Abstract:

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Agent:

Appaji Mohan; Mohan Associates, D-4, IIIrd Floor, Ceebro's Building, New No.32 (Old No.11), Cenetoph Road, Teynampet, Chennai 600 018, Tamil Nadu (IN).

Inventors:

PADDHAR, Aradhana [IN/IN]; #26, Bannerghatta Road, JP Nagar Phase III, Bangalore-560 076, Karnataka (IN),

TRIPATHI, Manu [IN/IN]; #26, Bannerghatta Road, JP Nagar Phase III, Bangalore-560 076, Karnataka (IN),

CHANDRASEKHARAN, Sreejith Alumplavil [IN/IN]; #26, Bannerghatta Road, JP Nagar Phase III, Bangalore-560 076, Karnataka (IN).

Title:

METHOD AND SYSTEM FOR BILLING SUBSCRIBERS FOR INFORMATION SERVICES IN A TELECOMMUNICATION NETWORK

Abstract:

A method and a system for billing a subscriber for at least one information service based on the occurrence of a trigger prompt is disclosed. The trigger prompt is associated to one or more information service events. The information service events are associated to the at least one information service. An information service application server generates a start trigger prompt upon occurrence of an information service event. The trigger module upon reception of the start trigger prompt bills the subscriber for the information service event based on pre-defined parameters and pre-defined conditions.
FIELD OF THE INVENTION

The invention relates to the field of telecommunications, and more specifically, to a method and system for billing subscribers for information services in a telecommunication network.

BACKGROUND

In a telecommunication network, Value Added Service (VAS) providers provide various information services to users of the telecommunication network. The information services enable a user to get information about events such as, movies, sports, cultural events, news, and the like on her communication device. Examples of the communication device include, but are not limited to, a mobile phone, a landline phone and a Personal Digital Assistant (PDA). The communication device, for the purposes of explanation, is herein referred to as a mobile phone. The user may subscribe to one or more information service by using her communication device. Example of the information service can be, without limitation, a cricket information service. The information service may include one or more information service events. Examples of the one or more information service events for the cricket information service may include, without limitation, a one-day cricket match and a cricket test match series. The information associated with the information services, for the purpose of explanation, is herein referred to as information service content. The information service content is transmitted to subscribers of the information service over a communication channel. The subscribers are allowed access only to the information service content corresponding to the subscribed information service. The information service content transmitted to the mobile phones may include a wide array of multi-media data, such as text, audio, picture, streaming video, and the like.

Typically, charges for the information service over a certain billing period are collected together and the subscriber is billed on a periodic basis. The subscriber is billed regardless of the amount of information service content accessed by the subscriber during that billing period. Also, the subscriber is billed for a particular
information service content without taking into consideration whether the information service content has been viewed by the subscriber or not. Further, it is not considered whether the subscriber is even interested in viewing the particular information service content. Hence, the subscriber may lose interest in availing the information service when the subscriber does not get information service content in line with her interests. Similarly, the subscriber may feel burdened with additional unnecessary bills when the subscriber is billed for information service content that the subscriber has not viewed or is not interested in viewing. Hence, a potential subscriber may unsubscribe from the information service and this may lead to a loss of revenue to the telecommunication service provider. Further, the VAS providers also can not formulate the definite number of users actually interested in accessing the information service.

In light of the above, there exists a need for a method of billing subscribers for the information service event, wherein the subscribers are not overbilled for subscribing to the information service. Further, the subscribers should not be burdened with additional unnecessary bills for information service content that the subscribers have not viewed or are not interested in viewing. Furthermore, the VAS providers should be able to estimate the number of users interested in accessing the information service.

DEFINITIONS

Information services: Services enabling an individual to get information about events such as, movies, sports, cultural events, news, and the like on her communication device are known as information services.

Information service content: Information associated with information service is called information service content.

Subscriber: An individual registered to one or more information services.

