

# ○ BEYOND NETWORK NEUTRALITY

## THE STATE OF PLAY IN JAPANESE TELECOMMUNICATION COMPETITION

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This paper describes the present information and communication technology (ICT) market in Japan and introduces some key policy issues currently impacting on the evolving broadband, mobile, Internet and next generation network market, and other issues likely to impact them in future. The paper argues that there is an implicit guiding principle behind several policy initiatives on these issues that might well be described as being based on the conceptual framework of 'Network Neutrality'. The paper further identifies some new policy issues, such as mobile content regulation, interconnection of the NGN and the Internet (IPv6), the introduction of Internationalised Domain Name (IDN) country code Top-Level Domain (ccTLD), and depletion of IPv4 address spaces. In order to accommodate these new policy challenges located in the upper layer of the communication architecture, this paper suggests extending the scope of Network Neutrality and examining the 'multi-stakeholder' approach exercised at the Internet Governance Forum (IGF).

### INTRODUCTION

This paper sets out to describe the current situation of the Japanese telecommunication and Internet markets and introduces policy issues and challenges for the near future. We notice that now there are many policy initiatives taking place in Japan in the information and communication technology (ICT) market, and we suggest that there is an implicit guiding principle behind these initiatives.<sup>1</sup> It might be best described as an approach based on the conceptual framework of 'Network Neutrality'.

### 'NETWORK NEUTRALITY' AS OVERARCHING POLICY GUIDING PRINCIPLE

First, we will introduce an overview of the Internet and broadband market and its competitive situation. Then we will discuss a number of challenges, starting with Next Generation Network (NGN) and its interconnection with the Internet using IPv6 – dealing with the multi-prefix problem. Next, we will discuss the development of the mobile market in Japan, including the policy issues related to mobile content regulation. Finally, we will discuss upcoming challenges: governance of critical Internet resources such as Internationalised Domain Name (IDN) country code Top-Level Domain (ccTLD) operation; IPv4 depletion and IPv6 coexistence, and the scheduled review of NTT's organisational status for 2010.

When we look at the policy directions on these issues in seemingly separate market segments, we notice that the principle of Network Neutrality exists as a kind of underlying common conceptual framework across different segments, i.e. broadband access, mobile content and NGN and Internet interconnection.

Though the term 'Network Neutrality' has different interpretations in different countries or markets, the Japanese version is defined in the Report on Network Neutrality (MIC 2007) convened by Ministry of Internal Affairs and Communications (MIC) in September 2007.

The Report defines 'Network Neutrality' as follows emphasising the users' perspective.

Below are three basic principles that provide the conditions for ensuring Network Neutrality. We think it would be appropriate to consider that Network Neutrality exists when the given network is maintained and operated in a manner that satisfies these conditions.

Principle 1: Users are entitled to use IP-based networks flexibly and access the content/application layer freely.

Principle 2: Users are entitled to connect to IP-based networks freely through terminals that comply with technical standards provided by laws and regulations and these devices may connect to each other flexibly.

Principle 3: Users are entitled to use the communication layer and the platform layer free from discrimination at a reasonable price. (MIC 2007, 5–6).

From this definition, we can say that the idea of Network Neutrality acknowledges the separation of layers; recognises that the IP-based network is the main stream; and implies that end-to-end connectivity and freedom of choice of services and content must be guaranteed for users (or consumers) with choice and affordability.

Furthermore, though it was not explicitly expressed in the MIC Report, we believe that the same principle can be effectively applied in the emerging policy arenas such as:

- Interconnection between NGN and the Internet Service Providers (ISPs)
- Measures to deal with the depletion of IPv4 addresses spaces including the co-existence of IPv4-based services and IPv6-based services together and its regulatory framework
- Selection process of new TopLevel Domain Name System registry including that of ccTLD (Country-Code Top Level Domain)
- General framework of Internet's operational policy and governance issues – security, spam, viruses, harmful content, fraud, privacy etc.

We will examine a number of specific issues in the following pages to test the above hypothesis.

## **INTERNET AND BROADBAND ACCESS MARKET**

It seems that Japan's Internet and broadband market is approaching a kind of saturation. According to the annual survey released by MIC (Ministry of Internal Affairs and Communications) on April 7 2009, the number of Internet users reached 90 million in 2008, 75.3 % of the total population, up 2.8 million from 2007. It grew by 3.5 times in the past 10 years. (MIC 2008)

The number of broadband users in recent months indicates this saturating trend more clearly. As Figure 2 indicates, the growth rate is decreasing. Though there was some more growth from 2007 to 2008, the quarterly growth rate in 2008 was reaching only 1%. The data for the first

quarter of 2009 was not available at the time of writing, but it is reported there was almost no growth, indicating the effects of the recent world-wide economic slump.

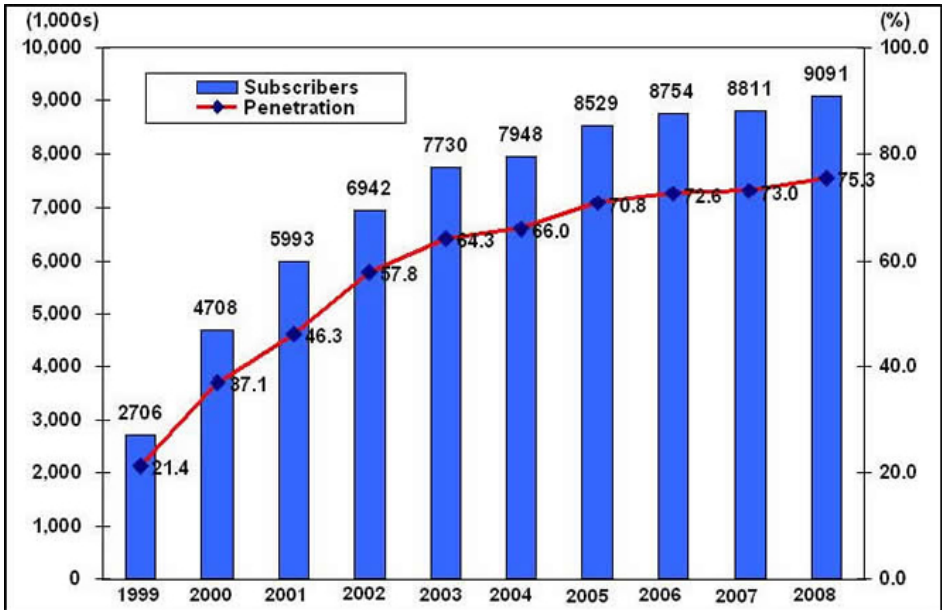


Figure 1 Number of Internet Subscribers and Penetration  
MIC Annual Telecommunication Survey FY 2008

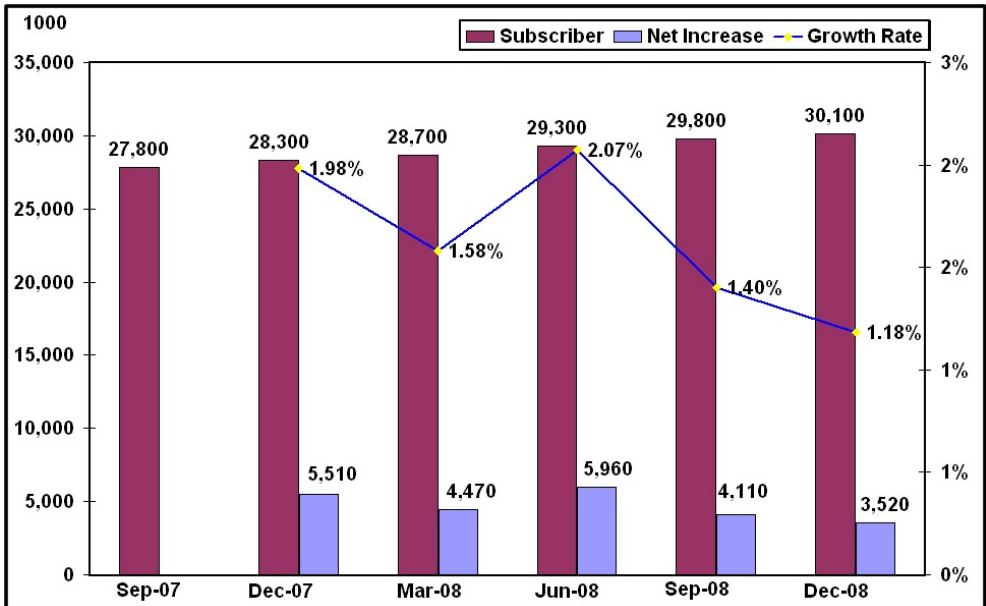
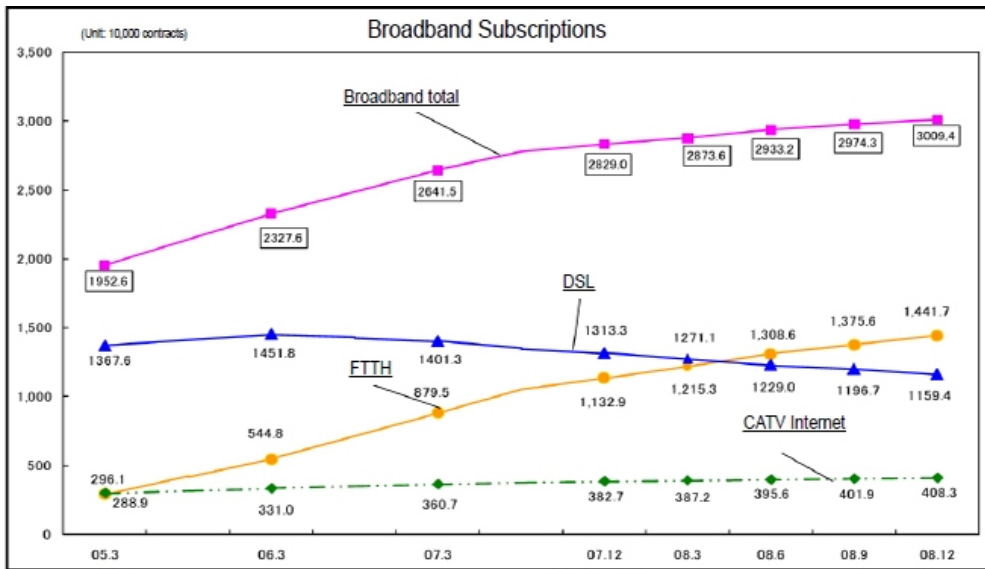


Figure 2 Number of Broadband Users  
MIC Quarterly Report on Number of Broadband Service Subscribers, as of Dec 2008

### NTT HAS 50% SHARE OF THE BROADBAND MARKET

As a part of its competition review in the telecommunications business field, the Ministry of Internal Affairs and Communications (MIC) has compiled the share data for the third quarter of fiscal 2008 (as of end of December 2008), and released it on March 25, 2009.

