

# **APNIC**



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# INTRODUCTION

The APNIC Survey has two parts. This report is the first part, which is qualitative. It consolidates up to date, in-depth feedback and opinions direct from the 'coalface' of APNIC members and non-member stakeholders who participated in online and face-to-face focus groups and individual interviews held during January and February 2018. The findings of this report inform the design of the second part of the survey, which is quantitative and will be conducted online mid 2018.

As an open-membership driven organisation APNIC operates on continuous feedback and implementation cycles. 2018 is the tenth year of the APNIC Survey. Commissioned by the APNIC Executive Council (EC) and conducted every two (2) years, the APNIC Survey is a significant and comprehensive feedback tool, used to improve APNIC performance, target activities and inform APNIC's strategic planning.

The APNIC Executive Council (EC) oversees the appointment of external organisations to conduct the APNIC Survey. As in 2016, independent consultants Anne Lord, Dr. John Earls and Survey Matters variously conducted the 2018 focus groups and individual interviews, with Survey Matters administering the quantitative survey.

### **Report Format**

Readers of this report can be guided by the following distinct sections. 'Key Highlights' summarises very high-level issues, 'Executive Summary' is a succinct and consolidated overview of all themes, 'Key Findings' consists of in-depth findings illustrated and supported by participant quotes and 'Potential Survey Topics Arising' concludes the report listing suggestions to help inform the quantitative survey design.

Throughout the report a distinction is made where appropriate, between the feedback and suggestions of APNIC members versus those of non-member stakeholders. To protect participant anonymity, no names, organisations or locations are identified in the report findings. The report includes direct quotes from participants to add authenticity and insight to the findings.

A glossary of abbreviations used in this document can be found at <a href="https://www.apnic.net/about-apnic/a-z-glossary/">https://www.apnic.net/about-apnic/a-z-glossary/</a>.

#### Note of thanks

Thank you to everyone who participated in the 2018 APNIC Member Survey focus groups and individual interviews. The feedback is highly valued by APNIC. In writing this report, every effort has been made to be faithful to the comments received.

Thank you to the NIR (National Internet Registry) and APNIC staff for their excellent co-operation, coordination and support in arranging focus groups with their members.

Thanks are also due to Dr John Earls for his wisdom, feedback and continuous support.

# **METHODOLOGY**

### **Survey Process**

After each APNIC survey, a review is conducted to identify process improvements to be considered for future surveys. In 2018, the process for the qualitative focus groups and individual interviews closely followed that of 2016. However, a notable change was to expand the use of online focus groups. Key aspects of the process include:

- Analysis of all member and stakeholder feedback from the previous year, as input to the draft discussion guide;
- Restriction of the discussion guide to four major topics to allow an in-depth discussion within the allocated time;
- Random selection by Survey Matters of member organisations to participate, removing any bias;
- Confirmation of member participation in a focus group through an online registration form;
- · Recording and note taking of sessions (subject to permission) for accuracy of transcription and subsequent analysis;
- Scheduling of six online focus groups for 2018 following the successful trial of one online focus group in 2016;
- Employment of independent facilitators to ensure complete anonymity of participants and confidentiality of the discussions;
- Avoidance of any conflict of interest with no Executive Council (EC) members or APNIC staff participating in focus groups or individual interviews.

#### **Selection of Locations**

The APNIC Secretariat, Survey Matters, Anne Lord and Dr John Earls provided input on locations for face-to-face focus groups with final approval by the APNIC EC.

The choice of location was based on the three factors: percentage of quantitative online survey responses in 2016 by economy type (i.e. Developed, Developing and Least Developed); locations visited in 2012, 2014 and 2016 and location of the NIRs in the region. Government advice regarding travel to some economies and size of member base in different locations were also taken into consideration, particularly for the online focus groups.

Five (5) economies and one (1) region were selected for online focus groups. Ten (10) economies were selected for face-to-face focus groups. India differed in that both a face-to-face and an online focus group were planned. The intent of the online session in India was to reach a wider distribution of members. A regional online focus group was planned for the Pacific for the same reason.

Twenty (20) focus groups were planned across the region, an increase of four (4) from 2016. Fourteen (14) were proposed face-to-face and six (6) online. The total number of actual focus groups held was nineteen (19) with thirteen (13) face-to-face and six (6) online. Six (6) economies hosted online focus groups with ten (10) economies hosting face-to-face groups.

Differences between the planned and actual numbers above reflect different circumstances. For one (1) face-to-face session, adverse weather prevented attendees from reaching the location; it was rescheduled and successfully held online. In another face-to-face location there were no registrations; this was reformatted as two (2) separate individual interviews held face-to-face. There were no registrations for two (2) online focus groups; one (1) was reformatted as two (2) separate online individual interviews. In the other, despite attempts to encourage participation, no members accepted the invitation.

Table 1 below shows the breakdown of planned focus groups by region and by UN economic classification.

	Planned Number of Focus Groups Conducted			Total by	
Region	by UN Economic Classification			Region	
	Developed	Developing	Least Developed		
East Asia	Japan, Tokyo (2)	China, Beijing (2)		6	
		Taiwan, Taipei (2)			
Oceania -	Australia Online (1)		Pacific Regional Online (1)	3	
	New Zealand Online (1)			3	
South East Asia		Malaysia, Kulala Lumpur (1)	Timor-Leste, Dili (1)		
		Philippines, Manila (1)		5	
		Indonesia, Jakarta (2)			
South Asia		India, Delhi (1)	Bangladesh, Dhaka (1)	6	
		India, Online (1)	Nepal, Kathmandhu (1)		
		Pakistan Online (1)	Afghanistan Online (1)		
% Members by Economic classification	41%	49%	10%	100%	
% of Responses in 2016 by Economic classification	27%	59%	14%	100%	
Total Number Planned Face to Face Focus Groups	2	9	3	14	
Total Number Planned Online Focus Groups	2	2	2	6	
Total Number Planned Focus Groups	4	11	5	20	

Table 1

#### **Individual Interviews**

Individual interviews were conducted with member and non-member stakeholders across the region. Interviews were held in the same location as the focus groups or conducted via Skype for those in other locations. In total eleven (11) individual interviews were conducted. Six (6) different stakeholder groups were represented including regulatory, government, academic, technical, civil society and regional Internet organisations. Anne Lord and Dr John Earls conducted the interviews.

#### **Discussion Guide**

Four (4) topics were developed for the 2018 discussion guide (Appendix A):

- 1. Issues and challenges providing Internet services as they relate to APNIC;
- 2. APNIC Services including APNIC Training (APNIC Members);
- 3. APNIC's Support for Internet Development; and
- 4. How is APNIC regarded?

# **Participant Selection and Recruitment**

From a full list of members provided by APNIC, Survey Matters randomly selected up to 100 member organisations from each location to participate in the focus groups. The selection process considered the number of member organisations in each location and the size of the member (Extra Large, Very Large, Large, Medium, Small and Very Small). The names of the organisations were then passed back to APNIC. From this point onwards, recruitment of participants was the same as 2016, with APNIC managing the invitation process.

APNIC and the NIR staff managed the recruitment of participants to the NIR focus groups. APNIC and NIR staff were available to assist with translating the invitations for locations where English was not the predominant language spoken.

The APNIC Secretariat and facilitators, Anne Lord and Dr John Earls, managed recruitment of stakeholders for the individual interviews.