Base subscription charge: The charge levied on a subscriber for getting access to an information service is called the base subscription charge for the information service. The base subscription charge may or may not include charge for one or more information service events associated with an information service.
SUMMARY OF THE INVENTION

A method and a system for enabling trigger based billing subscribers for at least one information service in a telecommunication network are disclosed. Information services transmitted to the mobile phone may include, but are not limited to, information (i.e. content) regarding movies, sports events, cultural events, news, and the like. The method includes billing a subscriber of the information service based on the occurrence of a trigger prompt. The trigger prompt is associated with one or more information service events. The subscriber is charged a base subscription charge for subscribing to the information service. The base subscription charge may or may not include charge for the one or more information service events. The method includes receiving a start trigger prompt upon occurrence of an information service event. In one embodiment, the start trigger prompt is associated with an end trigger prompt signifying the termination of the charging of the information service event. Further, the method includes billing all the subscribers subscribed to the information service for the information service event upon reception of the start trigger prompt, based on pre-defined parameters and pre-defined conditions. The predefined parameters include time duration for which the subscriber accessed the information service event, and information service content of the information service event delivered to the subscriber. According to an embodiment, the pre-defined conditions include termination of the charging of the information service event upon occurrence of the end trigger prompt. According to an embodiment, the end trigger prompt for termination of the charging of the information service event can be initiated by the subscriber herself, in order to terminate billing for the information service event. According to another embodiment, pre-defined parameters include a regular time period after which the subscriber is billed. For example, the subscriber may be billed with one USD for the information service event per day or at a regular time period of say 12 hours when the information service event occurs.

The system for trigger based billing subscribers for the information service in a telecommunication network includes an information service application server for generating a trigger prompt based on an information service event. The system also includes a subscription engine for maintaining subscription information of subscribers and a database for storing subscription information of the subscribers. Further, the
system includes a trigger module for billing the subscribers for the information service event based on pre-defined parameters and pre-defined conditions.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a communication environment according to an embodiment of the invention.

FIG. 2 is a flow diagram illustrating a method of trigger based billing subscribers for information services, in accordance with an embodiment of the invention;

FIG. 3 is a block diagram illustrating a subscription manager, in accordance with an embodiment of the invention; and

FIG. 4 is a detailed flow diagram illustrating the method of trigger based billing subscribers for information services, in accordance with an embodiment of the invention.

DETAILED DESCRIPTION

In the following description, specific details are set forth in order to provide a thorough understanding of the invention. However, it will be apparent to a person ordinarily skilled in the art, that the invention may be practiced without these specific details. Various aspects and features of example embodiments of the invention are described in detail hereinafter.

A method and system for billing a subscriber of a telecommunication network for at least one information service, is disclosed. The information services subscribed to by the subscriber may include, but are not limited to, information service content associated with movies, sports events, cultural events, news, and the like. Each information service may be associated with one or more information service events. For example, the information service 'Cricket' may be associated with one or more information service events such as a one-day cricket match or a test series. The method includes billing all the subscribers subscribed to the information service based on the occurrence of one or more trigger prompts. The trigger prompt is associated with the information service event. The trigger prompt may include but is not limited to a start trigger prompt associated to the occurrence of the information
service event and an end trigger prompt associated to the termination of the charging of the information service event.

FIG. 1 illustrates a communication environment according to an embodiment of the invention. The communication environment comprises a mobile device 102, a communication network 104, a subscription manager (SM) 106, an application server 108, an operator billing interface 110 and a provisioning server 112. Mobile device 102 may be carried by a user of communication network 104. Mobile device 102 is connected to application server 108 via communication network 104. Moreover, communication network 104 can support multiple mobile devices 102. The connection between mobile device 102 and communication network 104 is provided by a telecommunication service provider (telco). Communication network 104 may include different channels for communication, for example, MSC, SMSC, USSDC, internet, WAP etc.

SM 106 manages subscription information for each information service application and for billing the subscribers for information service. SM 106 provides subscription information to application server 108. SM 106 has been described in detail in conjunction with FIG. 3.

