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Certification

Welocalize Translations

AFFIDAVIT OF ACCURACY:

I, Fei Wang, hereby declare under penalty of perjury as follows:

1. I am fluent in both the Chinese and English languages, and I have experience translating technical documents between the two languages.
2. I am the translator of the attached English translation of the attached Patent Cooperation Treaty Application No. WO2010094188A1, including its figures, entitled "Service Policy Control Method and System," filed September 9, 2009 and published August 26, 2010.
3. I declare that all statements made herein of my own knowledge are true, accurate, and complete and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

王飞, Certified Translator

Location: Nanjing China

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Fei Wang

Project Number: DUMO_2512_P0009

136 Madison Avenue, 6th Floor
New York, NY 10016
212.581.8870

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(71) Applicant (For all designated states except US): ZTE Corporation [CN/CN]; ZTE Building, Keji South Road, High-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong 518057, China (CN)

(72) Inventors; and

(75) Inventors/Applicants (For US only): **PENG, Jiangyu** [CN/CN]; ZTE Corporation [CN/CN]; ZTE Building, Keji South Road, High-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong 518057, China (CN); **SUN, Min** [CN/CN]; ZTE Corporation [CN/CN]; ZTE Building, Keji South Road, High-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong 518057, China (CN); **JIN Hai** [CN/CN]; ZTE Corporation [CN/CN]; ZTE Building, Keji South Road, High-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong 518057, China (CN); **CHEN, Shengping** [CN/CN]; ZTE Corporation [CN/CN]; ZTE Building, Keji South Road, High-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong 518057, China (CN); **ZHAO, Hong** [CN/CN]; ZTE Corporation [CN/CN]; ZTE Building, Keji South Road, High-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong 518057, China (CN).

(74) Agent: **KANGXIN PARTNERS, P.C.**; 16th Floor, Block A, Yingdu Building, No. A48, Zhichun Road, Haidian District, Beijing 100098, China (CN).

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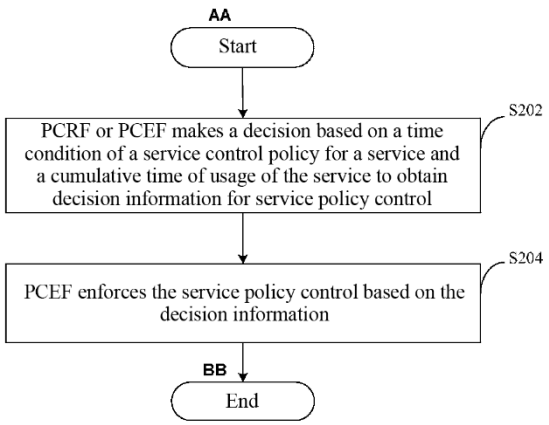

Figure 2

(57) Abstract: A service policy control method and system, wherein said method includes: a Policy and Charging Rules Function (PCRF) or a Policy and Charging Execution Function (PCEF) makes decisions on the basis of the time condition of service control policy of a service and the cumulative time for using the service, and obtains the decision information for service policy control. A PCEF implements the service policy control on the basis of the decision information.

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SERVICE POLICY CONTROL METHOD AND SYSTEM

Technical Field

This invention relates to the field of communications, and more particularly, to a service policy control method and system.

Background Art

As mobile networks evolve towards all-IP networks, in order to improve customer satisfaction, it is necessary to address issues such as end-to-end Quality of Service (QoS) assurance and flow charging. To address the aforementioned issues, 3GPP R7 proposed the Policy Charging Control (PCC) architecture. This architecture allows the network to detect different service flows and perform different QoS and charging controls for those service flows.

Figure 1 is a schematic diagram of a PCC system architecture in related art. As shown in Figure 1, the PCC system includes the following functional network elements:

an Application Function (AF) to provide service applications, provide session information to a PCRF, request the PCRF to perform dynamic policy/charging control on the user plane, and receive bearer event reports from the PCRF;

a Policy Control and Charging Rules Function (PCRF) to implement a Policy Decision Function (PDF) and a flow-based Charging Rules Function (CRF);

a Policy and Charging Enforcement Function (PCEF) to implement service flow detection, policy enforcement, and flow-based charging functions;

a Bearer Binding and Event Reporting Function (BBERF) to implement bearer binding and event notification functions;

a Subscription Profile Repository (SPR) containing information about all subscribed users which is used by the PCRF to formulate subscription-based policies and IP-Connectivity Access Network (IP-CAN) bearer-level PCC rules;

an Online Charging System (OCS) including a logical entity, namely, a Service Data Flow Based Credit Control Function (SDF), which performs online credit control functions; and

an Offline Charging System (OFCS).

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In the PCC system architecture shown in Figure 1, the PCRF is the core network element for policy decision. Its decision condition mainly originates from the AF and SPR (user subscription) as well as some policy rule conditions configured locally by the PCRF. As customers have increasingly higher requirements for differentiated services, the requirements for policy control conditions are becoming increasingly more refined. Among them, the cumulative time condition is one of said conditions.

The cumulative time condition mainly includes requirements in two aspects: one is the cumulative time at the session level, and the other is the cumulative time at the service level. For example, a user can be provided with a service quality of 2M bandwidth when he/she is online within 2 hours for one time, and a service quality of only 1M bandwidth when he/she is online for more than 2 hours. This reflects the concept of QoS policy control based on the cumulative time of one online session. Another example is streaming media services, which charge 10 yuan for cumulated 50 hours of video per month, and charge 2 yuan per hour after 50 hours. This also reflects the concept of charging policy control based on the cumulative usage time of the service at the service level.

According to the related art, different rates for the cumulative time are generally implemented by implementing different charging algorithms in the charging system. However, this method cannot solve the problem of different service qualities (e.g., bandwidths) for the cumulative time.

The PCC system can solve the problem of differentiated services, but the current 3GPP protocol specifications only allow time period-based policy control for time-based policy control, which can solve the problem of the cumulative time for one session, but cannot solve the problem of policy control based on the cumulative usage time of the service. There is no effective solution in the related art to the current problem of the incapability of policy control based on the cumulative usage time of the service.

Summary of the Invention

This invention is proposed in view of the problem of the incapability in the related art of policy control based on the cumulative usage time of services. Therefore, the main objective of

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this invention is to provide a service policy control method and system to solve the aforementioned problems existing in the related art.

