

APNIC Secretariat Report May 2017

DRAFT

CONFIDENTIAL

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1 Introduction

This report is provided to the APNIC Executive Council for the quarterly face-to-face meeting in Nairobi, Kenya, on 3 June 2017.

The report contains a summary of activities for the last complete quarter (Q1 2017) and 'to date' for the current quarter (Q2 2017, up to 15 May).

2 Services Area

The APNIC Services Area is responsible for the delivery of key services, including:

- Membership administration and support
- Internet resources delegation and registration

This Services report includes activity highlights and KPIs that support APNIC's strategic directions.

2.1 Membership administration and support

2.1.1 Membership statistics

	Q1 2017	Q2 2017
New Members	235	100
Closed Members	94	34
Reactivated Members	6	0
Total Members	6,145	6,211

Table 1 – Membership growth (to date)

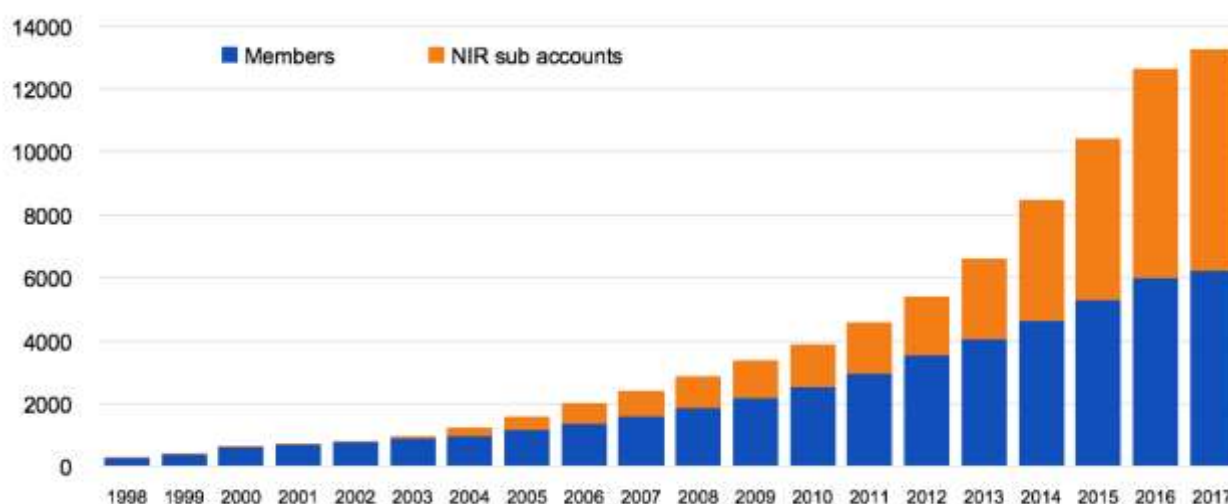


Figure 1 - Total membership (to date)

2.1.2 Membership industry type

The following table shows the distribution of APNIC accounts by industry type.

Industry Type	Number of Members
Academic/Educational/Research	418
Banking/Financial	446
Domain name registry/Registrar	46
Enterprise/Manufacturing/Retail	552
Government/Regulator/Municipality	291
Hardware vendor	56
Hosting/Data centre	1602
Industrial (construction, mining, oil)	127
Infrastructure (transport/hospital)	121
Internet exchange point (IXP)	56
Internet service provider (ISP)	1627
Media/Entertainment	210
Non-profit/NGO/Internet community	63
NREN/Research network	8
Software vendor	322
Telecommunications/Mobile operator	947
Other	49

Table 2 – Industry types

2.1.3 Instant Feedback

Through Instant Feedback, Members are invited to answer a very short survey after a service interaction. Table 3 below shows the feedback received for the following services:

- New Member application
- Helpdesk email support
- Membership administration
- Online chat

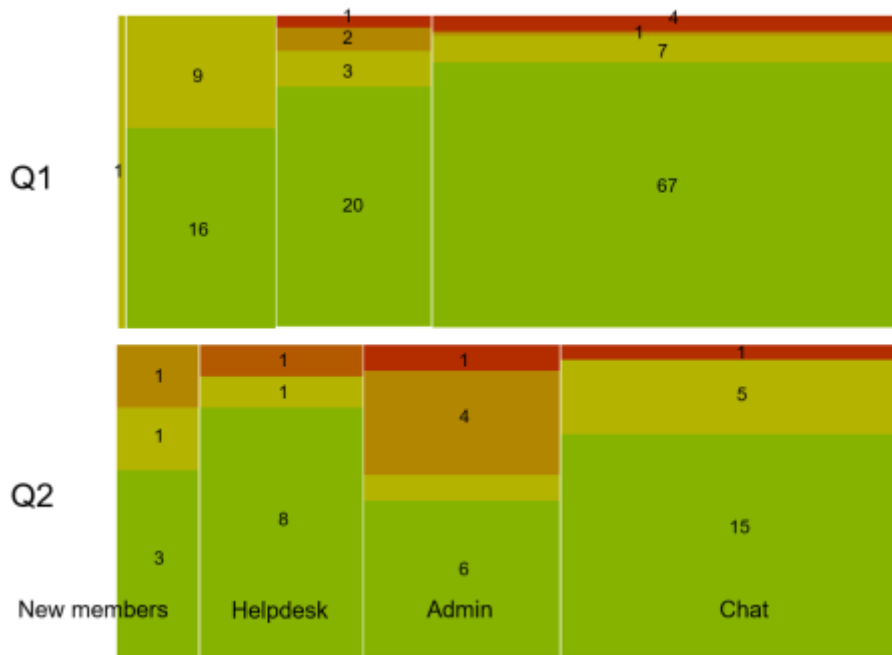


Figure 2 – Q1 to Q2 2017 Instant feedback ratings (to date)

Poor	Below average	Average	Above average	Excellent

Table 3 – Instant feedback ratings

- Two admin tickets received poor feedback:
 - A new Member submitted an incorrect form and we assisted them with submitting the correct form.
 - One new membership application was rejected as the Member could not provide the requested information. The Member reapplied with the requested information and their application was approved.
- Five chat requests received poor feedback:
 - In four cases, the requester left the chat before service was provided.
 - One Member required additional assistance, which was provided separately via email.
- Some positive feedback received from Members:
 - “Superb support >even kids can understand DNS. We are grateful to him for his excellent support. Once again thanks for the great support by the team as well..”
 - “I liked it how fast the ticket was worked on, from elsewhere I'm used to waiting for days for a reply”.
 - “Process for IP Transfer was very smooth and conduct by APNIC Staff was very professional and also very efficient.”

- "APNIC staffs are well experienced to explain the issue."

2.1.4 EC submission – Status: Resolved

APNIC Member account [NODERUN-PK] lodged a complaint to the EC regarding how APNIC processed their inter-RIR transfer request on 21 April 2017.

Subject: Illiterate Behavior of IP Analyst
From: Sapna Ahmad <irfanidum@gmail.com>
Date: 21/4/17, 6:12 pm
To: "Ec@apnic.net" <Ec@apnic.net>

Hello,
 We had a request in place for an inter-rir transfer. On asking for further documentation we supplied a simple contract that both parties had signed. We are a functional ISP in Pakistan and have been APNIC member since end of 2015. Analyst Tom Do claimed that the contract is fake without even asking for justification. We even provided justification on it but he said that he will still continue with the decision when we assured that we can prove that the documentation is legit and valid. We had our website relicated to <http://node.net.pk> 3 months ago. Please look into Ticket ID 3099533. This type of behavior is extremely illiterate and I request APNIC to consider reversing the decision as we are an active ISP. I will be waiting from a response from the EC.