Application server 108 is connected with communication network 104 and SM 106. Application server 108 may include one or more information service applications for providing information services to subscribers. For example, application server 108 may include an information service application 114 'Cricket' for providing information related to cricket to subscribers. The information may be sent to the subscriber via different means, for example, SMS. Application server 108 further comprises a database for storing phone numbers of subscribers and the content to be provided to the subscribers for each information service. For example, the database may include the SMS content to be provided to the subscribers of information service 'Cricket' during a cricket match. Information service application 114 uses the cricket related information stored in the database for providing information service to the respective subscribers. Application server 108 includes various information service applications based on computer programming languages like JAVA, C/C++, etc. Application server 108 manages information service content
associated with the information service to be transmitted to mobile phone 102. The information service content is typically generated by the value-added service providers and is transmitted to mobile phone 102 of the subscriber over a transmission channel of the telecommunication network. The information service content may be transmitted as a wide array of formats including text, audio, picture, streaming video, and the like. Application server 108 transmits a start trigger prompt to SM 106 upon occurrence of the one or more information service events of the information service. According to an embodiment, each start trigger prompt is associated with an end trigger prompt signifying the termination of the charging of the information service event.

Operator billing interface 110 bills the subscribers for subscribing to information service. Subscribers may have a prepaid connection, postpaid connection etc.

Provisioning network 112 is used for provisioning based on the information received from SM 106. For example, a user may be subscribed to the information service 'Cricket'. After the user has been charged for the service, SM 106 informs provisioning network 112 regarding the user being subscribed to the information service. Provisioning network 112, thereafter, classifies the user as a subscriber to the information service 'Cricket' and updates the subscription information in a subscription database 304 (shown in FIG. 3)

FIG. 2 is a flow diagram illustrating a method of trigger based billing the subscribers for information services, in accordance with an embodiment of the invention.

Information services include one or more information service events associated to the information services. A subscriber is subscribed to the information service. The subscriber is charged a base subscription charge for subscribing to the information service. The base subscription charge does not include charge for the one or more information service events. For example, consider a case where the subscriber is subscribed to "Cricket SMS alert" information service. The "Cricket SMS alert" information service includes one or more information service events like
sending SMS alerts to the subscriber on updates for one-day match, test match and the like as and when they take place. In one embodiment the subscriber is charged a base subscription charge and then she is billed separately for each of the information service events. In another embodiment, the subscriber is not required to pay any base subscription charge but is only billed for the information service events, as and when these events are served to the subscriber.

At step 202, SM 106 receives the start trigger prompt from application server 108 upon occurrence of the one or more information service events. Thereafter, SM 106 determines all the subscribers subscribed to the information service. Then, at step 204, SM 106 bills each subscriber for the one or more information service events. According to an embodiment, SM 106 bills the subscribers in real time for the subscribed one or more information service events based on various pre-defined parameters and pre-defined conditions. The pre-defined parameters include time duration for which the subscribers accessed the information service event, and information service content delivered to the subscribers. According to an embodiment, the pre-defined conditions include termination of the information service event upon occurrence of the end trigger prompt. According to an embodiment, the end trigger prompt can be initiated by the subscriber.

According to another embodiment, the pre-defined parameters moreover include a regular time period after which the subscriber is billed for the information service event. Further, the subscriber is billed based on the pre-defined conditions. For example, the subscribers may be billed one USD for the information service event per day or at a regular time period of say 12 hours when the information service event occurs.

