Draft report on IPv6 workshop, 22-23 June 2005, Geneva

ITU-T, in collaboration with the European Union's IPv6 Task Force Steering Committee (EU IPv6 TF-SC) and the IPv6 Forum, organized an IPv6 workshop at ITU Headquarters in Geneva, June 22-23, 2005.

As per TSB Circular 28 of 14 April 2005, with presentations on current practices and panel discussions on the business model and policy issues, the overall objectives of the workshop are to:

- Review the current development of IPv6 network, technology and applications
- Bring more awareness to those countries who are less-developed in internet to promote the development of IPv6
- Further discuss comments sent to the Director of TSB concerning the resource management policy.

About 70 participants from ITU Members, RIRs, NGOs and civil societies attended the workshop. The final programme of the workshop, all presentations and other information available to the participants, are available at: www.itu.int/ITU-T/worksem/ipv6/200506/index.html. The summaries of the sessions are provided in the following parts of this report.

A special consultation meeting with participants from developing countries was invited by the Director of TSB, immediately after the closure of the workshop. A brief summary of this meeting is attached in Annex 1 for information.

Session 1.1: Opening & Keynote addresses

Chair:Mr. Reza Jafari, Managing Director, NewStar International
Speaker 1: Mr. Houlin Zhao, Director, Telecommunication Standardization Bureau of ITU
Speaker 2: Mr. Brian Carpenter, from IBM, Chair of Internet Engineering Task Force (IETF)

Mr. Jafari welcomed the participants. He appreciated the initiative to organize this workshop, and considered it very important in the global discussions on IPv6 development. He wished this workshop a success, which will not only provide useful information to the public, but also play an important role in facilitating international cooperation.

Mr. Zhao highlighted the importance of IPv6 technology to the future of the Internet and reiterated ITU's support for the implementation of IPv6. In reply to the request of the floor he briefly introduced his presentation on IPv6 which was made at relevant meetings in Moscow and Beijing recently, explained his proposal to have blocks of IPv6 addresses to be assigned to countries by ITU, as an alternative approach to the existing one, so that the end users can have a choice from the "Dual system" within the current IPv6 address scheme.

Mr. Carpenter gave a brief historical overview of IPv6, analyzed the technical benefits and reviewed the progress of implementations. He indicated that IPv6's huge address space provides a great opportunity to overcome many problems encountered by IPv4, but it will not clear myths and misperceptions. Mr. Carpenter suggested to follow the market-oriented measures to push the IPv6 business and to try to avoid mistakes learnt from the IPv4 development. He expected that IPv6 be an opportunity for the next 50 years at least.

Session 1.2: IPv6 Internet Overview and Outlook

Chair: Mr. Reza Jafari, Managing Director, NewStar International
Presentation 1: Beyond Converging Networks, Mr. Patrick Cocquet, Chairman and Co-Founder of 6WIND

Presentation 2: The Real Space Internet, Mr. Hiroshi Esaki, Executive Director of the IPv6 Promotion Council of Japan.
Presentation 3: Enabling end-2-end Security, Mr. Wolfgang Fritsche, Manager Advanced IP Services IABG

Mr. Cocquet emphasized the role of IPv6 as a pillar technology for the future digital society. He introduced the measures to promote the convergence of ICT technology, economy and society based on his analysis of the European experience.

Mr. Esaki showed how IPv6 is characterized as the networking protocol for the ubiquitous computing environment. Mr. Esaki also presented several case studies and projects, which are already implemented in Japan.

Mr. Fritsche discussed security and privacy aspects related to IPv6 in technical details and offered an overview of the work done on IPv6 security within the EC funded SEINIT project.

Session 1.3: IPv6 Real-Life ISP Deployment

Chair: Mr. Reza Jafari, Managing Director, NewStar International
Presentation 1: The Two-way Internet, Mr. Latif Ladid**,** President**,** IPv6 Forum
Presentation 2: The P2P Internet, Mr. Yves Poppe, Director, IP Strategy, Teleglobe

Mr. Ladid, provided his vision on new Internet applications and services based on IPv6. He believes that IPv6 will lead the Internet where it should go and where it has not gone before. Mr. Ladid also believes that IPv6 is a tremendous opportunity for developing countries.

