APNIC

addressing the Internet in the Asia Pacific

2021 Annual Report

Contents

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WELCOME FROM THE DIRECTOR GENERAL

For all of us in the Asia Pacific, the COVID pandemic continued to disrupt life in 2021. "Work from home" has been the new normal for millions around the region, proving again the importance of the Internet and of the work of the APNIC community.

At the APNIC Secretariat we continued to adapt and improve our ability to work alongside the pandemic, for as long as necessary. We're looking forward to the day when we can again meet and work face-to-face as a Secretariat, as we used to. Even more, we look forward to resuming face-to-face conferences and community events, which have now been held online for two years.

Until we can meet face-to-face again, APNIC will continue to service and support Members online, just as we have in 2021. This Annual Report details APNIC's activities for this past year, but here's a snapshot of highlights, which I hope will show what a productive year we've had.

Encouraging the next generation of Internet leaders.
After fellowships were cancelled in 2020, APNIC was determined to continue the fellowship program, in an online mode. A new, five-month program was designed, with expert presentations, Academy training, and time with community mentors before the APNIC 52 conference. With forty-six fellows participating (52% female), and a Net Promoter Score (NPS) of 92, it was a great success and becomes the new model for 2022 and beyond.

Returning IPv4 addresses to availability.
Our work to reclaim unrouted and unused IPv4 space resulted in the return of 488,704 addresses (almost a /13) to APNIC. With many custodians of unused space either unresponsive or uncontactable – after exhaustive efforts – it is likely that at least another 1 million IPv4 addresses will be reclaimed in future, for the benefit of Members.

Operators taking routing security seriously.
RPKI adoption continued to grow. More than 36% of IPv4 address holders now have ROAs, up from 24% a year ago; the proportion of IPv6 address holders with ROAs reached 22% compared with 17% at the end of 2020. Eleven economies exceeded 90% ROA coverage – an outstanding achievement!

Demand for training remains strong.
With travel still restricted, all but one of APNIC's instructor-led training courses were delivered online. Ninety-six tutorials and workshops were delivered to 2,382 participants, and an additional 20 webinars reached another 1,202. At the same time, 5,428 users signed up for self-paced training on the Academy platform, and 1,735 completion certificates were awarded. Online technical assistance was also launched.

An active year in the labs.
Less time on the road equals more time in the labs to conduct experiments. In addition to releasing a new ROA measurement tool, the Labs team analysed BGP, IPv4 and IPv6 address pools, QUIC, and other DNS topics such as DOH and DNS query patterns. This work translated into a record 43 research articles, 41 presentations at industry events, and support for a new podcast, PING, which published five episodes.

WELCOME FROM THE DIRECTOR GENERAL – CONTINUED

Staying connected.

During another year of almost no travel for most of the community, online participation continued to be critical. Webcasting and technical support was provided to 16 technical community events – such as NOGs, peering forums and more – to help them reach online audiences and maintain community engagement. Event support was provided to 17 NOGs and 28 technical events overall, and 1,558 participated in APNIC's two online conferences. In addition, APNIC's pilot of an online community platform with 110 users was completed, as preparations continued for a 2022 full launch.

Improving security.

Security remained a top priority for Members and APNIC itself. The security team supported 43 security events, with 20 security training sessions delivered across nine economies and development support and advice provided to six CERTs. Three new organizations from Tonga, Bangladesh and the Philippines joined the Community Honeynet project taking the total

number of partners to 15. Internally, progress was made towards ISO27001 certification readiness. A great deal was also learned from a security incident APNIC experienced in June; you'll be hearing a lot more on security investments in 2022.

You'll find more information on these and other activities in the report that follows.

Thank you to all Members, and members of the APNIC community, for your continued support and cooperation, especially during such a challenging year for all of us. It is very much appreciated.

Paul Wilson
Director General

WELCOME FROM THE EXECUTIVE COUNCIL CHAIR

On behalf of the Executive Council (EC), welcome to APNIC's 2021 Annual Report.

I'm glad to say that year two of the global COVID-19 pandemic is behind us. It was another challenging year for all industries, APNIC Members, and our community.

Throughout, the demand for Internet Number resources and related information services, training and development assistance continued unabated. As you will see in the following report, it was a busy year for APNIC. It was also an eventful year for the Internet numbering community globally.

As I look back on 2021, there are a couple of notable developments I'd like to highlight.

Welcoming all resources to routing security.
At the EC's February/March meeting, the EC resolved that RPKI services would be made available to all historical resources held by APNIC Members and Non-Members. Improving routing security is critical to the health and stability of the Internet globally and APNIC is committed to supporting RPKI adoption in the region.

As part of these changes, the EC resolved that historical resource holders in the APNIC region would need to become Members or Non-Members by 1 January 2023 to receive registration services. While regular annual fees will be payable, historical resources will NOT be considered in the calculation of those fees.

These decisions by the EC aimed to provide holders of historical address space with access to RPKI services – a known previous source of frustration – while minimizing their ongoing costs.

In 2022, historical resource holders will need to begin the transition to APNIC membership. If your organization falls into this category, you'll hear more from the Secretariat as the year progresses.

Maintaining the integrity of the global registry system.
A dispute between AFRINIC, the RIR for Africa, and one of its Members gained global attention in 2021. The dispute is ongoing, so I will not get into the specifics of the issue.

However, the case gained international attention after an order granted by the Mauritian courts froze AFRINIC's bank accounts, restricting its access to funds. It was an unusual action – that was soon lifted – but at the time it caused some concern among the community, with questions raised about the sustainability of AFRINIC and the RIR system

These concerns were unfounded. AFRINIC continues to be sustainable and able to do its job. Secondly, the NRO Stability Fund commitments, established in 2018, set aside funding that APNIC and the other RIRs stood ready to provide should it have been required.

On this occasion the Stability Fund did not need to be called upon. The smooth operation of the Internet numbers system has continued while this legal process progresses towards a conclusion.

It is important to understand that while Internet number resources are managed by regional bodies, the RIR system is global, and cooperation between RIRs and cooperation in our global community make it resilient. APNIC and the NRO continue to stand ready as needed to help, for as long as needed.

WELCOME FROM THE EXECUTIVE COUNCIL CHAIR – CONTINUED

I think I speak for many in the community in hoping this legal action comes to a swift conclusion in 2022.

Delivering on the plan.
This was the first year where APNIC publicly tracked progress against its annual plan commitments on its website (replacing the 24-month survey action tracking).

As you'll see in this document, the Secretariat delivered well – despite changing circumstances – and I would like to thank all APNIC staff for their achievements in 2021.

However, there is always room for improvement on setting meaningful commitments; the EC worked closely with the Secretariat on the new measures in place for 2022. We hope these reports, plus the online tracker, provide the membership with an easy and transparent way to assess performance now and into the future.

We need your views.
Looking ahead, 2022 is an APNIC Survey year. While you can always contact the EC, the APNIC Survey offers a wider opportunity for you to provide feedback on APNIC's activities and the issues that matter to your organization. When the Survey is released mid-year, please take the time to share your views – it is much appreciated and helps APNIC serve you better.

Thank you again to all Members and the community for your continued support of APNIC. However long this pandemic takes to end, let's stay in touch and stay connected as a community.

Gaurab Raj Upadhaya

Vision and Mission

APNIC's Four Year Strategic Plan (2020-2023) introduced an updated Vision and Mission, and a new structure for activities under five strategic pillars (detailed on the following page).

[VISION] [MISSION]

A global, open, stable, and secure Internet.

To provide essential services as a Regional Internet Registry, and to support Internet development in the Asia Pacific region.

PURPOSE

To serve our community.

IDENTITY

A not-for-profit trusted authority on Internet infrastructure.

VALUES

Passion
Trust
Curiosity
Accountability
Inclusion

CREDO

We are APNIC.
One team dedicated to making a positive impact.
Our ambition will be achieved by working together.
Trust and respect for each other are not negotiable.
Inclusion and diversity really matter to us.
We take pride and excel in everything we do.
We are curious. We are accountable.
We are APNIC.

Strategic Pillars

1. MEMBERSHIP

Develop and deliver world-class products and services required by APNIC Members.

Engage with Members in building a global, open, stable and secure Internet.

Ensure accountable governance of APNIC as a membership organization.

2. REGISTRY

Develop and deliver world class registry products and services required by the community.

Ensure responsible stewardship of Internet number resources and deliver accurate registry services.

3. DEVELOPMENT

Invest in sustainable development of the regional Internet community, industry and infrastructure.

Build capacity for best-practice Internet operations across the Internet technical community.

4. INFORMATION

Support Internet development with needed network information services, and research outcomes which are of demonstrated value to the community.

5. CAPABILITY

Provide stable and secure technical infrastructure to support APNIC operations and services.

Develop a strong service culture driven by people committed to APNIC's vision and values.

Sustain a healthy and resilient organization.

APNIC Workstreams

The Four Year Strategic Direction (2020-2023) defines 18 workstreams, across the five pillars, as follows. Each workstream includes a number of activities that are described in this plan.

1. MEMBERSHIP

1A. MEMBER SERVICES
Deliver excellence in service and value to Members through active and quality engagement.

1B. MEMBERSHIP PRODUCTS
Apply best practice in development of membership products that meet Members' needs and exceed their expectations.

1C. MEMBERSHIP REPORTING
Ensure that APNIC remains fully accountable to its Members, by providing timely and accurate information about APNIC operations.

2. REGISTRY

2A. REGISTRATION SERVICES
Provide delegation and registration services for Internet numbers (ASNs, IPv4, IPv6) according to community developed policies.

2B. REGISTRY PRODUCTS
Maintain an accurate number registry and reliable registry services.

2C. POLICY DEVELOPMENT
Facilitate the open Policy Development Process to ensure resource policies in the APNIC region are developed and implemented in a neutral manner consistent with agreed rules and community expectations.

3. DEVELOPMENT

3A. APNIC CONFERENCES
Deliver engaging and relevant APNIC conferences for learning, sharing ideas and experience, professional networking, and Internet policy development.

3B. FOUNDATION SUPPORT
Provide financial and operational support to ensure the success of the APNIC Foundation.

3C. COMMUNITY ENGAGEMENT
Build and maintain close and meaningful relationships between APNIC and its various communities.

3D. COMMUNITY PARTICIPATION
Encourage awareness, diversity, participation, and leadership in APNIC processes, events, and activities.

3E. APNIC ACADEMY
Scale up training and technical assistance infrastructure with high-quality training content and curriculum.

3F. INTERNET INFRASTRUCTURE SUPPORT
Promote and support the deployment of critical Internet infrastructure and deploy tools for operational infrastructure monitoring.

4. INFORMATION

4A. INFORMATION PRODUCTS
Provide meaningful information services to the communities APNIC serves.

4B. RESEARCH AND ANALYSIS
Analyse the pressures shaping the evolution and future demands of Internet names and numbers infrastructure, and their impacts.

5. CAPABILITY

3C. INTERNAL TECHNICAL INFRASTRUCTURE
Provide stable and secure technical infrastructure to support APNIC operations and services.

3D. FINANCE AND BUSINESS SERVICES
Provide efficient and robust finance and business services and facilities to effectively support APNIC's operations.

5E. EMPLOYEE EXPERIENCE
Attract, develop and retain talented, service-oriented people to deliver APNIC's mission and exceed organization and community expectations.

5F. GOVERNANCE
Provide the legal, economic and governance framework and professional services to support APNIC's operations to minimize risk and ensure compliance and continuity.

2021 at a Glance

IPv6 growth

2A.1

Members with IPv6 addresses
68.43%

Asia Pacific IPv6 capability
37.65%

RPKI

3E.5

Address holders with ROAs
36.1%

↑ up
48%

Conferences

3A.1

APRICOT 2021
852 remote participants from **61** economies
3,855 YouTube views
832.04 hours

52 APNIC 52
706 remote participants from **48** economies
3,438 YouTube views
745.88 hours

Available resources

2A.1

0.40% IPv4 | **80.12%** IPv6 | **10.97%** ASNs

Training

3E.2

Instructor-led training
96 courses
2,382 participants

20 live webinars
1,120 attendees

Self-paced training
1,735 course completions
6,070 labs launched
5,428 new accounts

IPv4 reclaimed

2A.3

488,704
IPv4 addresses were **reclaimed**

Blog

4A.1

Record Blog views
824,651

2021

Information tools monthly users:

4A.2

365 DASH | **826** REx | **980** NetOX

Financial Performance Summary

OPERATING EXPENSES BY OUTCOME AREA

MEMBERSHIP
- Actual: $4,695,325 — 21%
- Budget

REGISTRY
- Actual: $3,164,209 — 14%
- Budget

DEVELOPMENT
- Actual: $4,928,017 — 22%
- Budget

INFORMATION
- Actual: $2,002,601 — 9%
- Budget

CAPABILITY
- Actual: $8,029,100 — 35%
- Budget

$Millions (AUD)
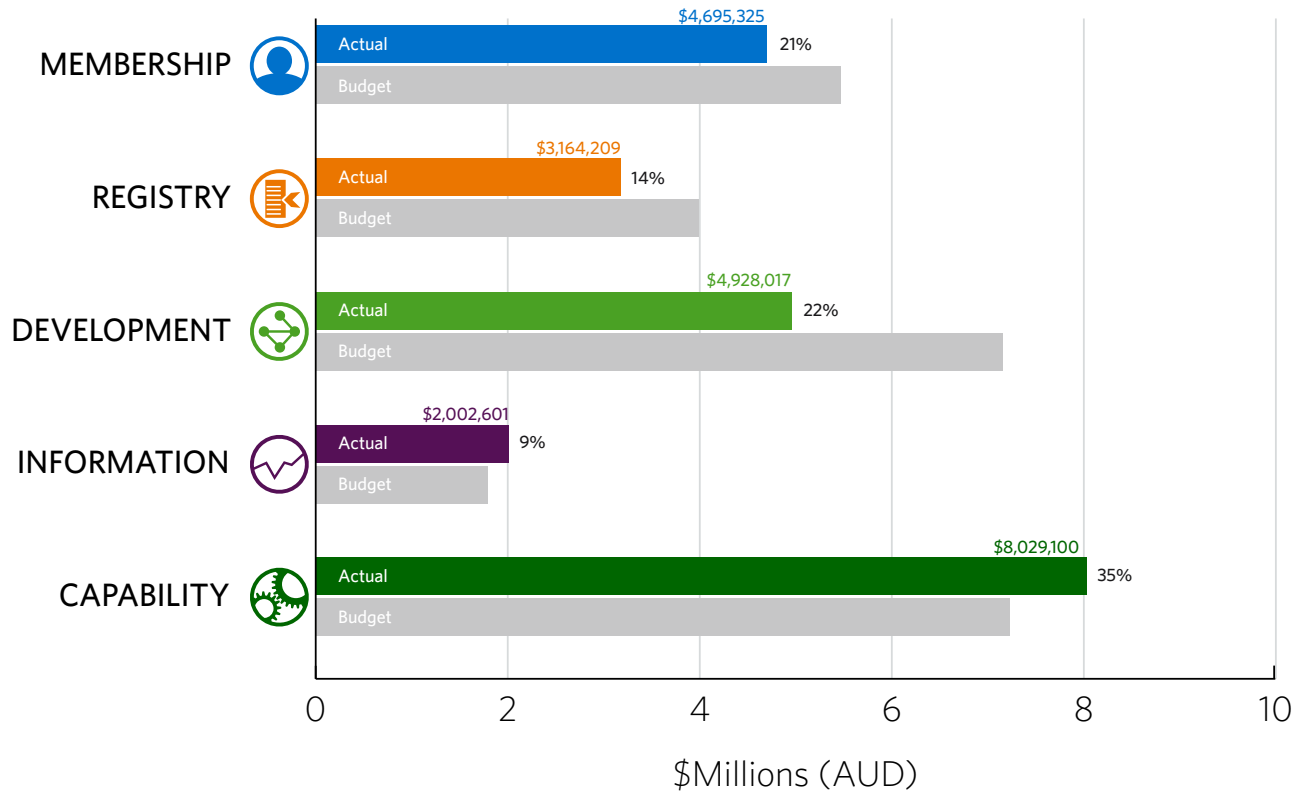
Note: Some numbers presented in this chart may not add up precisely due to rounding.

In addition to standard financial reporting, APNIC also reports activities and expenses under the five pillars and 18 workstreams detailed on page 10.

The chart on this page illustrates 2021's actual operating expenses compared to the budget in the 2021 Activity Plan. The percentage for each area indicates the proportion of the total budget it represents.

For more details on APNIC's 2021 finances, please refer to pages 91-94 to view:

- Financial Report by Activity
- Statement of Financial Position
- Statement of Income
- Cash Flow Statement

Notes on the Activities

APNIC's activities are reported in this document under the 18 workstreams and five pillars described in the previous section:

Membership	Registry	Development	Information	Capability

A table summarizes the resources (financial and human) needed to successfully complete the operations and investments in each workstream.

All monetary figures quoted are in Australian Dollars (AUD).

		Budget	Actual
1	FTE	22.42	19.88
2	Expenses	5,441,868	4,685,680
3	CAPEX	-	7,935

THE ACTIVITIES

The Activities are described as either 'Operations' or 'Investments'.

