Co-chairs' report on the APNIC 29 Community Consultation: IPv6 Address Management and ITU: Is an "additional parallel structure" required

By Masato Yamanishi and Sharil Tarmizi

The APNIC Community Consultation took place between 2:00 pm and 5:20 pm on Wednesday, 3 March 2010 as a scheduled session within the APNIC 29 meeting in Kuala Lumpur, Malaysia. Meeting organizers reported that around 160 people attended the session in person, a further 115 people watched via webcast, 20 people listened via an audio feed, and 51 people participated in the discussion via an online 'chat' facility (into which contributions were submitted and then reported to the session).

The session was co-chaired by Masato Yamanishi (Softbank BB), and Sharil Tarmizi, (Malaysian Communications and Multimedia Commission). The four panelists were Xiaoya Yang (TSB, ITU), Dr Sureswaran Ramadass (NAv6), Adiel Akplogan (AfriNIC), and Save Vocea (ICANN). Following presentations by the panelists, the discussion was opened to the floor.

The session was announced in advance with a published agenda, within the programme of the APNIC 29 meeting. Archives of the session, including video and a complete stenocaption transcript, were recorded and subsequently made available on the meeting website at:

http://meetings.apnic.net/29/program/consultation

This Chair's report represents a summary of the proceedings of the session, including opinions both within the meeting room and from those participating remotely. The report consists of two parts:

1. A summary of the discussion that took place at the Consultation.
2. A statement developed and endorsed by those present at the Community Consultation

Further to the Consultation discussion onsite in Kuala Lumpur, APNIC encouraged written submissions from the community. These have been compiled and are available from the website link above.

Summary of panelists' presentations

1. Xiaoya Yang

Xiaoya Yang described a historical imbalance that is observed in distribution of IPv4 addresses during the early days of the Internet. She noted that some ITU Members believed that the historical imbalance of IPv4 was not an issue of current concern, while other ITU Members were concerned that the IPv4 imbalance could be repeated with IPv6 distribution. She asserted it was difficult for developing countries to have their voices heard in the IP address management policy processes of the RIR system. She referred to sections of the WSIS principals and outcomes, and WGIG documentation that included references to equitable access to IPv6 resources and the opinion of some governments that address allocation should be under the sovereignty of national governments. She then referred to ITU decisions to study issues related to IP addressing in its activities. She pointed to the ENUM interim procedure, in which RIPE NCC takes care of ENUM registrations, as an example of ITU/RIR cooperation. She noted that the ITU could draft a global policy proposal, following the RIR policy process to reserve an IPv6 block for the future needs of developing countries. She noted that the RIR policy development process is readily perceived as open, transparent and bottom up and that what ITU can bring to the process is to get all 191 countries involved. She noted there was still a lot to be done by the ITU IPv6 Group in consideration of the reports commissioned by the ITU from Milton Mueller and Sureswaran Ramadass.

2. Sureswaran Ramadass

Sureswaran Ramadass explained the concepts behind the NAv6 report to the ITU, A Study on IPv6 Address Allocation and Distribution Methods. He explained that the model he proposed, aimed to reduce the costs to ISPs of obtaining IP addresses by adding an alternative Internet Registry model in competition with the existing RIR system. The proposed model also aimed to better achieve conservation of IPv6 addresses as CIRs would know the local requesting organizations better. He noted that the proposed International Internet Registry role, to be performed by the ITU, would need to be a multilateral, multi-stakeholder international body that would ensure close coordination between the CIRs and the RIRs. He stated that NAv6's research had shown that the proposed IIR/CIR model would produce no further fragmentation of the routing table and that the number of prefixes added to the routing table would remain the same. Under the model, the CIR would potentially be set up by an organisation of local ISPs and potentially provide cheaper or free IPv6 addresses. The CIR would have equal participation in the policy formation and resource distribution so that Internet resource distribution and decentralisation are more balanced, especially within their own countries. Sureswaran Ramadass acknowledged that the RIRs have greatly contributed to the growth of the Internet and that the CIR model will only work if implemented in the best interests of ISPs.

3. Adiel Akplogan

Adiel Akplogan discussed the operation of AfriNIC, as the RIR serving the biggest concentration of developing countries in the world. He observed that from his experience at AfriNIC, a significant challenge in achieving support is limited government awareness of the Internet IP address management system. He stated that AfriNIC's principle approach to this issue was to work closely and collaboratively with government wherever possible. He observed that governments are able to participate in the current address management structure and that several regulatory authorities already participate in AfriNIC's policy development processes. He stated that address management policies could not be maintained in a system which involves competition because competition would require one party to offer some advantage that the other can not offer, and that would necessarily entail deviating from a common policy.