Kind Regards
 Fard Ahmad

This Member provided a fabricated agreement in their original IPv4 transfer request and admitted, subsequently, that they created such a document for APNIC. Based on the conflicting information and the fabricated document provided, the APNIC Services team determined that this Member provided false documentation to mislead APNIC. Their account was then terminated.

This Member contacted Member Services to cancel their transfer request after lodging the complaint to the EC. In addition, they provided an original copy of the transfer agreement to APNIC, which they did not disclose during the transfer evaluation. In consultation with APNIC’s legal counsel, the APNIC Services team recently restored their membership account, after receiving confirmation from the recipient party that this Member did sign the original copy of the transfer agreement.

2.1.5 Fraud report

APNIC started sharing suspicious IPv4 transfer requests and fraud attempts starting from APNIC 42 and have been logging cases of fraud identified.

	Q1 2017	Q2 2017
Total number of fraud attempts	12	6
	5 x Identity theft 1 x Fabricated document 6 x Fabricated needs	3 x Identity theft 2 x Fabricated documents 1 x Fabricated needs

Table 4 – Fraud attempts (to date)

2.2 Internet resources delegation and registration

2.2.1 IPv4, IPv6, and ASN delegations

The following table shows the number of delegations for each resource type in Q1 2017 and up to 15 May 2017 for Q2.

Resource	Q1 2017	Q2* 2017
IPv4 (103 /8)	567	288
IPv4 (recycled space)	86	21
IPv6	328	163
AS numbers	336	101

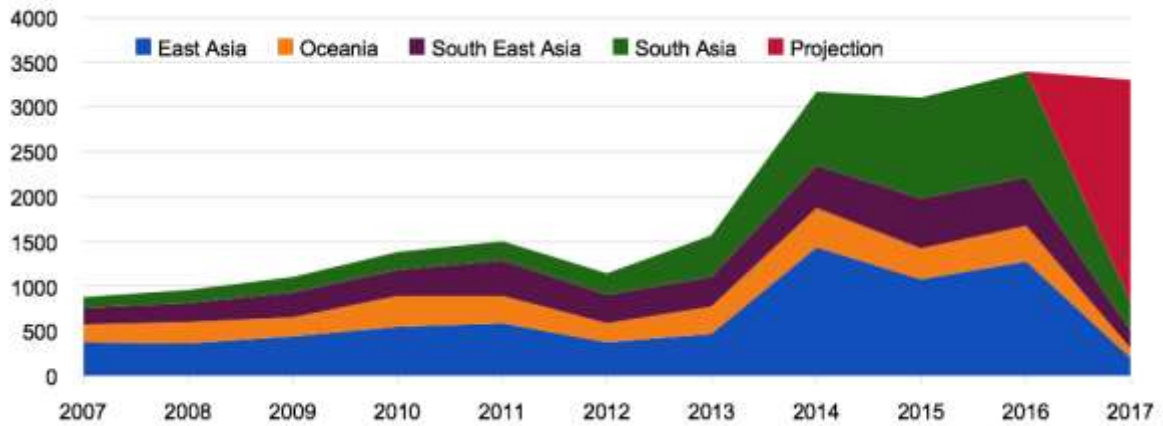


Table 5 - Resource delegations (to date)

Figure 3 - IPv4 delegations (to date)

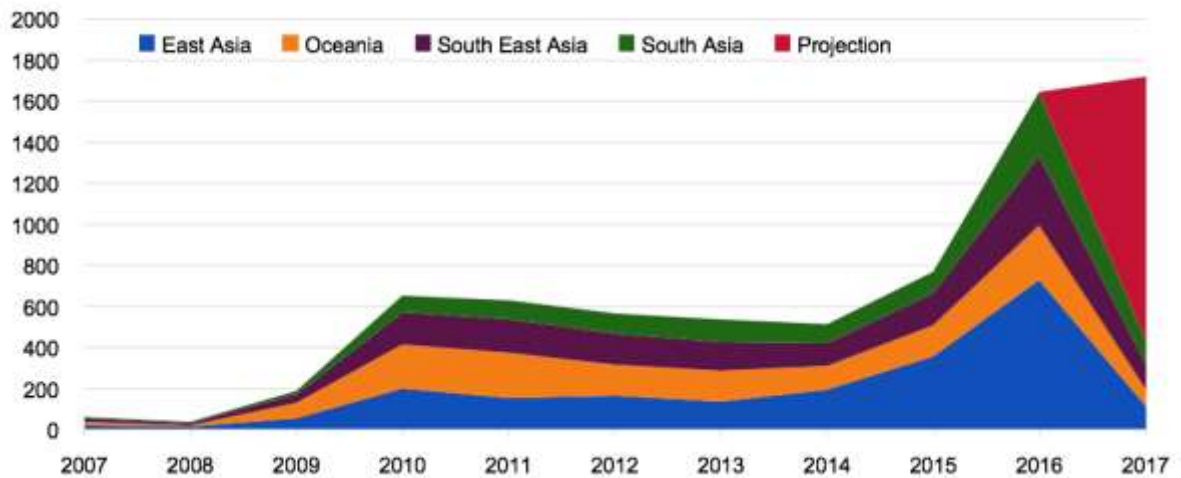
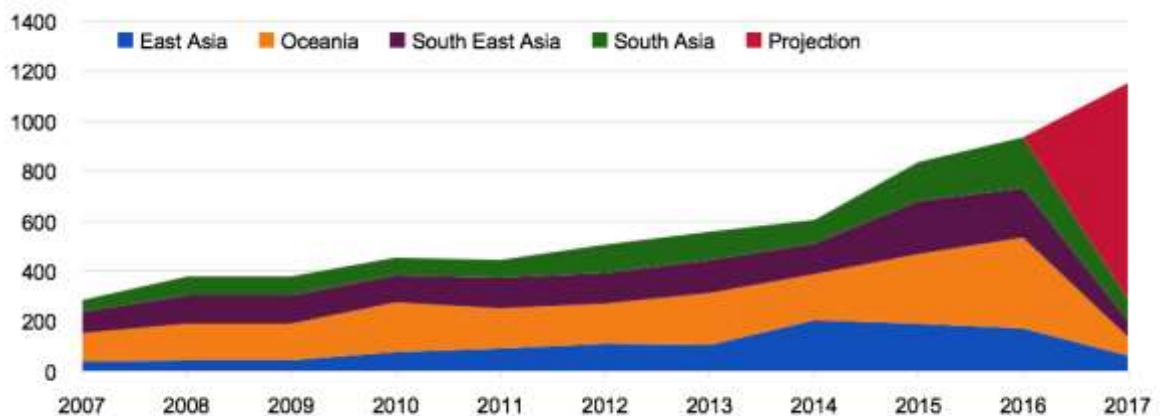


Figure 4 - IPv6 delegations (to date)

Figure 5 - Annual ASN delegations (to date)



2.2.2 Available IPv4 addresses (103/8)

APNIC is currently delegating IPv4 addresses from its last /8 (103/8) and also from the 'recycled' pool. With justification, every Member is entitled to receive a maximum of a /22 from each of these pools.

