

Report on Network Neutrality

Working Group on Network Neutrality

**Ministry of Internal Affairs and Communications,
JAPAN**

September 2007

Foreword to English Translation

This is an “informal” translation of the Japanese version of the final report of the Working Group on Network Neutrality, held by the Ministry of Internal Affairs and Communications (MIC) of Japan, published in September 20 2007.

This translation is published by the *Institute for InfoSocionomics*, Kumon Center, Tama University, in order to provide important reference material to the global policy research community working on Information Society, Internet and ICT issues. We believe that policy debates around the network neutrality and related areas poses critical importance for the international community, for mutual understanding, mutual recognition, and mutual development of the global policy framework around Internet and Information society.

As a government publication, we believe the original material does not have the proprietary “copyright”; the original Japanese report is placed in the public domain: http://www.soumu.go.jp/s-news/2007/070920_6.html#bt

While we took the liberty to translate this into English, we have voluntarily informed the Secretariat in charge at the Ministry, and received consent for translation. We have not examined the terms and usages with the Ministry’s conventional use. Therefore, the responsibility for the accuracy and quality of translation remains solely on the Institute, not on the Ministry.

The original report consists of more than 90 pages, but in the interest of time and expense, the Preface, the 5-page Addendum “Revision of Dominant Carrier Regulations and Application of Competition Assessment” as well as the Background material and other reference material were abridged; all of which in original Japanese can also be found at the same website above.

Finally, we would like to thank Prof. Toshihiko Hayashi, Chair of the Working Group, Mr. Yasuhiko Taniwaki, Director, Telecommunications Policy Division of the Telecommunications Bureau and other staff at the Ministry for their kind understanding and cooperation.

December 1, 2007

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Chapter I Basic Viewpoint on Network neutrality

1. Objective of the Study Group

Network structure and business models are significantly changing in the Japanese broadband market. To deal with these rapid changes in the market environment, it is necessary to devise a new framework for competition rules.

The purpose of this study group is to examine competition rules from the viewpoint of the broadband market as a whole. More specifically, we aim to construct a basic framework for competition rules that can respond flexibly to developments in the broadband market. Based on that, we aim to boost incentives to invest in facilities and encourage the development of diverse services in broadband market by preparing competition rules that can respond to market changes quickly and enhancing market transparency and predictability of competition rules.

2. Changes in the Broadband Market

(1) Advance of market integration

1) Vertical market integration

The rapid advance of broadband and IP-based networks in recent years has been accompanied by the modularization of functions on each network layer¹. This has led to diverse business models such as independent vertical integration by a single company or cooperative vertical integration by multiple companies.

For example, in the mobile phone business, an independent vertical integration model that integrates terminals, physical networks, communications services, and platform layers altogether by a single carrier has emerged that provides internet connection service along with related content and applications on top of the connection service layer together. Another example is a music distribution service that provides

¹ This report refers to four layers: 1) the physical network layer of facilities for providing telecommunications service, 2) the communications service layer of content and applications, 3) the platform layer of authentication and charge accounting, quality of service (QoS), digital rights management (DRM), and other functionality for providing smooth delivery of content and applications over the communications service layer, and 4) the content/application layer. The physical layer and communication service layer taken together are called the communication layer.

applications for terminals (portable music players) and personal computers (PC) and a delivery portal for content download. In this case, they do not provide the communication service itself, and thus they are considered as cooperative vertical integration business model among multiple actors.

In the past, competition policy in the communications sector focused on ensuring fair competition between carriers mainly on the communication layer. With the emergence of vertical integration business models (by single company or by cooperation between multiple companies), it has become necessary to investigate how to ensure fair competition under vertical integration. That is, whether these models enable business to develop in fair market conditions and whether the potential of cross-layer abuse of market power is present or not.

2) Horizontal market integration

The advance of broadband and IP-based networks also promotes horizontal market integration by eroding the traditional services distinctions between fixed and mobile lines, or between communication networks and CATV networks.

For example, horizontal integration can be seen in 1) fixed mobile convergence (FMC) that enables the use of fixed-line service and wireless service on the same device, 2) CATV service or various video on-demand services over communication networks, and 3) digital terrestrial broadcast service through IP-based networks currently under planning.

Traditional competition policy drew a priori market boundaries for each transmission network and then focused on achieving fair competition within each market. Now, as various transmission networks begin to provide the same type and quality of services, it has also become necessary to examine how to ensure fair competition under horizontal market integration.

(2) Distributed intelligence

Carriers are building Next Generation Networks from the viewpoint of advancing towards total IP-based infrastructures. Below are specific examples of these efforts.

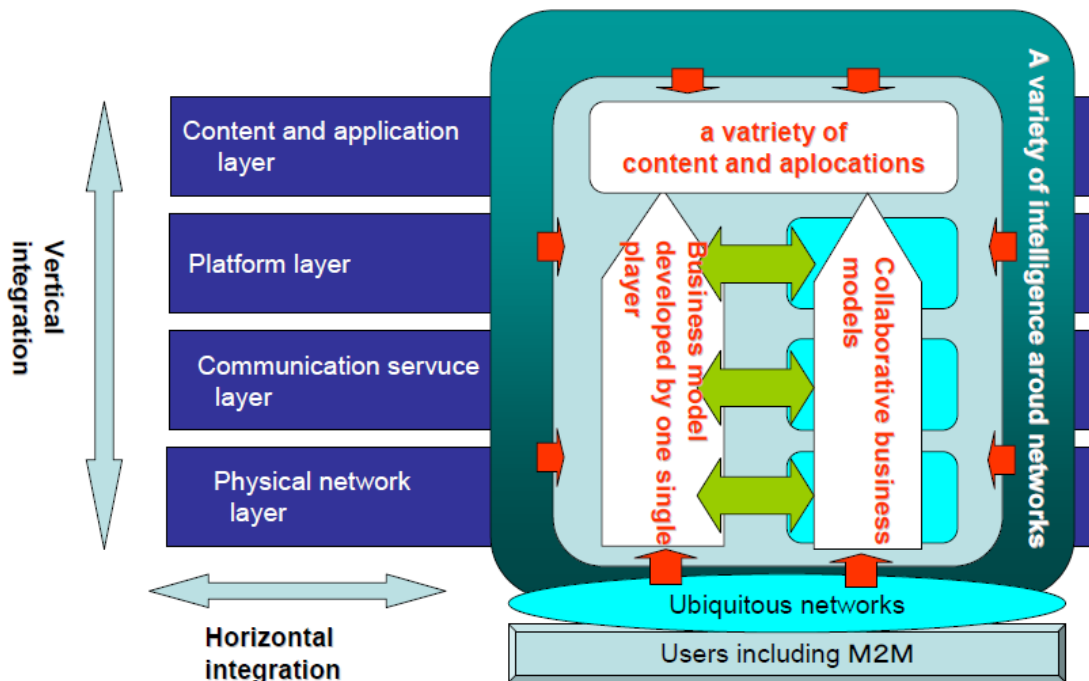
- (i) The NTT Medium-Term Management Strategy announced in November 2004 calls for building a Next Generation Network (NGN), launching NGN commercial services by the end of FY 2007, and providing FMC services that use the said network through

collaboration between NTT East, NTT West, and NTT DoCoMo. In July 2006, NTT announced plans for an NGN field trial to test technical requirements (e.g. application layer interface and terminal layer interface, and interconnection conditions with other companies). The trial began in December 2006 and will conclude in December 2007.

(ii) In June 2005, KDDI also announced the “Ultra 3G Plan” to achieve seamless delivery of FMC services through a packet-based core network. “Ultra 3G” is based on mutual cooperation between diverse access networks (e.g. fixed line, wireless).

The NGN built by the carrier will implement service provision functions (session control, authentication and security, charge accounting) inside the network on top of the network platform composed of access network and core network with transmission functions, and operate them together as single service. The core principle is to achieve a design that has both the flexibility of an IP-based network and the reliability of a traditional circuit-switching network by implementing intelligence inside their own network.

Change of Market Structure and Network Neutrality



In contrast, “the Internet” is promoting more distributed intelligence. Specifically following two points are observed:

- (i) Vast increase in computational power on PC and other terminals, advancing technology for cooperation between terminals using peer-to-peer (P2P), and grid computing that promotes network-wide distributed processing are all underway. These trends are enabling the Internet to accumulate massive amount of intelligence (computing capability) at the edge of network.
- (ii) The “Software as a Service (SaaS)” model at the upper layer help promote the new services that link intelligences between the terminal side and the server side.

These distributed intelligences enable content to stream from every possible edge of network into the center. This in turn 1) promotes consumer generated content (CGC) used by a large number of users, 2) advances the ubiquitous economy with direct connection between users (terminals)², 3) expands the popular use of content delivery networks (CDN), and 4) leads to new commercial distribution systems based on technologies such as IP multicast and P2P. Overall, distributed intelligence helps create diversity in content distribution channels.

(3) Multi-tiered network structure

With the advance of IP-based networks and popular use of search engines, attribute tags to identify information are becoming more widespread. These tags help provide the Web with greater structure through advanced correlation between widely dispersed information.³

Specifically, cross-referencing mechanisms based on Extensible Markup Language (XML) and Really Simple Syndication (RSS) are steadily advancing in addition to the rapidly growing search-related advertising.

New network usage models that enable users to only select and use the functions they

² In the past, the use of information and communication technologies (ICT) is largely promoted in enterprise industry sector and promoting the “digital economy” that replaces old analog services with more efficient new services. Users remained as passive recipients of ICT services at that stage. Now, however, “ubiquitous economy” is evolving in which people and enterprises directly connect to each other over networks. In every possible area of socio-economic activity people are learning how to make more efficient use of ICT and new business opportunities are emerging with these pervasive networks, added-value creation networking is taking root.

³ In addition to intelligence existing on the terminal at the edge of network, recently, the upper layer side has also been moving to enhance intelligence through the introduction of SaaS, information tagging, and online data storage.

need are appearing. Examples include 1) a layer 2 connection (data link)⁴ on the Open Systems Interconnection (OSI) reference model and 2) an overlay network that enables enforcement of service rules at the upper layer.

3. Basic Examination Viewpoint

(1) Three principles on network neutrality

On a traditional network, a single carrier has provided centralized and integrated network administration. In the broadband market today, vertical market integration, distributed intelligence, and a multi-tiered network structure enable multiple stakeholders on each network layer (or across layers) to roll out businesses.

For this reason, it is no longer sufficient to ensure fair competition in the broadband market as a whole through fair and effective competition between carriers in the traditional telecommunication layer (physical network layer and communications service layer) alone. There is a growing need to form broad-based consensus on policy development for fair and effective competition in the broadband market. That is, safeguards are required to eliminate restrictions and impediments to competition in the construction, operation, and use (including cost sharing) of networks as a whole between many stakeholders on each layer.

From the viewpoint of consumers (users of communication services) who use network services, it is essential to optimize benefits to all stakeholders who use the Internet by maximizing the potential of the Internet with its guiding principle of “autonomous, distributed, and cooperative network of networks”.

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.

Three principles

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

⁴ The OSI reference model has seven layers. The layer 2 data link provides communication methods for direct connection between devices over the network.

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

Principle 3: Consumers are entitled to use the communication layer and the platform layer free from discrimination at a reasonable price.

For policy development in the broadband market, administrative authorities need to continuously ensure **competitive neutrality** and **technological neutrality** by avoiding either advantageous or disadvantages treatment towards specified business operators. However, to respond to market integration and other changes in the market environment, as stated above it is no longer adequate to focus on competitive neutrality and technological neutrality in the communication layer alone. For this reason, administrative authorities as well as broadband stakeholders need to recognize a common viewpoint on **network neutrality** as mentioned above. That is, whether neutrality is being ensured in terms of the relations across layers. Then use this viewpoint as a benchmark to create the desired market environment.

The debate over network neutrality is basically examined from the viewpoint of competition policy. In doing so, it is necessary to compare competition rules for traditional circuit-switching networks and IP-based networks to clearly define common points and distinct points. On the IP-based Internet in particular, which operates under the guiding principles of autonomous, distributed, and cooperative network of networks, we must ensure the principle of “innovation without permission”,

(2) The relation between Internet and Next Generation Networks

When examining network neutrality, it is necessary to clarify the meaning of the term “network.” Specifically, the debate over network neutrality investigates how competition policy should respond to changes in market environment that accompany the development of IP-based networks. In this context, when using the term “network,” it is important to clearly distinguish its use in the context of “Internet” and that of “Next Generation Network” (NGN).

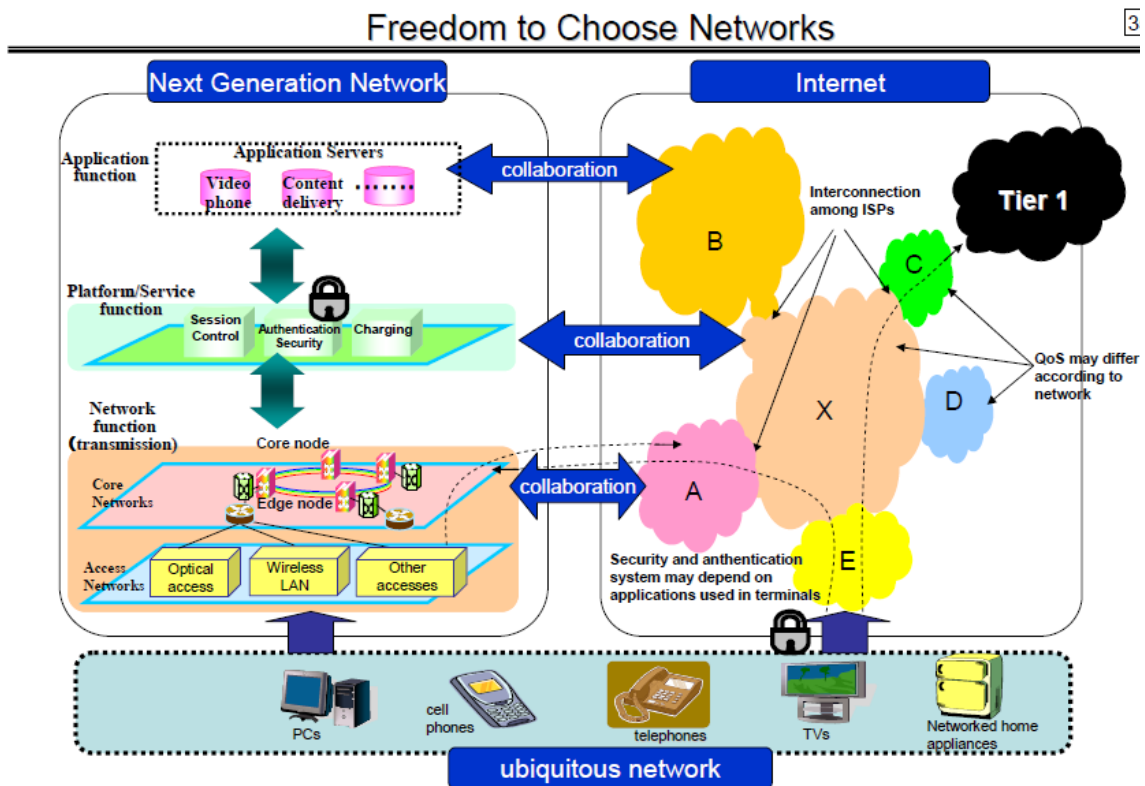
Unlike legacy networks, the Internet enables users to link diverse information with different modes (data format) by the use of tagging and to distribute them beyond the conventional constraints of geographic locale, language, time and cost, thereby allow them to create new added value through the free collection, sorting, and convergence of

information all by themselves.

That is, the Internet's salient feature is its self-reproductive quality without pre-designed harmony. Below are some characteristics of the Internet.

- (i) Basic idea is that intelligence should reside on the terminal side and executes security and authentication tasks, data are sent through "stupid networks" (no substantial controls for content distribution on the network side) to realize end-to-end communications. There is no unified mechanism for QoS for end-to-end transmissions.
- (ii) The Internet is a series of open networks interconnected on multiple layers functioning as an autonomous network of networks.
- (iii) Conscious and spontaneous collaboration by a large number of general users naturally achieves optimal solutions under a best-effort growth model.

In contrast, as stated above, the NGN environment has an IP-based infrastructure rebuilt from the existing carrier (telecommunication operators) network. The NGN is a carrier-managed network and implements QoS and security within service provision functions.



For this reason, though their founding principles of building and operating the

networks are different in these two networks, by realizing the coexistence of the highly-reliable, integrated NGN and the autonomous Internet in the same network ecosystem, we can expect to ensure the continuous innovations in internet-related technology (and their speedy commercialization) as well as to meet the diverse needs of broad users.

Based on the three principles stated above, in the debate around network neutrality, it is important to maintain an environment in which consumers can freely choose and use networks (freedom to choose networks).