'Operations' includes all ongoing activities required for continued provision of APNIC services.
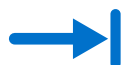
'Investments' are discrete project activities that result in new products, services, or improvements to APNIC services. Where these investments are funded by the APNIC Foundation (not Member funds), it is clearly noted.

1 **FTE:** The number of Full-Time Equivalent employees required for the activity. In all cases FTE figures comprise contributions from multiple employees. For example – an FTE of 1.6 may be made up of four employees who each contribute 40% of their time (0.4 FTE), for a period of one year. The detailed account of these allocations is provided in section 4.2, FTE Distribution.

SUCCESS MEASURES

The status of Success Measures in the document's following pages is denoted by a coloured circle for at-a-glance reference on progress.

2 **Expenses:** Refers to all operational costs directly incurred by the activity.

3 **CAPEX**: Provides the provision for capital expenditure required by the activity.

● **Completed**	● **At least 90% complete**	● **Less than 90% complete**

1. MEMBERSHIP

OBJECTIVES

Deliver world-class products and services required by APNIC Members.
Engage with Members in building a global, open, stable and secure Internet.
Ensure accountable governance of APNIC as a membership organization.

WORKSTREAMS

1A.   Member Services
1B.   Membership Products
1C.   Membership Reporting

MEMBERSHIP - SUMMARY

	Budget	Actual
FTE	22.42	19.88
Expenses	5,441,868	4,695,325
CAPEX	-	7,935

1A. Member Services

OPERATIONS

1A.1. Member services

The Member Services team handled 12,610 tickets created by Member and community enquiries, 1,869 voice calls (phone and Skype), and 3,287 online chat sessions. In addition, more than 10,733 Member invoices were processed. The APNIC Helpdesk maintained its standing commitment to respond to Member queries within two business days.

Helpdesk service satisfaction remained high at 93% 'excellent' and 'above average' ratings (830/891 responses). All negative feedback was actively resolved by Member Services staff.

Member services staff proactively contacted 148 Members across 47 economies on topics including RPKI, resource transfers, technical assistance, APNIC conferences and other events, and the APNIC Whois Database.

Twenty-two cases of attempted fraud in new Member applications were detected and prevented.

RESOURCING

	Budget	Actual
FTE	8.58	9.51
Expenses	2,253,270	2,219,361
CAPEX	-	7,935

1A. **Member Services** - continued

OPERATIONS

1A.2. Member experience

Members and the community provided 2,125 feedback items on topics including conference and training content, website improvements and bug fixes. 473 items required action and were resolved.

COMMUNITY FEEDBACK ANALYSIS
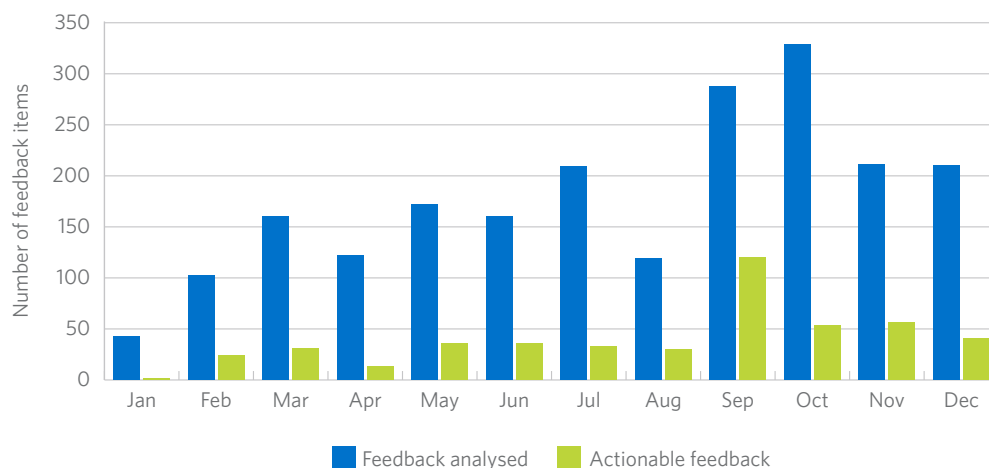
Following an independent audit of the website, 81 critical and high issues were identified that could impact accessibility for users with a disability. All issues were resolved.

The voluntary User Feedback Group, where community members can provide feedback on APNIC product development, grew to 526 people. A further 56 one-on-one interviews were held with Members during the year.

1A. **Member Services** - continued

1A.3. Membership development

New Member outreach was conducted at the PCTA e-Tech Show, PITA Business Forum & Expo 2021, CommunicAsia 2021 and at various NOGs, plus the APNIC conferences.

Two new Service Partners – Lao National Internet Center (LA) and Information Beam Company Limited (MM) – were engaged.

The majority of the 783 new Members joining APNIC in 2021 did so directly, with seven joining via Service Partners and 11 from Member referrals.

1A. **Member Services** - continued

MEMBERSHIP GROWTH
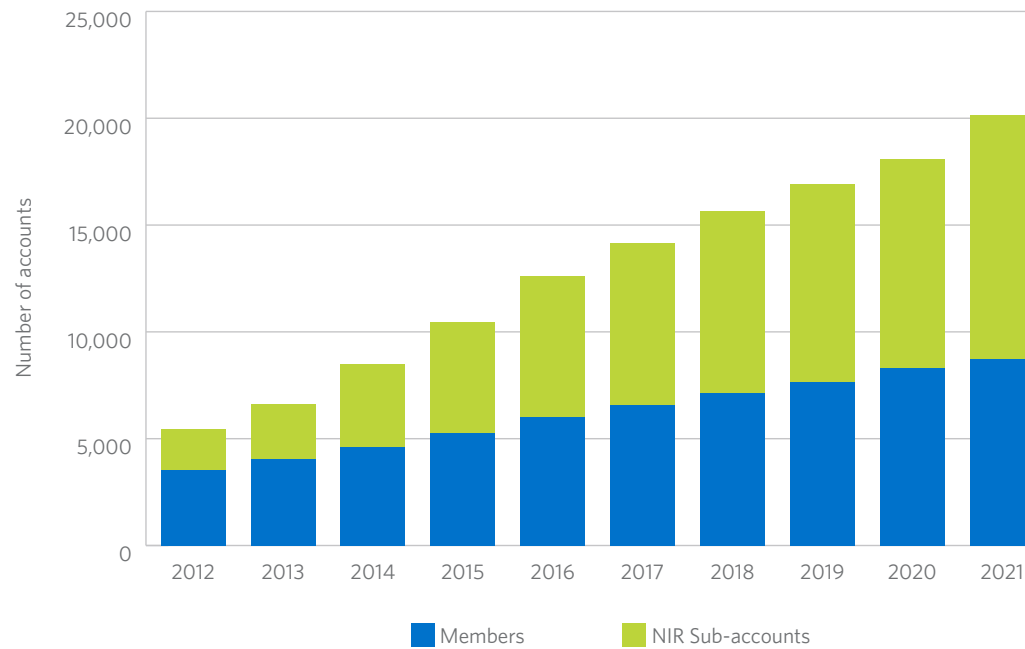
At the end of 2021, APNIC direct membership stood at 8,768, an increase of 5.1% on 2020. In addition, there were 12,089 NIR sub accounts, after rapid growth of 21.2% in 2021.

Total combined membership was 20,857.

1A. **Member Services** - continued

MEMBERSHIP INDUSTRY TYPE

INDUSTRY TYPE

- **366** Academic/Educational/Research
- **401** Software vendor
- **539** Banking/Financial
- **601** Enterprise/Manufacturing/Retail
- **886** Telecommunications/ Mobile operator
- **2,049** Hosting/ Data centre
- **309** Government/Regulator/Municipality
- **225** Media/Entertainment
- **2,779** Internet Service Provider (ISP)

613 OTHER

- **39** Domain names registry/Registrar
- **13** NREN/Research network
- **44** Hardware vendor
- **146** Other
- **67** Internet Exchange Point (IXP)
- **73** Non-profit/NGO/ Internet community)
- **111** Infrastructure (transport/hospital)
- **120** Industrial (construction, mining, oil)

1A. Member Services - continued

SUCCESS MEASURES – 1A

Targets	Results	Status
Maintain helpdesk SLA of 48-hour business day response to enquiries	100%	🟢
Maintain service satisfaction ratings of at least 93% "excellent and above average" feedback	93%	🟢
All "poor and below average" feedback is followed up and actioned	100% resolved	🟢
Proactive Member service engagement in a minimum of 47 economies	47 out of 47	🟢
All improvement suggestions received from all feedback channels are followed up and actioned	100%	🟢
All critical and high accessibility issues are resolved	81 issues resolved	🟢
Grow product and service user feedback group from 300 to 500 members	526	🟢
One-on-one UX feedback session with at least 50 Members	56	🟢
At least eight membership development activities, in economies with low membership relative to their Internet growth potential	7 out of 8	🔴
Total number of Members to match or exceed the 2021 budget assumption of 8,940	8,768	🟠

1B. Membership Products

OPERATIONS

1B.1. Membership product management

A new Help Centre, containing FAQ articles and 'how to' information, was deployed in February. Fifty articles across seven categories were published, with an average 'helpful' rating of 74% from users (from 641 ratings received).

help.apnic.net

HELP CENTRE VISITORS
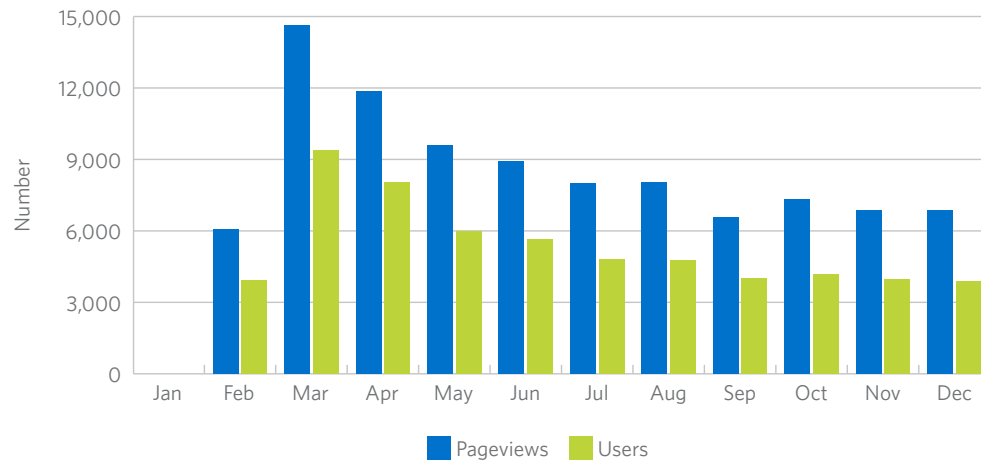
RESOURCING

	Budget	Actual
FTE	12.28	9.25
Expenses	2,473,335	1,856,909
CAPEX	-	-

1B. **Membership Products** – continued

HELP CENTRE FEEDBACK
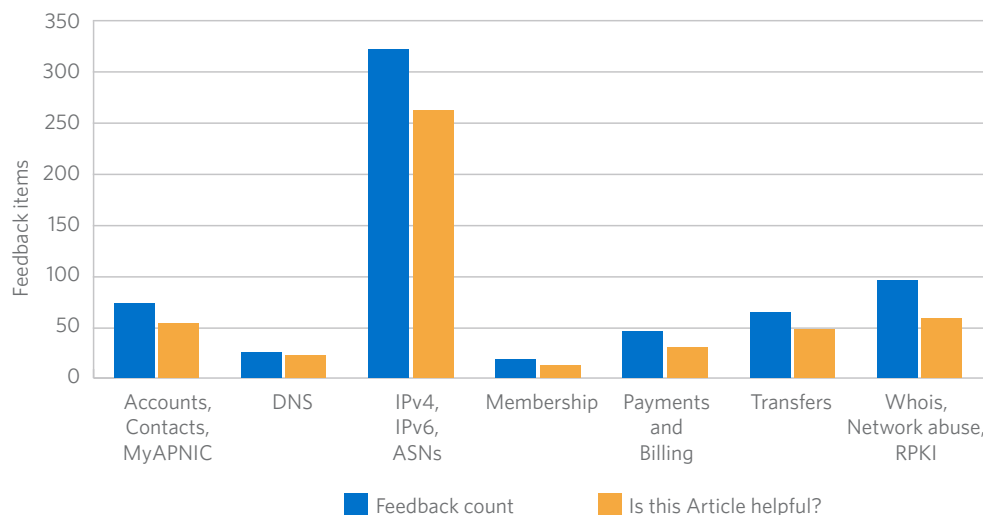
Updates to MyAPNIC included:

- Complete architecture conversion from WordPress to Java.
- Improvements to the billing section including new advance invoice management and downloadable receipts.
- Removal of billing surcharges for Members paying annual fees by instalment.
- An improved EC election dashboard to reduce support requirements.
- Web style updates to the MyAPNIC Resource Manager.
- Voting system updates to accommodate the addition of SIG and IANA RC elections (held at APNIC 52).
- Migration of the billing, elections and portal features to a microservice architecture.

Member application referrals were added to the Member application form to allow Members to refer their customers to APNIC for an easier application process.

1B. Membership Products – continued

SUCCESS MEASURES – 1B

Targets	Results	Status
Member Help Centre deployed	Completed	🟢
Migrate 100% of APNIC Logins to a new identity management system	Deferred to 2022*	🔴
Establish comprehensive testing infrastructure for membership product applications	Completed	🟢
Deliver problem-free EC, NRO, IANA and SIG elections via BigPulse	Completed	🟢

*See 5A.6.

1B. **Membership Products** – continued

INVESTMENTS

1B.2. Online community platform ➞|

'Tribe' was selected to pilot as a community discussion platform over five months, with a total of 110 users, and several test groups.

The trial findings included the requirement for the integration of mailing lists and a community manager to coordinate to overall operation of the platform. These findings and other lessons of the trial period are being assessed to determine next steps, with deployment of an operational product scheduled in 2022.

2021 Investment	Member Benefit
Online community platform	Network operators can better learn from each other's experience. Replace or augment aging mailing list facilities. Promotes online engagement between the APNIC community.

Status: **Ongoing**

1C. Membership Reporting

OPERATIONS

1C.1. Planning and reporting

The 2021 Activity Plan and Budget, and 2020 Annual Report were presented at the 2021 Annual General Meeting in March. The 2022 Activity Plan and Budget was approved by the EC in December.

A public webpage tracking progress against the 2021 activities was published to replace the previous 'Survey Tracker' webpage.

apnic.net/annualreport

RESOURCING

	Budget	Actual
FTE	1.56	1.12
Expenses	715,263	619,054
CAPEX	-	-

1C. **Membership Reporting** – continued

SUCCESS MEASURES – 1C

Targets	Results	Status
On-time publishing of required reports at the APNIC AGM and at APNIC 50	Completed	🟢
Publishing of EC Minutes within two months of each EC meeting	100% achieved	🟢
Event Wraps published for 100% of reportable events within one month of event	67 out of 67 published	🟢

2. REGISTRY

OBJECTIVES

Develop and deliver world class registry products and services required by the community.
Ensure responsible stewardship of Internet number resources and deliver accurate registry services.

WORKSTREAMS

2A. Registration Services
2B. Registry Products
2C. Policy Development

REGISTRY - SUMMARY

	Budget	Actual
FTE	14.21	11.71
Expenses	3,968,674	3,164,209
CAPEX	-	-

2A. Registration Services

OPERATIONS

2A.1. IPv4, IPv6 and ASN delegation and registration services

APNIC processed 1,398 IPv6 delegations, 2,532 IPv4 delegations, 6,808 ASN assignments, 709 IPv4 market transfers (496 within the Asia Pacific region and 213 between APNIC and other RIR regions), and 118 Merger and Acquisition IPv4 transfers. These are illustrated on the following pages.

The proportion of APNIC Members that hold IPv6 resources is 68.43%, up from 66.32% in 2020.

APNIC received eight blocks of ASNs from IANA (8,192 ASNs) to meet large requests from networks in China and India. No additional IPv4 or IPv6 allocations were received from IANA in 2021.

At the end of 2021, APNIC had allocated 99.40% of its total IPv4 number resource pool (leaving 0.60% available), 9.22% of its IPv6 pool (leaving 90.78%) and 89.03% of its ASN pool (leaving 10.97%). The size of the available IPv4 pool increased in 2021 following APNIC's IPv4 reclamation work (see 2A.3).

The status of APNIC's Internet number resource pools at the end of 2021 is below.

