MIC International Policy Division, Global ICT Strategy Bureau

Communications News

Vol. 19 No. 19
January 9, 2009

Biweekly Newsletter of the Ministry of Internal Affairs and Communications (MIC), Japan

ISSN 1349-7987

STATISTICS

Figures and Estimates for Japan's Broadband Subscription Numbers and Network Traffic

*MIC compiles statistics on the number of broadband subscriptions, based on the Rules of Reporting on Telecommunications Business (Ministerial Ordinance of MPT No. 46 of 1988), as well as collecting figures and estimates on Japan's Internet traffic with help from six Internet service providers (referred to below as "cooperating ISPs" (*1)) and researchers (*2) in order to grasp the situation of the shift to broadband.*

Trends in the number of broadband subscriptions

The number of subscriptions to broadband services (*3) at the end of June 2008, as announced at the end of September 2008 (*4), was 29.34 million. The figure stood at 28.75 million at the end of March 2008, and there was an increase of 590,000 over the previous term (Figure 1).

In addition, the number of FTTH access subscriptions at the end of June 2008 stood at 13.08 million (an increase of 930,000 over the previous term), overtaking the number of subscriptions to DSL access services for the first time.

Total volume of download traffic by broadband subscribers

MIC announced in August 2008 figures and estimates (*5) for Japan's Internet traffic as of May 2008. Types of traffic as calculated by cooperating ISPs and researchers are shown in Figure 2. As of May 2008, the proportion of traffic (B1 out) from cooperating ISPs within traffic exchanged (C) at Japan's main Internet exchanges (IX) (*6) was 42.6%, and this was assumed to be the share of cooperating ISPs within Japan's broadband subscriptions as a whole. The total estimated volume of download traffic by broadband subscribers from this share and from the download traffic (A1 out) by broadband subscribers to cooperating ISPs (*7) averaged at 880 Gbps (*8) (Figure 3). In comparison to the estimated index as of May 2007, this shows an increase of 1.2 times.

In addition, the total volume of download traffic, plus the total volume of upload traffic that was obtained using the same method were divided by the number of broadband subscriptions (*9) that are collected and announced by MIC, based on the Rules of Reporting on Telecommunications Business, to give an average traffic figure per subscription. Since 2006, the increase in average traffic per subscription has been noticeable.

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*1: Internet Initiative Japan (IIJ), NTT Communications, K-Opticom, KDDI (including ex-PoweredCom), Softbank BB, Softbank Telecom make up the 6 ISPs running 7 networks.
*2: Professor ESAKI Hiroshi, University of Tokyo, Professor KATO Akira, Keio University, Senior Researcher CHO Kenjiro, IIJ, and Associate Professor FUKUDA Kensuke, National Institute of Informatics
*3: FTTH access services, DSL access services, CATV access services, FWA access services
*4: MIC press release of September 17, 2008: Number of Broadband Service Contracts, Etc. (as of the end of June 2008) - FTTH outnumbers DSL for the first time (http://www.soumu.go.jp/joho_tsusin/eng/Releases/Telecommunications/news080917_2.html)
*5: MIC press release of August 29, 2008: Tabulation and Estimation of Internet Traffic in Japan - Announcement of tabulation results as of May 2008 (http://www.soumu.go.jp/joho_tsusin/eng/Releases/Telecommunications/news080829_5.html)
*6: JPIX which is operated by the Japan Internet Exchange Co. Ltd., JPNAP which is operated by Internet Multifeed Co., NSPIXP which is operated by the WIDE Project
*7: Subscribers to FTTH and DSL
*8: If converted to rewritable DVD medium (4.7GB), this would equal approximately 2 million discs a day in volume.
*9: The number of broadband subscriptions in May ad November, which is when traffic is calculated, was estimated from the proportion of increase in March to June, and September to December. The number of broadband subscriptions as of May 2008 was estimated from the proportion of increase in December 2007 and March 2008.