(3) Basic viewpoint that ensure network neutrality

When discussing network neutrality, it is necessary to examine by distinguishing between the Internet and an NGN as stated above. Specifically, the basic viewpoint can be examined from two angles.

(i) Fairness in network cost sharing

First, from the viewpoint of properly distributing the burden of network enhancements between related stakeholders, it is necessary to examine policy for ensuring fairness in network cost sharing.

Specifically, for the operator-to-operator settlement scheme (e.g. facility-based operator, ISP, content provider), it is necessary to examine how much free market mechanisms can function properly and whether a supplementary mechanism to market mechanisms is needed.

(i) Fairness in network use

Second, to avoid any adverse impact on other layers when market power exists on a specified layer, it is necessary to examine competition rules for ensuring fairness in network use.

Specifically, regarding dominant carriers who own bottleneck facilities on the communication layer, it is important to consider how to prevent abuse of market power through vertical integration (from lower layer to upper layer) and horizontal integration (within communication layer).

For this reason, as markets consolidate and dominant carriers build NGNs, it is

important to ensure open interfaces between the upper and lower layers and within the same layer with other carriers.

In the era of circuit-switching networks, policy was developed from the viewpoint of ensuring fair and effective competition in horizontal integration on the communication layer. However, now it is important to examine competition from the comprehensive viewpoint of achieving fair competition on upper and lower layers in both horizontal and vertical directions.

(4) Important matters for ensuring neutrality in networks

In developing measures to ensure network neutrality, it is necessary to establish competition rules that can respond to conditions in the IP-based network, which is different from those in the traditional circuit-switching network.

Specifically, from the viewpoint of maximizing potential of Internet as an autonomous, distributed, and cooperative network of networks, administrative authorities need to consider three operational principles for competition rules: 1) Minimal regulations, 2) Flexible application of rules based on objective criteria, and 3) Emphasis on *ex post* regulations through market monitoring.

1) Regarding “minimum regulations,” the revised Telecommunications Business Law enacted in 2004 already marked a transition from *ex ante* to *ex post* regulations to ensure minimum regulatory intervention. However, it is appropriate to always bear in mind this minimal regulatory framework be also kept for IP-based networks since remarkable changes in market structure and network structure brought on by rapid innovation are further expected.

2) Regarding “flexibility based on objective criteria for rules,” if competition rules with market divisions set a priori are applied rigidly, it will not only prevent to respond to market changes properly, but also such a framework of tight competition rules might impede market growth. For this reason, the legal framework must ensure flexibility. On the other hand, to prevent administrative authorities from using the said flexibility in an arbitrary manner, a prerequisite is to establish precise and reasonable criteria from the viewpoint of ensuring transparency in institutional implementation.

3) Regarding an “emphasis on *ex post* regulations through market monitoring,” to respond to market changes, from the viewpoint of realizing user benefits through fair competition, it is appropriate to establish basic principles for ensuring network

neutrality. At the same time, to enable a quick response to new market conditions that do not correspond to the said principles, it is appropriate to strengthen monitoring and actively use *ex post* regulations.

4. International situation on Network neutrality debate

(1) US

In the US, amalgamation in the telecommunications industry is continuing as the regional Bell operating companies (RBOC) merge with and acquire interstate carriers (former AT&T and MCI). In general, facility based operators in the broadband market are now limited to a duopoly made up of RBOCs and CATV operators.

To confront this, companies operating on the upper layer (e.g. Google, Amazon, eBay, MSN, Yahoo) emphasize the need to set up a legal system to prevent discrimination by facility based operators. Regarding the background to this dispute, in March 2005, the Federal Communications Commission (FCC) removed the unbundling obligation on RBOC broadband networks. This, in turn, raised concerns about potential abuse of market power by RBOCs and CATV operators were they to impose bandwidth limitations on companies operating on a specified upper layer.

In response, RBOCs and CATV operators countered that there was no specific example showing impediments to network neutrality. In addition, regarding the emerging internet market, they emphasized that it is inappropriate to take legal measures to ensure network neutrality.

In February 2005, during this period of heated debate, Madison River Communications — a small rural carrier — attempted to block the VoIP port that its customers used for placing calls through Vonage, a VoIP service provider. After the FCC opened an investigation, Madison River agreed to a settlement, which called for the company to unblock its ports and pay a fine to the Federal Government.

Later in August 2005, the FCC adopted “four principles “to encourage broadband deployment and to preserve and promote the open-interconnected nature of the public Internet” (hereinafter called “four neutrality principles”).⁵ Below are the four

⁵ FCC, “Policy Statement,” (September 23, 2005)
http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-05-151A1.doc

principles.

- (i) Consumers are entitled to access the lawful Internet content of their choice.
- (ii) Consumers are entitled to run applications and use services of their choice, subject to the needs of law enforcement.
- (iii) Consumers are entitled to connect their choice of legal devices that do not harm the network.
- (iv) Consumers are entitled to competition among network providers, application and service providers, and content providers.

The FCC recognized that there had been no specific problems with network neutrality up to that time and decided that, going forward, in the event of conflicts, it would handle each case separately in accordance with the four neutrality principles. There are two points to note about FCC activities since the adoption of these principles.

First, at the time of the AT&T - Bell South merger in December 2006, the two companies made voluntary commitments to ensure network neutrality and the FCC incorporated these commitments as conditions for the approval of the merger.⁶ Below are the three conditions.

- (i) Regarding the four neutrality principles, effective until 30 months after the merger closing date, AT&T-Bell South will conduct business in a manner that complies with the neutrality principles set forth in the FCC policy statement.
- (ii) The new company agrees not to provide or to sell to content, application, or service providers, including those affiliated with the subsidiary company, any service that subjects transmitted packets to discriminatory treatment based on their source, ownership, or destination. This commitment will apply from the customer's terminal to the closest internet exchange point (IXP). In addition, this commitment will be effective until two years after the merger closing date.
- (iii) Regarding the internet backbone, AT&T-Bell South will maintain (for a period of three years after the merger closing date) as many peering arrangements with operating entities as they did on the merger closing date (10 or more).

Second, in March 2007 the FCC published a Notice of Inquiry (NOI) entitled

⁶ FCC, "FCC Approves Merger of AT&T Inc. and BellSouth Corp.," (December 29, 2006) http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-269275A1.pdf
The AT&T-Bell South merger commitments submitted to the FCC can be found on at the following URL. http://www.fcc.gov/ATT_FINALMergerCommitments12-28.pdf

“Broadband Industry Practices.”⁷ This NOI seeks a wide-range of comments on how broadband providers are managing their internet traffic such as 1) whether it is appropriate for providers to charge different prices for different speeds and service content, 2) whether it is necessary for FCC policies to distinguish between content providers that charge end users for access to content and those that do not, and 3) how these industry practices impact consumers.⁸

On the other hand, there is a movement in Congress to enforce network neutrality as legislation. For example, in January 2007, Senate Bill S.215 to ensure network neutrality was introduced. The bill, based on the FCC’s four neutrality principles, prohibits 1) additional charges based on access quality to a site and 2) discriminatory treatment based on ownership of content. However, it is possible to provide a separate charge for services based on QoS and bandwidth.

(2) EU

In June 2006, the European Commission (EC) initiated revisions to the “2002 Framework for Electronic Communications Networks and Services.” The revision document⁹ mentions network neutrality. Specifically, the EC considers that the FCC’s

⁷ FCC, “Notice of Inquiry into Broadband Industry Practices,” (March 22, 2007)
http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-07-31A1.doc

⁸ Below are two more examples of activities related to network neutrality.

First, regarding the 1968 Carterfone ruling (allowing the Carterfone and other devices to be connected directly to network, as long as they did not cause damage to the system), Skype filed a petition in February 2007 requesting the FCC to make unmistakably clear that Carterfone applies to mobile devices in the wireless industry. In other words, Skype wants to ensure interface openness between the terminal layer and the communication layer, a request closely related to the network neutrality debate. Specifically, Skype wants to ensure that mobile devices can use applications freely to connect to VoIP services.

Source: “Petition to Confirm a Consumer’s Right to Use Internet Communications Software and Attach Devices to Wireless Networks,” Skype (Feb. 20, 2007)

http://gullfoss2.fcc.gov/prod/ecfs/retrieve.cgi?native_or_pdf=pdf&id_document=6518909730

Second, regarding the transition to digital broadcasting (by February 2, 2009), the FCC adopted the Second Report and Order in July 2007, which reorganized in the 700 MHz band currently occupied by channels 52 to 69. Regarding the auction of block C (22 MHz spectrum) in the 700 MHz band, the band plan requires licensees to allow customers to use devices, select applications, and download content freely.

Source: http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-07-132A1.doc

⁹ European Commission, Commission Staff Working Document, “Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions on the Review of the EU Regulatory Framework for electronic communications networks and services : Proposed Changes” (COM(2006)334) (June 29, 2006)

http://ec.europa.eu/information_society/policy/ecomm/doc/info_centre/public_consult/review/staffworkingdocument_final.pdf

four neutrality principles are best regarded as general guidelines, and that it would not be appropriate to translate them into legislative obligations.

Based on said principles, to ensure network neutrality, it is possible to apply interconnection rules and network access obligations on carriers with significant market power (SMP). On the other hand, applying these rules to all facility based operators would have the adverse effect of narrowing consumer choice in the service market.

Regarding competition policy in the broadband market, the EC opposes the removal of network access obligations. Specifically, below are examples.

(i) In the US, the DSL market has not been able to grow due to geographical reasons such as the large landmass and the long distance between user home and exchange station. On the other hand, facility-based competition with CATV and RBOC carriers has succeeded thus showing difference in market structure from that of EU market.

(ii) Not to apply network access obligations in the emerging market above is an approach called “regulatory holiday” that the European Commission opposes. Specifically, European markets have traditionally been controlled by monopolistic enterprises under national ownership. Even today, many years after the introduction of market principles, the EC clearly states its concern about structural impediments to competition (e.g. existence of SMP carrier).

(iii) Based on the above, the EC considers it appropriate to steadily apply ex ante regulations for network access obligations until such time as sustainable and effective facility-based competition is achieved. Once achieved, ex ante regulations are abolished and replaced by ex post regulations.

Incidentally, the European Regulators Group (ERG) composed of national regulatory authorities (NRA) emphasizes the importance of establishing a clear stance on network neutrality.¹⁰

(3) Korea

In the Republic of Korea, after HanaTV rolled out a video on-demand service in July 2006, the broadband provider LG Powercomm and the CATV operator Curix (among others) began blocking or reducing bandwidth speed to the service. In December 2007,

¹⁰ European Regulators Group (ERG), "Response to the Review of the EU Regulatory Framework for electronic communications network and services" (October 27, 2006) http://erg.eu.int/doc/whatsnew/irg_erg_resp_review_rf_final271006.pdf

the Korea Communications Commission (Conflict Settlement section of the Ministry of Information and Communications) intervened. Later in January 2007, HanaTV and LG Powercomm reached an agreement on connection charges and other matters. Shortly thereafter, HanaTV's VOD service connection was reopened. However, HanaTV's conflict with Korea Telecom and other CATV operators has remained at an impasse.

In April 2007, the Ministry of Information and Communications announced the "Communications Regulation Policy Roadmap." The roadmap calls for a team of experts to convene in mid 2007 to examine the issue of "freedom of choice for internet consumers" (i.e. network neutrality).

(4) Overseas debate compared to Japan

As shown above, debate in the US clearly pits facility based operators against upper-layer operators. Upper-layer operators seek safeguards against discrimination by the network side (facility based operators). The FCC has adopted a watch-and -wait approach (no action until a specific problem occurs), while the US Congress has moved to enact legislation. So at this time, it is difficult to say which way the discussions are headed. In the EU, to ensure effective network neutrality, the European Commission regards the FCC's four neutrality principles as general guidelines and applies SMP regulations against dominant carriers.

It is necessary for policy authorities in each country to examine policy principles based on common decision criteria for ensuring network neutrality. On the other hand, for specific policy development, it is important to bear in mind competitive conditions in each country's broadband market (e.g. geographical factors, current development stage, and extent of competition).

In Japan, even though customers enjoy the world's highest broadband penetration, there are still dominant carriers that own bottleneck facilities. Thus the network neutrality study requires an approach with a view to responding to these specific market characteristics.

Chapter II Fairness in Network Cost Sharing

1. Basic Viewpoint on Ensuring Fairness in Network Cost Sharing

Under the vertical integration business model, various functions are modularized and combined as services. Because the Internet is based on autonomous routing, it is difficult to obtain an accurate grasp of traffic conditions on each route. With the development of broadband infrastructure, traffic from rich content (e.g. video) is rapidly increasing.

So when planning network enhancements to handle these increases, it is necessary to examine how to share the cost. Based on an analysis of traffic trends, it is important to examine whether free market mechanisms are effective and what kind of supplementary measures are needed.

2. Network Traffic Conditions

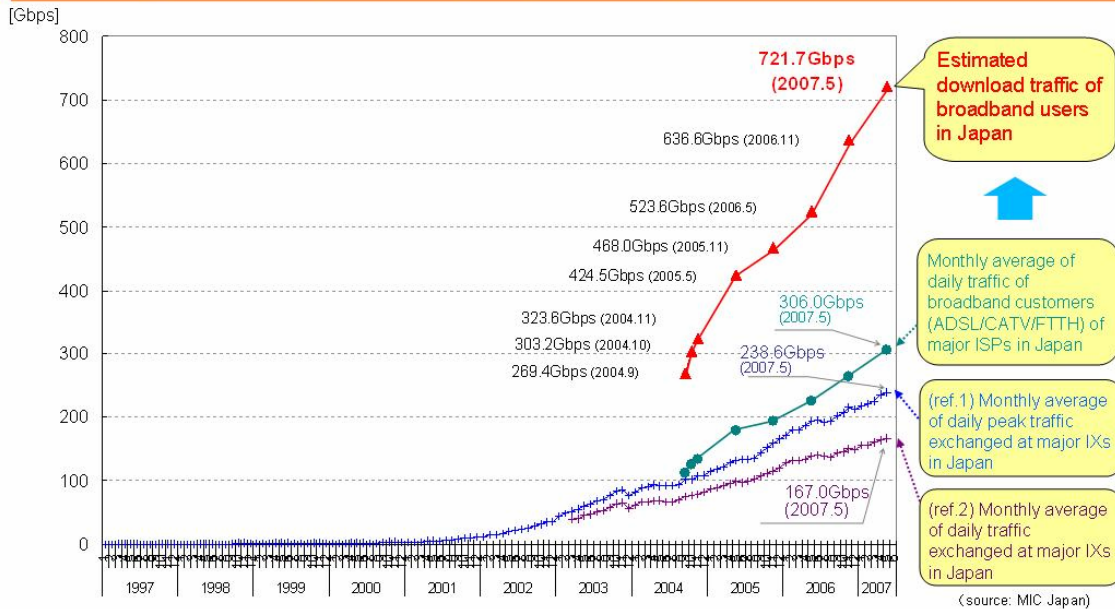
(1) Recent Trends in Traffic

Network traffic is increasing every year and even doubling every two years. This trend is likely to continue into the foreseeable future. (Refer to figure.) Specifically, the download traffic of Japanese broadband customers reached 721.7 Gbps in May 2007. At this rate, traffic may exceed 1 Tbps by May 2008. (See *Fig. 6*)

Fig. 6

IP Traffic on the Networks (Total Volume)

- The total amount of IP traffic in Japan was estimated at 721.7Gbps (May 2007), which accounts for about 1.4 times more than that of the previous year (523.6Gbps).
- Necessity for enhancing network capacity is increasing.



Recent traffic trends show five main characteristics.

