

REPORT ON OECD/ OSIPP (OSAKA UNIVERSITY) WORKSHOP “THE INTERNET: CONVERGENCE AND SELF-GOVERNANCE”

**Tuesday, 9 June and Wednesday, 10 June 1998
Senri Life Science Centre, Osaka, Japan**

Introduction

The OECD and OSIPP (Osaka University, School of International Public Policy) held a Workshop entitled "The Internet: Convergence and Self-Regulation" on 9-10 June 1998, in Osaka, Japan. The aim of the Workshop was to focus on emerging issues relating to new Internet services and explore what impact the Internet was having on existing policy frameworks. The Workshop brought together 70 participants from business, academia and government. Sessions ranged over a number of existing and emerging issues in respect to Internet developments. These included ongoing ICCP work on access to communication infrastructures, and convergence, with a particular focus on the needs of electronic commerce. A brief summary is recorded below. The agenda, background documents, presentations and list of participants of the Workshop are on the OECD's website at <http://www.oecd.org/dsti/sti/it/index.htm>.

Opening Remarks

In his opening remarks, **Professor Mitsuru Kurosawa**, Dean of OSIPP, welcomed the participants and thanked the OECD for jointly organising the workshop. Professor Kurosawa noted the importance of the Internet as a core infrastructure for social and economical change and said the Workshop was aimed at promoting discussion on the emerging issues faced by governments. **Mr. Dimitri Ypsilanti** of the OECD, also thanked the OSIPP, particularly Professor Masatsugu Tsuji for coordinating the Workshop, and welcomed the participants. The importance of resolving the emerging political and economical issues related to the Internet was emphasized, as was the link to the OECD's ongoing work on convergence and electronic commerce. Mr Ypsilanti also noted that the Workshop was being attended by a number of people involved in the preparation for the forthcoming Ministerial conference on Electronic Commerce in Ottawa.

Session 1: Overview of issues

Professor Toshihiko Hayashi of the OSIPP, Osaka University chaired this first session. Professor Hayashi commenced by noting the dramatic growth of the Internet and expectations that it would be further developed as a key communication infrastructure of the future. He stated the aim of this session was to explore the main policy issues for communications infrastructure and the Internet and explore how government can best provide frameworks to promote network development for electronic commerce.

Mr. Robert M. Pepper, Chief of the Office of Plans and Policy of the Federal Communications Commission (FCC) described the explosive growth of the Internet and examined the various policy issues needing to be resolved for the Internet to flourish as a foundation for electronic commerce. Mr Pepper noted that many policy issues relating to the infrastructure are arising, including the strong and increasing demand for bandwidth to meet rapidly growing traffic loads and speed response times for users. He noted

the critical importance of competition in meeting the demand for bandwidth, including competition between different service providers and network technologies. Mr Pepper stated the dramatic improvement in underlying optical networking technology and use of existing copper plant have not yet been fully reflected in the pricing of bandwidth. The need for more competition among infrastructure providers was repeatedly stressed in this context to bring greater amounts of capacity to the market. Mr Pepper also noted that digital technology was blurring the traditional boundaries in communication market structures and imposing new challenges for traditional regulatory frameworks based on the division of telecommunications and broadcasting. In closing, Mr Pepper proposed the following guiding principles for government policies in respect to the Internet to encourage the development of electronic commerce: promote competition; insulate services from regulation; provide incentives for technology innovation; consider social welfare as affordable access and consumer protection; and encourage industry co-operation.

Professor Shoichiro Asano of the National Center for Science Information Systems (NACSIS) and Vice-Chairman of ICCP Committee, introduced observations on the current and future Internet market from a business and technology point of view. Professor Asano referred to indications that the Internet market is becoming more oligopolistic with large ISPs expanding their market share. Professor Asano stated there was increasing private traffic exchange among major backbone providers. He noted the emergence of a new hierarchy in the market between backbone transit and local traffic exchange. Professor Asano also made a number of comments on technical aspects of Internet traffic exchange that needed to be improved for the Internet to support electronic commerce. He also noted that asymmetric patterns for international traffic was an emerging issue for the Internet community. In closing, Professor Asano proposed a number of principles and policy issues for further consideration: promoting technology development; promoting competitive pricing mechanisms; providing a self-regulatory framework; and promoting electronic commerce to eliminate the current imbalance of traffic flow through the increase of two-way transactions.