Figure 1: Trends in the number of broadband subscriptions

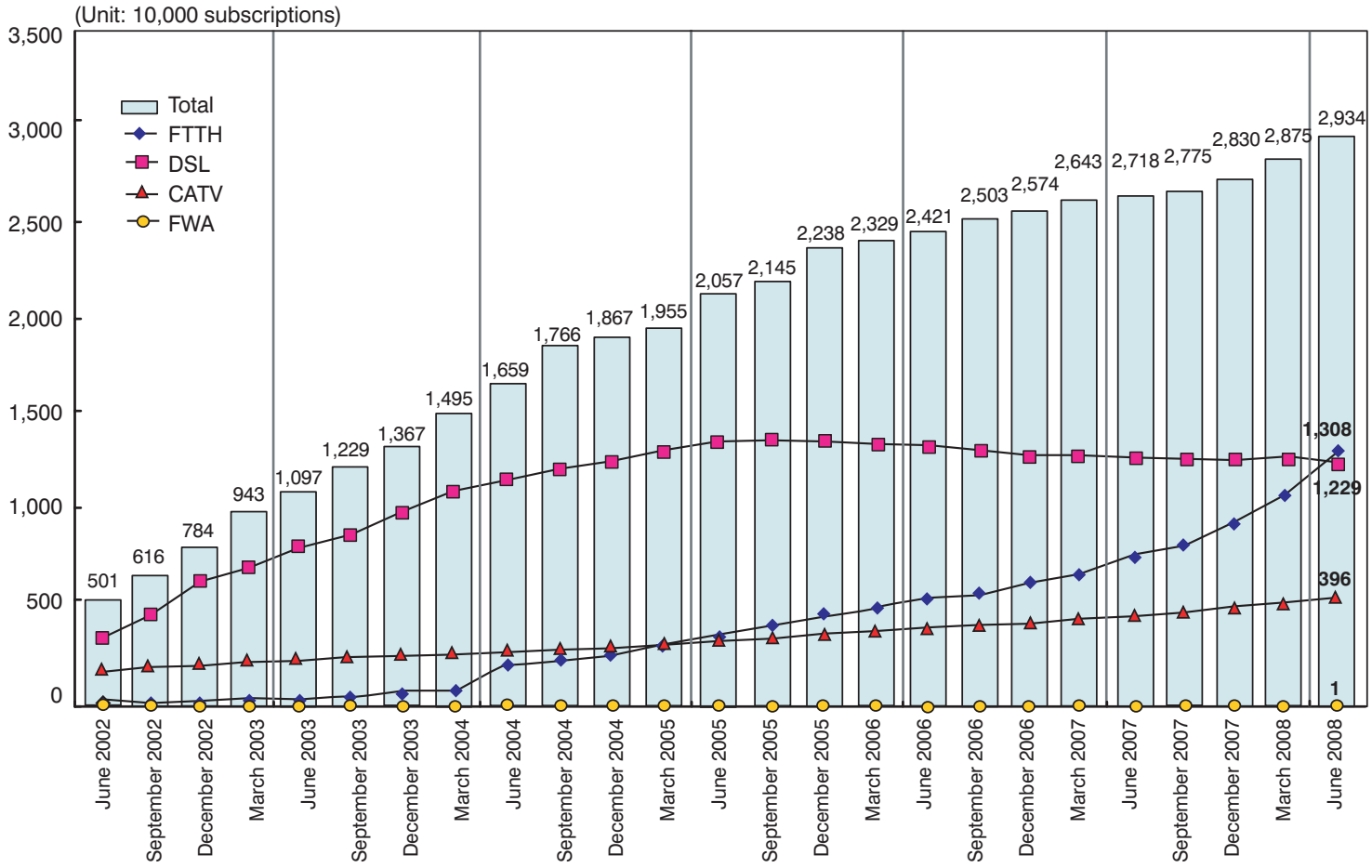


Figure 2: Types of traffic that were collected