Adiel Akplogan stated that each of the five RIR has been allocated an equal IPv6 block of /12 to distribute to networks in their respective regions.

4. Save Vocea

Save Vocea noted that IANA to date has only allocated 0.146% of the total IPv6 address space to the existing RIRs and that ICANN believes there is no evidence of a lack of access to IPv6 addresses by any stakeholder. He described ICANN's belief that the current system of allocation has demonstrated strong resiliency and is adaptable to change; and that in case of any problems in the future, existing mechanisms would produce solutions within the current system.

Summary of key points of the discussion

Speakers from the floor onsite in Kuala Lumpur and from remote locations via the online 'chat' facility made the following points:

- It was suggested that it was not appropriate to use the legacy effects of IPv4 early deployment as a basis for discussions on IPv6.
- The only viable solution to IPv4 depletion and associated issues is to move to IPv6.
- The potential for IPv6 address depletion, reported as a matter of concern for some ITU Member States, needs to be researched in more depth to assess whether this is actually a realistic concern.
- The ITU has stated that its membership wanted it to promote awareness of IPv6 since a few countries have not yet been allocated IPv6 address space, but in fact, the process of receiving IPv6 address space from the RIRs is quite simple.
- Governments often use request-based allocation policies, such as spectrum allocation, so the RIR allocation method should not be difficult for governments to understand.
- The impact of the CIR model on the routing table due to fragmentation of address space is dependent on the nature of the CIR implementation and the policies that each CIR adopts locally. Therefore, consistency between the policies of RIRs and CIRs is very important.
- The NAv6 paper proposes the CIR model as a solution, but it does not define or demonstrate the fundamental problem that needs to be solved.
- Further investigation is needed to identify the reasons why some ITU Member States report there are difficulties in receiving IPv6 addresses.
- The NAv6 paper's proposition that the CIR model could provide cheaper services is based on unproven assumptions about costs of registry operations and the potential for cost savings within a competitive system.
- The NAv6 speaker's suggestion that the CIR should be comprised as a collection of ISPs is actually the same model as followed by current RIRs.
- Sureswaran Ramadass suggested that if RIRs were able to allocate address space outside their respective regions, then the CIR model was not needed as ISPs could shop for the cheapest place to obtain IP addresses.
- Since the NAv6 paper is just a technical study, further study of the economic aspects of the CIR model is needed before proper assessment of the model can be made.
- Sureswaran Ramadass acknowledged there was not much difference between an NIR and a CIR. It is therefore not clear to the community why the current RIR/NIR approach cannot be used for developing countries.

- While the NAv6 paper says that there will be no adverse operational impact caused by the CIR model, many speakers observed that this is either incorrect or unproven.
- It was acknowledged that government representatives could experience difficulties when participating in the Internet community discussions. While RIRs have worked to build capacity within governments regarding participation, it seems that improvements are still needed.
- It was also noted that even recognized Internet experts could experience difficulties in participating in ITU discussions. To be involved in discussions at the ITU, Xiaoya Yang explained that larger private sector organizations participate directly as Sector Members, while other organizations can be represented via their appropriate Member State.
- It was noted that further communication between ITU and the Internet community is needed, perhaps by creating an environment where the Internet community and government including ITU can discuss concerns.
- It is preferable to discuss how RIRs could facilitate developing economies to embrace IPv6 as quickly as possible, rather than to develop a whole new structure for IPv6 distribution.
- It was noted that it is not necessary to pay membership fees to participate in RIR policy development process. Concern was expressed that member fees within an ITU-based CIR model could be a barrier to participating in CIR policy discussions.
- The most important function of IP addresses is the ability to use those addresses on the Internet. As the ISP community trusts the RIR community to implement policy in a participatory, open fashion, it is willing to accept the consequences of RIR-developed policy on the routing table. However, it is not clear the ISP community will have the same trust in CIR policies if the CIRs do not follow an open and transparent policy model.
- The cost to RIR secretariats of supporting their policy development processes is relatively expensive. This is an operational cost that does not seem to have been considered when developing the CIR model.
- Since ITU discussions first raised the issue of equitable IP address distribution, AfriNIC has been created and all RIRs have been delegated equally sized IPv6 address blocks. Therefore, concerns about equitable IP address distribution are no longer relevant.
- The two reports commissioned by the ITU do not solve the issues faced by developing countries and could, in fact, create further cost barriers.
- NIRs within the APNIC system have existed for many years and have contributed to APNIC policies and abided by those policies. So there is no policy divergence or fragmentation between RIR and the NIRs, or amongst the NIRs.

