
We do not have any RPKI/ROV deployment plans	40%	40%	37%	48%	46%	33%	36%	43%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies in the APNIC region

Significantly higher / lower than total

Survey respondents that had not fully deployed RPKI/ROV were then asked what was preventing their organization from doing this.

At 38% across Members and Stakeholders, the main reason given for not deploying RPKI/ROV was that their organization did not have the required knowledge or expertise. This proportion was 45% for respondents in LDEs, compared with 36% for those in Other economies.

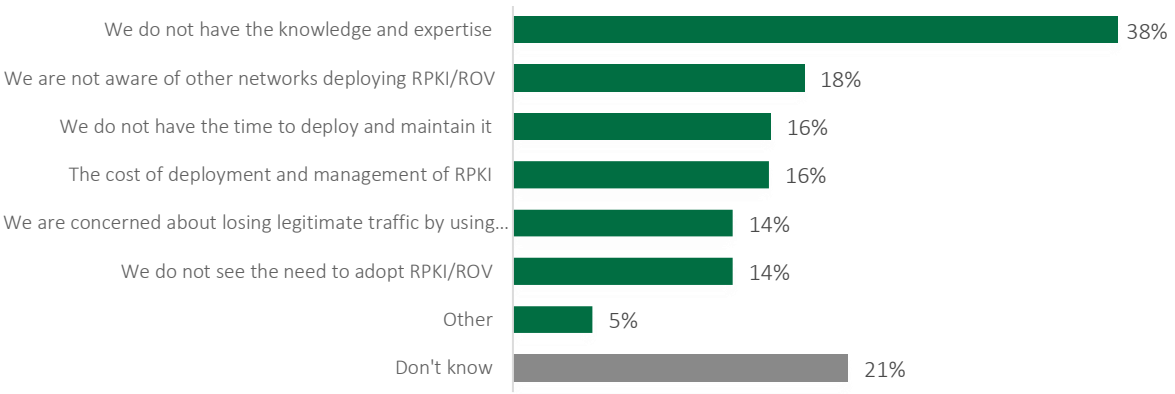
The second most frequent reason for non-deployment was not being aware of other networks deploying RPKI/ROV, at 18%. In both South Asia and South East Asia, 23% of respondents stated this was a reason, around twice as many respondents as in Oceania (12%) and East Asia (11%).

Not having time to deploy ad maintain RPKI/ROV was a reason provided by 16 of respondents, including 23% in Oceania, compared with 9% in South Asia.

RPKI deployment and management costs was a non-deployment reason stated by 16% of respondents, including 22% in East Asia, compared with 7% in Oceania.

Furthermore, 21% of respondents did not know what was preventing their organization from deploying RPKI/ROV.

What is preventing your organization from deploying RPKI/ROV?
(All respondents. Base n= 1,004)



	Member	Stakeholder	East Asia	Oceania	South East Asia	South Asia	LDE	Others
Sample Size	821	188	228	228	370	400	345	881
We do not have the knowledge and expertise	36%	44%	34%	32%	41%	43%	45%	36%
Don't know	22%	18%	21%	22%	20%	21%	23%	20%
We are not aware of other networks deploying RPKI/ROV	18%	20%	11%	12%	23%	23%	23%	17%
We do not have the time to deploy and maintain it	17%	13%	17%	23%	17%	9%	10%	18%
The cost of deployment and management of RPKI	15%	22%	22%	7%	18%	15%	14%	16%
We are concerned about losing legitimate traffic by using RPKI/ROV	14%	14%	15%	7%	13%	16%	17%	12%
We do not see the need to adopt RPKI/ROV	13%	15%	13%	14%	12%	15%	10%	15%
Other	5%	2%	4%	12%	3%	2%	2%	6%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies

Significantly higher / lower than total

Training and Internet Development Priorities

Training is a valuable component of APNIC services, and this repeatedly praised in the Interviews held with Members and Stakeholders before the quantitative survey as one of the best aspects of APNIC's service offering.

