

Promoting NTT Group's Medium-term Management Strategy

This article is based on an NTT news release dated Nov. 9, 2005 [1] and was rewritten by the editorial office. The Japanese original [2] is authoritative.

In November 2004, NTT Group announced the “NTT Group’s Medium-term Management Strategy”. To implement this strategy, we have put together a roadmap for building the next-generation network and developing ubiquitous broadband services. With this roadmap, we will create a network environment that provides a ubiquitous broadband service that is fast and convenient as well as safe and secure and that offers connectivity anytime and anywhere—so that our customers can easily and conveniently access our various application services. We believe this will help create a rich communications environment for individuals as well as communities, make corporate activities more efficient, and generate new business opportunities. Our intention is to build an open next-generation network that various players outside NTT Group can use to pioneer and develop various services and business models. At the same time, we plan to actively move ahead with alliances with these players. Through such initiatives, we will contribute to the achievement of the goals of the e-Japan Strategy and the u-Japan Policy, so that Japan may have an energetic aging society in which the social problems it faces today are resolved, including decreasing birthrate and rapidly aging population, issues of nursing and medical care, employment mismatch, crime, disasters, and energy and environment problems.

1. Trends in the information and communications market: changes in the past year

1.1 Fixed-line broadband market: optical access service is becoming prevalent and more applications are available

Fixed-line broadband access services*¹ are becoming

increasingly popular, with 20.6 million subscribers using some form of broadband service at the end of the first quarter of fiscal 2006. In particular, the growth of optical access has accelerated, with the net increase in subscribers exceeding that of ADSL from the fourth quarter of fiscal 2005. The number of optical access service subscribers surpassed 3.4 million at the end of the first quarter of fiscal 2006. Applications using optical access are also on the rise. Examples include *Hikari Denwa* (a highquality IP telephony service), video distribution, and bidirectional audiovisual communications such as videophones.

1.2 Mobile communications market: migration to 3G mobile phones is accelerating and more applications are available

In mobile communications, the number of subscribers in the overall market (including PHS (personal handyphone system)) reached 93 million at the end of September 2005. With the migration from 2G (second-generation) to 3G phones accelerating, the number of 3G mobile phone users exceeded 38 million at the end of September 2005. Furthermore, migration to 3G mobile phones has led to the expansion of broadband communication and to greater multifunctionality in mobile phones that feature mobile Internet access, video/music distribution, audiovisual communication (videophone), and micropayments using the *Osaiifu-Keitai* scheme (mobile phone equipped with a payment function). A wide array of applications that go beyond simple means of communication is being developed and offered.

1.3 Full-scale convergence of services has begun

As IP-based services*² become more prevalent, a convergence of services is taking place. The primary

*1 Fixed-line broadband access services include ADSL (asymmetric digital subscriber line), FTTx (fiber to the home/office/curb etc), and CATV (community antenna television, cable television).

*2 IP-based services: services based on Internet protocol.

broadband service offered by telecommunications carriers and CATV operators is the triple-play set of Internet access, telephony, and video distribution. Fixed-mobile convergence (FMC) is also progressing. For example, telecommunications carriers provide corporate customers with integrated communications systems using one handset functioning as both a fixed and mobile phone (one phone integration) and services that enable secure and remote access to corporate information systems using PDAs (personal digital assistants) and other handsets, and videophone communication between mobile and fixed-line phones. In addition, South Korea is moving ahead with preparations for the early commercialization of mobile WiMAX (WiBro). As more WiMAX-related technologies are developed, it is becoming increasingly clear that fixed-line and mobile communications services will converge even further. Furthermore, service convergence is developing in various ways, as exemplified by advances in the convergence of telecommunications and broadcasting through IP-based multi-channel TV broadcasts offered by telecommunications carriers and the distribution of content over the Internet by digital terrestrial broadcasters.

