

FTTH in Japan

IPv6 Network and Gigabit Access toward Next Generation Broadband Services

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1. Broadband Access Line Services Market in Japan

2. Current FTTH Services - “B FLET’S”




3. Next Generation FTTH Services - IPv6 & GE-PON -



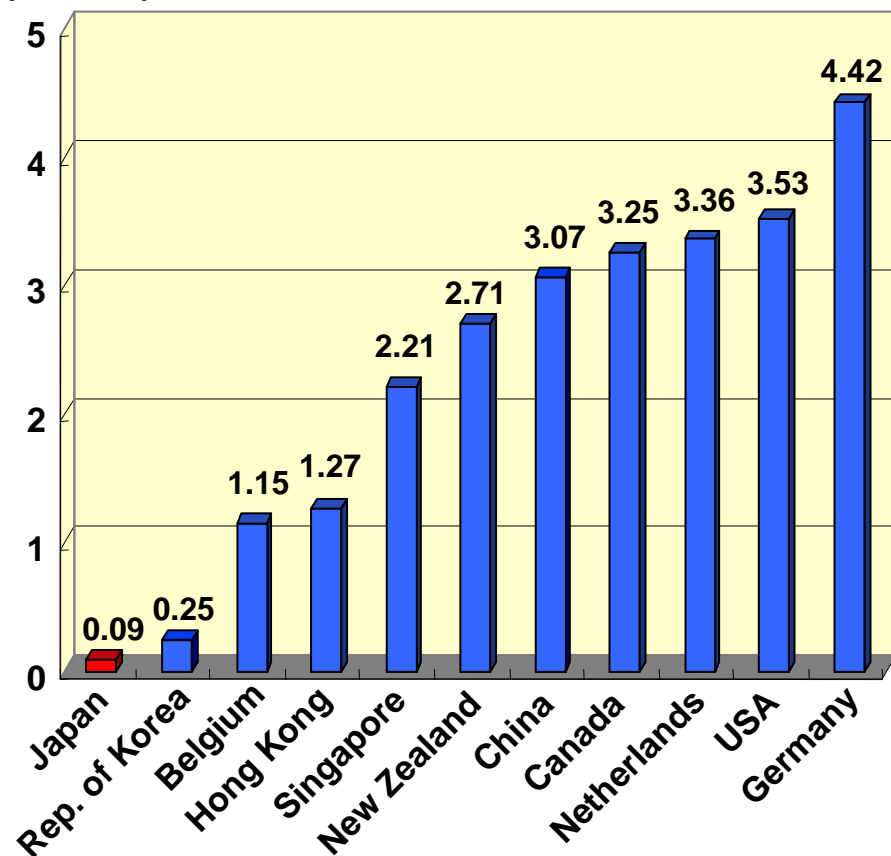
4. NTT WEST Mid-term Vision

- Broadband fees in Japan became the world's lowest levels.
- Japan is in third in terms of the number of lines behind US and China.

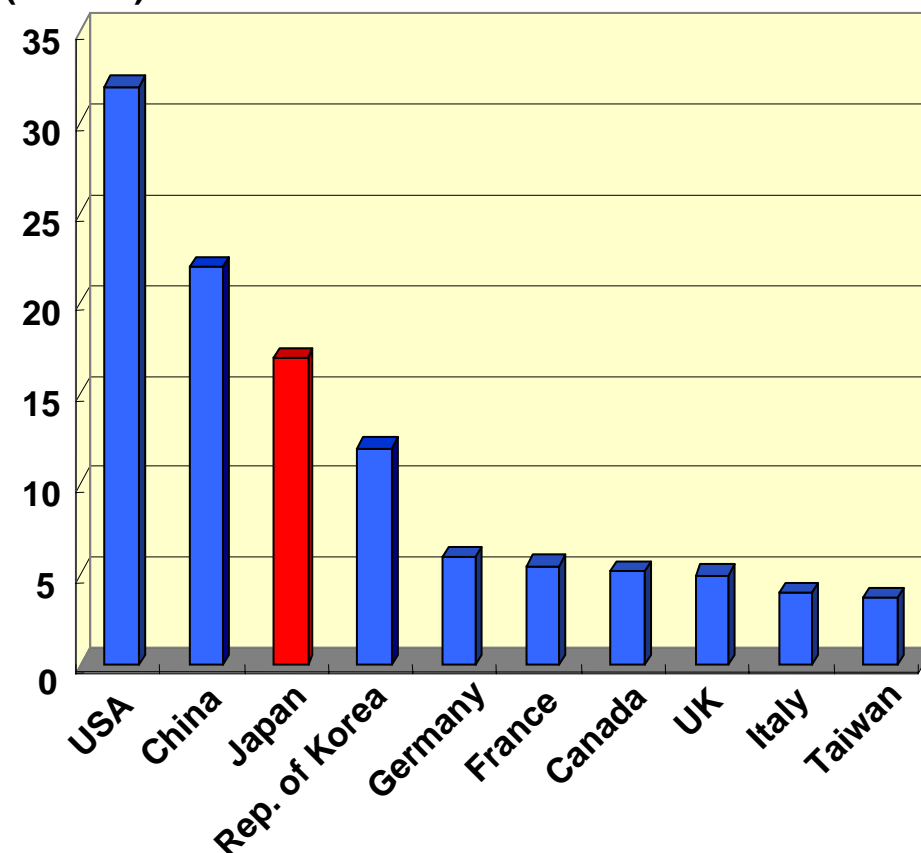
 **Broadband Fees** (cost per 100 kbps; July 2003)

 **Number of lines** (Q3, 2004)

(Dollars)



(Million)



*Comparison of fees per 100 kbps based on the service speeds and service fees of DSL and cable Internet in each country.