To achieve the above objective, according to an aspect of this invention, a service policy control method is provided.

The service policy control method according to this invention includes: a PCRF or a PCEF making a decision based on a time condition of a service control policy for a service and a cumulative time of usage of the service to obtain decision information for service policy control; and the PCEF enforcing the service policy control based on the decision information.

Preferably, the aforementioned cumulative time includes: a first cumulative time and/or a second cumulative time, wherein the first cumulative time is the total time of usage of the service at the end of the last usage of the service by the current user, which is pre-saved by the PCRF, and the second cumulative time is the total time of usage of the service when the current usage of the service by the current user exceeds a predetermined time, which is cumulated by the PCRF or the PCEF, wherein the predetermined time is set according to the time condition and the first cumulative time.

Preferably, when a duration of the current usage of the service by the current user does not exceed the predetermined time at the end of the current usage of the service by the current user, the PCRF stores the duration of the current usage of the service by the current user and adds the reported duration to the first cumulative time.

Preferably, the time condition is received by the PCRF from a subscription profile repository or pre-configured locally by the PCRF.

Preferably, in the case where the decision information is generated by the PCEF, before the PCEF generates the decision information, the method further includes: the PCRF sending the time condition and the first cumulative time to the PCEF via an IP-CAN session establishment message.

Preferably, after the PCEF generates and enforces the decision information, the method further includes: the PCEF sending the second cumulative time to the PCRF via an IP-CAN session release message.

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According to another aspect of this invention, a service policy control system is also provided.

The service policy control system according to this invention includes: a decision module configured to make a decision based on a time condition of a service control policy for a service and a cumulative time of usage of the service to obtain decision information for service policy control; and an enforcement module configured to enforce the service policy control based on the decision information.

Preferably, the system further includes: a first acquisition module configured to acquire the cumulative time, wherein the cumulative time includes a first cumulative time and/or a second cumulative time, the first cumulative time is the total time of usage of the service at the end of the last usage of the service by the current user, which is pre-saved by a PCRF, and the second cumulative time is the total time of usage of the service when the current usage of the service by the current user exceeds a predetermined time, which is cumulated by the PCRF or PCEF, wherein the predetermined time is set according to the time condition and the first cumulative time; a second acquisition module configured to acquire the time condition via a subscription profile repository; or a configuration module configured to pre-configure the time condition.

Preferably, the system further includes: a storage module configured to, when the duration of the current usage of the service by the current user does not exceed the predetermined time at the end of the current usage of the service by the current user, store the duration of the current usage of the service by the current user and add the reported duration to the first cumulative time.

Preferably, the decision module is provided in the PCRF or the PCEF, and the enforcement module is provided in the PCEF.

By utilizing the technical solution provided by this invention, decisions are made in the PCRF or PCEF based on the cumulative service time and the time condition of the service control policy, and the PCEF enforces the service policy control based on the decision information, which enables strategy control based on the cumulative service usage time, thereby meeting the user's needs.

Brief Description of the Drawings

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The accompanying drawings described here are used to provide a further understanding of this invention and constitute part of this application. Exemplary embodiments of this invention and description thereof are used to explain this invention, but do not constitute an undue limitation of this invention. In the accompanying drawings:

Figure 1 is a schematic diagram of a PCC system architecture according to related art;

Figure 2 is a flowchart of a service policy control method according to an embodiment of this invention;

Figure 3 is a schematic diagram of Example 1 of this invention;

Figure 4 is a schematic diagram of Example 2 of this invention;

Figure 5 is a schematic diagram of Example 3 of this invention;

Figure 6 is a schematic diagram of Example 4 of this invention;

Figure 7 is a flowchart of message interaction between a PCEF and a PCRF during IP-CAN session establishment in the scenarios shown in Figures 5 and 6 according to an embodiment of this invention;

Figure 8 is a flowchart of message interaction between a PCEF and a PCRF during IP-CAN session release in the scenarios shown in Figures 5 and 6 according to an embodiment of this invention;

Figure 9 is a block diagram of a service policy control system according to an embodiment of this invention; and

Figure 10 is a block diagram of a preferred structure of a service policy control system according to an embodiment of this invention.

Detailed Description

Function Overview

In view of the problems existing in the prior art, an embodiment of this invention provides a service policy control solution. The main idea of the solution is as follows: the PCRF or PCEF functional entity cumulates the time of usage of the service by the user, the functional entity that cumulates the time makes a decision based on the cumulative time and the time condition, and

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finally the PCEF enforces the service policy control based on the decision information. This invention enables policy control based on the cumulative usage time of the service, thus meeting the user's needs.

The preferred embodiments of this invention will be described below with reference to the accompanying drawings. It should be understood that the preferred embodiments described herein are for illustration and explanation only and are not intended to limit this invention. Provided that there is no conflict, the embodiments of this invention and the characteristics thereof can be combined with each other.

Method embodiment

According to an embodiment of this invention, a service policy control method is provided.

Before describing this invention in detail, the following definitions are first made:

Policy: a set of rules defined based on a series of conditions. For example, Internet access with 2M bandwidth for 150 hours. Here, "Internet access" (service condition), "150 hours" (time condition), and "bandwidth" (resource condition) are all conditions described in the rules.

Decision: an enforcement decision made by the policy in particular conditions. For example, for Internet access with 2M bandwidth within 150 hours, the decision to enforce is "2M bandwidth" when both the conditions of "Internet access" and "150 hours" are met.

Figure 2 is a flowchart of a service policy control method according to an embodiment of this invention. It should be noted that the steps described in the following method can be executed in a computer system such as a set of computer-executable instructions, and although a logical order is shown in Figure 2, in some cases the steps shown or described may be executed in a different order than that shown here. As shown in Figure 2, the method includes the following processing:

Step S202: a PCRF or PCEF makes a decision based on a time condition of a service control policy for a service and a cumulative time of usage of the service to obtain decision information for service policy control; and

Step S204: the PCEF enforces the service policy control based on the decision information.

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According to this invention, the cumulation of service time includes meaning on two levels: one is the cumulation of service time in the current session, and the other is the cumulation of total usage time of the service. As long as the cumulative time of the current session is obtained, the total cumulative time of the service can be obtained based on the cumulative time of various previous sessions of the service, that is, the cumulation of total usage time.

