Current Telecom Market in Japan and NTT’s NGN (Next Generation Network)

- NTT NGN has started in Japan-

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TISPAN Workshop
28 May 2008 – Beijing, China
Paradigm shift of Japan’s telecom market

Sources: Ministry of Internal Affairs and Communications, Consortium for Promotion of Mobile Computing, InfoCom Research Inc., and others.

Voice over IP subscribers with E.164 number in Japan

VoIP subscribers in Japan

- **0AB ~ J-VoIP**
- **050-VoIP**

First Line VoIP Service

- **0AB-J VoIP (4Q 07)** total: 6.8 million

PSTN/ISDN Simulation (Equivalent quality with PSTN)

Internet VoIP


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Number of Subscribers (POTS vs VoIP & ADSL vs FTTH) in NTT

Year

2003 2004 2005 2006 2007 2008 2009

Number of subscribers [million]

0 10 20 30 40 50 60 70

POTS

460 million (1Q 08)
(408 million, 1Q 09 Forecast)

FTTH

8.78 million (1Q 08)
(12.2 million 1Q 09 Forecast)

VoIP

5.73 million (1Q 08)
(9 million 1Q 09 Forecast)

ADSL

4.66 million (1Q 08)
(3.7 million 1Q 09 Forecast)

Sources: NTT News Release, May 13 2008
http://www.ntt.co.jp/news/news08e/0805qsvh/ljzn080513a_01.html

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Number of FTTH subscribers in NTT

The number of FLET'S Hikari, FTTH subscriptions reached 8.78 million as of March 31, 2008. The target is 20 million FTTH subscribers in 2010.

[Reference]
## NTT’s NGN roadmap

<table>
<thead>
<tr>
<th>Fiscal year</th>
<th>2006</th>
<th>2007</th>
<th>2008–</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Steps in introducing the NGN</strong></td>
<td></td>
<td></td>
<td>Provide optical access to 20M users (End of fiscal 2010)</td>
</tr>
<tr>
<td><strong>Core network</strong></td>
<td></td>
<td></td>
<td>Seamless integration with mobile network</td>
</tr>
<tr>
<td>Construct transit network</td>
<td>Field trials</td>
<td>Construct access networks</td>
<td>Deploy service control functions</td>
</tr>
<tr>
<td>- deploy core nodes</td>
<td></td>
<td>deploy edge nodes</td>
<td>IMS deployment (conforming to ITU standards)</td>
</tr>
<tr>
<td>- deploy optical wavelength transmission equipment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Service control functions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Service development</strong></td>
<td>Trial services &lt;For limited regions and users&gt;</td>
<td>Full-scale development of next-generation services</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Broadband Internet access</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- IP telephony</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Multicast transmission for video distribution</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Bi-directional video (data) communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Ethernet services, etc.</td>
</tr>
</tbody>
</table>

Open Interfaces

- SNI (Application Server-Network Interface) is provided as an open interface.
- This enables service providers to provide services using not only SIP applications but also video delivery and other servers.

SNI: Application Server-Network Interface
NNI: Network-Network Interface
UNI: User-Network Interface

- (1) Multicast communication
- (2) Unicast communication
- (3) Interactive communication
- (4) ISP connected communication
- (5) Ethernet connected communication
NGN Commercialization and Development

- Creating and rolling out broadband and ubiquitous services in accordance with customer needs, leveraging full-IP network infrastructure
- Driving the transformation of business portfolio centering on IP and solution businesses
Current NGN Commercial Service Menu

- QoS guaranteed services are offered for ‘Hikari’-Telephone*1, Video phone, and Contents delivery services.
- Charges for the best effort services and standard-QoS Hikari-Telephone and Video phone are almost the same as the existing services. Charges for other QoS guaranteed services are being planned.