1.4 Development of new businesses as broadband becomes increasingly prevalent

As broadband services become increasingly prevalent, a recent trend has been the development of new businesses targeted at the creation of new “communities” of individuals on the Internet. The blog^{*3} search engine business is growing due to the rapid increase in blog usage (473 million entries had been made as of the end of September 30, 2005), and business opportunities in advertising are expanding as a result of the growth in affiliate programs^{*4} and social networking sites^{*5}. We expect many more new business opportunities to emerge in the future.

1.5 Changes in the market and competitive structure as the transition to IP-based services progresses

As the transition to IP-based services moves for-

ward, telecommunications carriers in Japan and overseas are changing their network/business structures and entering into alliances to respond to fixed-mobile convergence as well as the convergence of telecommunications and broadcasting. In addition, new business models continue to develop as witnessed by the emergence of providers offering a variety of content and applications via IP networks. Furthermore, overseas carriers are proactively engaged in fortifying their international competitiveness in the emerging IP era in areas such as the standardization of the wireless broadband system (e.g., 4G and WiMAX in mobile communications) and IPv6. In these ways, the information and communications market and its competitive structure are rapidly changing both in Japan and abroad.

2. Measures to promote NTT Group’s medium-term management strategy

2.1 Building the next-generation network

(1) Basic concepts

NTT Group will build an efficient and flexible next-generation network enabling the provision of seamless IP-based services, using optical access and broadband wireless access for intra- and inter-prefectural communication, for communication between eastern and western Japan, and for communication between fixed-line phones and mobile handsets. These services will be offered through the collaboration of Group companies, consistent with the terms of fair competition as defined under the current legal framework. With this next-generation network, we will provide broadband Internet access, IP telephony, multicast communication for video distribution, bi-directional video (data) communications, and Ethernet services.

(Note) We will, as far as possible, use Ethernet services on the next-generation network to replace existing dedicated-line services, but for dedicated-line needs requiring a certain level of quality, we will install dedicated-line service nodes to allow network sharing at the wavelength multiplexing level. In addition, we are reviewing ways to integrate and consolidate service categories for dedicated-line services that use special codes.

The next-generation network will have specific functions for controlling traffic during times of congestion and for restricting unauthorized traffic, as well as for handling cyber-terrorism and physical damage due to natural disasters. By ensuring communications quality and bandwidth appropriate for

*3 blog: Blog is short for weblog, an online journal (or newsletter) that is frequently updated and intended for general public consumption.

*4 A system under which an ad is posted on a web site or e-mail newsletter, and if a visitor makes a purchase via the ad or some other desired result is achieved, a commission is generated.

*5 A community web site where participants introduce their friends to each other and form new friendships.

the various types of services, we aim to provide safe, secure, and convenient services that combine the advantages of the existing telephone network and the IP network.

The next-generation network will adopt a layered structure model for a better response to technological advances and service diversification. In addition, subject to certain conditions being satisfied, including the maintenance of security, we will disclose the interface between the network and application management systems in order to allow application service providers (ASPs), video distributors, and others to make use of the next-generation network and provide a wide range of application services. The service control functions of the next-generation network conform to the IP multimedia subsystem (IMS), which is compatible with the layered structure model being standardized by the International Telecommunication Union (ITU).

The next-generation network will be an open network that provides reliable connectivity with other IP networks (including those of Internet service providers (ISPs)). Specifically, voice communication connectivity will be the same as it is today; furthermore, with respect to video communications (other than voice communications), we will actively participate in efforts by the government and telecommunications carriers to ensure connectivity, while keeping an eye on how services are spreading and how the social consensus forms in relation to quality and other matters.

(Note) For office and home environments, we will enhance the convenience of our customers by installing optical outlets and providing optical cords that withstand bending, so that customers can connect equipment by themselves.

(2) Roadmap for building the next-generation network

Demand for optical access service is growing rapidly. Video-related services are expected to expand in fiscal 2008 due to consumer interest in the Beijing Olympics and IP retransmission of digital terrestrial broadcasts in high-definition format, which is slated to begin that year. Accordingly, it is imperative to build the next-generation network as soon as possible. In the US, the Federal Government is planning to develop an IPv6-compatible network in fiscal 2008.