Mr. Sam Paltridge from the OECD, outlined the issues the Secretariat had highlighted for discussion in the Workshop. He described how traffic was exchanged on the Internet, noting the differences with the public switched telecommunication network and the new issues being raised. Mr Paltridge stressed the importance of the Internet community taking the time to provide information and advice to policy makers. He noted that a number of issues had arisen at very short notice, such as those related to domain name administration and competition in backbone markets, for which policy makers needed to make decisions in unfamiliar areas. By way of example, some indicators were shown which had been developed by the OECD to assist policy makers to better understand the Internet.

Session 2: Webcasting and convergence

Ms. Deborah Howard, Executive Director of the Internet Service Providers' Consortium (ISP/C) chaired the second session which aimed to examine the regulatory framework for new services emerging from convergence.

To set the scene, **Mr. Hisashi Kasahara**, Research Group Leader of the Human Interface Laboratories of NTT, introduced a video webcasting system with a real-time demonstration. He stated that although the non-guaranteed bandwidth and packet delivery feature of the Internet was causing variable performance in webcasting at present, technical solutions were being developed. In this context, NTT had developed "Software Vision," a video streaming technology over IP. This is a software tool which enables video-on-demand and live video distribution over the Internet by installing a 'client-pull' video streaming technology. This technology enables higher quality and multiple video streaming via dial-up connections.

Mr Kasahara stated that with these types of technological development, webcasting was looked upon as a new tool for personal communication. He said it has the potential to enable anyone to operate and use webcasting at a relatively low price.

Mr. Keiichiro Seki, Senior Advisor from the Communications Policy Bureau of the Ministry of Posts and Telecommunications of Japan, introduced the policy of the Japanese government concerning convergence, based on a newly released report published in May 1998. Convergence was analyzed as having the following four aspects: convergence in services; in transmission paths; in business units; and in user terminals. The presentation indicated that convergence is not a simple unification process of the traditionally separated telecommunication and broadcasting sectors, but a diversification process in the communications sector. Mr. Seki argued that it is insufficient to cover the emerging trends by an unified or inclusive regulatory framework, and on the contrary, the regulatory framework of such trends should be considered separately subject to each field's characteristics. Webcasting was raised as one fruitful product of the ongoing diversification process. Technical solutions and industry self-regulation were recommended as principles for webcasting governance at present, although the degree of development, social influence and international harmonization may become key factors to be considered in discussing the legal status of webcasting from the viewpoint of "like services" in the future.

Mr. Gilbert Cattoire, Director Business Development of Global Theatre Network and Chairman of the French Chapter of the International Webcasting Association (IWA) outlined the webcasting market describing its impact on traditional broadcasting regulations. According to IWA's data, there were more than 1 300 audio webcasters in 1998, with a growth rate of over 300 per cent from the previous year. The interesting point of this number was that over 90 per cent of such service providers in the market were existing broadcasting companies with webcasters providing service solely via the Internet making up only 8.6 per cent. These figures indicated the major role of existing broadcasting companies in the development of the webcasting market. Mr Cattoire said these companies wanted to reach a new audience and generate business opportunities, as well as gain experience in interactive communications. As the quality and accessibility of webcasting improved, existing broadcasting regulation was also facing greater challenges, due to the potential ability of webcasting to create an unlimited number of information channels and that were not specific to any one network infrastructure. The presentation emphasized that the further diffusion of webcasting could further enhance and promote the main objectives of traditional regulation such as pluralism, content diversity, cultural and linguistic goals.

Discussion ranged over a number of topics including measurement of the number of webcasting sites and audiences, intellectual property rights and liability in terms of webcasting. However, the main issue discussed among participants was the impact webcasting was likely to have on traditional broadcasting regulation. Although all participants agreed that the market should be industry-driven and minimum regulation should be imposed, some participants raised the possibility that policy issues relating to social and cultural impacts (e.g. illegal and harmful content) may emerge as more services developed. Some other views mentioned the need for a comprehensive legal framework in the future covering both the existing broadcasting services and emerging new services like webcasting. Lastly, the distinction between digital television and webcasting was also raised for consideration. While some participants predicted that the two services would integrate in the future, others thought that digital television had a more passive characteristic compared to the potential interactive nature of webcasting.

