

Guideline for Packet Shaping

Japan Internet Providers Association (JAIPA)

Telecommunications Carriers Association (TCA)

Telecom Services Association (TELESA)

Japan Cable and Telecommunications Association (JCTA)

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1. Background on the Deliberations

(1) Traffic Increase and Packet Shaping

In Japan, broadband including DSL and CATV has become widespread at a rapid pace, as reflected in the number of broadband subscribers exceeding 28 million, and as exemplified by the number of subscribers to FTTH services exceeding 11 million as of the end of December 2007 (Reference 1). In conjunction with this, Internet traffic is continuing to increase year by year (Reference 2)¹.

On the other hand, given that survey results indicate that approximately 1% of all Internet users consume approximately 50% of the backbone bandwidth by using peer-to-peer (P2P) file sharing software² (Reference 3), the occupation of network bandwidth by a few heavy users is deemed to be one of the major reasons to the above-mentioned rapid traffic increase.

Constant occupation of network bandwidth by heavy users reduces the communication speed of the entire network, including that for other general users. In order to avert this situation and ensure the smooth usage of networks by general users, some internet service providers (hereinafter referred to as “ISPs”), etc. are implementing packet shaping³.

Packet shaping has been deemed reasonable to a certain extent from the viewpoint of stable network operation in the final report published by the “Working Group on Network Neutrality” on September 20, 2007. However, depending on how it is operated, it contains the risk of hindering the use of networks by users, in addition to the risk of breaching the principle of secrecy of communications under Article 4 of the Telecommunications Business Law (1984 Law No.86, hereinafter referred to as “Business Law”). For this reason, the need for interested parties to establish operation rules in concrete terms has been pointed out in the above-mentioned final report⁴.

In consideration of these circumstances, four telecommunications carriers organizations, namely, the Japan Internet Providers Association (JAIPA), the Telecommunications Carriers Association (TCA), the Telecom Services Association (TELESA) and the Japan

¹ The total amount of IP traffic in Japan was estimated at 812.9Gbps in Nov 2007, increased by about 2.5 times in 3 years (Efforts for Grasping Current Status of Internet Traffic in Japan , MIC (February 21,2008)).

² P2P (Peer to Peer) is a communication model in which each computer communicates directly with other computers. Such method is used for file sharing, IP telephone, and Contents Delivery Network etc. This Guideline describes P2P file sharing soft as the scope of packet shaping.

³ “Packet shaping” means controlling network traffic by checking applications, services or users and assigning a certain bandwidth or throughput for each of them.

⁴ “To establish a broad-based consensus on packet shaping, it is advisable to seek participation from relating parties in drawing up the “Guideline for packet shaping” (Report on Network Neutrality P28, MIC)

Cable and Telecommunications Association (JCTA), established the “Study Group on the Guideline for Packet Shaping” in September 2007, and decided to consider the content of the “Guideline for Packet Shaping” (hereinafter referred to as “the Guideline”).

(2) Fact-finding Survey on Packet Shaping

In order to investigate the actual state of packet-shaping operations, a questionnaire survey on packet shaping was conducted in November 2007 (hereinafter referred to as “Results of Questionnaire Survey on Packet Shaping”), targeting primarily at telecommunications carriers who were members of the above-mentioned four organizations.

The survey results revealed that among the 280 companies (including 225 ISPs) that gave valid responses, 69 companies (25%) implemented packet shaping, and 30 companies (11%) were considering implementing packet shaping. As for the method of packet shaping, at those 99 companies that either implemented or were considering implementing packet shaping, 59 companies restricted the traffic of specific applications (including protocols, hereinafter the same), while 13 companies restricted the communication bandwidth of users who carry out high-volume transmissions. As reasons for implementing packet shaping, the majority - i.e., 53 out of 99 companies - cited fairness among users and ensuring bandwidth for general users.

2. Purpose and Positioning

(1) Purpose

As described in Section 1, packet shaping is one of the methods adopted by telecommunications carriers to assure the quality of communication services. By formulating this Guideline, related telecommunications carriers shall confirm, as the minimum necessary rule concerning packet shaping operation standards, that packet shaping is a limited method which is acceptable only in cases where it is deemed reasonable to a certain extent. Also, the guideline shows the basic framework for the reasonable extent of packet shaping implementation in order to avoid arbitrary operations.

Accordingly, the Guideline clarifies the relationship between secrecy of communications and fairness in use under the Business Law by citing specific examples.

Furthermore, it presents the basic framework regarding disclosure of information when

implementing packet shaping from the viewpoint of facilitating network operation management among related operators and protecting users.

(2) Legal Characteristics

The Guideline is not an interpretation of judicial precedents or application of laws and regulations by government institutions, but has been voluntarily formulated by organizations of telecommunications carriers as an action guideline. Therefore, the Guideline is not legally binding, and whether to observe it or not is at the discretion of individual telecommunications carriers.

However, if telecommunications carriers implement packet shaping in accordance with the Guideline, it is expected that even if packet shaping is executed in a manner that infringes the secrecy of communications in form, it would be judged lawfully justifiable as an act performed in the pursuit of lawful business.

3. Coverage of the Guideline

(1) Entities within the Scope of the Guideline

ISPs, telecommunications carriers providing services relating to internet access (including Cable television broadcasters), which are implementing or considering implementing packet shaping (hereinafter referred to as “ISPs, etc.”).

(2) Types of Packet Shaping within the Scope of the Guideline

The Guideline covers packet shaping—which restricts the communication bandwidth of specific applications and specific users—implemented by ISPs, etc. for the purpose of ensuring the quality of their networks. Specifically, it summarizes the following two types of packet-shaping methods (Reference 4):

- (i) Traffic restriction of specific applications (e.g. P2P file sharing software)⁵; and
- (ii) Traffic restriction or cancelling the contract of heavy users whose traffic exceed a certain threshold.

4. Basic Principle of the Guideline

(1) Basic Concept

Because of the rapid increase in Internet traffic, ISPs, etc. that either already implement

⁵ This includes indirect restriction such as restricting or shutting out the bandwidth of a specific port.

or are considering implementing packet shaping are on the increase.

However, it would not be appropriate for ISPs, etc. to easily implement packet shaping beyond a reasonable threshold for the purpose of averting network congestion when it should be tackled by enhancing network capacity.

In the first place, ISPs, etc. should tackle the increase in traffic by enhancing its network capacity. It is important to recognize that packet shaping should be implemented only in exceptional circumstances, and to share this basic principle as a consensus among telecommunication carriers.

(2) Acceptable and Reasonable Extent of Packet Shaping

Having recognized the basic principle described above, the question is: In what circumstances is it acceptable to implement packet shaping as an exception?

In general, it should be deemed acceptable to implement packet shaping only in certain objective circumstances where the traffic of a specific heavy user excessively occupies the network bandwidth and consequently degrades the service of general users, giving rise to the need to restrict the traffic of such heavy users or specific applications that are occupying excessive bandwidth. Thus, when implementing packet shaping, such circumstances must be substantiated by objective data.

As it is necessary to determine the exact meaning of “specific heavy users” and “specific applications” on a case-by-case basis, in light of the structure and capacity status of the network of ISPs, etc., as well as the usage status of other users, it is difficult to determine a unified concrete definition or criteria under the Guideline. In this context, individual examples will be presented later in this Guideline to help telecommunications carriers deepen their understanding on this matter.