According to an embodiment, a user may subscribe to the information service, between the occurrence of the start trigger prompt and the end trigger prompt. The user has access to the all the information service events occurred between the occurrence of the start trigger prompt and the end trigger prompt. The subscriber will be billed accordingly based on the pre-defined conditions and the pre-defined parameters for each information service event. For example, suppose for information service 'Cricket', a start trigger prompt for the information service event 'India vs
Australia-One day match' is generated at 9:00 am and a start trigger prompt for the information service event 'Pakistan vs South Africa-One day match' is generated at 10:00 am. If a user subscribes to the information service 'Cricket' at 11:00 am, then the user will get access to and will be billed for the information service events, if the end trigger prompt of the information service events has not occurred before 11:00 am. The subscription information is updated in a subscription database 304, (shown in FIG. 3). According to another embodiment, the user, subscribed after the occurrence of the end trigger prompt will not be billed for the information service event associated with the end trigger prompt.

FIG. 3 is a block diagram illustrating subscription manager 106 in accordance with an embodiment of the invention.

According to an embodiment, SM 106 includes a subscription engine (SE) 302, a subscription database 304, a billing integration module (BIM) 306, a content provider interface (CPI) 308, a customer service interface (CSI) 310, and an admin module 312.

SE 302 is responsible for maintaining subscription information for the information service as well as subscribers. SE 302 may store subscription information in subscription database 304 and retrieve the information from subscription database 304 when required. SE 302 provides subscription information for the information service to BIM 306 for billing subscribers. CPI 308 and CSI 310 may also access subscription database 304 using SE 302. Further, SE 302 sends notifications to the subscribers via communication network 104. These notifications may be about the subscription to information services of the subscriber for e.g. a notification upon occurrence of an information service event, notification regarding the charge for an information service event etc.

Further, SE 302 manages the term of validity information for each information service and initiates renewal notifications to the subscribers for the information services that are on the verge of expiry.
SE 302 includes a trigger module 316 that receives the start trigger prompt and the end trigger prompt. Trigger module 316 computes charge for the information service event with the help of BIM 306 based on the pre-defined conditions and the pre-defined parameters. According to an embodiment, the start trigger prompt and the end trigger prompt are initiated by application server 108. According to an embodiment, trigger module 316 charges in real-time for the information service event, based on the pre-defined parameters and the pre-defined conditions. According to another embodiment, pre-defined parameters include a regular time period after which the subscriber is billed for the information service event.

BIM 306 is responsible for billing the subscribers for the information services the subscriber is subscribed to, with activation charge, rental charge, information service event charge and the like. BIM 306 interfaces with operator billing interface 110 for billing the subscribers for the information services, the subscribers are subscribed to. For prepaid connections, operator billing interface 110 interfaces with BIM 306 to deduct the charge from subscriber’s pre-paid account. For postpaid connections, BIM 306 passes on the charge to subscriber’s postpaid account.

Content Provider Interface (CPI) 308 of SM 106 is a web based interface for a content provider to download subscription information of the information services corresponding to the content provider. Content providers are third party entities that supply content to be used in the information services. For example, a content provider may provide 'movie updates' for an information service 'Movie', while another content provider may provide news alerts for an information service 'News'. Content providers can query SM 106 via CPI 308 for the subscription information of the information services showing number of subscribers with status 'Active' / 'Deactivated' / 'New' etc.

CSI 310 of SM 106 provides a web based graphical user interface to call center executives for providing customer service to the users. For example, a call center executive may receive a request from a user for subscribing to a particular information service and use CSI 310 to register him for the particular information service. Further, CSI 310 may be used by a call center executive to provide
subscription information to the subscribers. It will be understood that subscribers may be allowed access to only a part of subscription information.

Admin module 312 is a management and configuration interface of SM 106. Admin module 312 is a web based management tool to help system administrators in configuring and managing subscription information stored in subscription database 304. A system administrator may add, modify or delete subscription information related to a particular information service using admin module 312. For example, subscription information for an information service 'cricket' may include details like a subscriber is charged a base subscription charge of 5USD for the information service 'cricket' every month. A system administrator, using the Admin module 312, may change the base subscription charge amount to, for example, 10USD.

FIG. 4 is a detailed flow diagram illustrating the method of trigger based billing the subscribers, for the information services, in accordance with an embodiment of the invention.

