

February 21, 2008

## Tabulation and Estimation of Internet Traffic in Japan

Announcement of tabulation results as of November 2007

MIC announces the results of tabulation and estimation of traffic as of November 2007, accomplished through assistance and/or cooperation with six Internet Service Providers ("cooperative ISPs"<sup>1</sup>) and academia<sup>2</sup>, in order to understand the current status of Internet traffic (communication traffic) in Japan.

### 1. Key points

The total volume of broadband subscriber<sup>3</sup> traffic in Japan as of November 2007 was estimated to average approximately 800 Gbps, which is about 2.5 times greater than November 2004, when the effort to comprehend the traffic started.

In the year and a half since May 2006, the incoming traffic from overseas ISPs to the cooperative ISPs doubled. In particular, the traffic has been surging after November 2006. Consequently, the volume of the incoming traffic from overseas ISPs to the cooperative ISPs exceeded the volume of the outgoing traffic from the cooperative ISPs that was exchanged directly with domestic ISPs by means other than major domestic IXs.

### 2. Types of traffic<sup>4</sup> tabulated

#### A. Traffic by type of subscriber for the cooperative ISPs' services

A1: subscriber traffic for broadband (DSL and FTTH) services

A2: subscriber traffic for other services (i.e., dial-up, leased line, and data center)

#### B. Traffic that the cooperative ISPs exchange with other ISPs

B1: traffic exchanged with domestic ISPs at major domestic IXs

B2: traffic exchanged with domestic ISPs by means other than major domestic IXs  
(i.e., private peering, transit, and public peering at other IXs)

B3: traffic exchanged with overseas ISPs

#### C. Traffic exchanged at major domestic IXs<sup>5</sup>

The total volume of the subscriber traffic for broadband services in Japan was extrapolated from the cooperative ISPs' share (obtained through dividing an average monthly traffic that the cooperative ISPs exchanged with domestic ISPs at major domestic IXs [B1] by an average monthly traffic exchanged at major domestic IXs [C]) and the subscriber traffic volume for the cooperative ISPs' broadband services (A1).

Notes:

1. Networks of six ISPs: Internet Initiative Japan (IIJ), NTT Communications, K-Opti.com, KDDI (including the now defunct Poweredcom), SoftBank BB, and SoftBank Telecom
2. Prof. ESAKI Hiroshi, the University of Tokyo; Assistant Prof. KATO Akira, the University of Tokyo; Mr. CHO Kenjiro, Researcher at IIJ; and Assistant Prof. FUKUDA Kensuke, National Institute of Informatics
3. Subscribers for broadband services in this tabulation refer to the subscribers for DSL or FTTH services.
4. The tabulated data is to be uploaded to MIC's Information & Communications Statistics Database website: <http://www.johotsusintokei.soumu.go.jp/index.html>
5. NSPIXP, JPIX and JPNAP; IX: Internet eXchange

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[http://www.soumu.go.jp/joho\\_tsusin/eng/contact.html](http://www.soumu.go.jp/joho_tsusin/eng/contact.html)