Some ISPs, etc. seem to be moving to restrict the use of P2P file sharing software on the grounds that the use of such software is promoting copyright infringement. However, it is difficult for ISPs, etc. to determine the illegality of contents on an individual basis with respect to traffic generated by P2P file sharing software, and it is generally deemed to be beyond reasonable extents to implement packet shaping uniformly to all users on such grounds.

Furthermore, measures against security problems arising from the use of P2P file sharing software should be taken for the purpose of protecting the users themselves in the first place, and should not be deemed to be taken with respect to all users. Therefore, in such cases, it is deemed appropriate to take such measures in the form of an optional service provided in response to users’ requests, by obtaining users’ individual consent.

5. Relation to “Secrecy of Communications” (Article 4, Business Law)

When implementing packet shaping, many telecommunications carriers are adopting means that determine the type of applications such as P2P file sharing software or identify users by analyzing header information and payload information of packets. This situation gives rise to the need to conduct studies in relation to secrecy of communications under the Business Law. The Guideline provides a summary regarding what ISPs, etc. need to study in relation to secrecy of communications when implementing packet shaping.

Whether or not the implementation of packet shaping infringes secrecy of communications will be determined in accordance with the flow referred to in Reference 5. A study will be conducted in each of the following steps.

(1) Definition of “Secrecy of Communications”

The Business Law provides for the protection of secrecy of communications handled by telecommunications carriers (paragraph 1, Article 4 of the Business Law), under the provision of paragraph 2, Article 21 of the Japanese Constitution (protection of secrecy of communications)⁶.

Penal provisions are applied in the event of the infringement of secrecy of communications, and the punishment is heavier if a telecommunications carrier infringes the secrecy of communications (Article 179 of the Business Law)⁷.

Furthermore, if the method of conducting business by a telecommunications carrier is deemed to hinder the securement of secrecy of communications, a business improvement order is issued by the Minister for Internal Affairs and Communications (subparagraph 1, paragraph 1, Article 29 of the Business Law)⁸.

⁶ Furthermore, Article 4.(2) obliges heavier duty of secrecy of communications to the person engaged in the telecommunications business in order to maintain reliance of the users regarding telecommunication business.

⁷ Article 179.

(1) Any person who has violated the secrecy of communications being handled by a telecommunications carrier (including communications stipulated in Article 164 paragraph (2)) shall be guilty of an offense and liable to penal servitude for a term not exceeding two years or to a fine not exceeding one million yen.

(2) Any person who engages in the telecommunications business and has committed the act of the preceding paragraph shall be guilty of an offense and liable to penal servitude for a term not exceeding three years or to a fine not exceeding two million yen.

(3) An attempted offense of the preceding two paragraphs shall be punished.

⁸ Article 29.

(1) The Minister may, if it is deemed that business activities of a telecommunications carrier fall under any of the following items, insofar as necessary to ensure the users' benefit or the public interest, order said telecommunications carrier to take actions to improve operations methods or other measures:

i) When there is hindrance in ensuring secrecy of communications with respect to the operations methods of the telecommunications carrier

Telecommunications Business Law

(Protection of Secrecy)

Article 4.

- (1) The secrecy of communications being handled by a telecommunications carrier shall not be violated.
- (2) Any person engaged in the telecommunications business shall, while in office, maintain the secrets of others that have come to be known with respect to communications being handled by the telecommunications carrier. The same shall apply even after this person's retirement from office.

The scope of secrecy of communications is broad in that it includes the communicated content in individual communications, the name of the parties, transmission location, communication date/time, communications traffic, header information and other such component regarding individual communications, the fact of the communication's existence, communication counts, etc. Furthermore, acts of infringement of secrecy of communications include attempts by anyone other than the parties to the communication to proactively and intentionally gain knowledge of matters that fall under secrecy of communications, and the use of such matters in his/her own interest or another person's interest against the will of the parties to the communication.

Accordingly, as exemplified by cases in which an ISP, etc. implement packet shaping by detecting the packet patterns unique to a specific P2P file share software, the act of checking the header and payload information of packets passing its network, the act of detecting packets associated with specific applications, and the act of restricting the distribution of such packets based on the findings⁹, all correspond to an act of infringement of secrecy of communications.

Also, the act of detecting the traffic volume of users and restricting the distribution of packets of specific heavy users performed by ISPs, etc. all correspond to an act of infringement of secrecy of communications, as they involve identifying the communications traffic of individual communications and implementing packet shaping based on the identified traffic.

In this context, according to the "Results of Questionnaire Survey on Packet Shaping", some telecommunications carriers responded that in cases where packet shaping equipment is employed, since the equipment simply executes packet detection and

ii)~xii) abbr.

⁹ Deep packet inspection method. As well, there are methods for restricting traffic of specific applications called flow state control method which judges applications statistically from the flow of the traffic.

packet shaping without any checking by humans, it would not correspond to an act of infringement of secrecy of communications¹⁰. However, even if the packet shaping equipment is set to work automatically, since the ISPs, etc. implement packet shaping by using information subject to secrecy of communications, it does not necessarily mean that it does not correspond to an act of infringement of secrecy of communications - hence, caution must be exercised in this regard.

(2) Consent of Users

As the implementation of packet shaping corresponds to an act of infringement of secrecy of communications, it is generally impermissible to implement packet shaping without obtaining the clear and individual consent of the parties to communication.

In this context, caution needs to be exercised in that the clear and individual consent of the parties cannot be deemed to have been obtained, simply by establishing provisions in tariffs about giving consent to packet shaping or publishing them on the website.

In order for such consent to be deemed to have been given, examples of possible methods include establishing provisions about giving consent to packet shaping in the contract and explicitly confirming such provisions when a new user concludes the contract, sending an email individually to existing users and receiving their response about giving consent to packet shaping.

(3) Lawful Justification (Act performed in the pursuit of lawful business)

On the other hand, it is permissible to implement packet shaping regardless of whether or not consent has been obtained from the parties, if there are lawfully justifiable reasons for doing so. Measures taken by telecommunications carriers against increase in traffic can be divided into emergency measures and normal measures. At times of emergency, infringement of secrecy of communications under the Business Law is lawfully justified¹¹ in cases where self-defense referred to in Article 36 of the Penal Code (Act No.45 of 1907) and averting present danger referred to in Article 37 of the Penal Code are valid, whereas at normal times, it is lawfully justified in cases where it corresponds to an act performed in the pursuit of lawful business referred to in Article 35 of the Penal Code.

As the Guideline covers packet shaping implemented at normal times, this Guideline summarizes cases in which acts are deemed to correspond to acts performed in the

¹⁰ 19 companies answered that restricting communications based on specific applications by equipment does not correspond to an act of infringement of secrecy of communications unless they check the traffic by human.

¹¹ For example, packet shaping may be allowed as an “Averting present Danger (Penal Code Article 37)” if burst traffic of some heavy users degrade communication speed on other users.

pursuit of lawful business.

a) Approach to acts performed in the pursuit of lawful business

Penal Code
(Justifiable Acts)
Article 35.
An act performed in accordance with laws and regulations or in the pursuit of lawful business is not punishable.