Resource	Q1 2017	Q2 2017
Delegations (/24)	2,087	970
Remaining	40.01%	38.66%

Table 6 - Available IPv4 address space (to date)

At the current consumption rate of around 1% of a /8 per month, we expect to continue to allocate from the final /8 in the next 3 years.

2.2.3 Waiting list for IPv4 recycled addresses

Since 9 June 2016, requests for recycled IPv4 addresses have been put on the waiting list. Each week, terminated address space is returned into the recycled pool and requests on the waiting list are fulfilled accordingly.

As of 15 May 2017, there are 286 entries on the waiting list, for a total of 1,075 x /24 IPv4 blocks, an increase of 237 x /24 from February 2017.

2.2.4 Member resource type holding

APNIC started tracking the proportion of Members holding specific resource types from Q3 2016. The percentage of APNIC Members holding IPv6 addresses has reached 52.65% in Q2 2017.

Resource type	Q1 2017	Q2 2017
IPv4 (103/8)	67.74%	68.33%
IPv4 recycled space	25.87%	25.53%
IPv6	51.98%	52.65%

Table 7 - Member resource type holding (to date)

2.2.5 IPv4 Transfers and Returns

IPv4 transfers are classified as 'Mergers/acquisitions' or 'market transfers'. Market transfers may occur within the APNIC region, or to or from other RIR regions. Currently, ARIN and RIPE are the only regions that have compatible inter-RIR transfer policies.

Transfer type	Q1 2017 requests	Q1 2017 addresses	Q2 2017 requests	Q2 2017 addresses
Mergers/acquisitions	40	174,080	12	215,040
Market transfers	54	682,752	31	290,048
- Intra RIR	44	603,904	27	150,784
- Inter RIR	10	78,848	4	139,264
Returns				

Table 8 - IPv4 transfers and returns (to date)

As of 15 May 2017, the total of IPv4 addresses transferred between APNIC and the other RIRs are set out below:

Inter RIR transfer	Total address to date
ARIN to APNIC	8,999,936
RIPE to APNIC	139,264
APNIC to ARIN	40,960
APNIC to RIPE	121,344

Table 9 – Inter-RIR transfers (to date)

Services staff are tracking the number of transfers of the 'last /8' address blocks, and are reporting these during APNIC meetings.

	Q1 2017	Q2 2017
Market transfers	27	21
Mergers/acquisitions	22	5

Table 10 - Transfers of 103/8 space (to date)

2.2.6 Resource certification (RPKI)

The following table shows the total percentage of APNIC IP addresses under RPKI ROAs, out of the total IP addresses delegated by APNIC.

Resources	Q1 2017	Q2 2017
IPv4	1.04%	1.80%
IPv6	0.33%	0.34%

Table 11 – ROA coverage (to date)

3 Communications & Events

3.1 Communications

3.1.1 APNIC Blog

	Q1 2017	Q2 2017
Views	73,451	60,044
Posts	83	38

Table 12 - APNIC Blog activity level (to date)

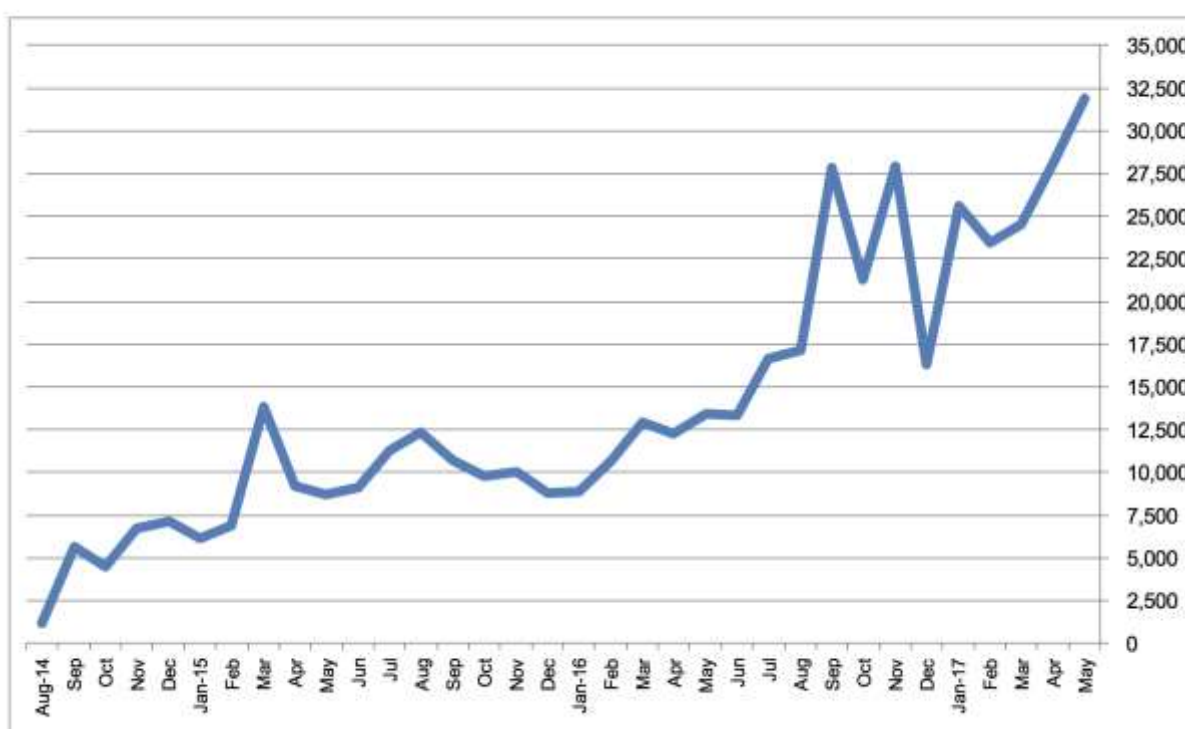


Figure 6 - Monthly APNIC Blog views (to date)

- APNIC Blog readership continued its strong growth in Q1 and Q2 2017. Average monthly views in Q1 were 24,484 and in Q2 to date, the monthly average is 30,022.
- 2017's total views to date (133,495) are 129% higher than the same period a year ago (2016: 58,222) and the 2017 monthly average of 26,699 is 22% higher than the final quarter of 2016 (21,831).
- There have been 53 Guest Posts in 2017 to date. One of the aims of the blog is to be a forum for community articles and discussion, and the proportion of Guest Posts has steadily risen. In 2017, 44% of posts have been Guest Posts; this number was 23% in 2016.

- Significant content during the period included Geoff Huston’s pieces on TCP control flow algorithms and satellite technology, and community guest posts on IPv4 transfers and submarine cables.
- The blog had its 1,000th post on 6 April.