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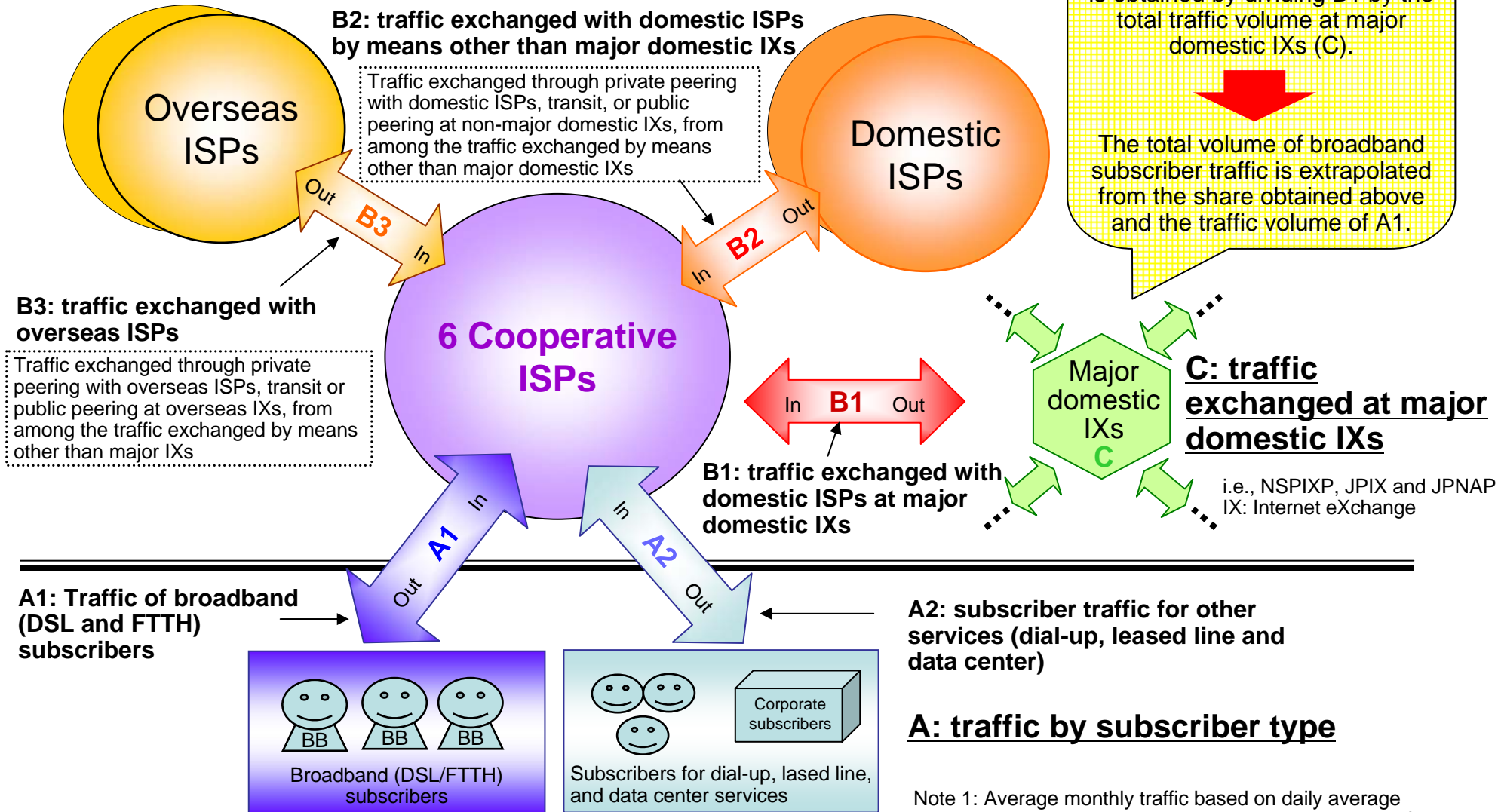
# Total Internet Traffic Volume in Japan

February 21, 2008

Computer Communications Division, Telecommunications Business Department,  
Telecommunications Bureau, Ministry of Internal Affairs and Communications