In order for the implementation of packet shaping to be regarded as an act performed in the pursuit of lawful business by ISPs, etc., it is generally deemed necessary to fulfill such requirements as: (i) the purpose of implementing packet shaping is legitimate in light of the nature of the business of ISPs, etc. (legitimacy of purpose); (ii) there is a need to implement packet shaping for such purpose (necessity of action); and (iii) the packet shaping method, etc. is valid (validity of means).

b) Study of specific examples

(i) Cases in which traffic of specific applications is to be restricted

- Cases in which the traffic of a specific P2P file sharing software is degrading or has a high probability of degrading the quality of service of other applications, by excessively occupying network bandwidth; therefore, traffic based on such applications is to be identified and *restricted* by employing packet-shaping equipment (refer to Reference 4: Application Control Method).

➤ Legitimacy of purpose and necessity of action

In cases where there are objective circumstances in which communication involving the use of a specific P2P file sharing software is excessively and continuously occupying network bandwidth and is thereby degrading or has a high probability of degrading speed and quality of service associated with other applications, such as causing delays in the display of web pages and transmission/reception of email, it is generally deemed acceptable in terms of legitimacy of purpose and necessity of action, to implement packet shaping in order to pursue stable network operation based on appropriate traffic management

and assure quality of service for other users.

➤ **Validity of means**

It is also generally deemed acceptable in terms of validity of means to implement packet shaping as it is limited to applications with particularly high traffic aimed at fulfilling the aforementioned purpose.

Therefore, if packet shaping is implemented in such a manner to the extent necessary based on objective data, there is a high possibility that it will generally be regarded as an act performed in the pursuit of lawful business.

- Cases in which the existence and extent of restrictions of traffic generated by P2P file sharing software vary with the type of application

Such cases can basically be addressed in the same manner as in the example above. In other words, it is deemed acceptable to vary the treatment with the type of application in cases where there are objective circumstances in which the traffic of a specific P2P file sharing software application is excessively and continuously occupying network bandwidth compared to other applications, and is thereby degrading or has a high probability of degrading the communication services for other users.

- Cases in which the traffic of a specific P2P file sharing software is degrading or has a high probability of degrading the quality of service of other applications, by excessively occupying network bandwidth; therefore, traffic of such P2P file sharing software is to be identified and to be *shut out* by employing packet-shaping equipment

With respect to the above example, completely shutting out the traffic of applications with particularly high traffic volume is deemed invalid as a means at normal times, considering that it is possible to resort to more moderate methods such as restricting the communication of such applications at a certain volume.

Therefore, it is generally difficult to accept shutting out the traffic of specific applications including P2P file sharing software as an act performed in the pursuit of lawful business. If packet shaping is to be implemented in such a manner, it is necessary to obtain the consent of the parties to communication.

(ii) Cases in which use of bandwidth by specific users is to be restricted

- Cases in which the shortage of network bandwidth is degrading or has a high probability of degrading the use of communication services by general users; therefore, the traffic volume of individual users is to be detected for the purpose of restricting the use of communication bandwidth by heavy users or warning them against exceeding a certain threshold

In cases where there are objective circumstances in which the shortage of network bandwidth is degrading or has an extremely high likelihood of degrading the quality of service for general users, possibly due to the large volume of traffic generated by specific users, it is generally deemed acceptable in terms of legitimacy of purpose, necessity of action and validity of means, to detect the traffic volume of individual users in pursuit of stable network operation based on appropriate traffic management.

- Cases in which the traffic generated/received by specific heavy users is excessively occupying network bandwidth and is thereby degrading or has a high probability of degrading usage by other users; therefore, the traffic of such heavy users is to be restricted by employing packet-shaping equipment (Refer to Reference 4: Total Volume Control Method).

➤ Legitimacy of purpose and necessity of action

In cases where there are objective circumstances in which a large volume of traffic generated by a small number of specific heavy users is excessively occupying network bandwidth over a certain period of time and is thereby degrading or has an extremely high likelihood of degrading quality of service for other general users, it is deemed acceptable in terms of legitimacy of purpose and necessity of action, to restrict the traffic of such users in order to pursue stable network operation based on appropriate traffic management and to assure quality of service for other users.

➤ Validity of means

To the extent that excessive usage by a small number of heavy users who generate a large volume of traffic is restricted in order to fulfill the above-mentioned purpose, the restriction of traffic is also generally deemed acceptable in terms of validity of means.

Therefore, if packet shaping is implemented in such a manner to the extent

necessary based on objective data, there is a high possibility that it will generally be regarded as an act performed in the pursuit of lawful business.

Furthermore, ISPs, etc. need to heed the principle shown in 4(1) when implementing packet shaping, and are required to give careful consideration.

6. Relation to “Fairness in Use” (Article 6, Business Law)

When implementing packet shaping such as restricting the use of bandwidth by specific heavy users, studies must be conducted in relation to the principle of fairness in use under the Business Law. This Guideline summarizes what kind of rules need to be observed in relation to fairness in use, when ISPs, etc. implement packet shaping.

(1) Definition of “Fairness in Use”

The Business Law prohibits unjust, discriminatory treatment pursuant to the provision of paragraph 1, Article 14 of the Japanese Constitution (equality under the law), and stipulates that telecommunications carriers shall not treat specific users in a favorable or unfavorable manner without any valid reasons upon concluding a contract for providing telecommunication services or upon providing telecommunication services.

When discriminatory treatment is deemed to have been given in breach of the duty referred to in the said Article, a business improvement order is issued (subparagraph 2, paragraph 1, Article 29 of the Business Law)¹².

Telecommunications Business Law
(Fairness in Use)
Article 6.
Any telecommunications carrier shall not discriminate unfairly in providing telecommunications services.

(2) Study of Specific Examples

¹² Article 29.

- (1) The Minister may, if it is deemed that business activities of a telecommunications carrier fall under any of the following items, insofar as necessary to ensure the users' benefit or the public interest, order said telecommunications carrier to take actions to improve operations methods or other measures:
 - i) abbr.
 - ii) When the telecommunications carrier unfairly discriminates against specified persons
 - iii)~ xii) abbr.

If traffic of P2P file sharing software, etc. generated/received by specific heavy users excessively occupies network bandwidth and thereby degrades or has a high probability of degrading usage by general users, traffic restriction imposed on such heavy users by ISPs, etc. by employing packet-shaping equipment is not normally deemed to correspond to unjust, discriminatory treatment, provided that objective data of the situation has been secured and traffic has been reduced to an equivalent level as other general users based on tariffs, etc.

Furthermore, cancellation of the contract with heavy users who continually generate traffic volume exceeding a certain threshold after giving a warning against such users, based on the tariffs, etc. is also not normally deemed to correspond to unjust, discriminatory treatment.

In contrast, implementing packet shaping to some heavy users but not to others who generate similar volumes of traffic or increasing the fees only for specific users would correspond to unjust, discriminatory treatment, unless there are valid reasons for such differences in treatment.

Furthermore, some content providers have pointed out that there is a possibility of communication delays in content distribution services¹³ due to the impact of packet shaping by ISPs, etc.

In this context, giving priority to specific content providers over other providers without any valid reason, or restricting traffic of specific providers without any valid reason would correspond to unjust, discriminatory treatment. Considering the fact that ISPs, etc. are expanding into content business nowadays, it is necessary to bear in mind that such acts would be problematic in view of ensuring an environment for fair competition.