# **KEY HIGHLIGHTS**

- Security is the greatest challenge, ever-increasing incidents, costs and management overhead. Collaboration needed;
- No tangible change in deployment of RPKI and DNSSEC; more promotion and support required;
- IPv4 panic replaced by pragmatism but more 'management' of market desired;
- 103/8 Transfer policy painful; interest generated in policy process and translation as members feel effects;
- IPv6 deployed in network core, negative dialogue and antipathy for deployment in access networks. More promotion and support needed;
- Increased demand for lightweight local APNIC presence to amplify local impact of APNIC, improve member support and develop local capacity;
- APNIC's enhanced support for Internet development widely appreciated; particularly NOG and IXP development;
- Significant value still attached to 'APNIC is a neutral body' not subject to influence from anyone;
- Registry integrity and accuracy required to support operations, concern over increased use of personal information by legal authorities;
- Effectiveness of current process for appointments to Executive Council raised. 'Nominations committee' suggested.

# **EXECUTIVE SUMMARY**

# **Challenges**

As in 2016, the three 'stand out' challenges facing both members and non-members are security threats, the difficulty in fully transitioning to IPv6 and the lack of available IPv4 address space. The change in 2018 is the difference in the degree of emphasis placed on each.

Security threats are regarded as the biggest challenge facing members and non-members. All forms of threats are bundled together, including end user vulnerabilities, network security, malware, cyber-security and more. Security threats are increasing in quantity, sophistication and impact, demanding more financial resources and personnel to manage. Smaller sized members appear to be more vulnerable, as are some governments whose responses are often perceived by members as inadequate or excessive. Outsourcing appears to have increased, noted as an expensive, likely unsustainable option. The predominant feeling is not optimistic: security threats and/or lack of security is of 'epidemic' proportions affecting everyone with a lot at stake.

In asking if and where APNIC can help with security, echoing 2016, responses typically included requests for "more". More training, collaboration, discussion, case studies and 'best practices'. APNIC is perceived as having key leverages and key influence, amplifying their ability to shape dialogue. Encroaching and increasing responses from government were highlighted as problematic and APNIC can help by engaging in thoughtful, sustained, one-on-one dialogue and showcasing examples of 'best practices' from other economies.

Again, similar to 2016, IPv6 transition and access to IPv4 address space were both identified as key challenges by members and non-members.

While IPv6 is deployed in the network core, very few members are positive about transition to customer networks. Instead a familiar negative dialogue prevails: fixed line customers are not interested in end to end transparency or the larger address pool, they are reluctant to change, have legacy equipment, lack knowledge and trained staff and are wary of IPv6 "performance and security issues". Members, particularly in saturated access markets, are risk averse. Other members had strong discouragement from vendors, sales cannot find a good business model and are unable to sell the service. Where there was a will, no IPv6 transit service is offered by the upstream provider. The result: antipathy.

When asked what the future holds, the response is muted though largely pragmatic. IPv4 will always co-exist with IPv6, it will always be on offer in the market, they can manage with NAT. There is uncertainty around scaling to meet the demands of IoT.

There is significant concern about the upward price trajectory of IPv4 address space. Some members said they would pay regardless of price. Mergers and acquisitions are often used to acquire additional address space, however the recent policy to restrict transfers for five years from within 103/8 prevents this and is viewed as extremely problematic. Motivated by a desire to change the 103/8 policy, many members are now more interested to participate in the APNIC policy processes and to have access to more translated APNIC web content.

In terms of where APNIC can help with IPv4 and IPv6 challenges, several members felt that APNIC should focus effort to extend the life of IPv4 through increased 'management' of the market. Examples include offering price/fee incentives to return IPv4 address space and creating a favourable IPv4 'returns' policy environment. As in 2016, suggestions are for continued dialogue, promotion, training and showcasing end-to-end deployment of IPv6. Emphasis is placed on the need for support in the transition of customer access networks, as well as dialogue with content delivery networks (CDN's). Government and regulatory agencies can also provide financial stimulus and other measures to encourage transition and lead by example.

Noting the increasing interest and use of the registry system by law enforcement agencies (LEAs), government and other organisations, the integrity and accuracy of registry data is another area identified as a challenge for both members and non-members. Members depend on accuracy to be able to resolve operational problems. At the same time members observe a trend away from storing personal information due to liability and legal concerns arising from the actions of LEAs, lawyers and governments, making this a complex area.

In some economies, training and maintaining skilled employees continues to be a major challenge. The 'brain drain' is significant with good, trained staff heading overseas for bigger salaries and lifestyle changes. APNIC can help by continuing efforts to enhance its training impact in the region.

# **APNIC Services (APNIC Members)**

APNIC services are frequently characterised as "friendly" and the quality of services regarded as good with quick response times. Services most frequently praised are Membership, Helpdesk, the Chat tool and Resource Services. Feedback regarding the introduction of 'single sign on' to MyAPNIC is also regarded positively. The APNIC blog appears to be more widely read and appreciated. Some newer members regard the procedures as cumbersome. Less appreciated and less used services are the Reverse DNS and the information services.

Training continues to be an extremely important service with a high value attached to it, particularly in helping to mitigate the challenge of maintaining well-trained staff identified in the section above. Face-to-face training is consistently preferred. Though there is less awareness of other channels, many had used YouTube and less so, the e-learning webinars. The Academy did not appear to be well known but is viewed positively. Confidentiality is stressed as an important attribute of the Academy.

Some members want more hands on training and a clear progression to advanced topics showing end-to-end solutions. Awareness of the 'on-demand' request process for training is low. Creating a more predictable face-to-face training schedule is suggested as helpful, so that managers are able to plan and budget in advance for training. Scheduling training for days off rather than weekdays would also be helpful. Reaching out to universities in shaping the 'Next Generation' of engineers and working more closely with universities through road shows or specific programmes is also regarded as important.

Across all services (including training), in explaining the most common reasons why services are not used, the barriers are lack of time, difficulty in understanding English and lack of awareness of the service. Cost is also a factor for members in some economies, affecting decisions to take part in training.

While noting that the Billing service is very accommodating of special requests, it is the area where the most suggestions were received for service improvements. More payment options, synchronised renewal dates for members with multiple accounts, more advance notice, payments to be permitted in US dollars, and requests for APNIC to work with necessary parties concerning restrictive foreign exchange banking rules that allow payments in but not out.

Expanding APNIC's impact by localising some services continues to be an important theme. In several economies, one or two members spoke of how they act in the role of the local "APNIC problem solver". They emphasised that communication is in local language, with examples focused on guiding applicants through the membership and resource application processes, solving specific problems and 'train the (local) trainer'.

# **Support for Internet Development**

In response to the results of the 2016 survey, APNIC increased its support for Internet development. In 2018 APNIC's activities to further support the development and operation of NOGs and IXP's had been noticed. APNIC's contribution: financial, resources and expertise as well as its neutrality are seen as key and are widely appreciated. Its ability to bring relevant players together is also seen as very important.

Feedback on APNIC's outreach to government and regulators is largely positive. The need for regular, sustained dialogue is emphasised as senior government positions are often subject to change.

Other activities under the heading of 'Support for Internet Development' attracted less feedback, notably meetings, the Foundation and fellowships. Many felt APNIC should be more visible in their economy through an increased presence at meetings, outreach and events. This was very keenly felt in one economy where the official advice remains 'do not travel'.

The fellowship programme and foundation are for the most part positively regarded. Most questions were raised about the foundation while suggestions were made to expand the fellowship programme to provide more opportunities. Several members raised the importance of developing the 'next generation' of Internet engineers in the region, similar to programmes initiated by some of the NOGs.

Not everyone felt comfortable to give feedback on APNIC collecting, summarising and publishing data to create a picture of the regional Internet. Where received, feedback is mostly positive, with plenty of suggestions for data that could be collected. Anonymity and confidentiality are essential pre-requisites. Existing collection of data by governments and regulators was mentioned in several economies, suggesting that APNIC should liaise with these entities as a first step.