- (i) In traffic between ISPs, the rapid increase in inflow from foreign ISPs is a result more viewers visiting overseas video websites. (See *Fig. 7*)
- (ii) Broadband customers of six major ISPs download 40% more than they upload. Looking at traffic by time slot shows peak conditions at 9 pm and 11 pm. However, even during low periods, traffic is nearly half the rate of peak hours. (See *Fig. 8*)
- (iii) According to data from a certain large ISP, network congestion occurs because certain time slots have 80% (upstream) and 90% (downstream) of the bandwidth share. (See *Fig. 9-10*)
- (iv) Peer-to-peer (P2P) file sharing (e.g. Winny, WinMX) accounts for over half the traffic while video streaming only accounts for a few percent. Thus the use of file-sharing software is currently a major cause of network congestion.
- (v) Survey results show that 60% of backbone bandwidth is consumed by only 1% of internet users. So another major cause of network congestion is bandwidth consumption by a few heavy users. (See *Fig. 11*)

Fig. 7

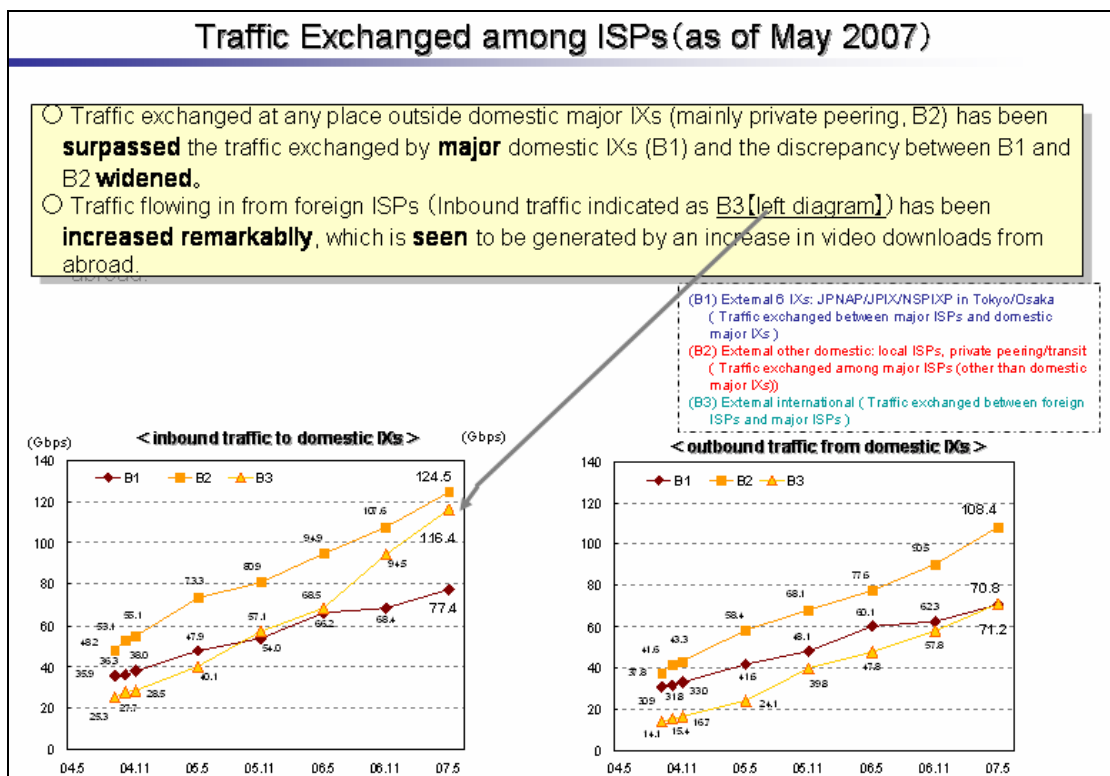


Fig. 8

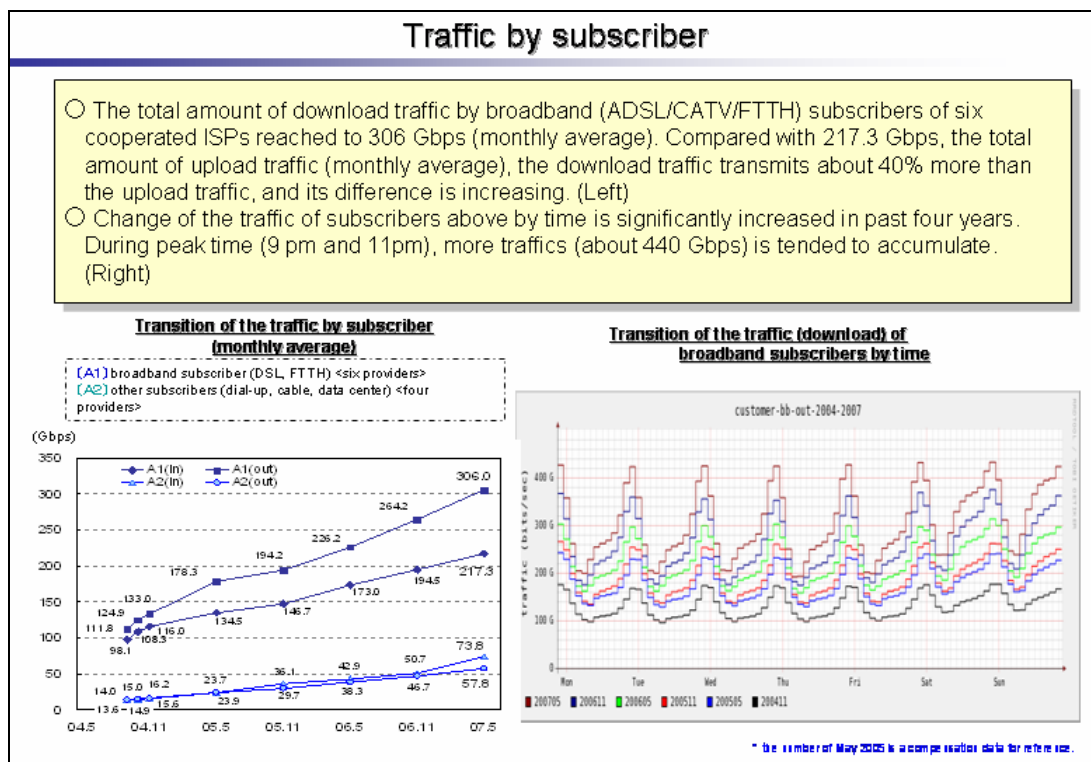


Fig. 9

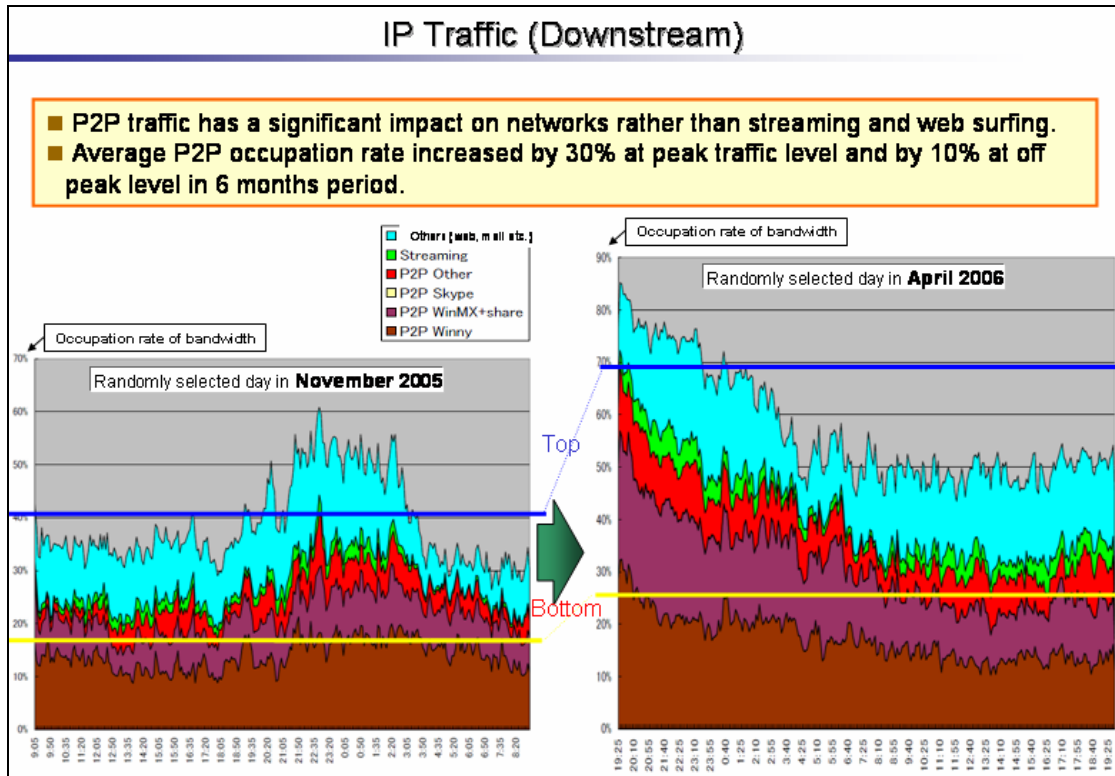


Fig. 10

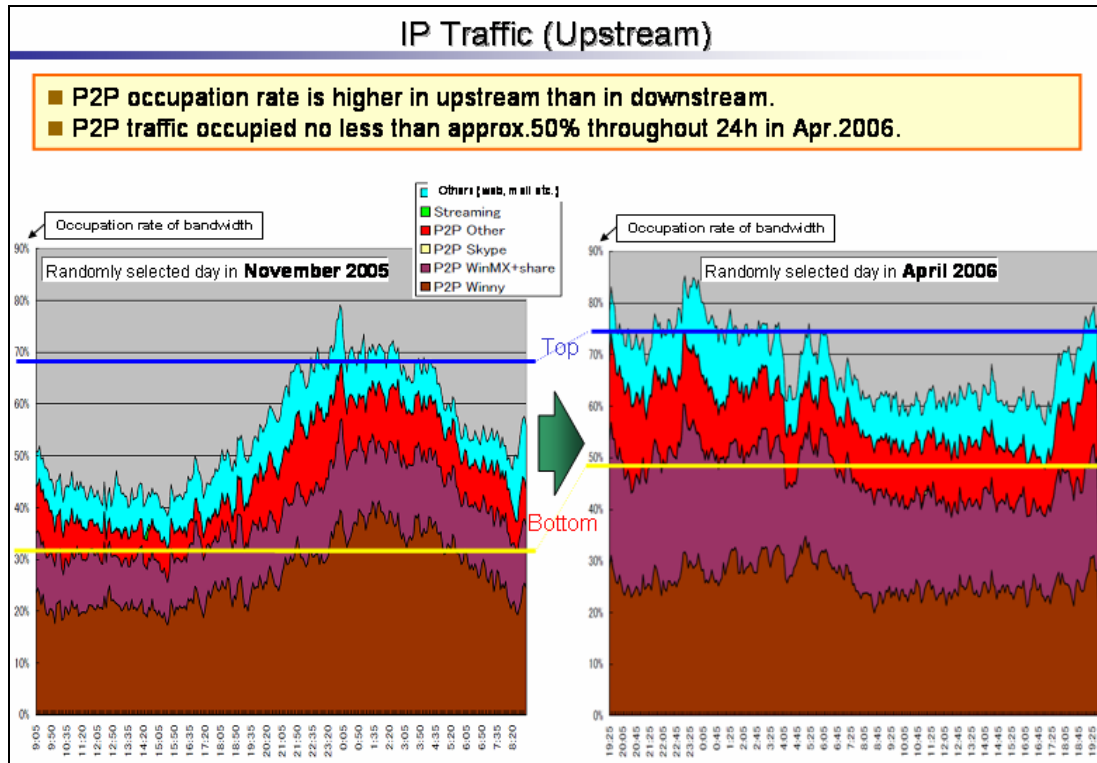
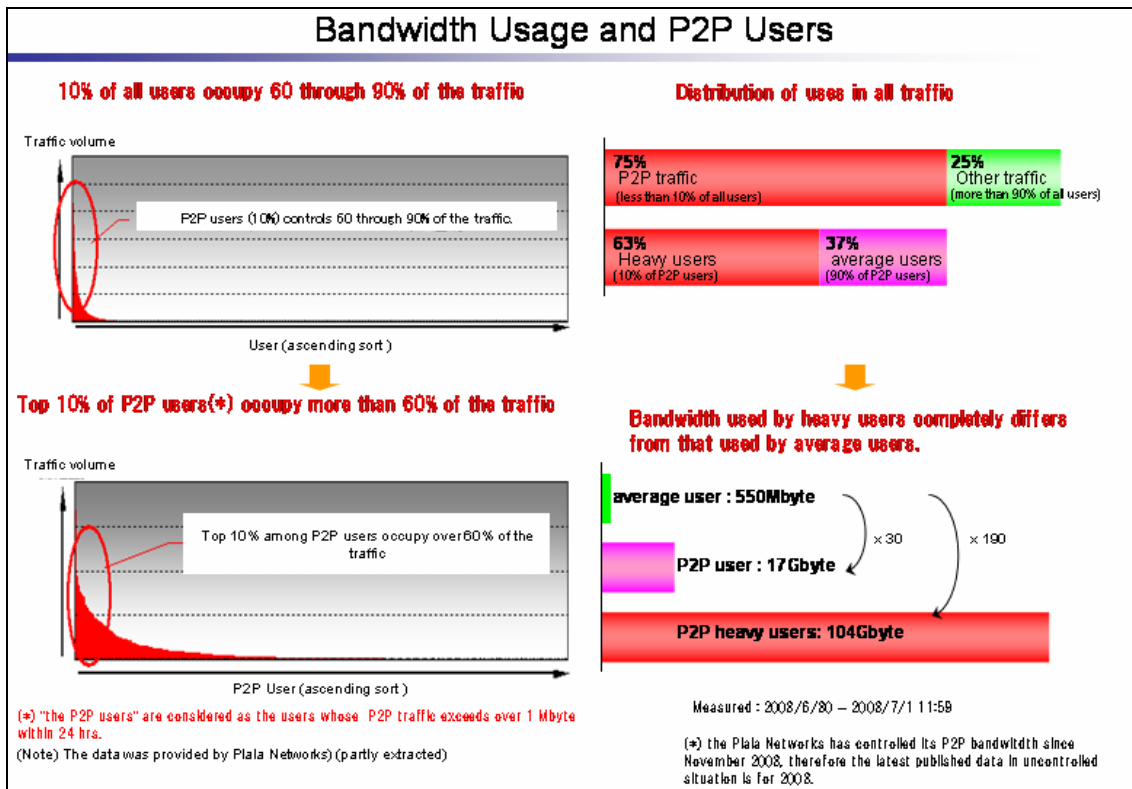


Fig. 11



(2) Background to increases in network traffic

The first factor (as stated above) is the spread of P2P file sharing. Peer-to-peer software runs on the terminal layer through distributed intelligence on the PC. As PC use and distributed intelligence continue to spread, this type of traffic will continue to grow. Regarding file sharing, an increase in the number of fiber-to-the-home (FTTH) customers has led to more uploading on broadband networks. As a result, in addition to content providers, general users find it easier to distribute video and other rich content over the Internet or to publish content on video sharing websites.

The second factor is the appearance of various consumer generated content (CGC) business models. Under a traditional model, the content provider would deliver content one-way to the end user. Now, however, under new models the rapid increase in traffic is a result of the greater relative importance of content flowing into the network from every possible edge. In other words, stakeholders of every imaginable type are involved in the increase in network traffic.

The third factor is development towards an ubiquitous economy, which is leading to the widespread use of 1) grid computing, 2) enterprise network services like SaaS (as stated above), and 3) new communication models such as machine-to-machine M2M. Going forward, these factors will continue to accelerate the pace of growth in network traffic.

3. Topics Related to Fairness in Network Cost Sharing

(1) Building scalable networks

1) Content distribution models over the Internet

For content distribution over the Internet, there is the client-server model and the P2P model. Roughly speaking, the client-server model can be achieved using unicast techniques or IP multicast techniques.

(i) Unicast method

A distribution server delivers content independently, which achieves a simple and stable distribution system. The unicast method does not require the installation of specified equipment by the ISP and it incorporates a packet loss recovery scheme. On the downside, as the number of viewers rises, server and traffic costs increase. In addition, network utilization efficiency declines as the traffic burden on the distribution server turns into a bottleneck. For this reason, the unicast method is not appropriate for the distribution of high-quality content to a large number of viewers.¹¹

(ii) IP multicast

IP multicast enjoys excellent network utilization efficiency and distribution stability even when the number of viewers increases. On the downside, it is less stable than the unicast method because there is no scheme to recover lost packets. In addition, IP multicast requires the installation of compatible equipment on the network side and thus on the communication layer as a whole (in the case of IPv4 IP multicast).

The P2P model has two types as follows.

¹¹ The unicast method can also be used in combination with a content delivery network (CDN). CDN nodes are deployed in multiple locations near end users. Each node is equipped with large-capacity edge servers that decrease the load on the backbone and increase the efficiency of content distribution.

(i) Pure P2P

Under this model, the search function is distributed among each peer and traffic is not concentrated on any specified transmission path. On the downside, it may not be possible to resolve some queries, there is no central server to manage information, and it is not possible to control traffic over the network.

(ii) Hybrid P2P

Under this model, there is a centralized index server to manage content/peer information and to control the search function. So a certain amount of traffic tends to concentrate on the transmission path to the index server. On the upside, it is possible to resolve each data query and to maintain security via the index server.

2) Ensuring network scalability

As shown above, Japan is experiencing rapid increases in both internet traffic and network congestion. As a result, it is becoming more difficult to manage network traffic on the carrier side alone. To ensure adequate capacity under any contingency (e.g. burst traffic), it is essential to build a scalable network that can flexibly absorb traffic fluctuations.

Under a client-server model of content distribution, the server load is heavy. In the event of a stampede of requests, the server is at risk of not being able to process each query.