Session 3: Internet service providers and telecommunication regulations

Mr. Lee Jong-Soon, Executive Director of the Asia-Pacific Telecommunity chaired this session which focused on cross-platform interconnection issues between incumbent PTOs and ISPs, and expressed the importance of resolving emerging tensions between the two groups to ensure the continued growth of the Internet.

Mr. Richard Cawley of the European Commission DG XIII, gave an outline to the Workshop about the current market, policy developments and the future perspectives of the European Union in terms of the Internet and related sectors (i.e. telecommunication and broadcasting). Focusing on the Internet market, analysis showed that leased line prices in Europe are still relatively expensive compared to those of the United States with a ratio of 16:1 in 1998. Internet access prices are also comparatively high and although the industry was showing fast growth in general, diffusion is still relatively low in some parts of Europe. Mr Cawley said ISPs are increasingly asking for open and fair access to network resources via leased lines, unbundled local loops, co-location and interconnection with the incumbent PTOs. An overall Review of the current European regulatory framework will begin in 1999. Mr Cawley added the Internet was already impacting on a range of existing considerations for regulatory and policy frameworks, including issues of access and interconnection, universal service, Internet telephony, webcasting, the role of public broadcasting and the approach to electronic commerce.

Mr. Eric Lee of Commercial Internet eXchange (CIX), a worldwide trade association of Internet Service Providers (ISPs), spoke about the current uneasy and unstable business environment for ISPs. He stated that the relatively simple entry into the market had facilitated the rapid growth of the ISP sector up to present but, if new or additional regulations were to be imposed the number of ISPs would certainly decline. Mr Lee said the ideal regulatory framework for ISPs contained the principles of open competition, open and equal access, and above all minimal government regulation. However, CIX viewed current developments as not proceeding in these directions in respect to ISPs. On the other hand Mr Lee noted the importance of regulation in terms of incumbents with bottleneck power over essential facilities for ISPs. In the United States he said the full implementation of the Telecom Act 1996 was extremely important since it would help to resolve some of the monopoly concerns such as: denial of interconnection; issues of bundled access; laying down the legal basis the obligations of local exchange carriers and rights of ISPs concerning interconnection agreements. Finally, referring to future regulatory challenges it was repeatedly stressed that the non-regulated environment had allowed the Internet industry to advance at its present rate and that this policy should be maintained.

Mr. Jim Dixon, President of EuroISPA, a federation of European trade associations representing approximately 500 European ISPs, told the Workshop that the present tension between ISPs and incumbent PTOs was being caused by two main factors: anti-competitive practices obstructing an open market and inefficiencies in the traditional pricing system. He expressed the view that there was often an overly close a relationship between the incumbent PTOs and regulators which he felt led the regulator to favor the incumbent PTO over ISPs. According to EuroISPA high pricing is just one example of such distortion where some governments had allowed incumbent PTOs to protect their interests. With the still relatively high telecommunication prices between European countries, he said it was a natural consequence that European ISPs transited traffic via the United States rather than directly between the countries concerned. Even more, because prices from European countries to the United States were falling more rapidly than those to any other country, the distortion in Internet traffic exchange was being aggravated. This phenomenon was resulting in the transfer of an enormous amount of money from European ISPs to European and North American telecommunication carriers and was retarding the development of the European Internet industry. Mr Dixon also criticized the incumbent PTOs for not reflecting the fall in underlying costs due to new technologies like Wave Division Multiplexing (WDM) in

their prices to ISPs. The presentation endorsed the principle of minimum regulation for ISPs and strong action by government against monopoly power.