- It was explained by an APNIC representative that the formulation of NIRs in the APNIC system avoids the two types of fragmentation that are possible under the CIR model: fragmentation of policies and fragmentation of address space.
- There are some countries or economies which hare not members of the ITU, but are members of one of RIRs.
- It is difficult to assess the correctness of the conclusions in the NAv6 report in the absence of necessary details of the model and the parameters used to simulate the different scenarios.
- If developing countries need assistance with Internet issues, it was expressed that the Consultation session was full of Internet engineers willing to help.

Community-endorsed statement

Towards the end of the session, a participant proposed a formal statement as a summary of the position of the meeting participants, and requested that the Chair should request a call for consensus on the statement. Although the statement was initially read out, it was then displayed on screen for the audience to review, and supplied to the Chair in electronic form. The statement is included below.

Introduction

IP address management is fundamental to ongoing Internet stability. Over the past decade the Internet has become fundamental to the world's economy. The Internet is truly global. What happens in one part of the world affects the rest of the world. So changes in IP address management could affect billions of devices globally, irrespective of the country where they are located.

The importance of an open environment

The Internet has become what it is today because of the open, transparent, bottom-up process used to develop the Internet's protocols and management policies. Everyone is encouraged to participate.

RIR decision making has no barriers to participation. Anyone, including government, can have their say. This is made transparent by public archives of the decision making process, including mailing lists, video, and meeting transcripts.

Risks of introducing a parallel address management system

The operational stability, security, and efficiency of the Internet rely on a single consistent address management framework. The introduction of "competing" address management systems is not desired by network operators, and carries the strong risk of fragmenting address management policies, of fragmenting the Internet itself, and of compromising the Internet's security and stability.

Equitable distribution

We note the equitable distribution of addresses is already in place in the current IPv6 management system and addresses are being deployed actively and effectively throughout the world at this time. Each RIR already has the same sized block to distribute to networks within their region.

This community believes there are no exhaustion issues associated with IPv6 and calls on recognized Industry experts to conduct a formal study into projections for IPv6 exhaustion to clarify this.

Actions

1. The proposal for a parallel address management system involves significant risks and therefore requires a clear problem statement, complete explanation of its details, and a thorough risk analysis of its consequence. The NAv6 paper satisfies none of these requirements. Therefore, the NAv6 proposal, the paper itself cannot be considered as a substantial basis for discussion at the ITU IPv6 Group's work.

2. We ask the ITU's IPv6 Group follow the example of the Internet community and the IGF process and make its documents and records available publicly, so that all Internet stakeholders can participate in deliberations which could have global ramifications. We ask ITU Member States and Sector Members to

recall the Tunis Agenda's call for a multi-stakeholder approach to Internet governance and call on the ITU to support the current multi-stakeholder system of address management.

Summary

Below is a summary of the main issues raised at the meeting. They appear in the list below in the order they were first raised in the Consultation discussion.

- There needs to be an investigation into the actual likelihood of an IPv6 address scarcity problem arising in the foreseeable future.
- There is concern about the ability to keep policies in synchronization between the RIR system and CIR model.
- There needs to be a clear problem statement regarding the specific IPv6 addressing issues that ITU discussions are trying to address.
- The Internet community and the RIRs need to build more awareness by governments of the current RIR processes.
- There is a desire by the Internet community to be able coordinate and work with the ITU in discussions relating to the Internet.
- IPv6 address allocation is equitable under the current address model: addresses are already readily available via RIRs and NIRs, and each RIR has equal sized IPv6 block.
- Economic problems associated with receiving addresses appear to be perception rather than reality.

Annex A: Minutes from the Community Consultation Session

Session commenced: 2:10 pm

Co-chairs: Masato Yamanishi, Sharil Tarmizi

The Chair introduced the session and explained the agenda. He also gave a brief overview of the ITU and highlighted a few of the recent and upcoming meetings of relevance to Internet discussions.