# **Regard for APNIC**

The word 'regard' was often too subtle to be understood well. Many members and non-members equated regard with function. Many described APNIC in terms of its important technical role in the Internet rather than how they regard it. For others, APNIC is largely regarded positively; it is friendly and responsive.

Members viewed APNIC as influential, with powers similar to that of a government or regulator. Neutral and impartial are frequent descriptors of APNIC, qualities held in high esteem.

Popular suggestions for 'if you could change one thing about APNIC' include reducing fees, provide localised services, increase translation and language support. Several members want improved governance procedures; a suggestion was made to establish a nominations committee for appointments to the Executive Council. Setting up a review function across all APNIC activities was also suggested to see if value is being delivered to members.

# **FINDINGS**

# **Topic A – Challenges**

Discussion of this topic began by asking both members and non-members for their thoughts on the challenges they face at work as they relate to APNIC's remit. Particular emphasis was placed on asking what had changed (if anything) over the last 2 years while referencing the results from survey respondents and actions taken by APNIC since the 2016 Survey.

# "Security is the greatest threat at all levels and is getting worse. How to tackle this is a big issue for the industry."

Security is the number one challenge. Dominant among members and non-members is the increasing threat and risk associated with **all** aspects of security. Security challenges are viewed as global, affecting everyone with far reaching consequences. Trying to keep up with the fast pace of the 'security' environment is a major challenge. Smaller sized members appear to feel particularly at risk, citing a lack of resources to employ a needed, dedicated team of staff. Others noted the tendency to employ (often very expensive) security consultants who advise helpdesk and in-house teams.

- "Security is a big concern across all platforms. This is a higher priority than IPv4/IPv6."
- "Security is always a problem because it is constantly evolving. I do not think network security will ever NOT be a major problem."
- "To address the increased threat of security we started our own SOC (Security Operations Centre). However, it is very difficult to run this kind of service in-house, so we are now thinking to outsource to external consultant. Environment is too fast paced."

#### **Network Security**

There appears to be little change with respect to network security. Few are deploying DNSSEC; upstreams rarely deploy it. Route hijacking appears to be more prevalent than in 2016. Resolving hijacks continues to be a problem. Seldom is RPKI deployed; a couple of members said they are "testing" it. DDoS attacks are felt to have increased; one member reported that they receive over 1,000 attacks every day, presenting a huge management challenge. Blacklisting of IPv4 addresses is very common and not easy to resolve. Blacklisting removal is a chargeable service that some members said they reluctantly pay for. As a result, customers are frequently requesting untainted 'new' IP addresses.

The comments below typify feedback received.

- "Many networks are taking 'new' IP addresses as many of their old IP addresses are blacklisted."
- "Some sites they will only remove the blacklisting if they get email from APNIC."
- "DDoS mitigation services from upstream providers are very expensive. We filter out bogons, but it is only 30-45% effective."
- "I have been watching the developments with DNSSEC closely. Not ready to pull the pin yet but I would like to."
- "RPKI is not fully deployed in the routing hierarchy. Major ISPs do not have RPKI deployed."

#### Security literacy of customers is lacking and potentially damaging to ISPs

Members and non-members are concerned about end user security; problems are exacerbated by the proliferation of mobile devices and lack of application security. Some viewed this as damaging to ISPs who strive to maintain their quality of service commitments.

Many members view government services as particularly vulnerable and are concerned about the consequences.

- "The government wants users to communicate with them through the Internet. The government is not aware of how to mitigate cyber-security and the importance of educating the people. So the cyber-security threats will increase exponentially."
- "There are regular government security breaches. Government just passed a cyber security law, but no one really cares about security (esp. government!). Need a lot of education."

#### Internet of Things (IoT)

While many anticipated that IoT could drive the uptake of IPv6, the lack of security for IoT applications is of significant concern and unless solved, it was felt that the rise of associated security problems would be exponential. There is very little enthusiasm for IoT as the panacea for IPv6 uptake while security issues persisted.

• "Service quality is important - and security is a prime concern in IoT applications using IPv6. Important to test carefully for security. This holds us up on IPv6 deployment."

#### **Government responses**

Many spoke with concern about the actions of governments in response to security threats. Recently imposed mandatory regulations in some economies are felt to place onerous requirements on members; log keeping, providing details about users, blocking content and shutting down sites are all common requests. Policy questions around these activities were not raised or discussed.

- "Government sends us lists of https URLs to block. How do you block it? There is no way to intercept it."
- "Record keeping is also difficult running CGN or DNAT and the regulatory agencies are always asking for the records."

#### What can APNIC do to help?

With security challenges, both members and non-members looked to APNIC or their NIR to help with sharing information, co-ordination and collaboration. In particular APNIC's relationships with other regional and national organisations are viewed as important leverages. More specific suggestions include help to form a master Computer Emergency Response Team (CERT) co-ordination activity, assistance to establish Security Operations Teams (SOCs) and establishing a collaborative framework for dialogue on security.

- "The need for collaboration is growing. This involves a pro-active APNIC."
- "Security is difficult everywhere; what does it really mean; can it be categorised? APNIC needs to seriously collaborate with others to get something done."
- "APNIC has access to different organisations in region. They can gather lessons learnt from different places and compile experiences, solutions, best practices in terms of solving these problems."
- "Each organisation has their own CERT, but there should be one master or Co-ordination CERT, so they co-ordinate with each other and communicate with the outside world via one channel, not many. APNIC could help sit with the policy makers to share their policy views and the importance of a co-ordination CERT".
- "..like to have a small volunteer team at the IX tackling network security incidents. APNIC can help building this up."
- "Can APNIC facilitate some kind of study, special interest group or working group for best practice on IoT security?"

#### "IPv4 address space is a very valuable commodity; price doubled in the last 2 years."

A divide appears to exist between the (typically larger) organisations that can and will pay for market sourced IPv4 address space, no matter what and those that are just not able to pay. Awareness of the remaining IPv4 address space that APNIC has available for allocations is not unnoticed.

• "IP addresses are like gold today", "IPv4 is like a commodity."

- "My company will continue to buy, whatever the price. It is an investment. Whenever you have more IP's your company valuation is higher."
- "It is quite expensive but when you compare it to the customers you might capture, it does not matter about the price."
- "We cannot afford IP addresses from the market and are aware of the need to transition to IPv6, but the reality is that we will need IPv4 addresses. We are very concerned as to how we can safeguard our future."

#### Very active IPv4 address market, multiple sources of supply

Two years ago the prospect of IPv4 address scarcity appeared to generate alarm. While still problematic and a challenge to manage, the response now ranges from pragmatic to relaxed. Scarcity is a reality that must be dealt with.

Members spoke of a variety of ways available to obtain needed IPv4 address space, with marked differences among the economies in the behaviour of the market.

In some economies everyone uses a single trusted local broker; in others "unofficial" sources are more common such as word of mouth through equipment vendors, or dealing direct with sellers. One member said they have a 'source' that could transfer IP addresses from within the AFRINIC region, while policies clearly do not permit this.

Others were more comfortable using the listed brokers. On price alone, one member commented that APNIC itself was viewed as being in competition with sellers. Unsolicited requests for either selling or buying address space were common. Regional and local meetings are active venues for buying and selling IPv4 addresses; dealers attend conferences for this sole purpose.

- "Some brokers offer prices that are quite competitive with APNIC's prices."
- "We are being approached by people who want to buy /16's from us, but we are looking for IP addresses. Especially for
  my customers."

In one economy enterprises acquire IPv4 addresses using a 'bidding' system with ISPs. No justification for the size of their IPv4 request is provided to the ISP. The ISP must simply "bid" for their custom based on whether they can fulfil the requested amount of IPv4 addresses. Focus group attendees viewed this as problematic.