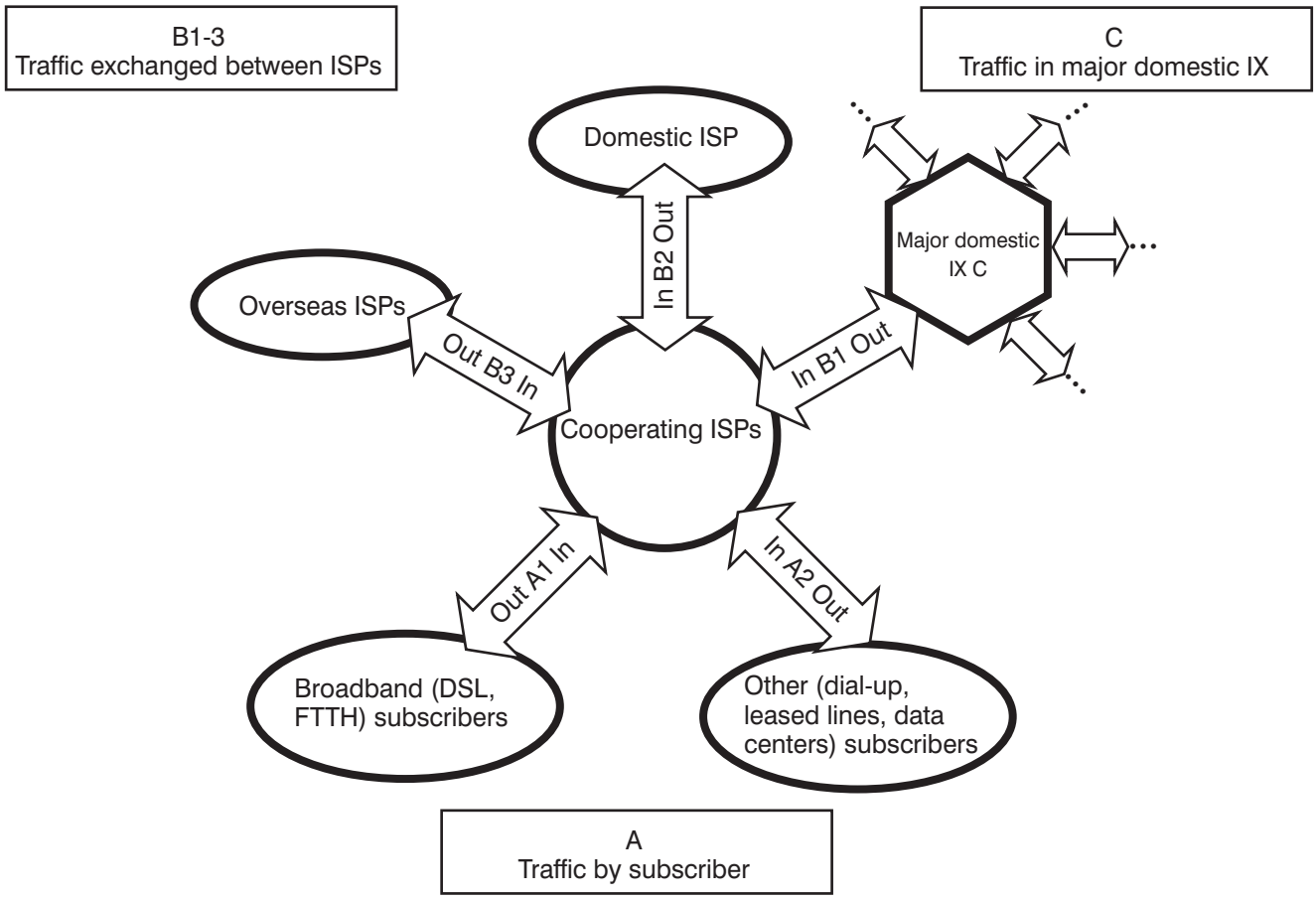
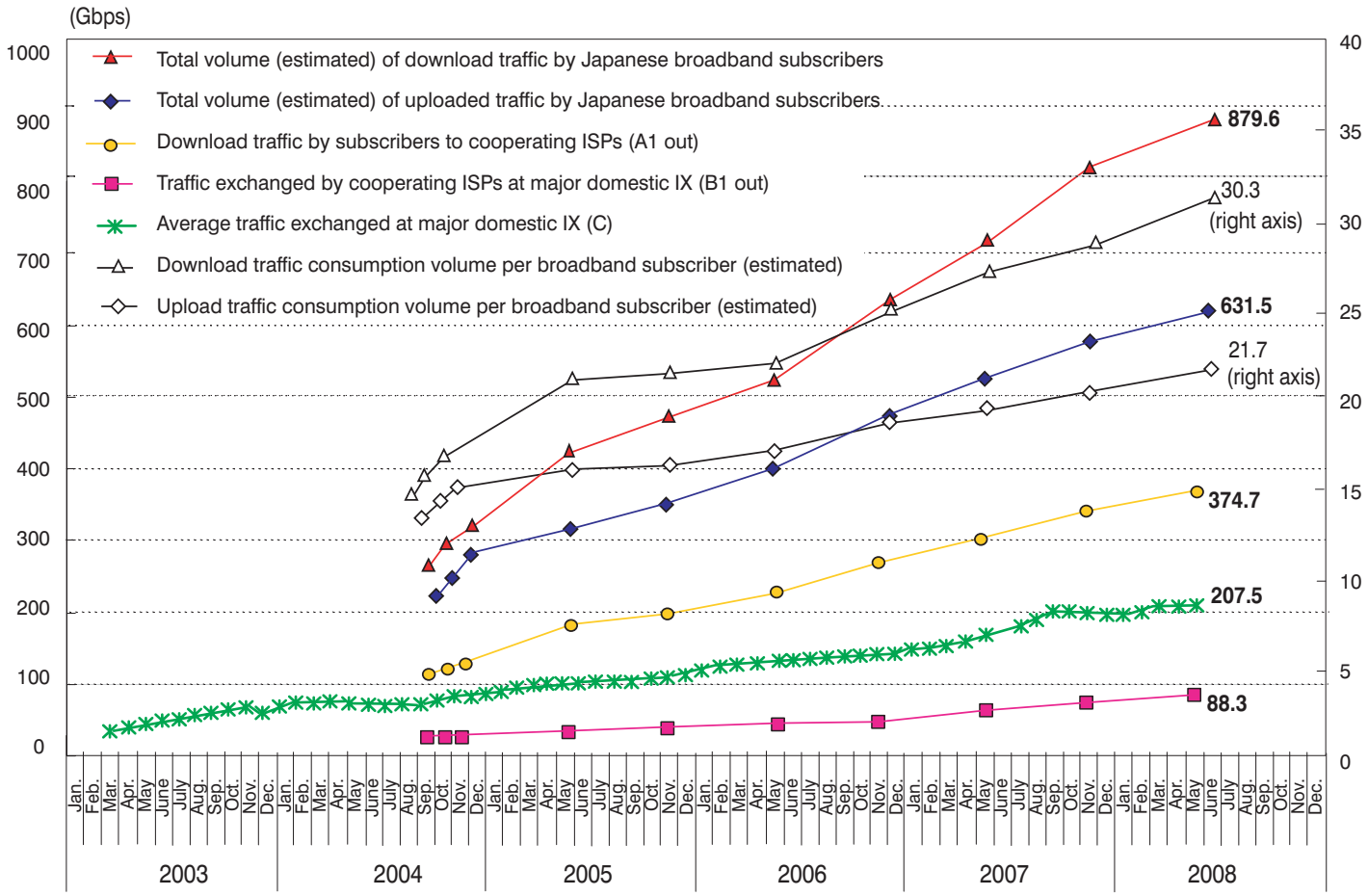