# 1. Types of Traffic<sup>1</sup> Tabulated

## B: traffic exchanged between ISPs

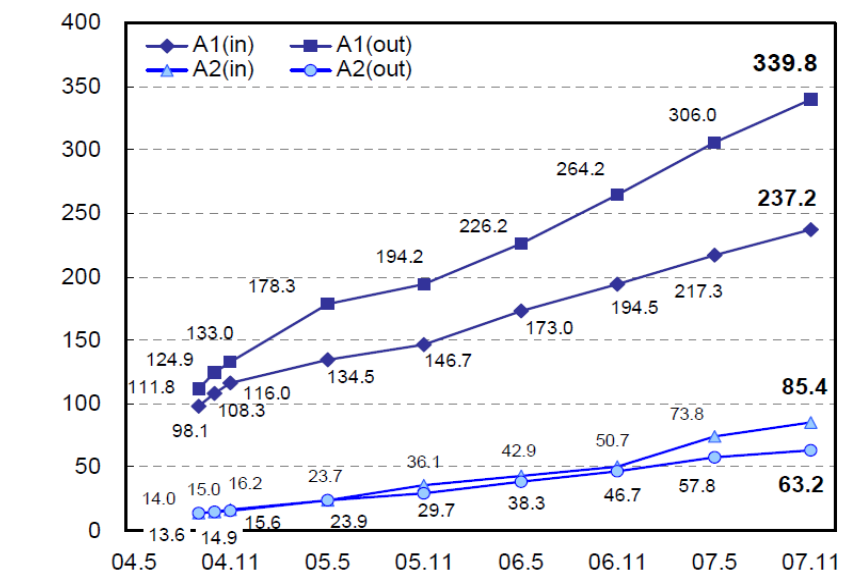


## 2. Traffic by Subscriber Type

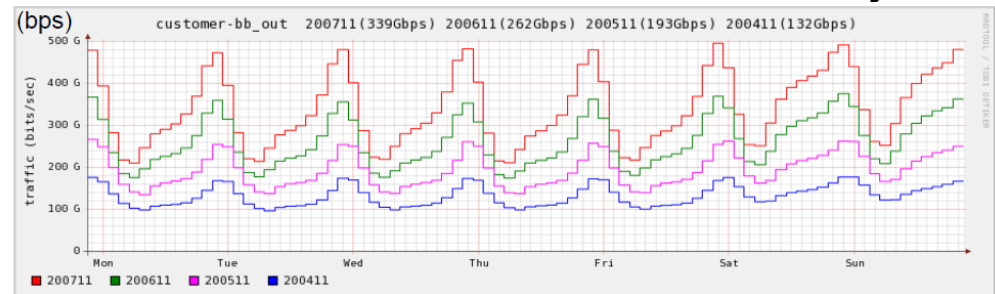
- Download traffic of broadband subscribers continues to increase at approximately the same rate.
- Traffic peaks at 21:00 and 23:00. This tendency has become more evident year by year.

1. The traffic of broadband subscribers (A1) has steadily increased. Average monthly download traffic reached nearly 340 Gbps in November 2007, 2.6 times greater than 3 years ago.
2. The download traffic (Out) to upload traffic (In) ratio of the broadband subscribers (A1) continues to increase, becoming about 1.2 times greater (from 1.1 to 1.4) in 3 years. This trend of download-oriented use is likely to continue.
3. In November 2007, the peak download traffic of broadband subscribers (A1) is at around 21:00 and 23:00, as in the past. Meanwhile, the gap in daytime Internet use between weekdays and weekends became more evident.
4. In the 3 years since the data-tabulation started in November 2004, the lowest traffic almost doubled (from 100 Gbps to 200 Gbps) while the peak traffic became 2.8 times greater (from 180 Gbps to 500 Gbps). The gap between the lowest and the peak became 1.4 times greater (from 1.8 to 2.5) in 3 years, indicative of traffic growth in the peak hours.