Mergers and acquisitions (M&A) are frequently used to acquire IPv4 address space. The policy restricting transfers within 103/8 generated a lot of energetic feedback and discussion. For this reason it is documented separately below.

#### New IPv4 address transfer policy applied to 103/8 unpopular

Many members from different economies cited the recent policy restricting transfers on 103/8 within 5 years as "problematic", expressing concern about the negative impact the policy could have on market behaviour. A number of members whilst midway through M&A's were unhappy to be told by APNIC that following the implementation of the new policy, they could not transfer the address space. In one case, this was the major motivation to attend the focus group! Reaction to the policy has ignited interest in participating in APNIC policy processes and access to more translated content on the APNIC website. This is detailed further in the section on 'APNIC Services'.

- "The transfer policy gave us access to more IPv4 addresses, but the new policy stops the access."
- "If there is no official policy permitting transfers then this will encourage under the table business."

#### 'Trust' an issue in IPv4 market

As in 2016, 'trust' is an issue for IPv4 address space acquired from non-RIR sources. Blacklisting of IPv4 addresses is often a problem. Many reported that thorough testing is needed before deployment with customers. To increase 'trust' in the brokers one member suggested a rating system, similar to other online purchases.

- "The integrity of the address space is important. You need to do your own background checks."
- "Sort brokers by the number of transactions, or have some kind of ranking or rating system."

#### Using NAT to extend IPv4 'life' is fine

In several economies, a few members appear unconcerned about the lack of IPv4 addresses or access to the market. Examples include members who had received large IPv4 allocations a long time ago, those operating in a saturated access market where demand for IPv4 addresses is less and those who are comfortable using NAT and IPv6 to extend the 'life' of their IPv4 resources.

- "In a nutshell, we're coping with our remaining v4 resources as we journey through dual-stack and single-stack in some cases."
- "IPv6 important issue but in reality we use many techniques to limit use of IPv4: virtual IP, NAT."
- "We are very comfortable using NAT boxes running LINUX. The boxes are very cheap. So the long term CAPEX cost of deploying NAT is not a major disincentive."

#### How can APNIC help?

#### Management, market intervention and recycling

Members in several economies felt that APNIC can do more to 'manage' the IPv4 address space to increase availability of IPv4 addresses. Suggestions include actively monitoring 'usage' and reclaiming 'unused' address space, offering incentives to return IPv4 address space and 'fixed' pricing in the IPv4 market. In one economy, there is a strong feeling that the content and cloud providers and those with larger blocks should be "required" to transition from IPv4 to IPv6 and return their IPv4 addresses to the registry. More transparency is requested when IPv4 address space is returned to the 'pool' with a public listing of returned IPv4 address blocks made available.

- "There should be some control of the market."
- "APNIC and the regulators should force the big ISPs and universities to release /24's every month and they should be forced to migrate to IPv6."
- "Current logarithm to calculate the membership fee creates a lack of motivation to not return unused IPv4 addresses."

#### "The big question - who cares about IPv6? No-one."

It is probably no surprise that IPv6 deployment is still problematic. While pragmatism describes the mood of the focus group participants around IPv4 scarcity, with few exceptions, antipathy could be used to describe the mood regarding the transition to IPv6. The majority are very aware of the need to transition to IPv6. Most had some level of IPv6 deployment in their network core; few had customers. Many stated that there is no sense of urgency to provide IPv6 services especially while IPv4 is still available.

- "Most people have no enthusiasm for IPv6. The push has slowed dramatically."
- "People would rather work around it [IPv6] than work with it."
- "Adoption of IPv6 is not considered as a must, because there are ways to get around lack of IPv4 addresses."

Reasons given for the slow rate of transition are very similar to those in 2016. Customers are not asking for IPv6, they had no interest in the larger address space or end-to-end transparency, it is still perceived by customers as operationally too difficult to work with, customers have too much legacy equipment and many associated IPv6 with "performance issues" regarding it as inferior to IPv4.

- "Customers have zero interest in IPv6. Zero. Despite larger available address space. There is no business incentive for them."
- "Companies do not care what version IP they use. They prefer IPv4 and are not interested in end-to-end transparency benefits."
- "One of the reasons the big enterprises do not request IPv6 services is that it is still too hard for them. It's complicated. It is hard to type, it is hard to do trace-routes."

• "We had customers who have deployed IPv6 but turned if off because they could not see any advantages."

Other reasons for the inertia are familiar: members cannot find a good business model, the increase in CAPEX expenditure impacts profits so management are not interested and vendors actively discourage some members from deploying IPv6. In several economies the saturated access market is regarded as a real problem, resulting in paralysis. Any organisation pushing IPv6 would do so at the risk of losing customer share or unleashing a tidal wave of customer complaints.

- "Top decision makers do not perceive any benefit to move to IPv6, there are no reasons at all."
- "From a financial point of view, there is no advantage AT ALL to change from IPv4 to IPv6. We have a lot of IPv4 here, and we can still use NAT."
- "They say: why bother about IPv6? What good will it bring? What money will it bring? Instead there will be lots of customer complaints with users on their mobile phones."
- "There is no room for manoeuvre in the market when it is saturated and so competitive."

#### Top carriers do not offer IPv6 transit

Similar to reports in 2016, several members spoke of their desire to offer IPv6 services to their customers but are unable to do so as their upstream provider does not offer IPv6 transit services. This is largely viewed as complacency but also aggressive market control tactics. With the largest share of the access market in many economies, mobile operators are singled out for criticism.

- "I want to implement IPv6 in my network but my upstream does not. When I give them pressure to implement it they tell us that we will not get proper access to all websites."
- "They (upstream) do not offer IPv6 services despite announcing their IPv6 allocations."

#### Content, hosting and cloud providers must move to IPv6

In 2018, more emphasis is placed on content and cloud providers, who are perceived as key in driving IPv6 deployment. The absence of content readily available over IPv6 and the lack of geo-caching are the most common complaints. In one economy members noted that IPv6 content is located outside their economy, adversely impacting performance for customers. A number of members felt that it would be helpful if APNIC could put more pressure on hardware, software, cloud and of course, content providers to fully transition to IPv6. One member suggested, "We should be having our own blacklist of sites that do not support IPv6."

- "Until the content is there on IPv6 and when there is no more IPv4, the industry will just find a way to handle it, but it will create some kind of barrier for the market to grow, especially the broadband market."
- "Facebook, Google, Akamai and the other big content providers are all v6 and we can see that in the huge increase in v6 traffic. But we connect to the cloud providers and they are not yet supporting v6."
- "The future of IPv6 is led by the content. We do not expect any significant change in the next 1-2 years. Same same."

#### Expectation that IPv4 will co-exist with IPv6 for up to 20 years

When asked what the future holds with respect to IPv4 and IPv6 there was often silence. Feelings are clear. Members are preoccupied with solving today's problems, not crystal ball gazing. Where comments were forthcoming, many believe IPv4 would never go away. Others said investing in CGNs (Carrier Grade NAT) is regarded as a better investment than IPv6.

• "Do not believe that IPv4 will disappear. It will simply remain, regardless of the market."

#### **How can APNIC help?**

"It's not just the backbone deployment but the whole ecosystem that needs to be shown, end to end."

With one or two exceptions, the outlook for IPv6 deployment appears grim.

When asked how APNIC can help, suggestions always focus on more training and outreach to build confidence and skill levels. Apart from training backbone engineers, more help is requested to appropriately train customer support, operations teams and management. 'Hand-holding' through a migration was also proposed. Fearful of customer reactions, others are keen to receive help with training on the access side.

Some members want APNIC to speak directly to their customers to create awareness about the need to transition or to offer training. For these members, APNIC is perceived as an outside (foreign) authority that is capable of exerting more influence on their customers than they are able to.