As of the end of December 2008, the number of total broadband subscribers was 30.094 million, up 1.2% from the previous quarter, and surpassing 30 million for the first time. Among them, FTTH (Fibre to the Home) services were 14.41 million or 48% of the total; DSL services were 11.6 million or 39% of the market; and CATV broadband was 4.08 million, 14% of the market.



**Figure 3** Broadband subscriptions per access type

Note 1: The figures do not include FWA services, and thus differ from the data disclosed in the March 18, 2009, MIC press release, "Number of Broadband Service Contracts, Etc. (as of the end of December 2008)."

Note 2: As figures for respective contracts are rounded, the total of the figures may differ from the actual total.

Disclosure of Quarterly Data concerning Competition Review in the Telecommunications Business Field MIC (MIC 2009d).

The combined share of NTT East and NTT West for total broadband services continued to rise at 49.2% (up 0.7 point from the previous quarter, or up 3.4 points year on year). Shares of the SoftBank Group and eAccess dipped to 15.0% (down 0.6 point from the previous quarter) and 5.9% (down 0.2 point), respectively.

Though Figure 2 shows that the number of FTTH subscribers continued to grow while DSL subscribers continued to decrease, again the latest data for the first quarter of 2009 shows a different picture. The shift to FTTH has stagnated and the demand for DSL seems to be staying steady. The economic downturn gave little incentive to shift from DSL to more expensive FTTH.<sup>2</sup> It is believed that some FTTH users have started to go back to DSL in order to pay a lower monthly subscription fee. How long and how far the latest changes will continue remains to be seen, but it is making a significant impact on the broadband market and its competitive situation.

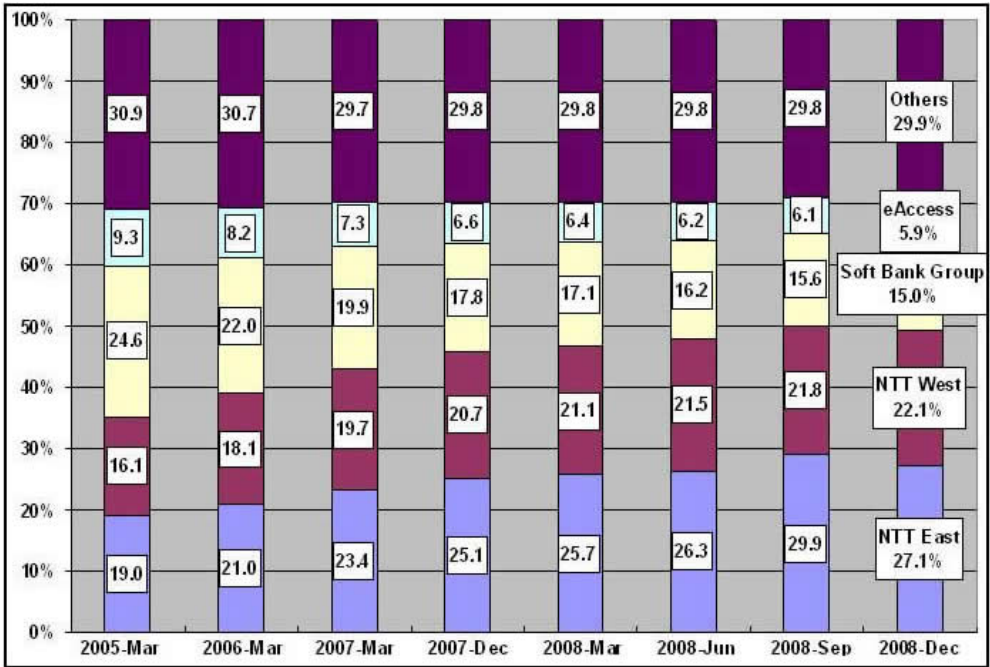


Figure 4 Carrier share of Broadband subscriptions  
Disclosure of Quarterly Data concerning Competition Review in the Telecommunications Business Field MIC (MIC 2009d)

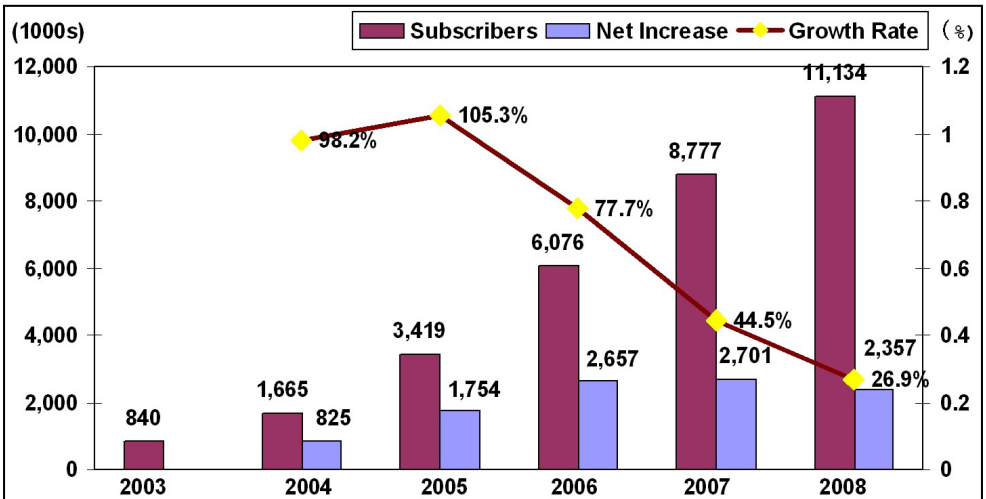


Figure 5 NTT's FTTH Subscribers  
Disclosure of Quarterly Data concerning Competition Review in the Telecommunications Business Field (MIC 2009d), with latest figure from Asahi Newspaper article, Apr 29, 2009

The rate of increase of NTT's FTTH service has slowed and as a result, the annual net increase of NTT's FTTH service, 'Flets Hikari' for FY 2008 ending March was 2.35 million, down 17.6 % from that of FY2007 (see Figure 5). This was well below the target of 2.5 million and showed the first decrease of net increase since NTT started to offer its FTTH service in 2001.

NTT was originally targeting the total number of its FTTH subscribers to reach 30 million by the end of FY 2010; however, in November 2007 they modified the target to 20 million. If this downturn for FTTH continues at the current level, NTT will have to revise its FTTH target downward again. On February 27 this year, NTT East and NTT West released their annual business plans, which include 7.76 million FTTH for NTT East and 6.01 million for NTT West, totalling 13.77 million. If they are to achieve the original target of 20 million, they need to increase by more than 6 million subscribers in FY 2010 alone. Given the economic situation, unless some miracle happens, this seems almost impossible to achieve. Consequently, NTT (holding company) President and CEO Satoshi Miura officially 'cancelled' the 20 million FTTH target by 2010 at a May 13 Press Conference. Instead of offering new target figure, Mr. Miura disclosed no new target figures or target year but only said 'we would like to achieve it (20 million) as soon as possible' (NTT 2009b).

### **NTT STILL DOMINATES THE FTTH MARKET WITH OVER 70% SHARE**

While NTT maintains its dominance in FTTH service even in the stagnating market, the competitors are not likely to chase NTT. A symbolic case was displayed by SoftBank, whose CEO Masayoshi Son has been most vocal in criticising NTT's dominant behaviour in the broadband market. While SoftBank still maintains the number one share in the DSL market, it started to resell NTT's 'Flets Hikari' FTTH service as their sales agent. SoftBank's DSL subscribers reached 5.16 million in March 2007, but now that has dropped to 4.43 million as of December 2008. It is widely believed that SoftBank needs to invest more on upgrading their mobile services and thus has no room for investing in the FTTH market. In 2007 they tried to lease NTT's local dark fibre cable per each code, not as a bulk of quad with eight codes bundled together for higher cost, together with other DSL service providers such as eAccess and KDDI, but NTT refused to offer the dark fibre per code at cost, and the MIC's panel judged in favour of NTT's claim.<sup>3</sup>

The other contender, KDDI, is also facing a difficult situation: they need to invest further in the mobile business in view of launching the 3.9G service scheduled around 2012. KDDI has 1.1 million FTTH subscribers, mostly acquired from power companies such as Tokyo Electric and Chubu Electric as both had decided to quit the telecom business. Still, KDDI is far behind NTT in the FTTH market and many are sceptical about their real intentions and their capability to compete against NTT in the whole local access market including telephony. They may remain competitive in the populous and lucrative urban area by cream-skimming, but few are expecting them to provide full-scale nation-wide coverage of FTTH in competition with NTT.