	Total at 1 Jan 2021	From IANA	Transfers in	Transfers out	Total at 31 Dec 2021	Total delegated	Total reserved	Total available
IPv4 (/24s)	3,482,617	0	2,410	1,095	3,483,932	3,463,031	6,986	13,915
IPv6 (/32s)	1,067,008	0	0	0	1,067,008	98,392	113,746	854,870
ASNs	21,143	8,192	5	4	29,336	26,118	0	3,218

RESOURCING

	Budget	Actual
FTE	4.53	4.89
Expenses	842,899	890,233
CAPEX	-	-

2A. Registration Services – continued

IPv4 DELEGATIONS

Number of delegations

Legend: South East Asia, East Asia, Oceania, South Asia, Out of region

IPv6 DELEGATIONS

Number of delegations

Legend: South East Asia, East Asia, Oceania, South Asia, Out of region

ASN ASSIGNMENTS

Number of assignments

Legend: South East Asia, East Asia, Oceania, South Asia, Out of region
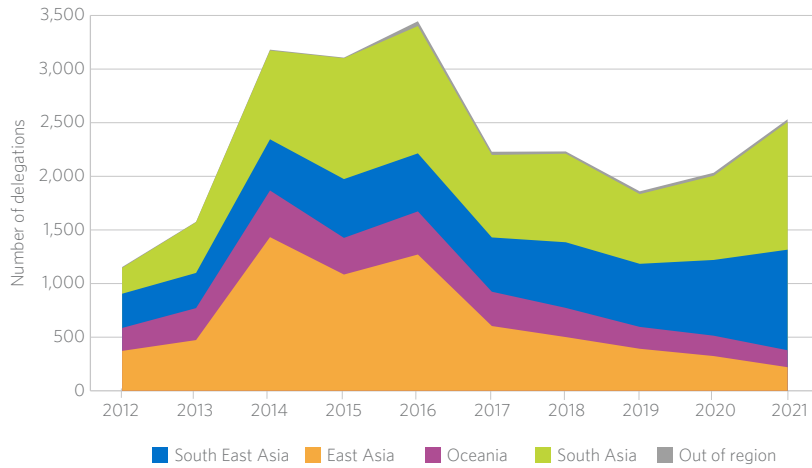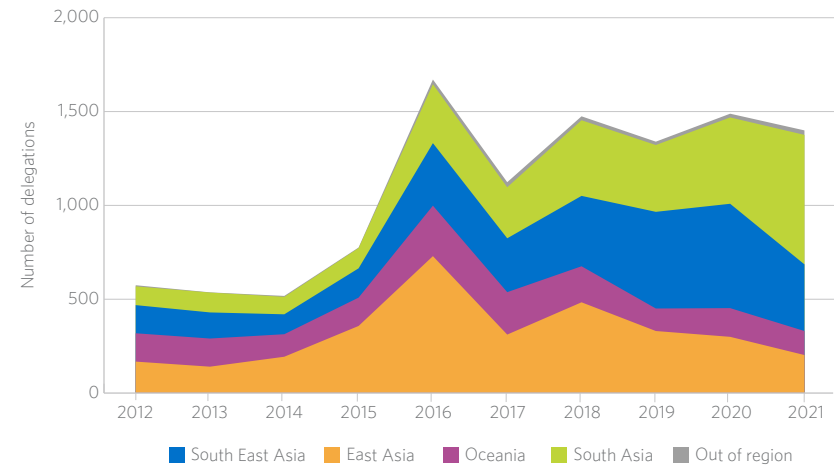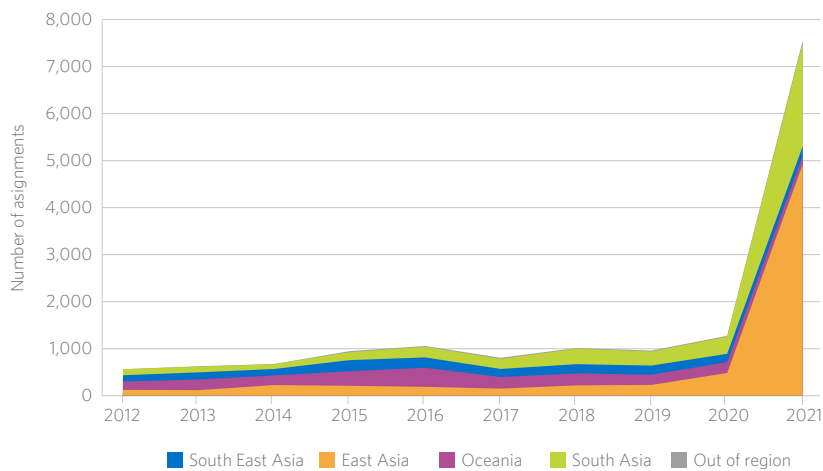
Note: Large requests from networks in China and India account for the significant rise in ASN assignments.

IPv4 MARKET TRANSFERS

Number of transfers

Legend: APNIC, Inter-RIR

2A. Registration Services – continued

MARKET TRANSFERS

Within APNIC market transfer size (/24s) — Within APNIC market transfer count

INTER-RIR TRANSFERS

Inter-RIR market transfer size (/24s) — Inter-RIR market transfer count
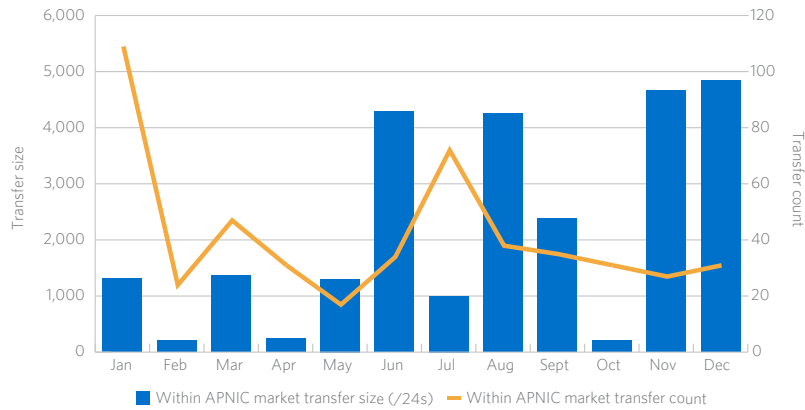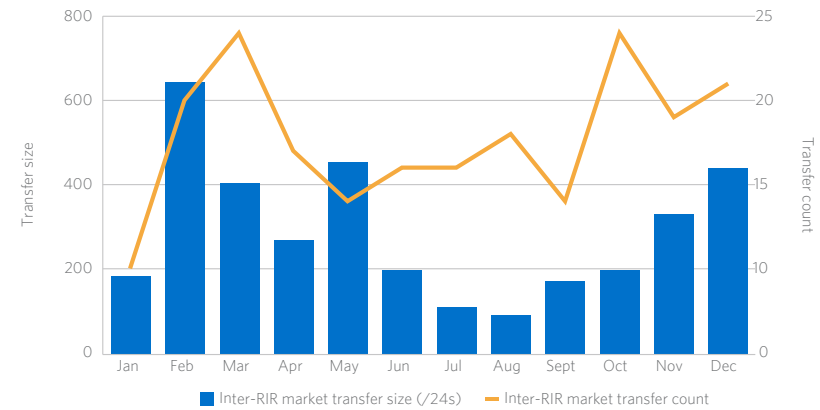
M&A AND HISTORICAL TRANSFERS

Transfer size (/24s) — Transfer count
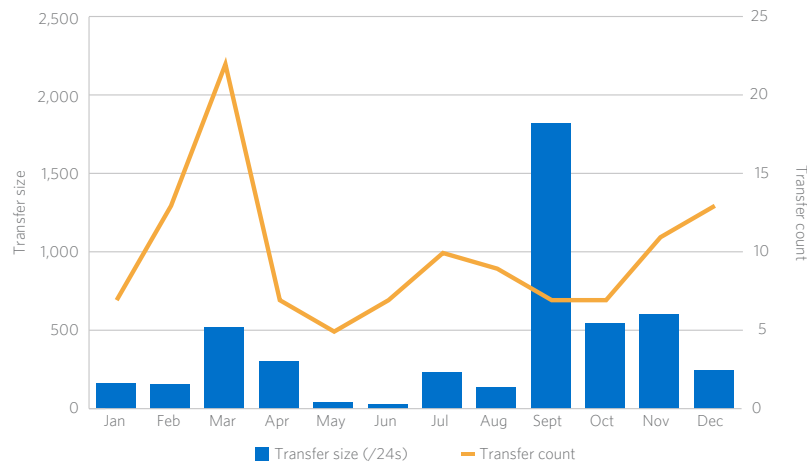
- Large IPv4 transfers from the Asia Pacific Internet Development Trust (APIDT) to various Members occurred in June, August, November, and December.
- A large transfer occurred within TWNIC in September.
- Inter-RIR market transfer activity slightly increased in 2021, albeit on small address volumes.

2A. Registration Services – continued

AVAILABLE IPv4 ADDRESS SPACE
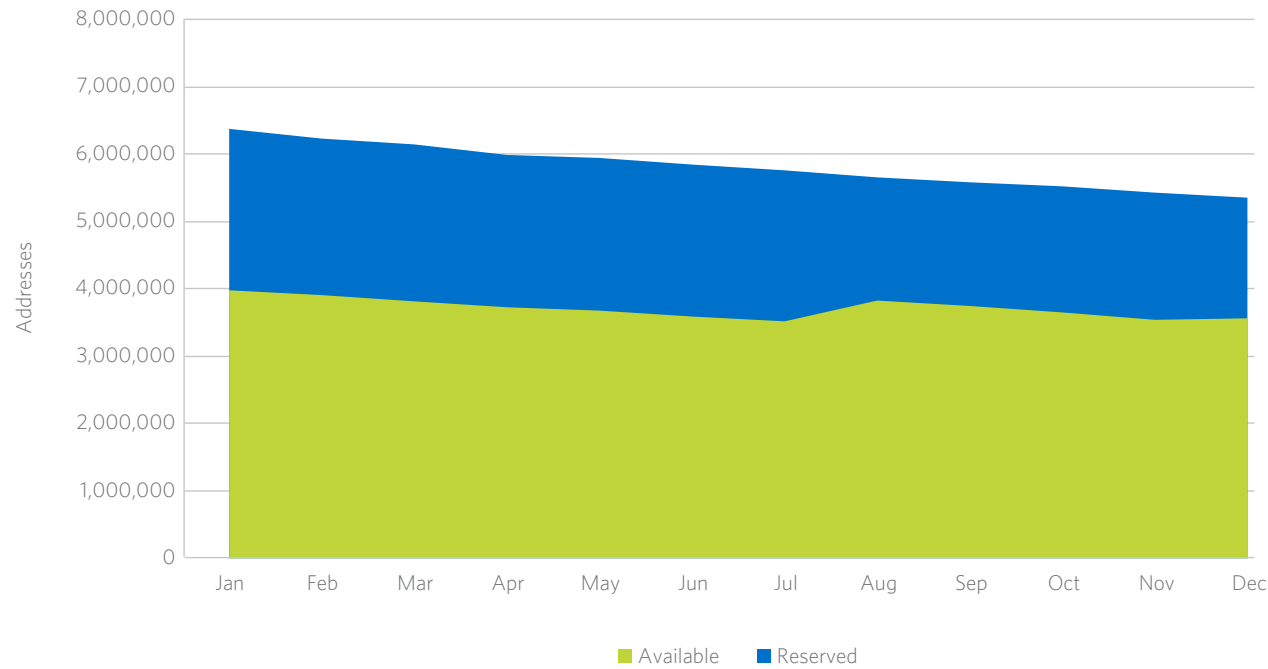
488,704 historical IPv4 addresses were voluntarily returned to the available pool in 2021 as a result of APNIC's IPv4 reclamation efforts.

2A. Registration Services – continued

OPERATIONS

2A.2. Maintain correct and current registry data

Improvements were made to IRT validation under prop-125, including simplification of email and notification templates, and better IRT management functionality in MyAPNIC to help Members update IRT details and handle validation emails.

13,826 email validation requests were issued with 10,277 validation requests confirmed, equalling a confirmation rate of 74.3%.

In response to ICANN's Identifier Technical Health Indicators (ITHI) initiative, the NRO defined the 'accuracy' of Internet number resources data under three dimensions: 'Comprehensive, Correct, and Current'. APNIC deployed measurements for two of the three dimensions, with measurement for 'Current' to be completed in 2022.

2A. Registration Services – continued

2A.3. Reclaiming unused IPv4 address space

Around 2.3 million unrouted historical IPv4 addresses were identified under prop-017 and 78% of the address custodians were contacted following an exhaustive contacts search using public information such as business registries and web research.

Contacted address custodians retained, or were in the process of claiming, 750,592 addresses while 488,704 addresses were returned to APNIC (equivalent to around 1,909 /24s).

The remaining address space (around 1.1 million addresses) for uncontactable custodians, or custodians that did not respond, will be reclaimed by APNIC in 2022.

STATUS OF RECLAIMED ADDRESS SPACE

Reclaimed addresses
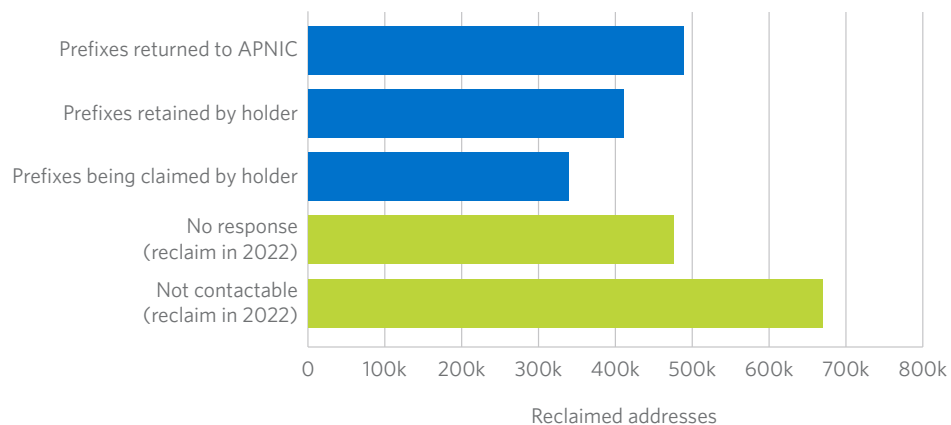
2A. Registration Services – continued

SUCCESS MEASURES – 2A

Targets	Results	Status
Maintain Registration Services SLA of two business day response to enquiries (>99.90%)	100%	🟢
Increase percentage of Members holding IPv6 address space to 70%	68.43%	🟠
Comply with NRO-defined Identifier Technology Health Indicators (ITHI) reporting	2 out of 3	🔴
Increase rate of validation by Members of registration records	74.3%	🟢
All unrouted historical resource prefixes identified under policy prop-017 are claimed, transferred, or returned to APNIC	Completed	🟢

2B. Registry Products

OPERATIONS

2B.1. Internet number resource management

Significant performance improvements were made to the core registry service to make the registry management system more usable (now 5-10 times faster for typical requests).

An API to assist NIR resource administration and registry accuracy was developed, with an external test environment established. Deployment is planned for early 2022.

A requirements specification to rearchitect the registry was completed as part of the multi-year 'Next-generation Registry' project.

2B.2. Registry product management

Updates to RPKI included improvements to route management functions in MyAPNIC, and to the Certification Practice Statement (CPS). The repository publication was made entirely atomic to avoid repository inconsistency/invalidity problems.

The finalized NRO RDAP profile was published in the IANA RDAP registry. APNIC will achieve full compliance with the profile in early 2022.

A public specification of a general Member registry API was developed, with the aim to share a prototype at APRICOT 2022.

MyAPNIC users can also now manage 'BYO IP' requirements for their resources by directly updating whois object attributes.

RESOURCING

	Budget	Actual
FTE	9.04	6.18
Expenses	2,580,512	1,831,592
CAPEX	-	-

2B. Registry Products – continued

SUCCESS MEASURES – 2B

Targets	Results	Status
Implement the NIR API and operate in conjunction with the NIRs	Completed for 2022 deployment	🟢
Create initial design documentation for the 'Next-generation Registry' by the end of Q4	Completed	🟢
Implement a bulk update method to improve usability of the MyAPNIC Routing Management feature	General Member API implementation in 2022	🔴
Improved support for 'BYO IP' services in MyAPNIC	Completed	🟢
Create a public specification of a general Member registry API	Completed	🟢
Implement the NIR KPI monitor for RPKI	Completed	🟢

2C. Policy Development

OPERATIONS

2C.1. Policy development

The APNIC Policy SIG considered the following proposals in 2021.

Proposal	Result
prop-130: Modification of transfer policies	Presented at APNIC 51. Did not reach consensus and abandoned.
prop-133: Clarification on Sub-Assignments	Presented at APNIC 51. Reached consensus and endorsed by the EC for adoption.
prop-135: Documentation	Reached consensus and endorsed by the EC for adoption.
prop-136: Registration Requirements	Reached consensus and endorsed by the EC for adoption.
prop-137: IPv6 assignment for Associate Members	Reached consensus but returned to author for clarification.
prop-138: Restricting AS-ID in ROA	Accepted as a guideline only.
prop-139: SOR not required	Reached consensus and endorsed by the EC for adoption.
prop-140: Update End-Site Definition	Reached consensus and endorsed by the EC for adoption.
prop-141: Change maximum delegation size of IPv4 address from 512 (/23) to 768 (/23+/24) addresses	Did not reach consensus and returned to mailing list.

RESOURCING

	Budget	Actual
FTE	0.64	0.64
Expenses	545,263	442,384
CAPEX	-	-

2C. **Policy Development** – continued

2C.2. Policy implementation

Policy text changes resulting from prop-133, -135, -136, -139, and -140 were implemented and published. Policy prop-138 was published as a guideline.

2C.3. Policy analysis

An update on the Policy Document Review was presented at APNIC 51, with an additional community consultation meeting held online in March, with 40 attendees.