With all training having to be conducted online as a result of COVID-19, the survey examined training attendance, seeking to understand the primary reasons for not attending any training, and ideas for training topics that APNIC could make available that would be useful.

Expanding on a question asked in the 2020 APNIC Survey, and arising from discussions with Members in the qualitative Interviews, the final section of the survey asked participants where APNIC could direct any additional resources to strengthen or improve Internet development. There were four broad categories for participants to rank the most important areas for APNIC to focus on, followed by more specific activities within each category for investment or improvement.

Training Attendance

In 2022, almost three out of 10 (29%) respondents stated they had not attended APNIC Academy training courses because they were not aware of the opportunities that were available. Pleasingly though, this was down from 40% of respondents in 2020. Further, only 21% of respondents in Oceania were unaware of available training, compared with 33% in South East Asia, and 32% in South Asia.

Approximately one-quarter (26%) of respondents indicated they did not have the time to attend training, with this figure at 15% for those in LDEs, compared with 30% for respondents in Other economies. Further, 36% of respondents in East Asia stated they had time constraints, compared with 12% in South Asia.

A preference for face-to-face training, which has not been available, was stated by 24% of respondents as a reason for not attending any APNIC courses. This figure was 40% for LDE respondents, and 18% for those in Other economies.

Training not offered in the local language prevented attendance for 22% of respondents in LDEs, and 26% in East Asia.

Earlier, you indicated you had not attended any APNIC Academy training in the past two years. Can you tell us why you haven't attended any training?
(All respondents: n=646)

	Member	Stakeholder	East Asia	Oceania	SE Asia	South Asia	LDE	Others
Sample Size	493	88	137	117	165	180	163	436
I didn't know about the training	28%	30%	30%	21%	33%	32%	31%	29%
I don't have time	26%	26%	36%	33%	26%	12%	15%	30%
I prefer face-to-face training	25%	23%	15%	19%	19%	39%	40%	18%
The courses are not suited to my role/job	14%	18%	18%	17%	15%	9%	7%	17%
Not offered in my local language	16%	15%	26%	1%	12%	19%	22%	13%
I couldn't get management approval	10%	13%	7%	8%	15%	9%	11%	10%
APNIC Academy training courses are not certified	7%	9%	4%	4%	8%	7%	9%	6%
The topics are too basic	5%	2%	5%	6%	4%	4%	6%	4%
Other	8%	2%	3%	12%	8%	7%	6%	8%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies

Significantly higher / lower than total

"Server Administration, Security Operation Centre (SoC) Management, Network Operation Centre (NoC) Management, Data Science for Network monitoring"

South Asia

Are there any training topics you would like APNIC to make available?

As would be expected given the Internet-related challenges, the majority of comments about training topics that would interest APNIC Members and Stakeholders were related to IPv6 deployment and Internet security.

Many called for more advanced training, saying "advanced IPv6 deployment and security configurations" and "advanced Linux" would be useful.

Others included multiple topics for APNIC to consider, with comments that they want "SDN technologies, datacentre technologies, enterprise technologies, security trainings, load balancer trainings. Training on automation like python, ansible, json etc.".

There were also comments that APNIC is already providing quality content, or that they didn't know what other topics could be made available, saying "I already see great content on APNIC academy, so not at present that I can think of" or that they "can't think of any at the moment."

"Transition to / deploying IPv6 basics, to advance step by step guide" (Oceania)

"Internet security and how to promote IPV6 Adoption ." (South Asia)

"Infrastructural topics are crucial for countries like us. We need more knowledge and more training on the topics related to the efficiency and enhancement of our infrastructure such as the use of root servers, advanced mediums, and advanced tools to boost the performance of our infrastructure with minimum cost." (South Asia)

"I'm hoping that recorded sessions for previous trainings are available on top of live attendance on the same training. Sometimes, a refresher course helps to revitalize the ideas/technology." (South East Asia)

"Topics for IPV6, DDOS Attacks, and Increasing Information Security." (East Asia)

Internet Development Priorities

APNIC Members and Stakeholders were asked what they considered to be the most important areas to focus on for Internet development.

