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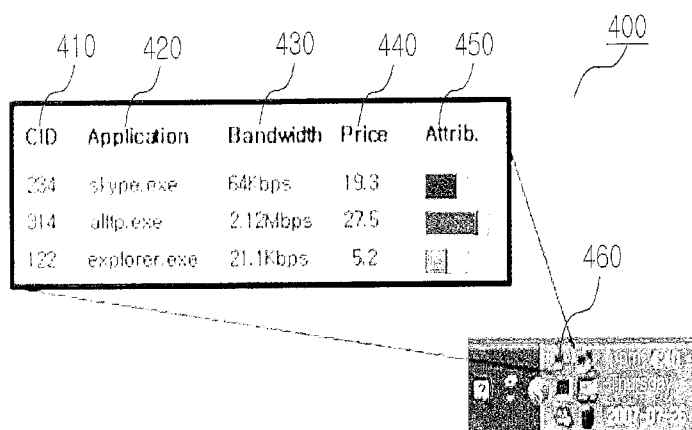
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(54) Title: A SYSTEM FOR MANAGING SERVICE QUALITY OF APPLICATIONS PROVIDED TO A PORTABLE SUBSCRIBER STATION

[Figure 2]



(57) Abstract: The present invention relates to a system and method for managing service quality in a portable internet, and more specifically to a system and method for managing service quality of applications provided to a portable subscriber station. To this end, the present invention provides a system for managing service quality of applications provided to a portable subscriber station, the system comprising: a portable subscriber station selecting desired data traffic attribute information and maximum pseudo bandwidth information according to the applications and transmitting the selected data traffic attribute information and maximum pseudo bandwidth information to a radio access station; and a radio access station allocating the bandwidth of the applications provided to the portable subscriber station using the data traffic attribute information and maximum pseudo bandwidth information transmitted from the portable subscriber station.



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【DESCRIPTION】**【Invention Title】**

A SYSTEM FOR MANAGING SERVICE QUALITY OF APPLICATIONS
PROVIDED TO A PORTABLE SUBSCRIBER STATION

5

【Technical Field】

The present invention relates to a system and method for
managing service quality in a portable internet, and more
specifically to a system and method for managing service
10 quality of applications provided to a portable subscriber
station.

【Background Art】

Service qualities according to a conventional IEEE 802.16
15 standard are classified as in the following table 1.

[Table 1]

Service	Definition	Applications	Mandatory QoS Parameters
UGS	Real-time Fixed data rate Fixed/Variable length	T1/E1 VoIP	Maximum Sustained Traffic Rate = Minimum Reserved Traffic Rate Maximum Latency
RT-VR	Real-time Variable bit rate to guarantee data rate	MPE video	Minimum Reserved Traffic Rate Maximum Latency
NRT-VR	Delay-tolerant Variable-sized Minimum data rate	FTP	Minimum Reserved Traffic Rate
BE	No minimum service level	HTTP	
ERT-VR	Real-time Variable data rate	VoIP	

<IEEE 802. 16 SERVICE QUALITY>

When supporting mobility of WiBro/WiMax, since a handover is made at a rate of 60Km/h or more, five service qualities are defined in the above IEEE 802.16 standard to support
5 Quality of Service (QoS) that makes performance degradation minimum.

-UGS(Unsolicited Grant Service): It is a service that is guaranteed a fixed transmission rate for a predetermined period and requires transmission delay conditions. Also, it is
10 service quality that is required for a service such as a VoIP (Voice over IP) or a dedicated network.

-ERT-VR (Extended Real-Time Variable Rate) service: It is service quality designed for the purpose of a VoIP and requires transmission delay conditions. Also, it is service
15 quality that is guaranteed resources according to a request during providing the corresponding services.

- RT-VR (Real-Time Variable Rate) service: It requires transmission delay conditions and is a service that is guaranteed resources during providing the corresponding
20 services. Also, it is a service that performs a data scheduling by a real-time polling of a bandwidth request. Further, it is service quality suitable for a video/audio streaming.

- NRT-VR (Non-Real-Time Variable Rate) service: It

guarantees a minimum transmission rate and does not allow packet loss. Also, it is a service that allows a transmission delay and is guaranteed resources during providing the corresponding services. Further, it is suitable for services
5 such as a file transmission, a multimedia mail, and a chatting.

- BE (Best effort) service: It is a service that allows a transmission delay and is not guaranteed resources during providing the corresponding services. Also, it is a service suitable for a web browsing and an e-mail.

10 The above service qualities are service quality proposed in the IEEE 802. 16 standard. An implementation thereof depends on a Vendor. The quality of service may be determined according to the implementation method.

As a technology associated with a service quality
15 classification according to the conventional IEEE 802. 16, there is a classifier in convergence sub-layer.