In contrast, when the number of users increases on the P2P network, there is no need to enhance distribution servers or add other equipment. Thus a certain degree of scalability and disaster resistance is built in to the system. Even if some peers are disconnected from the network, other peers step up to maintain distribution quality, which in turn minimizes the risk of destroying or damaging information.

In this way, P2P technology improves content distribution efficiency (no bottlenecks). In addition, it is possible to combine P2P and CDN to boost efficiency even more. Specifically, this topic can be condensed into the points below.

(i) Hybrid P2P differs from CDN in that, though P2P technology cannot guarantee speed, the burden on the source server is light, which enables the content provider to control distribution costs.

(ii) Hybrid P2P makes full use of peer resources on the user terminal. It enables a type of CDN based on the beneficiary-burden principle and thus takes advantage of

features in each model to flexibly distribute content.

(iii) Overlay multicast (OLM) technology has also emerged that uses the unicast method at the initial stage of content delivery, then as the number of viewers increases, P2P distribution method is added that achieves a significant reduction in communication traffic.¹²

3) Resolving network congestion by actively using P2P technology

As shown above, rapid increases in network traffic over the years is mainly due to P2P file sharing. In addition, the spread of FTTH service has led to rapid increases in the distribution of rich content such as video. This has also worsened network congestion. Going forward, the pace of growth in network traffic is expected to accelerate.

According to some views, technology innovation can absorb the increment cost of traffic growth. However, because it is difficult to predict the future rate of traffic growth, there are no reasonable grounds to conclude that innovation alone can ease or resolve the problem of network congestion.

Therefore, it is necessary to re-examine how communication service operators (facility based operators and ISPs) manage their traffic for networks as a whole. At such time, it is important to standardize rules for carriers to deal with burst traffic.

On this point, P2P technology is one effective way to efficiently distribute content over the network. While achieving distribution efficiency, P2P technology is also the source of greater network traffic as stated above. The important matter now is to focus on the upside (distribution efficiency) and move ahead with building scalable networks.

In recent years, many users of file-sharing software have unknowingly leaked private information onto the Internet. These incidents have caused P2P programs to lose a lot of credibility.¹³ On a positive note, new services based on P2P technology that take

¹² The “BB Broadcast” service by Softbank BB aired a live baseball game in October 2006 using the OLM method. The center server had 18.7% of the distribution traffic share and the P2P network had the rest. The peak audience reached 48,545 and the total audience was 105,986.

¹³ The Grokster ruling by the US Supreme Court has a direct bearing on the relation between P2P file-sharing programs and copyright law. This program was originally available for download in September 2000. In October 2001, the Motion Picture Association of America (MPAA) and the Recording Industry Association of America (RIAA) took legal action against Grokster on the grounds copyright infringement. The case was brought before the Supreme Court in June 2005. In its ruling, the Court held that a P2P program developer

advantage of improvements in content distribution efficiency continue to debut. For example, Skype is an internet phone service that allows customers to make phone calls, and BitTorrent is providing a content distribution service that respects copyright protection.

For this reason, while dealing with the downside (illegal) of content distribution, it is appropriate to give full play to hybrid P2P models and flexibly combine various distribution technologies towards the construction of scalable networks.

Coping with rapid increases in traffic (network congestion) requires dynamic terminal-network collaboration and the flexibility to absorb fluctuations in traffic. For this reason, while maximizing the full potential of P2P distribution efficiency, it is advisable to take advantage of current client-server and CDN technologies, pay attention to traffic trends and costs, and pick and mix flexible distribution models without relying on any specified technology.

Specifically, regarding traffic dispersion methods that use P2P technology, it is appropriate for industry, academia, and government to work together on field trials. In addition, it is important to examine how technical/social systems can encourage positive (and deter negative) use of P2P technology.¹⁴

(2) Bandwidth control (packet shaping)

1) Meeting the needs of diverse stakeholders

From the viewpoint of dealing with network congestion, there is a need to flexibly combine various content distribution methods such as P2P technologies. However, improving such methods to an advanced level imposes a considerable cost burden. In addition, it is possible that distribution efficiencies alone may not be sufficient to deal with the rapid increase in network traffic.

In such case, there is the problem of deciding who will pay for the network

is liable for the infringement activity of the program's users. The Court ordered the defendant to stop distribution of the said program and to pay \$50 million in settlement payments.

¹⁴ In August 2007, the "P2P Network Trial Test Council" was established under the auspices of the Foundation for MultiMedia Communications (FMCC) by communications carriers (including ISPs), content providers, content holders, and vendors. The aim of the council is to test video distribution applications that apply P2P technologies.

enhancements. On a legacy network in which traffic is managed end-to-end by the carrier, it is possible to identify users that generate network cost and request said users to share the burden. However, the Internet has myriad stakeholders such as content providers, upper/lower stream ISPs, carriers, and users. In this environment, it is difficult to apply reasonable criteria for cost sharing.

There would be no problem if there were a mechanism to calculate packet transmissions between related parties according to individual volume logs. However, no such mechanism exists on the Internet. There are two types of connection between ISPs: peering and transit. Specifically, a peering agreement is made between two ISPs of similar size with regard to network traffic. The agreement is mutual and neither provider imposes a fee on the other. On the other hand, in a transit agreement, the settlement scheme is normally based on a flat-sum system or variable-fee system according to the bandwidth. In a combination system, the ISP pays a flat-sum for a fixed quota and a variable fee for bandwidth beyond the quota.

Thus the world of Internet has no strict settlement scheme as used on a legacy network. In addition, the Internet data routing is based on a best-effort principle for ensuring the maximum level of mutual communication, without any expense settlement scheme.

This topic needs to be examined from various viewpoints. However, by focusing on the relevant parties, it is possible to condense the matter into the points below.

(a) Relation between content provider and carrier (including ISP)

Regarding content, there is the content provider and the end user. The content provider distributes rich content that increases traffic. To respond to this increase, the carrier enhances the facility. From one angle, the carrier should then collect a surcharge from the content provider.

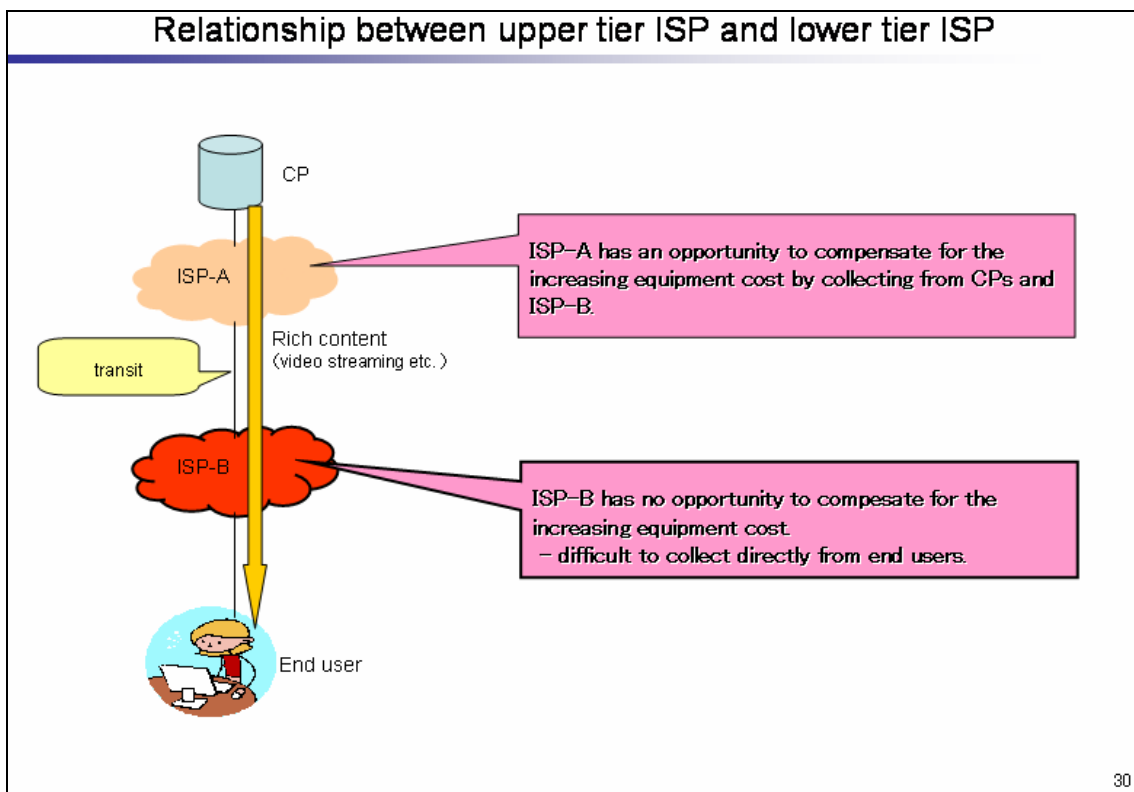
From another angle, the end user is the one who downloads large volumes of rich content, so the carrier should collect a surcharge from the said user. In particular, regardless of the fact that a small number of heavy users consume a significant share of the bandwidth (as stated above), the heavy user and the light user pay the same flat-rate without any charge differential.

(b) Relation between upstream ISP and downstream ISP

Next, it is necessary to examine how to share the cost between ISPs. Specifically, in the event of heavy traffic, it is possible for the upstream ISP to collect a surcharge from the direct content provider or from the downstream ISP that connects through a transit link.

On the other hand, in the event of heavy traffic streaming in from a content provider to a downstream ISP that is indirectly connected via an upstream ISP, it is not possible to collect a direct charge from the traffic source. Besides that, even if the said ISP collects charges from the end user, this is done under a flat-rate system. In addition, due to charge competition between ISPs, it is difficult to increase rates. The same type of situation may occur when heavy traffic streams in from a peering ISP. (See *Fig. 12*)

Fig. 12



To respond to traffic increases under these conditions, one argument is to rely on free market mechanisms. In such case, the following may occur.

- (i) Inequality between users will expand because under a flat-rate system (best-effort

principle), charges are not set according to the beneficiary-burden principle.

(ii) Free market mechanisms may not be able to work properly because as the relation between upper/lower ISPs shows, the broadband market contains information asymmetries that make it difficult for facility enhancements to keep pace with traffic increases. In addition, there is a significant cost burden.

(iii) Free market mechanisms may not be able to restore equilibrium because due to rapid technology innovation, the market is in a constant state of flux.

For these reasons, even while respecting the market mechanisms based on competition principle, when dealing with network traffic it is important to examine whether measures to supplement free market mechanisms (supply-demand adjustment based on price) are necessary or appropriate.

2) Necessity of surcharge on heavy users

Based on the discussion thus far, it is necessary to examine the need for surcharges 1) when the heavy user monopolizes bandwidth and 2) when the content provider distributes rich content. Originally, administrative authorities had no plan to intervene with charge schemes. From the viewpoint of protecting the user and ensuring fair competition, it is important to consider that intervention is above all only permitted when there are impediments to equality among users.¹⁵

First, it is necessary to stake a look at the rights or wrongs of surcharging the heavy user. Compared to the light user, the heavy user enjoys higher bandwidth benefits from the same facility. Thus, from the viewpoint of the beneficiary-burden principle, it is reasonable to collect a surcharge from the heavy user.

However, it is also important to consider the points below. First, suppose that the carrier implements facility enhancements to launch services for the heavy user. At the same time, suppose the carrier does not steadily implement facility enhancements for light user services. Under this scenario, the QoS of service for the light user would drop compared to that of the heavy user. This in turn, could induce the light user to switch to

¹⁵ Article 29 of the Telecommunications Business Law states that when the carrier unfairly discriminates against a specified person (Paragraph 1, Item 2) and when the user's profit is impeded because the charge calculation method is not appropriate or clear (Item 4), the said carrier will be given a business improvement order. Article 26 states that the carrier has an obligation to carefully explain telecommunications service charges and related service conditions to the contracted party.

the more expensive plan.

Second, under a best-effort service, it is difficult for the user to tell the difference between QoS levels. In addition, in planning a multi-tiered structure based on charge differentiation and taking into account that end-to-end quality is not ensured on the Internet, it is difficult to decide on a reasonable charge differential method (price versus transmission speed).

Third, it is difficult to accurately predict the rate of growth in future packet transmissions (as stated above). In addition, improvements in content distribution efficiency are expected to bring a level of relief to network congestion. So from a viewpoint of watch and wait during this period of rapid technology innovation, it is difficult to generally conclude that the heavy user should pay a surcharge.

Therefore, though the beneficiary-burden principle states that it is reasonable to collect the said surcharge from the heavy user, there are other important matters to consider as stated above ¹⁶. The internet connection service market is currently experiencing lively competition among carriers (including ISPs). As long as price formation reflects market conditions, there will likely be no impediments to competition. Thus from the viewpoint of protecting the user, it is appropriate to access price schemes on a case-by-case basis.

The above conclusion does not unconditionally reject the idea of a surcharge on the heavy user. Rather, because it is currently difficult to build unified charge indicators, a case-by-case approach is the most appropriate. Thus even if there is a good reason to collect a surcharge from the heavy user, it is important to examine the important matters stated above. In addition, the carrier that wants to impose a surcharge has the obligation to carefully explain conditions to users including existing subscribers.

Next, it is necessary to take a look at the content provider that distributes rich content and examine whether the content provider should be required to pay a surcharge. On this point, because sufficient competition exists between the content provider market and the ISP market, it is considered that prices should be set according to competitive

¹⁶ Even the beneficiary-burden viewpoint envisages the “heavy user” designation. For example, in a disadvantaged area, a customer may access a service on an IP-based network as an alternative means to use a public service. As a result, the customer is designated as a “heavy user.”

negotiations between providers. In the event that the two sides cannot agree on transaction terms and the content provider wants to change to another ISP, it is also considered that the switching costs in this competitive market environment are low and thus not an obstacle.

For this reason, it is not appropriate to have a general rule for surcharging the content provider that distributes rich content. Above all, it is appropriate to entrust the matter to negotiations between the ISP and the content provider.

3) Basic viewpoint on bandwidth control

From the viewpoint of ensuring quality of service (QoS), it is considered that bandwidth control (packet shaping) is an effective method to avoid a reduction in transmission speed over the whole network, including light users, due to a few heavy users who monopolize bandwidth.

For example, as an act of necessity, it is thought that society would accept bandwidth control to prevent a reduction in transmission speed to all subscribers (including light users) in the event of burst traffic caused by a few heavy users.

In addition, some ISPs have adopted packet shaping to control the bandwidth of specified heavy users that use specified applications. Bandwidth control is applied when heavy user bandwidth exceeds a fixed level, thus raising fears of a reduction in transmission speed to all contracted parties.

In general, ISPs mention bandwidth control policy in their contract agreements. However, there are no standard packet-shaping provisions for the said agreements and some ISPs fail to mention the subject at all.

Originally, if bandwidth exceeded a reasonable level and controls were applied, the increase in traffic would be a signal to implement facility enhancements. However, there is a possibility now that the ISP would only elect to apply controls and thus overly restrict the supply of bandwidth.

On this point, in addition to packet shaping to throttle the specified heavy user or specified application, port blocking closes the communication channel used by the said application. With these two methods, it is possible to apply anti-competitive bandwidth

control and act in manner not envisaged on a traditional network. (Refer to Chapter III “Fairness in Network Use.”)

In such case, it is important to consider the two points below. First, it is important to define “specified heavy user” and “specified application,” then to establish objective criteria for applying bandwidth control and avoiding arbitrary use. On this point, because there are currently no clear criteria, the carrier must decide on each specific case before applying bandwidth control.

Second, carriers have also thought about inspecting individual traffic patterns (e.g. flow pattern, packet characteristics, and embedded control information) and identifying individual applications (deep packet inspection). In addition to the high cost, it is necessary to carefully examine how deeply to analyze individual traffic patterns because packet inspection relates to respecting the “secrecy of communication” as stated in Article 4 of the Telecommunications Business Law.

4) Bandwidth control policy direction

From the viewpoint of ensuring QoS on the Internet as a whole, bandwidth control is recognized as an appropriate method. However, there is an undeniable possibility of using these methods as impediments to competition.

On this point, according to some opinions there is no problem because regardless of the access type (wired or wireless), the broadband market is full of diversity that exerts a certain amount of competitive pressure. If a carrier were to implement uniform bandwidth control in response to lower QoS due to traffic increases, it would be possible for the unsatisfied customer to switch service.

However, even when a market has alternative service providers, if the switching cost is high, competition may not work as expected. In addition, the user may not be able to recognize which part (carrier) on the network is causing lower QoS. For this reason, a two stage approach to bandwidth control policy is advisable. First, establish minimum rules with required operating criteria. Second, allow each ISP to set a specific bandwidth control policy based on these operating criteria.

4-1) Bandwidth control guidelines

To establish a broad-based consensus on bandwidth control criteria, it is advisable to

seek participation from diverse parties in drawing up “packet shaping guidelines”. Specifically, when stating the bandwidth control policy in the contract agreement, it is appropriate for each ISP to be clear about 1) the scope of information required for control 2) basic conditions for the application of control, and 3) other legal requirements. At such time, it is important to consider three points.