As in 2016, highlighting successful deployments and case studies are viewed as very important. However, when mentioning a recent successful case study detailed on the APNIC blog, few were impressed, assigning success to financial backing and dismissing it as a new deployment rather than a retrofit.

Extending knowledge and training to the next generation, reaching a wider audience, particularly university audiences and increasing support for local replicability with "train the trainer" programmes are also seen as key.

- "There are few engineers who understand IPv6, despite all the training that has taken place. This is a big problem."
- "If APNIC can send some engineers to do some handholding during the transition, to be around for the next 24 hours to help with any problems. This would help the ISPs build confidence."
- "We want more "end to end" success stories from this region. This is missing."

#### Government's role

The role of governments in assisting with IPv6 deployment was met with varied responses. Some members and non-members noted that IPv6 is not a top priority for their government. Others did not want the government involved at all. However, many felt that their government could play a more helpful, supportive role. Suggestions raised include listening to operators to understand what is needed, offering financial, tax and other incentives to encourage deployment or showing strong leadership by implementing IPv6 in all government agencies and services. Members in one economy suggested they would migrate only if mandated by government.

Where governments are playing an active role, the view from members and non-members is largely positive. Examples include one economy where the recent launch of IPv6 services on mobile phones has occurred as a result of a government led multistakeholder approach. In another economy, the recently issued government IPv6 deployment policy and roadmap is viewed positively.

APNIC is viewed as an organisation that can influence governments to do more to support, facilitate and collaborate with industry. Some of the suggestions received are included below.

- "APNIC can establish a team inviting the telecom regulator, members of the community and some of the mobile operators and IIG providers to help move the dialogue and bring about pressure for change."
- "Getting operators together with APNIC, ISOC, the regulator and ministry. Listening to the operators is important to find out what is stopping them transition: hardware, investment, what is their view of an incentive? All voices must be at the table."
- "IPv6 is off the government radar. APNIC could help with 'motherhood' kinds of statements and advice to the government."
- "There is no regulation or policy from top government to change networks to IPv6. This is the reality. Government should provide an incentive to users. Could be a financial incentive, tax deductions."
- "We would migrate if the Government mandated it, but otherwise it is a business decision, and there is no market incentive".

#### Other challenges and/or issues

Under this topic, respondents raised a variety of concerns, detailed below.

#### **Registry Integrity**

Several members and non-members raised the accuracy and integrity of the 'Whois' registry data as a challenge. 'Whois' often had incorrect contact information for networks, making it difficult to get in touch with the right people when needed. Some suggested that APNIC should increase its efforts to promote the accuracy of the 'Whois' database reflecting their beliefs that it is a core function of APNIC.

Respondents in one economy spoke of 'Whois' contact information being used by lawyers and other legal organisations to issue engineers with sub-poenas. It was noted that the risk of legal action together with data privacy concerns all work to obscure accurate contact information in the public 'Whois' database.

#### **Capacity Building Challenges**

Similar to 2016, non-members in emerging Internet economies spoke of capacity building challenges that dominate all other challenges.

While many members and non-members spoke of the difficulties of maintaining a highly trained staff, those in less developed economies felt this more acutely, highlighting the ongoing challenges associated with having sufficient numbers of competent, trained engineers conversant with the latest technical knowledge and skills. Also difficult is convincing management of the need for training, especially when budgets are tight and few engineers are employed to run the network. Moreover, good trained engineers often head overseas for better-paid jobs and lifestyle. A non-member spoke of the "risk of poaching" of engineers who were recipients of fellowships, noting the negative impact this has to their economy.

In two economies members and non-members spoke of the difficulties of their political environment. Constant change, ensuing instability and lack of political will are all enormous challenges that impact every facet of life. While it is noted that these are difficult challenges to surmount, encouragement was given to APNIC to regularise dialogue and engagement with senior government officials, whether at regional fora or one-on-one to encourage 'best practices' in Internet development, highlighting the importance of the 'multi-stakeholder' model.

In several economies, members spoke of the digital divide in relation to the problem of rural access to the Internet. Building infrastructure, delivering equipment and reliable power to remote areas are major challenges. In one economy, Internet access to the entire country is poised to undergo massive change. In trying to create an environment that fosters growth and opportunity, members of the same economy spoke of the immediate challenges faced in creating an enabling regulatory environment, building infrastructure and connecting their communities to support the development of the Internet. Help from APNIC (and other organisations and economies) is appreciated and strongly encouraged!

# **Topic B – APNIC Services (APNIC Members)**

"APNIC staff are really good. Very cordial and friendly. They provide a very fast service. We feel homely working with them."

When asked about the experience of using APNIC services, members are generally positive, noting that they rarely use all APNIC services. Resources, Helpdesk, Whois, Chat, MyAPNIC and Billing are all services where feedback is easily forthcoming. The fast response times, friendly, helpful and professional staff and improvements to MyAPNIC are all highly rated. The blog appears to be read more by focus group participants than in 2016, with several attendees proudly speaking of their own blog contributions.

- "... Generally happy that ... we can receive IP addresses and ASNs: providing they can run their business and it is not impacting them, it is business as usual."
- "Happy with APNIC services and chat facility. However English is still a bit tricky".
- "There are some good options incorporated in the portal" and "MyAPNIC is "brilliant" since the one-time password was introduced."

"Lack of time, no need" and "was not aware of..."

These are the typical reasons offered for not using APNIC services. More specific barriers often relate to procedures being difficult to understand, changing procedures and for non-native speakers, difficulty in understanding English. One member needed to use the services so infrequently that he found it frustrating; with each visit the procedures change. Another joked that he helped his "colleagues" in different companies so often that he would soon "start to charge for his assistance."

- "Everything is good except language. Use of services is restricted because it is too hard in English."
- "I only use needed services like MyAPNIC etc. Staff do not use the website for other information because it is in English. Engineers do not want to spend the time to read the English articles. Doing their daily job is already very time-consuming. Simplified Chinese would be good!"
- "It's not like riding a bike.... when you go to do something, the bike is not the same one as before".

#### Suggestions for improvements or for new services

The main themes in response to this question are related to translation, resource procedures, billing and improvements in the performance of the APNIC website. The availability of local experts is also mentioned as one way of improving the overall experience of APNIC services. A range of suggestions received is included below.

#### **Translation**

- "Can the APNIC website be available in different languages? Policy content and meeting transcripts would be the most useful."
- "Blog is very interesting but it would be much better if it could be translated. Meeting content is good."

#### **Billing**

- "More advanced notice required for membership renewal. Overseas financial controls mean that we need <u>much</u> more advance notice."
- "Synchronised renewal dates for members with multiple accounts."

#### **Website Performance**

- "Improve website performance it is very slow to load and difficult to use, particularly in the afternoons."
- "Place a proxy server, in either in Singapore or in India. The IX is also ready to host an APNIC proxy server."

#### **Localised APNIC services**

- "A local support person in this time zone would be better. For example, a local certified APNIC expert who the members can consult."
- "How to apply for an ASN needs to be on continuous loop. Maybe APNIC can be present with a mobile office and process requests for ASN's."

#### **Experience of APNIC's training service**

#### "It is vitally important to maintain an 'assembly line' of trained staff."

While not everyone uses or needs APNIC's training services, those that did, held it in high regard, noting it is an important service to members and stakeholders. Its importance is perhaps not surprising given the emphasis in the section above, regarding the challenge of training and retaining skilled staff.

Feedback on the quality of training is generally very positive, although some noted that the level of training is not regarded as sufficiently advanced or practical.