Mr. Dai Davies, General Manager of DANTE, described the differences between PTOs and the ISPs in all various aspects of technology and culture despite having a common set of issues for service quality. Mr Davies presentation focused on service quality. He presented a diagram indicating that because network performances decline as network loading increases, at above approximately 60 per cent total loading the network usage would become rationed among its users. In facing such problems of service quality, the approach by the PTOs and ISPs had showed a fairly clear contrast. While PTOs can maintain a sufficiently high level of service quality due to their pricing structure based on volume charging, the flat rate charging being favored in the Internet meant that revenues would remain relatively fixed, discouraging ISPs from investing in additional network and leading to increased rationing problems. Concerning interconnection issues between cross-platforms between the PTOs and ISPs, the need for principles based on cost sharing was strongly expressed. Lastly, the following role of regulation was mentioned: defining technical standards; setting commercial principles; and ensuring consumer protection which was becoming an increasingly important issue.

Several questions were raised in terms of the pricing structure for telecommunication services. Some participants noted that every country was trying to bring down the prices between the United States because they wanted to be the Internet hub of their region, and that this effort was accelerating the United States centric structure of the Internet. Mr Davies noted, from the perspective of a major purchaser of bandwidth from telecommunication carriers, that the increasing liberalisation of infrastructure in Europe post January 1998 was already starting to show a positive benefit.

Session 4: National and international Internet traffic exchange

Ms. Laina Raveendran Greene, Chair of the Singapore PECC Telecom and Information Industry Task Force and Managing Director of GetIT Pte Ltd chaired this last session of the first day which aimed to focus on the implications of current and emerging traffic exchange arrangements for infrastructure development. A better understanding on this subject was anticipated to help to head off a potential point of international friction.

Mr. Yoshikazu Ikeda, Director of the Multimedia Business Department of KDD and President of Japan Internet Exchange Co. Ltd. (JPIX) explained the various policy and business implications arising from the Internet traffic exchange in the Asia-Pacific region. He said the Internet was presently a US centric network where all the major elements such as traffic flow, domain name registration and content was centralized in the United States. He said the centralization of traffic flow was generating considerable issues of distortion in network topology and traffic exchange, and also raising significant questions of the validity of asymmetric interconnection agreements where the entire international circuit cost was being paid by non-US ISPs. Localization of Internet traffic exchange by developing Asia-Pacific backbones and national Internet Exchange Points was proposed as a possible solution for restructuring the existing situation. KDD was making backbone linkage with Asian countries and JPIX was providing an Internet exchange point in Japan, in this context. Focusing on the international infrastructure financing issue which had become a major concern of non-US ISPs, it was strongly expressed that network costs should be fairly shared reflecting the practical traffic exchange structure since traffic was becoming more and more balanced. The ratio between KDD to US ISPs decreased from 1:4 in 1996 to 1:3 in 1997, and it was predicted that this balance will approach to a more equal level in the future with the increase of balanced

benefit applications e.g. e-mails and Internet telephony, and reversed benefit applications in terms of traffic direction e.g. electronic commerce applications.

Mr. John Hibbard of Telstra outlined the current international arrangement for Internet traffic exchange and strongly insisted that the system has become both inequitable and unsustainable in the sense that non-US telecommunication carriers were continuing to pay for the whole network cost despite the change in traffic flows structure. The ratio of traffic exchange between the US and Australia was now 70:30 as of 1997 compared to that of 98:2 in 1990. Yet still, Telstra was paying 100 per cent of the transmission cost. According to Telstra's estimate, non-US telcos would have to pay US operators up to \$5 billion or more by the year 2000 if the current arrangement was to be maintained. He said the current situation was imposing high tariffs on non-US country users compared to those in the United States in order to cover up both the domestic and full international costs. This was restraining the incentive for service operators to invest in further network and leading to quality falls, usage falls and increasing prices. Furthermore, he mentioned that new emerging moves such as the Universal Connectivity Charge (UCC) in the United States was arising which was clearly against the principles of opposing the appliance of domestic taxes for international telecommunications raised at WTO and ITU. He strongly argued that Telstra would take further actions on this issue based on its action plan consisting from the following principles: promoting global awareness; applying pressure on US operators by increasing connectivity bypassing US and increasing wholly owned connections to the US; and undertaking new initiatives as involving the WTO, OECD and ITU on this controversial issue.