Agenda

1. Presentations by panelists
    a. Xiaoya Yang, ITU
    b. Sureswaran Ramadass, NAv6
    c. Adiel Akplogan, AfriNIC
    d. Save Vocea, ICANN
2. Open discussion

1. Presentations by panelists

The Chair stated that there would be plenty of time for discussion after the four panelists had spoken. He stated that he would limit questions immediately following each presentation to questions of clarification related to their presentation and requested that general comments and discussion be held over until the general discussion part of the agenda.

a. Xiaoya Yang, ITU

Xiaoya Yang described the ITU's activities that are a response to some ITU Member States requests for study into IPv6 deployment. The full presentation file is available at:

http://meetings.apnic.net/__data/assets/powerpoint_doc/0018/19170/Yang.ppt

Questions for clarification

- It was questioned whether using the legacy effects of IPv4 early deployment as a basis for discussions on IPv6 was inappropriate given the very large size of the IPv6 address space. Xiaoya Yang stated that there was concern from some ITU Members that the price of IPv6 would rise as it became exhausted in a similar way to the price of IPv4 rising as it is becoming exhausted now. A speaker from the floor responded that the solution to IPv4 depletion and associated problems was to move to IPv6.
- There was a question from the floor asking that given some ITU Members had concerns about IPv6 depletion, had the ITU studied, via consultant reports or staff assessments, the probability of IPv6 scarcity arising. Xiaoya Yang explained that the ITU's work on IPv6 had only begun in February 2009, but that if the IPv6 Group were to have further activities, it would be useful to propose such a study

for the Group. She noted that it was important for the Group's discussions to be based on accurate research.

- A speaker from the floor asked why, if it was a concern to some ITU Member States that the price of addresses could go up in a market environment, had ITU commissioned a report from Milton Mueller that proposed moving to a market environment. Xiaoya Yang noted that at an IGF workshop last year, it had been suggested that more study be made into the routing ramifications of Mueller's proposal, but that as the paper had not yet been discussed in the ITU IPv6 Group, she couldn't comment further.

- A speaker from the floor asked how, considering Internet operations had global impact, which is different to the telephone system, how could the Internet community become involved in decisions at the ITU that would affect how the Internet operated. Xiaoya Yang explained that the ITU was a membership structure and suggested that the Internet community first channel their concerns via their appropriate Member States, but that as a second option, there was ITU membership available to the private sector. She noted that industry players and big telecommunication companies were Sector Members of the ITU.

- A speaker from the floor asked if the ITU had made any effort to help the few remaining countries without IP v6 allocations to receive address space from the RIRs as the process of receiving space from the RIRs was quite simple. Xiaoya Yang explained that the ITU wanted to promote awareness of IPv6 and address the concerns of Member States.

- Sharil Tarmizi noted that governments were often used to first-come, first served policy, which is the model of IP address distribution within the RIRs. For example, at a national level, spectrum allocation is often performed in this manner.

b. Sureswaran Ramadass, NAv6

Sureswaran Ramadass outlined the concepts and main points behind the NAv6 report commissioned by the ITU, A Study on IPv6 Address Allocation and Distribution Methods. He also played a promotional video from NAv6 to demonstrate the organization's ideals. The full presentation file is available at:

http://meetings.apnic.net/__data/assets/powerpoint_doc/0006/19167/Sureswaran.ppt

Questions for clarification

- A speaker from the floor noted that the NAv6 report's assertion that the CIR model would have no impact to the routing table or fragmentation of the address space was very subjective and very dependent on the nature of the CIR implementation and the policies that each CIR adopts locally. Sureswaran Ramadass agreed that it was very important to follow baseline RIR models to ensure routing tables did not suffer.

- A speaker from the floor noted that the NAv6 report incorrectly referred to IETF as a research organization. Sureswaran Ramadass acknowledged that this was incorrect.

- A speaker from the floor noted that a precept in making changes to an operational system is to only make changes that are essential and asked Sureswaran Ramadass to identify the problem that his proposal was aiming to address. Sureswaran Ramadass explained that it was not his role to identify the problem, but that this was a question that should be addressed to the ITU.

- There was a question asking for what reasons some ITU Member States felt that they weren't able to receive addresses. It was asked whether it was a misunderstanding about the processes in place for requesting addresses, a language issue, or something else. It was suggested that this could be a question for further study.