While members and stakeholders are generally aware of the various channels that APNIC uses to provide training services, fewer were aware of the Academy. Other methods of accessing APNIC training are appreciated and described as helpful. Face-to-face training is still overwhelmingly preferred, many expressing a desire for more of this type of training.

In speaking further about the Academy, one stakeholder felt there might be a problem with marketing, as few people he spoke to seemed to be aware of it. Another commented that confidentiality is a very important aspect of the Academy, not to be underemphasised.

• "The Academy might be very good for engineers. Confidentiality must be stressed if you want people to use it!!"

#### Reasons for not using APNIC's training service

"Time!" and "Work!" Both were frequently raised as obstacles preventing members from participating in APNIC training courses. Lack of awareness or knowledge of the training service is the reason a few newer members had not participated in any training. Some did not know they had to request training or how. Training fees are also regarded as too high in several economies creating a barrier to participation. In one region charging stopped people from registering for training and the planned training was cancelled.

In several economies, respondents spoke of the difficulty of attending e-learning or watching the YouTube training due to poor bandwidth or content restrictions. Language and time zones (particularly for the live e-learning sessions) are also barriers. Cultural resistance to training was cited as a barrier in one economy. Comments below illustrate some of the feedback received.

- "Nothing stops me from using APNIC's training services, but my work hours are pretty rigid..."
- "Remote participation is very difficult with the connectivity here."
- "Remote session ...was too one-way and had all the problems of remote sessions (delay, jitter, echo, power failures etc). These are an important first step but cannot replace face to face."
- "Very high language barrier so have not made use of APNIC training services for technical staff. Would be good to have translated content."
- "It is much more comfortable for people to learn in local language. This is very important."
- "They don't want to expose what they don't know and feel they are supposed to know! So they don't want to take exams and do not want to go to training afraid of failure and being publically exposed."

#### **Suggestions for improvements**

There were plenty of suggestions on how to improve APNIC's training services.

A common theme is the desire for training in local language. As in 2016, extending the impact of training to enable more frequent local delivery through a train-the-trainer approach was popular, as is more liaison and interaction with universities. One member suggested that APNIC fellows work with APNIC to reach students in the universities who need access to relevant industry training material. Another suggested APNIC conduct university 'road shows' to increase awareness of IPv4 and IPv6. More hands-on training is popular around topics such as security and IPv6 deployment.

A more structured, predictable approach to scheduling training locations is preferred to the current 'on demand' approach to identifying locations. A popular suggestion is to conduct training on non-work days to avoid conflict with work. A number of members wanted to reduce or remove training fees. One non-member suggested establishing a sink fund to meet demands for unplanned training requests. This would avoid embarrassment of potential hosts unable to meet funding requests, as had recently occurred in one economy.

A range of the feedback received from members is below, grouped by topic.

#### **Scheduling and Planning**

• "It would be good for training to take place on Friday's and Saturdays (ie. on holidays). This would allow more people to be trained."

- "APNIC training is not bad but it does not appear to be systematic. Perhaps some of the basic, non-changing material could be published in book form and translated into other languages."
- "More consistency and a regular push rather than waiting for local members to request training. We are often too busy to look at events in the portal."

#### Costs

- "APNIC has recently requested hosts to provide funding to meet costs when the training was not scheduled. Why do they not have a "sink" fund to meet requests for under-served regions?"
- "Should be free, have food and a certificate. This is the sweet spot."
- "We have no separate budget to attend trainings or meetings. If the training fee and a fellowship were included in the member fee, this would enable us to attend meetings.

#### Localisation

- "If APNIC can train some local trainers it is more helpful for the community. If APNIC can only do 1 training a year, then the local trainer can help organise another 2-3 trainings so in a year you can have 6-8 trainings."
- "Reach into the universities to help cultivate the next generation. What about a programme?"
- "Bring APNIC people to talk about APNIC at university level. Conduct an APNIC "roadshow" to campuses to explain what it does and give an introduction to IPv4/IPv6."
- "If APNIC can conduct trainings in local language this will help the local industry."
- "Ask engineers at trainings to evangelize about the APNIC training offerings in its various forms. Word of mouth is very powerful."

Separately one individual interviewee from an economy with an NIR suggested there could be much more real collaboration between their and APNIC on projects of mutual interest.

• "While we work with our NIR, there would be real scope to sit down with APNIC and look at a joint approach to training e.g Education Toolkits."

#### **Suggested training topics**

- "More help in terms of cyber awareness and advanced cyber-security training is needed."
- "Training or refresher course for "MyAPNIC" to help understand every feature. It is not easy to go through the new portal."

# **Topic C – Support for Internet Development**

In discussing 'Support for Internet Development' with members and non-members, comments are often intertwined with suggestions for how APNIC can help further. Accordingly this is how the topic is written up.

#### "APNIC is playing a very vital role in our community, without them, we were nothing."

Overall there is a very strong appreciation of the work APNIC does to support Internet development in the region. The comments below echo a familiar sentiment felt in several economies.

• "APNIC has given us a lot of support. It is very good. They have good communication with the community. We have a very close relationship with them and feel comfortable to ask for help."

Partnerships and collaboration with local Internet community organisations is highlighted by non-members as important in being effective in supporting Internet development and to help build local capacity. Some noted that while good, there is room for better co-ordination.

Support to Network Operator Groups (NOGs) and Internet Exchange Point (IXP) development received the most feedback; high value is attached to these activities. There is little feedback on certain topics: deploying root servers, the APNIC Foundation and the Technical Assistance Programme. Emphasis is accordingly given to the topics that respondents provided most feedback on.

#### **NOG Support**

APNIC's neutrality, financial support and ability to bring overseas speakers are all described as important attributes of APNIC's success in supporting NOGs. In a number of economies (including one with an NIR), where no active NOG's existed, interest is high in either rejuvenation or starting a NOG with help from APNIC.

- "APNIC has been very visible in the community. This is very good. Our LDC is not neglected. All these things have been possible with APNIC's support: finance, trainers, resources."
- "APNIC really helped our NOG get rejuvenated with financial and in-kind support. It was established late 90's but died. The NOG now is a big benefit. Gets people talking together before they did not."
- "APNIC has a really important role in our NOG because they are <u>neutral</u> and they have the 'network'. They arrange the logistics. If we relied purely on the local committee it would not work."

When it came to helping NOGs locally, a non-member stakeholder noted in one economy that public mailing lists, like those often used by NOG communities elsewhere are not necessarily a natural choice for some cultures. Confidentiality is important. He explained:

• If I have something to ask in public and I am not sure if anyone will answer, that could be embarrassing. A mailing list then becomes a waiting list."

#### Help to establish IXPs

APNIC's work to help to establish IXPs is often highlighted in the context of collaborative effort and dialogue. Bringing together the different parties is seen as one of APNIC's strengths; showcasing the benefits of IXPs to communities and to important stakeholders, like governments.

- "Hardest thing about getting the IXP up and running was bringing stakeholders together."
- "If an EXPERT flies in and says this is "best practice abroad" there is the old colonial mentality they will sit up and take notice."
- "The development of an IXP is under the 'control' of the government, so they must be included as a stakeholder in any discussions, events, trainings etc. Has to be a government led thing. APNIC can help advise government."

When asked how APNIC can help further with IXP development, respondents spoke of the need for (continued) dialogue particularly with IXPs that are not functioning well, were selling transit and/or had restrictive peering policies.

- "If APNIC were to help further it would be on the IXP side, trying to get sensible policies established."
- "More education around 'what is an IXP and why is it important?"
- "How about a kind of "IX exchange programme with partnerships, or buddies to exchange "lessons learnt" between partner IXP's. APIX is a volunteer organisation but it could be built up with funds from APNIC, similar in function to the Euro-IX secretariat."