In this invention, the policy control is performed in the functional entity where the session time is cumulated. Therefore, in step S202, the service time can be cumulated by either the PCRF or the PCEF, specifically including the following two cumulation/control methods:

I. PCRF cumulation/control method

The PCRF performs session-level time cumulation and starts a timer based on a time condition to perform periodically the service policy control. The PCRF issues the final decision information to the PCEF, and the PCEF enforces based on the received decision information. This method enables centralized control of the policy.

II. PCEF cumulation/control method

The PCRF issues the policy information, including the current cumulative time information of the service, to the PCEF. The PCEF analyzes the policy information, cumulates the time of the current session, and starts a timer in conjunction with the time condition to make decisions periodically. This method can reduce the number of signaling interactions on the Gx interface.

Through the above embodiment, the objective of policy control based on the cumulative usage time of the service has been achieved. The details of the above processes are described in detail below.

Figure 3 is a schematic diagram of Example 1 of this invention. As shown in Figure 3, the PCRF cumulates the time and the PCRF acquires the time condition via the SPR specifically as follows.

First, the SPR sets the time condition of the service control policy based on the user subscription information. The method for acquiring the time condition can be customized for the specific service for the user. When the user comes online, the SPR sends the time condition to the

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PCRF via the signaling of the Sp interface and the time condition is saved on the PCRF; when the user uses the service, the PCRF makes a decision based on the time condition of the user subscription and the cumulative time of usage of the service by the user that is stored locally, and sends the decision information to the PCEF via the signaling of the Gx interface, and the PCEF enforces the policy decision.

Meanwhile, the PCRF cumulates the usage time of the service based on the time condition and starts a cumulative duration timer. If the timer expires, the PCRF reissues new decision information to the PCEF. The PCEF modifies the decision based on the policy information and enforces the modified policy (the difference between the new policy and the original policy may lie in the quality of service). When the service for the user is terminated, the PCRF saves the new cumulative service time for use at the next time of the service.

Figure 4 is a schematic diagram of Example 2 of this invention. As shown in Figure 4, the PCRF cumulates the time and pre-configures the time on the PCRF, specifically as follows.

First, the time condition for the service control policy is pre-configured on the PCRF. The configuration method for the time condition may be the same configuration across the entire network. When a user engages in a service, the PCRF makes a decision based on the locally configured time condition and the locally stored cumulative time of the last service for the user. The decision information is then sent to the PCEF via the signaling of the Gx interface, and the PCEF enforces the policy decision.

Meanwhile, the PCRF cumulates the usage time of the service based on the time condition and starts a cumulative duration timer. If the timer expires, the PCRF reissues new decision information to the PCEF, and the PCEF modifies and enforces the decision. When the service for the user is terminated, the PCRF saves the new cumulative service time for use at the next time of the service.

Figure 5 is a schematic diagram of Example 3 of this invention. As shown in Figure 5, the PCEF cumulates the time and the PCRF acquires the time via the SPR specifically as follows.

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First, the SPR sets the time condition for the service control policy through the user subscription information. When the user comes online, the SPR sends the time condition to the PCRF through the signaling of the Sp port and saves it on the PCRF. When an IP-CAN session is created, the PCRF sends the time policy information of the user subscription and the cumulative time information of the service for the user stored on the PCRF to the PCEF through the signaling of the Gx interface. When a service occurs, the PCEF makes a decision on the policy and enforces it. Meanwhile, the PCEF starts a timer based on the time condition and the cumulative time. When the timer expires, the PCEF makes a decision on the policy again based on the time condition and enforces it. In this way, the total cumulative time of usage of the service can be obtained based on the time of the current usage of the service, and the service control policy that should be used currently can be enforced based on the preset time condition. When the IP-CAN session is released, the PCEF needs to report the cumulative time of the current service session to the PCRF in order to refresh the total cumulative usage time of this service for the user.

Figure 6 is a schematic diagram of Example 4 of this invention. As shown in Figure 6, the PCEF cumulates the time and pre-configures the time condition on the PCRF, specifically as follows.

First, the time condition for the service control policy is pre-configured on the PCRF. When an IP-CAN session is created, the PCRF sends the locally configured time condition and the cumulative time information of the last service for the user stored on the PCRF to the PCEF via signaling of the Gx interface. When a service occurs, the PCEF makes a decision on the policy based on the received time condition and cumulative time and enforces it.

Meanwhile, the PCEF starts a timer based on the time condition and the cumulative time. When the timer expires, the PCEF makes a decision on the policy again based on the time condition and enforces it. When the IP-CAN session is released, the PCEF needs to report the cumulative time of the current service session to the PCRF in order to refresh the total cumulative usage time of this service for the user.

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In the scenarios shown in Figures 3 and 5, since the time condition for the control policy of the user subscription service needs to be set in the SPR, the subscription information about the time condition needs to be added to the Sp interface. When the user sends a request to the SPR, the SPR issues the time condition to the PCRF.

The interface specifications in the current 3GPP standard can support the PCRF time cumulation method used in the scenarios shown in Figures 3 and 4; however, in the scenarios shown in Figures 5 and 6, it is necessary to add the content of the time condition policy and the cumulative time information to the Gx interface. For the specific message interaction process, please refer to Figures 7 and 8.

Figure 7 is a flowchart of message interaction between a PCEF and a PCRF during IP-CAN session establishment in the scenarios shown in Figures 5 and 6 according to an embodiment of this invention. As shown in Figure 7, in the IP-CAN session establishment response message, the PCRF sends the time policy information and the service cumulative time information for the user to the PCEF for the PCEF to make a decision.

Figure 8 is a flowchart of message interaction between a PCEF and a PCRF during IP-CAN session release in the scenarios shown in Figures 5 and 6 according to an embodiment of this invention. As shown in Figure 8, in the IP-CAN session release request message, the PCEF sends the current service cumulative time information for the user to the PCRF for the PCRF to save it.

In the specific implementation process, one of the methods shown in Figures 3 to 6 can be selected according to the user's actual needs in order to meet the user's needs to the greatest extent.

According to an embodiment of this invention, a computer-readable medium is also provided. The computer-readable medium has computer-executable instructions stored therein which, when executed by a computer or processor, cause the computer or processor to perform the processing of each of steps S102 and S104 shown in Figures 2, 7, and 8. Preferably, one or more of the above embodiments can be executed.

