

Training Survey Summary

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Executive Summary

The following report summarises the outcome of the training survey and interviews undertaken by APNIC in early-2015. There were 249 responses from 37 economies, along with interviews of 6 NIRs and 41 other individuals.

Conclusions may be drawn as follows:

- APNIC training is mostly perceived as being good quality and APNIC's neutrality is considered important.
- Hands-on workshops are considered the most valuable form of training.
- eLearning has mixed support, and there appears to be declining interest. The topics need to be revised and improved, and eLearning as a whole requires better promotion.
- The eLearning video library is currently hosted on YouTube, which is blocked in some economies. Alternative hosting platforms (e.g. Vimeo) should therefore be investigated.
- There is reasonable support for the introduction of self-paced online learning, especially if these leads towards some sort of certification. It is considered important for reaching out to more trainees, although it should not replace existing face-to-face methods of delivery.
- Advanced topics such as Network Security, IPv6, BGP, DNSSEC, ISP/IX Design, MPLS, Incident Handling and Response and OSPF/IS-IS elicit by far the most interest. There is much lower interest in core APNIC topics such MyAPNIC, Whois Database and RPKI. There is also significant interest in SDN, which may be worth considering developing due to its implications for building networks in future.
- The most popular locations for training are overwhelmingly those where APNIC has received little or no requests for training. This would imply that APNIC could be more proactive in organising its own training in these preferred locations, rather than being reactive to requests originating from particular economies for local training.
- There appears to be overwhelming support for delivering training in English, although Cambodia, China, Laos, Myanmar, Taiwan and Vietnam expressed preference for training in their local languages. There is also some limited interest in Bengali, Bahasa Indonesian, Thai, Hindi, Malay and Cantonese.
- There is a slight preference for APNIC training to be undertaken by APNIC staff, although APNIC-accredited trainers also appear acceptable. The NIRs tend to support the training-the-trainers concept.
- APNIC training fees are set at, or slightly below the level that people are able and prepared to pay.
- There is a lot of a interest in APNIC developing examination-based certification. There is some limited interest in obtaining accreditation for its courses.
- There is some support for a fee paying technical assistance programme.
- Expected future demand for training is difficult to quantify, but more and frequent training is widely requested. Demand for training may reasonably be expected to grow in line with APNIC membership, although eLearning has decreased in popularity. There also appears to be demand to develop training-the-trainers and self-paced online learning programmes.

Introduction

This report summarises the outcome of the training survey undertaken by APNIC in February and March 2015. The online questionnaire was supplemented by individual interviews conducted by Anne Lord, an independent consultant (and formerly of the Internet Society, APNIC and RIPE NCC), with National Internet Registries (NIRs) and selected respondents of the survey.

There were 249 responses from 37 economies (including 2 non-APNIC economies) to the online questionnaire. 56% of the respondents were from APNIC member organisations, 29% from non-member organisations, and 15% did not know. In addition, 36% were from ISPs, 14% from telecommunications organisations, 12% from IT consultancies, 11% from educational institutes, and 9% from government departments. 5.6% from non-for-profit organisations, and 2.4% from financial services companies.

Anne Lord interviewed 6 of 7 NIRs (the exception being KISA, South Korea) and 41 other respondents from both APNIC member and non-member organisations. Feedback was therefore obtained from 19 economies that included Bangladesh, Bhutan, China, Cambodia, Fiji, Indonesia, India, Japan, Kiribati, Laos, Myanmar, Nepal, Pakistan, Philippines, Solomon Islands, Sri Lanka, Taiwan, Thailand and Vietnam (see Appendix). Interviews were targeted at the largest economies, those where APNIC has undertaken little or no training, and countries with embryonic or very limited Internet access.

As an incentive to complete the online questionnaire, respondents were entered into two draws to win an Apple iPad Air 2. The first draw was for those completing the questionnaire on or before 6 March 2015, whilst the second was for anyone completing the questionnaire by the closing date of 22 March 2015. The draws were conducted at APNIC Executive Leadership Team meetings, with the winners being Warren Fanasia of Solomon Telekom, and Ravneel Sharma of Telecom Fiji.

Background

Approximately 44% of respondents stated that either they or a colleague had participated in an APNIC training course, although this percentage varied slightly between eLearning, Tutorials and Workshops.