7. Disclosure of Information

(1) Relationship with End Users

According to the “Results of Questionnaire Survey on Packet Shaping”, more than half of all telecommunications carriers that implement packet shaping widely notified the implementation of packet shaping to end users, but some telecommunications carriers failed to do so. The notification methods were mainly tariffs, membership regulations, website and email. However, the fact is that the notification methods and notified matters currently seem to vary among telecommunications carriers¹⁴.

¹³ Report on Network Neutrality P29, MIC

¹⁴ 43 companies in 69 companies notice the implementation of packet shaping to users, but 21 companies implement packet shaping without notification. In addition, 38 companies describe on the tariffs, but

If packet shaping is to be implemented by ISPs, etc. in view of user protection, it is important that sufficient information on the packet shaping policy is provided to end users in advance.

a) Matters to be Widely Notified

If packet shaping is to be implemented, ISPs, etc. should provide sufficient information about their packet shaping policy.

Matters that should be widely notified include in which cases packet shaping is to be implemented, terms and concrete method of implementing packet shaping (e.g. the scope of packet shaping such as whether traffic of specific applications is to be restricted or whether the use of bandwidth by specific heavy users is to be restricted, and the packet shaping criteria such as restricted applications, traffic volume, etc.).

b) Notification Method

In view of clarifying the terms of providing communication services, users should be provided with an explanation that packet shaping will be implemented at the time of concluding a contract¹⁵. Also, the packet shaping policy should be clearly described in the tariffs. The following is an example of how the packet shaping policy may be described in concrete terms.

(i) Cases in which traffic of specific applications is to be restricted

- The Company may limit speed and traffic of certain communications by detecting applications which continually occupy bandwidth in large volumes , and restricting the bandwidth allocated to such applications (such applications will be prescribed by the Company*).

* Specific applications subject to such restriction are described in the appendix to tariffs and the website.

(ii) Cases in which use of bandwidth by specific users is to be restricted

- The Company may restrict the use of the service if the subscriber continually generates traffic volume exceeding the threshold prescribed by the

28companies do not.

¹⁵ Article 26 of Business Law requires telecommunication carries to explain to users the conditions regarding telecommunications services.

Company* and thereby imposes a huge load on facilities that use the service or otherwise degrades the use or operation of the service.

* The traffic volume threshold subject to packet shaping is described in the appendix to tariffs and the website.

Such provisions shall be added to the Model Clauses of Internet Access Service Tariffs (Alpha version) of the Telecom Services Association (TELESA) in the future.

In combination with the tariffs, an effective way of making the packet shaping policy widely known is to publish it on the website. When doing so, however, it is necessary to post such information at a place that is easily accessible by existing subscribers as well as users who are contemplating subscribing to the service.

On the other hand, even in cases where the ISP, etc. has widely notified the packet shaping policy to end users, critics have pointed out that, in cases in which use of bandwidth by specific users is to be restricted, the scope of packet shaping is unrecognizable because it is difficult for end users to determine their own traffic volume. In regard to this, some telecommunications carriers warn heavy users indivisually in advance of the implementation of packet shaping, and some telecommunication carriers have launched a service that discloses, to end users, their own traffic volume. Such efforts may be helpful. Some ISPs also disclose the usage rate of their backbone bandwidth, and the proactive disclosure of information to end users in such a manner would be useful in improving the objectivity of packet shaping.

(2) Relationship with Non-end-users

Considering that there is a possibility that the implementation of packet shaping by a certain ISP, etc. might affect not only its end users but also communication between such end users and subscribers to other ISPs, content distribution by content providers, etc., information on the implementation of packet shaping is important not only for such end users but for all internet users.

In this context, ISPs, etc. implementing packet shaping should at least provide information as broadly as the information provide to end users by publishing it on its tariffs and websites.

(3) Relationship with Other ISPs

If the packet shaping policy varies among telecommunications carriers, the policy of

one telecommunications carrier would affect the network operations of other carriers that are connected. In other words, communication between users who subscribe to the same ISP is basically restricted uniformly based on its ISP's policy. In contrast, communication between users subscribing to lower-level ISPs subject to transit and roaming, is affected by the higher-level ISP's policy. Furthermore, communication via networks such as IX is affected by the policy of the connected ISP (Reference 6).

Taking such circumstances into account, in the "Results of Questionnaire Survey on Packet Shaping", many telecommunications carriers responded that if the ISPs to which they are connected is implementing packet shaping, they wish such information to be provided¹⁶.

In this regard, if, for example, a higher-level ISP is implementing packet shaping, it should provide necessary information to lower-level ISPs from the viewpoint of smooth network operation and user protection. Specifically, as in the case of higher-level ISPs and lower-level ISPs, telecommunications carriers that have a contractual relationship based on transit or roaming may address the existence of packet shaping and the exact method of packet shaping in the context of their contractual relationship. On the other hand, telecommunication carriers with no contractual relationship such as those connected via peering and IX, should at least provide information to ISPs similar to the information provided to end users by publishing it in its tariffs and websites.

8. Issues for Further Consideration

(1) Increase in Video Content

The use of rich content is rapidly increasing nowadays, as exemplified by video sharing services and video distribution services¹⁷. Since the increase in such video traffic might lead to the shortage of network bandwidth, it is necessary to conduct studies on how related telecommunications carriers should deal with such traffic¹⁸.

(2) Impact of Implementation of Packet Shaping on Access Networks

While this issue is outside the scope of the Guideline, there is a possibility that packet

¹⁶ According to "Results of Questionnaire Survey on Packet Shaping", among 66 companies that gave valid responses, 23 companies responded that information regarding packet shaping should be disclosed.

¹⁷ The traffic flowing into domestic ISPs from foreign ISPs has been remarkably increasing by twice in 1.5 year. The download of video contents from foreign servers by domestic users is deemed to be the major reason. ("Efforts for Grasping Current Status of Internet Traffic in Japan" February 21 2008, MIC).

¹⁸ In February 26 2008, Google, KDDI and telecommunications carriers of Asian countries concluded an partnership agreement to construct an undersea cable network between Japan and the United States. Such network will ease the shortage of network relating to video contents.

shaping might be implemented in subscriber access networks for the purpose of securing specific bandwidth.

If packet shaping is implemented in the access network, traffic restriction imposed on IP protocols as a whole would seem like nothing but the network's physical speed limit from the viewpoint of both end users and ISPs. Moreover, there is a risk that fact-finding might become difficult in cases where packet shaping is implemented only with respect to specific applications¹⁹. Hence, such forms of packet shaping should be studied due to necessity.

(3) Information Sharing System among Relevant Players

In formulating the Guideline, the Study Group conducted studies primarily on the whole concept of disclosure of information to end users from the viewpoint of user protection, and arrived at a certain policy direction.

On the other hand, further studies need to be conducted in regard to whether more information should be provided to content providers and other ISPs than what is provided to end users, in consideration of how packet shaping is actually implemented and the requests from related telecommunications carriers in the future.

Furthermore, although P2P communications is leading to increased traffic in certain aspects, on the other hand, new services using P2P technology are also emerging, raising expectations for improved efficiency of content distribution. From such a point of view, it is necessary to conduct studies on the relationship between new services that are deemed to help utilize networks efficiently by effectively taking advantage of P2P technology and packet shaping implemented by ISPs, etc.