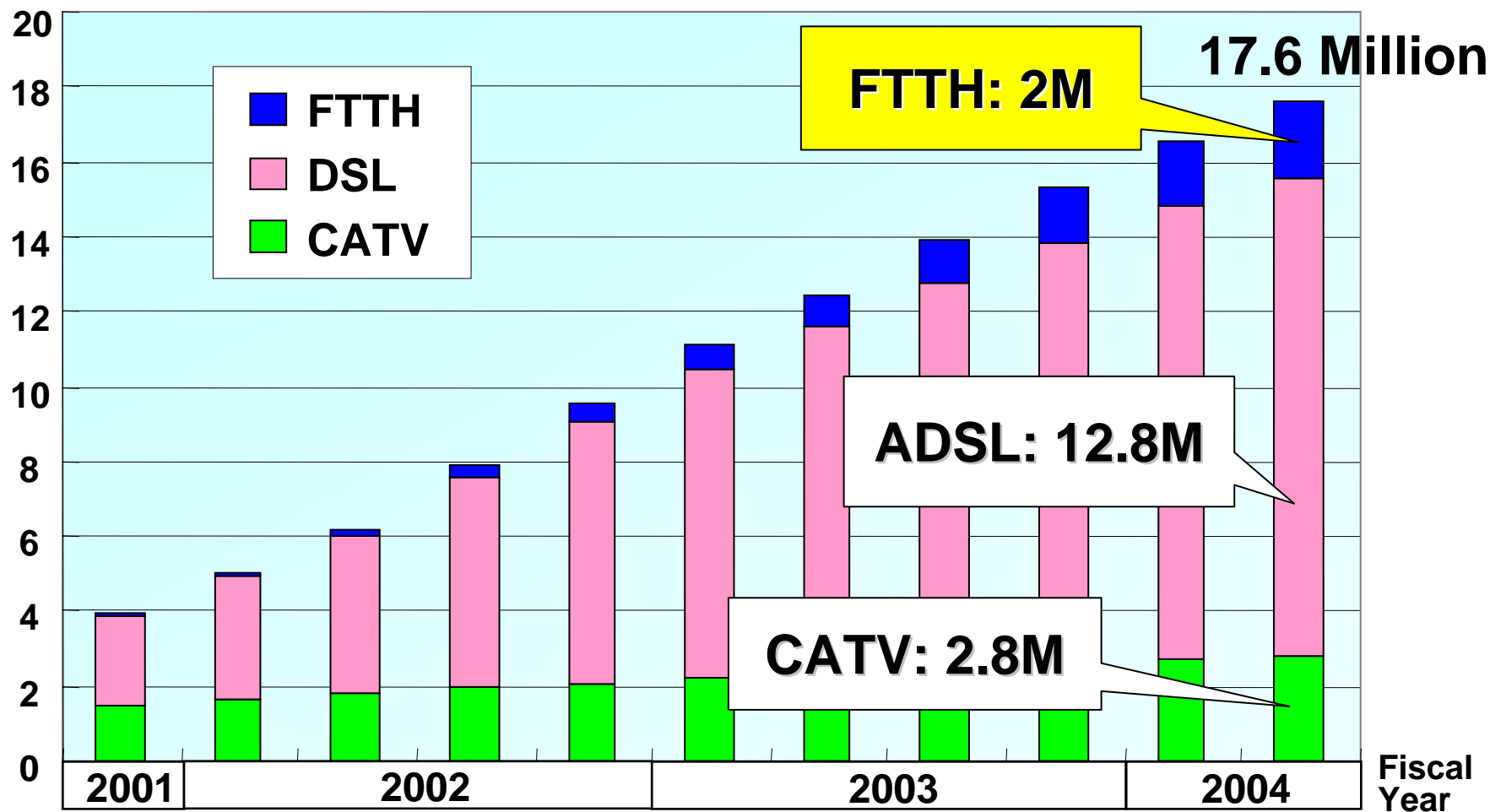
Source: "Birth of Broadband," ITU

Source: <http://www.point-topic.com/>

- The number of broadband subscribers in Japan reached 17.6 million, including 2 million FTTH subscribers.

Number of Broadband Subscribers
(Million Subscribers)

(September, 2004)



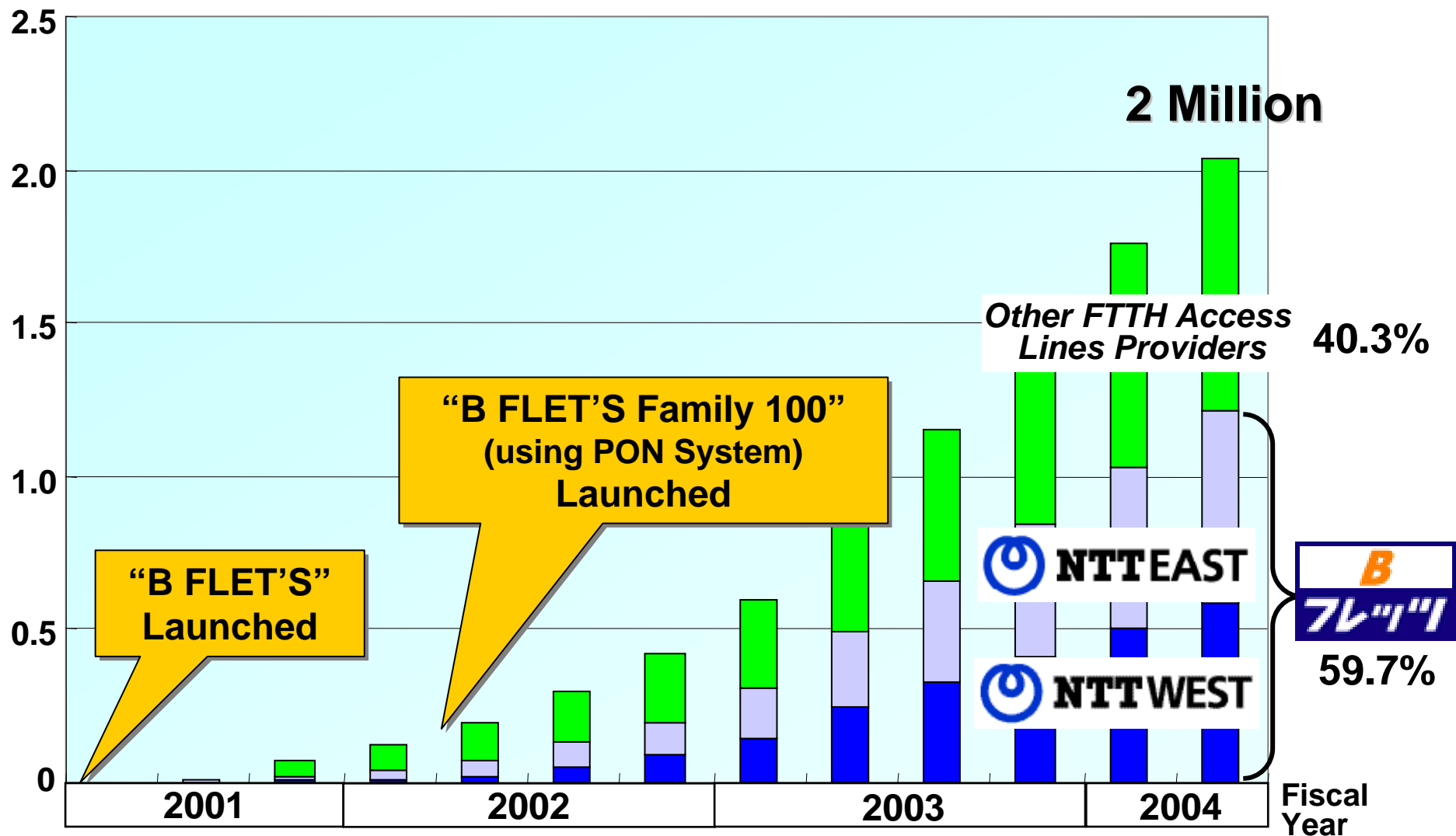
Source: Ministry of Internal Affairs and Communications (MIC)