A community Working Group (WG) was formed to review the Policy Document Review report and develop proposals for discussion at APNIC 52. The WG submitted nine proposals to the Policy SIG Chairs for APNIC 52; four were accepted for discussion at the Open Policy Meeting and all four reached consensus.

Impact assessments for the nine policy proposals discussed at APNIC 51 and 52 were conducted and shared with the Policy SIG. The APNIC 52 policy assessment was not presented due to time constraints.

www.apnic.net/policy

2C. **Policy Development** – continued

SUCCESS MEASURES – 2C

Targets	Results	Status
Achieve minimum overall satisfaction rating of 6/7 from Policy Chairs in annual review of SIG Chair support	6.7 out of 7	🟢
Met 100% of implementation timelines	100%	🟢
Deliver two policy analysis presentations at SIG meetings	1 out of 2 done	🔴
Publish a policy proposals analysis before each Policy SIG meeting	2 out of 2 done	🟢

3. DEVELOPMENT

OBJECTIVES

Invest in sustainable development of the regional Internet community, industry and infrastructure. Build capacity for best-practice Internet operations across the Internet technical community.

WORKSTREAMS

3A. APNIC Conferences
3B. Foundation Support
3C. Community Engagement
3D. Community Participation
3E. APNIC Academy
3F. Infrastructure Support

DEVELOPMENT - SUMMARY

	Budget	Actual
FTE	26.08	20.92
Expenses	7,118,088	4,928,017
CAPEX	118,150	21,878

3A. APNIC Conferences

OPERATIONS

3A.1. APNIC conferences

APRICOT 2021 (incorporating APNIC 51) was held online from 22 February to 4 March 2021. This was the first APRICOT conference to be held 100% online, due to the COVID-19 pandemic.

The event welcomed 852 remote attendees (via Zoom) in total, including 416 attendees that attended the tutorial week. There were an additional 3,855 views on YouTube.

An election for three available APNIC EC positions was held at APNIC 51 with Feng Leng (2,612 votes), Yoshinobu Matsuzaki (2,605 votes), and Gaurab Raj Upadhaya (2,567 votes) elected for two-year terms.

APNIC 52, held from 13 to 16 September 2021, was also held wholly online and welcomed 706 remote attendees in total (via Zoom). The tutorials on day one attracted 374 attendees. Technology additions for APNIC 52 included CometChat for delegate chat and networking, and Otter.ai for automatic transcription. Improvements to the conference login process were also made.

Several community meetings were held at the conferences from partner organizations including, DotAsia, APIX, APStar, and APNG.

conference.apnic.net

RESOURCING

	Budget	Actual
FTE	5.04	4.75
Expenses	1,466,163	930,345
CAPEX	43,150	4,296

	APRICOT 2021	APNIC 52
Total number of remote participants (Zoom)	852	706
Economies represented	61	48
YouTube views	3,855	3,438
YouTube hours viewed	832.04	745.88

3A. APNIC Conferences – continued

SUCCESS MEASURES – 3A

Targets	Results	Status
Achieve attendance of 1,000 delegates	1,558 attendees	●
Achieve 4,000 remote conference session views	8,145 views	●
Achieve a minimum average conference participant satisfaction survey rating of 90%	93%	●
Achieve average participant satisfaction of 85% for speakers	96%	●
Select and integrate online meeting technologies to provide a seamless online experience for APNIC 51 and 52	Completed	●

3A. APNIC Conferences – continued

INVESTMENTS

3A.2. Fellowships →|

A new online fellowships program was developed, comprising 11 technical, policy and Internet governance presentations over five months; pairing fellows with industry mentors; APNIC Academy training; and guidance during APNIC 52.

Forty-eight fellows were shortlisted from 293 applicants, with 46 accepting (24 female and 22 male; 34 professionals and 12 youth).

The Fellows' average overall attendance was 86%, with 136 APNIC Academy self-paced courses completed and participation in an additional 26 Academy webinars.

Twelve mentoring sessions were held in August to September between 27 fellows and 25 volunteer mentors from the APNIC community.

The program achieved a Net Promoter Score (NPS) of 92 from Fellows in the participant survey.

2021 Investment	Member Benefit
Fellowships	Diversity of participation in APNIC conference.

Opportunities for more Members to attend APNIC conferences. |
| Status: **Completed** | |

3B. Foundation Support

INVESTMENTS

3B.1. Operational and administrative support ➡️|

A total of 6.6 APNIC staff (FTE) were assigned to the Foundation, with all direct costs recovered.

APNIC continued to provide hosting and technical support for administrative, project and financial platforms used by the Foundation.

A new Affirmation of Commitments (AoC) was developed to cover both APNIC support and Foundation funding for APNIC activities.

2021 Investment	Member Benefit
Operational and administrative support	A well-run Foundation delivering successful and valuable Internet development activities in the APNIC region.
Status: **Completed**	

apnic.foundation

RESOURCING

	Budget	Actual
FTE	1.58	1.24
Expenses	571,518	76,428
CAPEX	-	-

3C. Community Engagement

OPERATIONS

3C.1. Technical community support

APNIC participated in 15 Network Operator Group (NOG) events during 2021 and 13 technical community events, providing sponsorship, speakers, and training (see Appendix for full list of events and economies). Webcasting and technical support was provided to help 16 technical community events proceed online.

Sponsorship of software and services for the technical community, supported by funding from the APNIC Foundation, was provided to PeeringDB, IXP Manager and IXPDB. APNIC also sponsored the Internet Society's MANRS Fellowship Program.

3C.2. Security community support

APNIC participated at 43 security community events, including presenting at eight events and providing training at seven events (see Appendix for full list of events and economies).

Sponsorship was provided to CrikeyCon VII and Threat Con 2021, with staff also participating in the program committees for AusCERT 2021 and the FIRST Annual Security Conference.

Sponsorship of services for the security community, supported by funding from the APNIC Foundation, was provided to Shawdowserver.

RESOURCING

	Budget	Actual
FTE	6.38	4.46
Expenses	1,826,724	1,410,868
CAPEX	-	-

3C. Community Engagement – continued

3C.3. Internet organization cooperation

APNIC partnered with LACNIC to commission a study from Analysys Mason on the Internet's technical success factors, and supported them in conducting 15 community interviews. The final report was published and presented during the 2021 Internet Governance Forum (IGF) in December.

Collaboration with other RIRs included participation in 34 online meetings with NRO coordination groups, supporting proposed revisions to the NRO MoU, and the proposed review of the NRO Strategic Plan. Staff participated in all RIR, ICANN and IETF meetings.

Staff participated in the Internet Technical Advisory Committee (ITAC) to the OECD, Internet Technical Collaboration Group (ITCG), ICANN Root Service Governance Working Group, the Root Zone Evolution Working Group, and the Security and Stability Advisory Committee.

NIR engagement included meeting with IRINN, NIXI, and the KRNIC Policy team and participating at the TWNIC OPMs and ICANN TWNIC Engagement Forum. Staff also provided training to the IRINN Hostmaster and Helpdesk teams on IRM, IPv6, the PDP and routing.

3C.4. Internet governance participation

Internet governance-related activities included:

- Participating in the 2021 IGF and conducting sessions on Learning Resiliency, Supply Chain IoT, and the results of the Internet Study on Technical Success Factors. Staff also participated in 62 meetings related to the IGF throughout the year including Multistakeholder Advisory Group (MAG) meetings, topic work groups, and the IGF Support Association Executive Committee.

3C. Community Engagement – continued

- Conducting two sessions at the 2021 APrIGF: Interoperable Internet infrastructure (with ISOC); and the Internet study on Technical Success Factors. Staff also participated in 60 APrIGF preparatory meetings covering event direction, arrangements, program, and fellowships.
- Participating in, and supporting the organization of three economy-level IGFs plus the new sub-regional Southeast Asia IGF (SEA-IGF).
- Sponsoring, presenting and participating at nine Youth IGFs and Schools of Internet Governance (SIG). APNIC also participated in 10 planning meetings for the Asia Pacific Internet Governance Academy (APIGA).
- Participating in six other Internet governance meetings online (see Appendix for full list of events and economies).

3C.5. Government engagement

APNIC engages with governments and inter-governmental organizations as a member of the technical community. Participation in 2021 included:

- Joining 25 intergovernmental meetings and consultations, including 19 ITU meetings (see Appendix for full list of events and economies).
- Meeting with the APT Secretary General and Secretariat to coordinate regional initiatives.
- Providing training and technical assistance support to the Mongolian government's Digital Nation (e-Mongolia) initiative.
- Contributing to an OECD draft document on routing and DNS security, and monitored discussions at five OECD meetings.

APNIC also engaged directly with the Law Enforcement Agency (LEA) and Public Safety community, delivering training to LEAs in Oceania as part of Cyber Safety Pasifika, LEAs in Taiwan, and participating at the 6th INTERPOL Global Cyber Crime Expert Group meeting and INTERPOL Forum on Ransomware.

3C. Community Engagement – continued

3C.6. External relations coordination

TYPES

- **111** Training
- **2** APNIC
- **3** Foundation Project
- **4** Member Outreach
- **4** Membership Development
- **4** NIR Engagement
- **8** Development
- **11** CERT Engagement
- **12** Coordination
- **19** NOG
- **19** Technical
- **25** Internet Governance
- **32** Government
- **33** Security

LOCATIONS

- **40** Asia-Pacific
- **33** Eastern Asia
- **76** Global
- **42** Oceania
- **60** South Asia
- **51** South-Eastern Asia
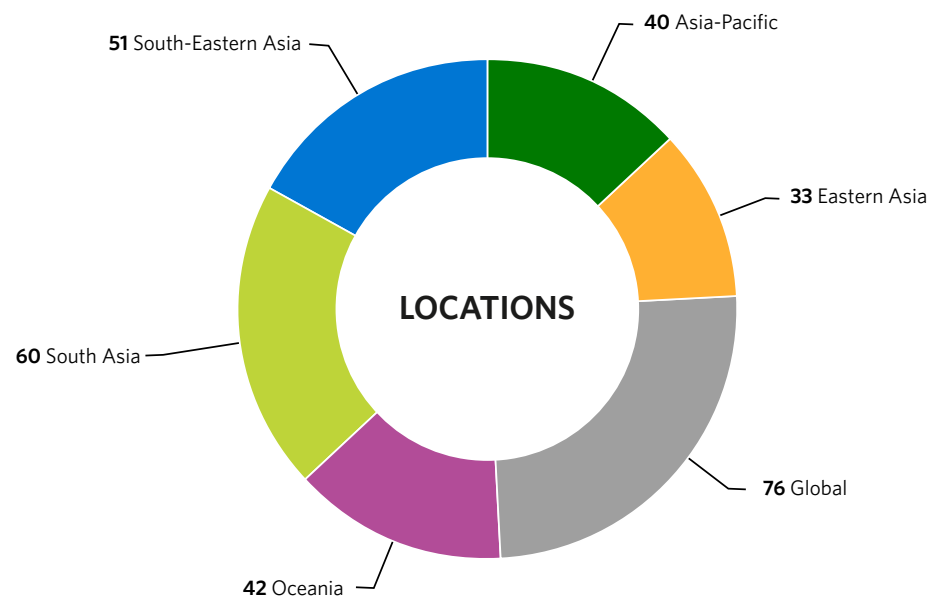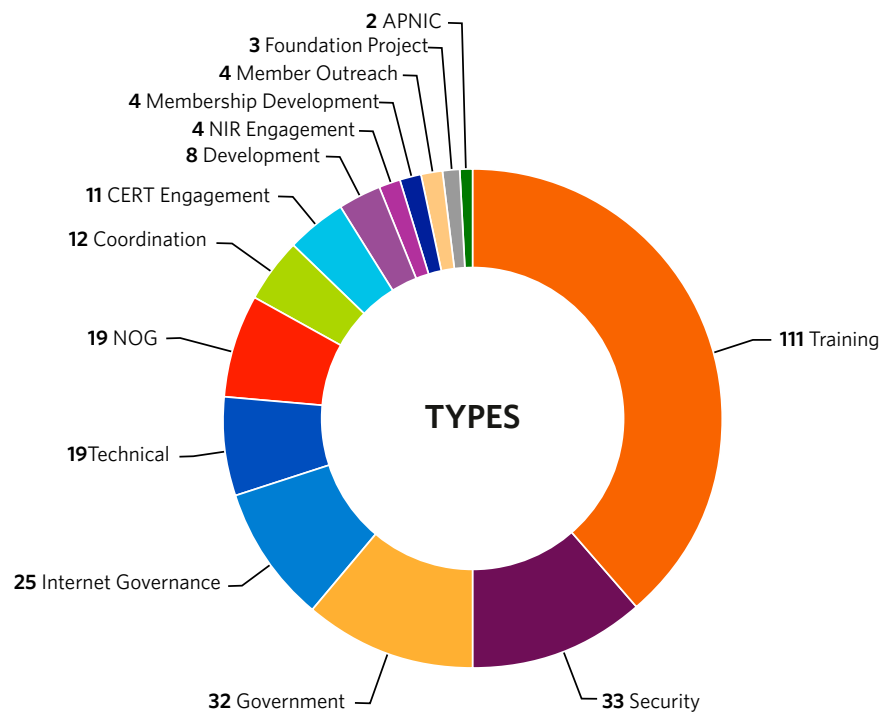
Engagements are units of measurement for meaningful interactions by APNIC staff with the community through events. There are currently 15 types of engagements in APNIC, as shown on pages 49 and 50.

Due to COVID-19 and related travel restrictions, APNIC's participation at face-to-face events shifted to wholly online representation.

3C. Community Engagement – continued

Legend:

- Ⓕ Foundation Supported
- Ⓡ Remote

- ● APNIC
- ● CERT engagement
- ● Coordination
- ● Development
- ● Foundation projects
- ● Government
- ● Internet governance
- ● Member outreach
- ● Membership development
- ● NOG
- ● Security
- ● Technical
- ● Technical assistance
- ● Training
- ● NIR engagement
- ● Product engagement
- ● Other

SOUTH ASIA

BD	Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ
BT	FR FR FR Ⓡ Ⓡ Ⓡ
IN	FR Ⓡ FR FR FR Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ
LK	FR Ⓡ Ⓡ
NP	FR FR FR Ⓡ Ⓡ Ⓡ
PK	FR FR FR FR Ⓡ Ⓡ
Sub-region	FR FR FR FR FR FR FR FR FR FR FR FR Ⓡ FR FR FR FR FR FR FR FR FR

EAST ASIA

CN	FR FR FR FR FR Ⓡ Ⓡ Ⓡ
HK	● Ⓡ Ⓡ
JP	Ⓡ Ⓡ Ⓡ Ⓡ
KR	● Ⓡ Ⓡ
MN	FR Ⓡ
TW	FR FR FR Ⓡ Ⓡ Ⓡ Ⓡ
Sub-region	FR FR FR FR FR FR

SOUTH EAST ASIA

ID	FR Ⓡ Ⓡ ● Ⓡ Ⓡ
KH	Ⓡ Ⓡ
MM	Ⓡ
MY	Ⓡ Ⓡ Ⓡ Ⓡ
PH	FR FR FR Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ
SG	Ⓡ Ⓡ Ⓡ Ⓡ
TH	FR Ⓡ Ⓡ Ⓡ Ⓡ
TL	FR FR FR FR FR Ⓡ
VN	FR Ⓡ Ⓡ
Sub-region	FR FR FR FR FR FR FR

OCEANIA

AU	FR Ⓡ Ⓡ Ⓡ ● ● ● Ⓡ Ⓡ Ⓡ ● ● Ⓡ ●
NZ	Ⓡ Ⓡ Ⓡ
FJ	FR FR FR Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ
VU	FR
PW	Ⓡ
TO	FR Ⓡ
TV	FR
WS	Ⓡ Ⓡ
Sub-region	FR FR FR FR FR FR FR FR FR FR FR FR FR FR

ASIA-PACIFIC

AP	Ⓡ FR Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ Ⓡ FR Ⓡ Ⓡ FR FR FR FR FR FR FR Ⓡ Ⓡ Ⓡ ● Ⓡ FR FR FR FR FR FR FR Ⓡ Ⓡ Ⓡ FR Ⓡ Ⓡ

Global Collaboration

Ⓡ Ⓡ

3C. Community Engagement – continued

SUCCESS MEASURES – 3C

Targets	Results	Status
Sponsor/participate in 30 technical community events including NOGs, Peering Forums and Research & Education community events	28 out of 30	🟠
Support 20 NOGs to conduct online events if physical events are not possible	14 out of 20	🔴
Facilitate and support two new/revived NOGs in two sub-regions	One in progress	🔴
Sponsor or participate in 10 security community events	43 events	🟢
Support targeted development of four new/existing CERTs/CSIRTs	6 CERTs/CSIRTs	🟢
Deliver six presentations/training sessions on the Security Threat Sharing Platform	10 presentations	🟢
Participate in all NRO and I* coordination meetings	100%	🟢
Participate in all NIR and RIR Open Policy Meetings	100%	🟢

3C. Community Engagement – continued

SUCCESS MEASURES – 3C CONTINUED

Targets	Results	Status
Sponsor and participate in APrIGF and IGF with workshop proposals, MSG/MAG participation, and speaking roles.	3 proposals to IGF 2 proposals to APrIGF Sponsored APrIGF	●
Participate in at least three national Internet governance initiatives	3 out of 3	●
Sponsor and participate in at least two schools of Internet governance.	2 out of 2	●
Participate in at least 12 engagements with governments/intergovernmental organizations.	25 engagements	●
Participate in at least three capacity building partnerships with governments/ intergovernmental organizations.	3 out of 3	●
Participate in six engagements with the Public Safety community.	6 out of 6	●
Facilitate one External Relations coordination retreat.	Completed	●
Facilitate 10 External Relations team coordination meetings.	10 out of 10	●

3D. Community Participation

OPERATIONS

3D.1. Community-led processes

Special Interest Group (SIG) meetings at APNIC conferences attracted 950 participants, with SIG mailing list subscribers increasing 5% from 1,268 to 1,333. Four 'intersessional' online SIG meetings (arranged by the Policy SIG and Routing Security SIG) were also held outside of APNIC conferences, attracting 139 participants.