In summary, we see little competition in the fixed line local access market including FTTH, and NTT's dominance stands out in the saturating market. Many believe that both SoftBank and KDDI almost gave up on nation-wide competition. Instead of putting more fibres in the ground, they are retreating from facility-based competition and focusing only on the mobile market while expecting the government to take strong regulatory measures to contain NTT. This means that in the lower layer fixed line market on broadband, the reliance or dependence on NTT became quite strong. NTT's position is that both FTTH and NGN are services made by

new investment and therefore should not be treated in the same way as the incumbent voice telephony services with dominant carrier regulation. The competitors claim that NTT takes advantage of voice access line dominance to offer FTTH and NGN and thus they should all be treated under special government regulation such as the unbundling obligation for FTTH. In any case, the author believes that there is a clear need to keep the activities in the upper layer free or 'neutral' from the lower layer infrastructure services such as FTTH.<sup>4</sup>

The privatisation of NTT in 1985 signalled the liberalisation of the telecom market; thus new entrants such as DDI and power companies became potentially strong competitors against NTT. After a quarter of century, this picture no longer exists, at least in the fixed line access market. Some may argue that the centre of the competition has now shifted towards the more profitable mobile market away from the costly fixed access market. The author believes that in the long run, those who offer both mobile and fixed-line services as a best mix will have the highest chance of succeeding. If the local FTTH results in monopoly again, keeping the 'neutrality' of the services above the physical layer will become all the more important.

## **INTERNET AND NGN – POSING STICKY INTERCONNECTION ISSUES**

### **'MULTI-PREFIX' PROBLEM TO INTERCONNECT NGN AND THE INTERNET**

NTT launched its Next Generation Network (NGN) access service in March 2008, and thus became the first major telecom carrier in the world to offer commercial NGN service. Originally, NTT did not announce a plan to interconnect NGN with the Internet. With their focus on quality and security, they have indicated that NTT's NGN would remain as a closed network service, linking only service providers and customers within their own NGN network.<sup>5</sup>

The situation changed however, and NTT has been offering interconnection service with its 'Flets Hikari Next' NGN access service using FTTH. The customers will notice no difference in using NGN Flets Hikari Next and conventional Flets – so long as they use IPv4 protocol, the standard Internet protocol used globally. By providing 'tunnelling' service, NTT NGN provides IPv4 end-to-end connectivity to its customers.

There is one sticky problem with NTT's design implementation of NGN, known as the 'multi-prefix' problem. IPv6 has a new feature that permits users to have multiple addresses on their own terminal to access different networks simultaneously. Suppose a user wants to use a service that remains in a closed NGN network and also to use NGN access service to connect to their ISP using IPv6 to reach services on the open Internet at the same time. Since both NGN and the user's ISP allocate IPv6 addresses to the users as default, there are two different IPv6 addresses co-existing. The user terminal should be able to select the right source address or the right routing route and failure to do so will cause various kinds of communication problems. Unfortunately, the design of the Home Gateway box supplied by NTN for the NGN service placed at the user's premises did not foresee this problem and thus lacks the capacity to deal with it.

NGN was designed, at least in its conceptual framework, as a kind of closed network, and little consideration was made for the functions needed to connect to the open Internet; yet it was decided to use Internet Protocol (IP) as the base addressing and routing mechanism for NGN. NTT's NGN was, as mentioned before, originally planned as a completely closed network, and it has several 'closed' services such as Virtual Private Network (VPN) and High quality Video delivery service. In fact, NTT's original strategy was to keep its NGN solely as a closed and

managed network, not interconnected to the open Internet. At least that was the strategy prepared by the NTT holding company and its R&D laboratory which designed most of NGN's basic technical specifications.<sup>6</sup>

When preparing the commercial implementation of the NGN services however, NTT East and NTT West, NTT's fixed line operating companies, expected receiving requests for interconnection to the Internet as an additional service to NGN – 'Flets Hikari Next' which is its service brand name. It is widely believed that interconnection with the Internet is almost the only practical service currently available for users and the take up of other closed services is rather slow and limited.<sup>7</sup>

### **MIC AUTHORISED NTT TO START NGN WITH SPECIAL CONDITIONS**

In February 2008, the Ministry of Internal Affairs and Communication (MIC) authorised NTT East and West to start to offer NGN access services, with the following conditions:

NTT was obliged to

- Conform with the international standard for the technical specifications related to the NGN to the maximum extent possible, and to engage in proactive dialogue with Internet Service Providers (ISPs) to solve the potential issues associated with the migration from IPv4 to IPv6.
- Consider offering a common technical interface that would treat all content providers on an equal basis between those who are connected to NTT's content delivery services [NGN service] and those who are connected via ISPs [conventional Internet connection] and report its result to MIC.

It was further confirmed in the Draft Final Report of the 'Study Group on Internet's smooth transition to IPv6' in April 2008, that 'NTT and ISPs will start to jointly consider the inter-connection methods to achieve reachability and connectivity [for NGN and the Internet using IPv6] by 2008.

### **NTT AND ISP NEGOTIATION REACHED GRIDLOCK**

Given these requirements from MIC, in April NTT commenced discussions with the Japan Internet Service Providers Association (JAIPA), the national ISP association with some 180 member ISPs. This is positioned as a 'private negotiation', with MIC attending as an observer. In the meantime, the Panel on Internet Policy was convened by MIC in February 2008 with 15 members consisting of academics and other experts as well as 20 observers from related industry. (MIC 2009a) This Panel and its Working Group on IPv6 Transition and preparation for IPv6 received joint progress reports from NTT and JAIPA and discussed policy implications during their meetings.

From the onset, the two parties considered the following three options as technically feasible solutions for the multi-prefix problem:

- Option 1: ISPs to provide IPv6 connectivity using NGN with tunnelling managed by the ISP
- Option 2: NTT (East/West) to provide IPv6 connectivity using NGN with tunnelling managed by NTT
- Option 3: ISPs to outsource to NTT to provide full connectivity using native IPv6.



The question was 'Which option to agree on?' Each option has pros and cons for the different parties. At the beginning of the negotiation, it was largely perceived as more of a technical matter and both parties were urged to agree on the technical methodology for interconnection so that preparation for IPv4 depletion could start earlier in accordance with the Action Plan compiled by the Study Group on the Internet's Smooth Transition to IPv6.

However, the negotiations became much more difficult to conclude than originally expected. The first target deadline was the end of August, but it became clear that both parties have very different ideas: It was reported that NTT wanted to choose Option 3 as this requires little technical work on NTT's part and technically it seemed simple and efficient. JAIPA, on the other hand, wanted to select Option 2 since it would secure their role with the customers, offering routing and address allocation service from the ISPs, not from the underlying access line provision service of NTT.<sup>8</sup>

In Japan, open and unbundling regulation has been strongly enforced by MIC and most ISPs were taking advantage of this so that they could offer ISP services on top of FTTH or DSL provided by the carriers. In fact they are re-sellers of NTT and yet primary service providers of Internet access to customers. Therefore, many ISPs considered that Option 3 would minimise the ISP's role and eventually push ISPs from the market.

Depending on the outcome, there would be significant impact on users' convenience, cost allocation and ISPs' business models. That would further affect the division of labour among the different business parties engaged, and the competitive situation in the broadband market as a whole in the long run. According to JAIPA, Option 3 would likely to wipe out most ISPs and secure NTT's dominance in the whole ISP market, and thus it will require careful scrutiny with respect to the dominant carrier regulatory scheme.

Before deciding upon the interconnection options, the two parties were requested to consider the following issues by the Panel on Internet Policy of MIC: (MIC 2009a, 41)

1. ISP services are offered with safe, secure and stable operation for affordable prices
2. NGN is a type-1 facility-based service and therefore it should be interconnected with as many operators as possible with fair and equitable arrangements in place
3. Fair competition and the opportunity to create new businesses must be guaranteed within layers and with different layers in the broadband market

These issues should be decided with not only a short-term perspective but also mid- and long-term perspectives as well.

It was further emphasised that the two parties should explain the factors used to decide the interconnection method at an appropriate time with full substantiation to the users and stakeholders concerned.

NTT and JAIPA have met at least 20 times during the negotiation. There are several contentious issues including management structure, cost allocation and competition policy.

NTT's starting position is that since interconnection to the Internet via NGN access is an 'option', not a basic service for NGN, the cost associated with realising the interconnection should be borne by those who request the interconnection, meaning the ISPs or ISP customers. They judged so partly because the projected number of users given by JAIPA was relatively small.

For JAIPA, since ISPs have been enjoying the layered structure where carriers offer access service only and ISPs offer reachability and connectivity services as their sole business domain, NTT's claim that ISPs should bear all the costs associated with Option 2 is unacceptable, because it would change the business structure and unduly favour NTT. For NTT and some others, this arrangement of separating the two layers and mandating carriers to offer unbundled services for upper layer players is unique to Japan giving too much protection to ISPs.

The negotiation stalled after NTT presented the cost estimate for Option 2 at the meeting held in late December 2008. JAIPA members range from large nation-wide ISPs such as Fujitsu's @Nify, NEC's Biglobe, and NTT's own OCN and its affiliate IJ to many smaller local ISPs. The smaller players could not absorb the estimated cost that NTT requested, which includes the termination equipment using IPv6; network management routers to enable IPv6-v6 tunnelling; the development of network operation system software; and replacing the Home Gateway box at the customers' premises. While the actual figures have been kept confidential by the negotiating parties, it was said that they would definitely hinder the business viability of smaller ISPs.

In January, it was reported that NTT and some national ISPs had started to modify Option 3 and proposed Option 4. Instead of outsourcing all interconnection arrangements to NTT, this new Option 4 designates up to three outside players to act as gatekeepers between ISPs and NTT, thereby reducing the threat of giving too much control to NTT. Though this seems to make more sense for competition and transparency, in reality it will give a handful of players and NTT decisive powers and establish a single national gateway point that would make the monitoring and control of the flow of information over the IPv6-based Internet much easier than in the current IPv4-based networks.