FTTH Subscribers in Japan

Number of FTTH Subscribers

(Million Subscribers)

(September, 2004)



Source: Ministry of Internal Affairs and Communications (MIC), etc.

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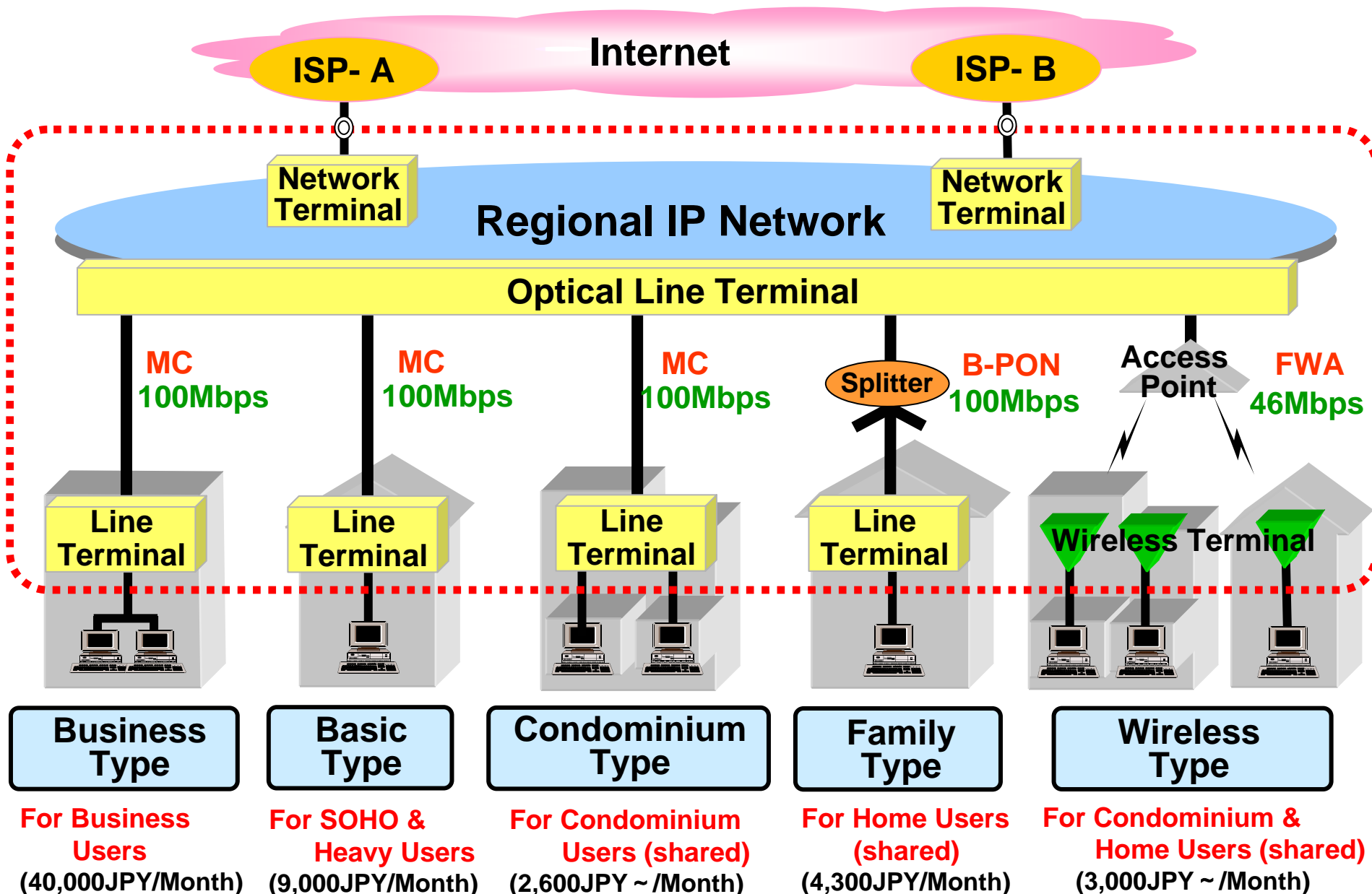