First, it is difficult for the general user to discern traffic volume at any given time. Thus it is necessary to examine how to notify the user when the number of transmission packets reaches a certain usage limit.

Second, in case broadband control policy is different among providers, the policy of one provider links to and has an impact on the operations of other providers. Thus it is necessary to further investigate the appropriateness of bandwidth control policy.

Third, due to the multi-tiered structure of the Internet, if the ISP handles traffic from users other than its own and implements performance enhancements, these improvements will not directly translate into profit gains. Thus the best-effort principle may not provide sufficient incentive to enhance capacity through capital investment. In addition, for the upstream ISP not directly connected to the user, it is possible to raise the transit charge according to increases in traffic. Thus instead of bandwidth control, there may be sufficient incentive to implement facility enhancements.

Taking account of these conditions, it is also worth examining an audit system to certify ISPs that satisfy certain criteria. By clarifying the performance of each ISP, the said audit system would promote service competition, facility enhancements and efficient traffic routing as a whole.

Some opinions support a certification system. However, other opinions stress 1) the need to consider an end-to-end assessment, not only on a limited part of the network, and 2) the difficulty to identify objective criteria in an internet environment of rapid change. With the great diversity of services and equipment configurations among ISPs, when examining such a system, it is important to consider opinions from each related side to gain a proper perspective on market conditions and objective criteria for certification.

As shown above, from the viewpoint of protecting the user, measures are necessary to

ensure 1) bandwidth control policy is clearly stated in the ISP contract agreement, 2) policy/content information is sufficiently disclosed, and 3) packet shaping inconsistent with contract provisions is not implemented. At such time, bandwidth control information and other content should be easy for the user to understand.

Bandwidth control guidelines also require revolving review (addition-deletion revision). In an environment of rapid change, periodic review enables a response based on market conditions. In addition, overly explicit content of the guidelines may inhibit service competition based on QoS policy. Thus the guideline should only contain a basic framework for bandwidth control. It is appropriate to entrust specific parts to each ISP.

4-2) Strengthening dispute settlement function

Some content providers at this working group have stated that some specified ISPs implement unfair bandwidth control.¹⁷ In general, it is important to recognize that unfair discrimination by the carrier is possible and may impede the healthy growth of the broadband market.

Under the current system, a dispute between carrier and content provider on the upper layer is settled through mutual discussions. Going forward, it is possible to envisage an increase in this type of dispute. Resolving each dispute through guidance is expected to promote the effective use of supply capacity on the Internet.

For this reason, it is advisable to examine whether to expand current conflict settlement procedures (Telecommunications Business Dispute Settlement Commission) and whether to introduce alternative dispute resolution (ADR) as an extra-judicial process. Based on the opinions of related operators, administrative authorities are advised to examine these mechanisms with a view to taking action as soon as possible.

¹⁷ USEN Corporation has a video distribution service that uses various servers and networks. Some ISPs claim that even though the service has sufficient bandwidth supply capacity, customers on both ADSL lines and FTTH lines experience nearly the same level of viewing trouble. Viewing trouble by ISP: 44% maximum and 26% minimum. Regarding the “Study Group on Competition Rules for Evolving IP-Based Networks” (Report, 2006/09), USEN responded that the viewing trouble reported by customers was a result of bandwidth restrictions imposed by certain carriers.

Japan Internet Providers Association (JAIPA) countered that according to its investigation found no proof that ISPs had acted to restrict bandwidth as claimed by USEN. Rather, the transmission speed differences were the result of Internet routing patterns and problems along the transit routes.

Based on the Telecommunications Business Law framework, specific institutional design is required from the viewpoint of whether there are impediments to healthy development in the telecommunications market as a result of discriminatory treatment towards upper-layer providers by carriers. At such time, fair competition criteria (system operation policy) require clarification.

4-3) Understanding traffic through deeper analysis

Traffic survey results by the Ministry of Internal Affairs and Communications (MIC) thus far have been based on data provided by six major ISPs. The approach adopted has been to estimate traffic volume for the whole country based on packet flow across exchange points.

To gain a more accurate picture of traffic conditions, it is advisable to seek the cooperation of many more ISPs. On this point, with a circuit-switching network, it is possible for the carrier to manage traffic. This information is then disclosed by administrative authorities in accordance with the “Telecommunications Carriers Reporting Regulations” (Reporting Regulations). On the other hand on IP-based networks, because each ISP considers its own traffic volume as sensitive management information, there may be insufficient cooperation to obtain accurate aggregate figures. As the shift away from circuit-switching to IP-based networks continues, understanding network traffic as a whole becomes an essential public policy for ensuring proper maintenance of communication networks as social infrastructure. Failure to disclose this information by claiming them as proprietary business information may harm the public interest as a whole.

For this reason, administrative authorities need to continue efforts to increase the accuracy of network traffic information.

(3) Smooth content distribution

Internet exchange points (IX) for ISP peering are concentrated in the Tokyo and Osaka areas, with only a few IXs located in local regions. In most cases, the local ISP routes its traffic through an IX located in Tokyo or Osaka.

The reasons for this situation are 1) there is large traffic from overseas and the international exchange points for the ISPs are located in Tokyo and 2) Tokyo is also the center of domestic information transmission. Under these conditions, the local ISP uses

a dedicated line to the IX in Tokyo or Osaka. However, the line has a high cost burden even when shared among multiple ISPs. In addition, supply on the backbone line is extremely tight.

Thinking about the information flow, the installation of a number of local IXs in itself would not solve the network traffic problem. In addition, it is necessary to respond to increases in cost burden and insufficient capacity on the relay backbone. One important measure is to equip local IXs with cache servers for information aggregation for content download. Fetching information from a local cache would ease network pressure and improve the internet usage environment for all local users. Therefore, from the viewpoint of promoting cache aggregation on local servers, it is appropriate for administrative authorities to support cooperation between related operators and to take necessary measures (including how the system should deal with issues such as copyright protection).

Chapter III Fairness in Network Use

1. Basic Viewpoint on Ensuring Fairness in Network Use

From the viewpoint of promoting competition in the broadband market on the communication layer (physical network layer and communications service layer), there is a need to ensure a reasonable balance between facility based competition and service based competition. In facility based competition, while ensuring open access to the dominant carrier's network, each carrier is allowed to build its own network and provide its own service. In service competition, each carrier, including those not owning facilities, is allowed to use the said network to develop business.

On this point, maintaining a healthy competitive environment requires a reasonable balance between the two IP-based networks and support of their mutual complementary development. The first is the Internet, which is a network of networks where multiple players cooperate. The second is the Next Generation Network, which is an integrated carrier-managed, IP-based network.

Because the NGN (built by the dominant carrier that controls bottleneck facilities) holds the key to healthy growth in the broadband market, it is necessary to design open networks, initiate specific revisions to dominant carrier regulations ("designated telecommunications facilities" system), and ensure fair competition within and across network layers.

The transition to IP-based networks marches on accompanied by market integration. While maintaining fair competition in the broadband market both vertically and horizontally, development throughout the broadband market is expected, from communication layer to upper/lower layers.

Next, the policy goal of fairness in network use is above all to maintain an equitable competitive environment. For broadband, that means a market within which new business opportunities can flourish.

A market like broadband that is influenced by rapid technology innovation requires a flexible approach to competition rules different than those for the circuit-switching market. In addition, as a prerequisite to examining the broadband market, it is important 1) not to dampen dominant carrier confidence to invest in facilities and 2) to

allow the carrier to earn a reasonable rate of return.

2. Interconnection Rules for Next Generation Network

(1) Examination of NGN interconnection rules

As shown in the previous chapters, the Internet is made up of a vast number of stakeholders who cooperate and compete both consciously and spontaneously. In this network of networks, there are many issues that require careful examination such as the difficulty in applying uniform traffic management and taking measures to control bandwidth as the need arises.

In contrast, the Next Generation Network (NGN) is an integrated carrier-managed, IP-based network. The carrier can centrally manage traffic within the network and provide QoS-based service (i.e. prioritize packet transmission for each user). Thus it is possible to actively deal with congestion and collect different charges from users depending on the QoS level required through centralized control. This has great significance for network congestion.

However, the dominant carrier that builds the NGN may abuse its market power. As pointed out in Chapter 1, this may inhibit the freedom to select networks and impede healthy development in the broadband market.

On this point, because the NTT East/West NGN (NTT NGN) is a newly built infrastructure, some opinions stress that it is not appropriate to define it as a designated telecommunications facilities. However, the NTT NGN uses the physical network (existing bottleneck) for access. In addition, it has been built gradually as an inseparable part of the core network to serve as an alternative and upgrade to the current network. For this reason, it is not appropriate to conclude that the NTT NGN is a new entity without bottleneck characteristics.

On one hand, the NGN is expected to have better network efficiency and reliability as a result of intensive concentration of equipment (e.g. routers). On the other hand, concentration of connection points and rapid increase in transmission volume may lead to far greater economies of scale and scope on access and core networks than before. As a result, market power of the dominant carrier may increase.

On top of this, NTT East/West still enjoys over 90% share of the access network¹⁸. This is an important consideration because when using the Internet, the connection usually goes through the access network, which includes the NTT NGN. Ensuring an environment in which these networks can coexist requires an examination of interconnection rules related to the NTT NGN.

Working out interconnection rules for the NTT NGN leads to several possibilities. For example, when the IP-based network of a competing carrier connects to the said network, the following is possible.

- (i) By providing bandwidth and connection points according to competing-carrier needs, it is possible to rapidly deal with traffic increases on the network and thereby support smooth traffic flow on the Internet as a whole.
- (ii) It is possible to prevent discriminatory treatment when the competing carrier installs essential connection equipment in the dominant carrier's building and thereby enable all carriers to enjoy smooth content distribution via the NTT NGN.
- (iii) It is possible to ensure connections between the NTT NGN and IP-based networks of the competing carrier, and it is expected that cooperation among IP-based networks will lead to the development of various services (including end-to-end service control).

For this reason, it is necessary to examine interconnection rules for the NTT NGN.¹⁹

(2) Basic viewpoint on interconnection rules

As a precondition, interconnection rules need to ensure that the NTT NGN is open to other carriers and upper layer providers. At such time, the matters below require clarification.

- (a) Interconnection points and technological interface for connections
- (b) Connection cost (construction, software revision) and term
- (c) Interconnection charge method

In relation to this, the matters below required clarification.

2-1) Scope of openness

First, it is necessary to clarify the scope of openness (open access unit). Unlike a

¹⁸ At the end of FY 2006 (March 2007), NTT East/West had a 92.5% share of the regional communications market (subscriber line base). The optical fiber share was 78.9%.

¹⁹ The "New Competition Promotion Program 2010" launched in September 2006 to examine interconnection rules and related interconnection charges (access charges) for ensuring an environment in which competing carriers can use the NTT NGN without any delay to develop new commercial services.

traditional facility, it is possible for one NGN facility to have multiple functions and service delivery platform (SDP) controlled by software. Thus it is necessary to focus on function unbundling. Different from the strict unbundling rules placed on the traditional circuit-switching network, less stringent unbundling will ensure that the interconnection rules can effectively adapt to market conditions.

From a different angle, the unified functionality built in to the legacy network will be split into separate functions in the NGN. Specifically, the NGN has three layers: Access network, core network, and SDP. For this environment, NTT East/West has already stated their intention to provide an open network-network interface (NNI) and an open application service-network interface (SNI).

However, while bearing in mind function separation by layer, in addition to NNI and SNI, it is important to provide open interfaces between each layer and thereby enable the carrier not owning facilities to use the layer-2 connection, to pick and mix NGN functions as required, to freely build its own IP-based network, and to develop new businesses.

In relation to this, NGN-based QoS control is a SDP performed within the said carrier's network, not an end-to-end service. Thus it is important to examine how to ensure end-to-end services (e.g. QoS, security) when the NGN of the competing carrier connects to the NTT NGN.

For this reason, it is appropriate to take necessary measures to ensure open interfaces between layers and thereby enable the development of diverse services that meet user needs. These measures should be based on reasonable and objective criteria and take into account the opinions of NTT East/West and competing carriers.

The reorganization of NTT in 1999 ensured fair competition by splitting the regional communications operations (intra-prefectural with bottleneck facilities) and the long-distance communications operations (inter-prefectural) into distinct entities. However, the transition from circuit-switching to NTT NGN is gradually rendering the regional-long distance dichotomy meaningless. So while shining a light on the intent of NTT reorganization, it is important to reconsider whether the methods used to ensure fair competition requirements are appropriate. On this point, issues related to NTT

Group structure will be examined in 2010.²⁰

2-2) Calculation method for interconnection charges

Next, Article 33 of the Telecommunications Business Law states that the interconnection connection charge method will seek fair and reasonable rates based on the appropriate cost price under efficient management conditions.

However, NGN has an integrated service model that does not easily support metered connection charges. Thus it is necessary to examine charge methods that are compatible with IP-based characteristics.

Going forward, it is desirable to deepen the study by examining how to ensure compatibility between NTT NGN connection charges and ISP settlement methods.

2-3) Time required to interconnect

When examining interconnection rules, it is important to consider how to avoid problems that may occur between NTT East/West and competing carriers, all of whom are using the NTT NGN to provide services. For example, when for no good reason the said carrier cannot use the network, or when the said carrier cannot interconnect within a reasonable time. The viewpoint of fair competition requires certain rules for ensuring interconnection equivalence, including the time required to interconnect.

On this point, during a time of rapid technology innovation for the NGN, the carrier 1) faces issues that differ from those of a traditional network, 2) envisages the expansion of network functionality, and 3) expects to earn “first-to-market profits” for new services. For this reason, to ensure reasonable market conditions for the carrier, it is necessary to examine the situation from a new viewpoint that differs from traditional perspectives.

²⁰ The “Government Ruling Party Agreement on the Way Forward for Communications and Broadcasting” released on June 20, 2006 stated as follows: “From the viewpoint of achieving advanced and expensive information/communication services, it is important to provide fair competition rules for ensuring open networks. In addition, regarding NTT structure issues, it is important to clearly grasp broadband penetration conditions and NTT medium-term management strategy. NTT structure issues will be examined in 2010 after which conclusions will be drawn as soon as possible. “Based on that , the “Basic Policies for Economic and Fiscal Management and Structural Reform 2007” released on July 7, 2007 (Cabinet Decision) decided that communications and broadcasting reform should be promoted in accordance with “Government - Ruling Party Agreement on the Way Forward for Communications and Broadcasting” and with a view to global conditions.

(3) Examination matters going forward

Based on the approach above, it is appropriate for administrative authorities to initiate an examination of NTT-NGN interconnection rules in line with the “New Competition Promotion Program 2010.” At such time, it is important to consider the points below.

Because IPv6 has abundant addresses, assigning one to each device will contribute to ubiquitous computing and ensure network reliability. The global supply of IPv4 addresses will probably run out soon after 2010. Thus it is necessary to switch to IPv6 as soon as possible.

On the other hand, it is necessary to take into account the impact that transition to IPv6 has on the NTT NGN and ISP functions. Thus from the viewpoints of technology and competition rules, it is important to examine how to forestall anti-competitive effects caused by the transition to IPv6. ²¹

(4) Market monitoring function required

The NTT NGN requires openness on the service-network interface (including SDP function) and the network-network interface (with other carriers) according to the characteristics of each interface. As stated above, this functionality is not etched in stone at a certain point in time. Rather, it is added gradually to enhance network performance.

For this reason, it is necessary to periodically monitor the market and make revisions to interconnection rules according to competitive conditions. Therefore, it is appropriate to use the “competition safeguard system” (from FY 2007)²² to periodically verify whether the NGN environment is open and whether the scope of designated telecommunications facilities is sufficient.

In addition to this safeguard system, it is appropriate to take into account the study

²¹ The “Study Group on Internet's Smooth Transition to IPv6” (from 2007/08) is examining measures to address the limits of IPv4 and the smooth transition to IPv6. The group will summarize its findings in March 2008.

²² The “competition safeguard system” examines whether the scope of, or requirements for, designated communications facilities is appropriate. In addition, the system periodically inspects the frequent use of fair competition requirements with the NTT Group. In April 2007, administrative authorities released “Guidelines for operation of the competition safeguard system” and issued a request for comments (from July 2007). Authorities will summarize the RFC results by the end of FY 2007 and thereafter take necessary measures.

results of the “Next Generation Network Committee” (from 2006/02) hosted by the Telecommunications Carriers Association.