System embodiment

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According to an embodiment of this invention, a service policy control system is also provided. This service policy control system can be used to implement the service policy control method provided in the above method embodiment.

Figure 9 is a block diagram of a service policy control system according to an embodiment of this invention; and Figure 10 is a block diagram of a preferred structure of a service policy control system according to an embodiment of this invention.

As shown in Figure 9, the service policy control system according to an embodiment of this invention includes: a decision module **10** and an enforcement module **20**, wherein:

the decision module **10** is configured to make a decision based on a time condition of a service control policy for a service and a cumulative time of usage of the service to obtain decision information for service policy control; and

the enforcement module **20** is connected to the decision module **10** and is configured to enforce the service policy control based on the decision information obtained by the decision module **10**.

According to an embodiment of this invention, said decision module **10** may be provided in the PCRF or the PCEF, and the enforcement module **20** may be provided in the PCEF.

As shown in Figure 10, on the basis of the structure shown in Figure 9, the service policy control system according to an embodiment of this invention may further include the following modules: a first acquisition module **30**, a second acquisition module **40** or a configuration module **50**, and a storage module **60**. Specifically:

The first acquisition module **30** is connected to the decision module **10** to acquire the cumulative time, wherein the cumulative time includes a first cumulative time and/or a second cumulative time, the first cumulative time is the total time of usage of the service at the end of the last usage of the service by the current user, which is pre-saved by the PCRF, and the second cumulative time is the total time of usage of the service when the current usage of the service by the current user exceeds a predetermined time, which is cumulated by the PCRF or PCEF, wherein

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the predetermined time is set according to the time condition and the first cumulative time. The first acquisition module **30** may be provided in the PCRF or PCEF.

The second acquisition module **40** is connected to the decision module **10** and is configured to acquire the time condition through the subscription profile repository; or

the configuration module **50** is connected to the decision module **10** and is configured to pre-configure the time condition.

Only one of the second acquisition module **40** and the configuration module **50** mentioned above is needed to obtain the time condition. The second acquisition module **40** and the configuration module **50** may be provided in the PCRF.

The storage module **60** is connected to the decision module **10** and is configured to, when the duration of the current usage of the service by the current user does not exceed the predetermined time at the end of the current usage of the service by the current user, store the duration of the current usage of the service by the current user and add the reported duration to the first cumulative time. The storage module **60** may be provided in the PCRF.

During the specific implementation, the system provided by the embodiment of this invention can also perform the processes shown in Figures 2 to 8, and the specific processing process will not be described again here.

To sum up, by utilizing the technical solution described above of this invention, decisions are made in the PCRF or PCEF based on the cumulative service time and the time condition of the service control policy, and the PCEF enforces the service policy control based on the decision information, which enables strategy control based on the cumulative service usage time, making the service policy control more flexible and humanized, thereby meeting the user's needs, improving the user experience, and filling in the blanks in related art.

Furthermore, the implementation of this invention does not require modifications to the system architecture or current processing flow, making it easy to be implemented and promoted in the technical field and have good industrial applicability.

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Apparently, those skilled in the art should understand that the modules or steps of this invention described above can be implemented using general-purpose computing devices. They can be centralized on a single computing device or distributed across a network consisting of multiple computing devices. Optionally, they can be implemented using computer device-executable program codes. Thus, they can be stored in a storage device for execution by the computing device, or they can be fabricated separately as individual integrated circuit modules, or multiple modules or steps among them can be fabricated as a single integrated circuit module. Thus, this invention is not limited to any particular combination of hardware and software.

Described above is only a preferred embodiment of this invention, which is not intended to limit this invention. For those skilled in the art, this invention can have various modifications and variations. Any modifications, equivalent substitutions, or improvements made within the spirit and principle of this invention shall fall within the scope of protection of this invention.

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CLAIMS

1. A service policy control method, comprising:

a Policy Control and Charging Rules Function (PCRF) or a Policy and Charging Enforcement Function (PCEF) making a decision based on a time condition of a service control policy for a service and a cumulative time of usage of the service to obtain decision information for service policy control; and

the PCEF enforcing the service policy control based on the decision information.

2. The method according to claim 1, wherein the cumulative time comprises:

a first cumulative time and/or a second cumulative time, wherein the first cumulative time is the total time of usage of the service at the end of the last usage of the service by the current user, which is pre-saved by the PCRF, and the second cumulative time is the total time of usage of the service when the current usage of the service by the current user exceeds a predetermined time, which is cumulated by the PCRF or the PCEF, wherein the predetermined time is set according to the time condition and the first cumulative time.

3. The method according to claim 2, wherein:

when a duration of the current usage of the service by the current user does not exceed the predetermined time at the end of the current usage of the service by the current user, the PCRF stores the duration of the current usage of the service by the current user and adds the reported duration to the first cumulative time.

4. The method according to claim 2 or 3, wherein the time condition is received by the PCRF from a subscription profile repository or pre-configured locally by the PCRF.

5. The method according to claim 4, wherein in the case where the decision information is generated by the PCEF, before the PCEF generates the decision information, the method further comprises:

the PCRF sending the time condition and the first cumulative time to the PCEF via an IP-Connectivity Access Network (IP-CAN) session establishment message.

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6. The method according to claim 5, wherein after the PCEF generates and enforces the decision information, the method further comprises:

the PCEF sending the second cumulative time to the PCRF via an IP-CAN session release message.

7. A service policy control system, comprising:

a decision module configured to make a decision based on a time condition of a service control policy for a service and a cumulative time of usage of the service to obtain decision information for service policy control; and

an enforcement module configured to enforce the service policy control based on the decision information.

8. The system according to claim 7, further comprising:

a first acquisition module configured to acquire the cumulative time, wherein the cumulative time comprises a first cumulative time and/or a second cumulative time, the first cumulative time is the total time of usage of the service at the end of the last usage of the service by the current user, which is pre-saved by the PCRF, and the second cumulative time is the total time of usage of the service when the current usage of the service by the current user exceeds a predetermined time, which is cumulated by the PCRF or the PCEF, wherein the predetermined time is set according to the time condition and the first cumulative time; and

a second acquisition module configured to acquire the time condition through a subscription profile repository; or a configuration module configured to pre-configure the time condition.

9. The system according to claim 8, further comprising:

a storage module configured to, when a duration of the current usage of the service by the current user does not exceed the predetermined time at the end of the current usage of the service by the current user, store the duration of the current usage of the service by the current user and add the reported duration to the first cumulative time.