4. NTT WEST Mid-term Vision

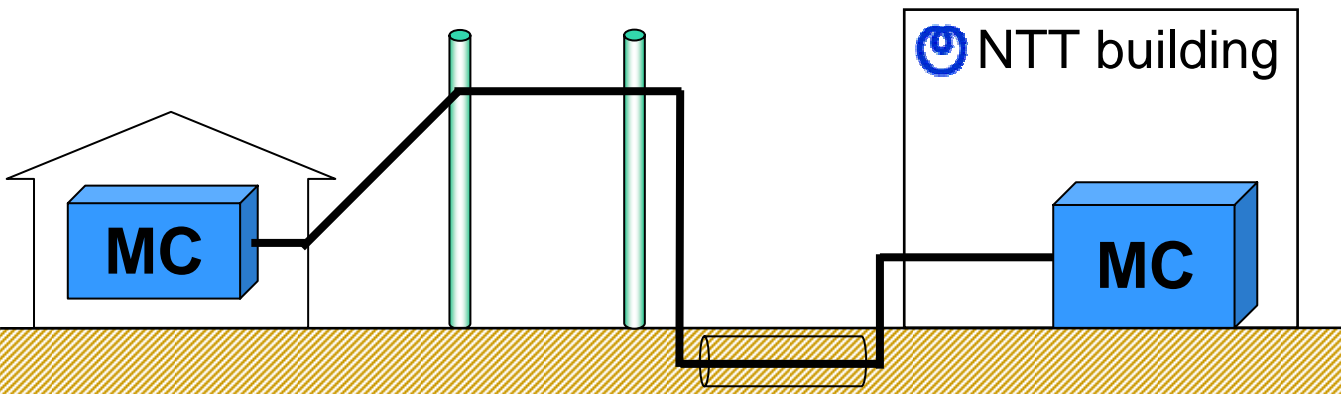


- ◆ **Flat-rate, best-effort** network service over the NTT WEST regional IP network.
- ◆ Optical fiber is used for the access line at a speed of up to **100 Mbps**.
- ◆ **“ISP Free”** - connecting subscribers via optical fiber to a compatible ISP of their choice.
- ◆ **Broadband Applications**, such as contents distribution, are provided over the NTT WEST regional IP network.

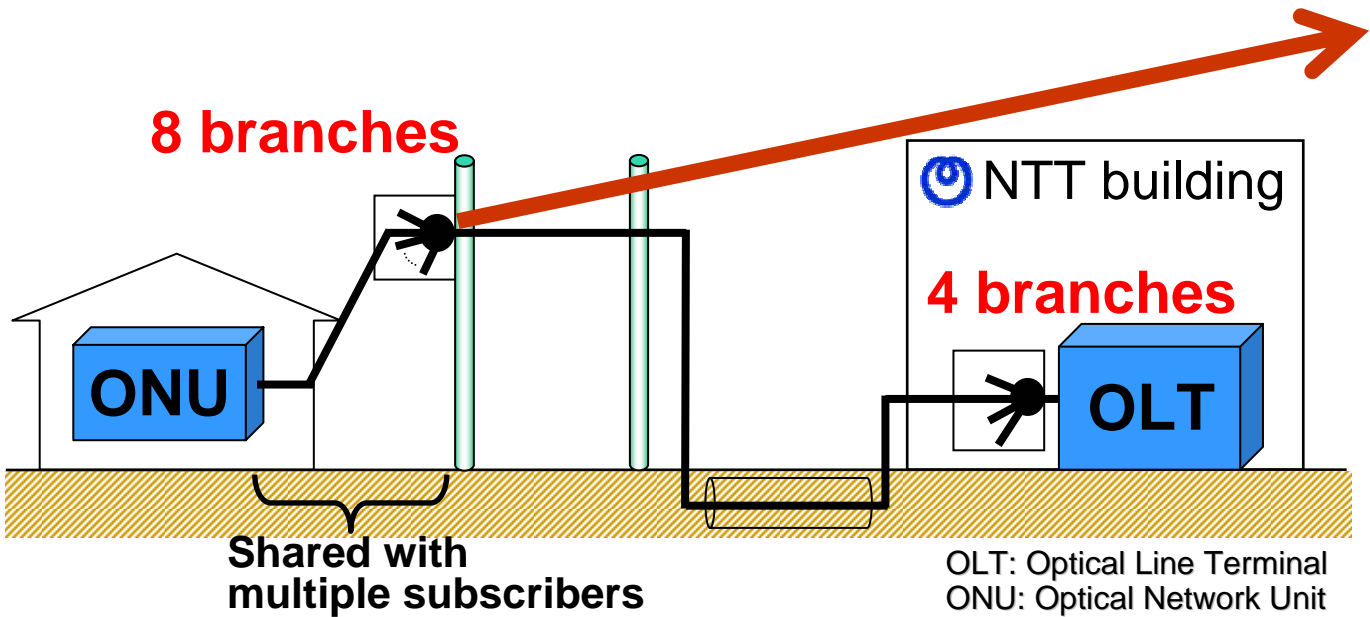
"B FLET'S" Services Lineup



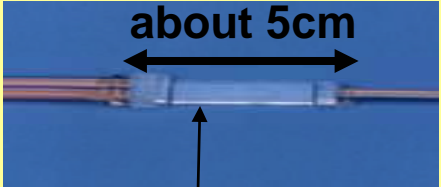
Single Star Method (a.k.a. MC)



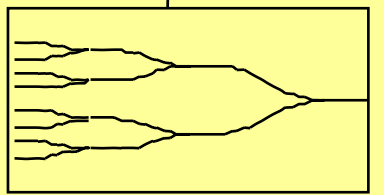
Passive Double Star Method (a.k.a. PON)