#### **Meetings and Events**

There is little feedback regarding the meetings and events, but where received it is positive. Comments frequently centred on the need for more **in country** presence by APNIC at meetings. Few focus group participants had followed meetings remotely, citing a lack of time.

One person described the IEEE approach to meetings and suggested that more online discussion prior to the actual face-to-face meeting would be beneficial. Members in one economy (with an NIR) noted that they are not able to attend APNIC meetings due to the cost, but hoped to be able to take advantage of remote participation more frequently in future.

#### **Outreach to Government and Regulators**

Members and non-members are largely appreciative of APNIC's outreach to governments and regulators. Many are emphatic that it is important to continue to maintain **regular** dialogue with governments, especially as senior people in government change frequently. In so doing, APNIC's neutrality is considered very important, not subject to influence from anyone. As noted elsewhere, APNIC is perceived as able to exert influence and 'leverage' where members could not.

Pushing for change with the regulator and government are also highlighted as important activities, particularly to reinforce the multi-stakeholder model. It was noted in one economy that non-local APNIC staff are better placed to exert more influence than those who are local.

#### **APNIC Foundation and Fellowships**

To discuss the APNIC Foundation a brochure was handed around to focus group participants. Most tended to support the purpose of the Foundation, without providing any further commentary. Non-members were more forthcoming. One noted that they need to see more local visibility, another questioned why it is registered in Hong Kong and another felt the role of the Foundation is unclear. The need for translated material was regarded as vital to help the Foundation be more effective in fundraising. It was suggested that translated material would also support an improved understanding of the role and activities of the Foundation, particularly to non-members.

The fellowship programme is well regarded. Some members felt APNIC can do more to help by providing increased funding to enable <u>more</u> fellowships and converting the partial fellowship program to complete one. Other suggestions include doing more to work to support fellowship programmes offered by NOGs and fostering the "Next Generation" of Internet engineers by allowing members of all economies to apply for fellowships. An operator of 'critical infrastructure' suggested a fellowship solely for operators of critical infrastructure regardless of country.

- "Fellowship programme should be open to the "Next Generation" of Internet engineers, with focus on Youth, not only for developing economies but for all."
- "It would really help to increase the number of fellowships from one to two. Sending one person does not make an impact."
- "Our NOG is trying to work with universities to offer fellowships to attend the NOG. APNIC can also work with the NOGs to form a local partnership to create awareness in the academic community.

Similar to the ITU model, a member in one economy suggested increasing membership fees to cover participation in training events and a fellowship for each member to the APNIC AMM and APRICOT.

#### Information services (resource statistics etc.)

In speaking about APNIC's information services few comments were forthcoming. Often it was necessary to elaborate further, indicating a general lack of awareness of available resources and data. A few of the non-members praised the research done by Geoff Huston, available on the APNIC labs site. Another non-member observed that the old APNIC meeting archives are not publically available – whereas ALL the IETF archives are.

#### Collecting, summarising and publishing data showing the regional Internet

Responses to this question are varied and not always forthcoming. A few said that as they are not the business decision makers, they are unable to comment. Of those that did, examples of suggestions received include:

- "Total bandwidth of Internet in the economy. The number of mobile users, fixed broadband users; most visited sites by access type?"
- "How much terabit of content is % of browsing, education purposes."
- "Information relating to network infrastructure, traffic volume, network topology maps of ASes (noting that there are some paid models where you can already get this information). Would be happy to have if it was free."
- "How many Internet users we have, with their exact stats talking about services they use."
- "Threats and security issues as well how much traffic is clean and how much is infected"
- "A visual map of all fibre connection that connects countries from one another and to the international fibres or sub marines if possible."
- "The total and actual number of Internet users in the region and as well as in all countries individually."
- "Interested to know what address space is used by member business type in the region."
- "Domestic industry data is available. Data from other countries IPv6 deployment access and service types would be interesting."

A couple of different opinions for the format in which data could be presented were offered:

- "Executive summaries would be essential, so that the high points can be easily reviewed."
- "It would need to be presented as a dashboard high level summary, free. People who wanted more detail could be charged for it."

#### Willingness to provide data, shared anonymously with the wider Internet community

Again, responses to this question are mixed. Some people are unwilling to comment noting that they would need to ask management if they could contribute.

If someone had expressed an opinion on the first part of the question, they tended to be interested in supporting an activity to contribute data, but often only on condition of assurance of confidentiality and anonymity. Others are happy to provide data but wanted it collected real time to minimise the effort involved.

- "Yes but only if 'sanitisation' of data is done at the point of collection. i.e. collect it in a way to ensure that it anonymous. **This is very important**."
- "We would be interested in aggregated info IF it was anonymous."
- "Would prefer data to be collected automatically, real time without having to submit information from time to time."

Members in several economies said that while they would be willing, their government or regulator is already collecting Internet related data and APNIC should first talk to them. Participants from several economies said they could access the government's statistics, though not all could. Reactions are divided in terms of interest in data collected by APNIC. On the doubtful side, one person wanted to know "How would APNIC's data be different to that provided by Google, Akamai?" Another commented that collecting this data would not be useful to the smaller ISPs and felt it served the interests of large ISP's only.

- "Yes, such information would be useful. The government has some of these statistics. Do not have information about IP addresses etc. There could also be a mutual exchange of statistics."
- "We are required to send reports to the Government such as how many local loops, traffic, IP addresses. Most of this information is available on the Govt website, but you cannot provide any feedback."

Some noted a lack of authoritative and/or reliable data, even when collected by government or regulator, expressing a preference for 'authoritative' data. One or two members pointed out inconsistencies between APNIC's data and that of their government, noting that such inconsistencies are problematic for them. In another economy members questioned the APNIC figures on IPv6 deployment and wondered what APNIC is actually measuring, with their measurements showing higher deployment.

• "The regulator has figures of Internet usage which are different to those of APNIC. Which do I trust? APNIC has their benchmark. Descriptive data needs to be included for APNICs data, along with the margins of error. What is needed are clear descriptions as to how the data is calculated."

# **Topic D - Regard for APNIC**

APNIC is consistently regarded as a 'friendly' organisation with an important technical role. Despite its friendly persona, APNIC procedures and documentation are regarded by some members as "daunting". Others regard APNIC as possessing powers equivalent to a government or a regulator (or beyond!), derived from their position at the top of the distribution channel for Internet resources in the region.

- "Perception of APNIC is that it is a technical organisation that you go to when you need IP addresses."
- "APNIC are very very, friendly. This is the best thing"
- "It can be daunting to deal with them. They have their own jargon, in an industry that's already full of jargon and their own specific technical requirements and specific documentation requirements."
- "APNIC play a very important role with IP address allocations, AS numbers and whois. "APNIC is an international organisation. We have to comply."
- "APNIC is like the father figure for the Internet industry in the Asia Pacific, as the ITU is for Telecom companies."

APNIC's neutrality and impartiality are extremely important attributes conferring trust. One member posed an existential question as to APNIC's bigger purpose.

- "Neutrality and impartiality. "This is why people trust APNIC on matters relating to Internet resources."
- "APNIC is very friendly and very neutral. APNIC has a very important and fundamental position."
- "As long as APNIC maintains its neutrality and independence, then it serves a purpose. The bigger question is what kind of bigger purpose do you want to continue with?"

#### APNIC's 'good' points

APNIC's good points are often framed in terms of responsiveness, their co-ordination and support for the community. The registry function is also regarded as a 'good point'.

- "Overall they work very well for the Internet Community."
- "APNIC is seen as providing a KEY registry function. This is its main good point."
- "APNIC is a bit like a bee, in a good way. They are everywhere."
- "APNIC is another organisation like ICANN. We are 'far away' from ICANN and 'far away' from APNIC. APNIC will respond quickly and are not bureaucratic. We can see their benefit as they are a coordinating organisation."