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10. The system according to claim 7, wherein the decision module is provided in the Policy Control and Charging Rules Function (PCRF) or the Policy and Charging Enforcement Function (PCEF), and the enforcement module is provided in the PCEF.

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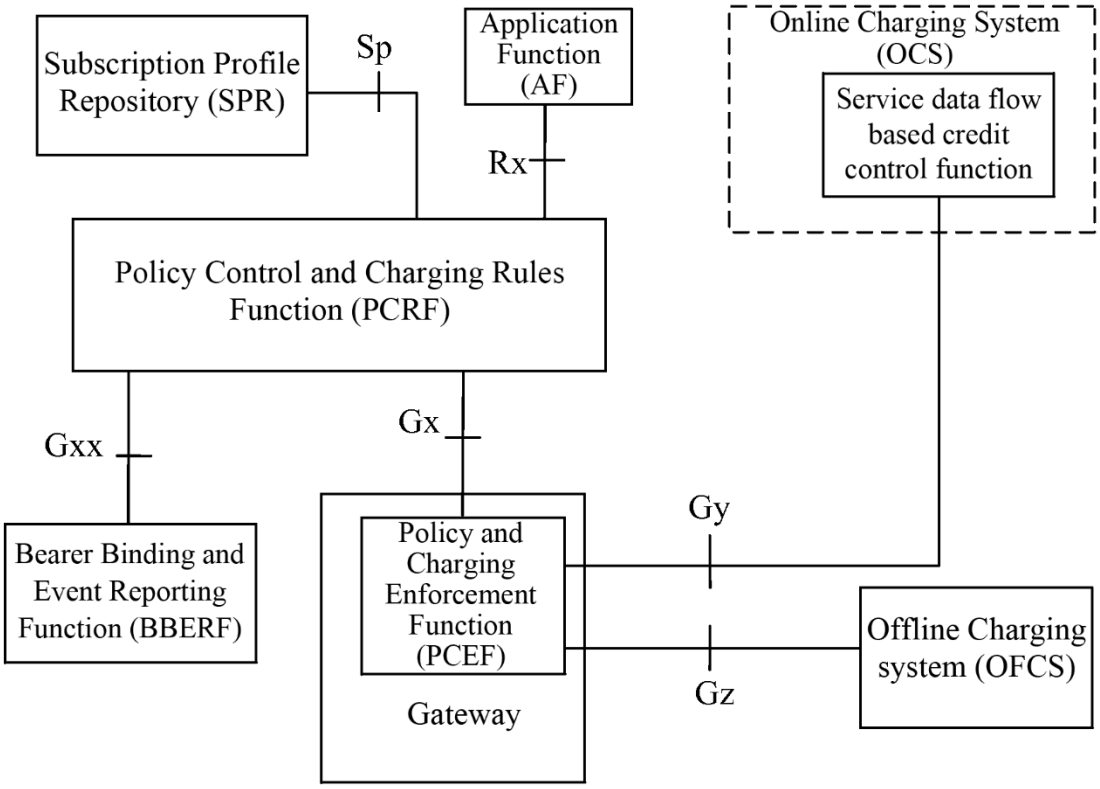

Figure 1

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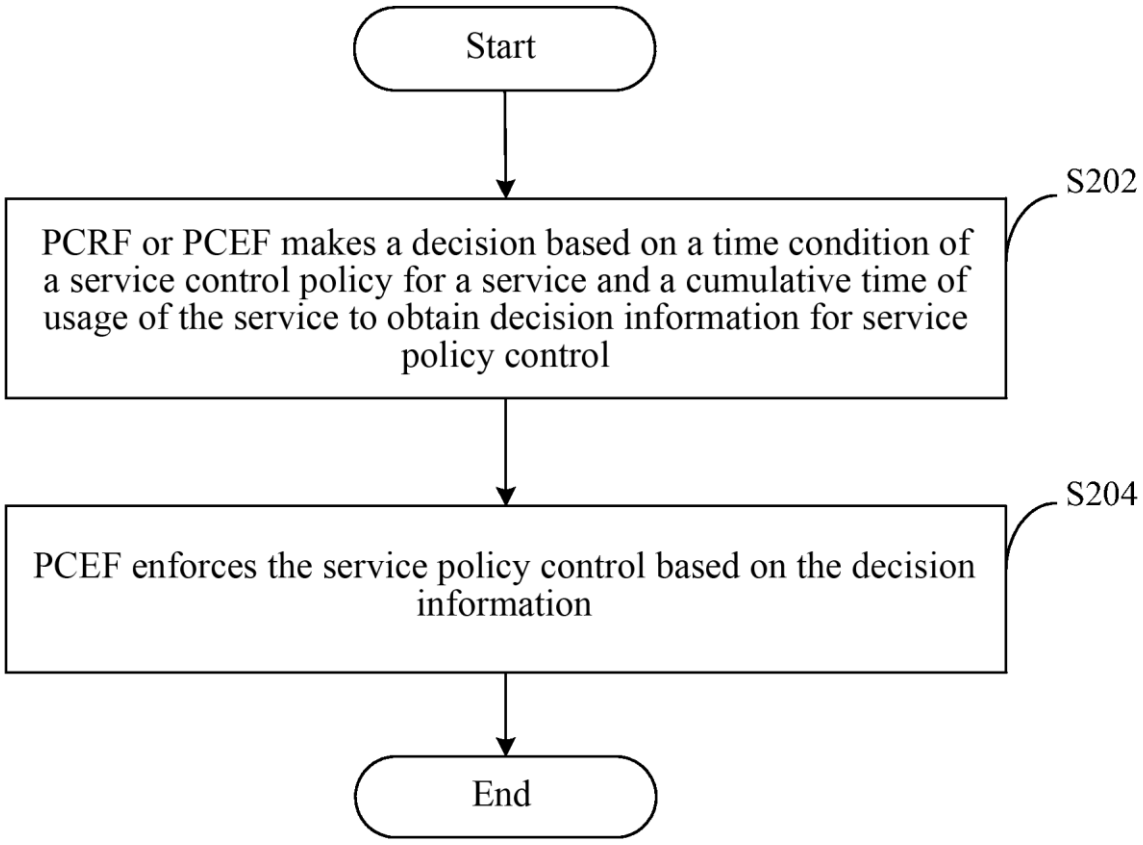