Optical Splitter



about 5cm

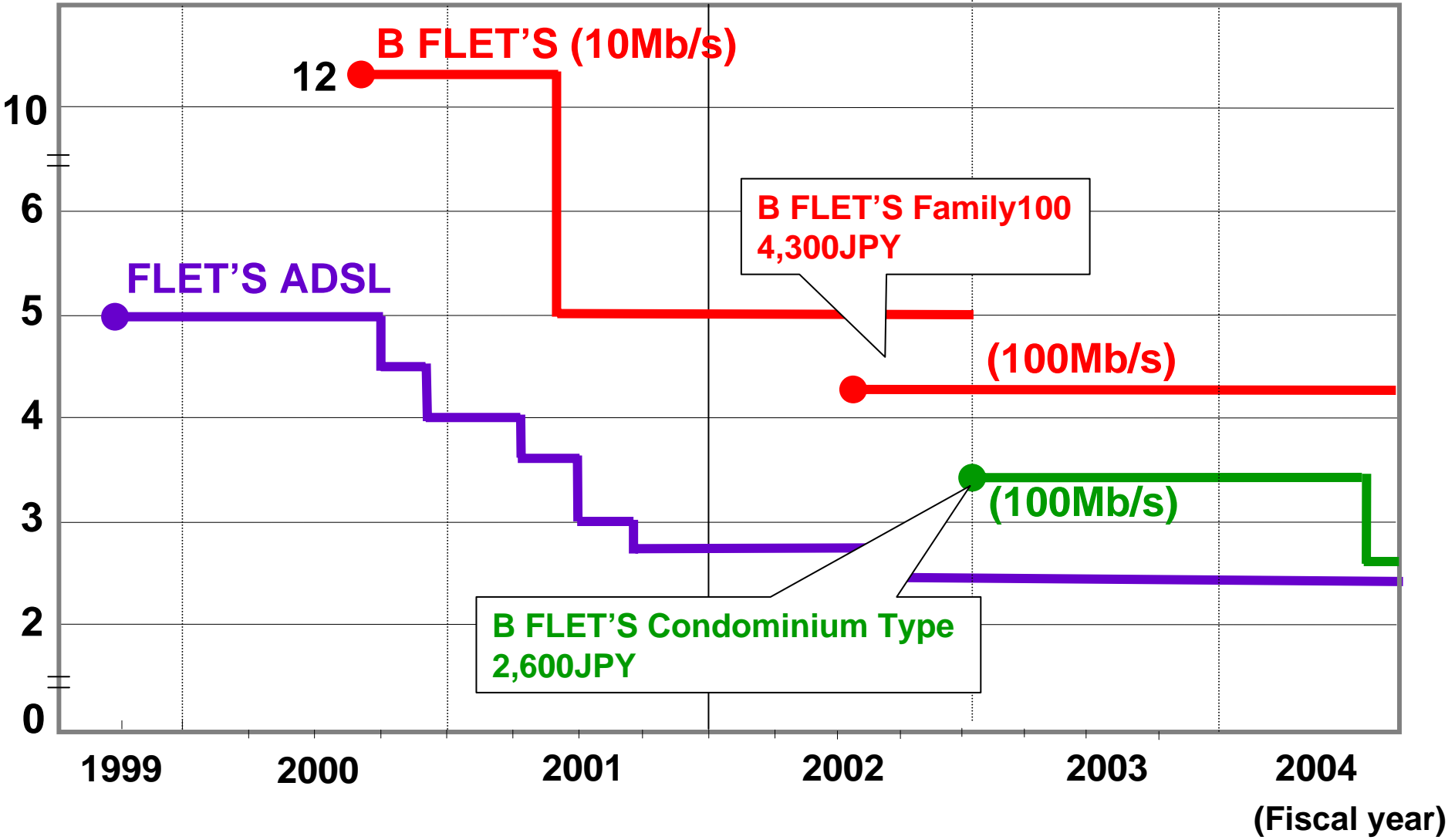


Output Input

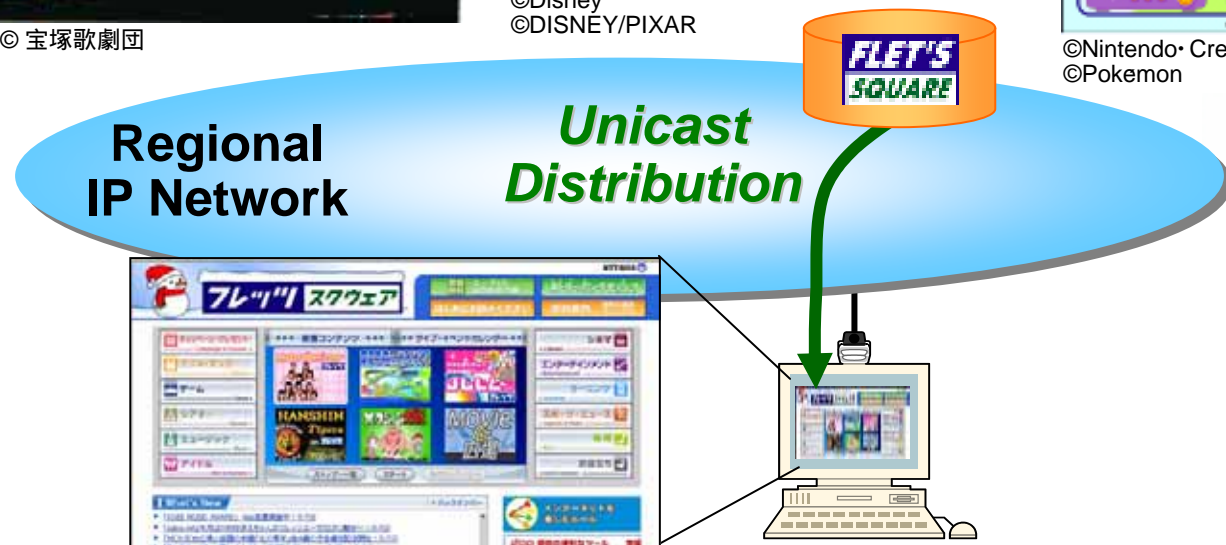
Single Optical Fiber is split into 8 branches.

Optical Branch Circuit

Monthly fee (1,000 JPY)



- Broadband contents site for FLET'S access line subscribers.
- A wide variety of free/paid contents are selected.
- High-quality and stable contents distribution due to closed IP network.



* PC Screen Image provided in Jan., 2005

* Other attractive contents are listed in the following; <http://www.flets-square.info/>

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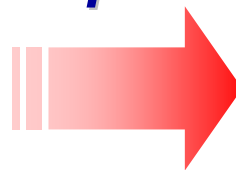
3. Next Generation FTTH Services - IPv6 & GE-PON -