In light of these circumstances, we will begin field trials in the second half of fiscal 2006 and begin building the next-generation network relay system by deploying relay nodes and optical wavelength trans-

mission equipment on the IP networks of NTT East and NTT West. Following this, in the second half of fiscal 2007, we will begin deploying edge nodes as well as service control functions and begin providing next-generation network services on a full scale. Existing user nodes and new edge nodes will initially be accommodated together in next-generation network relay nodes; we will overlay the new edge nodes on the network over time by gradually replacing the existing nodes.

We intend to achieve seamless linkage with the mobile network through the deployment of mobile network edge nodes at the time of NTT DoCoMo's introduction of the Super 3G service and through the migration of NTT DoCoMo Group's ATM (voice) network to an IP-based network.

As for specific measures to resolve the inefficiencies that result from the next-generation network coexisting with the existing fixed-line network, we will put together our plans by fiscal 2010 based on trends in demand for the optical access, next-generation network.

(3) Summary of field trials

Prior to the completion of development work on our new edge node technology, we will commence field trials in the second half of fiscal 2006 in order to carry out a technological review aimed at full-scale commercialization. While the field trials will be carried out only in limited areas, or with a limited member of trial users (which will be determined before the end of this fiscal year), we plan to steadily introduce new services including Internet access, IP telephony, video distribution, FMC services, and solutions services for corporate customers as soon as preparations are complete. The services and features currently undergoing technological review include end-to-end quality control functions utilizing active controls across the range from simple voice communications to high-vision-class high-resolution video distribution; IP-multicast functions that permit large-volume high-resolution video transmission; security functions including unauthorized access blocking that provide safe, secure, and convenient services; multi-tier integrated technologies that achieve convergence by enabling the provision of multiple services economically and efficiently; functions that combine fixed and mobile communications; and open connectivity functions to link applications.

We are conducting our field trials in association with manufacturers of information household appliances and software ASPs. As part of these field trials we plan to disclose our network interface to other car-

riers and ISPs.

2.2 Development of ubiquitous broadband services

By enhancing the efficiency of our business operations through the effective utilization of NTT Group's resources, and by responding to the demand for convergence of services and technologies while satisfying the conditions for fair competition under the current legal framework, we will actively promote the development of ubiquitous broadband services. To this end, we will clearly define the role and responsibility of each company for each network service, upper-layer service, and corporate customer service. At the same time, we will strengthen intra-Group collaboration and promote alliances with other companies. In addition, the holding company will strengthen its function of formulating overall Group strategy, including strategic alliances with domestic and overseas companies.

(1) Network services

In connection with the next-generation network, NTT East, NTT West, and NTT DoCoMo Group will build the network and provide seamless integration between fixed-line services (intra/inter-prefectural, and eastern/western Japan) and mobile IP-based services. Additionally, NTT Communications will provide corporate customers with one-stop services that include solutions services. In a continuation of current practice, NTT East, NTT West, and NTT Communications will provide fixed-line telephone network services for intra-prefectural, inter-prefectural, and international calls.

(i) Fixed-line communications

With demand recently increasing sharply, the number of subscribers using B FLET'S optical access services reached 2.3 million at the end of September 2005. By providing faster, more diversified, and more reliable services, we aim to further accelerate the expansion of this service and raise the subscriber figure to 30 million by fiscal 2010.

Specific measures include: (1) providing faster and more convenient broadband Internet access, (2) expanding services that will become possible due to IP telephony's multi-channel and multi-telephone-number functions, (3) providing more high-value-added functions such as IP-Centrex, (4) diversifying fee structures (e.g., quasi-flat rates) and working to promote flat rates, (5) enhancing high-quality, bi-directional video communications service (videophone) and bi-directional communications service for large data volumes, and (6) expanding

multicast communications for video distribution which will enable high-quality video-on-demand services and IP-based TV broadcasting services.

In implementing these optical access services, we believe that it is important to promote alliances with other ISPs and other companies to a greater extent than ever before. At the same time, we also believe it is important to form wide-ranging alliances with consumer electronics manufacturers, due to the importance of achieving coordination with user systems that incorporate recent developments in IT-capable home appliances (IT: information technology).