Figure 2

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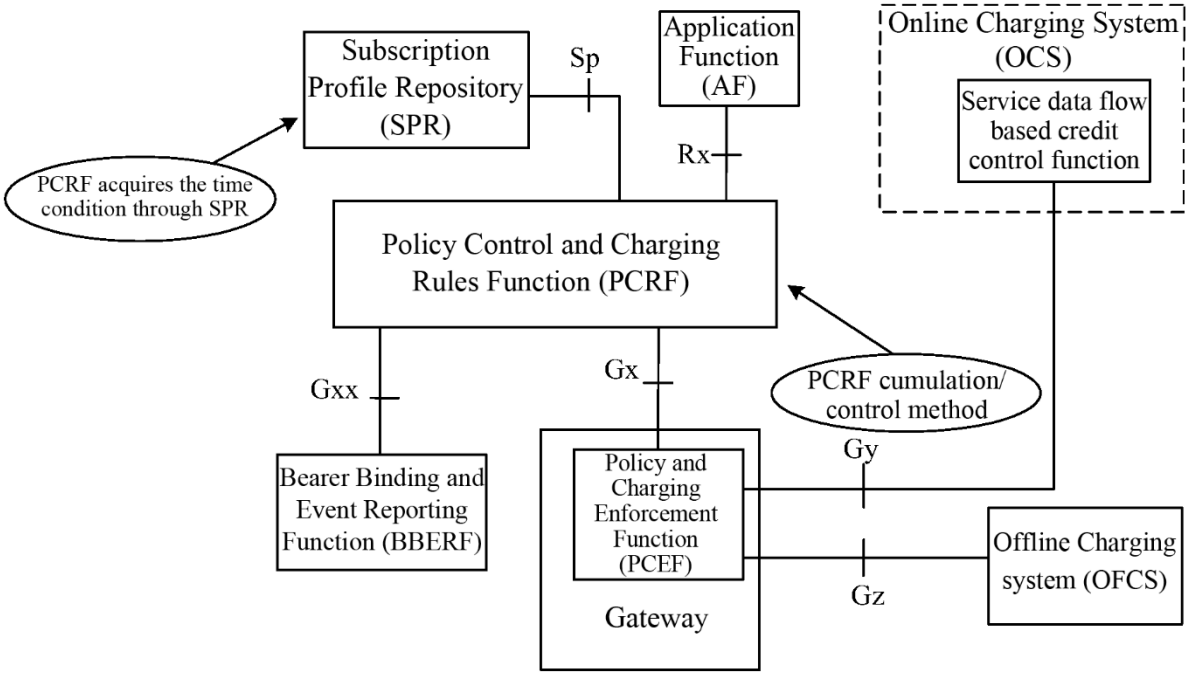