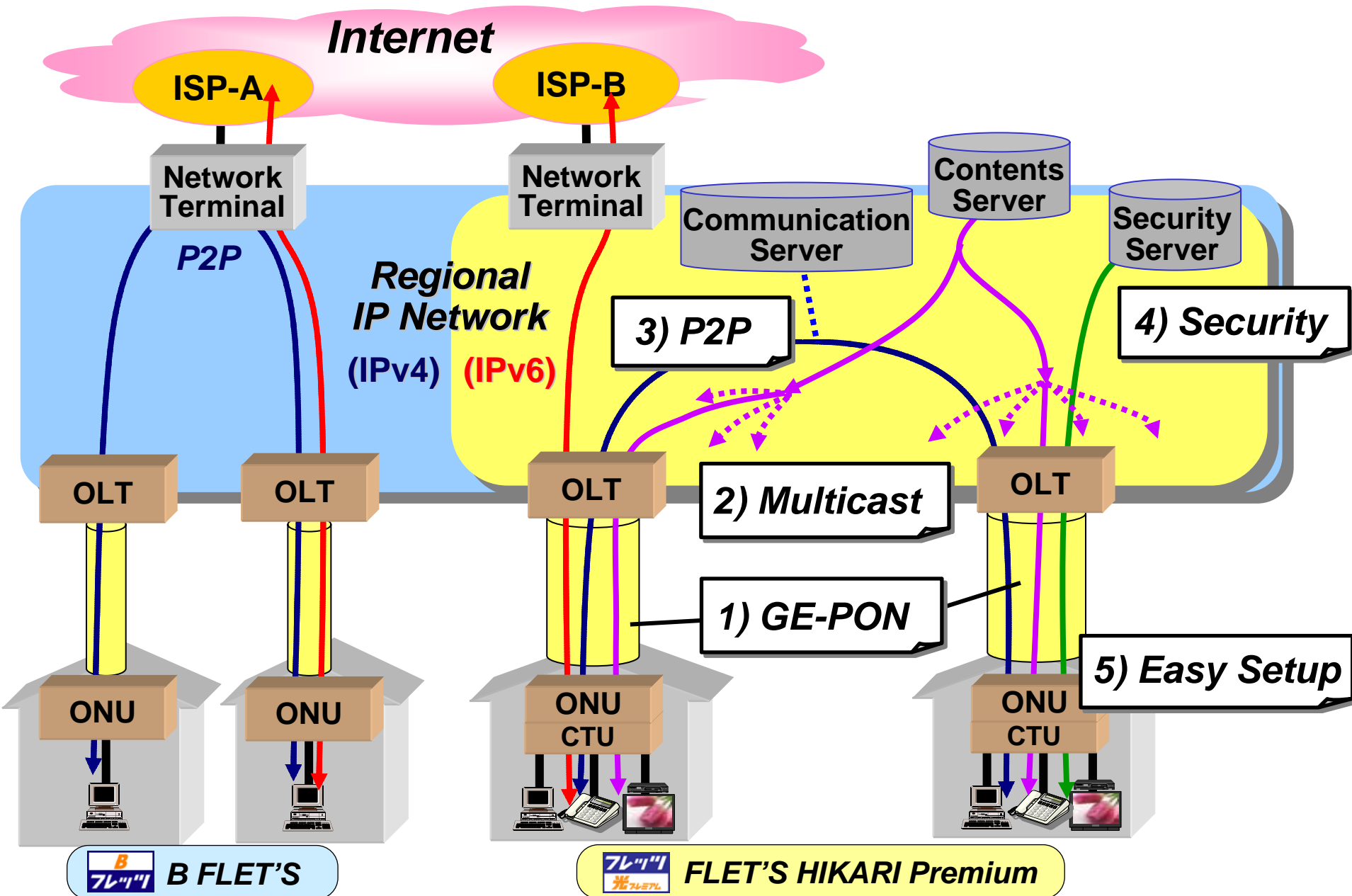
4. NTT WEST Mid-term Vision

| |  B FLET'S |  FLET'S HIKARI Premium |
|--------------------------------|--|--|
| Backbone Network | Regional IP Network (IPv4) | Regional IP Network (IPv6) |
| Speed | 100Mbps (100Mbps B-PON shared) | 100Mbps (1Gbps GE-PON shared) |
| Fees | 4,300JPY/Month | 4,300JPY/Month (incl. "Embedded" Applications) |
| "Embedded" Applications | _____ | <ul style="list-style-type: none"> • High-quality Video Communication • Security Protection |
| Other Applications | <ul style="list-style-type: none"> • Unicast Contents Distribution etc. | <ul style="list-style-type: none"> • VoIP • IP Broadcasting • Multicast Contents Distribution • P2P • QoS |

Competition



Key Features of New Services



- Verification of GE-PON system development has been progressing in NTT.
- GE-PON will be a powerful tool for future broadband accesses.

GE-OLT



GE-ONU



- IEEE802.3ah compliant
- 1.25Gbps 1000BASE-PX20 optical Interface
- DBA (Dynamic Bandwidth Allocation) for various QoSs
- Carrier-grade system OSS (Operation Supporting System)
- Automatic user registration and authentication schemes

2) High-quality Video Communication Tool **NTT WEST**



Skin image



PC screen image
(max. size of 640 x 480 pixel or VGA)

File Transfer Services

- Real-time file transfer to random users
- Server Storage for piling messages and data