(4) Situation in Other Countries

In the United States, disputes over network neutrality are exemplified by the problem of ports used by VoIP being blocked by Madison River Communications Corp., an ISP²⁰. Recently, the U.S. Federal Communications Commission (FCC) launched an investigation in response to complaints that Comcast Corp. had been slowing down some P2P communication by BitTorrent, etc. Similarly, in Europe, P2P traffic seems to be occupying network bandwidth, but the countermeasures taken by ISPs, etc. have not

¹⁹ For example, in cases where applications measuring the speed is not restricted but P2P file sharing software is restricted, it will be difficult to judge whether the reason of delay in service is due to packet shaping or to conditions of the computer.

²⁰ In February 2005, Madison River Communications Corp blocked the ports used by VoIP, which shutted out the services of VoIP operator Bonage. Due to the decision of the FCC, Madison River Communications Corp stopped blocking the ports in March 2005.

been identified²¹.

The whole concept of packet shaping in Japan needs to be reviewed as necessary while identifying such trends.

(5) Cost Sharing Model

There will still be challenges even if packet shaping is implemented according to the Guideline, such as the issue of fairness of cost burden among ISPs and the imposition of additional charges on heavy users. In this regard, it is necessary to conduct studies once again focusing on the relationship between the basic principle of best efforts and the beneficiary-payment principle, and summarize the agendas, etc.

9. Review of the Guideline

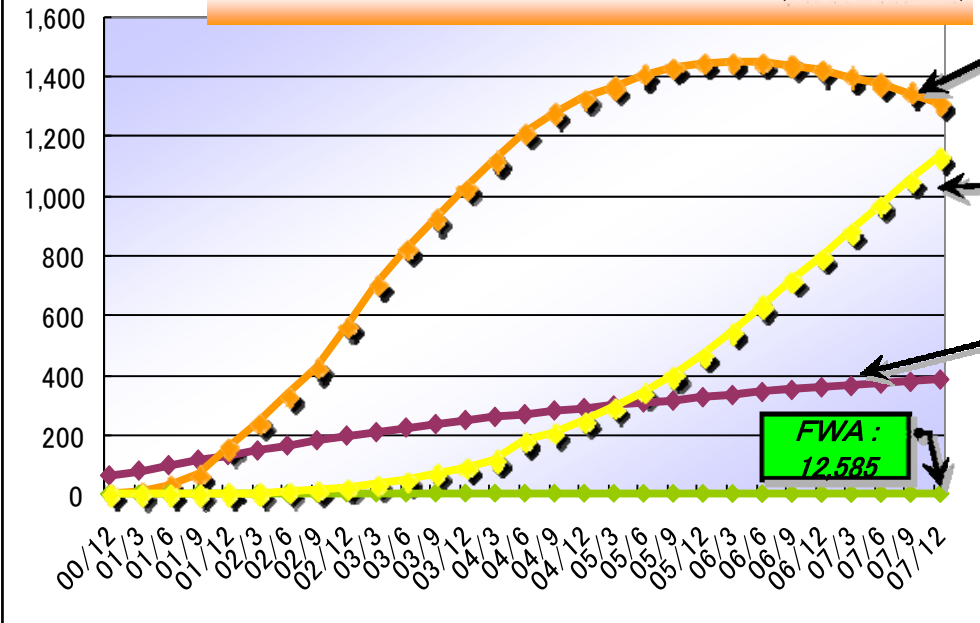
As the market environment for telecommunications services and the structure of networks are expected to continue changing dramatically in the future, it is necessary to review the content of the Guideline periodically.

²¹ Refer to the results of a survey implemented by Ipoque GmbH (Germany). http://www.ipoque.com/media/news/ipoque_internet_study_2007_p2p_file_sharing_still_dominates_the_worldwide_internet.html

Transition in the Number of Japan's Broadband Subscribers (Reference 1)

(Unit: 10 thousand)

Number of Broadband Service Users (As of Dec.2007)



DSL:13,133,113

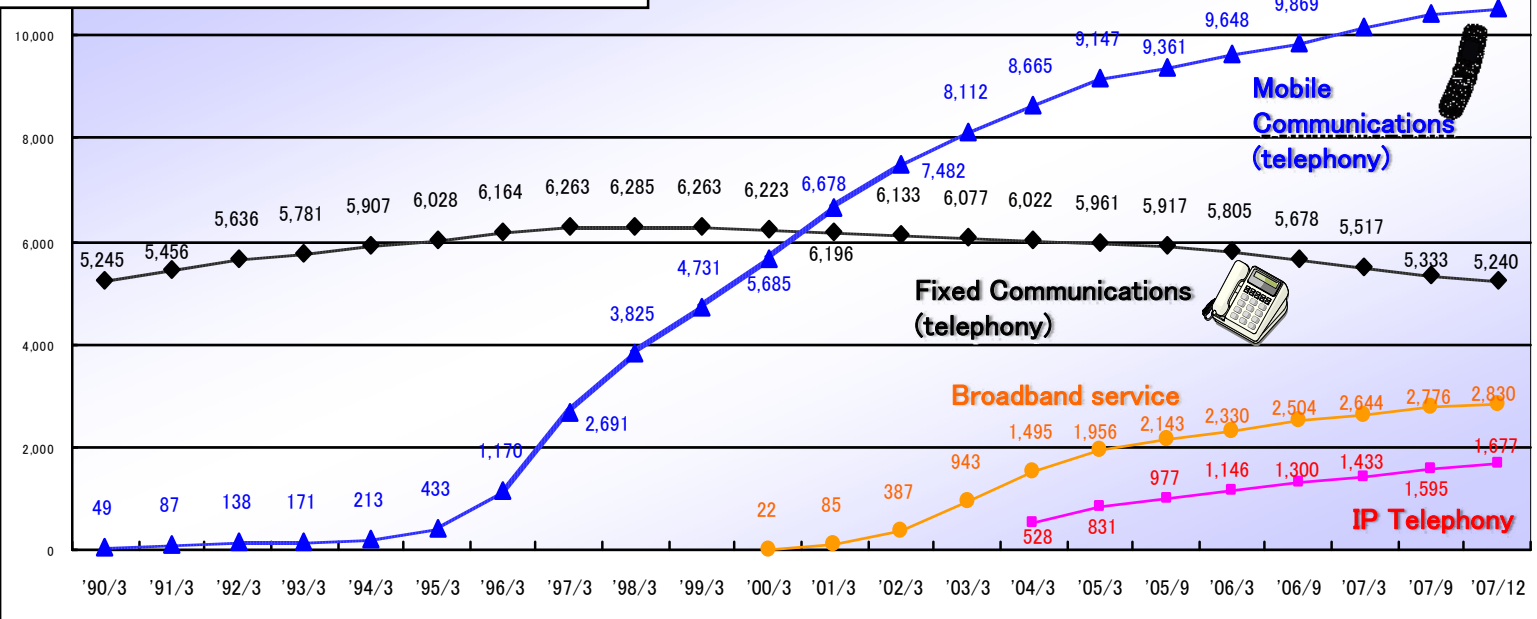
FTTH:11,328,952

CATV:3,827,502

**FWA:
12,585**

Number of Telecommunication Service Users (As of Dec.2007)