3.1.2 Social Media

		Q1 2017	Q2 2017
Facebook	Organic Reach	139,012	97,680
	Likes	26,247	26,207
Twitter	Followers	7,170	7,317
	RT/Likes/Mentions	2,244	778
YouTube	Views	12,839	2,804
	Minutes	93,600	15,336
Slideshare	Views	36,860	18,826
LinkedIn	Reach	45,559	18,578
	Followers	2,347	2,377

Table 13 - APNIC Social Media activity 2017 (to date)

3.1.3 Website

- APNIC’s new IPv6 pages were completed in Q1. The pages now feature a cleaner look, simpler layout and language, and updated resources and statistics:
<https://www.apnic.net/ipv6>

3.1.4 DNSSEC KSK Rollover

- ICANN plans to rollover the DNSSEC Root Zone KSK (Key Signing Key) in October 2017. APNIC is supporting ICANN’s efforts to raise awareness among network operators performing DNSSEC validation.
- During Q2, a communication plan was launched, including:
 - Identification of ‘higher risk’ network operators using APNIC Labs data.
 - Initial awareness emails sent to identified network operators.
 - Creation of resources web page: (www.apnic.net/keyroll).
 - Translation of ICANN materials has begun (with the support of NIRs).
 - Publishing a Guest Post from ICANN’s Matt Larson on the APNIC Blog.
 - Social media outreach including a Facebook Live video with ISC’s Eddy Winstead.
 - Sharing plans and materials with ICANN, NRO CCG, and sharing Labs research data with other RIRs for their use.

3.2 Events

3.2.1 APRICOT 2017

- APRICOT 2017 was successfully held in Ho Chi Minh City, Viet Nam, from 20 February to 2 March 2017.

Conference Statistics	
Total number of on-site delegates:	654
Economies represented:	56
APNIC Member organizations represented:	178
Remote Participants – Adobe Connect:	58
Remote Participants – YouTube:	1,537 views; 18,271 minutes views
Twitter #apricot2017 Posts:	1,220 (Twitter) by 407 unique users
Total people reached:	3,108,061

Table 14 – APRICOT 2017 conference statistics

- The event generated more than 27 pieces of media coverage across local print, online and television media, and regional online tech publications. APNIC hosted journalists from ZDNet and Bloomberg at the event.

3.2.2 APNIC 44

- APNIC 44 will be held in Taichung, Taiwan, from 7 to 14 September 2017. The Splendour Hotel Taichung has been confirmed for both the workshops and conference.
- Cisco's Anand Oswal has been confirmed as the first keynote speaker, with additional speakers to be confirmed in Q2/3 as submissions are received.
- Event website created and registration now open: <https://conference.apnic.net/44/>

3.2.3 Future conferences

- APRICOT 2018 will be held in Kathmandu, Nepal. The usual dates have moved forward by 1 day, to avoid clashing with a major holiday, Holi, on 1 March 2018. The new dates are 19 to 28 February 2018.
- Additional details of potential APNIC 48 locations (Sept 2019) have been provided to the EC for the coming meeting. The chosen location will be announced at APNIC 44.

4 Technical Area

4.1 Software

4.1.1 Core registry

Work continues on separation of the core registry into front-end clients and an event-sourcing-based back-end service.

- Numerous queries are still being performed against the database directly, rather than via the backend service. Further integration work to address these is required before event sourcing can be enabled.
- The event sourcing conversion will be integrated and enabled by Q2 2017.

4.1.2 MyAPNIC/ARMS development

Work continues to improve MyAPNIC and ARMS. The following features/improvements have been deployed or are currently in the process of being deployed:

- Bounced emails (ARMS) have been deployed. This feature notifies the contacts for an account when an email to another contact for that account has bounced, requesting that they update the relevant email address.
- Legacy RPKI ROA interface deprecation is scheduled for release by the end of May, simplifying the route management interface in MyAPNIC.
- Numerous bug fixes were implemented to MyAPNIC and ARMS.

4.1.3 WHOIS development

The WHOIS master server is currently being upgraded to version 4.

- Code updates are complete. Integration testing and preproduction deployment is in progress, with a production release scheduled for the end of May.
- The 'Organisation objects rules' feature was split into a separate project with a completion date of end-June 2017.

4.1.4 Single Sign-on

During 2017 APNIC is deploying single sign-on to allow common authentication across all sites and services.

- Evaluated and selected Keycloak for Identity Management.
- Basic integration with existing LDAP server and MyAPNIC complete (login, password change, TOTP setup, and theming). Work on certificate enrolment, certificate authentication, user administration, and user registration is in progress.
- The integration of this feature across all relevant APNIC sites and services is being planned.

4.1.5 Public APIs

This work provides an automated interface to MyAPNIC and other core services through public APIs.

- A draft specification was presented at APNIC 43.

- If there is no further Member and NIR feedback, implementation will begin in Q3, with deployment by the end of Q4.

4.1.6 Web interface to mailing lists

This work provides a more user-friendly web-based interface to APNIC's mailing lists, using the existing RIPE Forum software (<https://www.ripe.net/participate/mail/forum/>).

- Preparation is in progress and is scheduled to be completed by the end of June.
- Work on the mailing list search set up is in progress.

4.1.7 RDAP improvements

The current RDAP service does not perform as well as the port 43 whois service. The whoas service's approach, involving the pre-generation of query responses, will be used for non-historical queries as well to address this problem.

- Initial work is in progress, adapting the whoas service to work for non-historical queries.
- A separate RDAP redirection service specific to INRs is also being developed, since the functionality in the current RDAP implementation is not easily separable.

4.2 Infrastructure Services

4.2.1 Network and systems architecture

- Network Transmission upgrade by using CWDM (Coarse Wavelength Division Multiplexing) provides additional bandwidth and communication channels between data centres and the office.
 - Link between the office and Interactive data centre was completed successfully.
 - Remaining links between the office and NextDC and NextDC and Interactive data centres are scheduled to be completed by June.
- Secondary VPN (Cisco AnyConnect VPN)
 - Second-factor authentication added, including CRL checking of revoked certificates. Network ACL's updated to include consultant/contractor information.
 - Monitoring added to include key metrics and network reachability alerts.
 - Planned deployment at end of May.
- Office migration to RFC1918 address space
 - Lab testing and final design is currently in progress.
 - Migration of LAN and Wifi to be completed by the end of Q2.
- Network monitoring improvements
 - Requirements specification completed.
 - Proof of concept testing completed; vendor solution evaluation is currently being done.
- Network switching and routing rearchitecture

- Layer 2 improvement methods such as vPC (Virtual Port Channels) and MST (Multiple Spanning-Tree) protocol have been tested successfully in a lab environment.
- Some Layer 3 methods, e.g, HSRP (Hot Standby Router Protocol), IPv4 and IPv6 ACL (Access Control List) are being tested.
- Data centre rack rearrangements to accommodate new hardware and cable management is a work in progress.
- A detailed design and migration plan is in progress and is scheduled to be completed by the end of Q2.
- Ongoing network improvements
 - Layer 2 improvements, IOS upgrades, and decommissioning of retired VPNs.
 - Collecting netflow data from HK and JP routers to assist in diagnosing possible DDoS attacks and other issues.

4.2.2 Systems and services

- Email migration to Office365
 - Successfully completed the Office365 migration, providing improved email client, web client and server functionality, reduced maintenance, and email archiving.
- Wiki upgrade
 - Completed the upgrade of the internal wiki and added a theme to improve viewing on mobile devices.
- Whois updates
 - The whois test service was upgraded to the latest application code running on CentOS7.
 - Work on upgrading the whois query nodes is currently in progress and is scheduled to be completed by the end of May.
- Archiving improvements
 - Archive server network connections were upgraded to 10G.
 - A new archive server has been deployed and all identified archive data is being collected by the new server.
 - Validation of archive data is currently a work in progress, ensuring all data is recoverable and correct.
- Remote sites
 - The US site was decommissioned.
 - Testing of the anycast DNS service using a cloud provider is in progress.