Mr. Roger Hicks, Director and Vice Chair of the Asia & Pacific Internet Association told the Workshop that traffic exchange issues are a substantial question for the Internet due to its natural characteristic as a set of many networks needing to exchange traffic with other networks. He said the Internet had initially developed from a research environment where traffic exchange was a technical rather than a commercial issue, and it was at this stage that the zero basis settlement known as "peering" had been established on the assumption of equality of traffic exchange. Focusing on today's traffic exchange, however, the Internet itself had become extremely commercialized and traffic exchange was related to content demand and its availability. Content development had stimulated infrastructure diffusion, bringing the rapid development of broadband networks from various Asia-Pacific countries towards the United States. In this content, traffic exchange was no more a technical issue but had become a commercial and economic issue. Observing the general principles for the future international and national traffic exchange, the following points were raised: traffic exchange arrangements must not limit future services; it should realize values to both sides with no complex billing or arbitrary settlements; and be able to avoid any inequitable or anti-competitive behavior in order to ensure transparency and achieve open and flexible solutions.

Ms. Laina Raveendran Greene indicated the changing circumstances of traffic exchange on the Internet and strongly expressed the need for beginning dialogues immediately to find common solutions. She said the existing cost model was unsustainable and there was a clear need for it to be changed since the various assumptions underlying non-US telcos having to pay the full circuit cost were changing. Traffic was becoming increasingly more bi-directional, with the advent of services such as Internet telephony and webcasting, and the increasing amount of non-US content which US users are accessing. She said there was no longer a valid reason for holding on to the existing model. Focusing on the way solutions should be achieved, she told the Workshop that although there is a general consensus that solutions should be industry driven, there was still the need for government involvement since many ISPs generally lack bargaining power and there was no commercial incentive for US ISPs to change the current situation. Quoting from OECD's background paper on this issue, she remarked the government's role to be minimum but supportive in finding the solutions e.g. providing a neutral forum for industry to reach consensus or a neutral point for statistics to be aggregated to inform debate. Introducing activities on this

issue at APIA and APEC where dialogue was emerging, the importance for recognizing that the existing model is unsustainable and beginning dialogues for change was repeatedly stressed. Ms Raveendran Greene also added there was a need for more ISPs to participate in this dialogue and provide data to inform discussion.

Session 5: Internet Self-governance

Mr. Dimitri Ypsilanti of the OECD chaired this session which aimed to view the different initiatives on industry self-governance of the Internet. He remarked that the issue is a major challenge for the industry, in a circumstance where the number of components related to the Internet which all have different aims and objectives was increasing, and reaching a coherent view was becoming more difficult. Additionally, the global nature of the Internet was making the problems more complex. However, the extreme significance for the industry to tackle the issue without delay was emphasized in order to avoid the emergence of government regulation.

Mr. Paul Twomey, CEO of the National Office for the Information Economy (NOIE) of Australia, introduced the Australian government's policy for the Internet governance. He told the Workshop that industry self-regulation was clearly the most appropriate way for governing the Internet and that government role was limited to a supportive but minimum level on specific issues such as ensuring equitable access and security on the network. Industry self-regulation was appreciated because it would allow more flexibility in the response to user demands, and be more effective due to expert knowledge. The creation of an international industry based regulatory body was proposed to resolve emerging issues in accordance to the global nature of the Internet. The major mission of such body would be to develop a comprehensive policy framework to provide safeguards against anti-competitive actions and ensure open and fair competition in the global Internet market. The organization would also be requested to respond to any legitimate concern of its stakeholders that their interests were being unfairly ignored or distorted. It was strongly expressed that if the government was to be involved in the creation of such an organization, its role was to be limited to certain broad issues as fixing membership, legal structures and stipulating broad objectives, and it should not prescribe detailed operational policies or procedures of the organization.

