

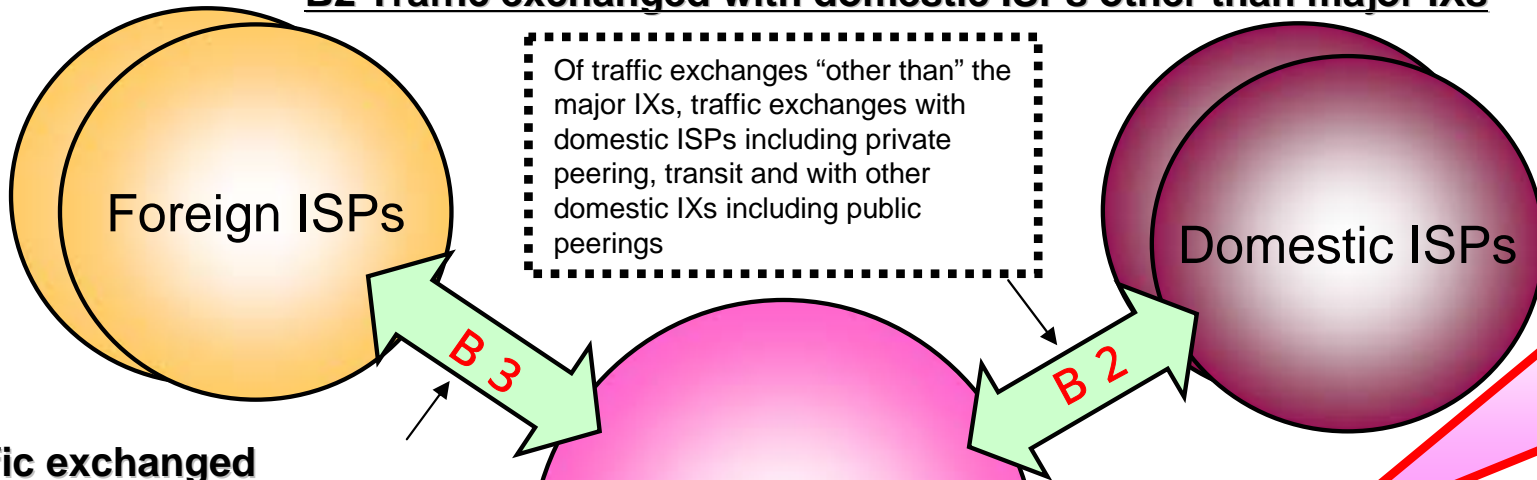
Estimate of Internet Traffic in Japan

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1. Types of traffic statistics*

B2 Traffic exchanged with domestic ISPs other than major IXs



How much traffic is occupied by the seven ISPs in the major IXs' traffic volume?
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 The total traffic volume in Japan is estimated through proportional allotment of A1 data

Average traffic volumes exchanged at the major domestic IXs* are disclosed.

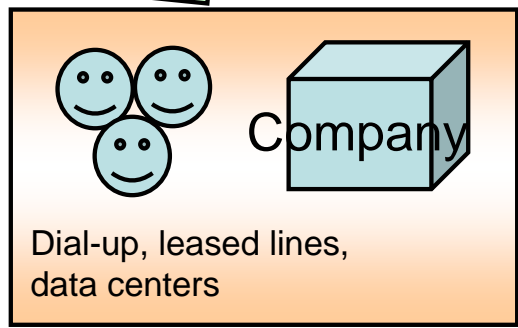
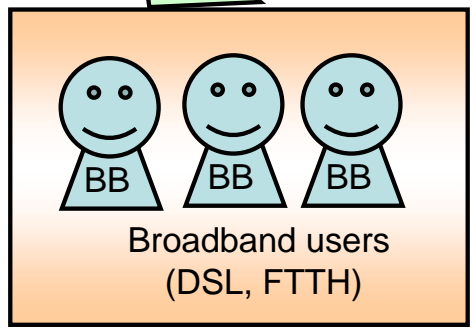
* NSPIXP, JPIX and JPNAP (IX = Internet exchange)