- A speaker from the floor asked Sureswaran Ramadass to clarify why the CIR model would be able to provide addresses at a lower cost than the current RIR model. Sureswaran Ramadass explained that there was an assumption that the cost could be local for CIRs and also that competition between registries could lower costs.

- Sureswaran Ramadass noted that the NAv6 report did not suggest that the CIR model needed CIRs to be created by governmental bodies and should be a collection of ISPs. A speaker from the floor suggested that RIRs were already a collection of ISPs.

- A speaker from the floor asked what the CIR model could achieve that the RIR model wasn't already achieving if the CIR model was based on following RIR policies. Sureswaran Ramadass explained that the CIR model aimed to increase competitiveness. He suggested that if RIRs were able to allocate address space outside their respective regions, then the CIR model was not needed as ISPs could shop for the cheapest place to obtain IP addresses.

- There was a question from the chat room read out to the onsite participants asking if that the CIR model provided all the services mentioned, costs would need to be recouped via its subscribers, and therefore be more expensive than the current model of distribution. Another question read out from the chat room suggested that as the CIR proposal seemed to be trying to address perceived economic barriers to obtaining IP addresses, perhaps the ITU could consider funding the RIRs to reduce costs passed on to ISPs. Sureswaran Ramadass stated that the NAv6 paper was not an economic study of the issue, but a technical study.

- There was a remote chat question about the difference between an NIR and a CIR. Sureswaran Ramadass stated that there wasn't much difference. A speaker from the floor then asked why the current RIR/NIR approach couldn't be used if some countries wanted to operate a localized Internet Registry. Sureswaran Ramadass stated that if he was able to get IP addresses from another RIR, he would see that as a democracy.

- A speaker from the floor asked for clarification about whether the author was stating that the case where the routing table isn't impacted, is the case where the global entities don't participate at all in the alternative addressing scheme proposed in the NAv6 paper. Sureswaran Ramadass confirmed that this was correct.

c. Adiel Akplogan

Adiel Akplogan spoke about his experiences working for AfriNIC, the RIR with the highest concentration of developing countries. He did not use presentation slides.

Questions for clarification

- There were no questions for clarification.

d. Save Vocea

Save Vocea presented ICANN's opinion that the current RIR model provided access to addresses for any network that needed it, and that it was a flexible enough model to adapt policies and processes in the event of problems being identified in the future. He did not use presentation slides.

Questions for clarification

- There were no questions for clarification.

Open discussion

- There was a question from the floor asking if there was a real danger of IPv6 shortage considering there was enough IPv6 to give each person on earth more than 5000 /48s.

- Xiaoya Yang acknowledged that the potential issue of IPv6 scarcity needed to be studied further. Xiaoya Yang noted that it was difficult for government representatives to participate in Internet policy discussion as they could not speak as individuals. She acknowledged the feedback about the difficulty of Internet experts participating in ITU discussions and suggested that the Internet community and ITU work together to find a solution.

- Sharil Tarmizi acknowledged that governments often didn't understand how to participate in Internet address management discussions, but that from his own experience, AfriNIC and APNIC had worked to build capacity within governments regarding participation.

- A statement from the floor noted that IPv4 distribution imbalances was an issue that is effectively 'in the past' and shouldn't be confused with the need to encourage IPv6 deployment. He suggested that rather than ITU discussions looking at developing a new structure for IPv6 distribution, the question ought to be; how RIRs could facilitate enabling developing economies to embrace IPv6 as quickly as possible.

- A speaker from the floor suggested that the NAv6 view that CIRs be run by the country's ISPs is not how the ITU has operated in other areas traditionally and that the speaker's concern was that the CIR process would devolve to be much more similar to the history of ccTLD processes. And if that were to happen to the address space, it would be "pretty ugly".

- Another speaker from the floor also noted that the perception of IPv6 scarcity was an artificial construct not borne out by reality.

- A participant in the chat room asked how, given that the participant could participate in RIR policy development without paying fees, was there a way to be able to participate in the proposed CIR processes without paying sector fees.

- Another chat room participant asked a question about the Mueller proposal: "Given that the TABL study specifies a higher price than RIR costs at least initially for TABL blocks, could you clarify why this mechanism would be useful for developing countries?"

- In answer to a question from the floor about the ENUM collaboration between ITU and RIPE NCC, Xiaoya Yang stated that she thought ITU was satisfied with the way the administration of the process had been implemented and operated by RIPE NCC.

