Final

Dr. Paul Twomey
President and Chief Executive Officer
Internet Corporation for Assigned Names and Numbers
(ICANN)

GIIC-Keidanren Conference
on
ICT and the Environment

Tokyo, Japan

Keynote Speech
How Can We Actualize the Sustainable Internet Society?

Thursday, 24 April 2008

Chairman Akikusa, [GIIC Chairman]

Vice Chairman Furukawa, [Nippon-Keidanren Vice Chairman]

Distinguished guests and colleagues,

Ladies and gentlemen.

The Internet is always growing. It has become a vast, global ecosystem embracing stakeholders from all sectors — the public, industry and business, academia, governments and civil society. It lies in the hands of a remarkable confederation of parties. All of these stakeholders own portions of the Internet — from individual devices to huge, complex infrastructure systems.

Some players own physical communication resources such as optical fiber, satellite, cable systems and wireless networks and others provide software and network-based applications.

Still others provide services that promote and support electronic commerce, social networking, electronic messaging of all kinds, content distribution and delivery, education, and many, many more online applications. All these owners of the Internet represent one of the most diverse groupings of entities in the history of telecommunications.

What gets us up in the morning — and often keeps us up at night — are the innovations and technological advances that are about to become part of that ecosystem. They represent the greatest change in the Internet since its beginnings nearly 40 years ago. They are opening the way for the next billion users to enjoy all that the global Internet has to offer.

Right now, there are about 20 generic top-level domains and 252 country-code TLDs supporting more than 153 million registered names in the domain name space.

Internet users are demanding more. When the global Internet community talks about the next billion users coming on line, they are talking about Asia and the Middle East region. Japan, with its population of 127 million, leads in Internet penetration at 68.7%. And Korea's population of 34 million has a penetration of 47.6%.

But China is booming. Its population of 1.3 billion has a penetration of 12.3%. India has a population of 1.13 billion and penetration of 5.3%. The Middle East shows similar numbers. Compare that with Europe and Australia, each with around 70% penetration.

So the Asian countries and the Middle East will be the new face of the Internet — the next generation of Internet users.

I find that prospect very exciting. But at the same time I realize that as the Internet grows in functionality, it also presents more challenges — to the diverse stakeholder communities and to the sustainability of the Internet itself.

For the ICANN community, sustainability means implementing these innovations and technologies — all of which are intended to improve openness, accessibility, diversity, and security — without placing the Internet's security, stability and interoperability at risk.

So I'd like to talk to you this morning about a sustainable Internet society in terms of —

- Multi-stakeholder participation through ICANN's bottom-up consensus-building model in creating and maintaining the technologies and policies that ensure a single, globally interoperable Internet;

  and

- How the business community can enhance their business models — and at the same time strengthen the Internet's sustainability — by implementing IPv6.

ICANN's mission and operating principles

First, let me remind you of ICANN's mission, which is —

- To coordinate, overall, the global Internet's system of unique identifiers, and to ensure stable and secure operation of the Internet's unique identifier systems. In particular, ICANN coordinates:

  1. Allocation and assignment of the three sets of unique identifiers for the Internet:

     - Domain names (a system called the DNS)

     - Internet protocol (IP) addresses and autonomous system (AS) numbers

     - Protocol port and parameter numbers

  2. Operation and evolution of the DNS root name server system

  3. Policy development reasonably and appropriately related to these technical functions

In fulfilling its mission, ICANN is guided by four founding principles. They are to —

1. Contribute to stability and security of the Internet

2. Promote competition and choice for registrants and other users

3. Forum for multi-stakeholder, consensus-based bottom-up development of related policy

4. Ensure an opportunity for participation by all interested parties on a global basis

It is within this framework that I talk to you this morning.