<table>
<thead>
<tr>
<th>Service category</th>
<th>Network services of NGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber Access Service</td>
<td>- The same as the existing services.</td>
</tr>
<tr>
<td>-ISP access service</td>
<td></td>
</tr>
<tr>
<td>-IPv6 available</td>
<td></td>
</tr>
<tr>
<td>0AB-J VoIP*2 / Video phone</td>
<td>- ‘Hikari’-Telephone, standard quality (3.1 kHz) and high quality (7 kHz) <strong>New</strong></td>
</tr>
<tr>
<td></td>
<td>- Business type is planned.</td>
</tr>
<tr>
<td></td>
<td>- Video phone, the existing quality and two high quality grades (SD, HD Quality) <strong>New</strong></td>
</tr>
<tr>
<td>VPN service</td>
<td>- Center-end type, CUG type</td>
</tr>
<tr>
<td>QoS</td>
<td><strong>New</strong></td>
</tr>
<tr>
<td>Contents delivery services</td>
<td>- The same as the existing services.</td>
</tr>
<tr>
<td>QoS</td>
<td><strong>New</strong></td>
</tr>
<tr>
<td>Ethernet service</td>
<td>- The same as the existing services and inter-prefecture services. <strong>New</strong></td>
</tr>
</tbody>
</table>

Existing IP Network services

- For House (Up to 100Mbps)
- For Apartment (Up to 100Mbps)
- For Business (Up to 1Gbps)

- Hikari-Telephone incl. office type
- None
- Video phone

- Office & Group access
- None
- FLET’S .Net EX/ v6 cast (unicast, multicast)
- None
- Business Ethernet (intra-prefecture)

*1: ‘Hikari’-Telephone is the service name of QoS guaranteed VoIP provided by NTT EAST/WEST
*2: Geographic number for PSTN and IP telephony with equivalent quality to PSTN/ISDN

Source: http://www.ntt.co.jp/news/news07e/0711zrmh/bqyt071109d_06.html
New contents delivery service (IPTV)

Retransmission of Digital Terrestrial Television over IP has just started.

No need to use TV antenna

- Retransmission of Digital Terrestrial Television over IP
- Multi-channel (9 Ch) broadcasting
- Video on demand (VoD)

Digital terrestrial broadcasting

VOD servers

IP delivery center

NGN

Opt. fiber

Communication

Contents delivery

IPTV service

PC

IP phone

CS
Features of NTT’s NGN

The NGN: high reliability and flexibility will bring new capabilities to the information and communication services.

- **Quality of Service (QoS)**
  Four quality classes (three classes with guaranteed QoS and a best-effort class)
  - The highest quality class: maximum clarity of sound and crispness of image

- **Security**
  - Protection against spoofing
  - Blocking of unwanted traffic

- **Reliability**
  - Redundant architecture for transmission links and equipments
  - Traffic control in the event of congestion
  - Guaranteed delivery of important communications
Keywords – “Open” and “Collaboration”

- The NTT Group cannot by itself make the most effective use of the NGN.

- Networks are used widely, so openness and interconnectivity are essential.

- “Open” interconnection and “Collaboration”
  - NTT’s NGN is open for interconnection with other providers
  - NTT will collaborate with partners in other business fields to create new services and added-value
New Service Creation on NGN

Creation of new services in cooperation with various industries

Cooperation or Tie-up with other industries and different business

Creating new services and values with open and collaborative works

The Internet

ISP

ISP

Carriers

Many kinds of Information appliances

Applications/Contents

Platform

SNI

UNI

NGN

Broad casting

Financial

Medical

Education

Advertise

Business industries

Internet services

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The Next-Generation Services Joint-Development Forum is set to support the rapid development and commercialization of new services. ‘Joint-Development of Services’; Joint-Development with business from various industries, creating new business models that take advantage of NGN features.

- ISP/ ContentsP/ ASP etc.
- Service Creation & Commercialization such as Telemedicine, Remote education, Telecommuting etc.

- Collaborate
- Incubation Support
  - Marketing
  - Technology consulting
  - Leverage R&D result
- Information & Environment
  - Seminars etc.
  - Utilize Test Beds
  - Exhibition Space ‘NOTE’
  - Enhance SNI&UNI

Contribute Capital as necessary