Communication Server

Files

Files

Regional IP Network

Message



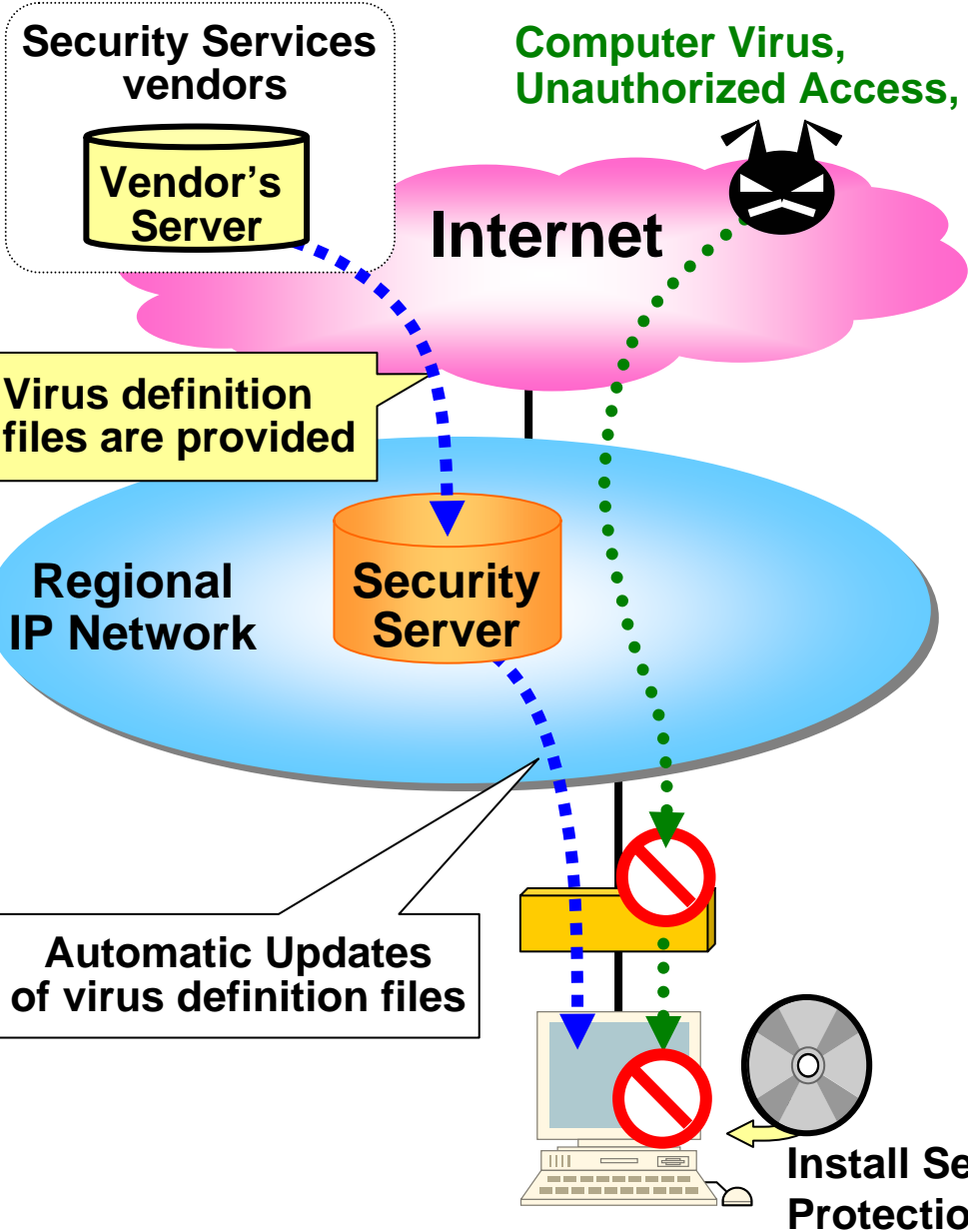
"FLET'S PHONE"

High quality video and voice communication on a big screen

Video, Voice Communication

Text-based communication among users

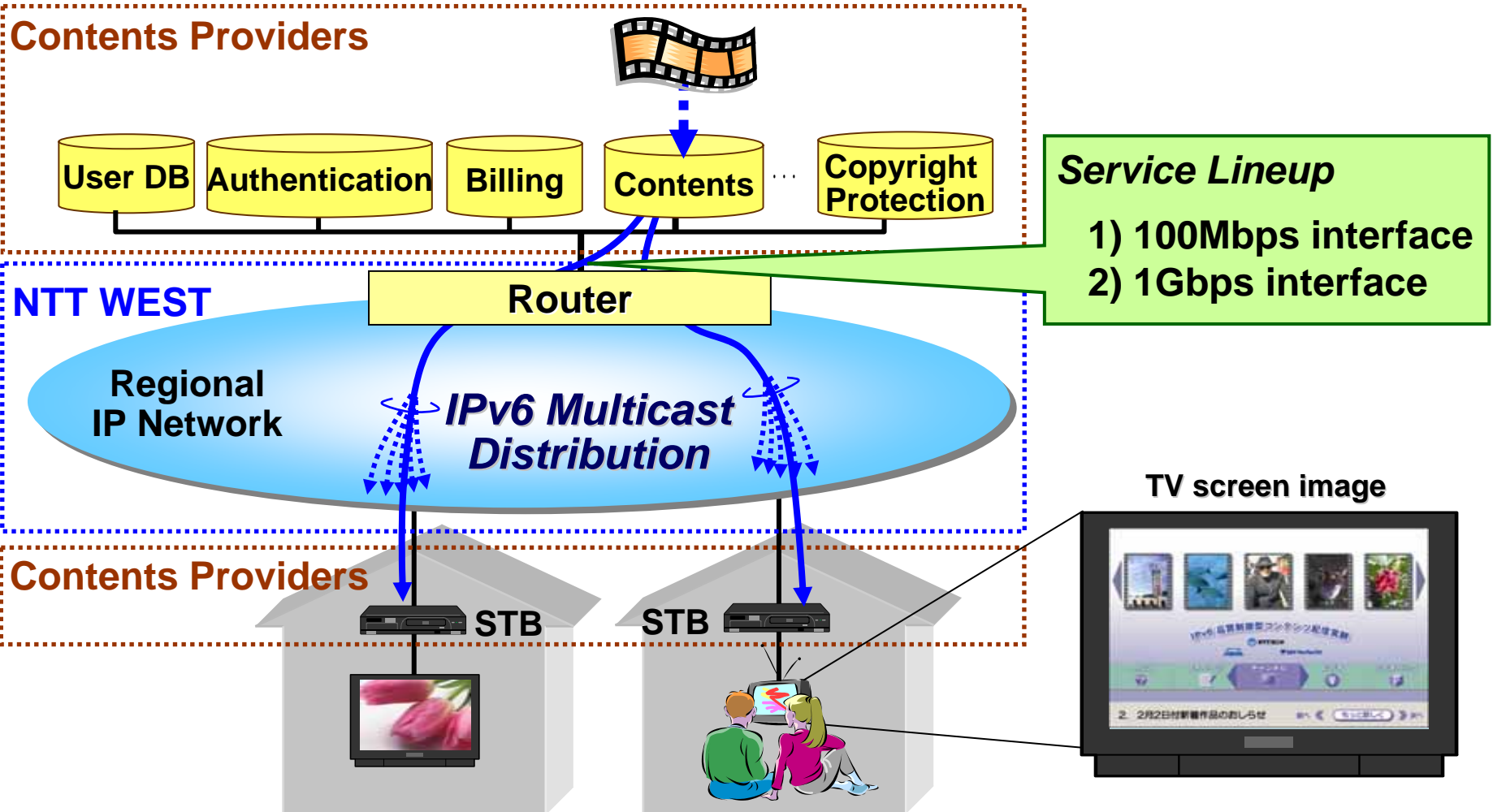
Messaging



| Functions | Overview |
|------------------------------|--|
| Antivirus | Automatic security updates, virus scan, quarantine, and delete. |
| Blocking unauthorized access | Prevention, detection, and blocking of unauthorized access. |
| Filtering software | Restriction of access to harmful information and website. |
| Blocking unsolicited emails | Detection and blocking unsolicited emails. |
| Privacy protection | Detection and removal of spyware, guard against phishing attacks, etc. |