4.3 Web and Systems

4.3.1 Internet Directory

- Work as part of the next release includes:

- Backend data issues have been fixed.
- Data ingestion time has been reduced from five days to two hours.
- Completion of monthly and daily 'drill down' features.
- Front-end development (improved styling) is in progress.

4.3.2 CMS and website

- Updates to the CMS continues, ensuring it is up to date, with security patches applied.
- The local development environment has been containerized, which significantly speeds up the build/test/deploy cycle. This is currently being tested in the production environment.
- The web team has started daily stand-ups, using the newly adopted Kanban approach.

4.3.3 Improving online experience

- APNIC is integrating its APNIC's online services to create a single point of access and improved experience for users of APNIC's services. The multiyear project, which encompasses various projects across departments is in the planning phase, with work focused on defining the current user experience.
- Single Sign-on (SSO), as part of this project, is being developed with the Software team:
 - The web team is currently working on the 'look and feel' and overall flow of all systems under the SSO scheme.
 - The Software team aims to deliver a prototype by end of June.

4.3.4 CRM

- Phase 1 (Contact Management) is in trial. The primary users have been trained. Additional users have been identified and are being trained. Feedback from phase 1 users have been logged and prioritized and is being implemented.
- Based on this feedback, phase 2 of the CRM project is being planned.
- The current focus is in getting more staff to use the system to capture their interactions with new and existing contact/organisation.

4.3.5 Other

- Ongoing software maintenance of the Fellowship system.
- Ongoing development of Web Style guide.

4.4 Information Analysis and visualization

4.4.1 'Whowas'

Whowas allows the retrieval of historical whois records.

- The historical service API is now operating in a production environment.
- An early release user interface is available: <https://www.apnic.net/whowas/>

- Standardization of an RDAP extension for history is progressing with the ECG, and will enter the IETF process this year.

IDN and EAI support on APNIC systems:

- We assisted the ICANN Universal Acceptance (UA) Steering Group, with an APNIC UA case study: <https://uasg.tech/documents>

4.5 Information Service and Security

4.5.1 Public services operational metrics

Public service	2016 Average annual query rates (queries per second)	2017 YTD Average query rates (queries per second)
Whois	463	439
RDAP	2	4
rDNS	21000	20510
RPKI	18	16
FTP	29	2
MyAPNIC	1.5	1.5

Table 15 – Operational metrics

4.5.2 Information Security Management System (ISMS)

- The initial ISMS release was communicated to all staff and published on the wiki (completed in March).
- The current policies are under review. We identified and merged similar policies between the QMS (Quality Management System) and the SMS. The ISMS Statement of Applicability will be prepared after the policy reviews.
- Ongoing internal and third-party evaluation will be followed by an audit during Q3. The first internal audit is scheduled for June.

4.5.3 Network security project

- As part of the ongoing network security improvements, the requirement for a stateful Firewall, which provides an Intrusion Prevention System, was identified.
- Four vendor evaluations were completed, and a proposal is under development.

4.5.4 Security incident report summary

The following list summarizes the security incidents that APNIC has experienced since the previous Secretariat Report. An incident report is available for more detailed information.

Date	Incident type	Systems/Services affected	Remediation	Future improvement/prevention
14 April 2017	www.apnic.net hosting service compromised and site redirected to malware site	www.apnic.net	Hosting service reverted site to backup copy	Migrate the www.apnic.net website back to APNIC infrastructure
16 March 2017	DDoS against DNS servers ns3.apnic.net and sec4.apnic.net	Reverse DNS from ns3.apnic.net and secondary DNS service from sec4.apnic.net	Upstream transit	Improve communications with upstream provider to ensure they only drop traffic for the duration of the attack

Table 16 – Security incident report summary

5 APNIC Labs

5.1 Presentations

To date, Geoff Huston has delivered 15 presentations at various events:

- Why Dane? (PTC'17, NZNOG 2017 and NANOG 60)
- The State of IPv6 (PTC'17)
- Forensic Tracing in the Internet: an update (Europol workshop)
- An Introduction to the IoT (HKNOG 4.0)
- BGP in 2016 (APRICOT 2017 and IETF 98)
- ECDSA (APRICOT 2017)
- Network Forensics in 2017 (APRICOT 2017)
- The Death of Transit (APRICOT 2017)
- Explaining the Root Service (ICANN 58)
- IP Address report (APRICOT 2017 and ARIN 39)

5.2 Articles

Geoff has authored the following 13 articles during this period:

- Scoring the DNS Root Server System, Pt 2 – A Sixth Star?
- Leaving it to the Last Second
- Lets Encrypt with DANE
- Postscript to the Leap Second
- BGP in 2016
- Addressing 2016
- NANOG 69 Report
- The Root of the DNS
- The Gilded Internet
- IETF 98 Report
- ARIN 39 Report
- UP!
- BBR, the new kid on the TCP block

5.3 Research

Current research activities include:

- KSK rollover, packet size and the impact on users
- IPv6 and large MTU settings (commissioned by Comcast)

- Measuring the extent of latent QUIC capability
- Defining a new set of Ad-based measurements on the failover time from IPv6 to IPv4
- DNS related research with ICANN (contract extended to 2018)
- Some part of the researches were supported by Joao Damas

6 Strategic Engagement

6.1 External Relations

6.1.1 Select ER highlights

- All APNIC external engagements are reported in the APNIC Blog and are often followed by additional blogposts about these events. All 'Event Wraps' are available at: <https://blog.apnic.net/category/events/>
- A visualization of 2017 ER activities and planning can be found in section 5.4.3 below.

6.1.1.1 NOG engagements

Since January 2017, APNIC staff participated in:

- [NZNOG in New Zealand](#)
- [SANOG 29 in Pakistan](#)
- [NANOG 69 in the USA](#)
- [HKNOG 4.0 in Hong Kong](#)
- [MMNOG in Myanmar](#)
- [PHNOG in the Philippines](#)
- BDNOG in Bangladesh (event wrap forthcoming)

APNIC provided sponsorship support for NZNOG, SANOG, HKNOG, MMNOG, and PHNOG.

Paul spoke at MMNOG, Myanmar, about the importance of local NOGs within the APNIC community, and how important it is for NOGs to connect to each other and at APNIC and APRICOT conferences.

6.1.1.2 IPv6

- At PTC'17, APNIC worked with ARIN to organize the 'IPv6 is Live! Real World Success Stories', including two case studies from the APNIC region — Telekom Malaysia and Telstra in Australia.
- APNIC worked with the ITU Asia-Pacific Regional Office (for the fourth year) to deliver an Infrastructure and IPv6 Security Workshop in Bangkok, for 35 participants from 11 economies. Philip Smith, consulting for APNIC and Fakrul Alam, delivered the training.
- Following a successful IPv6 engagement at PHNOG, PLDT reached out to APNIC for Technical Assistance on IPv6 deployment.