The convergence sub-layer (CS) is a protocol layer that connects an IEEE 802. 16 MAC (Medium Access Control) to an upper application program and includes a role of classifying
20 packets transferred from an application program. A packet classification determines an operation of recognizing packet data transferred by the piece as a continuous flow and a quality for the quality of service of the flow. The quality of service is classified according to a predefined rule. A

network operator or a device maker can determine the rule based on the proposals of the standard.

The quality of service (QoS) is produced when sharing limited resources and a problem of a degradation in the quality of service occurs when resources provided are smaller than requested resources. In order to maintain the quality of service, many studies on a wire network have been progressed. Since a development of a wire transmission technology provides a wide-range wire transmission channel and more resources than the requested resources, the problem of the quality of service does not come to us substantially.

But, since wireless resources are in poor environment and are not sufficient as compared to wire resources as well as are shared by a great number of people, the problem of the quality of service has been highlighted as a very important problem in a wireless network. However, since the wireless network has used connection modes (CDMA: Code Division Multiple Access, W-CDMA: Wideband CDMA, GSM: Global System for Mobile Communication) used to a voice communication in order to support a portable internet service, there is actually no a special scheme for supporting the QoS. In other words, a connected user is not allowed to connect by means of a call admission control when there are no resources to be used. Since the resources should be used only within a limited range

by the circuit switching methods after the connection, the problem of the quality of service (QoS) is mainly associated with problems of maintaining a channel state after the connection and of how to support the mobility rather than a
5 problem of distributing resources.

However, in the IEEE 802.16 portable internet technology, since the multiple access control (MAC) uses an orthogonal frequency division multiplexing access (OFDMA) capable of flexibly allocating the resources, the quality of service
10 requested by the user becomes a more practical problem. In other words, when the user connects to a network using specific application and then obtain a connection ID, he/she can flexibly request the resources to be used by means of the application.

15 Such a dynamic resource channel method leads to a serious resource competition when all users request more resources. As a result, congestion is caused due to such a resource competition and important data is not transmitted so that a significant degradation in the quality of service may be
20 caused. In particular, since the 802.16 is directional to an IP network, and TCP, a typical transmission protocol of the IP network, continuously requests a resource until the network is saturated, the saturation of the network is inevitable. In order to solve such problems, it is the service quality

classification that determines the importance of data to be transmitted and allocates the resources required for the service according to the importance.

However, the conventional technologies of classifying the service quality use the definition and method for the service quality classification proposed in the standard and most network operators implement it based thereon. However, the main body of determining the service quality is the user receiving the services rather than the network operator providing the service. However, the problem until now is that there is no an obvious method capable of determining it. Therefore, the quality of wireless services has a direct effect on the user due to a limitation of wireless resources. As a result, a method for allowing the user to determine the service quality is needed.

【Disclosure】

【Technical Problem】

In order to solve the problems, an object of the present invention provides a system and method for managing service quality of applications provided to a portable subscriber station, which can increase user satisfaction by allowing a user to directly selecting a service quality classification and obtain an optimal solution of a network in an arithmetic

and logic unit of a radio access station by transferring the selected information to the radio access station.

【Technical Solution】

5 In order to accomplish the above object, a system for managing service quality of applications provided to a portable subscriber station of the present invention comprises a portable subscriber station selecting desired data traffic attribute information and maximum pseudo bandwidth information
10 according to the applications and transmitting the selected data traffic attribute information and maximum pseudo bandwidth information to a radio access station, wherein the applications are provided to the radio access station using the data traffic attribute information and the maximum pseudo
15 bandwidth information.

The system for managing service quality provides at least one of connection ID information of the applications, name information of the applications, bandwidth information using the applications, and pseudo charge information of the
20 applications to the user through the portable subscriber station according to the selected data traffic attribute information and the maximum pseudo bandwidth information.

The data traffic attribute information is displayed in colors on a screen of the portable subscriber station.

The maximum pseudo bandwidth information is displayed in a box size on the screen of the portable subscriber station, and the box size displays the bandwidth currently used by the applications to the maximum pseudo bandwidth selected by the user.

The data traffic attribute information is any one of an inelastic service capable of achieving the user satisfaction only when it is a specific bandwidth or more and not capable of increasing the satisfaction although it supports a bandwidth above the specific bandwidth, a perfectly elastic service capable of increasing the satisfaction within any limitation as a transmission bandwidth is increased, and a partially elastic service taking an intermediate form of the inelastic service and the perfectly elastic service and having minimum satisfaction even in a narrow bandwidth.

The data traffic attribute information and the maximum pseudo bandwidth information are selected by the user of the portable subscriber station or selected by an automated program through a simple establishment of the user. The automated program automatically selects the data traffic attribute information and the maximum pseudo bandwidth information according to the characteristic per the user and a selected charge.

A portable internet used by the portable subscriber

station is WiBro/WiMax network using an orthogonal frequency division multiple access (OFDMA) scheme.