The most popular mode of learning was face-to-face workshops, with IPv6 (44%), Routing (43.6%) and Network Security (37.6%) being the most popular topic, and Internet Resource Management (24.4%) and DNS (30.4%) being the least popular.

For tutorials, the popularity of the topics is in the same order, but participation rates drop to 33.6%, 30.8%, 28%, 23.6% and 29.6% respectively.

eLearning appears to be the least popular mode of learning, although this would seem to be more suited to DNS and Internet Resource Management which maintain similar participation rates as for tutorials.

Around 40% of the respondents suggested there are organisations providing training similar to APNIC for most of the current topics, with the exception of Internet Resource Management. However, Laos, Myanmar and the Pacific economies in particular stated there are almost no training alternatives there.

Quality of teaching was given as the primary reason for choosing APNIC training (71% of respondents expressed this as 'Very Important'). This was followed by the available topics (70%), the possibility of interaction with experienced tutors (67%), the reputation of APNIC (48%), and convenient locations (46%). Cost (35%) and recommendations (36%) were by far ranked as the lowest reasons for choosing APNIC courses.

The interviews verified much of the above. The feedback on the quality of APNIC teaching was generally very positive (with the odd exception), with the neutrality of APNIC cited as an important factor. There were some suggestions for improvements, and the NIRs are particularly keen to explore exchange of training materials.

Mode of Delivery

Hands-on workshops with practical exercises are by far the most popular method of delivering training (75% of respondents expressed this as 'Very Important'). This is followed by face-to-face tutorials (53%), with significant interest being expressed in having materials published online (46%) – the latter of which is not currently undertaken. There is also fairly significant interest in self-paced online courses (37%), but less interest in the current webinars (30%).

This was backed-up by the interviews that expressed clear preferences for face-to-face hands-on workshops. The reasons are because it ensures participants have to dedicate specific time for learning, networking with other engineers is an important part of the experience, and there are opportunities to ask specific questions to the trainers.

There were mixed views about the webinars. Whilst some felt they were useful, there are strong indications that the topics are considered insufficiently advanced, they are held at inconvenient times, language can be an issue, and connectivity is too poor in some economies. The interviews also revealed poor awareness of the webinars and the video library in general, although YouTube is blocked in some economies (e.g. China and Pakistan) and alternative hosting platforms should be investigated.

There was reasonable support for the introduction of self-paced online learning, in particular for junior engineers and for demonstrating competency that would require some sort of certification process. It was also considered important for reaching out to more trainees, although it should not replace existing face-to-face methods of delivery.

There is clear support for continuing face-to-face training along current lines, and there would also appear to be sufficient support for developing self-paced online learning. However, the current eLearning webinars need to be reviewed, in terms of content, scheduling and frequency of delivery (although these issues have already been identified internally within APNIC). The manner in which these are being publicised also needs to be given some consideration.

Topics

By far the most popular topic is Network Security (79% of respondents expressed this as 'Very Important'), followed by IPv6 (65%), BGP (61%), DNS & DNSSEC (60%), ISP/IX Design (54%), MPLS (51%), Incident Handling and Response (48%), OSPF & IS-IS (47%), SDN (47% - although not currently offered) and Internet Governance (40%). The least popular topics are RDAP & NRTM (16%), (My)APNIC (22%), RPKI (30%), Internet Fundamentals (29%), Using the Whois Database (30%), IRR (32%), and requesting IP address and AS numbers (33%).

These results are more-or-less in line with the experience of the training team, although MPLS and ISP/IX Design appears to be more popular, and IPv6 less popular in practice. In addition, the least popular courses are all related to APNIC's core business, so have to continue to be offered. They also tend to be of relatively more interest to the NIRs (for obvious reasons), and it is possible they would more popular if there was more outreach to non-technical audiences. They are also obvious candidates for self-paced online learning.

New topics suggested by respondents include network virtualisation, wireless networking, fibre infrastructure, VoIP, network monitoring, cloud computing, disaster recovery, e-mail, setting-up a ccTLD registry, and cyberattacks. It should be pointed out that most of these suggestions are outside the scope of APNIC and even the IP/routing business, but SDN may be worthy of future consideration due to its implications for building networks in future.