6.1.1.3 Inter-governmental outreach

- APNIC worked with LACNIC to participate in APEC TEL 55 in Mexico City and delivered a presentation titled 'Update on IPv6 deployment across the APEC region'. This was the second collaboration with LACNIC on APEC TEL meetings in Latin America.

- The ITU will have the World Telecommunications Development Conference (WTDC) in October. WTDC will agree on plans for the ITU to engage in IPv6 and cybersecurity related activities in the Asia Pacific. Regional preparations are underway for the WTDC and APNIC has participated in both: the APT preparatory process as an affiliate member (a second preparatory meeting happened in Port Moresby in February); and an ITU Regional Development Forum and preparatory meeting in Bali in March.
- APNIC participated at the 10th APT Policy and Regulation Forum for the Pacific and a workshop for ICANN-GAC members of the Pacific. During this meeting, Paul Wilson talked about CERT development in the Pacific, following the successful recent launch of Tonga CERT.
- APNIC participated as an invited guest of the Ministerial Program of the GSMA Mobile World Congress, attending sessions and engaging with governments, regulators and mobile operators to speak about IPv6, IoT, and fast-growing networks.

6.1.1.4 Internet governance

- APNIC participated remotely in IPv6 and cybersecurity related sessions at the Afghanistan Internet Governance Forum in March and at the Afghanistan School of Internet Governance (AFSIG 2017) in April.
- APNIC, in collaboration with DotAsia, ICANN and ISOC, established the Asia Pacific Alliance for Schools & Academies (APASA) to help manage funding and support requests for the increasing number of Internet governance training initiatives (SIGs etc) in the region.
- The ASO Independent Review is due to be completed in July. The review kicked-off during APRICOT 2017 in Ho Chi Minh City with interviews held by ITEMS, the firm that was selected by the NRO EC and ICANN to perform the review. It continued during ICANN 58 in Copenhagen, Denmark, in March and is due to be completed after interviews in each of the RIRs and at ICANN 59 in Johannesburg, South Africa, in July.
- The IANA Numbering Services Review Committee, an element of the IANA Stewardship Transition plan, was convened during ICANN 58 in Copenhagen, and includes representatives of the five RIR communities.

6.1.1.5 Security outreach

Please refer to section 6.4.1 for APNIC's security outreach activities.

6.1.2 APNIC External Engagements – January to 15 May 2017

Completed & Planned External Engagements 2016-2017		
Subregion	2016	2017
S Asia	35	0 (22)
SE Asia	58	2 (34)
E Asia	23	0 (21)
Oceania	39	6 (19)
Global	34	3 (25)
Total	189	11 (121)

Completed & Planned External Engagements 2016-2017		
Category	2016	2017
● APNIC	5	1 (2)
● Coordination	19	7 (15)
● Development	17	4 (5)
● Foundation	n/a	4 (7)
● Government	13	8 (12)
● Internet Governance	10	3 (10)
● Member Outreach	9	7 (8)
● Membership Development	8	2 (4)
● NOG	16	7 (23)
● Security	27	9 (17)
● Technical	8	8 (10)
● Training	57	25 (41)
Total	189	85 (154)

7 Development Area

7.1 Policy SIG

Election

A Chair and Co-Chair election had the following results:

- Chair - Sumon Ahmed Sabir
- Co-Chairs (One-year term) - Ching-Heng Ku and Bertrand Cherrier

Proposals

The SIG considered three policy proposals; One proposal reached consensus and is awaiting endorsement from the APNIC EC:

- prop-117 - Returned IPv4 address management and Final /8 exhaustion
 - Recovered 103/8 space will be placed in the 103/8 (Final /8) pool
 - Recovered non-103/8 space will be placed in the IPv4 Recovered pool

The other policy proposals did not reach consensus and were returned to the mailing list for further discussion:

- prop-116 - Prohibit to transfer IPv4 addresses in the final /8 block
- prop-118 - No need policy in APNIC region

The Policy SIG also included a Joint SIG meeting to discuss a proposal to change the SIG Guidelines.

Confer

The Policy SIG Chair decided to stop using the Confer system following a complaint by a SIG participant, and discovery of invalid accounts (such as b@qq.com) that seemed to be distorting the results.

APNIC staff is documenting options for changes to Confer, for presentation to the Policy SIG, which will consider whether to continue using the tool.

7.1.1 NIR SIG

- The APNIC 43 NIR SIG had presentations from all NIRs: CNNIC, IRINN, KRNIC, TWNIC, JPNIC, IDNIC, and VNNIC.
- At APNIC 44, the NIR SIG will hold an election for Co-Chairs after both seats become vacant in September 2017.

7.1.2 Cooperation SIG

- The APNIC 43 Cooperation SIG meeting elected the Chair and Co-Chair to serve another term.
- The Co-Chair agreed to a one-year term to provide for staggered elections.
- There were six informational presentations and a good turnout, supporting continuance of the SIG.

7.2 Training

7.2.1 Key Metrics

Q1 2017	Face-to-Face	eLearning
Courses	15	33
Locations	10 cities in 10 economies	Online
Participants	402	264
YouTube channel	29,361 views + 398 subscribers	

Table 17 – Training in 2017 (Q1)

Q2 2017	Face-to-Face	eLearning	Academy
Courses	6	12	1
Locations	6 cities in 6 economies	Online	Registration: 1,213
Participants	199	87	Enrolled: 1,013
YouTube channel	10,317 views + 114 subscribers		Certified: 189

Table 18 – Training in 2017 (Q2 to date)

7.2.2 Highlights

Resource Plan Q1

- The APNIC Academy was successfully launched with the ‘Introduction to Cybersecurity’ course. There was an overwhelming response from the the community, in particular, noting the quality of the output.
- The online Training Resource Plan wiki page was launched in 2017: <https://wiki.apnictraining.net/>
 - This platform includes the training materials used in each session and detailed session plans for individual training events.
- A new webclass, ‘Introduction to SDN’ was launched.
- Tashi Phuntsho, Senior Training Officer, joined the team.

Resource Plan Q2 (to 15 May)

- A new Community Trainer from the Philippines was recruited. There are currently 10 Community Trainers.
- New tutorial on ‘Multihoming benefit with portable address’ was developed. This tutorial can be useful during regular Member development events.
- eLearning class on MPLS L3 VPN started.
- Anosh Khan, the new eLearning developer, has joined the team to develop online materials.

Event Plan Q1 2017

- Visited and delivered a three-day technical training course in Maldives for the first time.

Event Plan Q2 2017 (to 15 May)

- Visited and delivered a three-day technical training course in Macau for the first time.

7.3 Technical Assistance (TA)

7.3.1 TA Summary

Q1 2017	Dedicated TA Session	TA Demo at Conference	Email & Skype TA
Number of Activities	1	1	2
Locations	Port Moresby, PNG	HCMC, Viet Nam	Port Moresby, PNG
Topics	PNG IXP set up	Routing registry; RPKI	Added two new Members to PNG IXP

Table 19 – TA in 2017 (Q1)

Q2 2017	Dedicated TA Session	TA Demo at Conference	Email & Skype TA
Number of Activities	1	0	3
Locations	Manila, Philippines	n/a	Port Moresby, PNG
Topics	IPv6 deployment planning session for PLTD	n/a	Added three new Members to PNG IXP

Table 20 – TA in 2017 (Q2 to date)

7.3.2 Highlights

- The TA team helped to set up the test case IXP for PNG.
- Assisted PNG IXP to set up their traffic graph (MRTG)
- Worked with all five IXP members to configure their peering router to connect to the IXP.
- Helped on the PNG IXP network design to prepare for Google and Akamai CDNs.
- The team conducted a three-day IPv6 deployment training and one-day IPv6 deployment TA session for PLDT, a large transit provider in the Philippines.