In order to accomplish the above, a system for managing service quality of applications from a radio access station to a portable subscriber station of the present invention comprises a radio access station receiving desired data traffic attribute information and maximum pseudo bandwidth information from the portable subscriber station according to the applications, allocating a bandwidth using the data traffic attribute information and the maximum pseudo bandwidth information, and providing the applications to the portable subscriber station through the bandwidth, the data traffic attribute information and the maximum pseudo bandwidth information is selected by the user of the portable subscriber station and is transferred to the radio access station.

The radio access station uses the data traffic attribute information and the maximum pseudo bandwidth information as a measure of billing for the user of the portable subscriber station and the measure of billing is determined by impart weights to at least one of the data traffic attribute information and the maximum pseudo bandwidth information.

In order to accomplish the above object, a method for managing service quality of applications provided to a portable subscriber station of the present invention comprises

the steps of: selecting desired data traffic attribute information and maximum pseudo bandwidth information according to the applications using the portable subscriber station; transmitting the selected data traffic attribute information and maximum pseudo bandwidth information to a radio access station; and receiving the applications through a bandwidth allocated by the radio access station using the data traffic attribute information and the maximum pseudo bandwidth information.

10 The method for managing service quality further includes providing at least one of connection ID information of the applications, name information of the applications, bandwidth information used by the applications, and pseudo charge information of the applications to the user through the portable subscriber station according to the selected data traffic attribute information and maximum pseudo bandwidth information.

The data traffic attribute information is displayed in colors on a screen of the portable subscriber station.

20 The maximum pseudo bandwidth information is displayed in a box size on the screen of the portable subscriber station, the box size displays the bandwidth currently used by the applications to the selected maximum pseudo bandwidth selected by the user.

The data traffic attribute information is any one of an inelastic service capable of increasing the user satisfaction only when it is a specific bandwidth or more and not capable of increasing the satisfaction although it supports a bandwidth above the specific bandwidth, a perfectly elastic service capable of increasing the satisfaction within any limitation as a transmission bandwidth is increased, and a partially elastic service taking an intermediate form of the inelastic service and the perfectly elastic service and having minimum satisfaction even in a narrow bandwidth.

The data traffic attribute information and the maximum pseudo bandwidth information are selected by the user of the portable subscriber station or selected by an automated program through a simple establishment of the user. The automated program automatically selects the data traffic attribute information and the maximum pseudo bandwidth information according to characteristic per the user and a selected charge by the user.

Also, a service provided from the radio access station by means of the maximum pseudo bandwidth established by the user and a pseudo charge provided to the user for the service can be used as a basis for fixing a service charge that should pay for a service use.

In order to accomplish the above object, the present

invention provides a computer readable recording medium for running any one of the methods for managing service quality of the applications provided to the portable subscriber station as described above.

5

【Advantageous Effects】

As described above, an effect of a system and method for managing service quality of applications provided to a portable subscriber station according to the present invention
10 can be mainly divided into two viewpoints, that is, a user viewpoint and a supplier viewpoint.

First, in the user viewpoint, the user can establish options called performance and price and provide optimized services to a current network according to the establishment
15 thereof. Also, the user intending to receive premium services can receive certainly differentiated services from other users and directly establish the service quality to increase service quality satisfaction. Further, a price adjustment method is provided to a consumer so that the consumer can select various
20 options.

On the other hand, in the supplier viewpoint, the supplier can maximize network utility and impartially distribute the competed resources. In particular, the supplier can obtain higher returns by means of a differentiated price

policy as well as provide a basis capable of fixing a price for the services using a meter-rate system to the user.

【Description of Drawings】

5 The above and other objects, features and advantages of the present invention will become apparent from the following description of preferred embodiments given in conjunction with the accompanying drawings, in which:

10 Fig. 1 is a configuration view of a network system having a function for managing service quality according to one embodiment of the present invention;

 Fig. 2 is a view showing a program for managing service quality of a portable subscriber station according to one embodiment of the present invention; and

15 Fig. 3 is a view showing a classification per data traffic attribute according to one embodiment of the present invention.

【Best Mode】

20 Terms in the present application use currently widely used general terms if possible, but the terms optionally selected by the present applicant can be used in a specific case. In this case, the meanings thereof are described in the corresponding portions of detailed description of the present

invention and therefore, the present invention is to be understood with the meanings involved in the terms rather than with names of terms.

Hereinafter, the concrete embodiments of the present invention capable of realizing the above object will be described in detail with reference to accompanying drawings. However, the present invention is not limited to the embodiments.

Fig. 1 is a configuration view of a network system having a function for managing service quality according to one embodiment of the present invention. Referring to Fig. 1, the network system comprises more than one portable subscriber station 100 that can be wirelessly connected to an internet with moving anytime and anywhere and a radio access station 200 wirelessly connected to the portable subscriber station 100 and providing a communication service, and a public communication network (for example, public switching telephone network (PSTN) or internet network (Internet), etc.) connected to the radio access station 200 and a information providing system.