Mr. Poppe indicated that peer–to-peer in IPv6 will bring great revenue opportunities based on IP-based network convergence. He also expressed his opinion on the regulatory environment and its potential to affect IPv6. Poppe introduced Teleglobe's IPv6 pilot, Canada's first.

Session 1.4: IPv6 Resource Management

Chair Mr Ulf Dahlsten**,** Director, 'Emerging Technologies and Infrastructures' European Commission, Directorate-General 'Information Society and Media'**.**
Presentation 1: Will the v6 Address be a Universal Identifier? Mr. Louis Pouzin**,** European Languages Internet Conference (EUROLINC).
Presentation 2: IP Addressing: the Next Frontier of Internet Governance Debate, Mr. Milton Mueller, Professor at Syracuse University School of Information Studies.
Presentation 3: IPv6 Address distribution Mechanism, Mr. Geoff Huston, APNIC.
Presentation 4: Internet Number Resource Status Report, Mr Axel Pawlik**,** Chair, of RIRs, Managing Director, RIPE-NCC.

Mr. Dahlsten highlighted the importance of this session to affect the future development of global Internet service. He briefly reviewed the worldwide discussion on IP address management, in particular the EU work.

Mr. Pouzin introduced his ideas on potential IPv6 address semantics, expressed an option that IP address could become an identifier of the object. As objects can move and the traceability might be required, a number of scenarios of management of objects were introduced. He further discussed the point that multiple allocation sources fit various trade needs. Mr. Pouzin addressed concerns about the current Internet routing and allocation systems. In answering questions from the audience

he emphasized his opinion that we have to address framework, infrastructure, policy and regulatory issues in applying the IPv6 system.

Mr. Mueller expressed his views that RIRs have done a good job, that RIRs should be respected. However, following his principle to support competition in the market he recommended that current addressing policies be critically examined. According to him, conservation and route aggregation are the two main goals of current policies, and in both areas there is a lot of uncertainty about the best policies. In a desire to 'find the optimal public policy' on IP address management, he suggested four models. In promoting his preferred model, the one proposed by the Internet Governance Project (IGP), he suggested to introduce ITU as a global alternative source of IP addresses. He recognized the possible effects of competition, including charging, routing, diversity of ISPs and markets.

Mr. Huston concentrated on distribution mechanisms. He outlined the inherent characteristics, risks, threats and objections in distribution mechanisms. He showed that there are lessons to be learned from IPv4. In his presentation on the principles of IP address allocations, he referred to an expectation of the longevity of v6 for a 70-100 year lifespan and a global scalability at the order of hundreds of billions of sites. He further analyzed the distribution frameworks, raised enquiries on national distribution channels and the idea to introduce a competitive distribution channel. He expressed his options on the requirements of the form of distribution for the future IPv6 to ensure stability and assured availability of IPv6 addresses across its anticipated lifetime.

Mr. Pawlick, on behalf of RIRs, gave updated statistics on IPv4 and IPv6 address space status. He also explained IPv6 allocation policy and pointed out that RIRs coordinated to develop common policies and allowed for regional variations.

Discussion:

During the discussions the audience and the speakers exchanged views on various issues. Some developing countries requested that more work be done on the management of the IP resources, bearing in mind their concerns about sovereignty, security, etc. It was noted that IPv6 is recognized as the natural next step and there are a growing number of supporters, providers and users. It was agreed that, despite the best efforts made, the routing mechanisms currently applied couldn't meet future expectations. There is an urgency to conduct studies on optimal routing mechanisms, together with framework, structure, plan, while recognizing that we need to proceed in IPv6 within the limitations of currently understood and deployed routing technologies.

The speakers and audience both found this session very useful and important. It was recognized that developing country needs must be understood and safeguarded. It was commonly understood that to keep the stability of the Internet service is absolutely essential for any arrangements on the agenda of discussions, and that none of the proposals on the table can be considered as "not impossible", noting the technical difficulties and potential dangers with introducing alternative solutions. There is a clear common desire for greater collaboration and dialogue between all stakeholders on the issues of resource management.

Session 2.1 NGN Service Platform Commercial Services of Carriers

Chair: Ms. Rosa Delgado, ISOC Trustee
Presentation 1:Internet Evolution and the Way Forward, Mr. John Klensin, IETF
Presentation 2: Challenges and Opportunities in Deployment IPv6 Applications, Mr. Mark Blanchet, CTO, Hexago

Presentation 3: China Next Generation Internet project Introduction, Mr. Hequan Wu, Vice-President of the Chinese Academy of Engineering

Ms. Delgado briefed the audience with her views on the IPv6 developments worldwide, and highlighted the values of the speakers and their presentations.