B3 Traffic exchanged with overseas ISPs

Of traffic exchanges "other than" the major IXs, traffic exchanges with overseas ISPs including private peering, transit and with other overseas IXs including public peerings

B1 Traffic exchanged with major domestic IX ISPs

A1 Traffic of broadband users (DSL, FTTH)



A2 Traffic of other users (dial-up, leased lines, data centers)

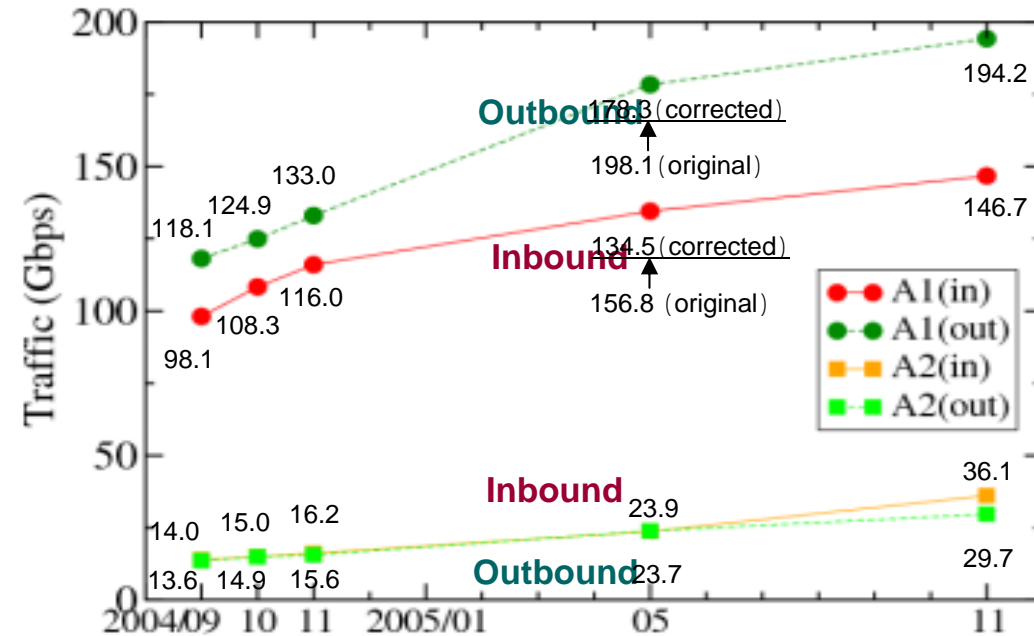
* Monthly average of average daily traffic volumes

2. Collection and results of estimates (1)

(1) A. Traffic by user type

1. While traffic for broadband users (DSL and FTTH) has been continuously increasing, the rate of growth has slowed somewhat. In November 2005, the total traffic of the seven ISPs was 194.2 Gbps.
2. Although the volume of outbound traffic (for ISPs; downloading traffic for users) is more than that of inbound traffic, inbound traffic also exceeds 134.5 Gbps. Thus, it is difficult for ISPs to design their networks on the assumption that "general users are mainly downloading data."
3. Among other subscriber categories (dial-up, leased line, data centers), inbound traffic is growing more than outbound traffic.
4. Taking a look at trends in broadband (DSL and FTTH) traffic by time zone, the lowest total traffic is over 110 Gbps. Thus, a considerable volume of traffic has been distributed regularly over the Internet.
5. The peak traffic period for broadband users is 9:00 pm - 11:00 pm, while the lowest level is at 7:00 am - 9:00 am. Traffic levels increase during the day on weekends, in contrast to the weekday pattern.