(5) Other matters for examination

Below are two other study issues related to the NGN. First, when NTT East/West plan to use the NGN to develop business beyond the regional telecommunications operation area, it is necessary to obtain approval in accordance with the business operations approval system stipulated in the NTT Law. In addition, it is important to adopt fair competition requirements based on the “Fair Competition Guidelines for NTT East/West Business Operation Scope Expansion” stipulated in the approval policy. The “Business Operations Approval Guidelines” were released in December 2001 and revised in July 2007.²³

In relation to this, in the past approval was obtained for the specific service unit and procedures to ensure fair competition requirements were adopted. For business operations approval related to the NTT NGN, as services are gradually added, it is important to consider the approach to bundling. So while shining a light on the spirit of the NTT Law²⁴, it is necessary to investigate the specific service unit and take necessary measures to satisfy fair competition requirements

Second, revisions to connection accounting system for designated telecommunications facilities are needed that respond to NGN construction conditions. Specifically, revision to facility-unit connection accounting is necessary because the NTT NGN does not have a traditional service-unit facility structure.

²³Taking into account services based on the NTT and fixed-mobile convergence services provided by NTT East/West and NTT DoCoMo, administrative authorities issued a request for comments (2007/06) in advance of revisions to the Business Service Scope Approval Guidelines. Based on these comments, revised guidelines were released in July 2007.

According to the guidelines, it is necessary to ensure that the NTT NGN does not obstruct fair competition in the telecommunications business sector. Thus, when developing new networks and services, they must not create a situation that, in effect, makes cooperation with other carriers impossible. Specifically, facilities on the transport and service layers of NTT East/West must be built and operated separately by each company.

²⁴ Article 1 (Section 2) of the NTT Law states [the purpose of NTT East/West is to have two companies for the management of regional telecommunications business operations. Article 2 (Section 3) states that to achieve this purpose, NTT East/West will manage regional communications business operations and associated operations. (Telecommunications business operations are work related to the installation of telecommunications equipment that can act as a medium for communication within a prefectural area without interference with the equipment of other telecommunications carriers.)

At such time, the integrated legacy network requires separation into an access network layer, a core network layer, and service authorization function layer. In addition, each layer requires an open interface. Thus when examining revisions, this NGN function separation needs to be reflected in the connection accounting (in particular, facility management accounting).

Administrative authorities will approach this examination from the viewpoint of ensuring a reasonable calculation method for connection charges and will make revisions to accounting regulations as soon as possible based on the results of the “Study Group on Accounting System in the Telecommunications Business.”²⁵

3. Dominant Carrier Regulations (“Designated Telecommunications Facilities” System)

As shown above, it is necessary to examine interconnection rules for the NTT NGN as soon as possible. Going forward, as IP-based networks and market integration continue to advance, it is also important to initiate specific revisions to dominant carrier regulations (“designated telecommunications facilities” system).

(1) Advance of IP-based networks and necessity of revisions to dominant carrier regulations (“designated telecommunications facilities” system)

Below is the basic approach to current dominant carrier regulations as stipulated in the Telecommunications Business Law.

- (i) The access network has two separate markets, each with its own characteristics. The fixed-line market has bottleneck facilities. The mobile market does not have bottlenecks; however, radio frequencies are a scarce, finite resource. Based on the Telecommunications Business Law, market boundaries are drawn a priori and each market is given different SMP identification criteria to pinpoint market power. (See *Fig. 13*)
- (ii) The fixed-line network and the mobile network have different characteristics.

²⁵ This study group aims to make necessary revisions to interconnection accounting and telecommunications business accounting (accounting by service) that can respond to changes in the IP-based network environment. The study group was launched November 2006 and released a draft report in August 2007. The final report will be ready in October 2007.

The draft report proposes revisions to 1) facility divisions related to connection accounting (arrange, eliminate, and combine), 2) expense allocations (transparency and reasonable criteria), 3) depreciation expenses (economic life calculation), 4) transparency in transactions with subsidiaries (understanding outsourcing efficiency and disclosing outsourcing conditions).

Thus dominant carrier regulations and related application methods for each market also differ. Specifically, the fixed-line market has a one-stage mechanism that applies identification of market power, bottleneck access obligations, conduct regulations²⁶, and service regulations²⁷. In contrast, the mobile market, which has no access obligations even when market power is identified, has a two-stage mechanism²⁸ that takes into account differences between the identification criteria and the application criteria for conduct regulations.

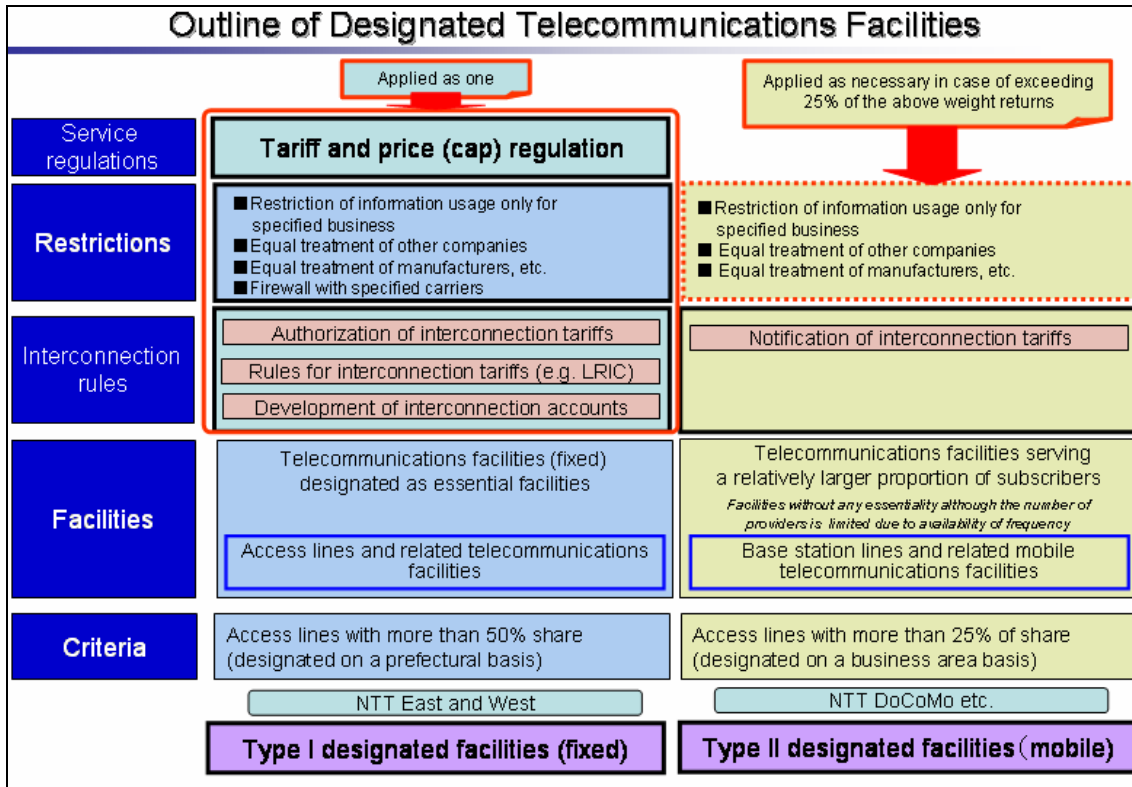
However, with the development of IP-based networks shifting into high gear, it is necessary to make revisions to the said system that makes a priori distinctions between fixed line market and mobile market. The reasons for this are condensed into the three points below.

²⁶ Article 30, Section 3 of the Telecommunications Business Law stipulates three conduct regulations that are applicable to the dominant carrier. 1) Use or provision of information about other carrier or its users, which was obtained through connection operations with the facilities of the said other carrier, for purposes other than the said operations. 2) In providing telecommunications operations, unduly give favorable treatment or advantage, or unduly give unfavorable treatment or disadvantage. 3) Unduly order or interfere with the business operations of the other carrier, or the manufacturer or the distributor of the telecommunications facility.

²⁷ When the carrier of Type I designated telecommunications facilities uses said facilities to provide telecommunications services and when the other carrier cannot sufficiently provide telecommunications services as an alternative to said telecommunications services, it is necessary to decide on a guaranteed contract agreement for charges and other service conditions related to the said services (Article 20, Paragraph 1, Telecommunications Business Law). Specifically, “designated telecommunications service” includes voice transmission services, and B FLET’S, and others.

²⁸ When the handset share of the mobile carrier within its operation area exceeds 25%, administrative authorities will specify the transmission facilities installed by the said carrier as Type II designated telecommunications facilities. In addition, when the earnings share of the carrier that installed said facilities exceeds 25%, said authorities will designate the said carrier as a separate case and apply conduct regulations.

Fig. 13



1) Review required in accordance with market integration

As already shown in Chapter 1, the broadband sector is experiencing both horizontal and vertical forms of market integration. To respond to this integration, it has become necessary to make revisions to dominant carrier regulations.

First, under horizontal market integration, service distinctions (i.e. voice, data, and video) and communication model distinctions (i.e. fixed line and mobile) are gradually losing their significance. New services are appearing that are not bound by traditional market distinctions. For example, fixed-mobile convergence (FMC) achieves services that combine fixed-line communications and mobile communications.

In the case of FMC, there is concern that a dominant fixed-line carrier may collaborate with a dominant mobile carrier to exercise combined market power, or a dominant fixed-line carrier may abuse its market power in the mobile market. So, when the market is integrating horizontally, the traditional framework for market division may

not provide sufficient flexibility. Therefore, it is necessary to make revisions in dominant regulations.

Next, under vertical market integration the dominant carrier may adopt a vertical integration business model. In such case, the said carrier may abuse market power of the communication layer (physical layer and communications service layer) at the upper layer, which in turn may result in impediments to fair competition on the upper layer. For this reason, it is necessary to look beyond the communication layer on which traditional dominant carrier regulations targeted, and to reexamine dominant carrier regulations that can respond to vertical market integration, including the platform layer.

That is, it is important for the mechanism to provide 1) market demarcation that responds to vertical integration and 2) market power identification capability, and thereby to enable dominant carrier regulations according to market conditions.

2) System maintenance

Next, there is a growing need to reorganize dominant carrier regulations and related rules and to perform methodical system maintenance.

Fair competition requirements, which are frequently used to deal with the NTT Group, have been established to guarantee the efficacy of structural separation measures. These measures, in turn, are taken to ensure fair competition. Similarly, approval conditions have been appended to the business operations approval system as criteria to guarantee that NTT East/West operations 1) do not interfere with the smooth execution of “original operations” and 2) do not interfere with the maintenance of fair competition in the telecommunications business. “Original operations” refer to regional communications operations as stipulated in the NTT Law.

In either case, the purpose is to supplement dominant carrier regulations that are based on the Telecommunications Business Law (general rules) by using provisions that have already been established to ensure fair competition in the telecommunications business.

For example, suppose the dominant carrier has a capital relationship with another carrier. Under the Telecommunications Business Law, rules are maintained to prevent

abuse of market power based on this collaboration. By repeated application of fair competition requirements, it will be possible to methodically improve the general rules and the system for ensuring fair and effective competition.

3) Revisions to respond to advance of IP-based networks

The big changes in market conditions and network structure brought on by the advance of IP-based networks have gradually begun to surface. To quickly respond to these changes, it is necessary to take into account subscriber lines and related telecommunications facilities that are designated as bottlenecks under the current framework. As the fixed-line market and the mobile market continue to integrate, it is advisable to re-inspect bottleneck conditions and to make revisions to the scope of facilities for those facilities that have been permitted to integrate with the access network.

On top of that, as a requirement to guarantee an open access network, exclusion from designation is an option for the facility that has continued to not accept a bottleneck or integration. It is important to use a flexible approach when applying dominant carrier regulations.

(2) Telecommunications Business Law and Antimonopoly Law

For revisions to dominant carrier regulations, it is important to sufficiently consider the relationship between the “Anti-Monopoly Law” and the “Telecommunications Business Law” and to achieve organic coordination between them.

Looking at the Anti-Monopoly Law, in the case of an act that impedes competition, a certain transaction sector (market) boundary is drawn based on the said case. When substantial restrictions to competition are recognized (formation, maintenance, strengthening of market power), fair and free competition is ensured through ex post removal of the said restrictions. The situation is different in the case of business combination. Prior to affiliation, each factor that influences competition in each transaction sector is analyzed to discover whether the said combination would cause substantial restrictions to competition.

In contrast, dominant carrier regulations in the Telecommunications Business Law must take into account a number of market-specific characteristics such as: 1) The

network facility sector is highly oligopolistic. 2) The network lock-in effect and the customer lock-in effect are strong. 3) Bottlenecks exist on access networks. 4) Information asynchronicities between the carrier owning bottleneck facilities and the carrier not owning facilities may create impediments to competition. 5) Market oligopoly is accepted because radio frequencies are a limited resource. Based on this background, once future potential for abuse of market power is identified, dominant carrier regulations are applied.

For this reason, the said laws ensure fair competition in the telecommunications market from slightly different policy viewpoints. On this point, joint guidelines are used to ensure organic cooperation between the said laws.²⁹

When examining revisions to dominant carrier regulations in the Telecommunications Business Law, to enable a flexible response to changes in market structure, it is appropriate to consider both Anti-Monopoly Law methods (e.g. market demarcation, market power identification) and the intent of the Telecommunications Business Law, and thereby to achieve as much coherence as possible between the said laws.

(3) Basic approach to identification of market power

1) Basic viewpoint

Under the current system, each market has its own mechanism to identify market power. Each mechanism is applied independently after legal a priori demarcation of the fixed-line market and the mobile market.

With the advance of structural changes brought on by market integration, while taking into account the current system framework focused on market characteristics in the telecommunications sector, it is appropriate to shift to a new framework that enables active market demarcation and identification of market power based on these boundaries. In case an entity is identified as having market power, it is necessary to recognize the potential of using the said power to impede fair and effective competition and then to apply certain rules.

In general, the identification of market power recognizes two types. In the first the

²⁹ Source: "Policy to Promote Competition in the Telecommunications Business Sector," MIC-JFTC (November 2001).

carrier has been identified as the owner of bottleneck facilities. In the second the carrier does not own bottleneck facilities, but operates in a market with oligopolistic characteristics.³⁰ For example, the oligopoly may exist because radio frequencies are a scarce, finite resource.

2) Identification criteria for market power

As stated above, the current market power identification criteria differ depending on the market. For the fixed-line market, identification is based on whether the carrier owns a bottleneck. For the mobile market, identification is based on market characteristics, not whether a bottleneck exists.

The market power identification criterion in the fixed-line market (bottleneck-based market power) is based on a threshold value of 50% for subscriber line share. For the identification of bottlenecks on the communication layer, the subscriber line share mechanism provides a clear benchmark that is appropriate to retain for the moment.

On the other hand, in the mobile market that has scarce, finite radio frequencies resources (but no bottlenecks), the criterion is based on a threshold value of 25% for both mobile handset share and sales share within the business operation area of each carrier. The application of conduct regulations is based not only on per annum market share, but on time series factors such as share transition and share ranking³¹. So even if

³⁰ These two types comply with “Specific Commitments of Japan” and “Definitions and Rules related to Regulation Framework for Basic Telecommunications Services” stipulated in the “General Agreement on Trade in Services” (GATS) treaty of the World Trade Organization (WTO). The provisions clearly state the conditions that must be satisfied to identify significant market power in a main service carrier: 1) Control over essential facilities and 2) Use of market position.

³¹ Of the carriers that establish Type II designated telecommunications facilities, the issue of designation in relation to the carrier that is subject to conduct regulations was discussed and the “Basic approach to the designation of Type II carrier (carrier with market power in the mobile communications sector) subject to conduct regulations in accordance with the Article 37-2, Paragraph 1, Telecommunications Business Law” was released in April 2004.

(i) In case the carrier has rank 1 in market share and has a high market share over 40% for a certain continuous period, designation is applied.

(ii) In case of multiple carriers that each have market share over 25% for a certain continuous period, if the said carriers are in the same business operation area and the difference between said market shares is small, designation of said carriers is applied. (This excludes the case in which each carrier (3 or 4) in a specified business operation area has an equal market share that is stable and continuous, and, in consideration of various factors (stated below), there is no cause to fear abuse of market power.)

(iii) Even in case the carrier has a market share over 25%, if the said carrier’s share is

the threshold values are exceeded at a specified point in time, the mechanism does not immediately determine that market power exists.

This mechanism enables a more flexible approach to market power identification than a rigid system operation based only on per annum share. It is also necessary to consider the spirit of the dominant carrier regulations, which is to decide on how to apply necessary rules after identifying whether market power exists. Thus, different from bottleneck-based identification of market power, it is appropriate to have a mechanism that can provide a comprehensive judgment based on — in addition to analysis of market share — market concentration³², market transparency, carrier switching cost, level of vertical market integration, and other qualitative/quantitative factors.

For the identification of market power, from the viewpoint above it is suitable to examine how to give full play to competition assessment results as a supplementary resource³³. The assessment results incorporate quantitative criteria (e.g. facility share,

rank 2 or below and the difference in market share between rank 1 and rank 2 is large, consideration will be given to share variation conditions and designation will be withheld. (iv) In case the carrier that always has a market share under 25% temporarily has a market share above 25%, the situation is watched closely and immediate designation is withheld. (For the carrier that has a market share over 25%, in case the said share suddenly falls below 25% for a short term, or the relative market share over several years falls, the situation is watched closely and immediate designation is withheld, or designation is removed.)