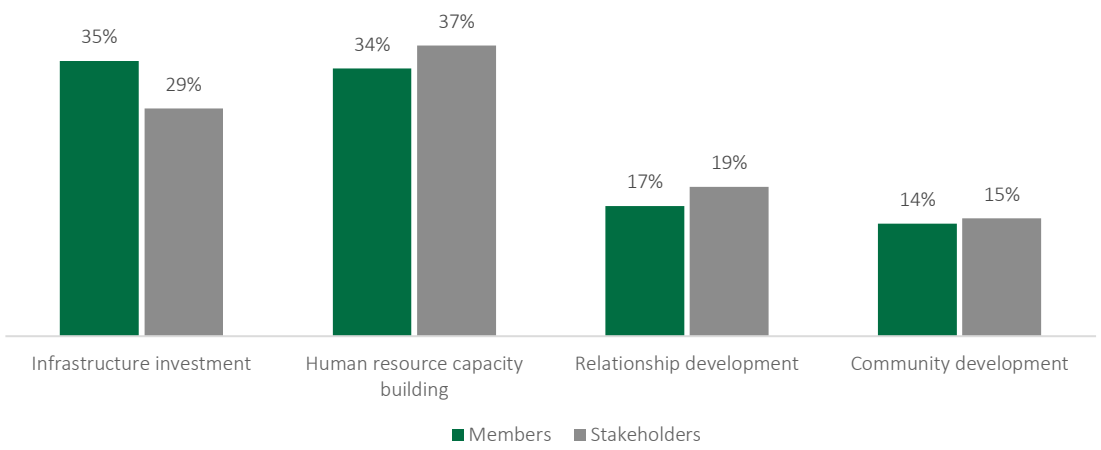
At 35%, infrastructure investment was selected by Members as the main area APNIC should focus its development activities, compared with 29% of Stakeholders. These percentages were relatively similar across regions and economies.

Similarly, 34% of Members stated that human resource capacity building should be prioritized, compared with 37% of Stakeholders. Again, these percentages were relatively similar across regions and economies.

Around half as many respondents chose relationship development as an area the APNIC Foundation should focus on, at 17% for Members, and 19% for Stakeholders. This was followed by community development, at 14% and 15%, respectively, across Members and Stakeholders.

Through the APNIC Foundation, APNIC has been able to expand Internet development activities in the region. In the next two years, what would you say is the MOST important area for APNIC to focus its development activities?

(All respondents. Base n= 1,623)



	Member	Stakeholder	East Asia	Oceania	South East Asia	South Asia	LDE	Others
Sample Size	1,061	312	269	275	454	486	395	1,089
Infrastructure investment	35%	29%	38%	36%	35%	33%	34%	36%
Human resource capacity building	34%	37%	29%	33%	35%	37%	36%	33%
Relationship development	17%	19%	15%	18%	19%	15%	17%	17%
Community development	14%	15%	17%	13%	11%	15%	13%	14%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies

Significance tests not performed on ranking questions

Infrastructure Development

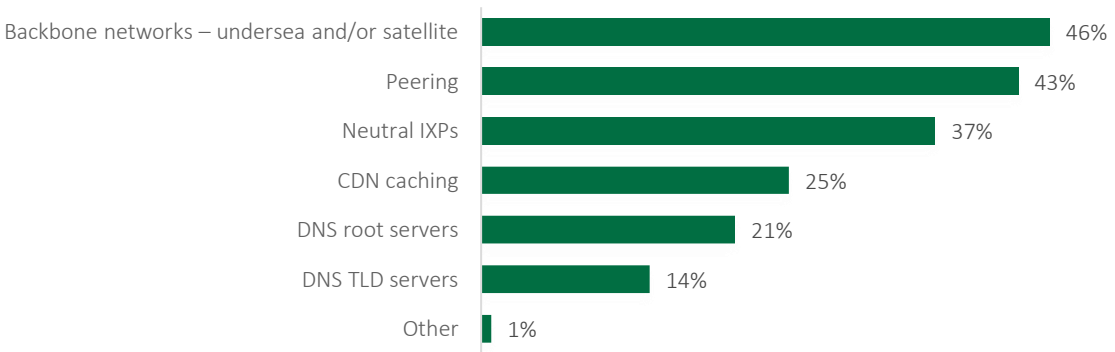
For respondents that selected infrastructure development as an important area for Internet development, almost half (46%) of respondents selected development support for backbone networks (undersea and/or satellite) as the main priority. This included 44% of Members, and 50% of Stakeholders. By region, 50% of applicable respondents in South East Asia selected this as a priority, compared with 40% in South Asia.

Peering was selected by 45% of applicable Members, and 40% of Stakeholders as a main priority area. This included 50% in South East Asia, and 39% in South Asia, with a relatively even split across economies.

While 37% of applicable respondents stated neutral IXPs as a priority, with an even split across Members and Stakeholders, there were some significant differences across regions and economies. Respondents in Oceania were significantly more likely to choose neutral IXPs as a development priority, at 47%. In contrast, respondents in South Asia (and those in LDEs) were significantly less likely to choose this option, at 28%.

Applicable respondents in South Asia, and LDEs, were significantly more likely to choose CDN caching as a priority, at 35% and 37%, respectively. Those in Other economies were less likely to choose CDN caching as a priority, at 22%.

You ranked infrastructure development as an important area for Internet development. What aspects of infrastructure development support should be the main priority?
(All respondents: n=940)



	Member	Stakeholder	East Asia	Oceania	SE Asia	South Asia	LDE	Others
Sample Size	**637**	**302**	**161**	**156**	**267**	**280**	**230**	**634**
Backbone networks – undersea and/or satellite	44%	50%	42%	48%	50%	40%	42%	46%
Peering	45%	40%	47%	41%	50%	39%	43%	45%
Neutral IXPs	37%	36%	43%	47%	33%	28%	28%	39%
CDN caching	27%	20%	22%	17%	25%	35%	37%	22%
DNS root servers	19%	24%	21%	21%	18%	23%	18%	21%
DNS TLD servers	13%	15%	11%	13%	10%	18%	19%	11%
Other	1%	1%	1%	1%	1%	1%	0%	1%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies

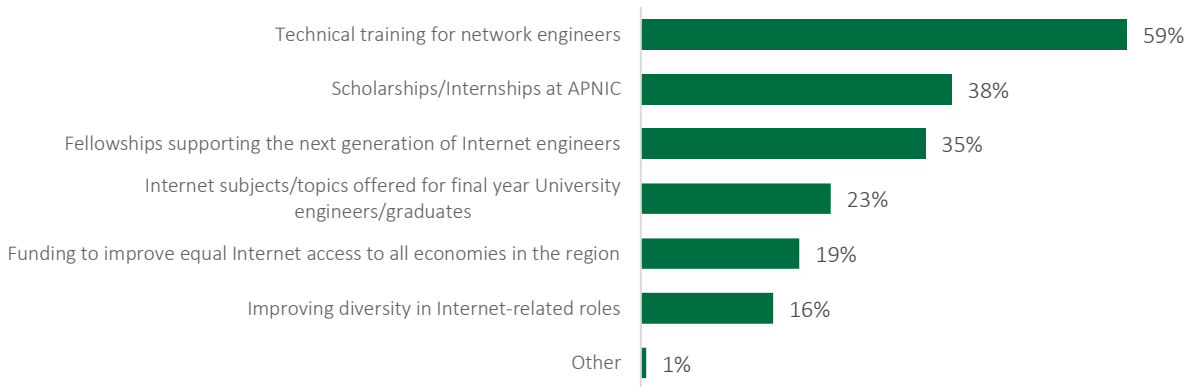
Significantly higher / lower than total

Human Resource Capacity Building

For respondents that ranked human resource capacity building as an Internet development priority, almost three out of five (59%) selected technical training for network engineers as the main area. This high percentage was consistent across Members and Stakeholders, and across regions and economies.

