(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
2 April 2009 (02.04.2009)

PCT

(10) International Publication Number
WO 2009/039677 A1

(51) International Patent Classification:
H04L 12/56 (2006.01)

(21) International Application Number:
PCT/CN2007/002802

(22) International Filing Date:
24 September 2007 (24.09.2007)

(25) Filing Language: English

(26) Publication Language: English

(71) Applicant *(for all designated States except US)*: **LUCENT TECHNOLOGIES INC.** [US/US]; 600-700 Mountain Avenue, P.O. Box 636, Murray Hill, New Jersey 07974-0636 (US).

(72) Inventor; and

(75) Inventor/Applicant *(for US only)*: **HU, Zhaowen** [CN/CN]; No. 169 SongLing Road, Qingdao, Shandong 266061 (CN).

(74) Agent: **ZHONGZI LAW OFFICE**; 7F, New Era Building, 26 Pinganli Xidajie, Beijing 100034 (CN).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(54) **Title:** METHOD AND SYSTEM FOR PROVIDING CHARGING INFORMATION IN IMS

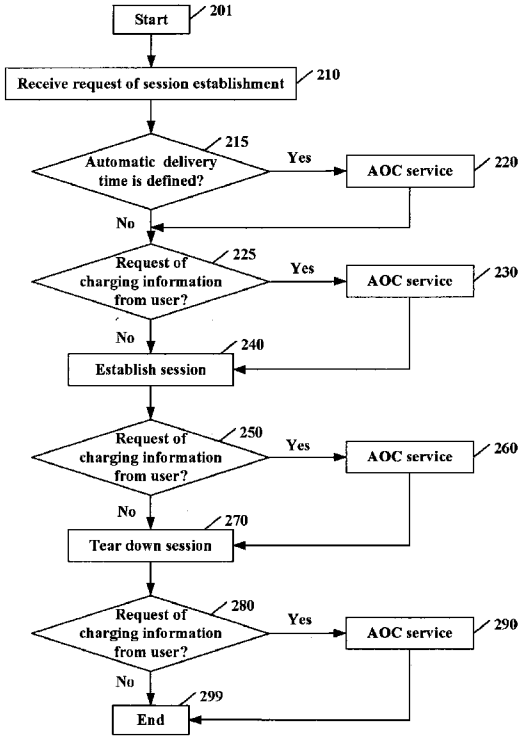


Fig.2

(57) **Abstract:** The invention proposes a method and system for providing charging information of a session to an end user in IMS. The method comprises the following steps: determining whether the user has subscribed a service of providing charging information in response to a request from the user; and providing the charging information from IMS to the user in response to determining that the user has subscribed the service of providing charging information. The service of providing charging information may be carried out before a session is established, during the lifetime of an established session, at the end of a session, or automatically at a certain time defined by the user. The method and system of the invention provides a new supplementary service for SIP end users in IMS, which may not only enable an end user to get charging information more quickly and improve the decision-making ability for the user, also generate more revenue for the service provider.

WO 2009/039677 A1

Method and System for Providing Charging Information in IMS

Technical Field of the Invention

The present invention generally relates to charging service in IP Multimedia Subsystem (IMS), and in particular, to a method and system for providing charging information of a session to an end user before a session is established, during the lifetime of an established session, or at the end of a session.

Background of the Invention

IMS (IP Multimedia Subsystem), proposed in 3GPP (the 3rd Generation Partnership Project) Release 5, is a new scheme for multimedia transactions, which can meet the novel and diverse requirements proposed by end-users on multimedia transactions. At the moment, IMS is considered to be core architecture in the Next Generation Network (NGN), realizing such functions as establishing, maintaining, and managing of IP multimedia transactions. The IMS implementation is based on SIP (Session Initiation Protocol), i.e. IMS UEs (User Equipments), such as 3G handsets, support the SIP protocol for originating or terminating voice and video sessions. Due to the flexibility of SIP and the standardized open interface, IMS becomes a common and uniform platform supporting various emerging services and the conventional terminals, independent of access technologies.

SIP, as one foundational session control protocol in IMS, is becoming an emerging workflow in the telecom Next-Generation-Network (NGN) and IT collaborative solution. SIP is one text-based signaling protocol. It operates independently of the underlying network transport protocols, establishing sessions between multiple users irrespective if the transferred data is text data, audio data, or video data. The SIP protocol enables end users to communicate with each other via messages. The basic form of a message could either be a request sent from a client to a server or a reply from the server to the client.