Figure 3

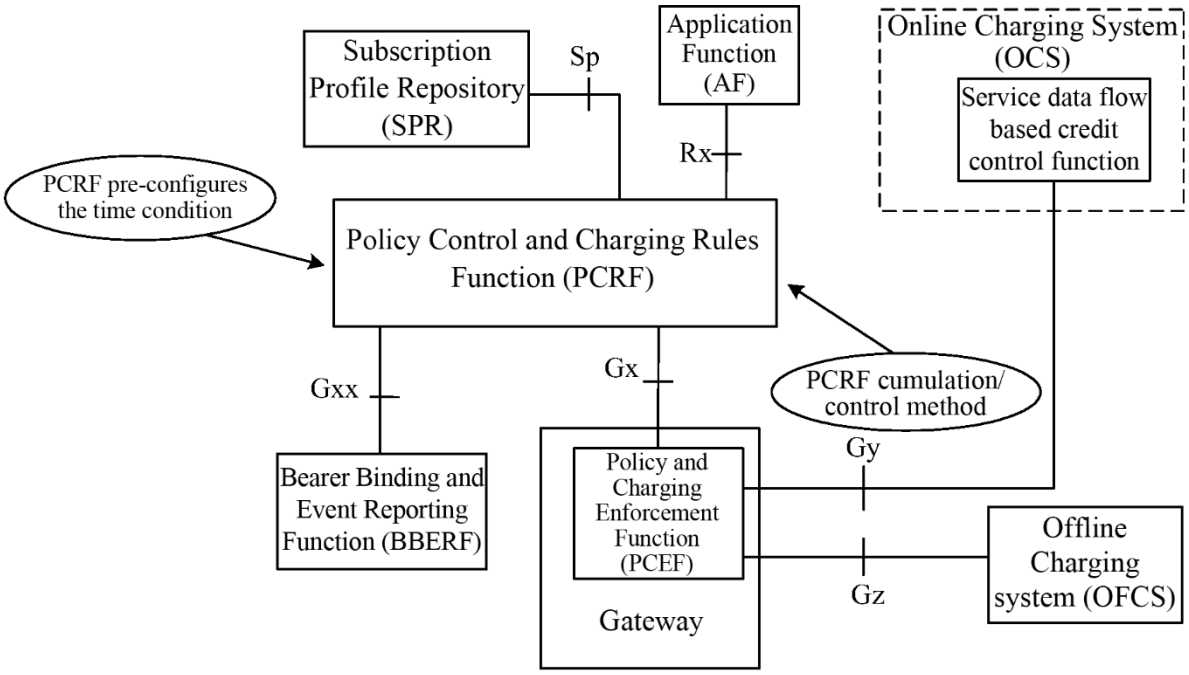

Figure 4

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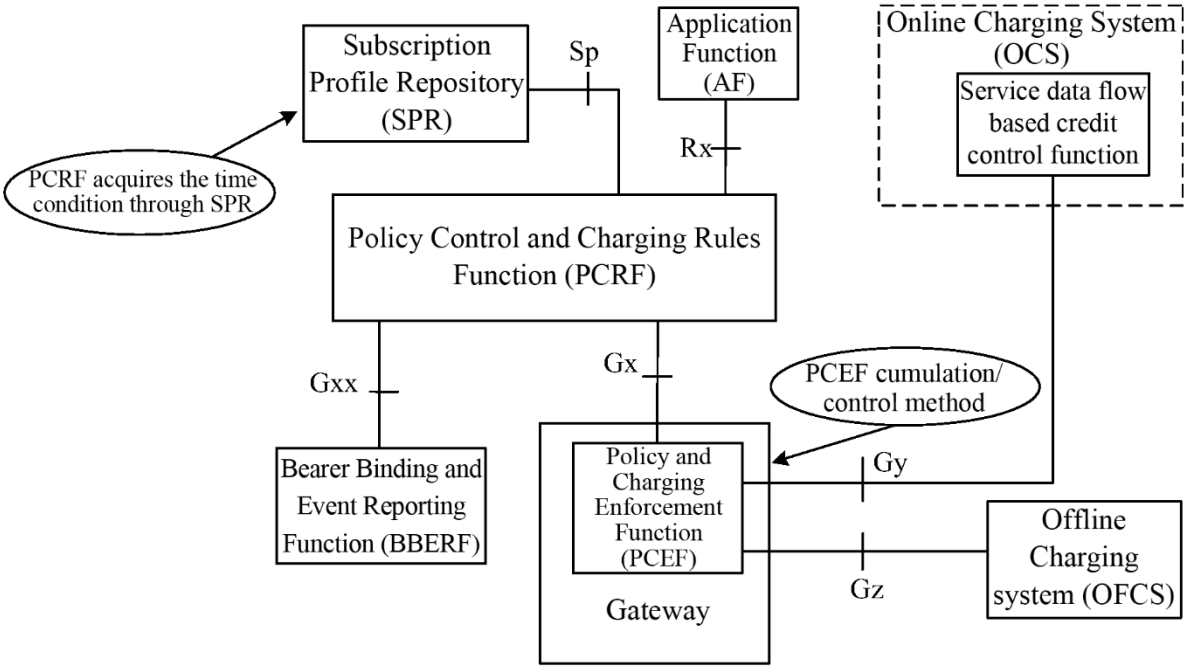

Figure 5

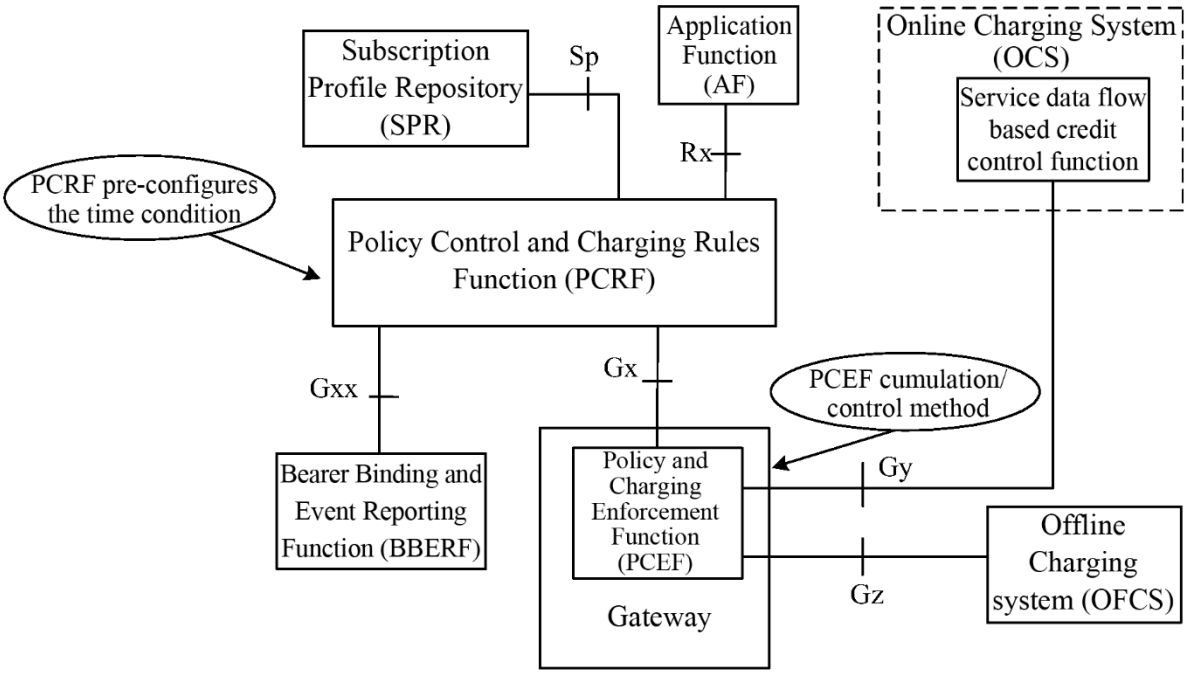

Figure 6

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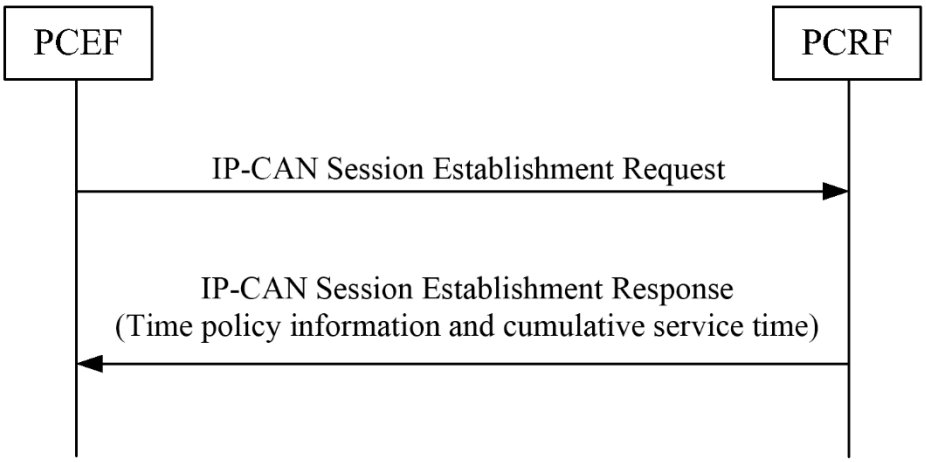