Other suggestions were more specifically targeted training for hostmasters, law enforcement agencies, government ministries and regulators, and generally improved information about Internet governance (again, issues already identified internally within APNIC).

It should also be pointed out that two vehement objections were expressed about APNIC conducting any training in competition with other commercial providers.

Location & Scheduling

By far the most preferable location for training would appear to be Singapore (28.8%), followed by Kuala Lumpur (20.4%), Bangkok (20%), Sydney (20%), Hong Kong (19.2%), Beijing (17.6%), Melbourne (16.4%), Tokyo (15.2%), Auckland (14%), Dhaka (12.8%), Brisbane (12.8%), Jakarta (12%), Delhi (11.6%), Taipei (11.2%), Shanghai (11.2%), Seoul (10.4%), Kathmandu (10.4%) and Kolkata (9.6%).

These results are quite interesting, as APNIC has received little or no requests for training at most these locations. Moreover, where training has previously been held in Bangkok and Hong Kong, there has not been overwhelming high attendance.

One conclusion that may be drawn is that certain cities are more accessible for surrounding economies even if there's a limited local requirement for training. This would imply that APNIC should perhaps be more proactive in organising its own training in these preferred locations, rather than being reactive to requests originating from particular economies for local training. This is further reinforced by the comments of one interviewee that Auckland is the most accessible location for many Pacific economies, even if there's a limited requirement for training in New Zealand itself. Other interviews also indicate that language may be an issue for China, Taiwan, Japan and Vietnam in particular, which may partly explain the limited requests for training in these economies.

On the basis of the survey, there would appear to be a strong case for targeting more training events at Singapore, Kuala Lumpur, Bangkok and Hong Kong. In terms of the Pacific region, the clearly favoured location (other than Auckland) is Suva (Fiji), followed by Apia (Samoa) and Guam,

Of course, APNIC also needs to take practical considerations into account. Whilst the likes of Sydney, Melbourne and Brisbane may appear to be potentially popular training locations, visa requirements may practically preclude their use.

No clear preferences were expressed for the best time of year to hold training courses, although marginal preferences were for June, September, October and November.

Language

There appears to be overwhelming support for training in English (85.2%), with some interest in Bengali (10%), Bahasa Indonesian (8.8%), Mandarin (7.2%), Thai (4.4%), Hindi (4%), Malay (4%) and Cantonese (3.6%). However, it needs to be acknowledged that the questionnaire was circulated in English, so English speakers would invariably be the primary respondents.

The interviews revealed that for Cambodia, China, Laos, Myanmar, Taiwan, Vietnam and to some extent Pakistan, local language training was preferred. The preferred delivery method differed though, with some asking for translated materials with teaching in English, whilst others were happy with English materials but teaching delivered in the local language.

Other economies expressed a clear preference for teaching in English, citing that some comprehension was necessary for Internet administration and configuring network equipment. Nevertheless, a slower pace of learning and more pictorial representation in training materials may improve the learning experience.

APNIC already has trainers capable of training in Bengali, Hindi and Filipino, as well as some Bahasa Indonesia and Malay capability. The addition of a trainer able to converse in Mandarin, Thai and/or

Vietnamese may therefore be an asset, although the survey reinforces that local language training should not be the highest priority and trainers must first-and-foremost be capable of delivering good technical training.

Trainers

There appears to be a marginal preference for APNIC training to be undertaken by APNIC staff (47% of respondents expressed this as 'Very Important'). Nevertheless, APNIC-accredited trainers also appear acceptable, with 46% support for non-local trainers, and 38% for local trainers.

This slightly contradicts the APNIC experience whereby training workshops conducted by local trainers have been poorly attended. Having said this, the interviews revealed support for locally based trainers in Bangladesh, South-East Asia and the Pacific as a solution to a lack of qualified trainers in those economies, as well as language difficulties. There was significant concern about maintaining quality though, and the importance of having international experts with knowledge of latest industry developments was highly stressed.

The NIRs generally seem supportive of the training-the-trainer concept. Another suggestion was for APNIC to work with NOGs to provide local training capabilities.

It can be concluded that there is some support, albeit limited, for a training-the-trainers programme. That the NIRs are amongst the stronger advocates of this, would suggest they could be possible partners for further developments in this area.