The portable internet network usable for the present invention may be configured of a wire internet public network and a wireless internet subscriber network having the portable subscriber station. The existing wire internet public network

is already provided with QoS in various schemes. Therefore, the present invention relates to a system and method for managing service quality of applications run in the portable subscriber station in the portable internet network with a structure where the wire internet network and the wireless internet network are connected, by newly configuring the wireless internet subscriber network connected to the existing wire internet public network already provided with the QoS.

The present invention relates to a system and method for managing service quality of applications run the portable subscriber station supporting a portable internet service provided through a WiBro/WiMAX network using an orthogonal frequency division multiple access (OFDMA) scheme. However, it is obvious to those skilled in the art that the technical idea of the present invention is not limited to the WiBro/WiMAX system, which is one example of the portable subscriber station.

The wireless internet subscriber network may comprise the portable subscriber station (PSS) 100 and the radio access station (RAS) 200 wirelessly transmitting and receiving voice signals and data to and from the portable subscriber station. Also, the wireless internet subscriber network may comprise an access control router (ACR) relaying the voice signals and the data transmitted and received through the radio access station

200 to other network apparatuses in the subscriber network and to network apparatuses in other networks connected through the public network.

The system for managing service quality of applications provided to the portable subscriber station according to one embodiment of the present invention may comprise a quality manager (QM) distributing a QoS policy to the portable subscriber station, the radio access station, or a control station in order to apply a management of service quality to the entire portable subscriber station having the wireless internet subscriber network configured as above. The quality manager determines the QoS policy and transmits the QoS policy to each network apparatus such as the ACR, the RAS, the PSS, or the like, in order to apply the determined QoS policy to the portable internet network. The detailed configuration method of the quality manager will be omitted in the present invention. The reason is that the present invention has a technical feature of allowing the user to actively determine the service quality through the portable subscriber station 100.

In the portable internet according to the present invention, the portable subscriber station 100 may comprise service quality classifier. The service quality classifier performs an operation of dividing the data transmitted as a

piece of datagram named a packet into one continuous flow. And, another role of the service quality classifier performs a role of classifying the service quality of packet divided into the continuous flow. The former case among the two operations may
5 be implemented by program or hardware through a mechanically repeated operation of classifying conditions conforming to predefined rules, but the latter case is hard to implement by the program or the hardware as an intellectual judgment. The prior art classifies the service per a kind in order to
10 implement the function of the latter (service quality classification) and is implemented by a scheme approximately proposing what service level is provided to any service. In other words, the service quality per a service provided to the user by the operator is previously determined.

15 However, the service level, that is, the service quality is different according to the user purpose.

 The present invention provides a method capable of increasing user satisfaction by allowing a user to directly selecting the service quality classification without depending
20 on the program for the intellectual judgment such as the service quality classification and obtaining an optimal solution of a network in an arithmetic unit of the radio access station by transferring the selected information to the radio access station and a method capable of performing a

billing based on the established pseudo bandwidth and the amount of used packet.

Fig. 2 is a view showing a program for managing service quality of a portable subscriber station according to one
5 embodiment of the present invention. A general operating program such as a window supports a wireless network connecting program. The present invention is a main point to provide a service quality managing program 400 to the used
10 wireless network managing program through the portable subscriber station. Referring to FIG. 2, there are shown using information (CID(connection ID)) 410 of applications connected to an internet through the current portable internet, a program name 420, a currently used bandwidth 430, a using price 440, and data traffic attribute 450. The using
15 information can be viewed by clicking a network displaying icon 460 on a screen of the portable subscriber station.

The information is determined according to the attributes established by the user. The attributes can be represented by different colors according to the classification per the data
20 traffic attribute.

Fig. 3 is a view showing a classification per data traffic attribute according to one embodiment of the present invention. The classification 500 per the data traffic attribute according to one embodiment of the present invention

is as follows.

a) Inelastic service 510: It is a service such as VoIP. It does not recognize the utility at all until it does not reach a specific transmission bandwidth and does not recognize
5 that the utility is improved although it has more transmission bandwidths. In the case of the inelastic service, the user cannot fix a price as constraint, but the price proposed by the supplier serves as the constraint.

b) Perfectly elastic service 520: It is a service such as
10 FTP. It increases the utility as it has more transmission bandwidths, but when it reaches some degree of level, it does not increase the utility any more according to the law of marginal utility.

c) Partially elastic service 530: It is a service such as
15 VOD. It does not recognize the utility before it reaches a specific transmission bandwidth and in the specific transmission bandwidth or more, it increases the utility as the bandwidth gradually increases. The law of marginal utility is also applied thereto.