At step 402, SE 302 receives the start trigger prompt transmitted by application server 108, upon occurrence of the one or more information service events of an information service. At step 404, SE 302 determines all the subscribers of the information service with the help of subscription database 304. Application server 108 then delivers the information service content associated with the information service event to the subscribers of the information service. SE 302 then forwards the start trigger prompt to trigger module 316 for billing the subscribers for the information service event.

At step 406, trigger module 316 performs a sub-type check i.e. trigger module 316 checks if the subscriber has taken a prepaid or postpaid connection. At step 408, trigger module 316 bills the subscriber for the information service event and sends an activation status report. The activation status report includes information whether the information service or the information service event can be activated or not and the like. In case the subscriber is a prepaid subscriber, step 408 would involve checking the balance in the prepaid account and billing the subscriber based on the pre-defined conditions and parameters in case of sufficient balance. However,
in case there is insufficient balance, trigger module 316 transmits the activation status report denoting that the information service event cannot be activated, to application server 108. In case the subscriber is a postpaid subscriber, trigger module 316 checks credit limit of the subscriber and if the unbilled amount of her postpaid account is below the credit limit by an amount equal to the charge of the information service event, trigger module 316 at step 408, bills the subscriber accordingly and sends the activation report denoting the activation. The credit limit is the maximum amount of credit in the postpaid account that a telecommunication service provider extends to the user registered to the telecommunication service provider.

The activation status report may be 'successful', 'activated' and the like denoting that the information service or the information service event can be activated. The activation status report may be 'failed', 'not activated' and the like denoting that the information service or the information service event cannot be activated.

Trigger module 316 also updates the charges to be paid by the subscriber in the subscriber's account in the subscription database 304. However, in case of insufficient credit limit, trigger module 316 transmits the activation report denoting inability to activate.

According to an embodiment, the billing the subscriber for the information service events is real-time, based on the pre-defined parameters and the pre-defined conditions. Trigger module 316 keeps track of the pre-defined conditions to bill subscribers. For example, trigger module 316 keeps track of the time duration for which the subscriber is served the information service event to enable time-based charging.

Consider a case where the subscriber is subscribed to 'Cricket SMS alert' information service. The subscriber will be billed based on the SMS alerts i.e. information service content delivered to him. However, if the subscriber is subscribed to 'Cricket live commentary' information service, the subscriber will be billed based on the duration for which the subscriber listens to the live commentary. Trigger
module 316 regularly updates the charges for information service events being served to the subscriber. According to another embodiment, the subscriber is billed a particular amount periodically based on the pre-defined conditions, for the information service event as and when the information service event occurs.

According to an embodiment, trigger module 316 performs functions like subtype check, balance check for pre-paid subscribers, credit limit check for post paid subscribers, charging, and the likes in association with BIM 306. The charge for the information service event to be paid by the subscribers is updated in operator billing interface 110.

At step 410, application server 108 checks whether the activation status report includes 'successful' and the like denoting that the information service event can be activated for the subscriber. If the activation status report is 'successful' and the like, then at step 412, application server 108 continues outputting the information service content of the information service event to the subscriber to mobile phone 102 of the subscriber. However, if the activation status report includes 'failed' and the like denoting that the information service event cannot be activated for the subscriber, then at step 414, application server 108 stops transmission of the information service content of the information service event to the subscriber. This can be explained in conjunction with the following example. Suppose, the activation status report of an information service event 'India vs Pakistan One-day match SMS alert' of an information service 'Cricket SMS alert' contains report such as 'successful' denoting that the information service event can be activated for the subscriber, then application server 108 will continue sending SMS alerts for update on India vs Pakistan One-day match. However, if the activation status report of an information service event 'India vs. Pakistan One-day match SMS alert' of an information service 'Cricket SMS alert' contains report such as 'failed' on account of low balance, denoting that the information service event cannot be activated for the subscriber, then application server 108 will stop transmitting the information service content of the information service event to the subscriber. According to an embodiment, the subscriber can be notified about the activation of the information service event via communication network 104 based on the information activation report.
Furthermore, SE 302 also keeps a count of the consecutive 'failed' activation status reports for a particular subscriber of an information service. According to an embodiment, the subscriber may be automatically unsubscribed from the particular information service on occurrence of a pre-specified number of consecutive 'failed' activation status reports.