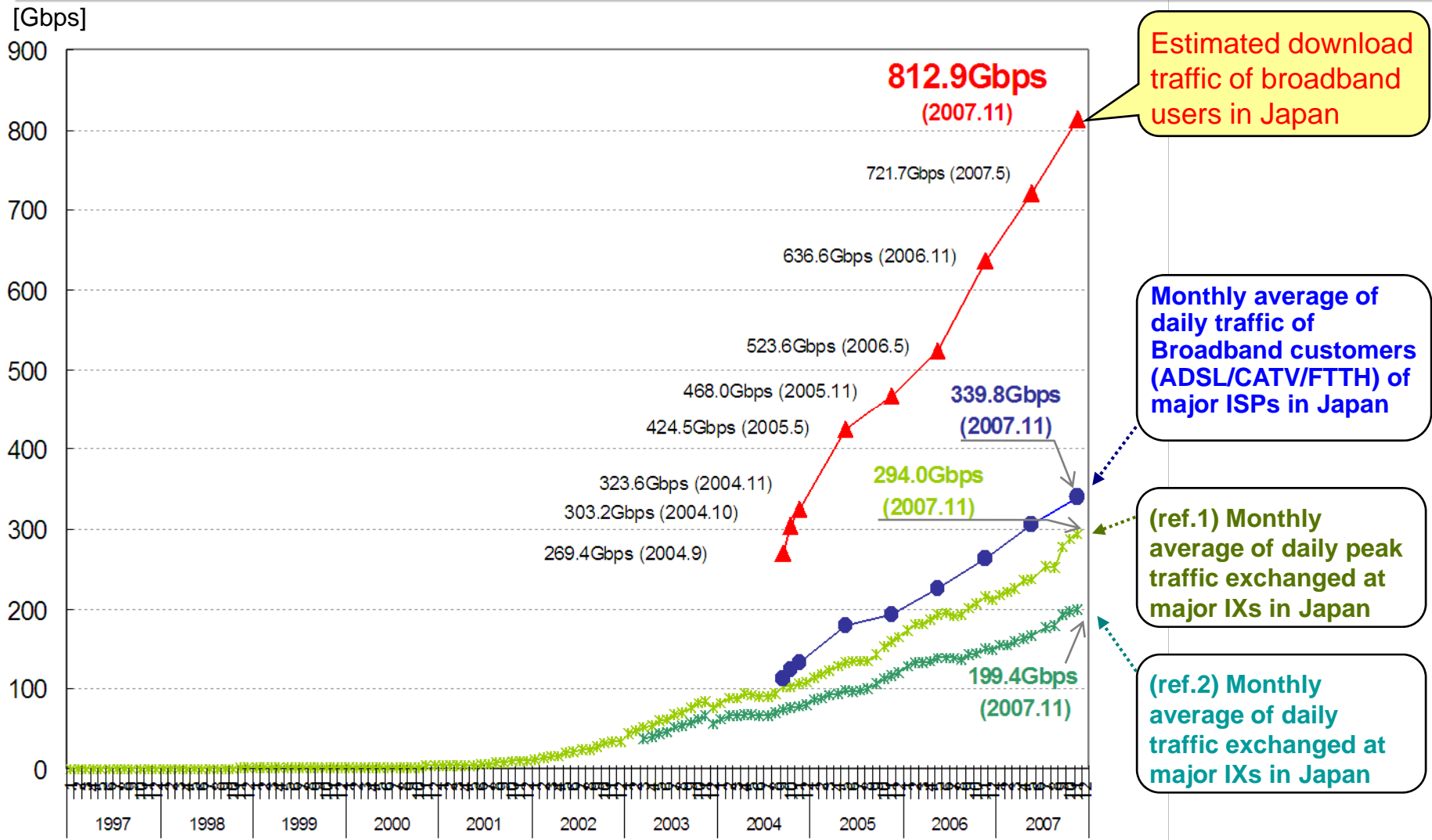
(Unit: 10 thousand)



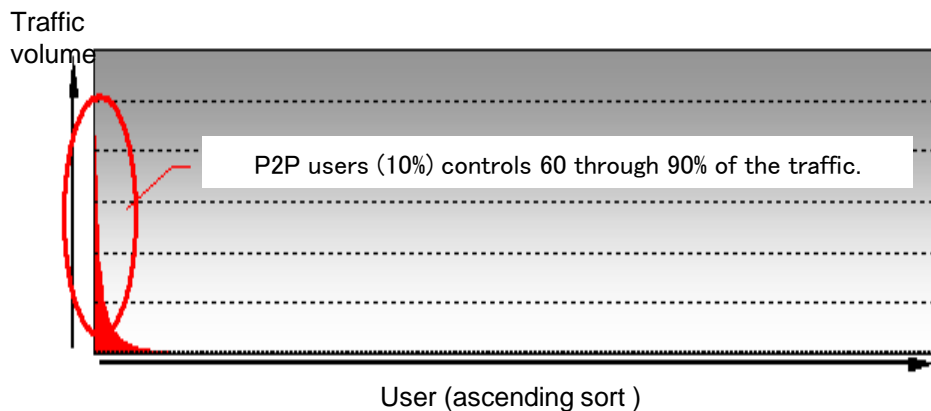
IP Traffic on the Networks (Total Volume)

(Reference 2)

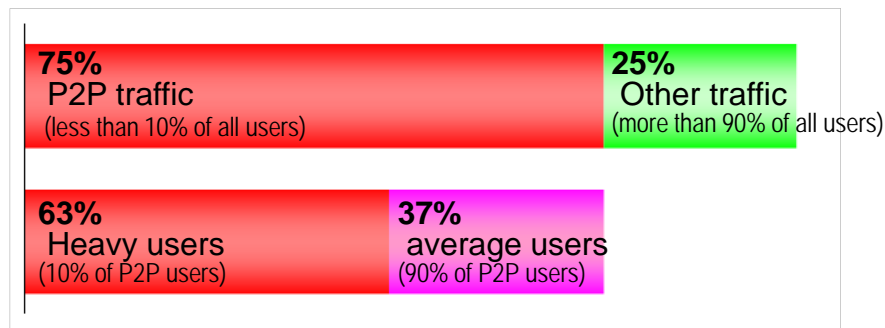
○ The total amount of IP traffic in Japan was estimated at 812.9Gbps in Nov 2007, increased by about 2.5 times in 3 years.