(Gbps) **Traffic by Subscriber Type (Monthly Average)**



**Download Traffic of Broadband Subscribers by Hour**

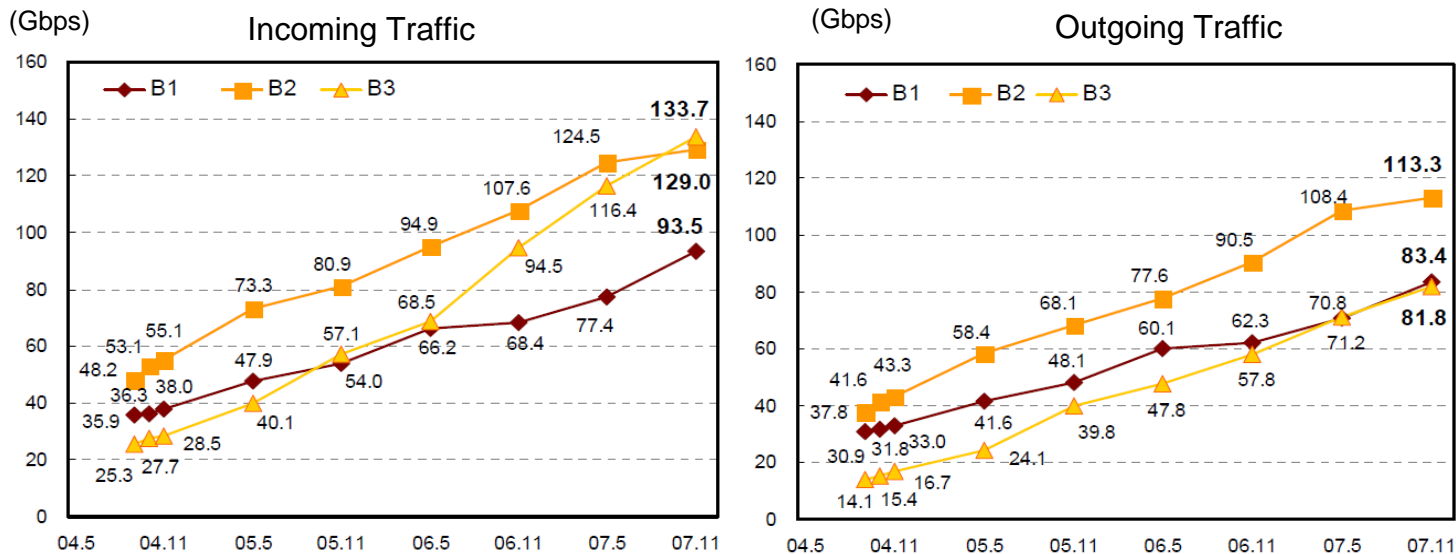


### 3. Traffic Exchanged between ISPs

- The incoming traffic from overseas ISPs (In) continues to surge, doubled in one and a half years, and exceeded the traffic exchanged by means other than major domestic IXs.
- The growth of traffic (In/Out) exchanged at major domestic IXs became sharper.

1. The incoming traffic from overseas ISPs to the cooperative ISPs (In of B3) **doubled in the year and a half** since May 2006, and showed sharper growth in particular since November 2006. Consequently, the volume of the incoming traffic from overseas ISPs to the cooperative ISPs exceeded the outgoing traffic from the cooperative ISPs exchanged directly with domestic ISPs (In of B2).
2. Compared with the tabulation as of May 2007, the growth of the traffic that the cooperative ISPs exchanged with domestic ISPs (In/Out of B2) slowed, while the traffic that they exchanged with domestic ISPs at major domestic IXs (In/Out of B1) is again on the rise. Consequently, the B1 to B2 ratio decreased from 1.6 to 1.4 for In, and from 1.5 to 1.4 for Out, in the 6 months from May 2007.