20 Also, the classification per the data traffic attribute is divided into an UGS (Unsolicited Grant Service), an ERT-VR (Extended Real-Time Variable Rate), an RT-VR (Real-time Variable Rate), an NRT-VR (Non-Real-Time Variable Rate), and a BE (Best Effort), which are five service qualities proposed by

standard, and can be represented by different colors according to the classification per the data traffic attribute.

The user determines the desired data traffic attribute and maximum pseudo bandwidth required by the applications, according to the applications through the service quality managing program. The data traffic attribute can be displayed in colors on the screen of the portable subscriber station and the maximum pseudo bandwidth can be represented by a box size with a quadrangular shape. A method for displaying the data traffic attribute and the maximum pseudo bandwidth is one embodiment and therefore, the present invention is not limited thereto.

When the data traffic attribute and the maximum pseudo bandwidth are selected according to key input information through the portable subscriber station, at least one of the information shown in Fig. 2 is transmitted to the user according to the selected information to help the user perform the optimized selection. The information shown in Fig. 2 is as follows.

1. CID (Connection ID) 410: It is a connection identification number for transferring the data through the portable internet. It is a unit recognized by a device and thus, it is represented to show the relation of one recognized by the device and the applications recognized by the user.

2. Application (program name) 420: it is an application program name used by the user. It displays the information to know if any program uses the current network.

3. Bandwidth(bandwidth) 430: It is a bandwidth used by the current applications. Its maximum value can be limited according to the establishment of the user.

4. Price (use price) 440: This information is represented by a use charge per unit time or a pseudo charge corresponding thereto. This information helps the user establish the data traffic attribute.

5. Attributes (attribute information) 450: The attribute information can be established to the traffic attribute represented by colors and the pseudo bandwidth represented by a size. A portion filled in a box size is represented according to the proportion of the maximum pseudo bandwidth established per the application program to the bandwidth currently used in the applications by the user.

The function for managing the service quality proposed in the present invention is an actual network theory. Therefore, it seems difficult to the general users to understand and use it. However, the information named the price and the maximum pseudo bandwidth is information of a level understandable by the general users.

It provides the information capable of making an optimal

selection through this and provides an intellectual decision conditions on the service quality determination in the service quality classifier included in the portable subscriber station by means of the service quality improvement recognized by this establishment.

The implementation of such a function can be made by the set of the user and can be made by the automated program. The service provider can automatically perform a proper set based on the aforementioned methods according to the characteristic per the user and the selected charge. In other words, the preset data traffic attribute and maximum pseudo bandwidth are automatically selected by the service provider according to the characteristic per the user and the selected charge without the user's selection. The automatically selected attributes are back represented to the user as the information named the price and the bandwidth, thereby helping the user understand the currently used service quality.

Another embodiment of the present invention relates to a method for determining a bandwidth allocation in order to provide the optimal service quality that can be satisfied by all users belonging to the radio access station by using the attributes (data traffic attribute, maximum pseudo bandwidth) established by the user.

The following equation 1 is a solution solving the

network optimization problem used in the network theory field. Through this equation, the optimal solution of the bandwidth (r) required by S users can be obtained if a congestion degree (represented by lambda) substitutes into a derivative relative to an inverse function of a utility equation of FIG. 3 represented by U

[Equation 1]

$$\max_r \sum_s \left(U(r_s) - r_s \sum_{l \in L(s)} \lambda_l \right) \Rightarrow r_s = U'^{-1} \left(\sum_{l \in L(s)} \lambda_l \right)$$

In the equation 1, the U is determined by the colors of attributes determined by each user. Each color determines the inelastic service, the perfectly elastic service, and the partially elastic service. The size (box size) of attributes determined by the user selects a slope of a graph corresponding to each service. The larger the box is selected, the higher the satisfaction is achieved in the same bandwidth. If the user transfers the established attribute information to the radio access station, the radio access station can solve the attribute information transferred by the users connected thereto by substituting them into the equation 1 and determine the bandwidth of each application capable of optimizing the network utility. Therefore, the radio access station uses this to solve the resource competition problem from the viewpoint

of the maximization of network utility as well as create higher profits by the service differentiation.

When performing the billing through the present invention, the price weights (W_s) are different according to the colors of attributes selected and the satisfaction weights (W_u) are different according to the box size selected. The price weight has the largest value in the case of the inelastic service and has the smallest value in the case of the perfectly elastic service. As the box size becomes larger, the satisfaction function moves upwards and as the box size becomes smaller, it moves downward. When performing the billing through this system and method, the price is fixed in a form such as the following equation 2.