It was also reported that since the NGN must achieve a quality standard for telephony close to that of the Public Switched Telephone Network (PSTN), including emergency call or monitoring functions, the actual capacity of routers of NGN network and Home Gateway boxes at the customers premises will only allow a maximum of three different interconnection players, and hence only three gatekeepers to be designated. This indicates the technical constraints of NGN with respect to interconnection to the Internet, as some technical experts have noted in their criticisms.

At this stage, in response to appeals by JAIPA and its supporters, MIC started to intervene. MIC has realised that the private-party negotiations have reached the gridlock point, and MIC thus started to pay more attention to the cost allocation issues than to the technical interconnection methodologies originally perceived as important. Some members of the Panel on Internet Policy also made their concerns known to the MIC, and it was finally resolved that this matter should be formally dealt with and scrutinised by the Interconnection Committee on the InfoCommunication Council, the highest regulatory advisory function to the Ministry.

At the end of April, NTT East and West revised some of their cost estimate and offered much-reduced figures to the ISPs. Again as the figures are not disclosed to the outside parties, we can only conclude that NTT has decided to absorb most of the cost associated with architectural changes within the NGN. NTT now only proposes that ISPs bear the cost of network termination equipment at the edge of the NGN, or where their Internet connection is interconnected with the NGN. This is very close to the current interconnection arrangement for IPv4-based networks.

Whether this revised offer will be accepted by JAIPA and its member ISPs, and whether having two different options (Option 2 and Option 4) is the best solution, remains unclear at

this stage. According to NTT, it will take close to two years to prepare the interconnection with NGN and Internet using IPv6. A long-term approach is required but it is hard to obtain any consensus.

In conclusion, NGN and IPv6-based Internet are both new and hence many factors are uncertain. Interconnecting two uncertain objects multiplies the uncertainty. Again, a conventional physical approach favoured by past regulatory policy has limitations, and a new approach based on a logical, higher layer framework must be worked out and accepted by all stakeholders. Network Neutrality is definitely a good starting point to consider this; however as this paper indicates, based on actual experience there are many more additional factors that now need to be taken into consideration.

## **MOBILE COMMUNICATION COMPETITION**

Now let us turn our attention to a different market segment, mobile. The Japanese mobile telecommunication market's success is only domestic so far. There are many reasons for this. We will explain what is behind the current regulatory and market situation of the Japanese mobile market, including the content regulation side, and will analyse its implications with respect to the principle of Network Neutrality.

### **GALAPAGOS ISLAND OF MOBILE PHONES?**

Traditionally, Japanese technology companies have used the domestic market as a springboard to enter international markets with well-developed and well-trying products. However, in the mobile communication sector, the standard that Japan has adopted (PDC) was not applied anywhere else in the world. This, and a set of other circumstances detailed below, prevented the Japanese mobile telephone manufacturers from penetrating the international market in large volume. This situation is often described as '*Galapagos Island*' since the vendors can still enjoy the heavily protected domestic market with its high volume, yet the species (ie products) that evolved to suit the special circumstances had little potential or incentive to succeed outside the isolated paradise. The same is true for the operators, too, since the operators and the vendors have co-evolved to shape the current Japanese mobile market.

In fact, neither the service providers nor the manufacturers are really successful internationally despite various attempts, such as NTT DoCoMo's European, American and Indian investment, and export attempts by NEC, Panasonic, Sharp Sony-Ericsson and others. This lack of success became a serious concern to the policy makers and industry leaders at large, and the MIC have convened several rounds of expert panels in recent years to come up with policy measures to help change the situation. The Study Group on Mobile Business in 2007 and its successor, the Study Group on Communications Platform are two such examples. In 2007 a Mobile Business Revitalisation Plan was published from MIC that tried to shape an 'Open mobile business environment' to offer a new business model separating the communication layer and content and application delivery services and seek for Fixed-Mobile communication (FMC). This attempted to separate terminal sales from operators' monthly subscriptions to reduce sales incentives paid from operators to vendors and the associated irrational terminal discounts. It also opened the door for new entrants for the Mobile Virtual Network Operators (MVNOs) in the Japanese market (Taniwaki, 2008).

The Study Group on Communications Platform concluded its discussion in December 2008 and the final report was published in January 2009.<sup>9</sup> In summary, it emphasised the emerging trend of fixed-mobile collaboration services; focused on the transaction functions over mobile services including that of authentication and settlement services currently dominated by the mobile operators; suggested separating transaction services from operators' communications services; and thus opening these services above the switching and transmission layers to non-operators such as banks, credit card companies and other financial institutions (Taniwaki, 2008). These are all geared towards enhancing the international competitiveness of Japanese mobile vendors and operators and, hopefully, of service providers as well. The operators are, however, reluctant to follow the suggestion, as that might undermine their vertically integrated services.

With the new 3G networks now well deployed in Japan, the chances of entering the international market are higher as similar standards are used throughout the world. The government has been trying to give incentives to the handset manufacturer sector so as to force them to enter the global market (see below for more details). It also has tried to use diplomatic channels to support the industry's effort to sell to other countries. One seemingly hopeful accomplishment is Prime Minister Taro Aso's recent visit to China during which Chinese Premier Wen Jiabao agreed to accept Aso's offer of technical assistance of Japan's R&D expertise for the introduction of 3G services in the vast Chinese market (C114 2009). This may include not only the handset's hardware functions, but also the advanced bundled services such as mobile settlement or mobile content with easy connection and control over the gateway to the Internet.

## **COOPERATION BETWEEN MANUFACTURERS AND OPERATORS**

Handset manufacturers in Japan have been working in close cooperation with DoCoMo. First, DoCoMo's R&D laboratory defined the specifications and the standard upgrades which were then forwarded to the manufacturers (Cheung 2004, 4). Thus, most innovation was done not by the manufacturers, but by the incumbent operator's research laboratory. In order to help 'family firms' close to DoCoMo (NEC, Fujitsu, Hitachi etc.), it gave the specifications to them earlier than to other firms, and paid in advance for producing the handsets, but in exchange required that the handsets were not sold to competitors until DoCoMo could distribute them in the market (Kushida 2005, 12). The 3G handsets have SIM cards, but they are manufactured so as to be locked into one service provider exclusively and there is no legal way to have them unlocked under present law. This shows the dominance of carriers on the market: handset vendors are unable to sell mobile phones without the carrier's approval.<sup>10</sup> In addition, the application software for each operator that enables the user to use mobile Internet is designed exclusively for that operator's service platform. Therefore, even if the users could undo the SIM constraints, they still would not be able to switch to other operators in any practical way.

Because of this close cooperation between the manufacturer and the operator in Japan, all capabilities of the phones were fully exploited, as there were no discrepancies or gaps between the services provided and the capabilities of the phone.

In Europe the relationship between carriers and manufacturers is much less close than in Japan. Mobile services are not tailored to the capabilities of the phones, and neither are phones optimised for the services that are to be offered by the operators. Lately some of the operators have passed over several services to the manufacturers and retain only customer support and billing (INDEX

2009). This may bring closer the supply and demand side between the phone specifications and the services also in Europe.

Nevertheless, the situation is changing in Europe. A clash of interests can be repeatedly observed between manufacturers and operators, aggravated by the mobile Internet access issue. As Wi-Fi is widely accessible in urban areas, not only do users access Internet for free with their Wi-Fi enabled handsets, but they also take advantage of the free (or cheap) phone services of Skype. Skype offers a special service for mobile handsets, and Nokia now tries to trade handsets with preinstalled Skype, annoying some operators with this, while other operators try to find a business model around Skype calls (Mobile 2009). For example the UK operator '3' announced its free Skype plan in April 2009 (Mobile Europe 2009). Clearly, operators have a strong commercial interest in offering packages that are competitive with the Wi-Fi – Skype option, even if this means losing part of their income which was associated to voice calls or SMS. Skype may substitute both calling and texting, but at least Internet access is provided by the mobile phone provider. The statistics of UK operator '3' show that those users who use Skype also use more mobile voice and SMS transmission, compared to other users (Mobile Europe 2009). This may also be due to the fact that mainly heavy users became interested in the new Skype package.

### **SUBSIDISATION OF PHONES**

In Japan, as described above, handsets are ordered and purchased in bulk by operators with advance payment. They are not necessarily sold for a regular market price by retail shops to end-users. Until 2008, many handsets were sold at heavily discounted prices or even offered for free to users by retailers. This enabled young people to get access to the latest technology immediately when it is available from the operator, roughly three times a year.<sup>11</sup>

The operators have been paying a huge amount of 'Sales Incentives' as a kind of subsidy to retailers. These subsidies are recovered through the monthly fees, and provided stable ongoing lucrative revenue for the operator. Although a condition of subsidisation was a requirement to enter fixed-term user contracts, early termination does not result in a penalty. This business model also presupposes that 99% of the phones are subscription based, unlike in Europe, where prepaid phones are very widespread.

While the introduction of Mobile Number Portability in 2006 had some impact on market competition, the dominance of operators over the handset vendors continued. With the subsidy given to the retail shops from operators, together with guaranteed bulk purchase for manufacturers, it became clear that this is in effect 'spoiling' the vendors, since it is easier to sell to operators than to sell directly to consumers and in competition with each other. It is like a drug that gives instant comfort at the expense of serious effort and fair competition. Some users who frequently replace their handsets could enjoy the latest features with little cost while other users, often older people or housewives, who do not want to change handsets so often and remain satisfied with simple old-fashioned machines, must pay the same high monthly subscription fee as the youngsters.

Having noticed this unfair practice, in 2008 the government then exerted pressure on operators to reduce the practice of subsidisation and to explore alternative ways of selling the handsets: to offer a regular (more expensive) handset price with reduced monthly subscription or a discounted handset price with a higher monthly fee. This new choice for the users was introduced in 2008 and already the change has become significant in the market.