Figure 7

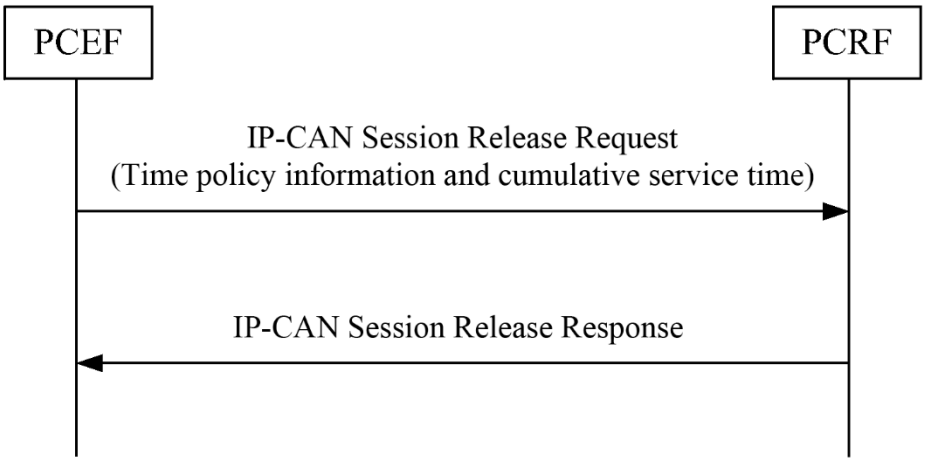

Figure 8

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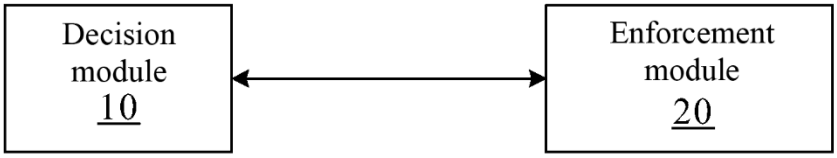

Figure 9

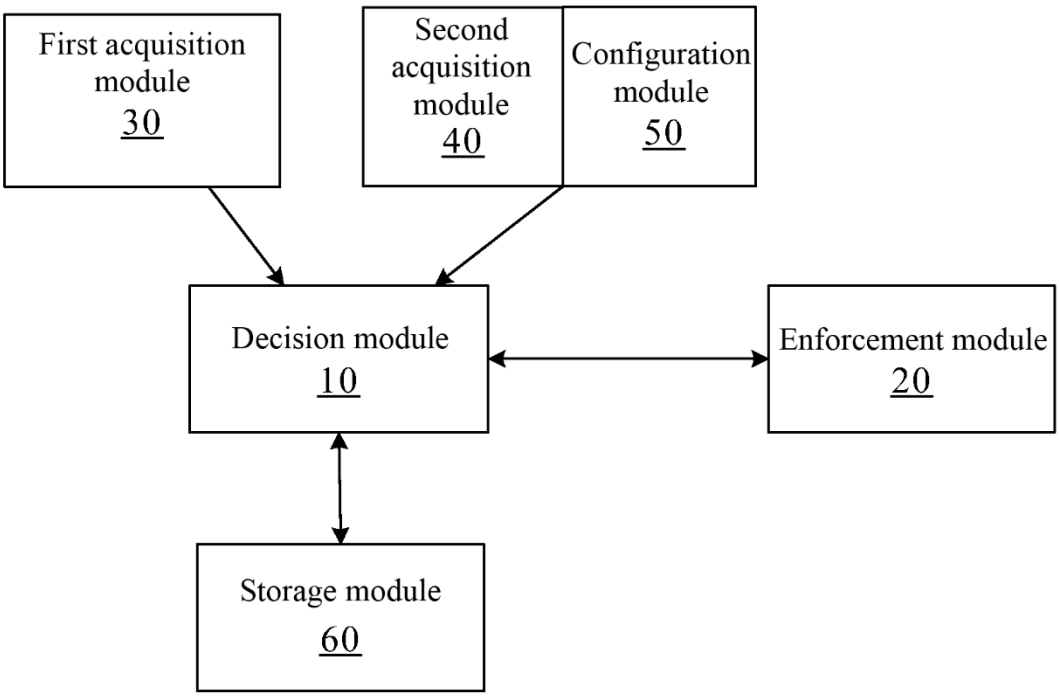

Figure 10

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2009/073845

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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:H04L12/-,H04L29/-,H04M15/-,H04M17/-,H04Q7-,G06F13/-

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNPAT,CNKI,WPI,PAJ,EPODOC:Strateg+/Polic+ fee/charg+ QoS time+ total+/add+ volume+ flow+ bandwidth speed+ rate+ PCRF PCEF PCC 3GPP IP w CAN

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN101119211A (ZTE COMMUNICATION CO., LTD.) 06 Feb.2008(06.02.2008)	7
Y	Description page 5 line 1-page 10 line 22	1,10
Y	CN1968139A (HUAWEI TECHNOLOGIES CO., LTD.) 23 May 2007(23.05.2007) Description page 4 paragraph 3-page 15 paragraph 1	1,10
A	CN1780347A (HUAWEI TECHNOLOGIES CO., LTD.) 31 May 2006(31.05.2006) The whole document	1-10

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"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

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
21 Oct.2009(21.10.2009)	**17 Dec. 2009 (17.12.2009)**
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer BIAN,Xishuang Telephone No. (86-10)62414221

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2009/073845

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR100819051B1 (KOREA ELECTRONICS TELECOMM) 02 Apr.2008 (02.04.2008) the whole document	1-10
A	EP1887738A1 (SIEMENS AG) 13 Feb.2008(13.02.2008) the whole document	1-10
A	JP 2000-151811A (TRY NETWORK INTERNAT KK.) 30 May 2000 (30.05.2000) the whole document	1-10
A	LIU Rongduo, QoS strategy control system in IMS network, TELECOMMUNICATIONS NETWORK TECHNOLOGY, September 2008, No.9, pages 4-7	1-10
A	WU Bin ,YUE Lan, QoS system and PCC structure in WiMAX study, GUANGDONG COMMUNICATION TECHNOLOGY, July 2008, pages 16-20	1-10

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2009/073845

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN101119211A	06.02.2008	NONE	
CN1968139A	23.05.2007	NONE	
CN1780347A	31.05.2006	CN100521720C	29.07.2009
KR100819051B1	02.04.2008	NONE	
EP1887738A1	13.02.2008	EP1887740A1	13.02.2008
		WO2008017662 A1	14.02.2008
JP 2000-151811A	30.05.2000	NONE	

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2009/073845

A. **CLASSIFICATION OF SUBJECT MATTER**: According to International Patent Classification (IPC) or to both national classification and IPC

H04L 12/14 (2006.01) i
H04L 12/56 (2006.01) i

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