Commonly, the structure of IMS has three layers:

· Service application layer. It is composed of application and content servers, responsible for providing value adding services.

· Control layer. It is composed of network control servers, responsible for managing call or session setting, modifying and releasing. The most important one among these servers is CSCF (Call Session Control Function), also referred to as SIP server, which will be described in detail

later. Further, this layer also comprises multiple support function, such as configuration, charging and operation maintenance functions. Boundary gateways at this layer are responsible for interconnecting with other operator networks and other types of network, or interconnecting within the networks themselves.

· Connectivity layer. It is composed of routers and switches for bone and access networks.

The IMS architecture supports both online charging function and offline charging function. The online charging refers to a process of IMS entities, such as AS (application server), CSCF, and GGSN (Gateway GPRS Support Node), interacting with an online charging system in real time. In the process the online charging function interacts with user's account in real time and controls or monitors service related expense. The offline function generally collects charging information after completing a session. In this case, IMS cannot affect the process of the service being employed in real time. Such two charging modes will exist simultaneously in a long term in light of different services and customers.

Currently, in the conventional IMS architecture, however, a SIP end user who will establish, is establishing, or established a SIP multimedia session could not get the charging information about the SIP session on time. The charging information may comprise consumer of the session, session establishment time, session duration, media components in the session, flow quantity, expense, and any other factors that the person with skilled in the art may be readily appreciated. Considering many factors involved in a SIP multimedia session established by a SIP end user in IMS, such factors may affect the decision of the user about the duration, the content, the necessity of the session. Thus, it would be convenient for a SIP end user to get charging information before his/her requested SIP session is established, during an established session, or when a SIP session is tore down.

Summary of the Invention

Therefore, to address the above issues, there is proposed by the present invention a method and system for providing charging information of a session to an end user in IMS before a session is established, during the lifetime of an established session, or at the end of a session.

In the present invention, according to one aspect of the invention, a method for providing charging information of a session to an end user in IMS, comprising the following steps:

determining whether the user has subscribed a service of providing charging information in response to a request from the user; and

providing the charging information of a session from IMS to the user in response to determining that the user has subscribed the service of providing charging information.

Wherein, the service of providing charging information may be carried out before a session is established, during the lifetime of an established session, at the end of a session, or automatically at a certain time defined by the user.

According to another aspect of the invention, a system for providing charging information of a session to an end user in IMS, comprising:

a user equipment, for providing the user with a subscription option of a service of providing charging information, and sending requests to IMS or receiving responses from IMS for the user;

a network element, for determining whether the user has subscribed a service of providing charging information in response to a request from the user; and providing the charging information of a session from IMS to the user in response to determining that the user has subscribed the service of providing charging information.

Wherein, the network element may provide the charging information before a session is established, during the lifetime of an established session, at the end of a session, or automatically at a certain time defined by the user.

The method and system of the present invention provides a new supplementary service for SIP end users in IMS, which may not only enable an end user to get charging information more quickly and improve the decision-making ability for the user, also generate more revenue for the service provider.

Description of the Drawings

The novel features believed characters of the invention is set forth in the appended claims. However, the invention itself and its preferred mode, together with further objects and advantages, will be best appreciated from the reading of the following detailed description of the illustrative embodiments taken in conjunction with the drawings, in which:

FIG. 1 illustrates an exemplary IMS architecture according to an embodiment of the invention;

FIG. 2 illustrates a flowchart of an exemplary workflow for establishing a session for a SIP end user upon user's request and, during the workflow, determining whether to initiate the service of providing charging information of the session to the end user in the exemplary IMS architecture according to an embodiment of the invention; and

FIG. 3 illustrates a flowchart of a method of providing charging information of a session to the end user according to an embodiment of the invention.

Detailed Description of the Invention

In order to comprehend the present specification precisely and thoroughly, an exemplary IMS architecture is introduced herein, in which the present invention may be practiced.

Now referring to figures, and particularly to FIG. 1, there is illustrated an exemplary IMS architecture 100 according to an embodiment of the invention. In FIG. 1, a SIP end user makes access to IMS 100 through a communication network, such as Internet, intranet, local area network (LAN), wide area network (WAN), mobile or cellular network, another variety of communication network, or any combination thereof, in order to establish a SIP session, for example, with another SIP end user or a service provider. The user access is often implemented through a User Equipment (UE). An IMS UE is a device allowing the end user to access to network services, such as a 3G handset, a SIP phone, a PDA (Personal Digital Assistant) or a soft-client running on a PC. A UE supports a number of audio/video media codecs and is capable of originating or terminating sessions to the IMS via the SIP interface.