All major three operators followed the government intervention. NTT DoCoMo generated a high income of 8 billion USD in fiscal year 2008, even though the sale of handsets dropped by 30% because they could discontinue the huge amount of cash incentives given to the shops. KDDI and SoftBank lifted subsidisation on some of its phones, but not all of them. However, as manufacturers suffer from the sharp drop of sales, the practice of subsidisation is being re-considered.<sup>12</sup> Due to the economic crisis European mobile sales also dropped in 2008 and 2009 (Davies 2008).

## **BUSINESS MODELS**

The Japanese mobile Internet was designed to resemble the general Internet as closely as possible, or sometimes to be even better and easier, and therefore worked from the beginning based on the HTML standard (Rheingold 2002, 10–11). Although for a perfect user experience of a website cHTML or xHTML code is the ideal, normal websites are also accessible almost in their original form. Both cHTML and xHTML can be easily applied by any website which wishes to be accessed through mobile. The sites can appear in full on the mobile screen including pictures and colours. The official sites are merely a collection of links that are thought useful for the user and where content was controlled and safe (and hosted by the mobile provider), but typing a URL into the address line took the user to the required location. The pricing was based first on traffic – with no difference between official and unofficial sites – and within less than a year, flat rates were introduced.

Among the financial and technical differences that led to the different way of development, one is that in Japan no high commission fees were charged to content providers for transmitting their content. While European operators requested 50%, in Japan only 7–9% is requested.<sup>13</sup> In Europe billing for Internet charges and for SMS and MMS traffic could not be separated until recently.<sup>14</sup> Therefore the downloadable content was charged per piece, which included the price of access as well as the price of the content.

When i-Mode was first introduced in 1999, NTT DoCoMo also tried to keep the content providers' monthly subscription to a minimum, mostly around 1 USD and with a maximum of 3 USD, so that users feel it to be easy to pay even if it is based on the subscription model. This set the standard for other operators (Matsunaga 2000).

As a result of this low pricing policy by i-Mode, Japanese official content sites proliferated and increased user experience, and also promoted fierce competition. The ratio of official sites and WWW sites accessed by users was 60%/40% at the beginning, 40%/60% a year later, and 20%/80% in 2008. A monthly Internet subscription of 33 USD provided practically unlimited Internet use, with some cheaper packages from 16 USD. Although still only 40% of the users use the flat rate plan, this helped to reach the critical amount and mobile Internet usage grew very rapidly (Billich 2008, 14). As emails are included in the flat rate and thus fewer people use SMS, Japanese operators cannot and do not rely on SMS revenues.

European carriers relied heavily on the lucrative voice and SMS traffic, and introducing Internet services carries a risk that voice and SMS traffic might decrease. DoCoMo, existing in a non-competitive market, did not have to face this threat.

However, the main revenues collected are from the high flat rate and subscription fees. Although voice fees are high, voice usage is falling so dramatically that the decline in revenues is

not compensated even by the increase of data charges. Minors especially, who are major customers of mobile Internet, use their phones mainly for data exchange, rather than voice. This tendency is very similar in Europe, too: youngsters prefer text messages.<sup>15</sup>

After WAP proved unpopular, European mobile operators offered Internet through separate devices that provided 'mobile access' through a portable computer. This structure allowed them to separate their billing for Internet and for voice, SMS and MMS. As these USB-Internet sticks quickly became popular, operators also had an interest in allowing the market to become saturated by them. Nevertheless, when separate billing for user-generated data (SMS and MMS) and other data traffic became possible (ZDNet 2000) through an operation system also for handsets, European providers started to offer more convenient, flat-rate packages and started intensive advertising campaigns relating to mobile (handset) Internet.

### **THE PREFERENCE FOR MOBILE OVER PC IN JAPAN**

Some 11% of the mobile Internet users (9.92 million people) never use the PC to access the Internet. This can be explained by the relatively low PC usage in Japanese society. Schools do not encourage the use of computers by children, and many children do not have their own computers at home. It is widely held in Japan that mobile phone is very useful during the long hours that many Japanese people spend commuting in crowded trains. Mobile phones create a virtual private space and provide spontaneous private entertainment for their holders.

In addition, Japanese Kanji characters provide a better writing and reading experience on the small screen of a mobile phone, which is able to carry 4 to 5 times more information than with Latin characters, as one character signals a syllable or even a complete word. This may make the usage of mobile content more convenient for its users. Typing Kanjis on a computer keyboard is regarded as more complicated than on the keypad of a mobile phone, according to some young users.

A further opinion was that it was tiresome to 'wait for a PC to start' only to view something online. In addition, a social expectation has developed that recipients will respond to emails within a few hours. This expectation can mount to a real pressure, especially among children, with response times as short as 5 to 10 minutes. Specialised mobile sites came into being, mainly created by and for youngsters and representing popular youth culture, and several of them cannot be accessed from a PC at all.

### **ACCESS CONTROL, CONTENT REGULATION**

Whereas social control of mobile phones is less likely (because of the private space it creates and represents), technological control is far more viable than on the PC.

Firstly, there are only a couple of gateways through which people may access the Internet on the mobile, whereas there are many ISPs that provide Internet access through a PC. Mobile operators are licensed and therefore subject to governmental regulation, while ISPs are like newspapers – they do not need a licence (in democracies, licensing ISPs and censorship of Internet content would be unacceptable) (Lessig, 1999; Balkin 2004; Council of Europe 2003; EuroISPA 2002). Secondly, mobile phones are used by one person only, who is usually a registered subscriber (especially in Japan, see above). PCs are often shared by many people, whether at school, at home, at a workplace or at an Internet café, while mobile phones are almost never shared. As

SIMs cannot be changed between phones by users, a Japanese operator always has an up-to-date database about who uses which handset.

This makes it very easy to monitor and control mobile usage: both personal communication and web browsing. Basically, as mobile has turned into an Internet access point, Internet browsing is just as easily detectable as regular telephone conversation, if not more. Filtering of mobile Internet content that is considered harmful for children becomes possible and lawful, because it is obvious who is a minor. If in the future Internet access in Japan will be mainly done by mobile, this may also raise an important freedom of speech issue. As Japanese mobiles are used for more and more applications – including payment in shops, public transport, and online shops – their personal nature, their usage as information access points and the GPS-capacity offer the possibility of total surveillance to providers or the government.<sup>16</sup>

### **COMPULSORY FILTERING TO PROTECT CHILDREN**

In Japan, as children are heavy users of mobile Internet, it is no surprise that a social panic started to develop around the dangers that unlimited and uncontrolled Internet usage poses for them. In 2007, 95% of the children between 10 and 12 years used Internet-enabled phones. Already between the ages of 4 and 6, 31% use mobile phones, and of that, 27% are Internet-enabled (Fujikawa 2007, 2).

The issue was on the table from 2002 onwards, repeatedly fuelled by crimes against and suicides by children. After long and heated discussions, and the formal request (in April 2008) by Mr. Hiroya Masuda, the Minister of Internal Affairs and Communication to impose filtering on children's mobile subscriptions an Act was passed in June 2008, coming into effect on April 1, 2009.<sup>17</sup>

The Act mainly consists of declarations of intention to prevent minors' access to harmful material and to make it possible for them to take advantage of the technology. The only concrete expectations are those that require mobile service providers to impose a filter, and to provide filtered Internet access to users under 18 years of age, unless these opted out with their parents' consent. For PC Internet, ISPs are also required to provide filtering to their clients if they so request, but it is unclear whether they should provide filtering software, a link to the software or only information about the software.

### **WHOLE SOCIETY COOPERATION**

The Japanese Act calls for all relevant actors to be obliged to help ensure a safe and healthy online environment for children; this includes parents, teachers, ISPs, manufacturers, retailers, content providers and even children themselves. The State and local public entities are obliged to take the necessary measures to provide safe Internet access for young people. Industry actors have to minimise the chance that young people may have access to harmful content over the Internet, as well as taking measures to help them acquire the necessary skills to utilise the Internet 'appropriately'. The parents or guardians themselves have to gain appropriate knowledge about how the young people use the Internet and to manage their use appropriately. The private sector is supposed to have a bigger role than the government, also considering that the unique nature of the Internet should be preserved and free expression remain respected.



## **ACCESS PREVENTION OF HARMFUL CONTENT THROUGH MOBILE**

Below we will describe the filtering scheme of the Japanese mobile regulation and make comparisons with the filtering and blocking scheme of the Australian self-regulation for Internet content. Although the Australian Broadcasting Services Act (ABSA) applies only for the general Internet at the moment – server level blocking may also affect mobile Internet.

### **DEFINITION OF HARMFUL CONTENT**

Harmful content is defined in three categories by the Japanese Act, with the common element that it is information disseminated on the Internet for the public, which considerably impedes the sound development of young people:

- a. Information about undertaking or mediating, or inducing a crime, or that induces a suicide;
- b. Obscene depiction of sexual conduct or genitals or other information that considerably stimulates sexual desire;
- c. Grisly depiction of murder, execution, torture or other extremely cruel content.

Although the content targeted is defined in the Act, the definition of rating and filtering criteria are left for the private actors.

### **OBLIGATIONS OF MOBILE ISPS AND GENERAL ISPS**

Where a contracting party or the user of the mobile terminal equipment is a minor, the mobile service provider should provide filtered services as a default. The parent or guardian of the minor may ask that the filter is switched off, and in certain cases, to filter only certain categories, or decide whether a whitelist or a blacklist is used – depending on the operator. The parent or guardian is obliged to notify the provider that the service will be used by a minor – this inquiry was done by providers before the Act came into effect. Details of the filtering method are fortunately not decided by the Act.