Although 38% of applicable respondents selected scholarships/internships at APNIC as a priority, there were some significant differences across segments. For example, those in South Asia and LDEs were significantly more likely to select this as a development priority, at 46% and 48%, respectively. In contrast, applicable respondents in East Asia were less likely to choose this, at 27%.

You ranked human resource capacity building as an important area for Internet development. What aspects of capacity building should be the main priority?
(All respondents: n=966)



	Member	Stakeholder	East Asia	Oceania	South East Asia	South Asia	LDE	Others
Sample Size	**614**	**351**	**156**	**162**	**268**	**301**	**246**	**641**
Technical training for network engineers	60%	57%	59%	60%	58%	58%	61%	58%
Scholarships/Internships at APNIC	36%	42%	27%	30%	44%	46%	48%	36%
Fellowships supporting the next generation of Internet engineers	35%	34%	40%	34%	31%	32%	33%	34%
Internet subjects/topics offered for final year University engineers/graduates	23%	24%	24%	28%	21%	22%	19%	25%
Funding to improve equal Internet access to all economies in the region	18%	22%	14%	17%	23%	21%	20%	19%
Improving diversity in Internet-related roles	17%	15%	23%	19%	15%	13%	13%	18%
Other	1%	1%	0%	1%	0%	1%	0%	1%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies

Significantly higher / lower than total

Relationship Development

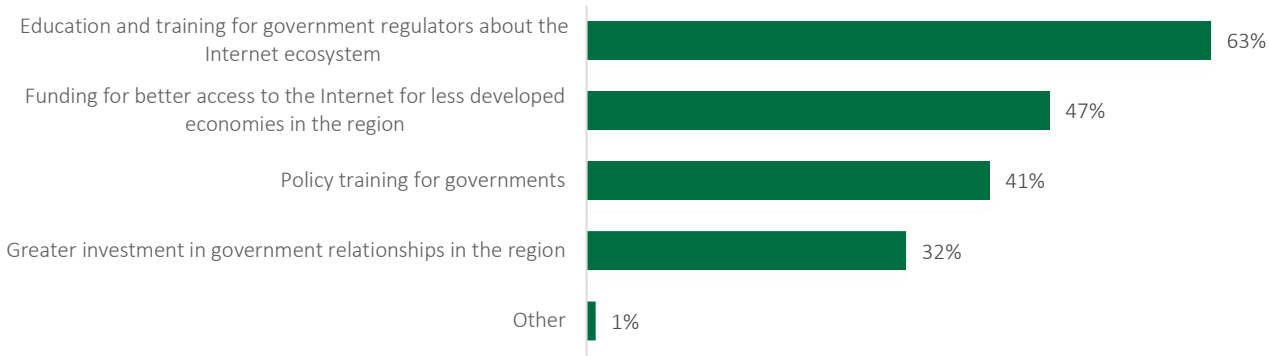
Many respondents chose relationship development as a key area for Internet development. Of these, 63% chose education and training for government regulators about the Internet ecosystem as the main priority, including 60% of Members, and 70% of Stakeholders.

Almost half (47%) of applicable respondents selected funding for better access to the Internet for LDEs in the region as a priority, including 55% for those in LDEs.

However, respondents in Other economies were significantly less likely to have selected this as a priority, at 42%.

Policy training for governments and greater investment in government relationships in the region were the main two priority areas, at 41% and 32%, respectively.