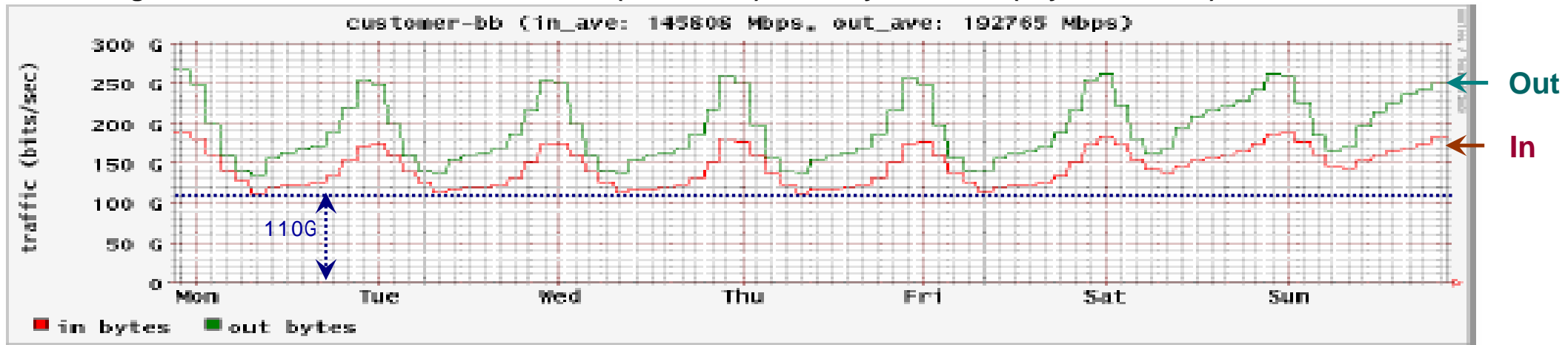
Figure 1-1: A - Traffic levels by subscriber type



A1 Broadband users (DSL, FTTH) - 7 providers
 A2 Other users (dial-up, leased lines, data centers) - 4 providers

* Corrected figures for broadband (DSL, FTTH) traffic (inbound and outbound) during May 2005

Figure 1-2: A1 Fluctuations in broadband (DSL, FTTH) traffic by time zone (day of the week)-- November 2005



* Outbound traffic is traffic from the ISP; inbound traffic is traffic to the ISP

2. Collection and results of estimates (2)

(2) A - Traffic by user type -- November 2004 versus November 2005

A comparison of broadband traffic in November 2004 and November 2005 shows that traffic levels are increasing, while daily fluctuation patterns remain largely the same

Figure 2-1: A1 - Inbound broadband (DSL, FTTH) traffic by time zone -- a comparison between November 2004 and November 2005