ISPs providing access to the Internet through a PC have to provide filtering software only upon request of the person who receives the service, but their obligation may be fulfilled just by sending information about a filtering service or by sending a link to a filtering service. As we see, while the mobile filtering works on an opt-out basis, the Internet filtering works on a more liberal opt-in system.

## **COMPARISON TO THE AUSTRALIAN REGULATION**

The obligation of ISPs in Japan is very similar to that included in the Australian ISP Code of Practice. An important difference however, is that the Australian system is based on self-regulation, with some powers held by the Australian Communication and Media Authority (ACMA) (Bayer 2007). Australian ISPs undertook to make filters available for their clients at the cost of obtaining, supplying and supporting them (IIC 2005a, 3–4). The ISPs' obligations extend to making the filter easily downloadable or attainable by post, and sending information to their clients about the filters every four months (IIC 2005a, 5–6). ISPs may also be required to block access to content, unless they comply with the above rules about filters.

Compliance with the take-down notices and the access-prevention notices is compulsory and must be performed by 6pm the next business day under penalty.<sup>18</sup> If the ISP fails to remove the

content, first ACMA issues a formal warning, and only then may ACMA request the Federal Court to order removal. ACMA decisions may be reviewed by the Administrative Appeals Tribunal (AAT) on the request of the service provider affected (ABSA 1992). In the Internet Industry Codes of Practice ISPs also undertake to report to ACMA if they become aware that another ISP hosts prohibited content in Australia (IIC 2005c, 13).

ISPs are obliged by the Criminal Code to report child pornography or child misuse material to the Australian Federal Police within reasonable time. If they fail to do so, they are liable up to 100 penalty units (Criminal Code 1995).

#### **FILTERING SOFTWARE DEVELOPERS**

Filtering software developers are obliged to develop their filter so that it restricts as many as possible harmful websites, and the fewest possible non-harmful websites. They should arrange that the filter has detailed settings, depending on the developmental stage of the minor, and the selection of the user. They are supposed to continuously develop and improve the performance and the convenience of the filter software.<sup>19</sup>

#### **COMPARISON WITH THE AUSTRALIAN SITUATION**

Filtering software has to be approved by ACMA, and the requirements for approval are listed in the Codes of Practice. Beyond being proven as effective, easy to install, and easy to use, the supplier of the filter has to agree that they would include the pages sent to them by the ACMA (IIC 2005c, 1–3). Suppliers have to submit their product to the Internet Industry Association regularly for testing its appropriateness (IIC 2005c, 2).<sup>20</sup>

#### **JAPANESE LEGISLATION REVIEW**

Within three years after coming into effect, the Japanese Act will be reviewed by the Government, and any necessary measures undertaken. Regarding the 'success' of the Act, however, the goal is not clarified. Considering that the legislative process was driven by crimes that happened against children after online grooming and suicide cases, it seems likely that further crimes and suicides would be understood as an indication of the incapability of the Act to tackle this issue. As the Act came into effect in April 2009, the first review is due in 2012, and the assessment process is likely to start at the end of 2011.

There is a strong concern that this incapability of the law would be interpreted as a need for a stricter filtering regime, rather than placing more emphasis on awareness-raising and education. These policy elements, although mentioned in the Act, are not discussed in detail and there is as yet no coherent governmental policy on this issue. Civil initiatives of this nature are somewhat scattered and lack funding and a coherent framework. Professor Masao Horibe, head of the Evaluation of Mobile Content Association and board member of several similar organisations, has expressed deep concern that the review will be only an excuse to bring back the draft version of the Act, which provided for stronger censorship, where the filtering criteria were to be defined by a governmental committee.

In conclusion, the current access control on Mobile Internet in Japan is relatively modest, simply requiring operators to provide filtering for minors; it is almost the first serious attempt by the government to exercise control over Internet content traffic, separated from underlying physical traffic. Again, this is a typical example of a layered approach for regulation: where the

lower layers are mobile wireless transmission, the upper layer is the Internet, and the gateway in between the two layers functions well for the control of communication flow.

## **CRITICAL INTERNET RESOURCES AND THEIR GOVERNANCE**

Aside from broadband and mobile, one newly emerging policy area is that of 'logical resources' such as the Domain Name System (DNS) and Internet Protocol (IP) addresses, the naming and numeric addressing identifiers necessary for all computers globally connected on the Internet. At the global level, there exists one international organisation – ICANN (Internet Corporation for Assigned Names and Numbers) – which is in charge of managing the allocation/assignments and policy coordination of DNS and IP address.

Since ICANN has its historical roots in the United States and its predecessors received some funding and research contracts with the Government of the United States, some governments began to question its legitimacy and global acceptance during the preparation process for the World Summit on the Information Society (WSIS) held in 2003 in Geneva and also in 2005 in Tunis. This political debate was largely dubbed as 'Internet Governance', which led to the creation of the Internet Governance Forum (IGF) under United Nations auspices in 2006.

Up until recently, the Internet governance debate has mostly focused on the global nature of the Internet. Yet, we are now starting to see some issues coming into the domestic circle. The planned introduction of the Internationalised Domain Name (IDN) country code Top-level Domain (ccTLD) by ICANN offers a good example. How to deal with the global depletion of the IPv4 address pool and the adoption of IPv4/v6 coexistence poses another example and challenge within a country as much as internationally. These issues seem to relate to the framework of 'Network Neutrality' as well since the new ccTLD registry operator in Japan must conform to the 'neutral' framework, and the arrangement for preparing for the depletion of IPv4 addresses should also be done in fair and neutral manner.

### **NEW IDN CCTLD – DOT NIPPON FOR OPEN BIDDING**

In the case of new IDN ccTLD, there was general consensus in industry and government in Japan that they welcome the early launch of 'Dot Nippon' (.日本) so that people can easily use the Internet using familiar Kanji characters in the domain name space. MIC convened a sub committee on the introduction of IDN ccTLD for Japan at its Info-communication Council in late 2008. The issue on the table is how to select the new IDN ccTLD registry.

Since the ccTLD registry must make sure that each registration is unique, it requires a kind of natural monopoly in each country. In Japan, a for-profit company called Japan Registry Services (JPRS) has been operating the '.jp' registration since 2002 (JPRS 2009). There were some concerns that the incumbent JPRS will automatically be given the same role in the new IDN ccTLD by exercising the dominant market position and influence extracted by .jp operation. This concern was partly based on the fact that there was little public process when the former registry Japan Network Information Center (JPNIC) established JPRS and delegated the .jp registry function to them. MIC sent a letter of endorsement for this shift to ICANN, which was essential for ICANN and US Department of Commerce, which oversees ICANN's changes in the master file of Domain Name root servers for ccTLDs.

At MIC's sub committee, it was agreed that the selection of the new registry should be made open to other entities that wished to enter the market in addition to the incumbent JPRS. It was also agreed that the selection process should also be open, fair and accountable while giving this task to the private sector's collaborative approach with the government attending as observer. Though it did not exclude the incumbent from bidding, the general agreement was to foster competition in the ccTLD management, a new attempt for the Internet policy process in Japan (MIC 2009b).

The draft report was released in April 2009 for public comment, and after considering the public comments, the final report will be submitted for formal adoption to the Info-communications Council's general meeting scheduled in July 2009. It is estimated that the plan outlined in the draft report will mostly be accepted by public at large and multiple organisations - several Internet and related industry associations together with business and consumer organisations – will jointly form a 'council' which will then set up a selection committee consisting of neutral third-party members. A formal Call for Expression of Interest will be published for bidding for the 'Dot Nippon' new registry later this year and the final selection will be made by the selection committee. The result must conform to the guidelines given from the Info-Communication Council and if so recognised, the government will endorse it and will send final endorsement to ICANN to formalise the selection.

At ICANN, it is said that more than 20 countries or economies are interested in starting the new IDN ccTLD sometime soon, including Russia, China and the Arabic countries. As far as the author knows at the time of writing however, there is no other country planning to introduce plural operators for IDN ccTLD registration service and likely to give the responsibility to the incumbent operator.

In Japan, it will be different. There is a good possibility that a new registry will be created and engage in competition with the existing registry. This is the first time that the Japanese government has made formal intervention on the domestic governance of such a critical (and logical) resource of the Internet.

Traditionally, Japan's MIC has played little part in the regulation of the management of the Internet's logical resources. It left this role to the so-called 'Internet community' who are mostly technical people who introduced the Internet to Japan and have been engaged in the operation and management of Domain Name and IP address resources.

Not only in Japan, the 'Internet community' tends to make these decisions within their own small circle. Up until recently, it has largely been successful. So far so good, however now that the Internet has become such a broadly used public resource and the societal dependency on its proper functioning has become quite high, we believe it is time to re-think this tradition and to make its governance more open and accountable in the local as well as the global market. The new approach taken for the 'Dot Nippon', at least in Japan, offers a new direction we may see more.

## **IPv4 DEPLETION**

Japan's MIC has been also organising a several rounds of studies on the promotion of IPv6 in view of IPv4 depletion. As many are aware, according to experts' prediction the remaining global pool of IPv4 addresses will be consumed around 2011 or 2012 (Huston 2009).

This does not mean that current Internet will have to stop; it will continue to operate as before. Rather, there will be a constraint in obtaining new address spaces for new services. The report by the MIC's Study Group on Internet's Smooth Transition to IPv6 articulated this and proposed an action plan for all actors involved (MIC 2009c).

A new study group was convened by MIC this year (MIC 2009d). The interim report of this Study Group identified where most efforts should be directed. It does not emphasise the 'transition' or 'migration' to IPv6 per se, but advises that efforts should be made to prepare all services on the Internet to be available from both IPv4-based as well as IPv6-based networks.