IMS 100 shown in FIG.1 comprises CSCF 110, HSS 120, and a charging module 130. Specifically, CSCF (Call Session Control Function) is the core module in IMS architecture. All SIP signaling will pass through CSCF, which is treated as an essential node in IMS. CSCF receives, checks, and parses every SIP message and thus determines how to deal with the SIP message, such as forwarding it to an application server (AS) or another SIP end user (both are not shown herein), storing it, filtering it to acquire desired information, etc. CSCF may also perform various functions, such as initiating QoS control based on the session description information received in the SIP message, performing session control services for the end user, generating Call Detail Records (CDR) for billing purpose, etc.

In the practical implementation, CSCF may be composed of three modules: P-CSCF (Proxy CSCF), S-CSCF (Serving CSCF), and I-CSCF (Interrogating CSCF). In the context of the present invention, they are generally referred to as CSCF. Since such sub-modules are not the subject matter of the invention, the particular descriptions and functions of them are ignored in this specification.

HSS (Home Subscriber Server) 120 is the IMS subscriber database, which contains all the IMS subscriber service profiles, e.g. registration data, service filter criteria, service data, and location data. In particular, in the present invention, it can also contain subscription related information with respect to a service of providing charging information. Once a SIP end user subscribes the service of providing charging information to IMS through his/her UE, CSCF 110 receives the subscription related information and sends it to HSS 120 for storage.

The subscription related information herein may comprise a user name, a user identifier, a

tag indicating the subscription option is on or off, automatic delivery time, or any other fields that the person with skilled in the art may be readily appreciated. Wherein, the field of automatic delivery time refers to an automatic information delivery time defined by the end user. If a certain time is explicitly defined in the field, such as, when a session is established, at the end of a session, then CSCF 110 will automatically delivery the charging information to the end user at the defined time point. In an alternative embodiment, the number of the field of automatic delivery time may be more than one, so that CSCF 110 will automatically delivery the charging information to the end user more than once. If there is no certain time defined in the field, i.e. it is left blank, it means that the user does not need automatic information delivery. In addition, whenever the user wants to request charging information, he/she must issue a request of charging information to CSCF 110, which, upon receiving the request, searches HSS 120 for the subscription related information. If the corresponding subscription related information is found in HSS 120 and it indicates that the subscription option is on, CSCF 110 triggers the service of providing charging information to the end user. Otherwise, if the corresponding subscription related information is not found in HSS 120 or it indicates that the subscription option is off, CSCF 110 denies the service and notifies the user of such situation, and, optionally, suggests the user subscribing that service.

The charging module 130 is a main entity for charging functions in IMS 100. It can be applied to both offline charging and online charging. IMS has the capability to support Call Detail Records (CDR) for various IP multimedia services. For one session established in IMS, CDR may contain essential information for charging, such as, consumer of the session, session establishment time, session duration, media components in the session, flow quantity, expense, etc. The detailed information contained in CDR could be determined based on the particular service. The charging function is performed by the charging module 130 based on charging rules, which are defined by IMS operators or service providers and transferred to the charging module 130 through a uniform interface so as to make charging for the provided services and contents. The charging module 130 is able to calculate the charging information for a session to be established, or having been established by the end user, and when inquired by CSCF 110, sends the current charging information to CSCF 110, which in turn sends it to the end user through the UE.

It is noted that, in addition to the modules mentioned above, there may be a variety of elements in IMS, such as application server, content server, GSN (GPRS Support Node) including SGSN (Serving GSN) and GGSN (Gateway GSN), etc. Since those modules are not related to the charging function of the invention, the detailed descriptions and functions of

them are ignored herein to avoid the confusion of the true spirit and scope of the invention.

Before the method for providing charging information of a session to an end user is executed, there is provided a new service subscription option by the invention, called as Advice of Charge (AOC) service. An end user could choose the option to subscribe to the AOC service in many ways, such as by selecting the option shown on the UE with which the user connects to IMS 100, through the web interface provided by the service provider, with the help of the assistant of the service provider, etc. Upon the subscription of the AOC service by the user, IMS receives the subscription related information and stores it into HSS 120. Then, with the option stored and activated, the end user may receive the charging information automatically or request the charging information before a session is established, during the lifetime of an established session, and at the end of a session.