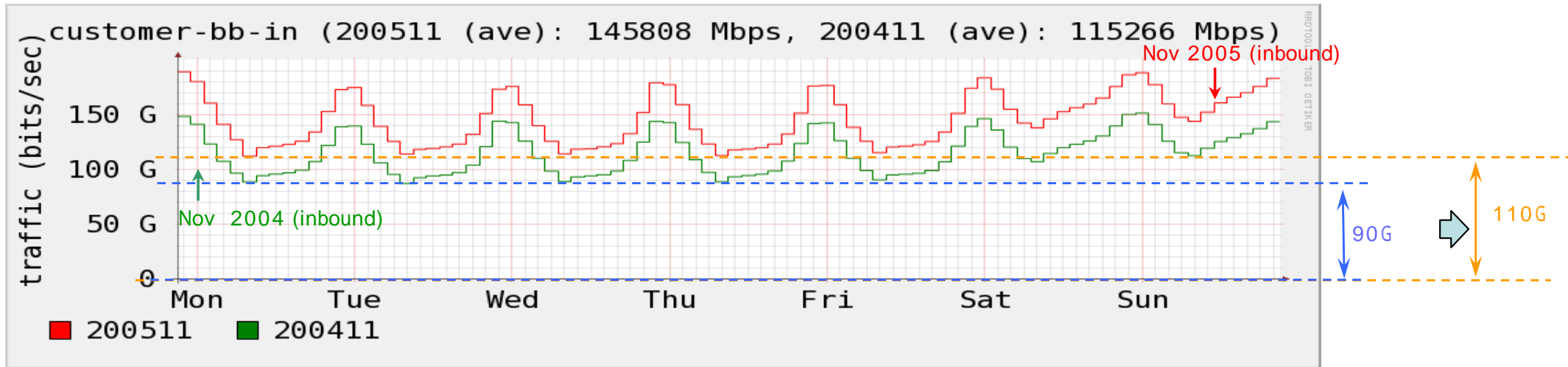
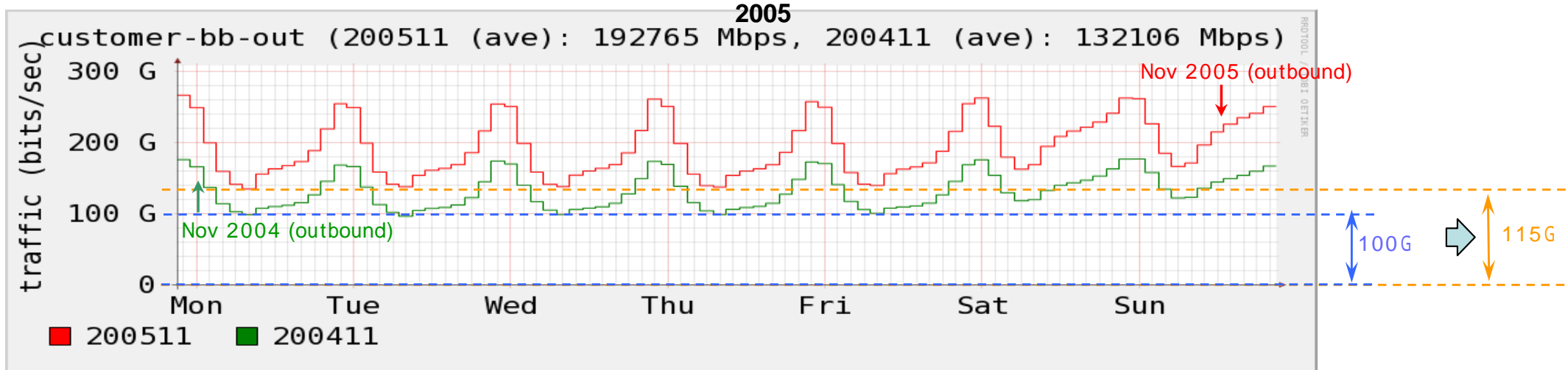