ICANN's multi-stakeholder model

Although only ten years old, ICANN is the flagship for multi-stakeholderism. The ICANN model represents the insight that a truly global resource like the Internet's addressing system cannot and should not be influenced by one country or region alone, or by one organization or individual. This multi-stakeholder consensus-building model enables the ICANN community and the global Internet community to develop policies that influence the way the Internet and the domain name system work.

Participation by the entire Internet community — by governments, the business community, the academic community, the technology community, the private sector, and civil society alike — is essential to ensuring that the continuing progress and achievements of the global Internet community benefit us all.

How to participate in ICANN

How can you participate in ICANN's policy-making processes?

The ICANN community's process for multi-stakeholder decision-making is very open. Debate is a crucial a feature. Often there are divergent positions that take time to work through. There are complex technical and legal issues behind most of the discussions about the creation of policies. We have seen this in the many policy issues ICANN has coordinated.

ICANN's work and its processes are also transparent. The entire process is available online so individuals can review policy as it is

developed and comment on it as they feel necessary. All substantive work is put out to public comment and those comments that are relevant are incorporated into the decision-making process. Your informed comments are one way in which you can participate in policy-making.

You can also join one of ICANN's Supporting Organizations or Advisory Committees, a more formal route into ICANN's policy-making processes. One of the main policy-making bodies of ICANN is the Generic Names Supporting Organization, which is made up of a number of constituencies:

- Commercial and Business
- gTLD Registries
- Internet Service and Connection Providers
- Non-Commercial users
- Registrars
- Intellectual Property experts

Why you should participate in ICANN

Why should you participate in ICANN's policy-making processes?

First, to gain access to latest expert knowledge. When it comes to the domain name system, many of the world's most knowledgeable technical and business minds are in the ICANN community. With criminals using the Internet infrastructure itself to carry out attacks, ICANN represents a good opportunity to gain access to the latest expert knowledge and analysis.

Second, to have easy and free access to reports. ICANN is a non-profit corporation dedicated to the security and stability of the Internet. All of its work is readily accessible online and made available free of charge.

A few months ago I had the great pleasure of serving as one of the principal authors of a practical guide for CEOs and Directors to respond to one of the fastest growing threats to corporate wellbeing — cyber-crime. One of the sponsors of that guide was the British-North American Committee, an organization very similar to your own.

This timely, concise and readable guide clearly shows that cybersecurity is a Board and CEO issue — not just for technical experts alone. The report outlines the issues clearly, and it gives time-poor CEOs a checklist to help address this grave risk.

Third, to have early awareness of problems and solutions. The Internet community is usually the first to recognize new problems as they arise, and the first to provide solutions. ICANN's Security and Stability Advisory Committee is notable for recognizing and analyzing new threats, and providing solutions, long before they become an issue of wider concern.

Fourth, to contribute to global Internet policies. ICANN coordinates the domain name system through a bottom-up consensus-building model. All are invited to participate and contribute. Policies designed through ICANN's processes have a far-reaching impact on the global Internet.

Fifth, to reinforce private sector leadership. ICANN is dedicated to enabling the private sector to lead in development of the Internet. Its unique multi-stakeholder model enables governments, business, the technical community, academia and civil society to have equal say in how the system

develops. The more the private sector engages in this model and provides practical solutions to real problems, the stronger that model becomes.

Sixth, to take advantage of networking opportunities. ICANN holds three international meetings annually in different locations around the globe, and more than one thousand people attend each meeting. These meetings provide a unique opportunity for the leading lights in the Internet industry to meet one another and share experiences and best practices.

I encourage every here to attend ICANN's upcoming meetings in Paris on 23 to 26 June or in Cairo on 2 to 7 November, and to participate in the specialist business briefing sessions scheduled for those meetings.

Seventh, to defend and build upon of a single, globally interoperable Internet. ICANN is a leading proponent of the current system, in which the same email address and website are accessible from any point in the network and so the world. This single root provides enormous economies of scale and is behind much of the Internet's success, but it also requires active promotion. Those that see the value in maintaining this single root can aid its defense by actively participating in ICANN's processes.