Now referring to FIG. 2, there is illustrated a flowchart of an exemplary workflow for establishing a session for a SIP end user upon user's request and, during the workflow, determining whether to initiate the service of providing charging information of the session to the end user in the exemplary IMS architecture according to an embodiment of the invention. Prior to performing the workflow, the SIP end user have a choice of subscribing the new AOC service by selecting the corresponding option, and if the user makes a subscription then the subscription related information is sent and stored in HSS 120 through CSCF 110 (see FIG. 1). Initially, the process starts at Step 201, and then proceeds to Step 210, where CSCF 110 in IMF 100 receives a request of session establishment from an end user. As the end user may want to obtain the charging information of the session automatically at some time, at Step 215, CSCF 110 checks the corresponding subscription related information stored in HSS 120, if the subscription related information indicates that the subscription option is on and an automatic delivery time is defined, the process proceeds via the "Yes" branch to Step 220, where CSCF 110 prepares to start the AOC service at an appropriate time defined by the user. The execution of the AOC service can be described in details later in the specification.

If, otherwise, the subscription related information indicates that the subscription option is off or no automatic delivery time is defined (the "No" branch of Step 215) or after the execution of the AOC service (Step 220), the process proceeds to Step 225, where CSCF 110 determines whether a request of charging information is received from the end user. As the end user may want to obtain the charging information before the requested session is established, he/she can initiate the subscribed AOC service to implement the function, e.g. by issuing a request of charging information. For example, the user may embed the request of charging information into the request of session establishment. In an alternative embodiment, the request of session

establishment and the request of charging information may be separated ones and they may be sent to CSCF 110 successively without a certain order. In either case, if CSCF 110 determines that a request of charging information has been received, the process proceeds via the "Yes" branch to Step 230, where CSCF 110 prepares to start the AOC service. The execution of the AOC service can be described in details later in the specification.

If CSCF 110 determines that there is no request of charging information received from the end user (the "No" branch of Step 225) or after the execution of the AOC service (Step 230), the process proceeds to Step 240, where CSCF 110 allows for the establishment of a session. According to the user's request, the session may be established with another end user or a service provider or any other entity. Then at Step 250, CSCF 110 determines whether a request of charging information is received during the lifetime of the session. As the user may want to obtain the charging information during the lifetime of the established session, he/she can initiate the subscribed AOC service. If CSCF 110 determines that a request of charging information has been received, the process proceeds via the "Yes" branch to Step 260, where CSCF 110 prepares to start the AOC service. The execution of the AOC service can be described in details later in the specification.

If CSCF 110 determines that there is no request of charging information received from the end user (the "No" branch of Step 250) or after the execution of the AOC service (Step 260), the process proceeds to Step 270, where the end user requests IMS to tear down the established session. At this point, the user may also want to initiate the AOC service to obtain the charging information of the session. Then at Step 280, CSCF 110 determines whether a request of charging information is received. If the determination is positive, the process proceeds via the "Yes" branch to Step 290, where CSCF 110 prepares to start the AOC service. If, otherwise, the determination is negative (the "No" branch of Step 280), or after the execution of the AOC service (Step 290), the process proceeds to Step 299, where the process is terminated.

From the above descriptions, the detailed descriptions of the exemplary workflow for establishing a session for a SIP end user upon user's request and, during the workflow, determining whether to initiate the service of providing charging information to the end user in the exemplary IMS architecture according to an embodiment of the invention are provided. It can be seen from the above descriptions, upon the initiation of the subscription of a SIP end user, IMS 100 shall provide charging information about a SIP session that the SIP end user requests IMS to establish, that IMS has already established per the SIP end user's request, or that the SIP end user requests IMS to tear down, automatically or upon the user's request. It will be apparent to the person with skills in the art that the steps or operations are taken as

examples only, not intended to be any limitation or exhaustion.