You ranked relationship development as an important area for Internet development. What aspects of relationship development should be the main priority?
(All respondents: n=674)



	Member	Stakeholder	East Asia	Oceania	SE Asia	South Asia	LDE	Others
Sample Size	442	233	113	132	197	181	157	466
Education and training for government regulators about the Internet ecosystem	60%	70%	68%	61%	59%	65%	62%	63%
Funding for better access to the Internet for less developed economies in the region	46%	48%	35%	40%	53%	48%	55%	42%
Policy training for governments	40%	43%	46%	41%	41%	43%	43%	42%
Greater investment in government relationships in the region	34%	29%	27%	33%	37%	28%	27%	34%
Other	1%	1%	0%	2%	1%	1%	1%	1%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies

Significantly higher / lower than total

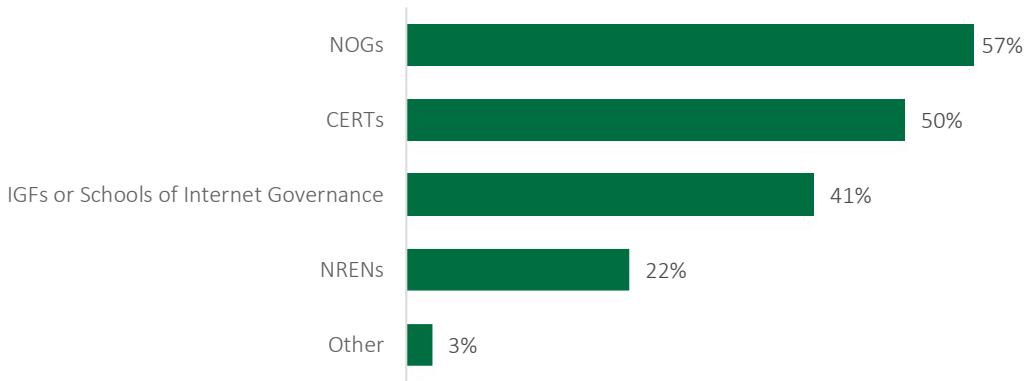
Community Development

Among respondents that identified community development as an important area for Internet development, 57% selected NOGs, with a fairly even split across Members and Stakeholders, and across regions and economies.

Further, half (50%) of respondents selected CERTs as a priority area. However, at 39%, applicable respondents in LDEs were significantly less likely to choose this as a priority, while those in Other economies were more likely, at 54%.

Internet Government Forums (IGFs) or Schools of Internet Governance were considered a priority by 41% of applicable respondents, including 39% of Members, and 44% of Stakeholders. However, those in East Asia were significantly less likely to consider this a priority, at 25%, along with respondents in Other economies, at 36%

You ranked community development as an important area for Internet development. What aspects of community development support should be the main priority?
(All respondents: n=662)



	Member	Stakeholder	East Asia	Oceania	SE Asia	South Asia	LDE	Others
Sample Size	427	235	107	100	175	209	155	436
NOGs	58%	54%	64%	60%	54%	57%	63%	56%
CERTs	51%	48%	49%	52%	55%	45%	39%	54%
IGFs or Schools of Internet Governance	39%	44%	25%	36%	45%	44%	48%	36%
NRENs	21%	24%	22%	13%	23%	24%	28%	20%
Other	3%	3%	3%	4%	2%	2%	2%	3%

Note: Segments exclude respondents from non-APNIC regions included in the 'Total'; 'Other' segment includes developed and developing economies

Significantly higher / lower than total

Appendix

APNIC Definitions of Sub-regions

East Asia	
CN	China
KP	Democratic People's Republic of Korea
HK	Hong Kong Special Administrative Region of China
JP	Japan
KR	Republic of Korea
MN	Mongolia
MO	Macao Special Administrative Region of China
TW	Taiwan