TA resource plan Q1 and Q2 2017

- Built a complete set of internal resources for the IXP set up and IPv6 deployment TA. These resources can be reused for similar TA sessions in other locations, with necessary customization provided for individual Members.

7.4 Security Outreach

- In February, APNIC hosted the two Tonga National CERT team members for a two-day in-house training and one-day working visit to the CERT Australia office in Brisbane.
- At APRICOT 2017, APNIC worked with FIRST, APCERT and VNCERT to organize a one-day FIRST Technical Colloquium (FIRST-TC). A meeting with the APCERT Steering Committee was also held to discuss plans for 2017 and 2018.
- APNIC participated remotely on the cybersecurity panel at the Afghanistan Internet Governance Forum in March 2017. APNIC also delivered a session remotely on 'Introduction to Cybersecurity' at the Afghanistan School of Internet Governance (AFSIG 2017) in April 2017.
- At the end of March, the APNIC Academy's 'Introduction to Cybersecurity' course was launched. Various partners were contacted to promote the new course. A Facebook live session was also organized by the Communications team.
- APNIC presented at the Financial Information Security Analysis Center (FS-ISAC) APAC Summit in Singapore in (3-4 April 2017) .
- A workshop was held in April on 'Introduction to Cybersecurity & Honeypots' at the University Malaysia Sabah (AS132874). In addition, a security talk for university staff and students was delivered at the International Islamic University Malaysia (AS45344).
- APNIC Foundation applied to the Australian Department of Foreign Affairs and Trade's Cybersecurity Capacity Building fund to help support and expand APNIC's incident response capacity-building efforts in the Pacific. This project brings an opportunity for APNIC to support a community-led approach to CERTs in the Pacific.

7.5 Community Development

7.5.1 NOGs

- APNIC provided our fellowship management system to SANOG, APRICOT, APriGF, and APIGA.
- APNIC is also planning to or has sponsored the following NOG events:
 - HKNOG 4.0
 - bdNOG 6
 - IDNOG 2017
 - SGNOG 2017
 - npNOG 2017
 - NZNOG 2017
 - MMNOG 2017

- phNOG 2017
- SANOG 30

7.5.2 Organizational sponsorships and support

APNIC has sponsored or supported:

- Networking, Systems and Security Conference (NSysS 2017), Dhaka, Bangladesh
- Sri Lanka Cert CC 2017
- BKNIX Peering Forum
- APRALO – Partial fellowship support for the Chair and Co-Chair to attend APRICOT 2017

APNIC also provides annual membership contributions to the APT, PTC, ISOC and PeeringDB.

7.5.3 Fellowships

APNIC will provide fellowships to APNIC 44 for working professionals and youth, and 'Returning' fellowships for selected past recipients.

APNIC will provide a level 1 basic Linux Administration training workshop to APNIC 44 youth fellows, following feedback received from the youth fellows at APNIC 42.

APNIC will contribute AUD 10,000 each to the APriGF 2017 and PaIGF 2017 fellowship program.

7.5.4 Regional Infrastructure

- Root servers
 - Coordinated with Netnod and Sri Lanka Telecom to replace the failed I root server in Colombo.
 - APNIC is assisting Verisign in deployment of J root servers in Nepal, India and Australia, and two in Singapore.
 - APNIC will deploy a root server node in the PNG IXP in collaboration with NICTA.
- IXPs
 - Provided support to the APIX meeting at APNIC 43 and assisted the APIX Steering Committee elections.
 - Provided support to the development of APIX' s Peering Asia Logo.
 - Sponsored an open peering event working group lunch at APNIC 43.
 - Successfully launched the Islamabad and PNG IXes with support from APNIC and ISOC.
 - Discussions are underway to set up IXes in Kabul and the Maldives.
- Internet measurements:
 - RIPE Atlas Anchors were deployed in Mongolia, Nepal, Indonesia, Australia, and Vietnam.

Atlas probes are distributed at every training workshop. To date, in total, we have distributed 250+ probes in the Asia Pacific region.

7.6 The APNIC Development Program

7.6.1 APNIC Foundation

- Funding for the Foundation's first major project was confirmed. AUD 200,000 has been granted under the Australian Department of Foreign Affairs and Trade's (DFAT) Cyber Cooperation Program to Build Cyber Capacity in the Indo-Pacific for an APNIC project entitled 'Raising Cyber Security Capability and Awareness: A secure and resilient Internet infrastructure for development in the Pacific'. The project will start in July. Two other project proposals for funding were unsuccessful.
- With the Foundation now fully operational, the following staff have been seconded on a full-time basis from APNIC to the Foundation: Duncan Macintosh as CEO and Executive Director; Sylvia Cadena as Head of Programs. Replacing Duncan as Development Director is Che-Hoo Cheng.
- An Affirmation of Commitment (AOC) was signed between APNIC and the Foundation to document their support, engagement, and cooperation with each other.
- A Foundation BoF was held at APRICOT 2017 to share information on the Foundation's activities with the community. It was the second Foundation BoF held at an APNIC conference.
- With Sylvia's secondment, the ISIF Asia program was incorporated into the APNIC Foundation.
- The nomination process for the Foundation Board continues with candidates being identified.
- Funding discussions also continued with the ITU, DFAT, JICA, and IDRC.
- The new Cross-Community Working Group (CCWG) on gTLD Auction proceeds continued its work with APNIC representative, Sylvia Cadena, taking part.

7.6.1.1 Foundation next steps

- Charitable registration and Board processes continue.
- Continuing fund raising and proposal development.

7.6.2 The APNIC Development Program

7.6.2.1 Funding support

- A JICA-funded project supporting the development of online training materials for CERTs was completed. The release of the materials marked the launch of the new online APNIC Academy. More than 1,000 people registered for the training in the first two months of the Academy
- The annual ITU IPv6 Infrastructure Security Workshop was held in Bangkok attended by 34 participants from 13 economies.

7.6.3 ISIF Asia

7.6.3.1 Status of IDRC and Sida funding

- The current IDRC grant has been extended until 31 December 2017. The Technical and Financial Progress reports were submitted to IDRC in January 2017 and were approved. Final reports are due in January 2018.
- A new IDRC grant to support the ISIF Asia 2018 grants and awards is under negotiation with the final details yet to be confirmed. The original amount discussed was reduced due to IDRC budget cuts.
- The Technical and Financial Progress reports were submitted to Internet Society in January 2017 and were approved. Final reports are due in November 2017.

7.6.3.2 Grants implementation

- Technical and Financial reports from the 2016 grant recipients are coming in for the AUD 441,000 in grants awarded during 2016 to 10 grants in 9 economies.
- The Call for 2017 grants and awards will be launched in June 2017 along with the new ISIF Asia website. The funding pool for 2017 from APNIC of AUD 160,000 will be distributed among three categories: Cybersecurity, Internet for Development, and Network Operations Research.