Mr. Christopher Kelly, Senior Counsel for Intellectual Property, Antitrust Division, US Department of Justice introduced the newly released White Paper on domain name system (DNS) management, which had been published on 5th June by the United States Department of Commerce. The White Paper focused mainly on the following points: the possible areas of competition in DNS management and how it should be realized and the ideal functioning mechanism of the proposed new corporation for DNS management so as to contribute to benefits for users. He remarked that the principle which had led the discussion in producing the White Paper was to hand over DNS management to the private sector in global terms and introduce competition where ever possible. The paper had defined the following two areas for possible competition: registration of domain names; and operation of gTLDs. Introducing additional new gTLDs had brought controversy in the administration in terms of its benefit to users and its viability. The question of the correlation between competition in registration of domain names and additional new gTLDs was also raised, due to doubts on the virtual effect of competition with no additional new gTLDs. Overcoming such discussions, the White Paper proposed to defer the decision of having additional gTLDs to the proposed new corporation, although referring to the significant benefit competition brings in general. Lastly, referring to the ideal characteristics of the new corporation - being representative, responsive, transparent decision making etc., the presentation remarked that the new corporation should not be granted immunity under anti-competitive frameworks. Several questions were raised from the

participants on the procedures of creating the new corporation and the urgent need of doing so, and the procedures of authority transfer from NSI to the new corporation.

Mr. Toru Takahashi, Chairman of the Internet Association of Japan and the Executive Council of APNIC, expressed self-governance as the appropriate regulatory framework for the Internet. He strongly told the Workshop that the Internet community had been self-managed from the beginning and that the government's main role should be solely to promote such self-governance, apart from acting in legislation issues for electronic commerce and intellectual properties. Furthermore, the increase in international subjects to be resolved was strengthening the demand for self-governance. Mr Takahashi commented on the proposed structure of the new Internet Assigned Names Authority (IANA) and said the level of self-governance was still insufficient, and the structure and procedures for the new IANA needed to be further defined. Concerning the domain name system, he said there were concerns that NSI's inherited dominance on gTLD registration may lead to abuses. APNIC's work based on Japan's WIDE project for IPv6 address allocation was also introduced.

Mr. Tomoo Okada, President of NIFTY Corporation and corporate member of International Law & Policy Forum (ILPF) introduced the background of ILPF and its current activities for promoting self-regulation on the Internet. ILPF is an organization consisting from members from the telecommunication, software and ISP sectors such as AT&T, AOL, British Telecom, Fujitsu and others. The mission of the ILPF is to foster electronic commerce based on an industry self-regulatory framework and accomplish harmonization of international laws. ILPFs Working Group on self-regulation was currently creating a comprehensive on-line bibliography of self-regulation examples as an initiative step. After qualitative analysis of these examples, the ILPF is planning to present the results of its studies at the OECD Ministerial conference on electronic commerce at Ottawa in October 1998. Referring to some examples of industry self-regulation initiatives in Japan regarding the Internet such as the Privacy Marking Program and the guidelines for code of practice for ISPs, the presentation expressed the effectiveness of industry initiatives such as those of ILPF in responding to the demand of the users and public, and placed emphasis that such industry initiatives should inevitably become international due to the global nature of the Internet with open and transparent discussion as its basis.

Session 6: Internet domain names and IP addresses

Mr. Roger Hicks, Director and Vice Chair of the Asia & Pacific Internet Association chaired the session introducing that the aim of the session was to share information on the policies and practices of national registries in OECD member countries and to also focus on the administration of IP addresses and Autonomous System Numbers.

Mr. Naomasa Maruyama, Vice President of Japan Network Information Center (JPNIC) introduced the structure and activities of JPNIC, a pro bono association consisting from ISPs in Japan with the main task of domain name assignment and IP address assignment in Japan. JPNIC was receiving no financial support from the government and its budget consisted from membership fees and assignment fees being collected since 1995. JPNIC registered domain names had increased rapidly since 1996 especially in terms of commercial companies. Concerning domain name assignment, JPNIC's policy could be summarized to the following four points: first come first served; one domain name per organization; non-transferable; and the need of local presence in Japan. The second and third policy principle were aimed at reducing possible conflicts and preventing the trading of domain names, both of which was regarded as adding little to the development of the Internet. For IP address assignment business, JPNIC had adopted a delegation system in which member ISPs would act as a 'middle-man' between JPNIC and the end-users.

This method had been adopted in order to reduce work load and improve the interface with end-users and was working out effectively by providing a more competitive environment in the assignment business.