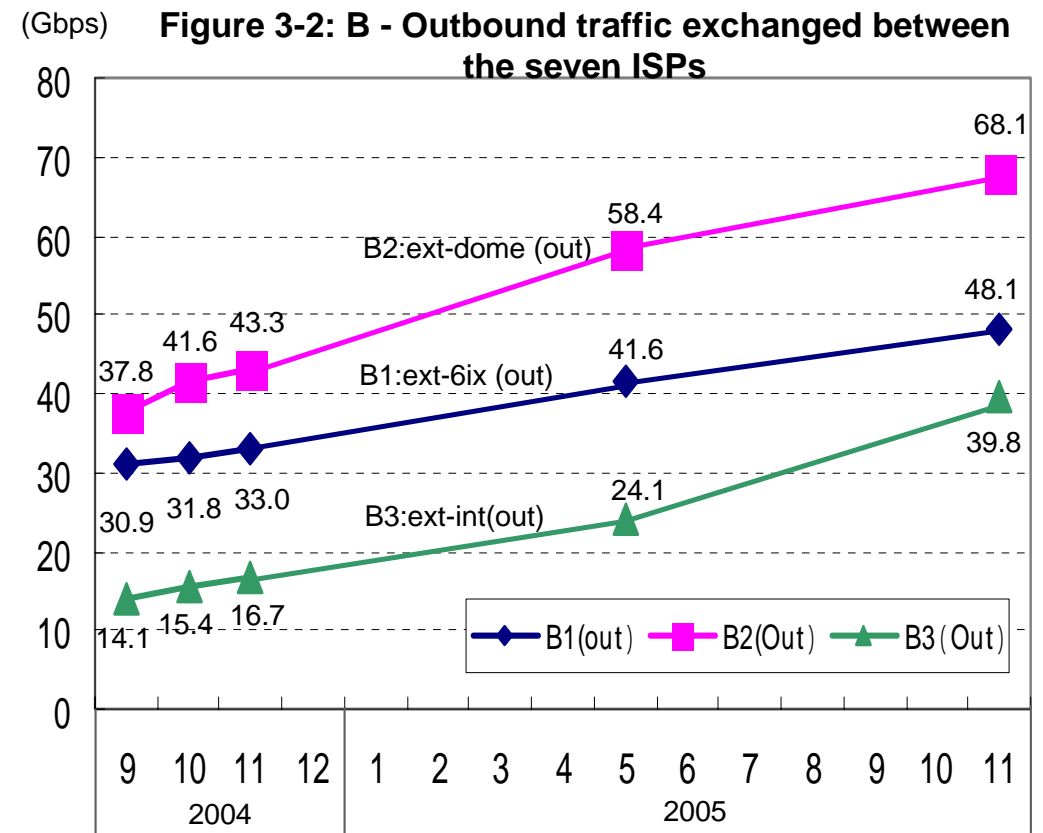
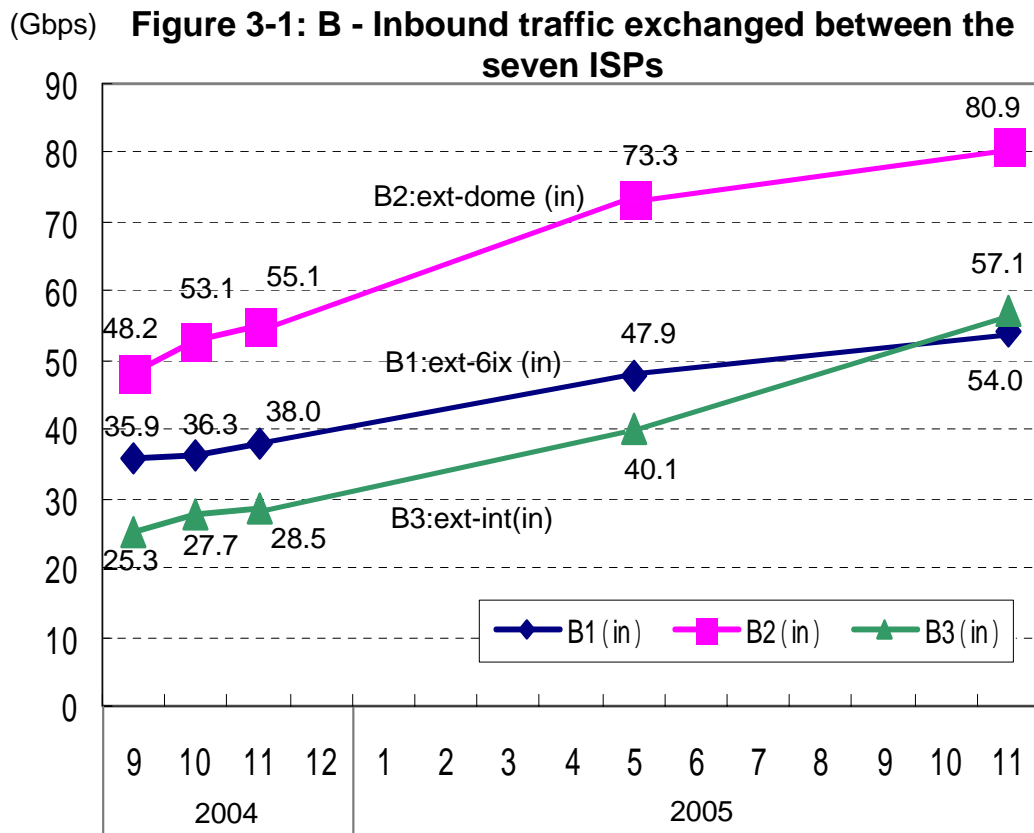
Figure 2-2: A1 - Outbound broadband (DSL and FTTH) traffic by time zone – a comparison between November 2004 and November 2005