10% of all users occupy 60 through 90% of the traffic

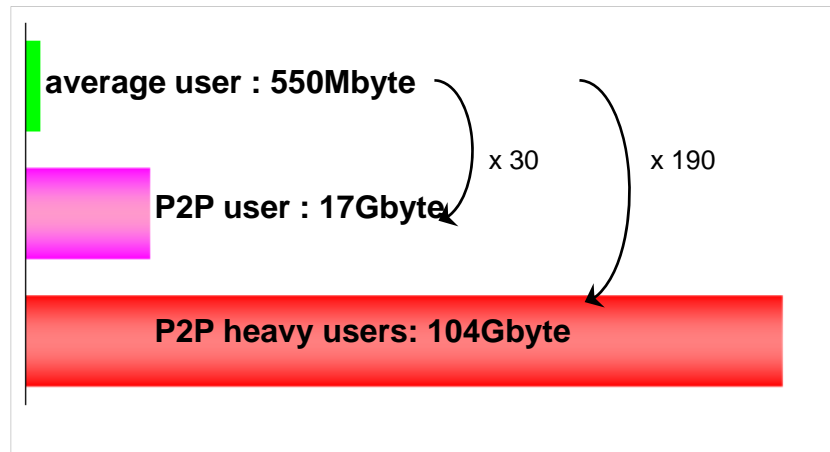
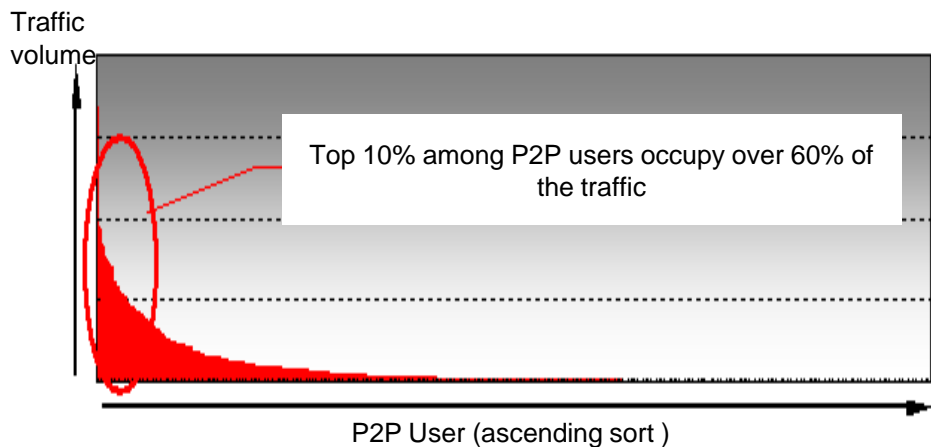


Distribution of uses in all traffic



Top 10% of P2P users(*) occupy more than 60% of the traffic

Bandwidth used by heavy users completely differs from that used by average users.

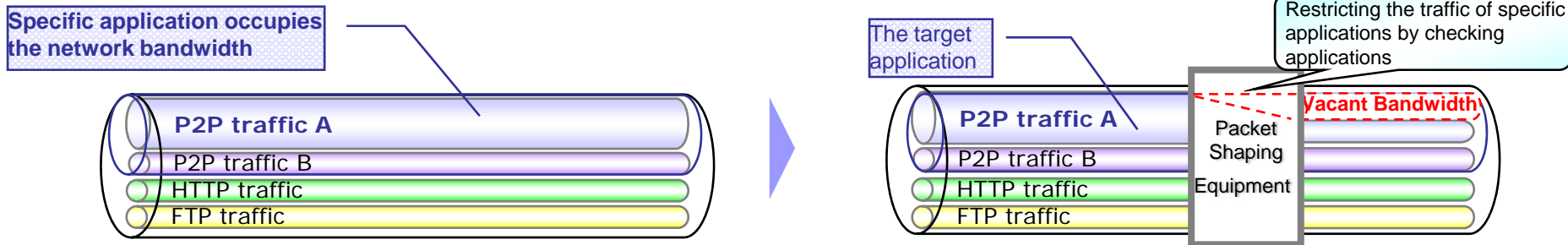


(*) "the P2P users" are considered as the users whose P2P traffic exceeds over 1 Mbyte within 24 hrs.

Applications Control Method

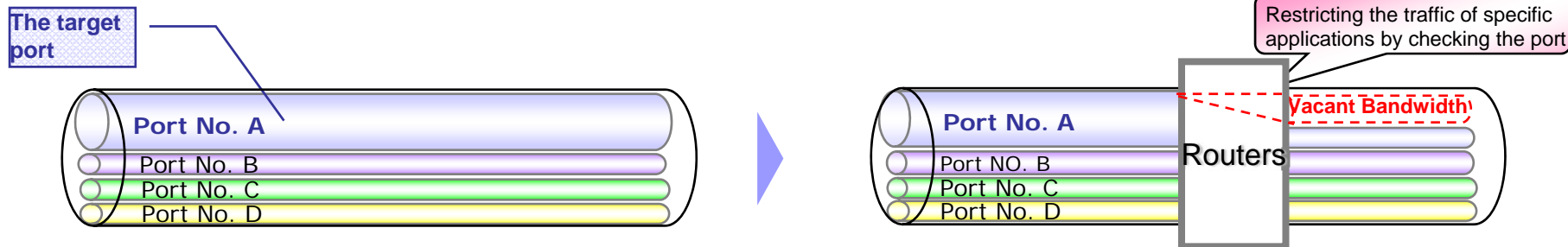
(1) Restriction utilizing packet shaping equipment

- ◆ Traffic restriction of specific applications by checking the flow or the behavior of the applications.



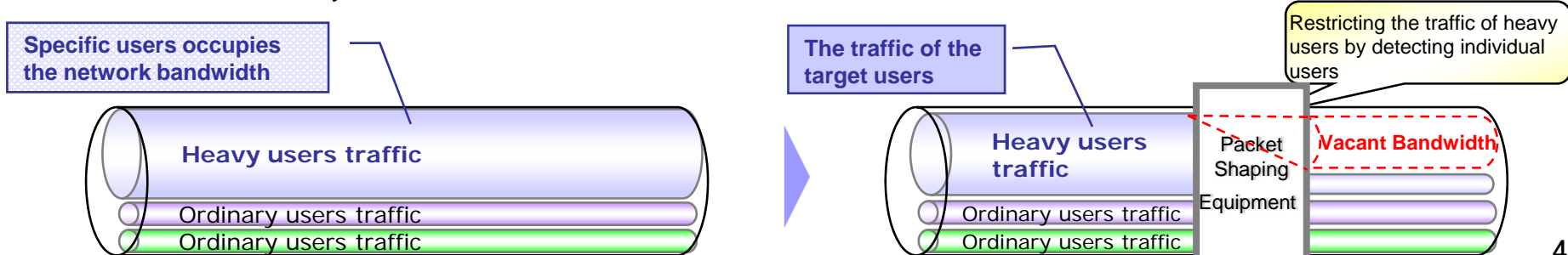
(2) Port Restriction

- ◆ Traffic restriction of specific application by restricting or blocking the bandwidth of specific port.