The SIG Guidelines were updated in April following a joint SIGs meeting to discuss and agree proposed changes to SIG elections.

At the elections completed at APNIC 52:

- Joy Chan (TW) was re-elected Chair of the Cooperation SIG for a two-year term.
- Oanh Nguyen (VN) was elected Chair of the NIR SIG for a two-year term.
- Bertrand Cherrier (NC) was elected Chair of the Policy SIG and Shaila Sharmin (BD) was elected Co-Chair, both for two-year terms.
- Afifa Abbas (BD) was elected Co-Chair of the Routing Security SIG for a two-year term.
- Ching-Heng Ku (TW) was elected to the IANA RC for a two-year term.
- Di Ma (CN) was elected unopposed to the NRO NC for a two-year term starting 1 January 2022. Nicole Chen was reappointed by the EC to the second NRO NC seat for a one-year term beginning 1 January 2022.

Quarterly 'Community Elected Leaders' meetings were held by the APNIC EC and elected representatives of the SIGs, IANA RC, NRO NC, members of APIX and APNOG, and Secretariat staff. Discussions covered community feedback on APNIC conferences, the online conference format, election procedures, the use of confer at OPMs and the online community platform trial.

apnic.net/sigs

RESOURCING

	Budget	Actual
FTE	1.52	1.37
Expenses	310,076	244,552
CAPEX	-	-

3D. Community Participation – continued

3D.2. Online participation

Visitor numbers to apnic.net peaked in September, with time on site at its highest point in July and August. The top five visitor economies were the United States, Hong Kong, India, China, and Australia.

Users consumed 4,013 hours of video content via APNIC's YouTube channel. Experimentation with paid information sharing campaigns on Facebook and Twitter helped increase Facebook reach by 13% (from 3 million to 3.4 million), and APNIC tweet engagement by 285% (from 63,749 to 245,337).

APNIC.NET WEBSITE VISITS

Unique Users   Sessions   Time spent on site (minutes:seconds)
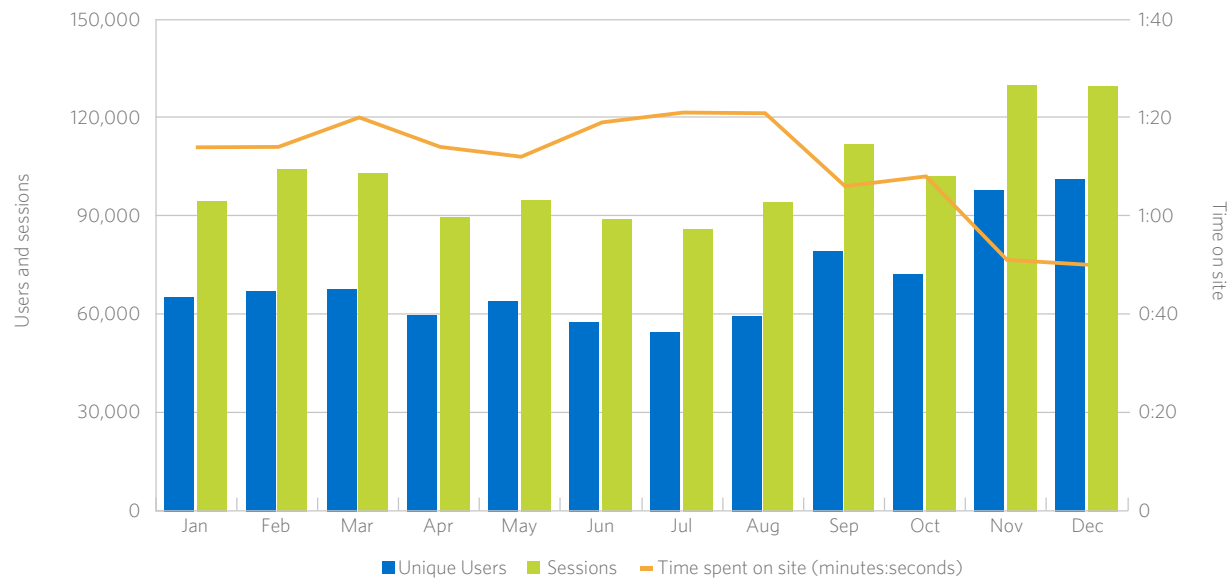
3D. **Community Participation** – continued

3D.3. Encouraging newcomers and diversity

APNIC presented and participated in the Diversity in Tech Panel session at APRICOT 2021/APNIC 51 and the Women in ICT session at APNIC 52. A NextGen Careers BoF was also held at APNIC 52. Thirty-seven percent of APNIC conference attendees were newcomers.

Following the elections at APNIC 52, two of the four SIG Chair positions and two of the six Co-Chair positions were held by females (previously, only one SIG leadership role was held by a female).

APNIC attracted 235 new Blog subscribers, 1,548 new Twitter followers, and 1,414 new LinkedIn followers.

An independent community survey on language understanding and translation was commissioned in August. The survey was provided in 11 languages and received 489 completed responses. Services identified by respondents as having the highest value – if available in local language – were training, conferences, and policy information.

3D. Community Participation – continued

SUCCESS MEASURES – 3D

Targets	Results	Status
Achieve 800 online SIG participants across two conferences	950 participants	●
Grow SIG mailing lists subscribers from 1,268 to 1,325	1,333 subscribers	●
Achieve 6,000 remote conference session views	8,145 views	●
Achieve attendance of 1,000 conference delegates across two conferences	1,558 attendees	●
Grow all-time Blog views from 2.6 million to 3.4 million	3.46 million	●
Increase 12-month tweet engagement from 60,000 to 62,000	234,929	●
Increase annual Facebook posts reach from 3 million to 3.2 million	3.4 million	●
Attract 400 newcomers to APNIC conferences	578 newcomers	●
Attract 125 new Blog email subscribers	235 new subscribers (total 1,235)	●
Grow Twitter followers from 12,100 to 13,250	13,763	●

3E. APNIC Academy

OPERATIONS

3E.1. Product management

The integration of Salesforce event management and training registration systems was completed. Training content on apnic.net was also migrated to the APNIC Academy website.

Note that additional investments in the training platform are covered in 3E.7 below.

3E.2. Instructor-led training

APNIC remained unable to deliver full face-to-face training due to COVID-19 restrictions (all but one instructor-led training session was remote). The training delivery team conducted 96 courses for 2,382 participants in a mix of online and 'hybrid' sessions. Twenty webinars were also delivered to 1,120 participants.

Two new courses on Network Management and Monitoring (NMM) and Network Automation were completed. Updates were also made to existing courses on Internet routing, IPv6 deployment, network security, and the RPKI/ROV lab guides.

RESOURCING

	Budget	Actual
FTE	10.80	8.07
Expenses	2,392,222	1,886,157
CAPEX	15,000	16,351

3E. **APNIC Academy** – continued

3E.3. Self-paced training ↻

The APNIC Academy added 5,428 new accounts, with 1,735 course completions (3,340 contact hours), and 6,070 labs launched.

A self-paced Routing Fundamentals course, containing 39 new topics and five hours of new learning material, was published to replace the existing Routing Basics course.

New virtual labs were added including Hashing (File Integrity), SSH (Secure Shell), DHCPv6-PD, Linux Basics, PGP (File and Email Security) and Using Suricata to Analyse Packet Captures. The RPKI Lab was updated.

academy.apnic.net/en

3E.4. Technical assistance ↻

Technical assistance was provided to 34 Members across 14 economies, including:

- DNSSEC troubleshooting with a Member in Samoa to solve email delivery issues.
- Proactive outreach and support to 18 network operators in the region to reduce invalid RPKI routes.
- IPv6 deployment support with network operators in India, Pakistan, Sri Lanka and Australia.
- Network design development and discussions with Members in Tonga and Kiribati, plus network consolidation discussions with a Member in Brunei.
- IXP training, setup and configuration for PKIX Lahore.

academy.apnic.net/en/technical-assistance

3E. **APNIC Academy** – continued

3E.5. RPKI awareness and deployment support

RPKI adoption in the APNIC region increased in 2021. The percentage of IPv4 address holders with ROAs grew from 24.4% to 36.1% in 12 months, while IPv6 address holders with ROAs increased from 17.3% to 22.3%.

ADDRESS HOLDERS WITH ROAS
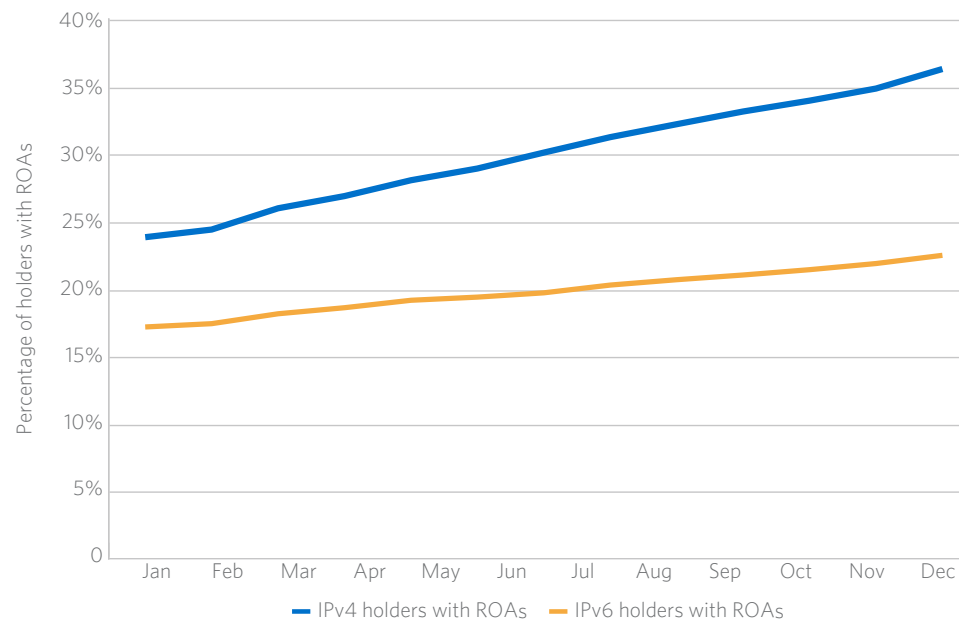
The amount of IPv4 addresses covered by ROAs grew from 21.4% to 28.8%, with IPv6 address space covered by ROAs increasing from 24.0% to 31.7%.

Eleven economies reached 90%+ IPv4 ROA coverage by the end of 2021: VU (92%), TO (96%), LK (94%), MN (99%), BT (96%), MV (99%), TO (95%), NP (94%), NU (100%), NR (92%), MH (90%).

3E. **APNIC Academy** – continued

In addition to technical assistance provided (see 3E.4), 18 RPKI training events were delivered. Five RPKI deployment case studies and 36 RPKI-tagged posts were published on the APNIC Blog, including six in support of the Internet Society's 'RPKI Week' promotion.

APNIC Labs released a ROA measurement tool (alongside the existing ROV measurement tool) to help monitor the progressive deployment of RPKI across the Internet.

www.apnic.net/rpki
stats.labs.apnic.net/roa
stats.labs.apnic.net/rpki

ADDRESSES AND ROUTES COVERED BY ROAs

— % IPv6 Routes   — % IPv6 Address   — % IPv4 Routes   — % IPv4 Address
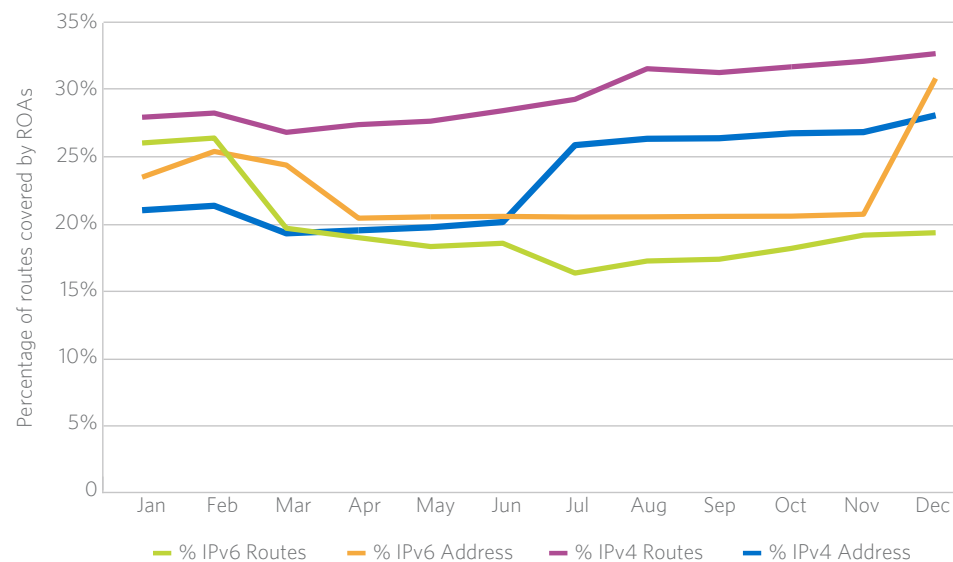
3E. **APNIC Academy** – continued

3E.6. IPv6 awareness and deployment support

IPv6 capability for the Asia Pacific region ended the year at 37.65%, as measured by APNIC Labs.

Seventeen IPv6 deployment focused training events were delivered, with three IPv6 deployment success stories and 23 IPv6 blog posts published.

www.apnic.net/ipv6

3E. APNIC Academy – continued

SUCCESS MEASURES – 3E

Targets	Results	Status
Migrate legacy training site information to APNIC Academy and decommission previous site	Completed	🟢
Develop a comprehensive curriculum of blended learning for future certification	Commencing in 2022	🔴
Develop two new/updated courses for instructor-led tutorials/workshops	2 new courses completed 3 courses updated with 7 new modules	🟢
Conduct 70 instructor-led tutorials/workshops across four sub-regions	96 tutorials/workshops delivered	🟢
Conduct 18 live webinars	20 webinars delivered	🟢
Publish four new/revised self-paced online courses	2 new courses completed 2 courses revised	🟢
Publish five new self-paced virtual labs (associated with multiple courses)	6 new labs delivered	🟢

3E. **APNIC Academy** – continued

SUCCESS MEASURES – 3E CONTINUED

Targets	Results	Status
Begin conducting technical assistance via the APNIC Academy online platform	Completed	●
Conduct eight RPKI/ROV focused instructor-led tutorials/workshops spread equally across sub-regions	18 completed	●
Achieve 90% ROA coverage for four additional economies	Completed	●
Publish four RPKI/ROA/ROV deployment case studies	5 published	●
Conduct eight IPv6 deployment focused instructor-led tutorials/workshops spread equally across sub-regions	17 done	●
Publish three IPv6 deployment case studies	3 published	●

3E. **APNIC Academy** – continued

INVESTMENTS

3E.7. Platform and curriculum development ➡️|

APNIC Academy development included extended translation support to online video-based courses, and the launch of the online Technical Assistance platform.

3E.8. Community Trainers network ➡️|

The number of active Community Trainers (CTs) was increased to 30. Twenty-eight CTs from 14 economies were engaged for 68 instructor-led online training events.

A new Retained CT model was created to provide dedicated on-the-ground training support, with recruitment begun.

2021 Investment	Member Benefit
APNIC Academy development	Improved access to training and technical assistance. Improved technical capacity in the APNIC region.
Status: **Ongoing**	

Community Trainers network	Local support for APNIC training and technical assistance. Increased instructor led APNIC training in targeted economies. Options for training in local language and improved translation support for training content.
Status: **Ongoing**	

3E. APNIC Academy – continued

3E.9. Curriculum for non-technical audiences ➡️|

A team of instructional designers was appointed in May to develop an online educational game to help young, non-technical, Internet governance enthusiasts to better understand how the Internet works and inspire their involvement and participation in the Internet ecosystem.

A procurement process was established to select a game developer through a tender process, and three workshops and four consultations with target audience groups were conducted. The game developers are expected to release a minimum viable product in the first half of 2022.

2021 Investment	Member Benefit
Curriculum for non-technical audiences	More informed government decision-making on issues that impact Internet operations. Better prepared fellows for APNIC conference participation. More meaningful engagements with non-technical audiences.