[Equation 2]

15 PSEUDO PRICE = $W_s \times W_u \times$ AMOUNT OF USED PACKET

The method for managing the service quality in the portable internet according to the present invention is implemented by a program instruction form capable of being performed through various computer means. The computer readable medium may include a program instruction, a data file, a data structure, etc., independently or in combination. The program instruction recorded in the medium is specially designed and configured for the purpose of the present invention, but is known and used to and by those skilled in

the art of computer software. As an example of the computer readable recording medium, there are magnetic media such as a hard disk, a floppy disk, and a magnetic tape, optical media such as a CD-ROM and a DVD, magneto-optical media such as a floptical disk, and a hardware device specially configured to store and perform program instructions such as a ROM, a RAM, a flash memory, etc. The media may be light including a carrier wave transmitting signals that designates a program instruction and a data structure, etc. etc., or transmission media such as a metal line, a waveguide, etc. The example of the program instruction includes a machine language made by a compiler as well as a advanced language code executable by the computer using an interpreter, etc. The hardware device may be configured to be operated by means of more than one software module in order to perform the operation of the present invention, and vice versa.

【Industrial Applicability】

Although the present invention have been shown and described with reference to specific details such as concrete components, etc., and limited embodiments, and the drawings, this is provided to help a general understanding of the present and therefore, the present invention is not limited to the embodiments. Accordingly, it would be appreciated by those

skilled in the art that changes and modifications might be made in these embodiments from the description.

Therefore, the idea of the present invention is not limited to the described embodiments, but the following claims
5 and their equivalents belong to the scope of the present invention.

【CLAIMS】**【Claim 1】**

A system for managing service quality of applications provided to a portable subscriber station comprising:

5 a portable subscriber station selecting desired data traffic attribute information and maximum pseudo bandwidth information according to the applications and transmitting the selected data traffic attribute information and maximum pseudo bandwidth information to a radio access station,

10 wherein the applications are provided to the radio access station through the maximum pseudo bandwidth that the radio access station allocates using the data traffic attribute information and the maximum pseudo bandwidth information.

【Claim 2】

15 The system as claimed in claim 1, wherein the system for managing service quality provides at least one of connection ID information of the applications, name information of the applications, bandwidth information using the applications, and charge information of the applications to the user through
20 the portable subscriber station according to the selected data traffic attribute information and maximum pseudo bandwidth information.

【Claim 3】

The system as claimed in claim 1, wherein the data

traffic attribute information is displayed in colors on a screen of the portable subscriber station.

【Claim 4】

The system as claimed in claim 1, wherein the maximum
5 pseudo bandwidth information is displayed in a box size on the screen of the portable subscriber station, and the box size displays the bandwidth currently used by the applications to the maximum pseudo bandwidth selected by the user.

【Claim 5】

10 The system as claimed in claim 1, wherein the data traffic attribute information is any one of an inelastic service capable of achieving the user satisfaction only when it is a specific bandwidth or more and not capable of increasing the satisfaction although it supports a bandwidth
15 above the specific bandwidth, a perfectly elastic service capable of increasing the satisfaction within any limitation as a transmission bandwidth is increased, and a partially elastic service taking an intermediate form of the inelastic service and the perfectly elastic service and having minimum
20 satisfaction even in a narrow bandwidth.

【Claim 6】

The system as claimed in claim 1, wherein the data traffic attribute information and the maximum pseudo bandwidth information are selected by the user of the portable

subscriber station or selected by an automated program

【Claim 7】

The system as claimed in claim 6, wherein the automated program automatically selects the data traffic attribute
5 information and the maximum pseudo bandwidth information according to the user configuration or a selected charge.

【Claim 8】

The system as claimed in claim 1, wherein a portable internet used by the portable subscriber station is
10 WiBro/WiMax network using an orthogonal frequency division multiple access (OFDMA) scheme.

【Claim 9】

A system for managing service quality of applications from a radio access station to a portable subscriber station
15 comprising:

a radio access station receiving desired data traffic attribute information and maximum pseudo bandwidth information from the portable subscriber station according to the applications, allocating a bandwidth using the data traffic
20 attribute information and the maximum pseudo bandwidth information, and providing the applications to the portable subscriber station through the bandwidth,
the data traffic attribute information and the maximum pseudo bandwidth information is selected by the user of the portable

subscriber station and is transferred to the radio access station.

【Claim 10】

The system as claimed in claim 9, wherein the radio
5 access station uses the data traffic attribute information and maximum pseudo bandwidth information as a metric of billing information for the user portable subscriber station.

【Claim 11】

The system as claimed in claim 10, wherein the metric of
10 billing information is determined by impart weights to at least one of the data traffic attribute information and maximum pseudo bandwidth information.

【Claim 12】

A method for managing service quality of applications
15 provided to a portable subscriber station comprising the steps of:

selecting desired data traffic attribute information and maximum pseudo bandwidth information according to the applications using the portable subscriber station;

20 transmitting the selected data traffic attribute information and maximum pseudo bandwidth information to a radio access station; and

receiving the applications through a bandwidth allocated by the radio access station using the data traffic attribute

information and maximum pseudo bandwidth information.