* Outbound traffic is traffic from the ISP; inbound traffic is traffic to the ISP

(3) B - Traffic exchange between ISPs

1. B2 traffic volume (traffic exchanged with domestic ISPs other than major domestic IXs) of both inbound and outbound traffic is more than that of B1 (traffic exchanged with domestic ISPs via major domestic IXs). Traffic exchanges at the major IXs should not be constructed as the total volume of traffic exchanges.
2. Traffic growth since May 2005 has been strongest in the B3 category (traffic exchanged with overseas ISPs), with outbound traffic growing by 65.2% and inbound traffic by 42.4%.



* Outbound traffic is traffic from the ISP; inbound traffic is traffic to the ISP

2. Collection and results of estimates (4)

(4) Traffic growth rates -- November 2004 versus November 2005

1. Looking at broadband (DSL and FTTH) traffic (A1), outbound traffic has grown 46%, indicating a significant increase in user downloads.
2. Traffic exchanged with domestic ISPs is growing more quickly in the non-domestic IX category (B2) compared with the domestic IX category (B1).
3. Traffic exchanged with overseas ISPs (B3) is growing more quickly than other categories, at a rate of over 100% (i.e., the traffic volume more than doubles every year).

Figure 4-1: Traffic growth rates -- a comparison between November 2004 and November 2005

(Gbps)

	A1 Broadband traffic (DSL, FTTH) (7 providers)	B1 Traffic exchanged with domestic ISPs at major domestic IXs (7 providers)	B2 Traffic exchanged with domestic ISPs other than major domestic IXs (7 providers)	B3 Traffic exchanged with overseas ISPs (7 providers)	Total traffic exchanged at major domestic IXs
Nov 04	In) 116.0	In) 38.0	In) 55.1	In) 28.5	
	Out) 133.0	Out) 33.0	Out) 43.3	Out) 16.7	In) 80.3
Nov 05	In) 146.7	In) 54.0	In) 80.9	In) 57.1	
	Out) 194.2	Out) 48.1	Out) 68.1	Out) 39.8	In) 115.9
Annual growth	In) +26.5%	In) +42.1%	In) +46.8%	In) +100.4%	
	Out) +46.0%	Out) +45.8%	Out) +57.3%	Out) +138.3%	In) +44.3%

* Outbound traffic is traffic from the ISP; inbound traffic is traffic to the ISP

(5) Total broadband user traffic in Japan

1. If the total traffic volume carried by major domestic IXs is apportioned in accordance with traffic volumes for the seven ISPs with the IXs in November 2005 (B1), the seven ISPs together account for 41.5% of traffic carried by major domestic IXs.
2. Based on this calculation and the figure for broadband (DSL & FTTH) subscriber traffic (A1), the total average broadband user traffic volume in Japan is estimated at 468.0 Gbps as follows: $194.2 \text{ Gbps} \div 41.5\% = \underline{468.0 \text{ Gbps}}$
3. Compared with total traffic of 323.6 Gbps in November 2004, this represents growth of 44.6% in the space of one year.

Figure 5-1: Broadband user (DSL & FTTH) traffic volumes

	Inbound traffic exchanged at major IXs	B 1 Outbound traffic exchanged with major domestic IXs (based on seven ISPs)	Share of the seven ISPs	A1 Broadband user (DSL & FTTH) traffic of the seven ISPs	Broadband (DSL & FTTH) traffic volume
Nov 04	80.3 Gbps	33.0 Gbps	41.1%	133.0 Gbps	323.6 Gbps
Nov 05	115.9 Gbps	48.1 Gbps	41.5%	194.2 Gbps	468.0 Gbps

* Outbound traffic is traffic from the ISP; inbound traffic is traffic to the ISP

Traffic exchanged by major domestic IXs (JPIX, JPNAP, NSPIXP)