(ii) Mobile communications

NTT DoCoMo Group will offer high-speed downlink packet access (HSDPA) and Super 3G services to enable services such as high-speed high-volume video, audio, and text distribution and video communications. In addition, based on the *Seikatsu-Keitai* concept (the mobile phone acting as a multifunctional tool useful for people's diverse lifestyle needs), NTT DoCoMo Group plans to promote diversification of mobile phone handset use by building in credit card and electronic money functions as well as incorporating functions such as GPS (global positioning system).

(iii) Fixed-mobile convergence (FMC)

We will offer our individual customers handsets that serve as both a fixed-line and a mobile phone by achieving dual connectivity with WiFi and FOMA (One Phone). We are also making preparations for the timely provision of services such as forwarding calls between fixed-line and mobile phones when there is no response and of rate discounts for service packages. We will also provide flexible, high-level communications services that can move seamlessly between fixed-line and mobile communications by introducing the next-generation network and combining it with WiFi, WiMAX, or other wireless broadband technologies.

(2) Upper-layer services (Internet connection, portal services, etc.)

We intend to improve the efficiency of our business operations for services that Group companies currently offer (e.g., Internet connection, IP telephony (050 numbers), video distribution (platform and content provision) and portal services) by consolidating our facilities and operations as well as our procurement activities into one entity. Also, by vertically integrating these businesses, we intend to promote the construction of a new business model by offering

service packages composed of flexible combinations of upper-layer services and by creating a common points system. Moreover, integration of these businesses will unify and clarify the point of contact for companies looking to enter into an alliance with NTT Group. By proactively forming alliances with other companies, we will seek to promote the development of new businesses such as advertising, e-commerce, and payment settlement businesses, including micro-payments.

In preparation for the planned business consolidation of NTT Resonant and NTT Communications, our upper-layer fixed-line services will be transferred to NTT Communications by the summer of 2006. We will consolidate the facilities and operations in stages to allow our users to make a smooth migration.

(3) Corporate services

For corporate services, we will aim to develop a centralized service and response system for corporate users and strengthen our total solutions products and services for fixed/mobile services, for networks, and for software/information systems. In addition, we will look to create new businesses by further promoting alliances with other companies.

To provide enhanced solutions using open-source software, which is expected to be used more in the future, we will consolidate the open-source software-related operations dispersed throughout NTT Group to create a uniform support system from systems development to operations, and we will also increase our ability to develop strategic software. Moreover, in response to increasing diversification in payment methods and growth in applications using IC cards for personal identification, we will strengthen our card solutions that incorporate user authentication technology and encryption technology using IC cards.

To this end, we will review our user account system within the Group by summer 2006. In principle, NTT Communications will be responsible for responding to customers, including providing network solutions. Moreover, to accommodate our customers' increasing FMC requirements, we will strengthen business ties between NTT Communications and NTT DoCoMo Group. NTT East and NTT West will continue to take the leading role in serving customers that are closely affiliated with their localities. NTT Data will mainly be responsible for software/information systems solutions for our corporate customers, while strengthening its ties with NTT Communications and NTT Group software companies.

(4) Convergence of telecommunications and broadcasting

By proactively responding to the convergence of telecommunications and broadcasting, we will aim to increase the market penetration of our optical services, improve the video distribution platform business, and expand our content distribution business by forming alliances with content owners. In line with the movement toward system reforms to enable IP retransmissions of digital terrestrial broadcasts, we will address the fiscal 2005 research conducted by the Ministry of Internal Affairs and Communications and continue to work toward the commencement of IP retransmission services by proceeding to unify our intra-Group video distribution platform, by actively participating in the formulation of technical specifications, and by promoting alliances with TV set manufacturers. We will also promote alliances with terrestrial broadcasters, for example by jointly establishing sales and operating companies that offer multi-channel pay TV services using optical fiber and by jointly developing new services that promote the convergence of telecommunications and broadcasting and take advantage of the new opportunities created by the commencement of one-segment broadcasting*6 for hand-held receivers. Furthermore, we will promote alliances with broadcasters to improve content for our video-on-demand (VOD) services.