In relation to said cases, other specific cases may occur in which it is difficult to determine whether designation is applicable. For these cases (stated below), a comprehensive judgment will be made based on a measurement of factors for understanding the overall business capability of the said carrier. Factors that may require consideration relate to 1) business scale, market influence, and brand strength; 2) diversity in products and services; 3) absence of potential competition; 4) superiority and excellence based on technology; 5) substitution possibility of supply and demand, price elasticity; and 6) presence of complaints.

The judgment on whether market power exists is based on market share. Because this system examines the business operation area of each carrier, the judgment conforms to the relevant area.

³² Aggregate share for the top ranked companies (3 to 5) or the Herfindahl-Hirschman Index (HHI) are used to indicate the degree of market concentration.

³³ The EU uses the “Market Analysis and SMP Designation Guidelines.” In case of market share over 50%, the carrier is designated as having SMP, unless there are exceptional conditions. In case of market share over 40%, the carrier is designated having normal market power. And in case of market share below 25%, the carrier is designated as not having market power. In the other hand, the Japan Anti-Monopoly Law states that one market structure requirement for a monopolistic situation is a case in which the carrier in a certain business sector has the top rank with market share over 50% or two carriers have rank 1 and rank 2 with an aggregate market share over 75%.

HHI is an index for market concentration. For example, according to “EU Horizontal Merger Guidelines,” in case the HHI index is below 1,000 after a merger, often there is no

market share) for setting threshold values and other qualitative/quantitative factors. Specifically, when identifying market power, a two-stage threshold is established. In case the carrier exceeds the upper threshold, it is immediately identified as a market power. In case the carrier is between two threshold values, it is positioned as a potential market power and a competition assessment is added that takes into account qualitative and quantitative factors. This comprehensive judgment enables a conclusive identification of market power. Going forward it is appropriate to examine this type of mechanism.

(4) Preventing abuse of multi-market power

1) Basic approach

As horizontal and vertical market integration continues to develop along with service convergence and integration, multiple markets can connect with each other more closely. With these changes in market environment, it is appropriate to perform necessary system maintenance as a basic course of action. As stated above, provide a mechanism that enables active market demarcation based on objective criteria and identification of market power based on these boundaries. Also, provide a mechanism to prevent joint abuse of market power by the dominant carrier and the carrier having capital relationship with dominant carrier.

At such time, unlike before when it was not thought possible to abuse market power at the same time between the fixed-line market and the mobile market, new characteristics exist that are clearly different from traditional market features. Two possibilities are envisaged. In one case, the dominant carrier leverages its market power in a neighboring market³⁴. In another case, the dominant carrier and another

investigation.

The US Fair Trade Commission (Department of Justice) states that in case the HHI value is below 1000, there is no concentration. A value above 1,000 and below 1,800 indicates moderate concentration. In case the value is 1,800 or above, there is high concentration.

In March 2007, the Japan Fair Trade Commission released the revised "Guidelines to Application of the Antimonopoly Law in relation to Review of Business Combination." The Guidelines state that in case the HHI value after business combination is 1,500 or below, there is normally thought to be no substantial restrictions to competition. A value of 2,500 or below (and market share is 35% or below) normally indicates a small fear of substantial restrictions to competition.

³⁴ The EU Regulatory Framework for electronic communications has one instruction that states in case the carrier has significant market power (SMP) in a specified market and the said carrier tries to use its said SMP as leverage to strengthen its SMP in a neighboring market, the said carrier is considered to have SMP in both the said market and the

carrier enter into a capital relationship. This combination is then used to abuse market power in multiple markets (or in one market).

Such abuse of dominance across multiple markets is not a problem limited to the fixed-line market and the mobile market. Because of convergence and collaboration between communications and broadcasting that accompanies the advance of market integration, even more cases may occur that require investigation. However, the current framework on dominant regulations does not envisage identification of market power in the case of multi-market abuse. For this reason, it is appropriate to combine revision of the said framework with the reorganization of repeated fair competition requirements related to the NTT Group.

In addition, the carrier may develop business in multiple markets. In such case, suppose the said carrier has been identified as a market power and the possibility to abuse market power in multiple markets has been recognized. Then if the said carrier does not maintain centrally managed security measures (firewall) for the entire organization, it may not be able to ensure fair and effective competition.

For this reason, from the viewpoint of accounting system, it is important to take necessary measures to prevent cross-subsidization from other markets. At the same time, it is important to examine the need for an organization-wide firewall.

2) Preventing abuse of horizontal market power

Market integration on the communication layer creates the possibility of abuse of market power by the dominant carrier. Thus a framework is needed that can handle this possibility. As fixed-mobile convergence advances in stages, initially integrated services based on FMC will lead the advance. After that, integration will spread to other markets, including the transmission network and services provided on this layer.

Thus, for the moment, it is appropriate to adopt fair competition requirements based on the current framework³⁵. However, for the next stage of partial market integration

neighboring market (Article 14, Paragraph 3). Thus the Framework uses an SMP leverage concept.

³⁵For example, the Business Scope Approval Guidelines (Article 2-5) state the following about FMC service provided through collaboration between NTT East/West and NTT DoCoMo. The transmission facilities, exchange facilities, and facilities with charge,

(overlap in FMC and other services), it is appropriate to deepen examination of whether to use the multiple approaches below.

(i) First, demarcate the said market as a partial market in the fixed-line market or in the mobile market. Then identify market power in the said partial market and apply rules directly to the said market.

(ii) Conduct a competition assessment of the said market by investigating whether leverage originates from the fixed-line market or the mobile market. Based on the results, apply appropriate conduct regulations against the dominant carrier in the fixed-line market or in the mobile market.

At such time, it is advisable to take into account qualitative/quantitative analysis in the competition assessment and not rely on a single meaning of market power based on threshold values for market share.

As market integration advances to the next stage, it is possible that multiple dominant carriers with capital relationships within the same market will surface and wield joint market power. Thus it is necessary to examine revisions to the current “carrier having special relations” system. (Refer to Section 4 “Other important matters to consider.”)

3) Preventing abuse of vertical market power

Going forward, as the vertical integration model becomes mainstream, it is necessary to examine a framework to ensure fair competition by preventing abuse of market power across layers. Specifically, examination is required from the two viewpoints below.

First, it is necessary to examine the possibility of abuse of market power from the communication layer to the upper layer. For example, suppose there is a possibility that the market power of the dominant carrier with bottleneck facilities can extend to the upper layer. To ensure fair competition in an environment that includes vertical integration, as the need arises, it is necessary to strive for openness in platform functions that are united with bottleneck facilities.

authentication, and service control are built and operated separately from NTT DoCoMo. Thus in principle, even in under difficult conditions, these facilities will not be for common use with NTT DoCoMo (independent facility construction). In addition, NTT East/West will not enter into exclusive business collaboration with NTT DoCoMo (collaboration prohibition).

In relation to this, abuse of market power is also possible from the upper layer to the communication layer. However, dominant carrier regulations in the Telecommunications Business Law always adopt the viewpoint of preventing abuse of market power on, or originating from, the communication layer. On the other hand, abuse of market power from the upper layer to the communication layer is also a possibility. In such case, as long as the upper-layer carrier is not a telecommunications carrier, application of the Antimonopoly Law (general rules) is possible. In addition, responding to convergence and collaboration between communications and broadcasting requires comprehensive investigation from the legal system's perspective.

Second, while bearing in mind the provisions stipulated in Article 30, Paragraph 3 of the Law³⁶, it is necessary to re-examine the possibility of abuse of market power from the communications layer to the lower layer (terminal manufacture, business outsourcing). When the carrier and a subsidiary engage in business as a single entity, it is possible to abuse market power from the communication layer to the lower layer. Thus, measures are required to ensure fair competition between these layers.³⁷ In this case, two approaches are possible:

- (i) Apply certain rules to prevent the exercise of market power by the said carrier.
- (ii) Identify the joint market power of the said carrier and subsidiary.

This case differs from the one in the previous section, which discusses the prevention of abuse of horizontal market power. For vertical market power, it is important to consider that the subsidiary may or may not be a telecommunications carrier. Going forward, as specific system designs take shape, it is appropriate to carefully compare each one.

4) Other important matters to consider

When examining how to identify multiple market power (as stated above), it is appropriate to establish a fair-competition mechanism to prevent joint abuse of market power by the dominant carrier and the entity having capital relationship with dominant carrier.

At such time, it is also necessary to investigate the framework from the viewpoint of ensuring compatibility with repeated fair competition requirements related to the NTT

³⁶ Refer to Footnote 29.

³⁷ As the need arises, it is also appropriate to examine similar competition worries about the possibility of abuse of market power from the communication layer to the upper layer.

Group. Basically, the requirements are applied to the carrier having capital relationship with dominant carrier and are designed to prevent leveraging power in multiple markets. For this reason, in case these requirements are incorporated into the Telecommunications Business Law as general rules, it is necessary to readjust the entire framework together with the “carrier having special relations” system.

The “carrier having special relations” system is a set of security measures³⁸. For example, suppose the carrier having capital relationship with NTT East/West and the competing carrier connect to bottleneck facilities owned by NTT East/West. In such case, the security measures (firewall) ensure fair competition between the said carrier and the competing carrier. On this point, in contrast to fair competition requirements to prevent joint market power, the firewall enables a system design that takes into account limited and specific policy objectives.

Therefore, when designing a system to prevent abuse of joint market power, it is not appropriate to limit the examination to within the framework of the “carrier having special relations” system. Rather, to deal with the dominant carrier, what is needed is a comprehensive investigation to select general business rules that can be used in a mechanism to ensure fair competition.

(5) Application of dominant carrier regulations

As stated above, when identifying market power, there may or may not be a bottleneck. Regulations that distinguish between the two cases are applied. However, it is

³⁸ The "carrier having special relations" system (Article 31, Paragraphs 1 and 2) stipulates the following conduct rules. From the point of view of ensuring fair competition, the telecommunications carrier (NTT East/West) that installs Type I designated telecommunications facilities will observe the following. 1) The said carrier's officers will not concurrently be officers of the carrier having special relations. 2) In relation to interconnection and peripheral operations related to telecommunications business operations, the said carrier will not discriminate against the carrier having special relations and other carriers. Of the parent and subsidiary companies (said carrier), the Minister of Internal Affairs and Communications has designated NTT Communications as a “carrier having special relations” (MIC Notification, 2002). Regulation 2) includes two other provisions. (a) The said carrier will not give unfair treatment in installation and maintenance of telecommunications facilities necessary for interconnection with Type I designated telecommunications facilities, usage of land and buildings, and provision of information. (b) The said carrier will not give unfair treatment in intermediation, commission, and procuration of conclusion of contract concerning provision of telecommunications service, or business operations entrustment from other telecommunications carrier.

reasonable to maintain the basic framework by continuously inspecting how the regulations are applied. When making revisions to the dominant carrier regulations, it is necessary to include the three points below.

1) Relation between retail market and wholesale market (business transaction market)

To prevent abuse of market power caused by ownership of bottleneck facilities, for current Type I designated telecommunications facilities, a fictional demarcation between the facility management divisions (install and manage bottleneck facilities) and the facility usage division (use facilities to provide service) is drawn. It is envisaged that the facility usage division and the competing carrier can use the bottleneck facilities under the same conditions. The current interconnection accounting system is composed of these two divisions. The concept of equivalence with the competing carrier is also used in the “carrier having special relations” system.

For this reason, the wholesale market is focused on the facility management division (business transaction market) and the retail market is focused on the facility usage division. It is also worth examining the distinction approach in the application of regulations.

In the current system, to ensure fair competition in the wholesale market that is focused on the facility management division (business transaction market), access obligations (interconnection rules) are applied to the bottleneck facilities. On the other hand, to ensure fair competition in the retail market that is focused on the facility usage division, conduct regulations are applied. In addition, the “designated telecommunications service” system applies retail service regulations to prevent abuse of market power caused by bottlenecks.

For example, suppose the interconnection rules in the wholesale market operate effectively, which in turn leads to effective competition in the retail market. In such case, in the “designated telecommunications service” framework, as the market share declines, the said regulations will no longer be applied.³⁹ On the other hand, the

³⁹ In the “designated telecommunications service” system, the market share and other factors are all taken into account and used to decide on whether to apply the regulations. As stated above, while examining the “identification criteria for market power,” it is advisable to also investigate the use of the competition assessment in the “designated telecommunications service” system.

conduct regulations will continue to be applied.

On this point, in case effective competition is achieved in the retail market, it is worth examining whether the conduct regulations still need to be applied. The dominant carrier is always subject to the fictional division between the facility management division and the facility usage division. However, as an organization under centralized management, it may not be subject to conduct regulations. Thus a careful examination is required to understand whether this exemption causes problems.

Under the current framework, the wholesale market and the retail market are under centralized management. The competition assessment analyzes market characteristics even further, which contributes to the examination stated above.

2) Flexibility in revisions to scope of designated telecommunications facilities

When making revisions to dominant carrier regulations, it is appropriate to give full play to the competition assessment stated above and to periodically examine the scope of designated telecommunications facilities. To respond to market conditions and changes in network structure — as well as to the scope of designated telecommunications facilities — as a requirement to guarantee an open access network, exclusion from the designation process is an option for the facility that has continued to not accept its necessity. It is important to use a flexible approach when applying dominant carrier regulations.

3) Re-inspect conduct regulations in response to advance of IP-based networks

Under current conduct regulations, unfair discrimination treatment by the dominant carrier is prohibited. The conduct regulations and specific cases are clearly stated in the joint guidelines. However, guidelines do not have enough specific case studies that bear in mind IP-based networks. Therefore, it is necessary to first re-inspect specific cases in conduct regulations that can respond to the advance of IP-based networks. Next, from the viewpoint of network neutrality, it is important to examine the relation between the upper layer and the lower layer.

Below are specific examples.

- (i) Ensure that the carrier does not assign priority bandwidth to transmission packets

of users who access the website of the content provider having capital relationship with the carrier and of the carrier's own users. The carrier does not use indirect routing, or bit discrimination, for access to the website of other providers having no specified relation with the carrier.

(ii) Ensure that the carrier does not detect the ports used by a specified application and disable the said ports so that the said application cannot operate (port blocking).

It is believed that these will ensure the healthy development of both NGNs and the Internet. For this reason, from the viewpoint of ensuring future network neutrality, it is necessary to reexamine how to model various types of unfair discrimination acts.

In the examples above, measures should be taken in response to social needs such as to prevent 1) spam mail, 2) burst traffic, and 3) information leakage from using P2P file-sharing software. Except for cases like these, the examination should focus on anti-competitive conduct in relation to economic activity.

(6) System maintenance for revision of dominant carrier regulations

1) Basic direction in system review

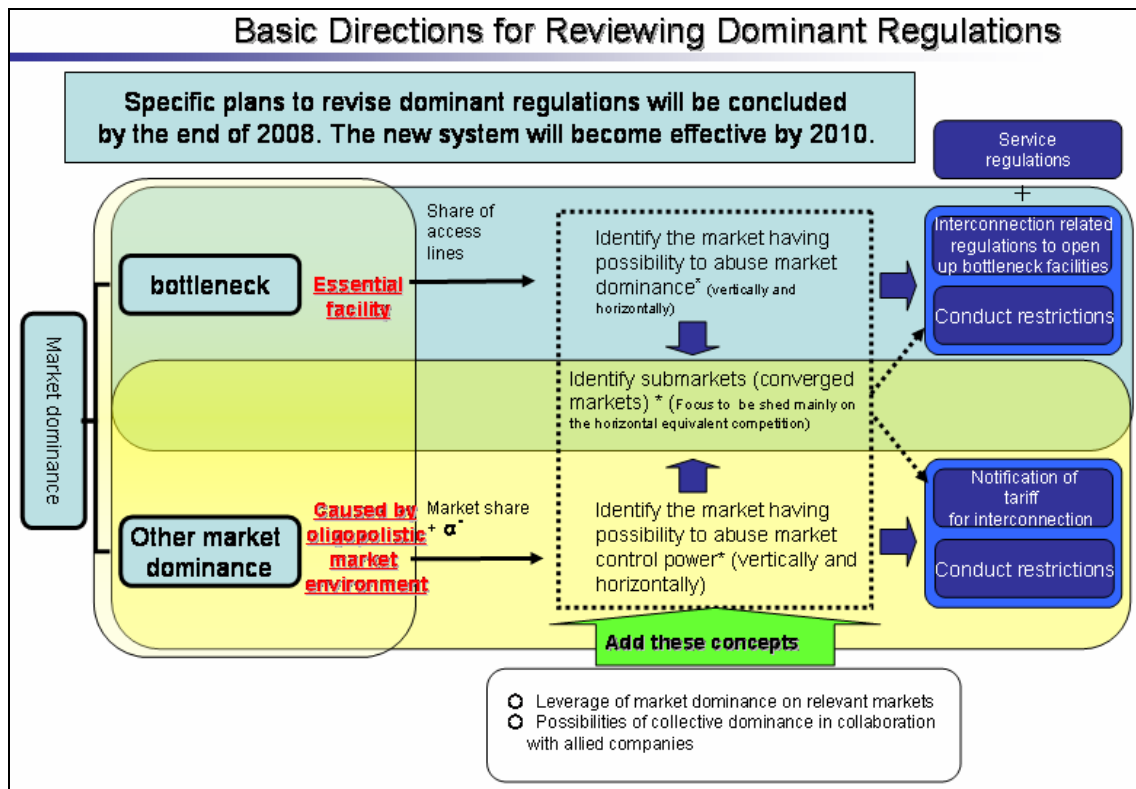
As stated above, when making revisions to dominant carrier regulations ("designated telecommunications facilities" system), it is necessary to rebuild the system as a comprehensive framework. While continuing to focus on market characteristics in the telecom sector, the new framework will incorporate market demarcation to respond to integration trends and identification of market power to prevent abuse of dominance based on collaboration between the dominant carrier and the carrier having capital relationship with dominant carrier.