In the conventional telecommunication regulatory framework, there is no specific framework to deal with the IP address management or usage. On the one hand, it is just a technical protocol, plays a critical, but subtle and invisible role in the operation of the Internet, and has no legal status. On the other hand, if the IPv4 address pool becomes very scarce, the value it offers may rise quite high and trading of these scarce assets may start to surface. Moreover, all public services offered over the Internet should continue to remain available even for those users who have to use the new IPv6-based networks.

The good news is that IPv4-based services will remain functional even after all the remaining pool of IPv4 addresses is consumed, and the actual amount of newly acquired IPv6 addresses will be not too large. Therefore, the effort to make existing v4-based services available for users on the v6-based network could be relatively narrow in scale. The bad news is that IPv6 is not compatible with IPv4 in terms of linking the services on the Internet. This means that some application/services designed to function on an IPv4-based network may not necessarily run on an IPv6 network. Depending on the way the application software operates, some additional measures may be needed to allow IPv4 services run over IPv6 networks.

While this does not sound so complicated, no one knows exactly how much it will take to make sure that all application software, middleware, security and other functionalities that make the Internet will be available to ordinary users. What is certain, according to the Study Group report, is that each and every site must prepare technical work to analyse and modify, where necessary, existing IPv4-based services to accommodate IPv6-based networks.

There is no internationally unified framework for the policy makers and regulatory bodies to respond to this challenge. The Network Neutrality principles proposed by the MIC's Study Group could be applied if we interpret 'IP-based network' as both 'IPv4-based and IPv6-based networks':

Principle 1: Users are entitled to use IP-based networks flexibly and access the content/application layer freely.

Principle 2: Users are entitled to connect to IP-based networks freely through terminals that comply with technical standards provided by laws and regulations and these devices may connect to each other flexibly.

Principle 3: Users are entitled to use the communication layer and the platform layer free from discrimination at a reasonable price. (MIC 2007, 5–6).

In other words, we should not discriminate between IPv6-based networks and IPv4-based networks. How to achieve that is the real challenge.

## CONCLUSION – TOWARD FUTURE CHALLENGES

In Japan, a review of the status of the NTT Group is scheduled to be concluded in 2010 (Taniwaki 2008). It was agreed in 2006 between then MIC Minister Heizo Takenaka and the ruling Liberal Democratic Party (LDP) as a political compromise since Minister Takenaka planned to further break up NTT, completely separating the four operating companies and abolishing the parent holding company while the LDP's main factions were in favour of retaining the status quo partly because of strong lobbying from the union and their allies.

It is not clear whether that agreement will be still valid if the current ruling party loses its power at the next general election which is scheduled to take place by September this year. The opposition 'Democratic Party' is largely expected to become the winner, and if that happens they might be able to cancel this agreement.

Irrespective of the political situation however, the authors believe that some kind of review of the competitive situation and NTT's legal and regulatory status is inevitable. It is not caused by the political situation per se, but rather by the dynamic changes in technology, services, and the market.

Such 'digitisation' allows separation of lower layers – which are mostly physical, facility-based – from upper layers which are mostly logical, bit-based entities. In other words, lower layers are more materialistic while the upper ones are more abstract, without the constraints of the physics of time and distance and, often, economic costs.

It used to be that most communication services were operated with both physical and logical services together as vertically integrated services. Telephones and televisions are good examples. Now the Internet has changed this structure, giving less control capacity to the physical players, and allowing more value and wealth to be created and transferred to the players at the upper layer: Google's combination of search and advertising, or the book sales giant of Amazon, for example. The separation of layers or functionalities made possible by the inherent architecture of the Internet which technically separates the physical link and logical link by the use of TCP/IP protocol suites, is the key.

The Network Neutrality framework reflects this shift and separation very well. Under this framework, new players prefer horizontal separation of services to create innovation, despite strong resistance from the status quo. Some forward-looking policy makers and regulators have noticed this trend and are trying to apply this framework as the new guiding principle.

What it lacks now, though, is that while separating different layers has certain advantages, such as allowing more new entrants and more innovations, it is not clear how the different layers are inter-related (after separation). If the control from the lower physical layer over the upper layer services is perceived as unfair, how about the control from the dominant players in the higher layer (such as Google or Amazon) over the physical layer services?

The conventional telecom policy, legal and regulatory framework has been designed largely around physical functioning. However, there are almost no laws or regulatory arrangements specifically designed with the logical functions in the upper layer as the prime target in the dynamically changing telecom market – at least that is the case in Japan. The Internet's critical resources such as Domain Name or IP addresses as yet do not have any explicit legal arrangement, while they are becoming all the more important in facilitating all the traffic and activities over

the Internet. The Network Neutrality framework may play a major role in establishing a more explicit legal and regulatory framework with logical layer in the centre.

Who are the valid stakeholders in this new arrangement? How to govern this new trend flexibly enough without stifling the innovation and social development, while yet protecting some basic rights of the users such as privacy, security or economic fairness? In order to answer these questions and achieve the principles offered by Network Neutrality in the real world, we might have to move to a new framework beyond Network Neutrality per se. It will inevitably involve all stakeholders concerned. We suggest that the multi-stakeholder approach being exercised at the Internet Governance Forum (IGF) be examined further.<sup>21</sup>

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## ENDNOTES

- 1 To trace MIC's numerous policy setting activities, see their website's *Study Group* section: [http://www.soumu.go.jp/main\\_sosiki/joho\\_tsusin/eng/studygroupreport.html](http://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/studygroupreport.html).
- 2 On April 21 2009, leading DSL access provider eAccess announced the revision of their financial forecast for FY2008 saying, "Under the unprecedented global economic crisis since late 2008, we have seen more consumers to be budget conscious. Consumers pay more attention to the reasonably priced ADSL service over FTTH. This trend led to the slow down in ADSL monthly churn rate as well as improved subscriber acquisition. Although we had a subscriber net decrease in fiscal year ended March 2009, we had more-than-expected ADSL accumulated subscriber numbers at the end of March 2009."
- 3 Info-Communications Council, Mar 17 2008, requested NTT to lower the lease cost of the unbundled fibre cables to other service providers, but it did not go so far as to obligate NTT to offer it with each one code in the quad.
- 4 "Fake Competition by Two Telecom Giants, keeping high mobile prices forever", *Wedge* October 2008, gives good insights of the mobile and broadband market competition, but is only available in Japanese.
- 5 There was a plan to technically prepare the interconnection with non-NGN network, under the Network to Network Interface (NNI). But there was no real 'service plan' prepared by NTT. NTT was only passively waiting for any interconnection request.
- 6 There is no explicit record that NTT declared to keep NGN as closed network only. However, the author has heard this comment several times from people at NTT Holding Company, and there was no demonstration of NGN interconnected to the Internet when NTT exhibited the "joint-demonstration" with participating third-party service providers at its official demonstration site called 'NOTE' in Tokyo in 2007.
- 7 There is little disclosure about the number of subscribers of NGN from NTT. In fact, the number of NGN 'Flets Hikari Next' is merged with the number of 'Flets Hikari', NTT's service name for FTTH in general, and no detailed breakdown is published. Likewise, the number of Business NGN subscribers or on-demand TV services or other closed services is not disclosed.
- 8 According to NTT East, they have never made any formal statement to choose Option 3.
- 9 As of writing, only the Japanese edition is available from:  
[http://www.soumu.go.jp/menu\\_news/s-news/2009/pdf/090130\\_3\\_bt\\_1.pdf](http://www.soumu.go.jp/menu_news/s-news/2009/pdf/090130_3_bt_1.pdf) last accessed on May 1 2009.
- 10 MIC tried to release SIM lock at its 'Study Group on Mobile Business' in 2007, where most operators argued that it should be decided by the operator, not by the regulator, and thus its final report concluded that 'Though in principle SIM lock practice should be better removed, we will wait for 2010

to reach a final conclusion when 3.9G and 4G standards will take shape, taking account Broadband Wireless and handset market development and other factors.' See the report of the Mobile Business Study Group, Sep 20, 2007, in Japanese only, available from: [http://www.soumu.go.jp/menu\\_news/s-news/2007/070920\\_5.html#bt](http://www.soumu.go.jp/menu_news/s-news/2007/070920_5.html#bt) last accessed on May 16 2009.

11 Mobile operators in Japan regularly introduce new handset models in Spring and Autumn/Winter with occasional minor model changes in Summer.

12 The author express thanks to Mr. Takeshi Natsuno for sharing this data with me. This drop was also described as the 'Taniwak Slump' as Mr. Taniwaki of MIC was central to pushing the separation of terminal sales from monthly subscription charges.

13 This was partly because European operators were unable to separate data traffic of their own content (ringtones, etc.) and of foreign content. Because the downloads' price was set so as to include the price of the content as well as of the data traffic, rather than changing this model, they continued this pricing logic for foreign content as well.

14 The author express thanks to Christopher Billich for sharing these observations.

15 Started by SoftBank, the introduction of unlimited free call among users of same operators, children are starting to use their phones with friends with same operator.

16 'Life-logs' to utilise customers' all transaction records was one of the subjects of Study Group on Communication Platform in Japan in 2008, yet no clear conclusion was reached.

17 'Act to establish environment in which minors can safely and securely use the Internet' passed in June 2008 after heated protests from civil organisations and some parts of industry, most notably by Japan Internet Service Providers Association (JAIPA) since its early draft called for the Government to directly establish the commission to determine what is harmful to the minors, posing fear for government-driven monitoring and censorship and extra burdens for ISPs.

18 The penalty is 50 penalty units which was AUD \$5500 per day for an individual and up to \$27500 per day for a corporation in August 2006.

19 In Section 20 of the Act. The Act has not been translated into English yet. Japanese text of the Act is available from: <http://law.e-gov.go.jp/announce/H20HO079.html>, last accessed on April 30, 2009.

20 In fact, service provider industry codes must deal with this question, according to Part 5, Division 3, 60(2)d of the Act.