(5) International business

With increasing demand for global services that bring together domestic and international services and with competition unfolding on a global scale, NTT Group will use the expertise it has developed and the fruits of research it has obtained in ubiquitous broadband services to form alliances with equipment manufacturers to actively create business opportunities overseas. To strengthen Japan's international competitiveness, we intend to actively participate in the formulation of international standards and other international initiatives through the International Telecommunication Union (ITU) and the World Summit on the Information Society (WSIS). Accordingly, we will establish an international section within the holding company, which will be tasked with formulating NTT Group's international business strategy and international standardization strategy

*6 One-segment broadcasting: A broadcasting format for terrestrial digital broadcasting, which was launched recently in Japan. In terrestrial digital broadcasting, one channel is divided into 13 segments, and one segment is designated for broadcasting to mobile terminals.

and coordinating the international businesses of the Group companies.

With respect to China, where the Beijing Olympics (2008) and the Shanghai World Expo (2010) promise growth opportunities, we intend to establish an NTT Group office in Beijing that will be the unified point of contact for the Chinese government and Chinese businesses. By doing so, we will strengthen our efforts in this market as we work in collaboration with local Group subsidiaries.

(6) Providing one-stop services to our customers

Amidst the diversification and convergence of services due to the shift to IP-based networks, we will ensure the availability of one-stop services for customers and seek collaboration between Group and non-group companies to increase customer convenience in all facets of our business (sales, installation, user support, repairs, etc.). In particular, customers have made especially strong requests for a unified billing service for NTT Group services. Although we have already been accommodating the individual needs of our corporate customers, we now intend to increase customer convenience by enabling individual users to pay fixed and mobile phone bills online with a single sign-on. This service is expected to be in place by the end of the first half of fiscal 2006. We are also considering other measures to increase customer convenience. Because completely unifying the payment system for existing services that various Group companies separately offer would require a major system reorganization, we are focusing our efforts on efficiently achieving unification of the payment system in conjunction with the construction of the next-generation network.

(7) Working toward a safe and secure society in line with the e-Japan Strategy and u-Japan Policy

NTT Group is working hard toward the achievement of the goals of the e-Japan Strategy and u-Japan Policy by taking steps to alleviate social problems caused by the falling birthrate and aging society, employment mismatch, problems related to nursing care and health care, crime, disasters, and energy and environmental problems through the use of information and communication technology (ICT).

More specifically, we are working to make remote medical care possible by using our next-generation network to allow health monitoring and consulting to be carried out by video. Additionally, we are developing technologies and providing system solutions so

that health-care systems can exchange information with each other.

As demand increases for diversified employment forms tailored to individual needs as a means to eliminate the problem of employment mismatch, we are making efforts to facilitate teleworking (working from home using telecommunications) and SOHO (small office, home office) style working using the next-generation network and to promote the distribution of help-wanted and position-wanted ads.

Following recent natural disasters such as the Niigata earthquake of October 2004 and the increase in crime rate, the need for means of disaster and crime prevention has been increasing. We have been working to enhance the reliability of our networks by combining the strengths of our fixed-line and mobile communications systems, to prevent service disruptions when natural disasters occur, and to quickly restore service. We will further strengthen our efforts in these areas, and we will also strive to develop home security, off-site monitoring, and home control services on the next-generation network using IT home appliances.

With the Kyoto Protocol being adopted in 1997 and worldwide attention being focused on global warming, Japan is taking measures to respond to energy and environmental problems by recycling and reducing waste. NTT Group will contribute to resource and energy conservation by utilizing its information and communications technology.

Numerical figures and descriptions contained in this document related to predictions were estimated according to information available at the time of writing and may change in response to trends in the Japanese economy and the information communications world, as well as new services and charges, etc. Therefore, NTT Group does not guarantee the reliability of the figures and descriptions related to predictions herein.

References

- [1] <http://www.ntt.co.jp/news/news05e/0511phqg/051109.html>
- [2] <http://www.ntt.co.jp/news/news05/0511phqg/051109.html>

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