And, finally, to enhance future opportunities. While much of ICANN's work is technical, it is also at the cutting edge of significant future changes in the evolution of the Internet. ICANN is designing the process by which new generic top-level domains will be added to the Internet. It is also designing the processes that will add Internationalized Domain Names to the Internet, making the Internet more readily accessible to billions of users not yet online.

ICANN is also playing an important role in the shift to IPv6 — the technology that will enable the Internet to continue to grow at the same rate despite the demand for increased connectivity driven by the burgeoning reliance on mobile and wireless devices and by other new technological advances. IPv6 will be the subject of several workshops at our Paris meeting this June.

The business case for IPv6

By now, everyone here has become at least somewhat familiar with a central issue facing the Internet community — the depletion of available, unique IPv4 address space and the need to put into place the next-generation IPv6 address space.

IPv6 stands ready to revitalize the growth and use of networking and the Internet as a platform for commerce, education, entertainment and general information sharing. However, it is still largely perceived as a tool, albeit one critical to the development of new applications and network-based services.

Another impediment to IPv6 adoption has been the focus on extolling its technical virtues rather than its business potential. Its technological advancements — a larger address space, auto-configuration, more robust security, and better mobility support — have not resonated universally with big business.

Business leaders are rightly concerned about how to resolve problems, how to generate revenue, and how to build efficiencies and cost savings into their organizations.

But let's face facts. Organizations of all stripes increasingly use information technology to solve everyday business problems. The result is that:

- IPv4 address space is in short supply. Although IANA recently recovered some long-unused IPv4 addresses, the last blocks of IPv4 address space are expected to be allocated within the next two to three years. Any space remaining will more than likely be reserved for regions where there is little demand for devices requiring individual unique addresses and little money to purchase them.

- The adoption of networking technologies to facilitate communications, conduct financial transactions, or exchange information has pushed IPv4 to its limit.

- The free pool of IPv4 address space will run out long before IPv6 is fully implemented. Lack of IP address space will impact Internet growth.

- This situation has short-changed technology advancements in areas like anycasting, multicasting, or peer-to-peer exchanges.

- Security and quality of service have also had to take a back seat.

Standards bodies and industry have provided solutions that extended the capabilities of the network, but also drastically increased its complexity and created additional problems. Also, these solutions — NAT, translation like NAT-PT and ALGs, and so forth — were never intended to be permanent, despite the enormous capital investment in them.

Now, feel the weight of all those next billion users bearing down on us. Most will likely expect to connect to the Internet through devices that require individual IP addresses.

IPv6 integration has enjoyed success in recent years through support from government or industry standards bodies. For example:

- The IETF's IPv6 working group has decided that its IPv6 development was complete. IPv6 development now goes on in the IPv6 Management working group, whose future work will be tweaks rather than major protocol development work.

- In September 2000, Prime Minister Mori of Japan identified IPv6 as a critical part of the eJapan 2005 initiative and initially offered tax incentives to corporations. Now that the initial financial incentive has given Japan an impetus for deployment the follow-through has been left to market forces.

- The Asia Pacific region is among the leaders in IPv6 deployment as measured by the number of IPv6 allocations to ISPs and the amount of space allocated. In particular, a bit more than one-third of the IPv6 space that has been allocated in the Asia Pacific region.

- The Chinese government created and financially supports CNGI, an IPv6 backbone network designed to be the core of China's Internet infrastructure.

- The United States Department of Defense mandated the integration of IPv6 in June 2003 to be ready by 2008, and procurement mandates are in place.

- NIST is developing profiles that will apply to all US government agencies, and they will become mandatory in the near term.

However, the support of these institutions will only be justified when the majority of commercial ISP networks offer IPv6 services as part of their standard packages. Indeed, support by commercial network operators is essential to maintain credibility.