Now referring to FIG. 3, there is illustrated a flowchart of a method of providing charging information of a session to the end user according to an embodiment of the invention. Upon the proceeding of Step 220, 230, 260, or 290 (see FIG. 2), i.e. the AOC service is ready to be initiated by CSCF 110, the method is carried out. First at Step 310, CSCF 110 determines whether the end user has subscribed the AOC service by communicating with HSS 120 (see FIG. 1) containing all the IMS subscriber service profiles and searching HSS 120 for the AOC service subscription related information. If there is no subscription related information found in HSS 120 or the subscription related information in HSS 120 indicates that the subscription is off, then the method proceeds via the "No" branch to Step 320, where CSCF 110 notifies the end user of no available AOC service subscription and optionally, suggests the user subscribing the AOC service, then terminates the method. It is noted that, although the method of FIG. 3 is terminated, the workflow of FIG. 2 is operating as normal, except that, instead of obtaining the charging information of the session, the end user will receives a notification of no AOC service subscription available for him/her and optionally, a suggestion of AOC service subscription.

If there is available AOC service subscription related information found in HSS 120 and the subscription related information in HSS 120 indicates that the subscription is on, then the AOC service can be triggered, the method proceeds via the "Yes" branch to Step 330, where CSCF 110 communicates with the charging module 130 (see FIG. 1) to obtain the charging information for the session to be established, or having been established by the end user. Note that the calculation of charging information may be performed by the charging module 130 upon CSCF 110's enquiry or periodically. The calculating operation of the charging modules 130, i.e. how to perform charging function in IMS is a complicated process, which supports event charging, session charging, traffic bearing charging, etc. Since the operation itself is not the inventive concept or the concentration in the present invention, its detailed descriptions will be ignored so as not to confuse the true spirit and scope of the invention. The charging information may comprise consumer of the session, session establishment time, session duration, media components in the session, flow quantity, expense, and any other factors that the person with skilled in the art may be readily appreciated.

Then the method proceeds to Step 340, the charging module 130 sends the calculated charging information back to CSCF 110, and in turn, CSCF 110 sends it to the end user via announcement, message, etc. Then at Step 350, the method of FIG. 3 returns to the corresponding step in FIG. 2 (i.e. Step 220, 230, 260, or 290).

Hereinabove, there is provided the detailed description of a method and system for providing charging information of a session to an end user before a session is established, during the lifetime of an established session, or at the end of a session with reference to the preferred embodiments and accompanying figures. As appreciated by the person with ordinary skills in the art, the present invention may be embodied as a method, a system, and/or a computer program product. Therefore, the present invention can be embodied in the form of hardware, software, or the combination thereof. The present invention can be realized in a centralized fashion in one computer system or in a distributed fashion where different elements are spread across several interconnected computer systems. Any kind of computer system or other apparatus adapted for carrying out the methods described herein is suited. A typical combination of hardware and software can be a general-purpose computer system with a computer program that, when being loaded and executed, controls the computer system such that it carries out the methods described herein.

Additionally, the present invention may be embodied as a computer program product contained on machine-readable media where the computer executable program instructions for programming a computer system to execute the process according to the invention are stored. The term "machine-readable media" used herein includes any media that provide the computer system with instructions for execution. Such media may take various forms, including but not limited to: non-volatile media, volatile media, and transmission media. Non-volatile media commonly comprises, for example, floppy disk, floppy magnetic disk, hard disk, magnetic tape, or any other magnetic media, CD-ROM or any other optical media, slotting card or any other physical media with hole pattern, PROM, EPROM, EEPROM, flash memory, any other memory chip or cartridge, or any other media that can be read by the computer system and are appropriate for storing instructions.

Although the present invention has been presented and described specifically by reference to the preferable embodiments, it is not intended to be exhaustive or limited the invention in the form disclosed. Many modifications on forms and details will be apparent to those ordinary skills in the art without deviating from the spirit and scope of the invention. The embodiments were chosen and described in order to best explain the principles of the invention, the practical application, and to enable others of ordinary skill in the art to understand the invention for various embodiments with various modifications as are suited to the particular use contemplated.

CLAIMS

1. A method for providing charging information of a session to an end user in IMS, comprising the following steps:

determining whether the user has subscribed a service of providing charging information in response to a request from the user; and

providing the charging information of a session from IMS to the user in response to determining that the user has subscribed the service of providing charging information.

2. The method of claim 1, wherein providing charging information of a session from IMS to the user is carried out automatically at a certain time defined by the user.

3. The method of claim 1, wherein providing charging information of a session from IMS to the user is carried out before a session is established.

4. The method of claim 1, wherein providing charging information of a session from IMS to the user is carried out during the lifetime of an established session.

5. The method of claim 1, wherein providing charging information of a session from IMS to the user is carried out at the end of a session.