Fees

This is a difficult question to get an accurate response to, as the tendency of the consumer is always to want to pay less, and certainly never more. APNIC also has different tariffs for different economies as well as for different types of training, but does not distinguish between topics as other training providers might.

Quite predictably, the majority of respondents favoured the lowest price category of 'less than USD 150' for a 3-day workshop. However, there was some support for the 'USD 150-300' and 'USD 300-600' categories, particularly for Network Security, MPLS, Advanced Routing, ISP/IX Design and the not currently offered SDN. There was very little support for fees above USD 600.

The interviews were perhaps more revealing because interviewees were also made aware that APNIC effectively subsidises the courses. The general feedback was that APNIC training is reasonably priced and could perhaps sustain a small increase in fees for some courses, especially if these supported multi-vendor solutions and/or led to a recognised certificate. However, the fees were still felt for prohibitive for unsponsored junior engineers and students when measured against local earnings, and China and Indonesia in particular indicated there were cheaper local alternatives.

The consensus is probably that APNIC training fees are about right or slightly below what people would be prepared to pay.

Certification and Accreditation

There is an overwhelming indication that APNIC training courses would be more popular if they led to examination-based certificates, with 68% of respondents responding in the affirmative, and just 9% expressing no interest. This was a view also expressed most of the NIRs, with one going further and suggested that recognised accreditation for the courses would add even more value.

It should be noted that going down the accreditation route would substantially increase costs, which does not entirely correlate with the responses related to fees. In addition, there would be very limited time to undertake examination processes during face-to-face workshops, unless these are either extended in duration, or the amount of material covered is reduced.

Future Demand

Expected future demand for training is difficult to quantify from the responses or the interviews. In 2014, there were a total of 2,354 trainees from 236 organisations at face-to-face workshops and tutorials; or approximately 10 participants per organisation. There were 197 respondents indicating a combined requirement for 364 trainings a year, which could be extrapolated to a figure of between 1,970 and 3,645 participants – either more or less than currently. Several of the respondents may though be from the same organisation (this information was not collected), and there is no certainty that the average number of trainees per organisation will remain constant.

There appears to be good awareness of face-to-face training, and the fact that only around 44% of respondents have actually participated in training for various reasons, would suggest there further potential for expansion. The interviews reinforce this view, suggesting that APNIC undertakes more and frequent training, with the NIRs particularly interested in training-the-trainers. However, some of this interest is linked to the ability to have training in local languages, as well as in geographically difficult to reach parts of the Pacific. The interviews also suggest that more advanced, vendor neutral, and more often updated materials are necessary.

Whilst the respondents to the survey would appear to be primarily interested in the more advanced technical training, some of the feedback from the interviews along with experience of the ARIN and the RIPE NCC in their respective regions suggests there is an almost entirely untapped market for more background training in Internet governance and basic registry procedures for government officials and law enforcement officers.

A frequently cited barrier to participation was getting the support of senior management, or approval from a government department. Another was a lack of awareness that APNIC training is open to non-members as well as members, albeit at a higher fee level. Further consideration should be given to how this can be improved.

The webinars are clearly an area for concern, with declining interest and the subject of most of the few negative comments received. There was already a 45% decrease in participation in 2014 over the previous year, and there would seem to be limited prospects for an upturn in numbers without substantial revision of the materials and better promotion.

There appears to be good interest in self-paced online learning, provided this supplements rather than supplants face-to-face training. This will require significant investments in time and money though, and the general consensus is this should focus on more basic concepts as grounding for junior engineers and non-technical staff.

Around 39% of respondents indicated they would be interested in hands-on technical assistance on a fee-paying basis, with a further 45% uncertain. Just 16% were not interested at all.

No indication was given as to costs of providing technical assistance, and only one amongst the NIRs expressed specific interest in this. One suggestion though, was international industry experts to have more engagement with regional and national NOGs.

Of course, most of those completing the questionnaire or participating in the interviews would naturally already be aware of APNIC, and most likely its training programme too. It is highly probable that as APNIC expands its membership, this will also bring increased demands for both training and technical assistance, although the only current basis on which to attempt to predict future demand would be against expected APNIC member growth.