21 Various contributions published from the Internet Governance Forum (IGF) website indicate the positive evaluation of the multi-stakeholder approach, or 'multi-stakeholderism' as the best achievement of the IGF. Available from: <http://www.intgovforum.org/cms/index.php/contributions>, last accessed on May 17.

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## REFERENCES

- Australian Broadcasting Services Act (ABSA). 1992. Schedule 5, Part 10 s92.
- Balkin, Jack M. 2004. 'Digital Speech and Democratic Culture: A Theory of Freedom of Expression for the Information Society'. *New York University Law Review* 79 (1): 1–58.
- Bayer, Judit. 2007. 'Liability of Internet Service Providers for Third Party Content. A comparative analysis with policy recommendations.' VUW Law Report, Special Edition. Wellington, New Zealand.
- Billich, Christopher. 2008. '21st Century Mobile Marketing. Global Insights into the World's Most Advanced Mobile Society: Japan'. Infinita Inc. April 11, 2008.
- C114. 28 April 2009. 'Japan, China eye cooperation on mobile services'. Accessed 30 May 2009. Available from: <http://www.cn-c114.net/583/a407821.html>.



- Cheung, Lawrence. 2004. 'A perspective on the mobile markets in Japan and Korea.' Hong Kong Productivity Council.
- Council of Europe. 2003. 'Declaration on freedom of communication on the Internet (Strasbourg, 28 May 2003)'. Accessed 23 May 2009. Available from: <http://www.coe.int>.
- Criminal Code Act 1995 (Cth), Division 474 Telecommunications offences, Subdivision C Offences related to use of telecommunications, s.474.19.
- Davies, J. 2008. 'European mobile phone sales drop for first time since 2001. Mature markets struggle with slow high-end handset sales and manufacturers face mid-market challenge'. *Computing*, May 28, 2008. Accessed 22 May 2009. Available from: <http://www.computing.co.uk/computing/news/2217685/first-decline-european-mobile>.
- eAccess Broadband Services. 2009. Accessed 22 May 2009. Available from: [http://www.eaccess.net/press\\_img/7313\\_pdf.pdf](http://www.eaccess.net/press_img/7313_pdf.pdf).
- EuroISPA 2002. 'European Parliament Opposes Web Blocking'. Euroispa Press Release. 11 April 2004. Accessed 22 May 2009. Available from: [http://www.euroispa.org/docs/childprot\\_final\\_110402.pdf](http://www.euroispa.org/docs/childprot_final_110402.pdf).
- Fujikawa, D. 'MobilePhone and Children in Japan'. Faculty of Education, Chiba University, Japan. Accessed 22 May 2009. Available from: <http://www.oecd.org/dataoecd/22/31/41554474.pdf>.
- Huston, G. The IPv4 report. Accessed 22 May 2009. Available from: <http://www.potaroo.net/tools/ipv4/index.html>.
- IIC 2005a Australian Communications and Media Authority. 2005a. Australian Internet Industry Codes of Practice (IIC) May 2005 Version 10.4 Content Code 3, 19.
- IIC 2005b Australian Communications and Media Authority. 2005b. Australian Internet Industry Codes of Practice (IIC) May 2005 Version 10.4 Content Code 1, 9–2.
- IIC 2005d Australian Communications and Media Authority. 2005c. Australian Internet Industry Codes of Practice (IIC). May 2005 Version 10.4 Schedule 1.
- INDEX. 21 April 2009. 'Gyártók lépnek a mobilszolgáltatók helyére'. Accessed 22 May 2009. Available from: [http://index.hu/tech/2009/04/21/gyartok\\_lepnek\\_a\\_mobilszolgáltatok\\_helyere](http://index.hu/tech/2009/04/21/gyartok_lepnek_a_mobilszolgáltatok_helyere).
- Japan Registry Services Co. Accessed 22 May 2009. Available from: <http://jprs.co.jp/en/about.html>.
- Kushida, Kenji. 2002. 'The Japanese Wireless Telecommunications Industry: innovation, organizational structures, and government policy'. *Stanford Journal of East Asian Affairs*. Spring 2002, Volume 2.
- Kushida, Kenji. 2005. 'The Politics of Restructuring NTT. Historically Rooted Trajectories from the Actors, Institutions and Interests'. *Stanford Journal of East Asian Affairs* 5, no. 2 (2005): 29–36. Accessed 22 May 2009. Available from: <http://www.stanford.edu/group/sjeaa/journal52/japan1.pdf>.
- Lessig, Lawrence. 1999. 'How to regulate speech on the Internet?' (Hogyan szabályozzuk a szöveget az Interneten?) *Fundamentum*. INDOK, Budapest, 1999/1.
- Matsunaga, M. 2000. 'i-Mode Jiken', Kadokawa Publishing, Japanese edition only.
- Ministry of Internal Affairs and Communications (MIC) of Japan Working Group on Network Neutrality. 2007. 'Report on Network Neutrality', translated by the Institute for InfoSocinomics, Tama University under 'Creative Commons' licence. Accessed 10 April 2009. Available from: [http://www.soumu.go.jp/main\\_sosiki/joho\\_tsusin/eng/pdf/070900\\_1.pdf](http://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/pdf/070900_1.pdf).
- Ministry of Internal Affairs and Communications (MIC) of Japan. 2008. 'Annual Telecommunication Survey FY 2008'. Accessed 1 May 2009. Available in Japanese, from: [http://www.soumu.go.jp/main\\_content/000016027.pdf](http://www.soumu.go.jp/main_content/000016027.pdf).
- Ministry of Internal Affairs and Communications (MIC) of Japan. 2009. 'Final Report from Panel on Internet Policy', released on Feb 26, 2009. Accessed 30 April 2009. Japanese edition available from: [http://www.soumu.go.jp/menu\\_news/s-news/090223\\_4.html#bt](http://www.soumu.go.jp/menu_news/s-news/090223_4.html#bt).
- Ministry of Internal Affairs and Communications (MIC) of Japan. 2009. 'The Internet Policy for the 21st Century – toward the introduction of new Top-Level Domain Names'. Draft released for Public Comment on Apr 28 2009. Accessed 2 May 2009. Available from: [http://www.soumu.go.jp/menu\\_news/s-news/090428.html](http://www.soumu.go.jp/menu_news/s-news/090428.html), in Japanese.

- Ministry of Internal Affairs and Communications (MIC) of Japan. 2009. 'Report of the Study Group on Internet's Smooth Transition to IPv6'. Accessed 2 May 2009. Available from: [http://www.soumu.go.jp/main\\_sosiki/joho\\_tsusin/eng/pdf/080617\\_1.pdf](http://www.soumu.go.jp/main_sosiki/joho_tsusin/eng/pdf/080617_1.pdf).
- Ministry of Internal Affairs and Communications (MIC) of Japan. 2009. 'Study Group on advancing the use of the Internet by IPv6' Draft Interim Report released for public comment on May 1 2009. Accessed 2 May 2009. Available from: [http://www.soumu.go.jp/main\\_content/000020253.pdf](http://www.soumu.go.jp/main_content/000020253.pdf) in Japanese edition only.
- Ministry of Internal Affairs and Communications (MIC) of Japan. 2009. 'Disclosure of Quarterly Data concerning Competition Review in the Telecommunications Business Field.' Third quarter of FY2008. March 25, 2009. p.1. Accessed 22 May 2009. Available from: <http://www.nttdocomo.com/about/operating/index.html>.
- Ministry of Internal Affairs and Communications, Ministry of Economy, Trade and Industry Japan 2009. 'Workshop on Initiatives in Promoting Safer Internet Environment for Children'. 29 April 2009.
- Mobile. 26 Feb 2009. 'Nokia riles operators with its plans to introduce Skype onto N series handsets'. Accessed 22 May 2009. Available from: [http://www.mobiletoday.co.uk/nokias\\_skype\\_proposal\\_starts\\_row.html](http://www.mobiletoday.co.uk/nokias_skype_proposal_starts_row.html).
- Mobile Europe. 23 April 2009. 'UK announces unlimited free Skype-to-Skype calls. Accessed 22 May 2009. Available from: [http://www.mobileeurope.co.uk/news\\_wire/114752/3\\_UK\\_announces\\_unlimited\\_free\\_Skype-to-Skype\\_calls\\_and\\_instant\\_messages\\_.html](http://www.mobileeurope.co.uk/news_wire/114752/3_UK_announces_unlimited_free_Skype-to-Skype_calls_and_instant_messages_.html).
- National Telecommunication Authority of Hungary. 2009. 'Márciusban csökkent a mobil-elfizetések száma'. Accessed 16 April 2009. Available from: <http://www.nhh.hu>.
- NTT Group. 2009. Overview of our Businesses. Accessed 22 May 2009. Available from: [http://www.ntt.co.jp/csr\\_e/2008report/profile01.html](http://www.ntt.co.jp/csr_e/2008report/profile01.html).
- NTT Group. 2009. Accessed 17 May 2009. Available from: <http://www.ntt.co.jp/kaiken/index.html>, only Japanese transcript is available.
- Rheingold, H. 2002. *Smart Mobs: The Next Social Revolution*. Basic Books.
- Taniwaki, Yasu. 2008. 'Broadband Competition Policy in Japan'. Telecommunications Policy Division, Telecommunications Bureau. Ministry of Internal Affairs & Communications (MIC), JAPAN. March 2008.
- ZDNet White Papers. July 2000. 'Charging and Billing Models for GSM and Future Mobile Internet Services'. Accessed 22 May 2009. Available from: <http://whitepapers.zdnet.com/abstract.aspx?docid=155004>.
- Cite this article as: Izumi Aizu and Judit Bayer. 2009. 'Beyond network neutrality: The state of play in Japanese telecommunication competition'. *Telecommunications Journal of Australia*. 59 (2): pp. 25.1 to 25.26. DOI: 10.2104/tja09025.