South Asia	
AF	Afghanistan
BD	Bangladesh
BT	Bhutan
IN	India
IO	British Indian Ocean Territory
LK	Sri Lanka
MV	Maldives
NP	Nepal
PK	Pakistan

South-East Asia	
BN	Brunei Darussalam
CX	Christmas Island
ID	Indonesia
KH	Cambodia
LA	Lao People's Democratic Republic
MM	Myanmar
MY	Malaysia
PH	Philippines
SG	Singapore
TH	Thailand
TL	Timor-Leste
VN	Viet Nam

Oceania	
AS	American Samoa
AU	Australia
CK	Cook Islands
FJ	Fiji
PF	French Polynesia
FM	Federated States of Micronesia
GU	Guam
KI	Kiribati
MH	Marshall Islands
MP	Northern Mariana Islands
NC	New Caledonia
NF	Norfolk Island
NR	Nauru
NU	Niue
NZ	New Zealand
PF	French Polynesia
PG	Papua New Guinea
PW	Palau
SB	Solomon Islands
TK	Tokelau
TO	Tonga
TV	Tuvalu
VU	Vanuatu
WF	Wallis & Fortuna Islands
WS	Samoa

Definitions of Economies*

Developed/Developing Economies	
AS	American Samoa
AU	Australia
IO	British Indian Ocean Territory
BN	Brunei Darussalam
CN	China
CX	Christmas Island
CC	Cocos and Keeling Islands
CK	Cook Islands
KP	Democratic People's Republic of Korea
FJ	Fiji
PF	French Polynesia
TF	French Southern Territories
GU	Guam
HK	Hong Kong Special Administrative Region of China
IN	India
ID	Indonesia
JP	Japan
MO	Macao Special Administrative Region of China
MY	Malaysia
MV	Maldives
MH	Marshall Islands
FM	Federated States of Micronesia
MN	Mongolia
NR	Nauru
NC	New Caledonia
NZ	New Zealand
NU	Niue
NF	Norfolk Island
MP	Northern Mariana Islands
PK	Pakistan
PW	Palau
PG	Papua New Guinea
PH	Philippines
PN	Pitcairn
KR	Republic of Korea
WS	Samoa
SG	Singapore
LK	Sri Lanka
TW	Taiwan
TH	Thailand
TK	Tokelau
TO	Tonga
VN	Viet Nam
WF	Wallis and Fortuna Islands

Least Developed Economies	
AF	Afghanistan
BD	Bangladesh
BT	Bhutan
KH	Cambodia
KI	Kiribati
LA	Lao People's Democratic Republic
MM	Myanmar
NP	Nepal
SB	Solomon Islands
TL	Timor-Leste
TV	Tuvalu
VU	Vanuatu

*United Nations Classifications of Economies can be found at http://unstats.un.org/unsd/methods/m49/m49regin.htm

About Survey Matters

Survey Matters specialise in providing services to the Member-based and not for profit sector.

Survey Matters have helped a wide range of organizations understand their value proposition - what is important to respondents, how the organization can help and how satisfied they are with their performance. We also work with the sector to generate and build industry data and knowledge to support advocacy, promotion, industry development and marketing activities.

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ACKNOWLEDGEMENTS

In conclusion, we would like to take the opportunity to thank all respondents for participating in the 2022 APNIC Survey. Your input is extremely valuable.

The robust sample size of 1,622 provides APNIC with clear direction on the preferences and opinions of the Internet community.

The 2022 Survey highlighted many of the challenges facing the Internet community, particularly after two years of the COVID-19 global pandemic. It also provides the APNIC EC and Secretariat with insights and information to continue to assist the Internet community in providing a global, open, stable and secure Internet in the Asia Pacific region.

We trust this information forms a solid basis upon which the APNIC EC and Secretariat can craft their strategic plans and service delivery for the coming two years.

If there are any questions about this report, please do not hesitate to contact Survey Matters.