Mr. Peter Gerrand, CEO of Melbourne IT, the administrator of com.au introduced the policies and practices of the national domain name administration in Australia. Melbourne IT was the first registry to adopt various service programs such as the advance dispute resolution process, service guarantees and a help-desk service. It had also just launched a new range of services to meet the demands of ISPs for: a secure and real time electronic payment system for electronic commerce; reliable and fast turn-around times; and early warning of potential infringements of intellectual property. Under Australia's legislation, industry self-regulation was clearly the main principle for the regulatory framework of domain names and government intervention was reserved for cases of anti-competition behavior. However, government initiatives were anticipated in areas such as assisting the creation of an organization to succeed ADNA (the Australian Domain Name Administration Ltd), an industry self-regulatory body which was established to set up domain name policies in Australia but which was not functioning adequately at present.

Mr. David R. Conrad, Executive Director of the Internet Software Consortium and former Director of APNIC, spoke to the Workshop about the emerging issues and trends in the domain name area. He explained the practical existence of a bottom-up governance structure between end-users and ISPs, and between ISPs and registries, based on authority and funding. The following four points were also raised as emerging issues and trends for domain names: allocation policy evolution; funding model evolution; creation of a global address registry; and the increased politicization of the address registry system. Focusing on the evolution of allocation policy, the trend of efficient allocation taking precedence over the management of the routing system was pointed out, with the speaker predicting that ISPs would eventually be required to supervise the routing system. As for the funding mechanism, the need for creating a more usage based funding model to take over the current membership based funding model was suggested, in order to spread the cost of the registries in a more efficient and fair way. Lastly, the establishment of the Global Address Registry (GAR), was recommended since some registry functions could be provided more effectively on a global scale.

Session 7: Measuring Internet performance

Professor Hajime Oniki of Osaka-Gakuin University, also Professor Emeritus of Osaka University chaired this session which was aimed at reviewing existing performance indicators of the Internet and exploring the possibility of new indicators. Measurement of the Internet has become a crucial but difficult task for both the government and the industry.

Mr. Barry Raveendran Greene, Cisco, in an online presentation, spoke about the current problems ISPs were facing in terms of network bandwidth and service quality, and emphasized the need for ISPs to collect and analyse network data in order to tackle the problems of CoS, QoS and I3F. ISPs were recommended to utilise two essential tools for gathering network data: the Simple Network Management Protocol (SNMP) and Remote MONitoring Protocol (RMON). SNMP and RMON would indicate what is happening on the network by extracting data on loading, PPS and packet drops, although this indicator had the defect of not being able to determine which entity was responsible for quality failure. He also referred to the effectiveness of flow based data analysis. Netflow data analysis has various advantages: it allows an advanced billing system based on various factors such as detailed volume, application and distance; and also informs ISPs of their customer's action on the network. Such aggressive measurement and analysis of network data of the Internet is considered critical for the survival of both the ISPs and the Internet itself.

However, the measurement and actual data analysis taking place is inadequate at present and many people were speculating with weak back-up data.

Mr. John Leong, Chief Technical Officer of Inverse Network Technology - an enterprise providing tools to measure the quality of services of the Internet - described the current problems occurring on the Internet in terms of quality of service and introduced an approach to measuring such quality. Slow performance on the network is the major quality problem today. However, because no single entity has end-to-end responsibility on the Internet and the structure of the Internet is getting more complex, it is very difficult to measure service quality and identify the cause of the problem. As an appropriate approach for measurement, he told the Workshop that Inverse had favoured the application centric approach which focuses on the user side, rather to the network centric approach. The application centric approach is a top-down model based on the user's actual experience, although it does have the weakness of still requiring low level metrics for locating the source and cause of problem. Finally, he noted that the biggest challenge in measuring service quality of the Internet is to overcome the unwillingness of ISPs and corporations to share operational data and that they were strongly encouraged, and had a mutual interest, to increase co-operation.