Figure 3: Trends in Japan's Internet traffic and traffic per subscriber



TOPICS

Elimination of No-Signal Areas for Mobile Phones and the Improvement and Diversification of Services

Introduction

There are currently more than 100 million subscribers to mobile phones in Japan, and the situation has almost reached that of each person owning a phone and some owning several. There is an even greater need to be able to use mobile phones with a good signal at any time, and the needs associated with how they are used continue to grow increasingly more diversified. Given these conditions, mobile phone business operators are offering a variety of services, and it is expected that these services will continue to become increasingly diversified in the future.

This paper will introduce the femtocell base station (ultra-small cellular base station) as one of the devices which is expected to improve the convenience of mobile phone services further.

The current state of mobile phones

No-signal areas for mobile phones

There are now more and more people who do not have a fixed telephone line and make do just with a mobile phone. But there are still quite a few locations where it is not possible to use mobile phones. For example, there are places, such as high-rise buildings, inside homes or in underground complexes where signals from outside base stations do not pass (Figure 1).

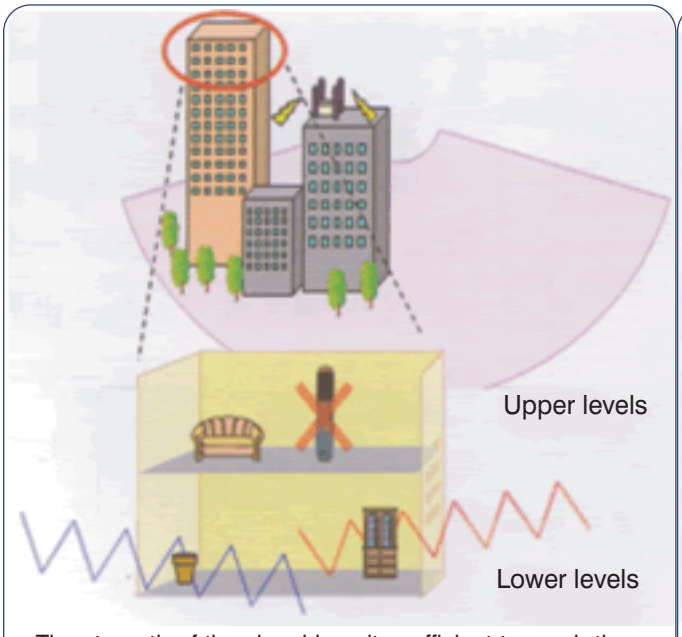
At present, there are many external base station installations for mobile phones, and efforts are being made on a daily basis to eliminate no-signal areas, but the following problems are found in putting in place and operating base stations in high-rise buildings, inside housing and in underground complexes, making it difficult to eliminate no-signal zones in such areas.

(1) Since the installation itself is large in size, large scale construction would be necessary.

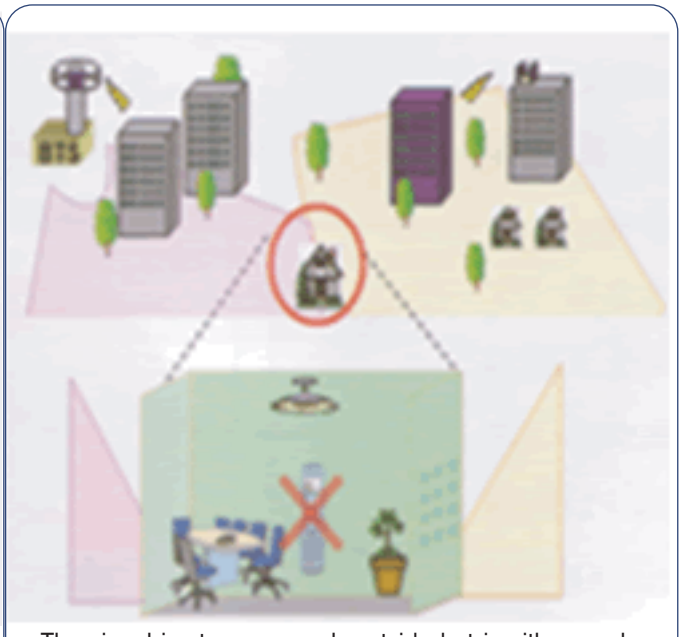
(2) Since leased lines belonging to mobile phone service operators are used between the base stations and the mobile phone service operators' exchanges, putting the equipment in place is difficult in buildings where there are restrictions to installations.