Total Volume Control Method

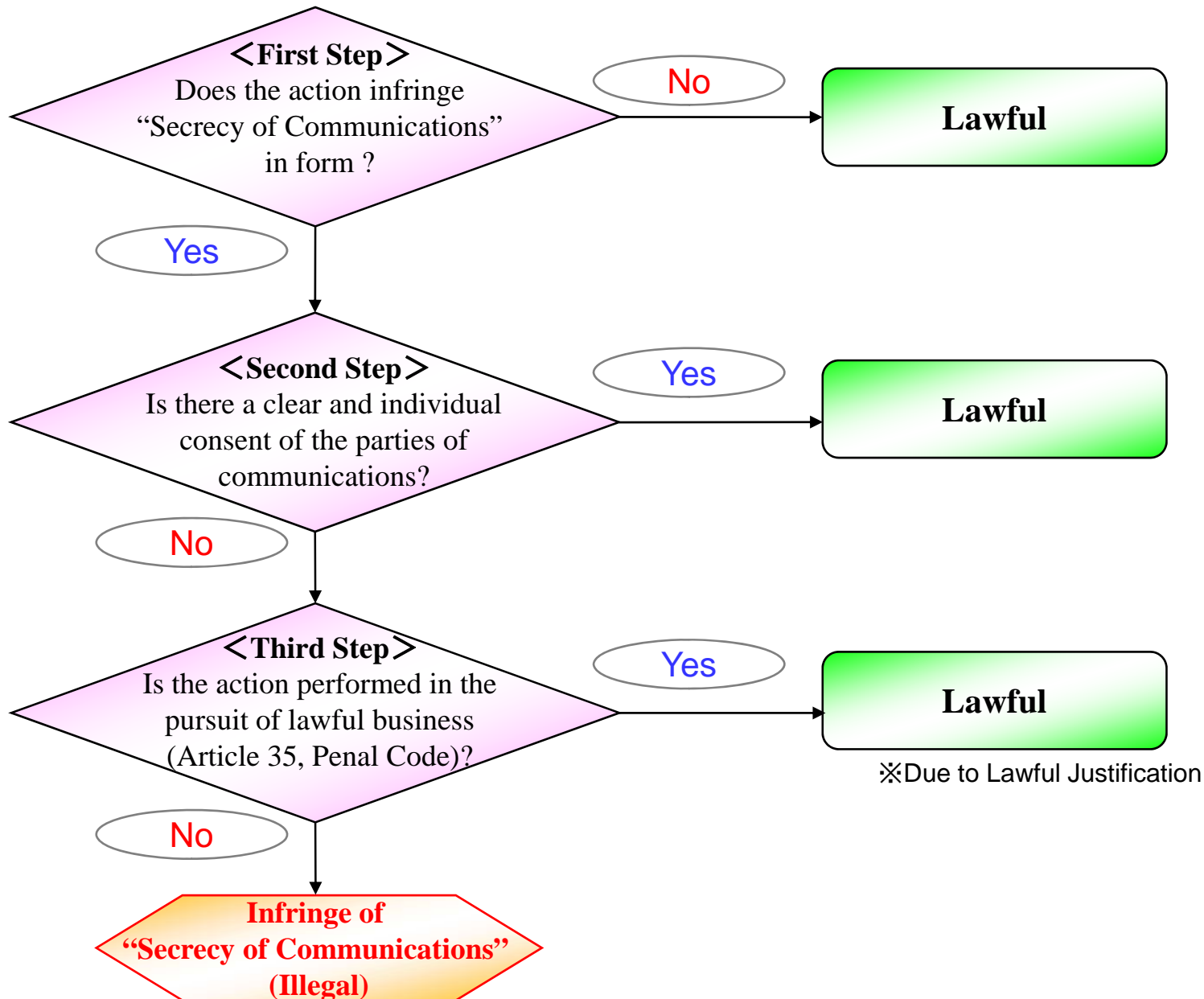
- ◆ Traffic restriction of heavy users whose traffic exceed a certain threshold.



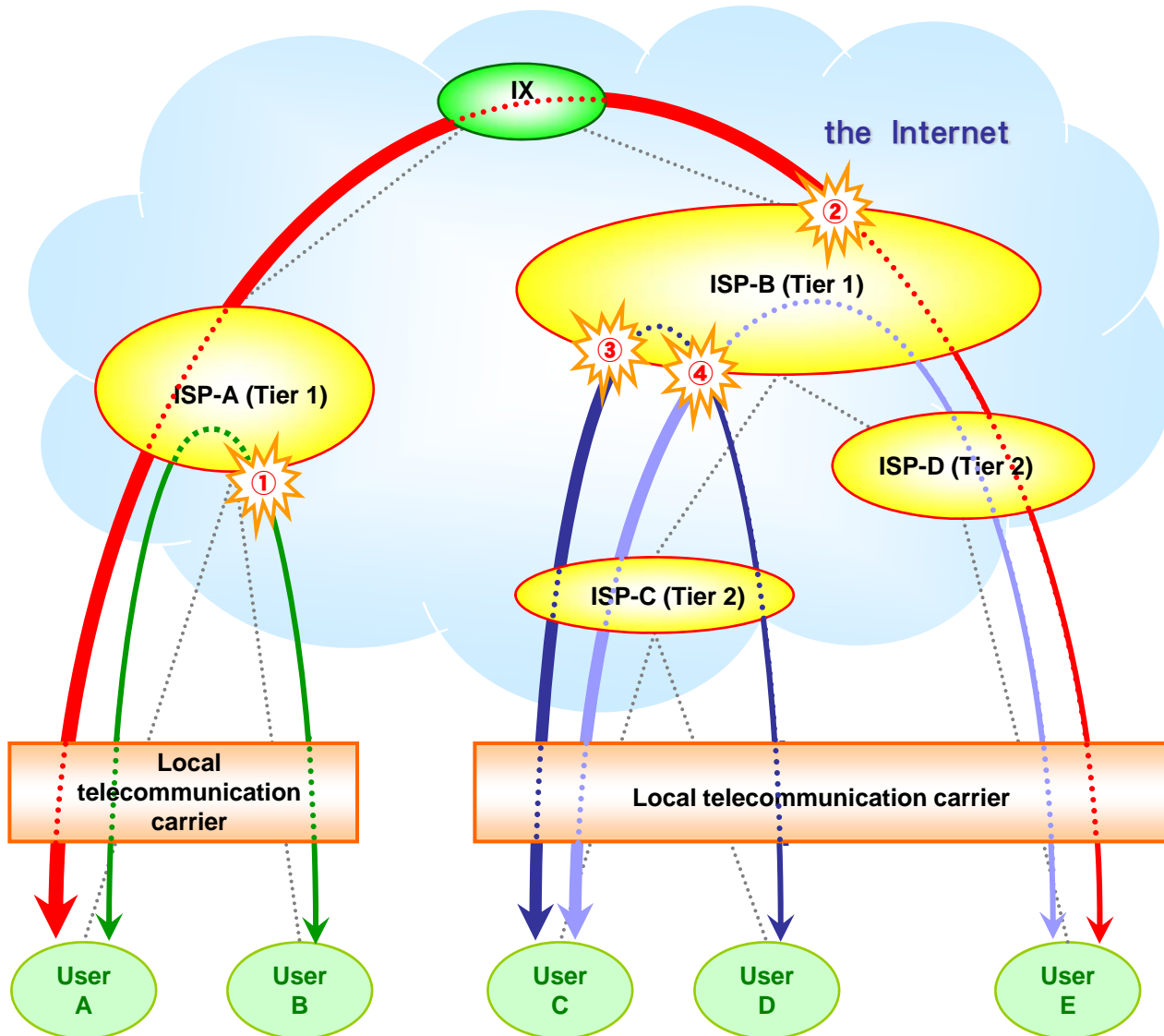
Flow of “Secrecy of Communications”

(Reference 5)

(Article 4, Telecommunications Business Law)



Effects of Packet Shaping to Other ISPs (Reference 6)



- ① Communication between users under the same ISP is restricted uniformly based on the policy of the ISP concerned.
- ② Communication via the IX is effected by the operation policy of the connected ISP.
- ③ Communication between users under the same ISP is effected by the higher-level ISP.
- ④ Communication between ISPs which are not connected via peering may be effected by the higher-level ISP.

In cases of ②~④, users cannot acknowledge the effect of ISP-B's traffic shaping.