Status: **Ongoing**

3F. Internet Infrastructure Deployment

OPERATIONS

3F.1. Internet infrastructure deployment

Training and IXP setup/configuration support was completed for the new Pakistan IX in Lahore in September.

Operating principles and high-level design work was completed with MV IX in the Maldives, with deployment to continue in 2022 when equipment arrives. Support was also provided to the planned upgrade of Fiji IX, and assistance was given to Bhutan IX to implement ROV on their route server.

Challenges in sourcing hardware replacements for seven disconnected RIPE Atlas anchor hosts led to APNIC testing software anchors on mini servers as an alternative. It is hoped this will allow resolution in 2022.

Root server deployment focused on the M-root project (see 3F.3).

RESOURCING

	Budget	Actual
FTE	0.76	1.03
Expenses	551,384	379,668
CAPEX	60,000	1,231

3F. Internet Infrastructure Deployment - continued

3F.2. Community Honeynet and Security Threat Sharing Platform

The Community Honeynet project was expanded with the addition of five new partners, including three from the APNIC region (Tonga, Bangladesh, and the Philippines).

Feeds from the honeynet dataset were created for consumption by instances of the MISP threat sharing platform, and shared with various national CERTs, the ShadowServer Foundation, and APNIC's DASH service.

Eight engagements were held with communities in Bhutan, Mongolia, Taiwan, Nepal, Timor Leste, Tonga and Fiji on honeynet and threat sharing, with two webinars on Practical Threat Hunting delivered via the APNIC Academy.

Content for the 'Introduction to Suricata Intrusion Detection System' training course was also developed based on the honeynet datasets.

3F. Internet Infrastructure Deployment - continued

SUCCESS MEASURES – 3F

Targets	Results	Status
Support deployment of at least two new or upgraded IXPs	1 deployed 1 in progress	🟡
Support four additional IXPs to deploy RPKI/ROV on their route servers	1 deployed 1 in progress	🔴
Deploy or upgrade four RIPE Atlas anchors at various networks	0 deployed 7 in progress	🔴
Deploy 12 new root server instances	1 deployed 11 in progress (see 3F.3)	🔴
Increase Community Honeynet partners from 10 to 15	15 partners	🟢

3F. **Internet Infrastructure Deployment** - continued

INVESTMENTS

3F.3. M-root anycast instance deployment ➔|

Deployment of the M-root instance in Hanoi was completed in collaboration with the WIDE Project and JPRS.

Deployment of servers in 11 locations (Guam, Kaohsiung, Manila, Dhaka, Kuala Lumpur, Bangkok, Jakarta, Ulaanbaatar, Kathmandu, Mumbai, and Singapore) progressed, however equipment delivery delays prevented progress. Deployment in these locations will be completed in 2022 upon equipment delivery.

2021 Investment	Member Benefit
M-root anycast instance deployment	Faster and more reliable DNS service. Faster and easier deployment of root DNS anycast instances at desirable or underserved locations.
Status: Ongoing	

4. INFORMATION

OBJECTIVE

Support Internet development with needed network information services, and research outcomes which are of demonstrated value to the community.

WORKSTREAMS

4A. Information Products
4B. Research and Analysis

INFORMATION - SUMMARY

	Budget	Actual
FTE	6.54	10.31
Expenses	1,784,352	2,002,601
CAPEX	80,000	62,532

4A. Information Products

OPERATIONS

4A.1. APNIC Blog

The APNIC Blog averaged 68,721 unique views per month in 2021, a 6.1% increase on 2020's monthly average of 64,778. The Blog passed the milestone of 3 million views (all-time) in June.

There were 179 Guest Posts, representing 56% of total opinion posts (in line 2020). 'Related articles' functionality was added to the Blog in June.

A new APNIC podcast, 'PING', was launched in October, with the first five episodes attracting 648 downloads. PING will focus on Internet research and interview researchers and experts from around the world, with episodes to be published fortnightly.

blog.apnic.net

BLOG VIEWS
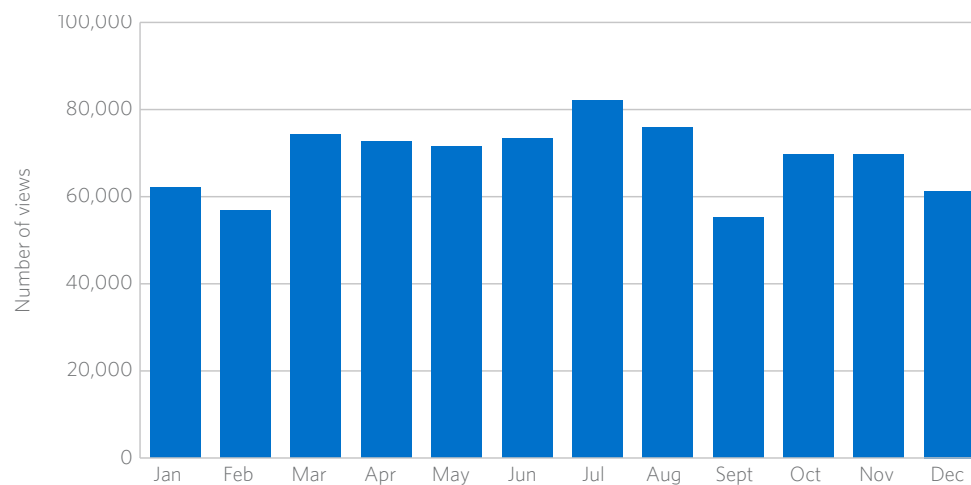
RESOURCING

	Budget	Actual
FTE	5.52	9.31
Expenses	985,151	1,254,806
CAPEX	–	–

4A. Information Products – continued

4A.2. Information product management

The Internet Directory was renamed Resource Explorer (REx) and updated with better support for new users, a new information architecture, and other UX improvements. An awareness campaign in October generated a significant increase in usage.

rex.apnic.net

Updates to DASH included a recurring reports feature, to allow users to receive PDF reports by email at their chosen frequency; implementation of new empty states to improve usability; and performance and reliability improvements. An 'Identifying suspicious traffic with DASH' webinar was delivered to 45 attendees from 20 economies to increase community awareness of the product.

dash.apnic.net

A new 'Experimental' tab for NetOX was created for widgets to allow users to trial new features before they are adopted. Stability and performance improvements were deployed in the backend.

netox.apnic.net

MONTHLY NUMBER OF USERS
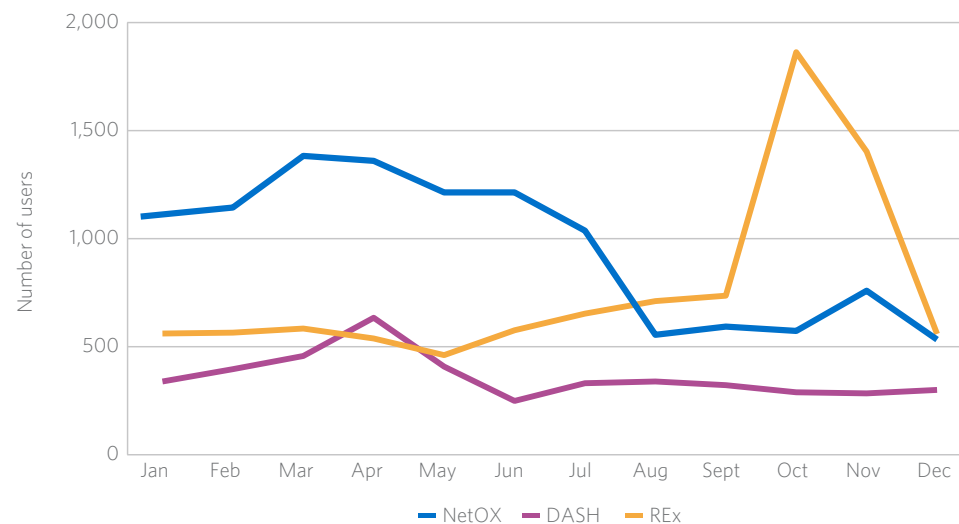
4A. Information Products – continued

SUCCESS MEASURES – 4A

Targets	Results	Status
Grow all-time Blog views from 2.6 million to 3.4 million	3.46 million	🟢
Average 64,000 Blog views per month	68,721 views/month	🟢
Maintain Blog Guest Post ratio between 45-65%	56%	🟢
Reach an average of 400 users per month to NetOX and DASH, and of 700 users per month to REx	980 NetOX 365 DASH 826 REx	🟠
Achieve a net promoter score (NPS) of 80+ for all products	68 NetOX 68 DASH 59 REx	🔴
Achieve a usability score of at least 4.5/5 for all products	4.4 NetOX 4.5 DASH 4.4 REx	🟠

4B. Research and Analysis

OPERATIONS

4B.1. Conducting research and measurements

APNIC Labs research activities included:

- New measurements on the use of IPv6 as a transport protocol for the DNS and IPv6 Extension Header handling, including fragmentation.
- Analysis of IPv4 and IPv6 advertised, unadvertised and reserved address pools over time.
- Reporting on the annual state of BGP, and further development of routing bogon and CIDR reports, as input to ISOC MANRS. Work continued on automated BGP anomaly detection.
- Development of an RPKI ROA monitor to help measure progressive deployment of RPKI.
- Research analysing of the handling of large DNS responses, adoption of DOH, and DNS query patterns.
- Measurement of QUIC usage following the release of beta software that adds QUIC support to NGINX servers.
- Publishing 43 blog articles covering research findings, analysis of trust infrastructure, and commentary on new Internet technologies. Three podcasts were also recorded.

labs.apnic.net

RESOURCING

	Budget	Actual
FTE	1.02	1.00
Expenses	799,201	747,795
CAPEX	80,000	62,532

4B. Research and Analysis – continued

4B.2. Cooperative research

APNIC entered into a cooperative research program with ISOC in support of MANRS, providing a feed of routing data. As part of an agreement with ICANN, work continued on the measurement framework for ITHI.

Research collaboration also continued with Cloudflare.

4B.3. Sharing research outcomes

Forty-one presentations on research findings were shared at technical forums globally.

4B. Research and Analysis – continued

SUCCESS MEASURES – 4B

Targets	Results	Status
Twelve research articles and reports published	43 articles	●
Conduct cooperative research with organizations such as CloudFlare, ICANN, RIPE NCC and others	3 collaborative research projects	●
Ten research presentations delivered	41 presentations	●
At least two research presentations at APNIC conferences	6 presentations	●

5. CAPABILITY
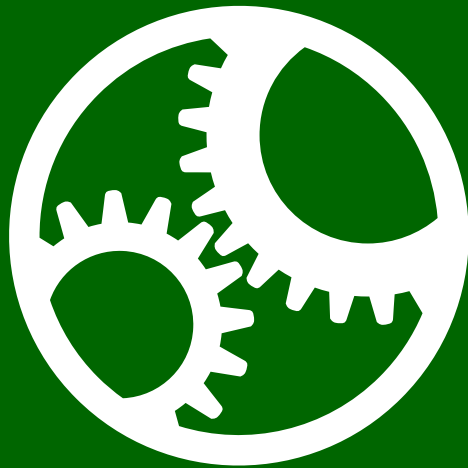
OBJECTIVES

Sustain a healthy and resilient organization.
Develop a strong service culture driven by people committed to APNIC's vision and values.
Provide stable and secure technical infrastructure to support APNIC operations and services.

WORKSTREAMS

5A. Internal Technical Infrastructure
5B. Finance and Business Services
5C. Employee Experience
5D. Governance

CAPABILITY - SUMMARY

	Budget	Actual
FTE	23.75	33.88
Expenses	7,190,675	8,029,100
CAPEX	2,543,200	400,222

5A. Internal Technical Infrastructure

OPERATIONS

5A.1. Architecture and technical coordination

OpenAPI was adopted to describe internal APIs, with dependencies between products and components managed using APIs and architectural documentation.

Dependency management tooling (Dependabot) was deployed to ensure systems remain current, and its use will expand as part of the regular system maintenance cycle.

Rust was adopted as a supported language for APNIC product development. The Information Product team used Rust to achieve lower memory footprint deployments than with Java or Python, with strong static safety checks.

5A.2. Network and infrastructure operations

Connectivity from Brisbane to HKIX (via PCCW) was completed, with a shared Point of Presence (PoP) in the Singapore SG1 data centre established for critical APNIC services and an M-root global anycast node.

APNIC signed up to the NextDC carbon offset program to offset 100% of the carbon emissions generated by the Brisbane data centre.

A new service status page was also created to display the real-time operational status of APNIC's services.

RESOURCING

	Budget	Actual
FTE	6.20	14.78
Expenses	1,903,032	2,472,811
CAPEX	353,200	390,978

5A. Internal Technical Infrastructure – continued

5A.3. System and platform operations

Initiatives to improve online service performance, stability and availability included:

- Completing the migration of the DNSSEC signer from Secure64 to Knot.
- Updating the APNIC Academy site to use Cloudflare.
- Deploying RDNS anycast nodes in Hong Kong, Mexico, Toronto, and London.
- Deploying a whois node in the KDDI data centre in Tokyo.
- Completing an upgrade of the secured centralized logging system to an open-source log collector for each host to send logs via secure TLS channels.
- Completing the upgrade of the on-premises Kubernetes test cluster, virtual machine environment hosts, and management server.
- Replacing aging network storage with two new high performance storage arrays to two separate data centres.
- Reconfiguring the new Hardware Security Module (HSM) to provide high availability service to RPKI, allowing data centre failover.
- Upgrading the community mailing list interface to Mailman 3 to support all external mailing list services.

Core system uptime	
FTP	100%
MyAPNIC	99.99%
RDNS	100%
RDNS DNSSEC Validity	100%
Whois	99.99%
RPKI	99.99%
RDAP	99.99%

Average data centre bandwidth usage (Mbps)	
AU edge inbound	99.3
AU edge outbound	280
JP edge inbound	21.9
JP edge outbound	65

Average query rates (per second)	
Whois	430
RDAP	92
RDNS	18,600
RPKI (RSYNC and RRDP)	99.10
FTP	2.47
MyAPNIC	0.53

5A. Internal Technical Infrastructure – continued

5A.4. Internal security operations

The Vulnerability Reporting Program generated 52 unique and verified vulnerability reports from external security researchers in 2021. Forty vulnerabilities were resolved, with seven still in progress within the 90-day period. Unresolved vulnerabilities outside of the 90 days are being addressed as part of larger upgrade projects.

HackerOne was selected to perform triage of newly reported vulnerabilities and continuous penetration testing to replace single annual tests commissioned in previous years.

Rapid7 was deployed on workstations, servers and network equipment for vulnerability scanning and Security Information and Event Management (SIEM).

The Acceptable Use and Bring Your Own Device policies were reviewed and updated. Online fraud training was completed with finance and services staff.

Policies and procedures that align with ISO 27001 were updated, and a gap analysis conducted in November indicated APNIC is ready to seek certification in 2022.

5A.5. Enterprise application management

New contract management software, device management systems, and CRM backup technology was implemented.

The APNIC office telephone system was migrated to Zoom phone and Zoom Room technology was deployed to meeting rooms.

5A. Internal Technical Infrastructure – continued

SUCCESS MEASURES – 5A

Targets	Results	Status
Complete review of testing environment and practices	Completed	🟢
Complete quarterly data centre failover tests	4 out of 4 completed	🟢
Maintain availability of 99.99% for critical APNIC services and 99.95% for less-critical services	99.99% and 99.98%	🟢
Develop strategy for cloud and interconnection	Draft completed	🟢
Complete service migration to cloud for six services/websites	Completed	🟢
Achieve readiness for ISO27001 certification	Gap analysis completed	🟢
Track and resolve all vulnerability reports within 90 days	40 out of 52 reports resolved (7 in progress, 5 missed target)	🟠
CRM roadmap established	Completed	🟢

5A. Internal Technical Infrastructure – continued

INVESTMENTS

5A.6. Product platform development →|

A new Single Sign-On (SSO) architecture to cover all online services was developed during 2021. Deployment was deferred from December to March 2022 to avoid disruption to APRICOT registration.

2021 Investment	Member Benefit
Further development of infrastructure and services platforms common to APNIC products to streamline product development, integration and consistency	Standardized user experience across products. Faster access to new products and services. Improved maintenance of online infrastructure to reduce operational risk.

Status: **Ongoing**

5B. Finance and Business Services

OPERATIONS

5B.1. Knowledge management

A new staff intranet was launched in December.

5B.2. Financial services

Monthly forecasting was initiated to track income and expenses to identify variations to budget caused by COVID-19 restrictions.

New accounting procedures were developed to manage APNIC Foundation-funded projects, with implementation support provided to the Foundation for its new ERP system.

The annual audit of the 2020 financial accounts was completed by Deloitte and presented to the EC at APNIC 51.

5B.3. Business services

An external surveillance audit of APNIC's ISO9001:2016 quality management system was completed successfully in August.

A project to digitize legacy paper membership forms was completed at the end of March to improve access for services and finance teams.

RESOURCING

	Budget	Actual
FTE	10.14	11.45
Expenses	2,207,847	2,353,479
CAPEX	30,000	9,244

5B. Finance and Business Services – continued

5B.4. Data governance and business intelligence

Reporting functions in APNIC's legacy business intelligence system (O3) were replicated into a new system based on Tableau. Additional software platforms were also implemented to improve the production of charts.