A strong IPv6 deployment business case will not come from government support. It will come from cost savings, the potential for considerably larger networks, greater network stability and security, and the long-term potential for the creation of new and improved net-centric sets of products and services.

IPv6 can be used to solve real world problems that add value to organizations and have return on investment models attractive to management. Here are just three of the many very promising technologies where IPv6 will be a critical building block:

- Sensor Networks — A new concept, sensor networks can be found in manufacturing equipment, heavy machinery, security systems, and heating, ventilation, and air conditioning systems. But the

concept of integrating all those proprietary systems into one communications system is still new. The use of monitoring systems to detect toxins and radioactivity in water systems, air filtration systems, or at airport or shipping terminals around the world has increased substantially.

- Product Tethering/Communities of Interest — Manufacturers would love to have relationships with their product once it leaves the factory. In a world where all things can be connected, the opportunity to create new value-added services is almost endless. Not only could the end users' experience be enhanced, but manufacturers or their ISP partners could create new services not feasible in an IPv4 world.

- Ubiquitous Communications — With the increase in the number of mobile phone users, the expansion of Internet-related services through the cellular networks, and an increasing number of connection mediums — UMTS, WiFi, Wimax, UWB, and so on — there is a need for a uniform communications protocol that supports mobility and can handle a large number of devices.

Yet the need for increased communications, security and monitoring has to be offset against the cost of deploying and managing those systems. IPv6 offers a very stable and flexible platform that supports mobility, ad-hoc networking, and a large number of simple devices.

There remains a need for a coordinated effort to increase IPv6 awareness and advancement in three major areas:

- Strategic planning at the corporate level — the US Department of Defense is one example of a long term strategic planning by a large-scale organization

- Return on investment — the Chinese government, which has a 20-year plan to connect, is an example of long-term planning for ROI. Its entire industry, institutions and nations favoured by its central planning system

- Technical knowledge at a tactical level — 3GPP is an example of a Greenfield standard for next generation wireless with strategic thinking in terms of scale and dimension of the project

The OECD is studying the risk-reward ratio of businesses moving toward IPv6 sooner rather than later. We expect it to find that the cost of supporting IPv4 and interim network extension measures will increase sharply once end-user demand for IPv6-enabled devices, networks, and operating systems is coupled with the increasingly scarce supply of IPv4 addresses.

The introduction of the IPv6 address space is becoming increasingly critical to a sustainable Internet. ICANN is addressing this issue in cooperation with the Number Resource Organization and the Regional Internet Registries to support IPv6 in:

- Backend server support (EPP, RPP, IRIS, and the like)
- Front end website support
- IPv6 glue records in zone files
- IPv6 enabled registration services

ICANN is also working with the IETF and other organizations to ensure that IPv6 is first-class citizen in DNS root zone — and to ensure that IANA/ICANN does everything it can to support rapid and universal IPv6 deployment.

Ladies and Gentlemen

The Internet is the most powerful and pervasive means of empowering individuals in recent human history. It is part of the glue which ensures a rapid unleashing of humanity's knowledge and possibilities for all persons no matter what age, sex, creed, class, ethnicity and — at least to some degree — wealth. And it is radically reducing transaction costs and barriers to markets across a globalized economy.

It requires the continuing efforts of all stakeholders, from governments, the private sector, civil society, academia, and the technical community to preserve and strengthen this model. By doing so, we can ensure its resiliency and utility — and guarantee the rapid and successful development of a secure, stable and globally interoperable Internet.

I would like to conclude with my strong recognition that effective participation will greatly and positively contribute to the Internet as a whole, bringing valuable and novel views to the dialogue from which the global community can benefit.

It's always a pleasure to meet with colleagues to discuss the continuing evolution of the Internet. It has been my great pleasure to speak to you today, and I look forward to joining in your discussions throughout the rest of this conference. Finally, I'd like to extend special gratitude to our hosts, whose efforts brought about this important conference.

Thank you . . .