6. The method of claims 1, further comprising the step of keeping record of subscription related information in IMS, wherein the subscription related information comprises at least one of the following: a user name, a user identifier, a tag indicating the subscription is on or off, and automatic delivery time.

7. The method of claims 1, wherein the charging information of the session is calculated in IMS, wherein the charging information comprises at least one of the following: consumer of the session, session establishment time, session duration, media components in the session, flow quantity, and expense.

8. The method of claims 1, wherein, if the determining step determines that user has not subscribed the service of providing charging information or the subscription related information in IMS indicates the subscription is off, then denying triggering the service of providing charging information.

9. The method of claims 8, wherein, if the determining step determines that user has not subscribed the service of providing charging information or the subscription related information in IMS indicates the subscription is off, further comprises notifying the user of such situation, and suggesting the user subscribing the service of providing charging information.

10. A system for providing charging information of a session to an end user in IMS,

comprising:

a user equipment, for providing the user with a subscription option of a service of providing charging information, and sending requests to IMS or receiving responses from IMS for the user;

a network element, for determining whether the user has subscribed a service of providing charging information in response to a request from the user; and providing the charging information of a session from IMS to the user in response to determining that the user has subscribed the service of providing charging information.

11. The system of claim 10, wherein the network element provides the charging information of a session to the user automatically at a certain time defined by the user.

12. The system of claim 10, wherein the network element provides the charging information of a session to the user before a session is established.

13. The system of claim 10, wherein the network element provides the charging information of a session to the user during the lifetime of an established session.

14. The system of claim 10, wherein the network element provides the charging information of a session to the user at the end of a session.

15. The system of claim 10, further comprising:

a subscriber data storage, for keeping record of subscription related information in IMS, wherein the subscription related information comprises at least one of the following: a user name, a user identifier, a tag indicating the subscription is on or off, and automatic delivery time.

16. The system of claim 10, further comprising:

a charging module, for calculating the charging information of the session in IMS, wherein the charging information comprises at least one of the following: consumer of the session, session establishment time, session duration, media components in the session, flow quantity, and expense.

17. The system of claims 10, wherein, if the network element determines that user has not subscribed the service of providing charging information or the subscription related information in IMS indicates the subscription is off, then the network element denies triggering the service of providing charging information.

18. The system of claims 17, wherein, if the network element determines that user has not subscribed the service of providing charging information or the subscription related information in IMS indicates the subscription is off, the network element further notifies the

user of such situation, and suggests the user subscribing the service of providing charging information.

19. A computer program product comprising computer-executable instructions, which, when loaded on a computer and executed, causes the computer to carry out all the steps of the method according to any one of claims 1 to 9.