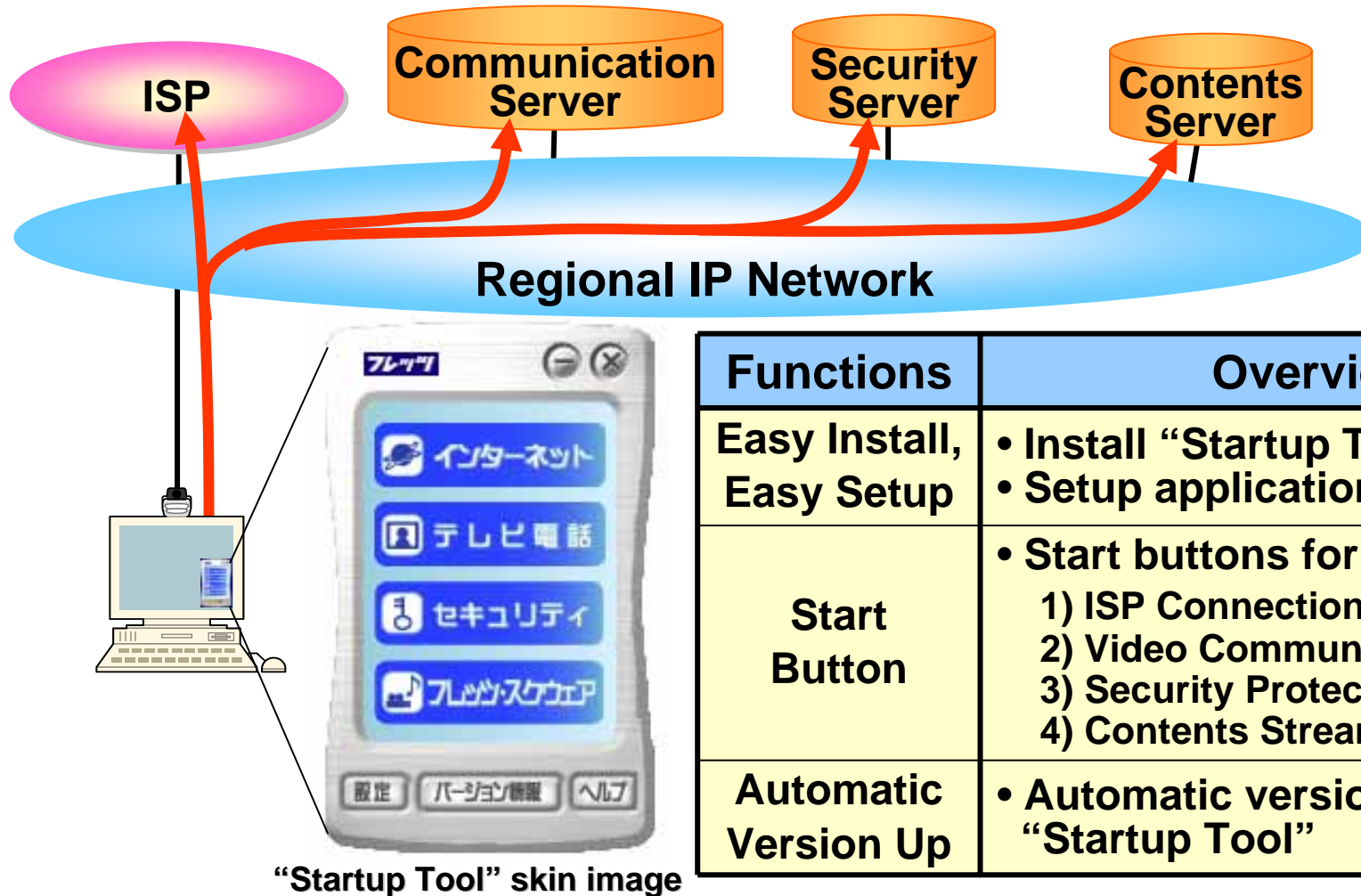
4) Multicast Contents Distribution

- IP broadcasting services: packaged programs by Contents Providers
- VOD services: online video rental services
- Streaming video distribution services by STB plus TV



5) Overview of “Startup Tool”

- “Startup Tool” improves convenience and user-friendliness in using broadband access.
- “Startup Tool” is always displayed on the top of the screen.



| Functions | Overview |
|--------------------------|--|
| Easy Install, Easy Setup | <ul style="list-style-type: none">• Install “Startup Tool”• Setup applications usage |
| Start Button | <ul style="list-style-type: none">• Start buttons for applications<ol style="list-style-type: none">1) ISP Connection2) Video Communication Tool3) Security Protection4) Contents Streaming |
| Automatic Version Up | <ul style="list-style-type: none">• Automatic version-up of “Startup Tool” |

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4. NTT WEST Mid-term Vision

1) Transition from metal wire access to Optical fiber access

- ✓ Boost demand of optical fiber through developing infrastructure for triple play services and interactive video communications
- ✓ Reduce cost by introducing technical innovations, cutting equipment cost, improving production methods
- ✓ Develop optical infrastructure for shifting 15 million customers in western part of Japan to optical fiber access by 2010

2) Development of advanced broadband IP network

- ✓ Aim for early implementation of high-quality and flexible IP network with new technologies such as 1Gbps shared access (GE-PON) and IPv6

3) Dissemination of high-quality, low-rate IP telephone services over optical fiber

- ✓ Seamlessly migrate from fixed to optical IP telephone services with reliability, safety, and quality

4) Realization of “anywhere, anytime, anything” ubiquitous services

- ✓ Create ubiquitous broadband services that meets the needs of home and business users
- ✓ Provide total solutions integrating fixed and mobile, voice and data communications

5) Provision of high-quality and various video communications

- ✓ Promote interactive, high-quality video communications over broadband IP network, through alliances

Thank you