#### Changing one thing about APNIC

Comments in response to this question are wide ranging. Popular suggestions include reducing the fees and spending more money on activities of value to members. Examples of comments received are below.

• "Reduce the membership fee."

- "Remove the transfer fee (especially on externally sourced IP addresses)!"
- "Change the membership fee to include training and fellowship opportunities."
- "Spend and stop hoarding."
- "Set up a review function to look at each activity and see if it ADDS value for members and the Internet community."
- "The resources are there on their website i.e. Training material, help. etc. But APNIC now needs to reach a wider audience, just as the Internet now does. APNIC now needs to broaden its circle."

A few of the non-members are concerned with changes to improve governance of the organisation.

- "Establish a Board nominations committee and good governance standards for the EC".
- "What skills are required of Board/EC members? There are no Good Governance standards. They are elected on Votes not on Ability. ICANN has a Nominations Committee. APNIC needs to do the same."
- "Change the composition of the EC membership so that it more accurately reflects the industry and membership profile. Currently EC is dominated by NIRs."

A local presence and/or more local activities are also popular responses.

- "A local presence/resource would be good. Easier 'access' (onboarding) for new members."
- "Have a more local presence. Push APNIC programmes so they cascade down locally. Need to balance it so that you do not push too hard so you are seen as a heavy hand."
- "Local language support. This is very important."
- "APNIC's remit has naturally expanded with the growth of the Internet. Best help from APNIC would be to have some form of physical presence in the country. Making the presence of APNIC felt more strongly, having a local presence is important."
- "Having a localised presence. This would really help to reach out to more people, to a wider audience."
- "More exposure here. That means seeing APNIC here visible, locally and at more at events."

Other suggestions possibly reflect the increased interest in more translated material and include using more appropriate language when communicating with different audiences and hiring more employees with multiple language skills.

# SUGGESTED SURVEY TOPICS ARISING

In concluding this report, the suggestions below are offered as potential areas for survey topics in the 2018 quantitative online survey.

- Explore ideas for collaborative approaches to security threats, what and how;
- Examine support for enhanced 'management' of IPv4 by APNIC identifying potential actions;
- Explore what would incentivise the IPv6 deployment dilemma;
- Review perceptions of member value attached to APNIC's activities and services;
- Identify areas on the APNIC website to target for increased translation;
- Gather support for all suggested improvements to training;
- Identify if support exists for a 'Next Generation Engineers' programme;
- Refine suggestions for useful statistical data collection, including research on what is currently available;

- Explore preferred ranking of services for local delivery;
- Examine member and stakeholder value attached to registry accuracy;
- Take temperature on governance model to identify support for change to Executive Council appointment process.

# **APPENDIX A**

#### **Discussion Guide APNIC Members**

NIR members and non-member interviewees used the same questionnaire omitting Topic B - Secretariat Performance.

### **APNIC Survey 2018 Online Focus Group - Discussion Guide**

#### Invitation

As part of the APNIC Survey 2018 you have been invited to take part in an Online Focus Group.

This document gives you information about the APNIC Survey, the purpose of Focus Groups and what to expect if you attend. Pages 2 & 3 outline the topics to be discussed.

Interviewers are independent of APNIC and respondents are assured of anonymity.

#### **About APNIC Surveys**

APNIC Surveys are conducted every two years to gather views and opinions of APNIC Members and stakeholders to contribute to APNIC's planning processes.

As an open, membership-based organization, APNIC acts on the results of the APNIC surveys in order to continuously improve its services and activities. You can read about initiatives resulting from past APNIC surveys on APNIC's Survey Response Activity Tracker web pages.

The APNIC Survey has two parts: Focus Groups and an Online Quantitative Survey. More details about the Focus Groups are below.

#### What is a Focus Group?

A Focus Group is a small <u>confidential</u> face-to-face or online group meeting. Names of who said what are NOT recorded. Participants are randomly selected.

Information gathered is in-depth, detailed and honest. There are no right or wrong answers. Your own opinion is important. There is no requirement for everyone in the group to agree.

#### Why does APNIC hold Focus Groups?

Online and in person Focus Groups are held to gather opinions and feedback from APNIC Members on a range of APNIC and Internet industry related topics.

Key themes from all Focus Group discussions are summarized into a report, which is published. This report informs the design of the questions for the Quantitative Online Survey. Your name is <u>not</u> included in the report.

#### How does an Online Focus Group work?

An independent facilitator conducts the Online Focus Group. No APNIC staff are involved.

Questions are typed online by the facilitator. You reply by typing your answers. You can read, reply or comment on answers from other attendees. They do not know your identity.

For accuracy, a transcript is made of the whole discussion. It is destroyed after the Survey.

Information you provide is 100% confidential & anonymous.

#### **GUIDE TO QUESTIONS**

We want your feedback. It does not matter if your opinions are different from others in the group. Everyone is encouraged to speak.

Privacy and confidentiality are extremely important. Do not share any information with others when the online session ends.

#### **Topic A - Challenges**

I would like start by understanding the challenges you face, as they relate to APNIC, in running your networks.

In the 2016 APNIC Survey results, key challenges were: IPv6 transition, lack of available IPv4 addresses and Security threats. APNIC introduced initiatives to help overcome these challenges, including more 'Best Practices' and Case Studies for IPv6, 'Best Practices' in Security and an 'Introduction to Cyber-Security' training course.

1. I would like to know your thoughts on the topics below:

How is this affecting you? What has changed in the last year (if anything)? How do you see the future? What can APNIC do to help?

- IPv6 transition
- IPv4 exhaustion & access to the IPv4 IP address market
- Network security

Are there other challenges or issues that concern you?

#### **Topic B - APNIC's Services**

- 2. Thinking about APNIC services for example:
  - Internet resources services and Helpdesk
  - Tools: MyAPNIC & others
  - Billing, fees and administration
  - WHOIS Registration services and Reverse DNS
  - APNIC website, Blog & communications
  - Information services (resource statistics, etc.)

What is your experience in using any of these services?

What (if anything) stops you using some services?

Can you make any suggestions for improvements or for new services?

3. APNIC Training

In response to the 2016 Survey results, APNIC expanded the number of community trainers and added training content. It also launched the APNIC Academy, offering online self-paced learning.

What are your experiences with APNIC's training services, including the Academy?

What stops you (if anything) from using APNIC's training services?

Can you make any suggestions for improvements?

#### Topic C - Support for Internet development

- 1. APNIC works in collaboration with other Internet organizations to support the development of a robust, stable and secure Internet. Examples of APNIC's work with the local community are below:
  - Assisting in the development of Internet Exchange Points (IXPs)
  - Supporting community forums like the "Network Operator Groups" (NOGs)
  - · Meetings and events with Members
  - Outreach to government and regulators
  - Fellowships
  - APNIC Foundation
  - Technical Assistance programme

Do you have any feedback for APNIC about its support for Internet development? How can APNIC help?

2. Member-based organisations often collect, summarise and publish data about the industry they represent. This helps members understand what is happening across the whole industry. Data collected is anonymous and can be technical, customers/users or business information.

If APNIC could collect, summarise and publish data to create a picture of the regional Internet

What type of information would you want?

Would you be willing to provide data that could be shared anonymously with the wider Internet community?

#### Topic D - How is APNIC regarded?

- 1. If you had to describe APNIC to a friend or colleague, how would you describe it? How do you think APNIC is regarded in your economy? What are its 'good' points? What could be improved?
- 2. If you could change one thing about APNIC, what would it be?

#### End of Session - Thank you!

Before we end the session, is there anything else you would like to say?