【Claim 13】

The method as claimed in claim 12, wherein the method for managing service quality further includes providing at least one of connection ID information of the applications, name information of the applications, bandwidth information used by the applications, and pseudo charge information of the applications to the user through the portable subscriber station according to the selected data traffic attribute information and maximum pseudo bandwidth information.

【Claim 14】

The method as claimed in claim 12, wherein the data traffic attribute information is displayed in colors on a screen of the portable subscriber station.

15 【Claim 15】

The method as claimed in claim 12, wherein the maximum pseudo bandwidth information is displayed in a box size on the screen of the portable subscriber station, the box size displays the bandwidth currently used by the applications to the selected maximum pseudo bandwidth selected by the user.

【Claim 16】

The method as claimed in claim 12, wherein the data traffic attribute information is any one of an inelastic service capable of increasing the user satisfaction only when

it is a specific bandwidth or more and not capable of increasing the satisfaction although it supports a bandwidth above the specific bandwidth, a perfectly elastic service capable of increasing the satisfaction within any limitation
5 as a transmission bandwidth is increased, and a partially elastic service taking an intermediate form of the inelastic service and the perfectly elastic service and having minimum satisfaction even in a narrow bandwidth.

【Claim 17】

10 The method as claimed in claim 12, wherein the data traffic attribute information and maximum pseudo bandwidth information are selected by the user of the portable subscriber station or selected by an automated program.

【Claim 18】

15 The method as claimed in claim 17, wherein the automated program automatically selects the data traffic attribute information and maximum pseudo bandwidth information according to the user configuration or a selected charge by the user.

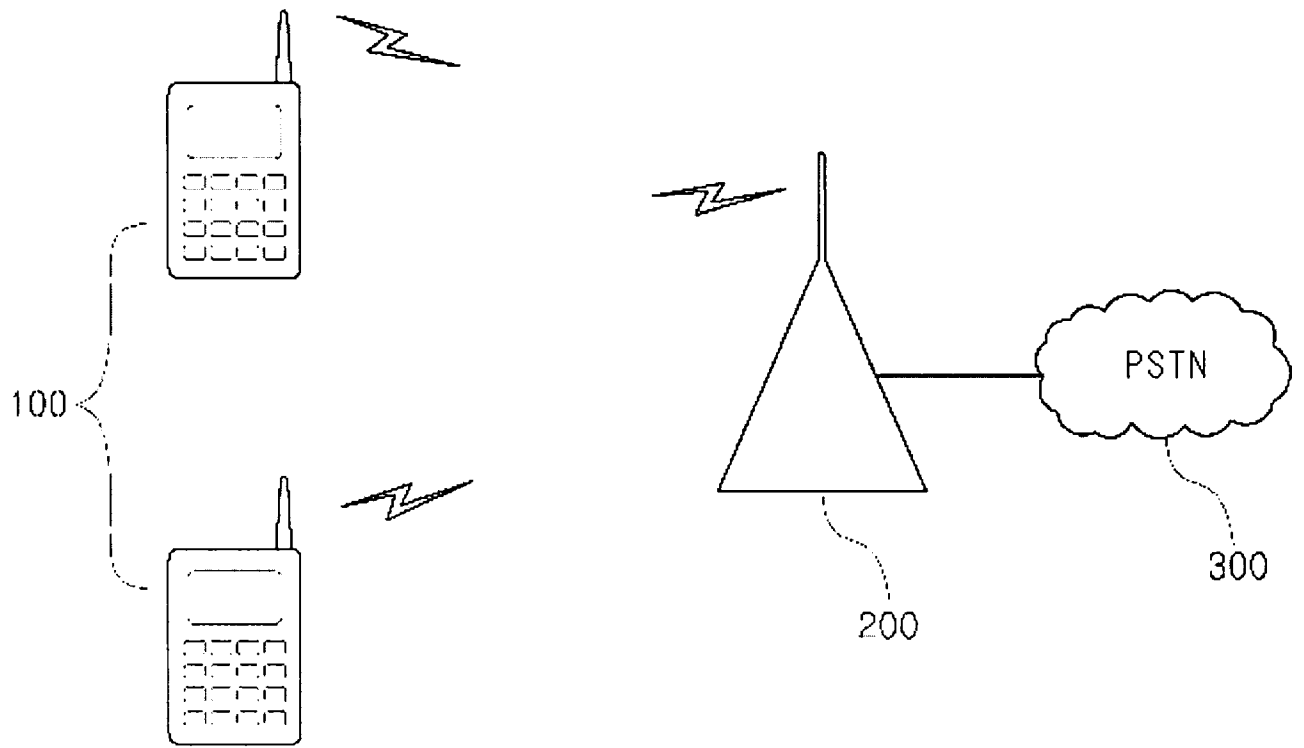
【Claim 19】

20 The method as claimed in claim 12, wherein a portable internet used by the portable subscriber station is WiBro/WiMax network using an orthogonal frequency division multiple access (OFDMA) scheme.