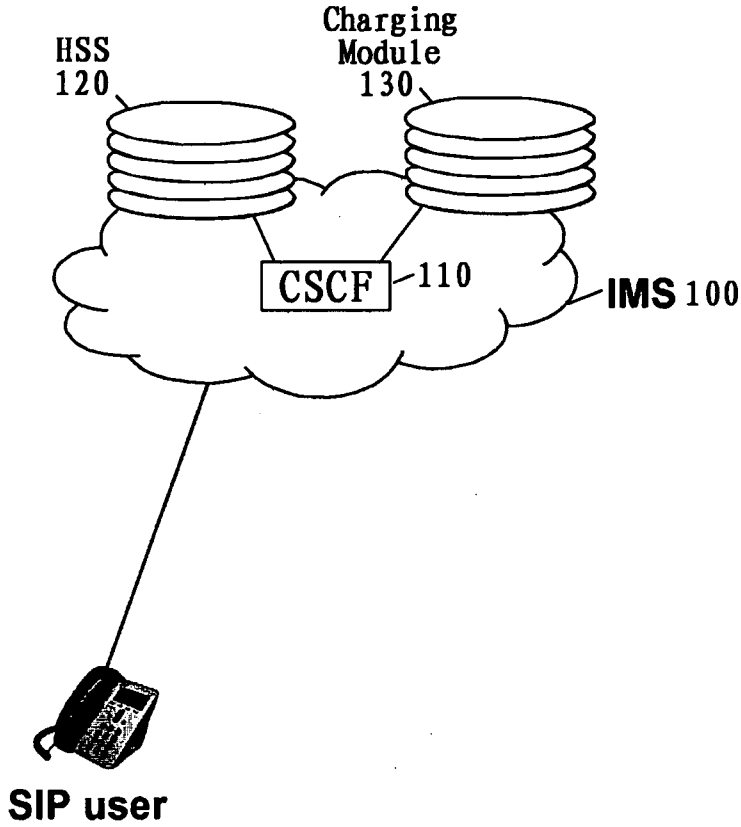


Fig. 1

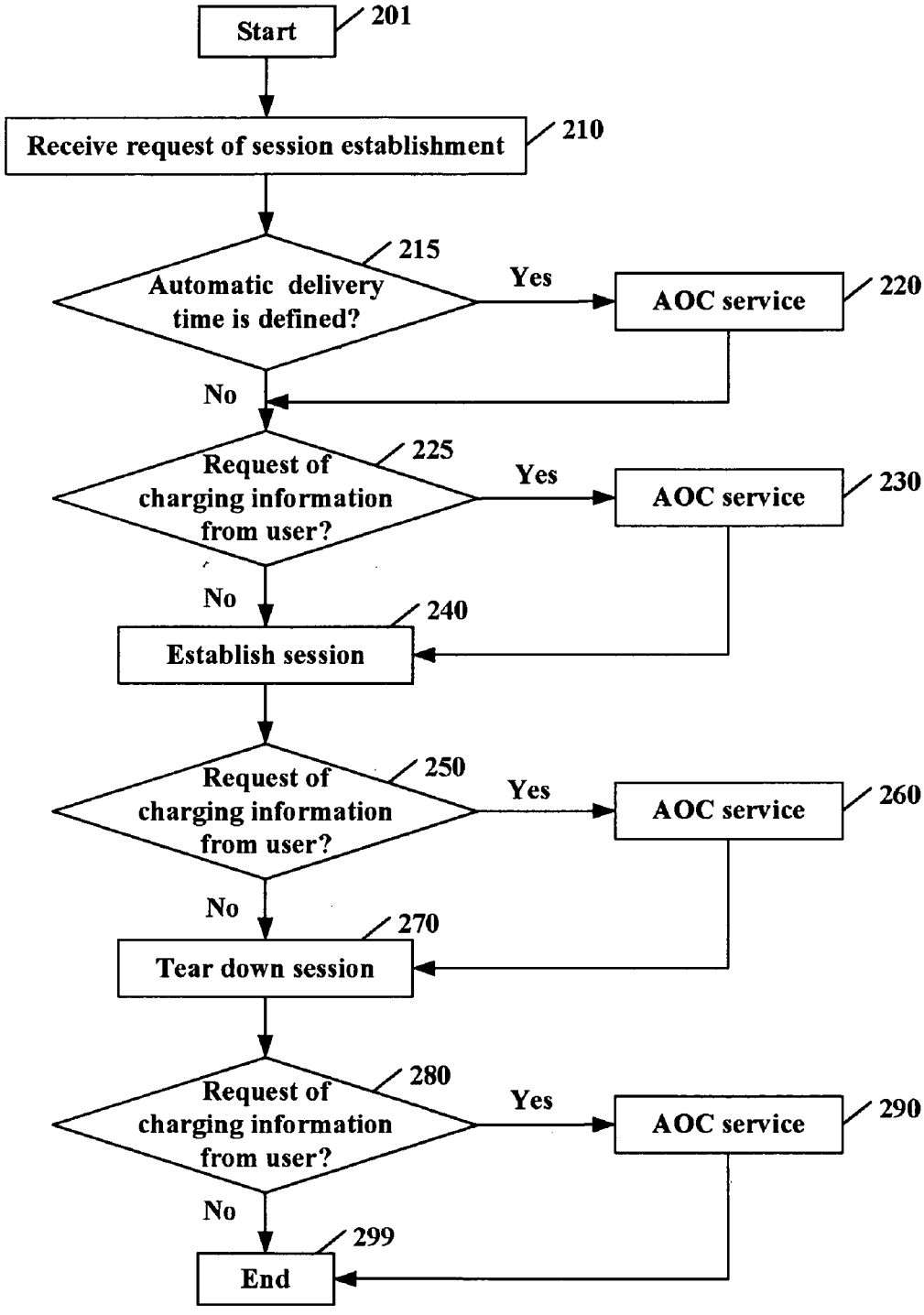

Start
201
Receive request of session establishment
210
Automatic delivery time is defined?
215
Yes
AOC service
220
No
Request of charging information from user?
225
Yes
AOC service
230
No
Establish session
240
Request of charging information from user?
250
Yes
AOC service
260
No
Tear down session
270
Request of charging information from user?
280
Yes
AOC service
290
No
End
299