Mr. Klensin presented his thoughts on the topic of Internet evolution, how IPv6 fits into it, and good and bad approaches to moving IPv6 along. He focused on topics raised on the first day, elaborated the two essential principles of Internet: end-to-end and packet-switching, which are, according to him, the virtue leads to application innovation and service competation. He also compared the routing mechanisms of PSTN and the Internet.

Mr. Marc Blanchet introduced his views on ROI (Return on investment). As the deployment of IPv6 will take some time to become mature in the markets, he discussed strategies and scenarios to introduce IPv6, highlighted the features of TSP (Tunnel Setup Protocol), which follows the incremental deployment policy based on the IETF IPng Recommendation (RFC 1752, 1995).

Mr. Wu introduced the fast growth of ICT services in China, and provided information on the field trials of NGN and NGI projects, in particular, the CNGI (China's Next Generation Internet Network Project), which is supported by 8 Chinese Ministries and coordinated by him. He quoted the statistics by NIDA that at the end 2004, 100 million Internet users in China took up 55 million IPv4 addresses, compared to 1.28 billion occupied by the US. He further indicated that if India, or another country with a big potential market – reflects this growth pattern, the need for IPv6 deployment will become even more compelling.

At the end of this session, the questions about China's IP address application experience triggered some discussions of IP address management.

Session 2.2 IPv6 Network Practice and Commercial Application

Chair: Mr. John Klensin, IETF
Presentation 1: The European ISP Case, Mr. Tayeb Ben Meriem, Head of IPv6 Skills Centre, France Telecom R&D Division
Presentation 2: IPv6 and Home Appliances -New Trend of the Internet, Mr. Makoto Saito, NTT Communication Corporation
Presentation 3: IPv6 Benchmarking, Mr. Carlos Friaças, FCCN,

Mr. Ben Meriem presented the IPv6 activities in France Telecom. He explained France Telecom IPv6 strategy, the function of France Telecom IPv6 Skills Centre and introduced IPv6 business cases developed by France Telecom.

Mr. Saito presented "m2m (machine-to-machine)-x"platform by NTT Communications as a case of IPv6 application which makes, according to him, the end-to-end communication secure, easy to operate and cost effective. He provided brief introduction on the architecture and the standardization status of m2m-x and stated that this project is supported by more than 50 vendors and ISPs.

Mr. Friacas introduced the benchmarking activity being carried out through questionnaires within Europe, which serves a purpose to evaluate the current deployment progress of IPv6 against their roadmap. He presented the results made in Portugal last year. According to him, the economic barrier and other business problems still exist. He further pointed out a fact that there are only 14

NTFs (national task force) out of 25 Members of the European Union should be improved by NTFs for all Members of the EU. He proposed to raise awareness and other promotion work.

Sessions 2.3+2.4: fixed/Mobile Convergence; IPv6 in other business sectors

Chair: Latif Ladid, President of IPv6 Forum
Presentation 1: Introduction of IPv6 TF-SC Project and IPv6 the Catelyst for Convergence, Mr. Bosco Fernandes (Siemens), coordinator of IPv6 TF SC Project Phase III
Presentation 2: IPv6 from Developing Country Perspective, Mr. Baher Esmat, Chair of Egypt IPv6 Task Force,
Presentation 3: Creating enhanced services with IPv6, Mr. Karim El Malki, Ericsson,

Mr. Fernandes introduced the European Union IPv6 Task Force Steering Committee and its current activities. In his second presentation, Mr. Fernandes believed that IPv6 is essential for gluing most of different networks, multimedia contents, and mobility, facilitating the concept of IMS (IP Multimedia Subsystem). He further indicated that IPv6 will enable global IMS based peer to peer services and the web service on IMS to offer "Internet on the air' will be made.

Mr. Esmat introduced the ICT developments in Egypt. He presented Egypt's IPv6 strategy as well as the vision, the mission, and the work plan of the Egypt IPv6 TF. Among those achievements, the IPv6 test lab at Smart Village starting from March 2005 was well received by the meeting. He also discussed some difficulties from developing countries.