8 Business Area

8.1 Activity-based costing

All financial expenses are allocated to the defined activity codes set out in the 2017 budget submission.

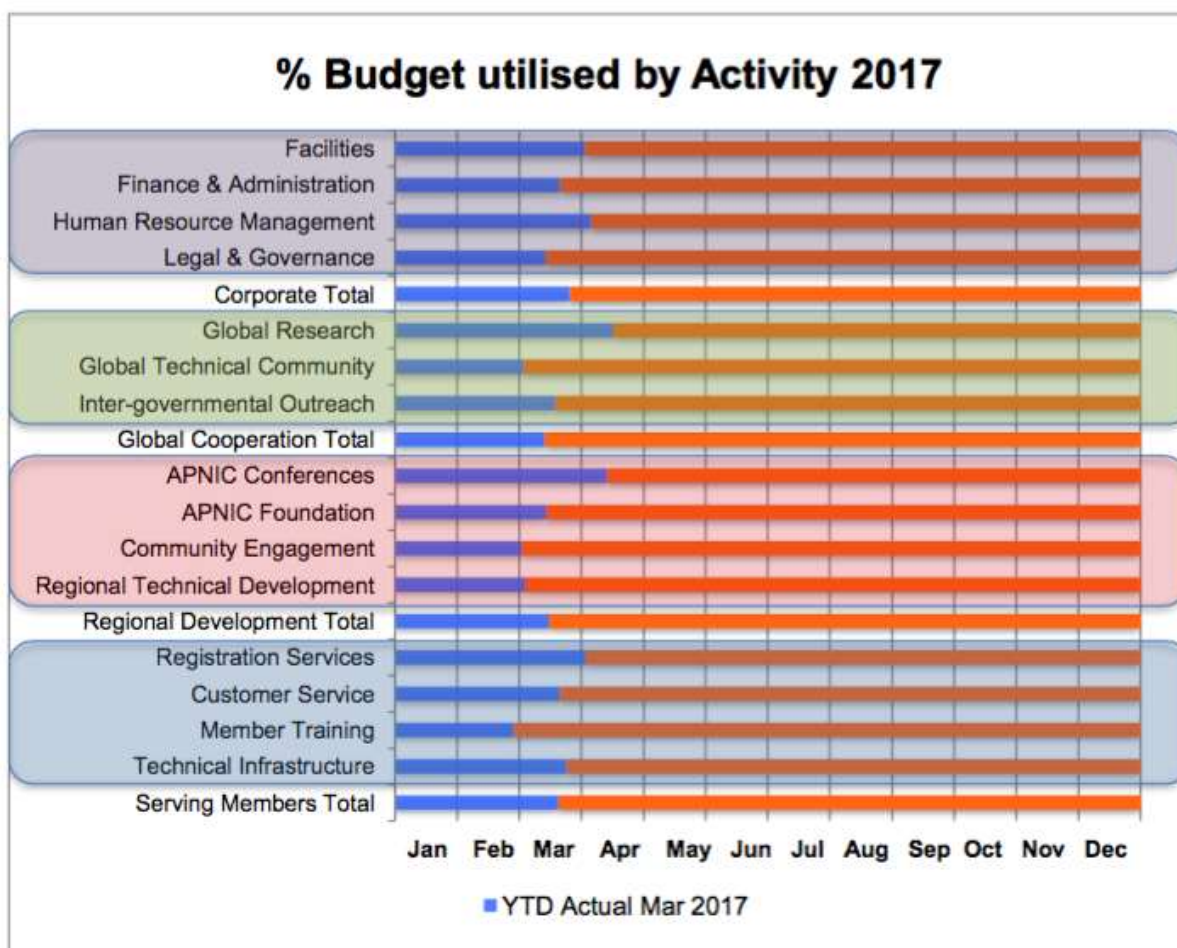


Figure 7 – Activity Reporting 2017

8.2 APNIC Survey

- The Survey team has undertaken a review of the findings of the 2016 APNIC Survey conducted by Anne Lord and Survey Matters. A comprehensive framework and project plan have been developed for the next APNIC survey.

8.3 Facilities review

- The Secretariat undertook a review of the APNIC office facilities to help determine how the layout might be best amended to accommodate changing requirements. As a result of this the following changes are underway:
 - Increase in workstation numbers by reconfiguring existing layout.

- Change of furniture in common areas, meeting rooms, general office, and outdoor areas to facilitate more informal collaborative workspaces.
- Reconfiguration of new small private rooms and screen installation in small meeting rooms.

8.4 ISO9001 Annual Audit

- Preparation for the annual external review of the quality management system to retain accreditation to ISO9001 is underway with a program of internal audit undertaken in the first quarter.

8.5 Business Continuity Planning

- Business Continuity Plan activities continue, with quarterly scenario testing undertaken by the core BCP team. Brisbane experienced an extreme rainfall event in April, and whilst the event was monitored closely by the team, the BCP was not instigated.

8.6 APNIC Foundation

- The implementation of the APNIC Foundation requires a stand alone reporting system to manage the Foundation's financial and administrative activities. APNIC was able to source a free version of the Netsuite ERP through their CSR program; this is currently being implemented and will be active from June 2018.

8.7 Insurance Program

- Annual insurance policies have been placed and includes building and property; public liability; cyber, information technology products and services; management liability; and employee income protection. All insurance is now managed through a single broker.
- APNIC Foundation activities are included in APNIC's insurance program.

8.8 Member Feedback

- The Finance team's interactions with Members are the subject of a pilot commenced in April requesting feedback from Members. This activity aligns closely with the current tools used by the Services area.

8.9 Finance Statistics to date

Number of	Apr-17	Avg/Mnth	YTD	2016	2015
Phones Calls (Outward)	268	263	1050	3500	
RTs Received (Total)	2086	1887	7546	21396	23275
E-Bill Queue	1268	1250	4999	15331	19603
Finance Queue	149	116	463	1328	1332
Accounts Payable Queue	77	91	364	1261	841
Bounce Queue	416	202	809	1415	1496
Inward Payment Queue	176	175	699	2061	3
Accounts Receivable					
APNIC Member Count			6182	5994	5268
New Members	62	74	296	1030	940
New Non-members	0	1	5	18	24
Receipts Processed	581	597	2387	7514	6645
Invoices issued	687	626	2505	7537	7271
Credit notes issued	39	36	145	529	575
Accounts Closed (Mem and Non-Mem)	23	30	121	322	358
Closure Notice sent	107	79	316	945	900
Reactivation Members	0	3	12	45	51
Reactivation fee waived	0	0	1	8	6
Refund Members (Duplicate and Over-payment)	8	6	23	68	46
Accounts Payable					
Asset Created	11	32	127	189	156
Asset Disposal	2	3	11	127	147
PO created by Finance	49	31	122	213	209
PO Billed	148	153	611	1947	1980
Supplier <u>EFT</u> Payment	65	71	283	891	946
Nexonia Reimbursement Payments	33	31	124	386	388
Credit Card Payment	312	313	1251	3377	3050
Journals processed	85	76	305	888	1005
Cash Advance Request	4	3	10	18	28
Vendor Request	7	9	34	141	431

Figure 8 – Finance statistics (to date)

9 Human Resources (Confidential)

[Confidential material redacted]