【Claim 20】

A computer readable recording medium for running the method according to any one of claims 12 to 19.

【Figure 1】



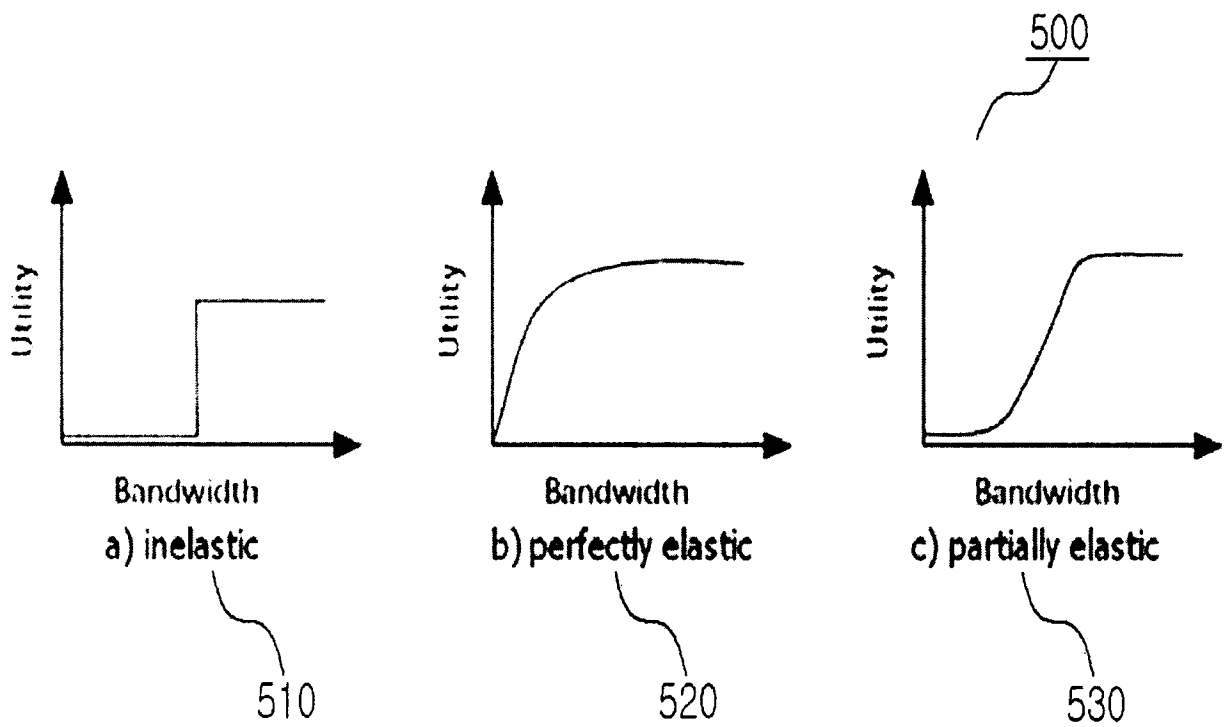
【Figure 2】

Diagram illustrating a network management interface (400) displaying a table of network data (410-450) and a corresponding network status bar (460).

CID	Application	Bandwidth	Price	Attrib.
234	skype.exe	64Kbps	19.3	[Icon]
314	alltp.exe	2.12Mbps	27.5	[Icon]
122	explorer.exe	21.1Kbps	5.2	[Icon]

The interface (400) also includes a network status bar (460) showing various network-related icons and information, including a clock displaying 12:00 PM on Thursday, 2007-07-26.

【Figure 3】



A. CLASSIFICATION OF SUBJECT MATTER**H04B 7/26(2006.01)i**

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 H04B 7/26, H04L 12/56, H04Q 7/00, 7/20

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

KOREAN UTILITY MODELS AND APPLICATIONS FOR UTILITY MODELS SINCE 1975

JAPANESE UTILITY MODELS AND APPLICATIONS FOR UTILITY MODELS SINCE 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS, DELPHION, ESPACENET & Keywords : wireless, service, quality, QoS, application, attribute, bandwidth, OFDMA and similar terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US2007-165565 A1 (JUNG et al.) 19 July 2007 * abstract, figure 2 *	1-20
A	US2007-127375 A1 (BAE et al.) 7 June 2007 * abstract, figure 4 *	1-20
A	WO2007-80050 A2 (SIEMENS AKTIENGESELLSCHAFT et al.) 19 July 2007 * abstract, figure 1 *	1-20
A	US2006-215559 A1 (MESE et al.) 28 September 2006 * abstract, figure 3 *	1-20



Further documents are listed in the continuation of Box C.



See patent family annex.

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search

14 JULY 2008 (14.07.2008)

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

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