Mr. El Malki covered a wide range of IP applications and IP services in the mobile networks, moving networks and the Area networks. He discussed the IMS from the end user perspective and application opportunities for IPv6. He suggested to push IPv6 through new services such as "Pushv6".

Closing

The two-day workshop was generally considered successful. There is consensus that IPv6 is recognized by all the future of the Internet services. The audience was pleased with the workshop results. The good atmosphere of the debates and the remarkable spirit of cooperation were recognized.

The participants from developing countries appreciated the workshop and requested ITU to disseminate the rich information to the ITU-T Members, to assist the developing countries, and to take care of the interests of developing countries in the international activities on IPv6 related matters wherever they cannot participate for various reasons and constrains.

Mr. Zhao, Director of TSB, assured the meeting that he will bring the results of this workshop to ITU-T Study Groups concerned, and to work with the ITU-T Members to make contributions to the international efforts. He quoted the cooperation between ITU and IETF/IAB and RIPE NCC on ENUM as an excellent model of international cooperation, and sincerely hoped that the cooperation between ITU and RIRs as well as with the other NGOs on IPv6 related issues would provide another good example to address the internet issues. He thanked the speakers and the sessions chairs for their excellent contributions to this workshop.

Mr. Ladid, President of IPv6 Forum, jointed Mr. Zhao to expressed his thanks to speakers and session chairs. He encouraged people not to wait, but to start with deployments of IPv6 systems.

Mr. Fernandes, coordinator of EU IPv6 TF-SC, concurred with Mr. Ladid.

ANNEX 1
Report of a consultation meeting with developing countries
Geneva, 23 June 2005, 18:00-19:00

Under an invitation by the Director of TSB, a meeting with the participants of developing countries to the IPv6 Workshop was held between 18:00 hours and 19:00 hours on 23 June 2005, immediately after the closure of the workshop. The delegates from the following countries participated in the meeting: Azerbaidjan, China, Egypt, Iran, Kenya, Mauritius, Mexico, and Syria.

Mr. Zhao explained the problems of developing countries for participating in the international debates on technical issues. As far as IP address resources management is concerned, during the recent years, he has received requests from developing countries on this issue. He noted that this issue is also referred to in the WSIS process. However, in the WSIS debates, this issue was considered as a technical issue and referred to WGIG; but during the WGIG, it was again considered as a technical issue, therefore was referred to experts. In other words, this issue has never been well addressed in WSIS/WGIG. On the other hand, the study on the management of IP addresses, which are not limited to the concerns on sovereignty of developing countries, as learnt from this workshop, cannot be completed if the concerns and interests from developing countries are not properly covered. During such studies, developing countries could actively join the debates, and other stakeholders would appreciate and welcome the active participation of developing countries. The problem of the participation of developing countries comes from budget constraints, the shortage of experts and lack of information, difficult choice of many international entities to participate, etc. Although ITU is a place where developing countries have full confidence, there are also some problems for developing countries to attend the meetings. It would be difficult for an efficient cooperation between ITU and other entities if there were no meaningful inputs from ITU based on contributions by developing countries.

The meeting agreed:
1) To request ITU in general, and ITU-T in particular, to continue working with other competent bodies, including non governmental entities, to ensure a fair allocation of IP addresses to facilitate a smooth IPv6 deployment, noting that the Council-05 documents, eg., C05/43 from Syria, expressed their opinions on this issue.

2) To request ITU in general, and ITU-T in particular, to continue working with other competent bodies, including non governmental entities, to meet the requirements of developing countries in improving routing mechanisms in a more economic way.

3) To explore the possible means to facilitate the participation of developing countries in the international activities on IPv6 related issues, eg., the establishment of (a) regional group(s) according to WTSA-04 Resolution 54.

4) That a regional group in the Arab region be established as a trial and Egypt was suggested as coordinator of this group. Director of TSB will contact SG 2 to endorse the establishment of this regional group.

5) That the Director of TSB will work with other entities, eg. NROs, to look for a proper means, such as establishing communication process according to ITU-T Rec. A.4, or establishing a "focus group" according to Rec.A.7, in order to facilitate ITU-T Members and Non-Members to jointly work on issues of common interests.

6) To encourage developing countries to actively contribute to PrepCom3 and to WSIS II.