Development of an APNIC-wide data model and data dictionary is underway and scheduled for completion in 2022.

Data warehouse methodologies and tools were investigated and tested, with a priority on scaling and compatibility with industry standards. Basic membership and resource details were loaded into the data warehouse and transformed for Tableau visualizations.

5B. **Finance and Business Services** – continued

SUCCESS MEASURES – 5B

Targets	Results	Status
Successful implementation of internal knowledge management tools with increased user satisfaction and experience	Completed	🟢
Achieve a successful audit of APNIC's annual financial accounts	Completed	🟢
Complete annual ISO Quality management compliance audit successfully	Completed	🟢
Undertake quarterly BCP scenario testing	Completed	🟢
Complete APNIC-wide data model and data dictionary	70% complete	🔴
Generate all Secretariat report data/charts from BI system	20% complete	🔴

5C. Employee Experience

OPERATIONS

5C.1. Organizational development

The executive and leadership teams participated in a regular leadership webinar program provided by external coaches.

A new goal setting process was established to clearly link individual goals to organizational goals and improve goal progress monitoring.

A monthly agile leaders forum was created for continuous learning and development.

5C.2. Work environment management

With COVID-19 restrictions changing regularly, a hybrid working environment of office access and work from home arrangements was maintained.

An updated travel health policy was developed to encompass COVID health risks and insurance implications.

RESOURCING

	Budget	Actual
FTE	4.65	5.69
Expenses	1,945,989	2,137,539
CAPEX	2,160,000	0

5C. Employee Experience – continued

5C.3. Talent attraction and retention

Twenty permanent roles (including two new Directors for the Services and Finance areas) and five casual roles were filled. Nine contractors and six Community Trainers were also engaged.

Support was provided to recruit four operations staff for the APNIC Foundation.

5C.4. People operations management

Hybrid working principles were developed for staff to combine remote and office work and maximize engagement and effectiveness.

Emergency leave was introduced for staff to access when childcare was impacted by COVID restrictions, and for COVID testing and vaccinations.

5C. **Employee Experience** – continued

SUCCESS MEASURES – 5C

Targets	Results	Status
Strategic goals clearly cascade to individual performance measures in performance management system in 2021	Completed	🟢
Deploy agile work practices across the organization	76% complete	🔴
No WHS incidents caused by APNIC's local or remote work environments — zero fault incident reports	3 incidents – none caused by APNIC	🟢
Maintain staff turnover rate within acceptable benchmarks of 5-15%	4.8 % turnover	🟢
Training budget is 100% allocated and distributed across the organization	50% spent	🔴
All HR policies, in particular, hybrid work, parental leave and travel safety policies, reflect best practice	Completed	🟢

5C. **Employee Experience** – continued

INVESTMENTS

5C.5. Agile APNIC ➡|

Seventy-six percent of teams adopted appropriate Agile practices for the management of their work. The remaining teams will complete adoption by March 2022.

5C.6. People management portal ➡|

Implementation of the Sage People human resources portal is in progress. The Core HR module was launched in September and Compensation Management was launched in December. Performance and Recruitment modules are undergoing UAT, for completion in January 2022.

5C.7. APNIC workspace remodelling ➡|

An architectural and structural review of the current office building in South Brisbane indicated it could be extended to seat 140 staff, but at significant cost. It also concluded that significant capital improvement is not financially viable due to the limited future potential of the building itself.

APNIC staff reviewed several alternative office locations, for a potential relocation within two to three years.

A study of the current workspace use was completed to assist with short-term remodelling that may be undertaken, as well as longer term requirements for alternative office location in future.

2021 Investment	Member Benefit
Agile APNIC	A focus on continuously improving operations and performance.
Status: **Ongoing**	
People management portal	Improved reporting on HR analytics. Reduced HR administration to focus instead on improvement initiatives.
Status: **Ongoing**	
APNIC workspace remodelling	Improved organizational flexibility and productivity. Allows full benefits of a distributed workforce.
Status: **Ongoing**	

5D. Governance

OPERATIONS

5D.1. Executive Council (EC) support

Feng Leng was elected to the APNIC EC for the first time at APNIC 51, with Gaurab Raj Upadhaya, Kenny Huang, and Yoshinobu Matsuzaki re-elected to the EC, for two-year terms.

Four EC meetings were held. The Annual EC satisfaction survey indicated a high level of satisfaction with the support provided by the APNIC Secretariat.

5D.2. Corporate governance and legal

The Strategic Risk Register was maintained and presented to the EC quarterly for review.

RESOURCING

	Budget	Actual
FTE	2.76	1.96
Expenses	1,133,807	1,065,271
CAPEX	-	-

5D. Governance – continued

SUCCESS MEASURES – 5D

Targets	Results	Status
Achieve a high level of satisfaction from a survey of EC members	Completed	🟢
Quarterly Strategic Risk Register updated and reviewed	Completed	🟢

2021 FINANCIAL REPORT BY ACTIVITY

Activity	FTE			CAPEX			OPEX		
	Actual 2021	Budget 2021	Variance	Actual (AUD) 2021	Budget (AUD) 2021	Variance (AUD)	Actual (AUD) 2021	Budget (AUD) 2021	Variance (AUD)
Member Services	9.51	8.58	0.93	7,935	0	7,935	2,219,361	2,253,270	-33,909
Membership Products	9.25	12.28	-3.03	0	0	0	1,856,909	2,473,335	-616,426
Membership Reporting	1.12	1.56	-0.44	0	0	0	619,054	715,263	-96,209
Membership - Total	**19.88**	**22.42**	**-2.54**	**7,935**	**0**	**7,935**	**4,695,325**	**5,441,868**	**-746,543**
Registration Services	4.89	4.53	0.36	0	0	0	890,233	842,899	47,334
Registry Products	6.18	9.04	-2.86	0	0	0	1,831,592	2,580,512	-748,920
Policy Development	0.64	0.64	0.00	0	0	0	442,384	545,263	-102,879
Registry - Total	**11.71**	**14.21**	**-2.50**	**0**	**0**	**0**	**3,164,209**	**3,968,674**	**-804,465**
APNIC Conferences	4.75	5.04	-0.29	4,296	43,150	-38,854	930,345	1,466,163	-535,818
Foundation Support	1.24	1.58	-0.34	0	0	0	76,428	571,518	-495,090
Community Engagement	4.46	6.38	-1.92	0	0	0	1,410,868	1,826,724	-415,856
Community Participation	1.37	1.52	-0.15	0	0	0	244,552	310,076	-65,524
APNIC Academy	8.07	10.80	-2.73	16,351	15,000	1,351	1,886,157	2,392,222	-506,065
Internet Infrastructure Support	1.03	0.76	0.27	1,231	60,000	-58,769	379,668	551,384	-171,717
Development - Total	**20.92**	**26.08**	**-5.16**	**21,878**	**118,150**	**-96,272**	**4,928,017**	**7,118,088**	**-2,190,071**
Information Products	9.31	5.52	3.79	0	0	0	1,254,806	985,151	269,655
Research and Analysis	1.00	1.02	-0.02	62,532	80,000	-17,468	747,795	799,201	-51,405
Information - Total	**10.31**	**6.54**	**3.77**	**62,532**	**80,000**	**-17,468**	**2,002,601**	**1,784,352**	**218,249**
Internal Technical Infrastructure	14.78	6.20	8.58	390,978	353,200	37,778	2,472,811	1,903,032	569,779
Finance and Business Services	11.45	10.14	1.31	9,244	30,000	-20,756	2,353,479	2,207,847	145,632
Employee Experience	5.69	4.65	1.04	0	2,160,000	-2,160,000	2,137,539	1,945,989	191,550
Governance	1.96	2.76	-0.80	0	0	0	1,065,271	1,133,807	-68,536
Capability - Total	**33.88**	**23.75**	**10.13**	**400,222**	**2,543,200**	**-2,142,978**	**8,029,100**	**7,190,675**	**838,425**
Total	**96.70**	**93.00**	**3.70**	**492,566**	**2,741,350**	**-2,248,784**	**22,819,252**	**25,503,657**	**-2,684,404**

Note: Some numbers presented in this chart may not add up precisely to the totals provided due to rounding.

STATEMENT OF FINANCIAL POSITION

For a better understanding of APNIC Pty Ltd's financial position and performance, as represented by the results of its operations for the financial year ended 31 December 2020, the statement of financial position, and statement of income, should be read in conjunction with the annual statutory financial report and the audit report contained therein.

Assets

	2021 (AUD)	2020 (AUD)	% change
Current assets			
Cash and cash equivalents	7,065,707	7,081,222	0%
Trade and other receivables	5,340,114	5,356,419	0%
Other current assets	973,041	780,654	25%
Total current assets	**13,378,862**	**13,218,295**	**1%**
Non-current assets			
Financial assets	36,728,127	31,036,408	18%
Property, plant and equipment	6,726,988	6,948,694	-3%
Total non-current assets	**43,455,115**	**37,985,102**	**14%**
Total assets	**56,833,977**	**51,203,397**	**11%**

Liabilities

	2021 (AUD)	2020 (AUD)	% change
Current liabilities			
Trade and other payables	1,535,635	1,369,013	12%
Employee benefit liabilities	2,700,030	2,233,396	21%
Unearned revenue	12,243,100	11,885,376	3%
Total current liabilities	**16,478,765**	**15,487,785**	**6%**
Non-current liabilities			
Deferred tax liabilities	1,126,296	1,131,984	-1%
Employee benefit liabilities	383,353	406,744	-6%
Total non-current liabilities	**1,509,649**	**1,538,728**	**-2%**
Total liabilities	**17,988,414**	**17,026,513**	**6%**
Net assets	**38,845,563**	**34,176,884**	**14%**

Equity

	2021 (AUD)	2020 (AUD)	% change
Contributed equity	1	1	0%
Retained earnings	38,845,562	34,176,883	14%
Total equity	**38,845,563**	**34,176,884**	**14%**

STATEMENT OF INCOME

Revenue	2021 (AUD)	2020 (AUD)	% change
Membership fees	24,252,513	22,766,728	7%
Non-member fees	257,209	260,483	-1%
Reactivation fees	22,400	18,400	22%
Sign-Up fees	302,750	347,250	-13%
Transfer fees	244,156	216,016	13%
Sundry income	444,336	534,307	-17%
Foreign exchange gain/ (loss)	32,136	-72,448	-144%
Operating revenue	**25,555,500**	**24,070,736**	**6%**
Investment income	865,457	924,590	-6%
Total revenue	**26,420,957**	**24,995,326**	**6%**

Expenses			
Communication expenses	634,015	697,060	-9%
Computer expenses	1,514,824	1,216,809	24%
Contribution to APNIC Foundation	0	760,890	-100%
Contribution to ICANN	197,515	223,432	-12%
Depreciation expense	652,409	707,658	-8%
Meeting and training expenses	88,786	135,335	-34%
Office operating expenses	367,000	290,543	26%
Professional fees	2,212,253	1,932,613	14%
Salaries and personnel expenses	15,707,940	14,070,813	12%
Sponsorship and publicity expenses	315,397	437,724	-28%
Travel expenses	65,455	331,259	-80%
Other operating expenses	1,063,656	978,134	9%
Total expenses	**22,819,250**	**21,782,270**	**5%**

Operating surplus			
Surplus before tax and fair value gain on financial assets	**3,601,707**	**3,213,056**	**12%**
Fair value gain on financial assets at fair value through profit or loss	1,061,285	650,379	63%
Surplus before income tax	**4,662,992**	**3,863,435**	**21%**
Income tax expense	5,687	-411,255	-101%
Surplus for the year	**4,668,679**	**3,452,180**	**35%**

CASH FLOW STATEMENT

	2021 (AUD)	2020 (AUD)	% change
Cash flows from operating activities			
Receipts from customers	25,549,754	24,574,280	4%
Payments to suppliers and employees	-19,556,837	-19,250,306	11%
Interest received	46,080	70,754	-35%
Net cash inflow from operating activities	**4,221,434**	**5,394,728**	**-22%**
Cash flows from investing activities			
Investment distribution income	828,161	853,836	-3%
Payments for property, plant and equipment	-442,940	-517,273	-14%
Proceeds from sale of property, plant and equipment	8,264	4,811	72%
Purchase of available-for-sale financial assets	-4,630,434	-2,683,188	73%
Net cash /outflow from investing activities	**-4,236,949**	**-2,341,814**	**81%**
Net increase/decrease in cash and cash equivalents	**-15,515**	**3,052,914**	**-101%**
Cash and cash equivalents at the beginning of the year	7,081,222	4,028,308	76%
Cash and cash equivalents at the end of year	**7,065,707**	**7,081,222**	**0%**

Supporters

APNIC acknowledges and thanks the following organizations for their generous support for APNIC conferences and training events.

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Appendix: Events attended in 2021

The following is the list of events in which APNIC staff participated. A star (★) indicates events where APNIC provided sponsorship

JANUARY	Economy	Engagement type
Webinar: Practical Threat Information Sharing	AP	Training
Live eTutorial: Segment Routing	TW	Training
MMNOG 4 (2021)	MM	NOG
CWG-Internet Open Consultation	CH	Internet Governance
Live eTutorial: Network Security	Oceania	Training
Live eTutorial: IPv6 Deployment	South Asia	Training
Live eTutorial: Securing Internet Routing with RPKI	Oceania	Training
Live eTutorial: Network Security	South Asia	Training
JANOG 47 ★	JP	NOG
3rd International Cyber Resilience Conference (CRC)	MY	Security
SANOG 36	NP	NOG
3rd Meeting of ITU TDAG WG on WTDC Resolutions	CH	Government
2021 TPRE (Trans-Pacific RandE) Virtual Meeting	US	Development
SANOG: Securing Internet Routing tutorial (RPKI/ROV implementation)	NP	Training
Outreach/TA - TashiCell	BT	Training
IBCAST 2021 Pakistan	PK	Security
Live eTutorial: Securing Internet Routing with RPKI	East Asia	Training
Live eTutorial: IPv6 Deployment	East Asia	Training
PTC '21	US	Development

FEBRUARY	Economy	Engagement type
APEC TEL 62 DSG Meeting	NZ	Government
1st IGF 2021 Open Consultations and MAG Meeting	CH	Internet Governance
APRICOT 2021/APNIC 51	AP	APNIC, Training
Live eTutorial: Cryptography Fundamentals	East Asia	Training
NDSS Symposium 2021	US	Technical
Live eTutorial: DNS Fundamentals	South East Asia	Training
Samoa Cyber Security Week	WS	Security
Live eWorkshop: Securing Internet Routing with RPKI	PK	Training

	Economy	Engagement type
MANRS Tech Talk with Tashi Phuntsho	AU	Technical
Live eTutorial: IPv6 Transition Techniques	PK	Training
Live eTutorial: Secure Internet Routing	PK	Training
APAN 51	PK	Development
NANOG 81	US	NOG
Live eTutorial: Securing Internet Routing with RPKI	IN	Training
Outreach/TA - u-blox Lahore Pvt Ltd	PK	Training
Outreach/TA - Bank Alfalah Limited	PK	Training
Outreach/TA - Pakistan Software Export Board	PK	Training
Outreach/TA - Interwood Mobel Pvt Ltd	PK	Training
Outreach/TA - National Telecommunication Corporation	PK	Training
Outreach/TA - i2c inc	PK	Training
Outreach/TA - CubeXS Pvt Ltd	PK	Training
Outreach/TA - IJ Internet Services (PVT.) Limited	PK	Training
Outreach/TA - Pakistan Petroleum Limited	PK	Training
Live eTutorial: DNS Fundamentals	Oceania	Training
Live eTutorial: IS-IS Operations	East Asia	Training
Live eTutorial: OSPF Operations	South Asia	Training
Live eTutorial: IPv6 Architecture & Address Planning	South Asia	Training
Live eTutorial: BGP Fundamentals	South Asia	Training
FIRST Regional Lightning Talk Session	JP	CERT engagement
Live eWorkshop: Introduction to SDN	IN	Training
DNS-OARC 34 Workshop	US	Technical
Live eTutorial: OSPF Operations	South East Asia	Training
Webinar: Single Sign On (SSO) for Remote Workforce	AP	Training
Live eTutorial: Cryptography Fundamentals	Oceania	Training
Live eTutorial: IS-IS Operations	Oceania	Training

	Economy	Engagement type
Live eTutorial: BGP Fundamentals	East Asia	Training
APT WTDC21-2 Preparatory Meeting	TH	Government
Live eTutorial: IPv6 Architecture & Address Planning	East Asia	Training
Webinar: Internet Resource Management	AP	Training
Informal Experts Group on WTPF-21	CH	Government
APRICOT: Live eTutorial: ROA/RPKI	PH	Training
Root Server System (RSS) Information Sharing	AP	Development
APNIC EC Meeting - 22 Feb 2021	AU	Other
bdNOG Policy Discussion for APNIC 51	BD	Member Outreach