According to an embodiment, application server 108 transmits the end trigger prompt for termination of the charging of the information service event to SE 302 as and when it occurs. SE 302 forwards the end trigger prompt to trigger module 316. Trigger module 316 stops billing the subscriber for the information service event upon occurrence of the end trigger prompt. According to another embodiment, the subscriber can send the end trigger prompt.

While example embodiments of the invention have been illustrated and described, it will be clear that the invention is not limited to these embodiments only. Numerous modifications, changes, variations, substitutions and equivalents will be apparent to those skilled in the art without departing from the spirit and scope of the invention as described in the claims.
CLAIMS:
1. A method for billing a subscriber in a telecommunication network, the subscriber having subscribed to at least one information service, the information service being associated with one or more information service events, the subscriber being charged a base subscription charge, the base subscription charge being associated with the information service, the method comprising:
   a. receiving a trigger prompt based on an information service event, the information service event being associated with pre-defined parameters; and
   b. billing the subscriber for the information service event based on the pre-defined parameters and conditions.

2. The method of claim 1, wherein the base subscription charge is the charge for getting access to the information service event.

3. The method of claim 1, wherein the pre-defined parameter comprises a regular time period after which the subscriber is billed for the information service event.

4. The method of claim 1, wherein the pre-defined parameter comprises time duration for which the subscriber accessed the information service event.

5. The method of claim 1, wherein the pre-defined parameter comprises the content of the information service event delivered to the subscriber.

6. The method of claim 1, wherein the pre-defined condition comprises termination of the information service event upon the occurrence of trigger prompt for termination of the information service event.

7. The method of claim 1, further comprising transmitting the information service event upon detection of the occurrence of an information service event.
8. A system for billing a subscriber in a telecommunication network, the subscriber having subscribed to at least one information service, the information service being associated with one or more information service events, the subscriber being charged a base subscription charge, the system comprising:
   a. an information service application server for generating a trigger prompt based on an information service event, the information service event being associated with pre-defined parameters;
   b. a subscription engine for maintaining subscription information of subscribers;
   c. a database for storing subscription information of the subscriber; and
   d. a trigger module for billing the subscriber for the information service event based on pre-defined parameters and conditions.

9. The system of claim 8, wherein the pre-defined parameter comprises a regular time period after which the subscriber is billed for the information service event.

10. The system of claim 8, wherein the pre-defined parameter comprises time duration for which the subscriber accessed the information service event.

11. The system of claim 8, wherein the pre-defined parameter comprises content of the information service event delivered to the subscriber.

12. The system of claim 8, wherein the pre-defined condition comprises termination of the information service event upon the occurrence of trigger prompt for termination of the information service event.

13. A method for billing a subscriber in a telecommunication network, the subscriber having subscribed to at least one information service, the information service being associated with one or more information service events, the subscriber being charged a base subscription charge, the base subscription charge being associated with the information service, the method comprising:
a. receiving a start trigger prompt upon occurrence of the information service event;
b. verifying that an end trigger prompt is not received from the subscriber; and

c. billing the subscriber for the information service event based on the verification.
Start

Receiving a start trigger prompt based on an information service event

Billing the subscribers for the information service event based on pre-defined parameters and conditions

Stop

FIG. 2
Start

Receiving a trigger prompt upon occurrence of one or more information service events of a information service

Obtaining all the subscribers of the information service and delivering the information service content

Performing sub-type check of a subscriber

Billing the subscriber and sending activation status report

Activation status report="Successful"

Transmitting information service content to the subscriber till occurrence of end trigger

Stop transmission of information service content to the subscriber

Stop

FIG. 4