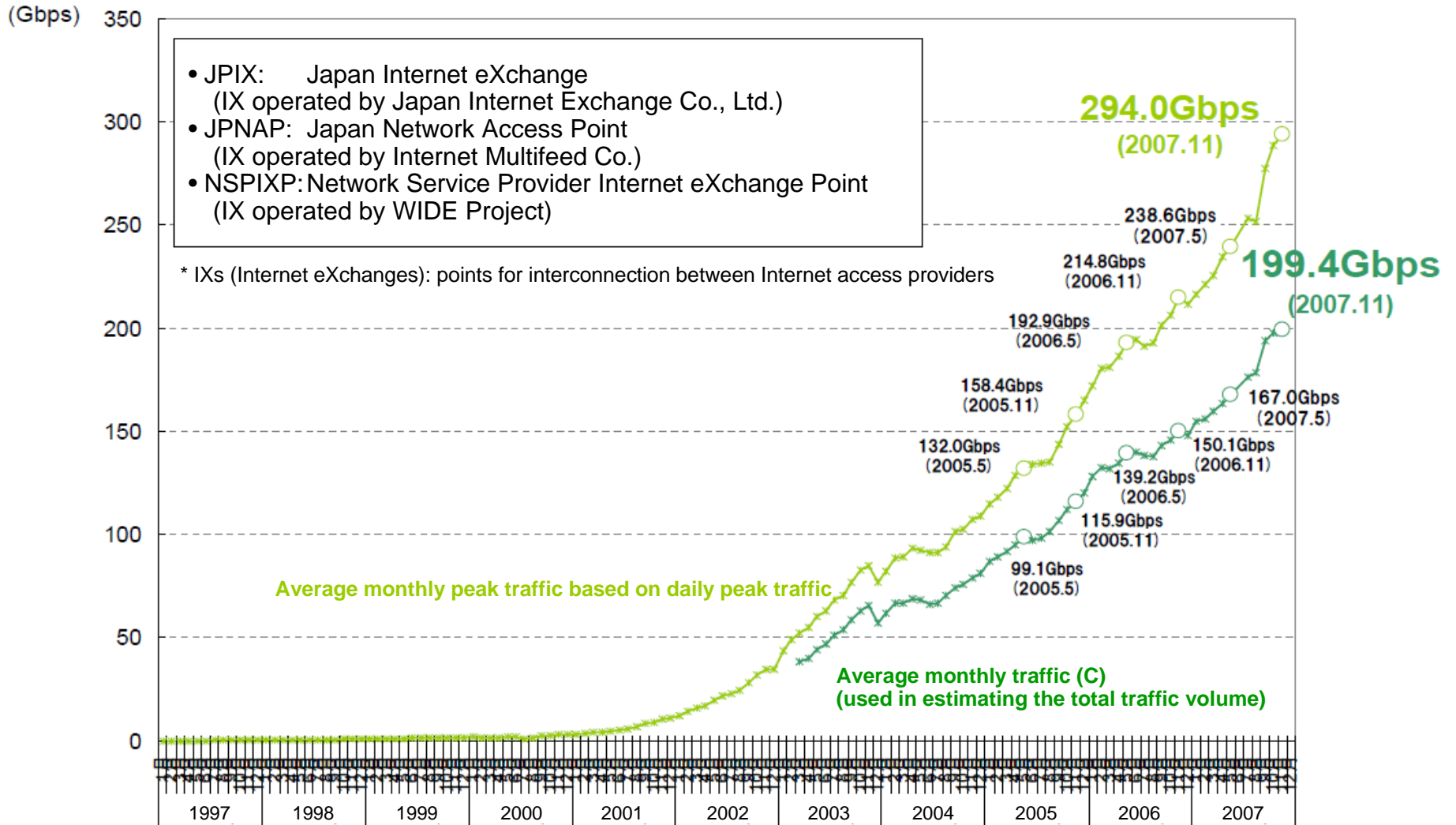
**Traffic Exchanged between ISPs**



**B1:** traffic exchanged with domestic ISPs at major domestic IXs  
**B2:** traffic exchanged with domestic ISPs by means other than major domestic IXs  
**B3:** traffic exchanged with overseas ISPs

# (Reference) Traffic at Major Domestic IXs

## (Reference) Traffic Exchanged at Major Domestic IXs (JPIX, JPNAP, and NSPIXP)



\* The figures as of June 2007 were excluded due to data deficiency.

## 4. Estimated Traffic Volume of Broadband Subscribers in Japan

- The traffic of the 6 cooperative ISPs accounts for 41.8% of the total traffic exchanged at major domestic IXs (remaining at the same level for one year).
- Assuming the above percentage as their domestic share, we estimated the total download traffic volume of broadband subscribers in Japan to be about 800 Gbps. It is likely that such a volume of traffic is being distributed over the Internet.

1. The traffic of the 6 cooperative ISPs (B1) accounts for 41.8% of the total traffic exchanged at major domestic IXs (C). We suppose the percentage to be their share of the total broadband subscribers in Japan.
2. Based on their share and the traffic of the subscribers to their broadband services (DSL/FTTH) (A1), we extrapolated the total download traffic of broadband subscribers in Japan. Presumably, an average traffic of about 800 Gbps is being distributed over the Internet.

$$339.8 \text{ Gbps} / 41.8\% = 812.9 \text{ Gbps}$$

3. The total traffic volume became 2.5 times greater in the 3 years between November 2004 and November 2007.

### Estimated Traffic Volume of Broadband (DSL/FTTH) Subscribers

	C traffic exchanged at major domestic IXs <Monthly average based on daily average>	B1 traffic from 6 cooperative ISPs exchanged at major domestic IXs (Out) <6 ISPs>	Share of 6 cooperative ISPs (B1/C)	A1 download traffic of broadband (DSL/FTTH) subscribers <6 ISPs>	Estimated total traffic volume of broadband (DSL/FTTH) subscribers in Japan
Nov. 2004	80.3	33.0	41.1%	133.0	323.6
Nov. 2005	115.9	48.1	41.5%	194.2	468.0
Nov. 2006	150.1	62.3	41.5%	264.2	636.6
Nov. 2007	199.4	83.4	41.8%	339.8	812.9

# 5. (Summary) Internet Traffic<sup>1</sup> in Japan

○ The scale of the Internet traffic in Japan became 2.5 times greater, to 800 Gbps, in 3 years.

Internet Traffic in Japan (Average)