Fig.2

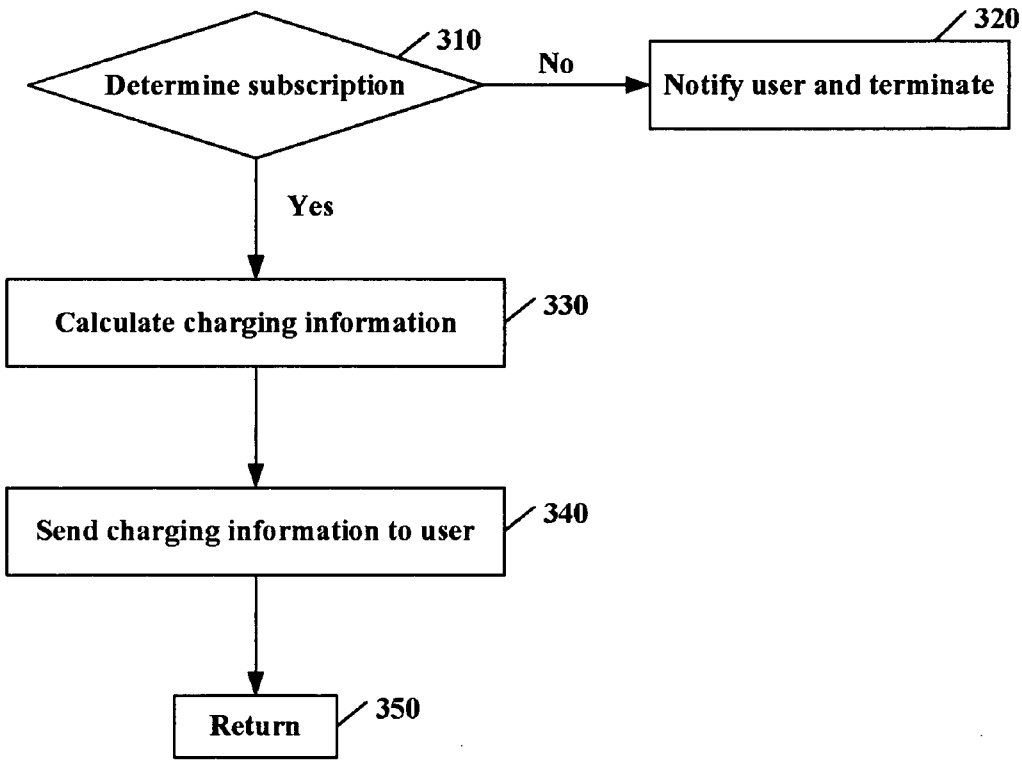

Determine subscription
310
No
Notify user and terminate
320
Yes
Calculate charging information
330
Send charging information to user
340
Return
350

Fig.3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2007/002802

A. CLASSIFICATION OF SUBJECT MATTER

H04L12/56 (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: H04L H04Q

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)

WPI、EPODOC、PAJ、CNPAT CNKI: charg+ bill information message notify advice SIP session IMS server

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN1474538A ((HUAW-N) HUAWEI TECHNOLOGIES CO LTD) 11 Feb. 2004 (11.02.2004) Description, pages 6-12, fig 1-2	1-19
X	CN1633150A (ALCATEL SHANGHAI BELL CO LTD) 29 Jun. 2005 (29.06.2005) Description, pages 3-7, fig 2	1-19
A	CN1929636A ((HUAW-N) HUAWEI TECHNOLOGIES CO LTD) 14 Mar. 2007 (14.03.2007) The whole document	1-19
A	CN1852464A ((HUAW-N) HUAWEI TECHNOLOGIES CO LTD) 25 Oct. 2006 (25.10.2006) The whole document	1-19
A	CN1859129A ((HUAW-N) HUAWEI TECHNOLOGIES CO LTD) 08 Nov. 2006 (08.11.2006) The whole document	1-19

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

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified)

"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
19 May 2008 (19.05.2008)	**05 Jun. 2008 (05.06.2008)**
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 CHENG Dong Telephone No. (86-10)62411276

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2007/002802

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN1474538A	11.02.2004	CN1225862C	02.11.2005
CN1633150A	29.06.2005	None	
CN1929636A	14.03.2007	None	
CN1852464A	25.10.2006	None	
CN1859129A	08.11.2006	None	