The identification of market power recognizes two types. In the first, the carrier is identified as the owner of bottleneck facilities. In the second, the carrier not owning bottleneck facilities, but the market has oligopolistic characteristics. It is appropriate to establish identification criteria based on these types.

For example, when identifying market power, a two-stage threshold can be established. In case the carrier exceeds the upper threshold value, it is immediately identified as a market power. In case the carrier is between two threshold values, a competition

assessment is conducted to enable a comprehensive judgment on the presence of market power. The competition assessment takes into account qualitative and quantitative factors. (See *Fig. 14*)

Fig. 14



The mechanism includes active market demarcation based on objective criteria and identification of multi-market power. A market assessment identifies whether there is a risk of leveraging power in a neighboring market and whether joint market power exists. In case market power is identified, it is appropriate to take necessary measures to ensure that conduct regulations are applied to the dominant carrier. In case the judgment identifies the emergence of a partial market (overlap), it is worth examining whether to apply certain dominant carrier regulations.

For this framework, it is also necessary to examine how to implement active market demarcation. Basically, market divisions are based on a qualitative judgment of substitutability of service demand. To support this judgment, it is appropriate to use competition assessment results, which are based on the qualitative/quantitative analysis of market factors.

When demarcating the market, it is important to consider two points.

(i) Achieving active market demarcation requires revisions to the current mechanism in which uniform divisions are made based on the law. The basic requirements for identification of market power need to be stipulated by law. Thus it is appropriate to examine a system framework that stipulates specific market demarcation based on subordinate laws.

(ii) If the competition assessment is used in association with dominant regulations, it will be effectively applied to market demarcation and identification of market power. If used in association with conduct regulations, it will be effectively applied to inspection for ensuring suitable fair competition requirements. Thus it is appropriate to adopt these measures based on related laws or operation guidelines.

2) Strengthening market monitoring function

As state above, the MIC introduced the “competition safeguard system” in 2007 to periodically review (once a year) the scope of designated telecommunications facilities and to inspect repeated fair competition requirements related to the NTT Group⁴⁰.

To review dominant carrier regulations and to prepare for the new system, it is necessary to combine the competition assessment system and the competition safeguard system. For the new competition assessment system (once each year), it is advisable to periodically implement the following series of measures. (a) Assess market demarcation and degree of market competition (measure effect of competition policy). (b) Based on this assessment, inspect the scope of designated telecommunications facilities. (c) Identify/remove the market power obligation (as the need arises). (d) Examine new competition promotions.

To ensure transparency in the combined “competition assessment and safeguards” system, it is appropriate to take into account opinions and feedback from each related side. In addition, the “competition assessment and safeguards” needs to be a mechanism that can periodically inspect the applicability of dominant carrier regulations and that can quickly remove regulations that have lost their purpose.

⁴⁰ Refer to Footnote 23.

Chapter IV Other Topics on Network neutrality

1. Topics on Fairness in Network Use

(1) Promoting access network diversity

Establishing fairness in network use requires diversity in access networks. Achieving diversity in turn is expected to enhance the freedom to select the network of choice. Specifically, diversity is expected to expand transmission bandwidth and improve the possibility to switch between operators (dominance drops) as a result of more access services (substitutability increases).

Regardless of whether the network is wired or wireless, diversity in access networks cannot be accomplished without the smooth introduction of new technology. Thus it is appropriate to examine various measures to promote more access networks including the following. (a) Constantly monitor whether the competing carrier has smooth access to utility poles and conduits. (b) Support local government in efforts to build new networks and promote open access to these networks. (c) Introduce broadband wireless access (BWA) systems.

When increasing diversity in access networks, it is important to consider the influence that switching cost has on market competition and the customer switch rate. The switching cost is the time and money required to change service from the dominant carrier to another carrier.

(2) Revising legal structure to respond to new business models

In recent years, consumer generated content (CGC) has emerged as a Web business model. Initially the CGC site offers its service for free. This strategy enables the discovery of users who value the site's service. As the number of users increases so does the content because the users themselves generate it. As the site wins over more users, a viable modus operandi is gradually established.

The advertising model is based on covering business costs by selling ad space (separate user of service and payment of service). Other models include community wireless LAN, partial viability (with a few successful services).

With many of the new models, it is difficult to judge their viability. To respond to the new IP-based business models, it is necessary to make revisions to the concept of viability under the Telecommunications Business Law and the division of roles between the TBL and the Wired Telecommunications Law (WTL). To ensure free competition, it is important to examine how to deal with new business models as they appear.

At such time, the examination needs to consider differences in the legislative intent of each law. The main objective of the WTL is to ensure network safety. On the other hand, the TBL takes into account the fact that a viable service is like a public service used by a large number of the general public. Thus the TBL incorporates administrative measures for ensuring the suitability and soundness of these business services.

The advance of IP-based networks is accompanied by convergence and collaboration between communications and broadcasting. Thus the examination needs to bear in mind that market integration is redrawing traditional demarcation lines in communications. The “Study Group on a Comprehensive Legal System for Communications and Broadcasting” is examining a new legal framework that can respond to the convergence of communications and broadcasting. The study group will release a final report by the end of 2007⁴¹. While ensuring legal consistency and network neutrality, it is appropriate to design an extensible framework that can maintain openness between the layers in communications-broadcasting convergence legislation.

(3) Ensuring openness in platforms

The NTT NGN incorporates various controls including quality assurance, online presence information, and session data. The mobile network operator (MNO) also manages presence information and user IDs. In a broad sense, these platform-specific functions enable the creation of new business.

In particular, with the advance of ubiquitous computing, open mobile platforms enable

⁴¹ The “Study Group on a Comprehensive Legal System for Communications and Broadcasting” released an interim report in June 2007 and made a request for comments. The final report will be released by year’s end and be used by the MIC Information and Communications Council as the basis for discussions on a comprehensive legal system for communications-broadcasting. A bill is expected to be submitted to the regular Diet session in 2010.

the development of various new applications for mobile handsets. In addition, the advance of NGN and fixed mobile convergence (FMC) is expected to achieve a seamless communication environment between fixed and mobile networks. Platform functions in this environment can then be used to create new business opportunities⁴².

To ensure the openness of platform functions, including those for fixed-line business and mobile business, it is appropriate 1) to conduct a competition assessment for understanding market conditions, 2) to conduct a detailed phase-2 examination on network neutrality⁴³, and then 3) to develop specific policy.

(4) Borderless Internet and identification of market power

For fairness in network use it is important to ensure freedom of network choice in an environment where the NGN and the Internet coexist. Thus it is also necessary to examine revisions to NGN interconnection rules and the “designated telecommunications facilities” system.

However, while the content application layer undergoes borderless development of business, the communication layer faces growth restrictions from the physical nature of network facilities in each country. In such case, when examining competition policy it may be necessary to take into account differences in market characteristics between the upper layer and the lower layer. Traditional competition policy based on analysis of the domestic market alone may not work for the upper layer because there is a network effect on the borderless market as a whole (no geographical restriction).

In such case, when identifying market power, it is also important to consider differences in geographical restrictions between layers and the impact on the scope of market demarcation. Currently, this issue does not cause a direct problem in competition policy. However, in the future, when taking measures to ensure fair competition in the broadband market, this issue will become very important.

⁴² The “Mobile Business Study Group Report” (September 2007) states that importance of strengthening cooperation between platform functionality. Items for examination include user IDs, “push” type information delivery function, and positioning information.

⁴³ The “New Competition Promotion Program 2010” (September 2006, revised in October 2007) says the working group on network neutrality will released its first report in the summer of 2007 followed by the final report to be released by the end of 2008.

2. Improving User Protections

With the advance of broadband and IP-based networks, providing a safe and secure use environment requires various security policies, including anti-spam measures, privacy protection measures, measures against illegal and harmful content, and response to cyber attacks. Efforts to ensure high reliability of the network environment as social infrastructure are being carried out by the cooperation of government, industry, and academia.

However, to ensure network neutrality, maximize the Internet's inherent conveniences for users, and accelerate the Internet growth model (virtuous cycle) will require an even wider policy examination for protecting internet users.

In particular, promoting end-to-end communication involves the participation of diverse stakeholders. For example, it is not easy to guarantee end-to-end QoS service. If quality declines at a specific point on the path, the entire QoS is affected. Thus it is necessary to examine how to identify these types of disadvantages to users. In particular, when a problem service occurs, the user with low information literacy may not understand who to contact and whether it is appropriate to lodge a complaint. Thus from the viewpoint of user protection, it is necessary to develop policy even further.

For this reason, it is necessary to examine the measures below more deeply. First, for a financial service it is very important to take into account customer knowledge, experience, and assets. Thus there is "suitability rule" obligation designed to protect the user. Going forward, while bearing in mind user conditions and the victims of telecom services, it is appropriate to make a specific examination of user protection rules in the telecommunications business.

Over the years, broadband service charge plans have become extremely complex and difficult for most people to understand. For example, the British Office of Communications (Ofcom) established a suitability standard for a price comparison scheme. A website offering a price comparison service that applies for and receives accreditation is permitted to display a special logo mark. This scheme guarantees to the user the suitability of the price comparison calculator. While using such schemes as a reference, going forward it is appropriate for administrative authorities to examine the introduction of an accreditation system for price comparison services.

3. Terminal Policy Review

Ensuring fairness in network use requires steady effort to revise terminal policy. As pointed out in Chapter 1, the advance of distributed intelligence on the Internet is creating a pressing need for major revision on what a terminal function should be and what the terminal concept is. More than a communication device, the terminal will perform many of the controls essential to the ubiquitous network.

For terminal policy to respond to the advance of IP-based networks, the terminal must support three essential functions: Connectivity, safety and reliability, and convenience⁴⁴. At such time, while bearing in mind these three new functions, ensuring network openness requires the introduction of terminal authentication methods. In addition, it is necessary to examine models for division of responsibility between the parties that guarantee terminal functions. In particular, the traditional fixed terminal is changing into an interactive device that collaborates with the network and the upper layer. Embedding new functionality through the network increases the number of stakeholders responsible for smooth operations on the terminal. Thus, it is important to clarify the division of responsibility for terminal functions.

4. Contribution to Coherence of International System

To maintain internet autonomy, it is necessary to practice caution when examining comprehensive revisions to the legal system to ensure network neutrality. However, if the international system lacks coherence, people may find ways to bypass regulations on the borderless Internet and this may lead to problems.

For this reason, we need to promote a common awareness at the ITU, OECD, APEC, and other international fora on general principles for network neutrality. Whether it would then be appropriate to legislate these principles into law would be up to each country to decide. What is important is to use these general principles of competition for consensus building.

In particular, because Japan leads the world in broadband penetration and construction of the IP-based networks, it faces numerous specific problems related to network

⁴⁴ The “Study Group on IP-Based Communication Terminals” discussed this topic and released a report in August 2007.

neutrality. Thus administrative authorities need to communicate information and make other efforts in policy development.

Chapter V Advisable Policy Direction

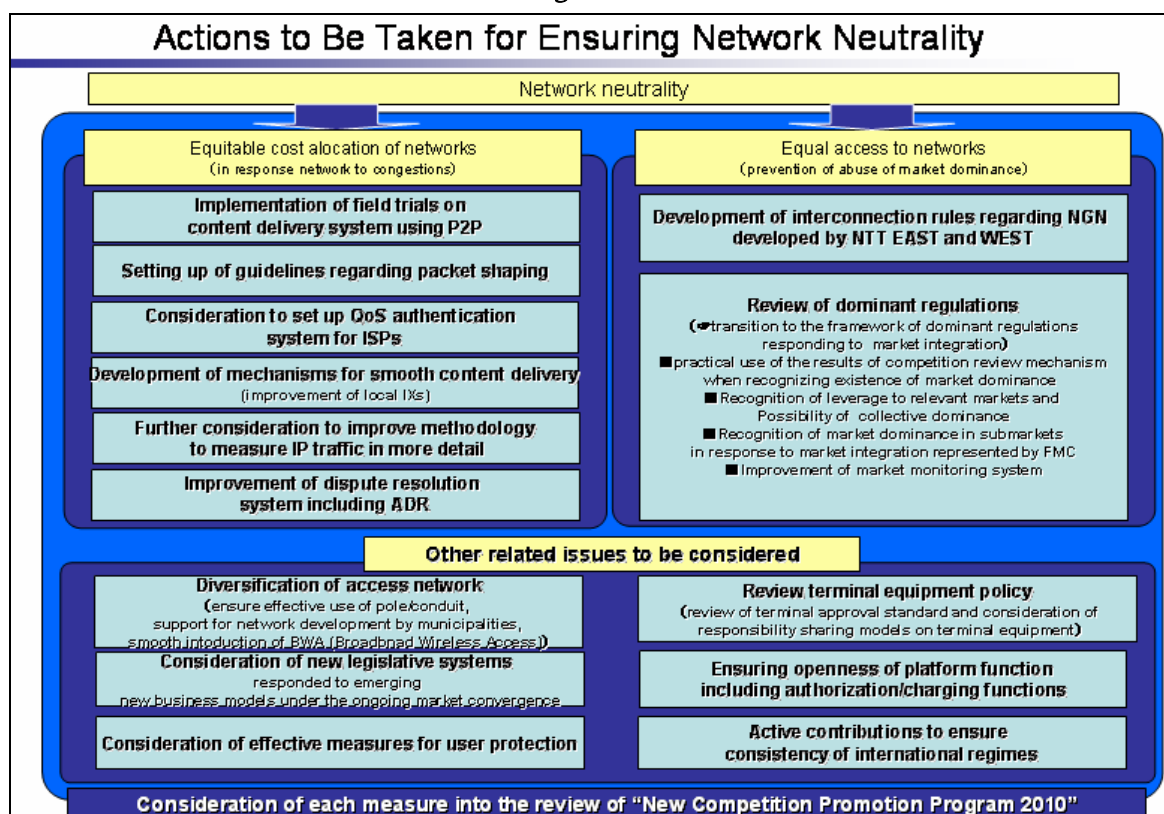
Administrative authorities need to position network neutrality as one of the basic viewpoints in broadband policy. It will ensure Japanese people to have the freedom of network choice and the basic right to create and receive information at a reasonable price.

Network neutrality requires “fairness in network use” and “fairness in network cost sharing.” When examining these requirements, it is important to distinguish between the Internet and the Next Generation Network (carrier-managed IP-based network).

Network neutrality faces a variety of issues. During a period of rapid change in market structure, rigid policy development would likely be an impediment to healthy growth of the Internet. For this reason, a checklist based on the network neutrality principles is made for ensuring fairness in network cost sharing, and fairness in network use. This checklist is used in consensus building among related parties and in policy development. Specifically, it is appropriate to promote a comprehensive examination as shown in the

Fig. 15.

Fig. 15.



The network neutrality principle is clearly positioned as one of the basic concepts in competition policy. For example, network neutrality should be a basic viewpoint in the broadband policy of the “New Competition Promotion Program 2010.” It is also advisable to incorporate the checklist stated above into the program.

The network neutrality debate has various diverging viewpoints. In addition, the markets related to the discussion are changing at an unprecedented rate. Thus it is necessary to steadily deepen examination of the issues.

For this reason, to achieve more specific policy development, it is necessary to steadily move ahead with the phase-2 examination and continue discussions on network neutrality, including its important relation to open platform functionality and the advance of market integration as stated above. The phase 2 working group on network neutrality will release a final report of its findings by the end of 2008. It is appropriate for this examination to advance from multiple viewpoints as a comprehensive Internet strategy for Japan, including competition policy, industry policy, and international strategy.