Mr. Jeff Kraft, Senior Consultant of LECG Inc. analysed the requirements and method of measuring the backbone market share of the Internet to ensure fair competition. This was important given the global trend of mergers in the market, and in the emerging context of the Internet as a key communication infrastructure. ISPs and backbone providers were assumed as components of separate product markets in terms of competition policy purposes, and as a natural characteristic of the Internet, backbones were relying on mutual dependence. Under such circumstances, specific mergers could distort the market through various factors e.g. degraded interconnection. It is in this context that measuring the backbone market share could help to assess the horizontal effects such as the likely harm to consumers, and the likely harm to competition due to expansion of degraded interconnection. Due to a specific analysis of the market share based on small ISPs connection capacities, MCI was estimated as having a 24 per cent share of the market and WorldCom 23 per cent. Although government regulation needed to be the minimum for the governance of the Internet and self-regulation was the best method in principle including interconnection issues, it is also true that competition policy was the only backstop for avoiding anti-competitive behavior and competition authorities should carefully scrutinise backbone mergers by applying appropriate measures.

Session 8: Roundtable: Implications for e-commerce and policy

Mr. Michael Tiger of Industry Canada and Chairman of OECD Working Party on Telecommunication and Information Service Policies chaired this last session, structured as a roundtable discussion with the aim of drawing the main policy implications for developing electronic commerce and the issues requiring international co-operation. OECD's leading role in assessing electronic commerce was also mentioned and the various initiatives being taken internationally were noted including the forthcoming Ministerial conference in Ottawa

Panelists' remarks dwelt mainly on the Internet and its implication for the development of electronic commerce and policy. **Mr. Robert Cohen**, an Adjunct Fellow of the Economic Strategy Institute looking back at the Workshop indicated that many of the discussions and policy problems raised concerned ISPs and service delivery over the Internet in the national context. However, as other industries, ISPs were expected to become more global in the next several years, resulting in a much smaller number of ISPs in the market. It was also emphasized that the unpredictable rapid development of the Internet and electronic

commerce would surely bring a strong impact on both the economic and social aspect at a world-wide level such as growth in GDP and job creation.

Mr. Dai Davies raised two policy issues deriving from the discussions of the Workshop: a commercial issue and a technical issue. The fact that cost and price structures of the Internet industry are not strongly related to each other, especially in the international context, caused problems for non-US countries in the commercial sphere. The need for fair and equitable settlement arrangements based on actual cost structures was urgently required. In terms of technical aspects, the issue of service quality was crucial to foster electronic commerce and ensure end-to-end service.

Professor Toshihiko Hayashi questioned the validity of the traditional criteria for ensuring efficiency and equity - which had been raised quite frequently during discussion of the Workshop - given the rapid speed of innovation of the Internet. Self-regulation was supported as the best method for governing the Internet mainly because speed of change of the Internet was not amenable to formal regulatory procedures, although there still remained specific policy issues to be resolved by government such as pricing policies. As well, the need for promoting public awareness on consumer protection in terms of new technology was also emphasised.

Ms. Deborah Howard outlined the current trends in the electronic commerce market. She proposed as general principles for the development of electronic commerce: ensuring access to infrastructure; building consumer trust; and minimising regulatory uncertainty. She expressed that the second point on building consumer trust was recognised as the most important factor for the future diffusion of electronic commerce.

Mr. Paul Twomey indicated that the Internet has both positive and negative implications, and that for the latter, which included illegal and harmful content and privacy problems, there was a need for the government to play a supportive role. He also remarked that as the Internet develops, it will evolve from a technical phenomenon to an economic and social phenomenon requiring education of not only the industry but also consumers and that this was essential for the future development of electronic commerce.

Finally, all of the participants agreed that industry self regulation was the best principle for Internet governance and electronic commerce due to its rapid innovation in technology. However, it was also understood that the government had a minimum but supportive role to play in order to overcome the various policy issues such as infrastructure competition, pricing policies, and a number of other issues important for the further development of the Internet and electronic commerce.

Closing Remarks

Professor Shoichiro Asano ended by providing an overview of the Workshop. He thought that all the sessions had discussed successfully the emerging important issues for the Internet. The outcome of the Workshop was important in the future work of OECD and the ICCP Committee. The need for further collaboration within and between the private sector and the government, and the need for frameworks for such collaboration was recommended in order to cope with emerging issues. Principles to help find policy solutions for issues relating to electronic commerce should, he argued, ensure fairness and non-discrimination; transparency; self-regulation; reliability; and further development of technology. Emphasizing the significant need for a continuous dialogue between experts of various sectors, Professor Asano concluded his remarks by thanking both the OECD secretariat and OSIPP for organising this fruitful conference.