- Another speaker from the floor asked for a hypothetical example showing where IPv6 conservation may possibly be an issue.

- A speaker from the floor stated that the most important part about addresses are the ability to actually make use of the addresses in the Internet. The ISP community trusts the RIR community to implement policy in a participatory, wide-open fashion. So that at the end of the day the ISP community is willing to accept the consequences of the globally developed policy in each of the RIRs on the routing table. This has huge implications and it's not assured by any other process. We do not know whether or not the CIR local policy process, or an ITU process, will be seen as participatory enough by the ISP community.

- The speaker continued, stating that the RIR policy development process is expensive for RIRs to support, and asked if the NAv6 model had considered the cost to CIRs of participating in and supporting policy development. If the CIR model duplicates the policy development process, it makes it very expensive for everyone and will not lower costs for ISPs within that system.

- A speaker from the floor noted that this issue of a perception of IPv6 difficulties for developing countries had been around since late 2004, but that since that initial discussion, AfriNIC had been created and all RIRs had been delegated equal sized blocks, so the initial problem the ITU had sought to address has gone away.

- A speaker from the floor suggested that Member States work to ensure their ccTLDs be available over IPv6.

- A speaker from the floor asked what the specific problem is that the ITU discussion is attempting to solve, as this is not clear. The two reports commissioned by the ITU do not solve the issue of developing countries, so perhaps it would help to have a clear problem statement. The speaker also stated that everyone at the Community Consultation would be happy to help if there are problems to solve, but first, the problems needed to be well identified.

- Adiel Akplogan stated that the real issue for him was to create an environment where the technical community and the Internet community and government from ITU can discuss concerns.

- A speaker from the floor clarified that NIRs within the APNIC system have existed for many years and have contributed to APNIC policies and abided by those policies. So there is no question in the APNIC NIR model of a policy divergence or fragmentation between the regional registry and the NIR, or amongst the NIRs.
- The speaker also clarified that APNIC region NIRs do not receive a pool of addresses, but draw upon the common APNIC pool. The implementation of NIRs in the APNIC system avoids the two types of fragmentation that are possible under the CIR model: fragmentation of policies and fragmentation of address space.
- The speaker also noted that given the size and scale of the operation of a new NIR, it takes time to go through the approval process.
- A speaker from the floor disputed the notion that the RIR system fails to represent some people, particularly in developing countries. The speaker noted that the list of countries that are members of the ITU omits 18 generally diplomatically recognized countries that are served by the RIR constituency.
- Sureswaran Ramadass noted that there had not been any comments submitted on the NAv6 paper and asked for people to submit feedback on the technical aspects of the report.
- A speaker from the floor asked for clarification on how CIR allocations get globally routed. Sureswaran Ramadass requested the speaker to send him an email requesting further information on that topic.
- A speaker from the floor noted that it's very hard to be able to weigh the correctness of the conclusions in the NAv6 report, in the absence of the description of the model and the parameters used to simulate the different scenarios. The speaker asked if the paper had been peer reviewed. Sureswaran Ramadass stated that it had been peer reviewed by Cisco Internet engineers.
- A speaker from the floor reported that he had written a brief statement based on the discussions that had been taking place in the session and on mailing lists and read it out to the participants. He asked that the community support the statement being submitted to the ITU as a summary of the participants' views.
- A speaker from the floor stated that if developing countries needed assistance with Internet issues, there was the current room full of engineers willing to help.
- A speaker from the floor stated that as a large ISP, they intended to help provide smaller, poorer ISPs in their country with IP addresses. She suggested that perhaps ITU Member States could consider subsidizing smaller ISPs in their own countries in a similar fashion.
- A speaker from the floor suggested that ITU could play a role in helping national regulators understand how to participate in the current address management model.
- A speaker from the floor asked for a list of the countries that felt they had problems getting addresses under the current system. The Co-chair stated that he did not have such a list.

- A speaker on chat noted that APNIC has a 50% fee discount for developing countries, and that RIR fees were devised on a cost-recovery basis, so the cost issue raised as a barrier to address space was a red herring, particularly since many ISPs use IP addresses to make a profit.
- The Chair asked if there were any strong objections to the proposed statement summarizing the participants' opinions being submitted to the ITU IPv6 Group. There were no objections so the Chair deemed the statement to have reached consensus.

Session ended: 5:20 pm.