(3) The operation of base stations must be carried out by specialized mobile phone business operators, and it would be difficult for response teams to enter these locations should problems arise.

Figure 1: Indoor no-signal areas for mobile phones



The strength of the signal is quite sufficient to reach the lower levels, but the quality deteriorates rapidly in the upper levels or they are out of reach of the signal.



The signal is strong enough outside but is either weak or unobtainable inside.

Improvement and diversification of mobile phone services

With advances in the functionality of mobile phone handsets, their use is becoming diversified and their use to access the Internet in particular has grown tremendously. In addition to that, the contents that are being offered via the Internet, such as image transmission and games, are becoming larger in volume. If the speed of mobile phone transmissions is increased, these services will be easier to use. At present, the introduction is under way of new systems such as HSDPA, and measures are being taken to increase transmission speeds, but since multiple users access the same base stations simultaneously, there are cases where transmission speed per person becomes slower, and people are looking for guarantees of stable transmission speeds.

Introduction of femtocell base stations

What is a femtocell base station?

It is against this background that a new type of base station, known as femtocell, was developed.

As shown in Figure 2, the femtocell base station is an ultra-small base station with an output of less than 20 mW, and is about the size of a wireless LAN router. Also, it can be connected to a home or office broadband line for use.

The derivation of the word is from the combination of "femto" which is the metric prefix denoting one quadrillionth (million billionth) of a unit, and "cell," a unit of area covered by base stations. As opposed to the coverage area of existing base stations which ranges from a radius of several hundred meters to several kilometers, the femtocell covers a radius of only a few tens of meters, not because the cell is one quadrillionth the size of existing cells, but because it is a great deal smaller than existing cells.

The advantages of femtocell base stations

Since femtocell base stations are ultra-small in size and can be used with broadband lines, installations is very simple and, unlike repeaters that amplify the frequencies from outside base stations to cover internal locations, there is no weakening of the signal from outside base stations. Also, the equipment comes in a small casing and its handling requires only simple operations such as activating the on/off power switch, meaning that it does not require specialists.

In addition, a femtocell base station can only have a maximum of four users, meaning that steady transmission speed per user can be maintained.

Putting in place systems in conjunction with the introduction of femtocell base stations

Systems were put in place in May 2008 in order to promote the introduction of femtocell base station, including an amendment of the Radio Law, which came into effect on October 1. With this, general users of mobile phones can easily operate femtocell base stations in high-rise buildings, homes and the like (Figure 3).

Also, the formalities that mobile phone operators have to go through to obtain a license have been simplified so as to make it easier for them to install femtocell base stations.

With these systems being put in place, users can easily have their own dedicated base stations, and it is expected that the introduction of femtocell base stations, which makes it possible to use mobile phones in a stable frequency environment and transmission speed, will spread.

Aiming for more convenient and pleasurable use of mobile phones

In the text above, we introduced femtocell base stations which will contribute to the elimination of no-signal areas for mobile phones as well as improvement and diversification of services.

MIC is promoting mechanisms for the elimination of no-signal areas for mobile phones and the improvement and diversification of services, thereby working towards the realization of greater convenience and pleasure in the use of mobile phones in the future.

Figure 2: Femtocell base station

Output	20mW
Number of users	4
Size	135×184×40mm
Weight	About 0.6 kg

Output	20mW
Number of users	4
Size	135×187×53.5mm
Weight	About 0.3 kg

Figure 3: Working example of femtocell base station