MARCH

	Economy	Engagement type
APEC TEL 62 SPSG Meeting	NZ	Government
Internet & Jurisdiction Policy Network Toolkit Lounge	FR	Internet Governance
BrisSEC21	AU	Security
Live eTutorial: Securing Internet Routing with RPKI	South Asia	Training
CrikeyCon VII ★	AU	Security
ICANN 70	MX	Coordination
IETF 110	CZ	Technical
IPv6 Deployment (Intensive) - Vanuatu - Pacific Technical Training Project	VU	Training
APEC TEL 62 Plenary	NZ	Government
ITU RPM-ASP WTDC-21	TH	Government
Live eTutorial: Securing Internet Routing with RPKI	IN	Training
Live eTutorial: MPLS Fundamentals	South East Asia	Training
Live eTutorial: 464XLAT	South East Asia	Training
Live eTutorial: Packet Analysis	South East Asia	Training
ITU 1st Interregional Meeting for WTDC-21	CH	Government
Live eTutorial: DNSSEC	AU	Training
Live eTutorial: Multihoming	AU	Training
Outreach/TA - Optus	AU	Training
Webinar: Identifying Suspicious Traffic with DASH	AP	Training
ITU-T Study Group 13 Meeting 2021	CH	Government
Live eTutorial: Securing Internet Routing with RPKI	CN	Training
ROA workshop with PH cable operators	PH	Member Outreach
OECD - 3rd Session of the Working Party on Security in the Digital Economy	FR	Government

APRIL

	Economy	Engagement type
Live eTutorial: MPLS Fundamentals	East Asia	Training
Live eTutorial: BGP OpSec BCP	South Asia	Training
Live eTutorial: DNSSEC Fundamentals	South Asia	Training
Live eTutorial: BGP TE Techniques	Oceania	Training
Live eTutorial: 464XLAT	South Asia	Training
Live eTutorial: Packet Analysis	Oceania	Training
bdSIG 2021 ★	BD	Internet Governance
Webinar: OTT – Challenges and Technical Evolution	AP	Training
ARIN 47	US	Coordination
5th Meeting of ITU TDAG WG on WTDC Resolutions	CH	Government
MPLS - Fiji - Pacific Technical Training Project	FJ	Training
Outreach/TA - Globe Telecom	PH	Training
HKIGF 2021 (Internet Censorship)	HK	Internet Governance
SWITCHSEA Welcome Event	AP	Foundation Projects
PITA Exposition & Business Forum	FJ	Membership Development
35th TWNIC IP OPM	TW	NIR Engagement
2nd ICANN APAC-TWNIC Engagement Forum 2021	TW	NIR Engagement
PCTA e-Tech Show (Convention) 2021	PH	Membership Development, Training
Live eTutorial: Introduction to Suricata Intrusion Detection System	South Asia	Training
Webinar: Demystifying ASO	AP	Training
PNG 2021 ICT Summit and Expo	PG	Technical
IPv6 Deployment live eTutorial	CN	Training
Tabletop Exercises for FIRST Fellowship Teams	Global	CERT Engagement
Securing Internet Routing with Resource Key Public Infrastructure (RPKI) - PCTA	PH	Training
Webinar: Datacentre Power Systems and solutions	AP	Training
Talk: Securing the Internet Routing	PH	Security
FIRST Cyber Threat Intelligence (CTI) Summit 2021	US	CERT Engagement
Connectivity Capital Deep Dive: Hybrid Fiber/RF for Creative Deployments	US	Foundation Engagement
Marshall Center APCSS 2021	DE	Government

MAY

	Economy	Engagement type
APNIC 52 Online Fellowships - IPv6 Fundamentals	AU	APNIC, Training
APNIC 52 Online Fellowships - Network Security Fundamentals	AU	APNIC, Training
Webinar: What to Expect in a Cyber Security Assessment	AP	Training
BKNIX Peering Forum 2021 ★	TH	Development
APT WTDC21-3 Preparatory Meeting	AP	Government
WSIS Forum 2021	CH	Internet Governance
WTPF 2021 (ITU World Telecommunication/ICT Policy Forum)	CH	Government
ThaiNOG 3 ★	TH	NOG, Training
28th Meeting of the ITU Telecommunication Development Advisory Group (TDAG-21)	CH	Government
LACNIC 35	MX	Coordination
RIPE 82	DE	Coordination
NZNOG 2021	NZ	NOG
ITU 2nd Interregional Meeting for WTDC-21	CH	Government
Digital Transformation - Opportunities for The Downs & South West Region (ACS)	AU	Member Outreach
Live eTutorial: BGP TE Techniques (2 Parts)	South Asia	Training
Live eTutorial: IPv6 Security	South Asia	Training
Live eTutorial: BGP OpSec BCP	Oceania	Training
Live eTutorial: TLS/SSL	South Asia	Training
DNS-OARC 35	US	Technical
Telemars Engagement at APNIC	AU	Foundation Projects
5th Meeting of the Informal Experts Group for ITU WTPF-21 (IEG-WTPF-21)	CH	Government
AusCERT 2021 Conference	AU	Security
Live eTutorial: Cyber Security	South East Asia	Training
AIS'21	MU	Coordination
Live eTutorial: OpenFlow	South Asia	Training
ThaiNOG eTutorial: IPv6 Protocol Architecture & Address Planning	TH	NOG, Training
Live eTutorial: Cyber Security	South Asia	Training
NMM - Tonga - Pacific Technical Training Project	TO	Training
Live eTutorial: DNSSEC Fundamentals	South Asia	Training
Conference talk: RPKI status in Thailand	TH	Security
Webinar: Anycast service deployment	AP	Training

	Economy	Engagement type
Live eTutorial: Securing Internet Routing with RPKI	TW	Training
BTCIRT Community Workshop 2021	BT	CERT Engagement
ICANN DNS Symposium 2021	US	Technical
BTCIRT Community Workshop 2021	BT	CERT Engagement
ICANN DNS Symposium 2021	US	Technical

JUNE

	Economy	Engagement type
CSP Threat Landscape 1	Pacific Islands	Security
CSP Threat Landscape 2	Pacific Islands	Security
UNITAR (MY) Security Talk	MY	Security
GFCE Pacific Consultation Meeting 2021	Oceania	Government
ROW #10	US	Technical
APNIC 52 Online Fellowships - Routing/RPKI Fundamentals	AU	APNIC, Training
Live eTutorial: Packet Analysis	NP	Training
Live eTutorial: Cryptography Fundamentals	NP	Training
FIRST Annual Conference 2021	US	CERT Engagement
APNIC 52 Online Fellowships - Demystifying SDN	AU	APNIC, Training
ICANN 71	NL	Coordination
RightsCon 2021 ★	US	Internet Governance
APNG Webinar #1	AP	Technical
ASEAN CyberSecurity Forum	MY	Security
PacNOG 28	FJ	NOG, Training
bdNOG - NMM live eTutorial	BD	NOG, Training
Live eTutorial : OpenFlow	Oceania	Training
PacNOG: Routing Fundamentals eTutorial	FJ	NOG, Training
bdNOG 13 ★	BD	NOG
NIXI Webinar: Digital Economy – expanding footprints	IN	Technical
Securing Internet Routing with RPKI live eTutorial	Oceania	Training
Live eTutorial: IPv6 Security	Oceania	Training
Live eTutorial: TLS/SSL	South Asia	Training

JUNE

	Economy	Engagement type
APNIC Routing Security SIG	AP	Technical
APONet MoU signing ceremony	AP	Coordination
Live eTutorial: Introduction to Suricata Intrusion Detection System	South East Asia	Training
bdNOG - Segment Routing live eTutorial	BD	NOG, Training
GSMA Mobile World Congress 2021	ES	Government
ITU 21st Global Symposium for Regulators (GSR-21)	CH	Government
NANOG 82	US	NOG
Fluxxcon 2021	US	Foundation Engagement
Live eTutorial: Securing Internet Routing with RPKI	IN	Training
Webinar: Hosted vs. Delegated RPKI	AP	Training
Webinar: Automating and Securing Route Servers with IXP Manager	AP	Training

	Economy	Engagement type
IETF 111	US	Technical
vPhNOG 2.0 ★	PH	NOG
JANOG 48 ★	JP	NOG
SANOG 37 ★	LK	NOG
Live eTutorial: DNS Fundamentals	IN	Training
CommunicAsia 2021	SG	Membership Development
1st Meeting of the APT Preparatory Group for PP-22 (APT PP22-1)	AP	Government
Live eTutorial: Securing Internet Routing with RPKI -phNOG	PH	Training
Webinar: WiFi Security	AP	Training
Webinar: APNIC Policy Framework and Development Process	AP	Training
Live eTutorial: IPv6 Protocol Architecture & Address Planning	East Asia	Training
Outreach/TA - RACQ - IPv6 Deployment	AU	Training

JULY

	Economy	Engagement type
6th INTERPOL Global Cybercrime Expert Group (IGCEG)	SG	Security
Live eTutorial - Information Security for System Administrators	South Asia	Training
Youth IGF Bangladesh 2021 ★	BD	Internet Governance
Live eTutorial: NMM: Network Documentation with NetBox - SANOG 37	LK	Training
TL Security Community Engagement	TL	CERT Engagement
Consultation: RPKI Consultation and Technical Assistance for PH community	PH	Training
INTERPOL Forum on Ransomware	FR	Security
Live eTutorial: NMM: Model Driven Programmability - SANOG 37	LK	Training
ITU Emerging Technology Week	CH	Government
Live eTutorial: IPv6 Protocol Architecture & Address Planning - SANOG 37	LK	Training, NOG
LKNOG 5 (SANOG 37)	LK	NOG
Live eTutorial: Introduction to Suricata Intrusion Detection System- SecTalks	AU	Training
Honeypots / Threat Sharing Handson - Tonga	TO	CERT Engagement
SGNOG 8 ★	SG	NOG

AUGUST

	Economy	Engagement type
AI3/SOI Asia Joint Meeting	JP	Foundation Project
Webinar: Internet Measurement Tool For the End Users	AP	Training
Webinar: Internet Transit, Peering and the Variants	AP	Training
ASEAN-JAPAN Cyber Security Seminar	TH	Security
Live eTutorial: Introduction to Suricata Intrusion Detection System - APAN	ID	Training
Asia Peering Forum 2021	AP	Technical
Cambodia CERT Seminar	KH	CERT Engagement
Introduction to SDN - Fiji - Pacific Technical Training Project	FJ	Training
APAN 52 ★	ID	Development, Training
APEC TEL 63	NZ	Government
Live eTutorial - IXP Planning & Deployment - PK	PK	Training
Hack In The Box (SIN) 2021	SG	Security
India IGF Pre-Event Webinar	IN	Internet Governance
YouthxPolicyMakers Internet Governance Workshop	DE	Internet Governance
PANDI Meeting 12	ID	Technical
2021 CNCERT International Partnership Conference	CN	CERT Engagement

SEPTEMBER

	Economy	Engagement type
World Internet Conference 2021 (Wuzhen Summit)	CN	Government
APrIGF 2021	NP	Internet Governance
IDNIC Special Meeting/APJII National Meeting 2021 ★	ID	NIR Engagement
VNIX-NOG 2021 ★	VN	NOG
ITU Global CyberDrill 2021	CH	Security
ITU CWG-Internet Open Consultation	CH	Government
IGF 3rd Open Consultations & MAG Meeting	PL	Internet Governance
AP* Retreat 2021	AP	Coordination
IGF 2021 Townhall - Hybrid Format in Practice	CH	Internet Governance
Pacific IGF (PacIGF) 2021 ★	FJ	Internet Governance
APNIC 52	SG	APNIC, Training
Live eTutorial: IPv6 Protocol Architecture & Address Planning	LK	Training
Threat Con 2021 ★	NP	Security
HKNOG 10.0 ★	HK	NOG
Webinar: Using RIPE Atlas for network diagnostics	AP	Training
Webinar: Network Security for IoT & IIoT Environments	AP	Training
SEA-IGF 2021	ID	Internet Governance
Security Workshop National University of Samoa	WS	Security
APCERT AGM 2021	AP	CERT Engagement
6th Meeting of ITU IEG-WTPF-21	CH	Government
Asia Pacific Youth IGF 2021	AP	Internet Governance
APNIC 52 - NMM live eTutorial	SG	APNIC, Training
Live eTutorial: Network Security & Packet Analysis - APT CN	CN	Training
Network Traffic Measurement and Analysis Conference 2021	US	Technical

OCTOBER

	Economy	Engagement type
Global IPv6 Summit 2021	CN	Technical
36th TWNIC OPM	TW	NIR Engagement
ISCR 2021	KR	Security
APIGA 2021	KR	Internet Governance
KRCERT/CC APISC Training 2021 (Virtual)	KR	Security

	Economy	Engagement type
Cybersecurity Bootcamp for Senior Non-technical Experts	ES	Security
ARIN 48	US	Coordination
ICANN 72 (23rd AGM)	US	Coordination
CSP Internet Fundamentals Oct 2021	PW	Security
Securing Internet Routing with RPKI	AU	Training
ITU Telecom World 2021 (Digital World)	CH	Government
GFCE Southeast Asia Regional Meeting 2021 (SICW)	SG	Government
Broadband India Forum Session on IPv6	IN	Technical
3rd Interregional Meeting for Preparation of WTSA-20	CH	Government
VBLocalhost 2021	US	Security
Suricon2021	US	Security
8th Meeting of the ITU Telecommunication Standardization Advisory Group (TSAG)	CH	Government
GSMA Mobile 360 Asia Pacific Policy Leaders Forum	AP	Technical
MANRS Community Meeting	US	Technical
UMS Cybersecurity Awareness Seminar	MY	Security
Live eTutorial: Openflow/SDN	TW	Training
LACNIC 36/LACNOG 2021	CO	Coordination
ISC2 Security Congress	US	Security
Security Sessions with FJ community	FJ	Security
Cybersecurity Asia 2021 Conference	AP	Security
IPv6 Protocol, Architecture, Address Planning & Deployment	CN	Training
Philippine International Cybersecurity Conference 2021	PH	Security
Live eTutorial - Introduction to SDN	TV	Training
Live eTutorial - Information Security for System Administrators	South East Asia	Training
Y4IT 2021	PH	Technical
btNOG 8 ★	BT	NOG
btNOG: Network Security live eTutorial	BT	NOG, Training
MNNOG: SDN 4-day live eWorkshop	MN	NOG, Training
MNNOG 3 ★	MN	NOG
btNOG: Network Management and Monitoring (NMM) live eTutorial	BT	NOG, Training
OSDFCon	US	Security

NOVEMBER

	Economy	Engagement type
NANOG 83	CA	NOG
PacNOG 29	FJ	NOG
Marshall Center iPCSS 2021	DE	Government
AFRINIC 34	MU	Coordination
RIPE 83	NL	Coordination
GFCE Annual V-Meeting 2021	NL	Government
IGF Preparatory Session on Trust, Security, Stability	PL	Internet Governance
Securing Internet Routing with RPKI - VNNIC	VN	Training
Vietnam Youth Internet Governance Forum 2021 ★	VN	Internet Governance
DNS-OARC 36	US	Technical
IETF 112	US	Technical
DINR	US	Technical
NetThing 2021	AU	Internet Governance
Securing Internet Routing with RPKI	AU	Training
IIGF (India Internet Governance Forum)	IN	Internet Governance
inSIG 2021	IN	Internet Governance
ID Honeynet Project 10th Year Anniversary Webinar	ID	Security
Japan Internet Week 2021 ★	JP	Member Outreach
7th Meeting of the ITU IEG-WTPF-21	CH	Government
ITU SG13 Plenary 2021	CH	Government
ITU TDAG-21/2 meeting	CH	Government
Telecoms World Asia 2021	TH	Membership Development
Live eTutorial: Network Management & Monitoring	TL	Training
Live eTutorial: IPv6 Deployment	TL	Training
Live eTutorial: Network Security	TL	Training
Live eTutorial: Internet Routing	TL	Training
Live eTutorial: DNS Fundamentals	TL	Training
Peering Asia 2021v	AP	Technical
DNS/DNSSEC live eWorkshop	AP	Training
Imagining the Future of Internet Governance Workshop	AP	Training
Webinar: Lightning fast DDoS detection with FastNetMon Community	AP	Training
Webinar: Lightning fast DDoS detection with FastNetMon Community (Part 2)	AP	Training

DECEMBER

	Economy	Engagement type
Securing Internet Routing with RPKI - CNNIC	CN	Training
Securing Internet Routing with RPKI	FJ	Training
PKSIG 2021 ★	PK	Internet Governance
Women in Networking Series	PH	Technical
Ph Peering Forum: Women in Tech session	PH	Technical
IGF 2021	PL	Internet Governance
bdIGF 2021 ★	BD	Internet Governance
btCIRT: Network Security Live eTutorial	BT	Training
Bhutan CyberSecurity Week 2021 ★	BT	Security
KHNOG 3 ★	KH	NOG
Youth IGF India 2021	IN	Internet Governance
Meetings with APJII/IDNIC	ID	NIR Engagement
APSIG 2021 ★	LK	Internet Governance
FIRST & AfricaCERT Virtual Symposium 2021	CH	CERT Engagement
ITU 2nd Interregional Meeting for WTDC-21	CH	Government
WTPF 2021 (ITU World Telecommunication/ICT Policy Forum)	CH	Government
Taiwan LEA Training 2021	TW	Security
AVAR 2021	AP	Security
Webinar: RPKI: 2021 in review	AP	Training

APNIC

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