US 20140165173A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2014/0165173 A1

(43) Pub. Date: Jun. 12, 2014

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(54) **MEDIATION SERVER, CONTROL METHOD THEREFOR, SUBSCRIPTION INFORMATION MANAGING APPARATUS, CONTROL METHOD THEREFOR, SUBSCRIPTION MANAGEMENT SERVER, AND CONTROL METHOD THEREFOR**

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(21) Appl. No.: **14/131,213**

(22) PCT Filed: **Jul. 27, 2011**

(86) PCT No.: **PCT/SE2011/050972**

§ 371 (c)(1),
(2), (4) Date: **Jan. 7, 2014**

Publication Classification

(51) **Int. Cl.**
H04L 29/06 (2006.01)

(52) **U.S. Cl.**
CPC ***H04L 63/08*** (2013.01)
USPC **726/7**

(57) **ABSTRACT**

There is provided a mediation server. The mediation server comprises, among other things, a device identity receiving unit configured to receive, from a communication device, a device identity which enables the communication device to connect to a network operated by a network operator associated with the mediation server, a login request sending unit configured to send, to the communication device, a login request for requesting login credentials for one of at least one user identity associated with the device identity, and a login credentials receiving unit configured to receive the login credentials from the communication device. The mediation server also comprises a subscription information relaying unit configured to obtain subscription information for use by the communication device from a selected network, and forward the obtained subscription information to the communication device.

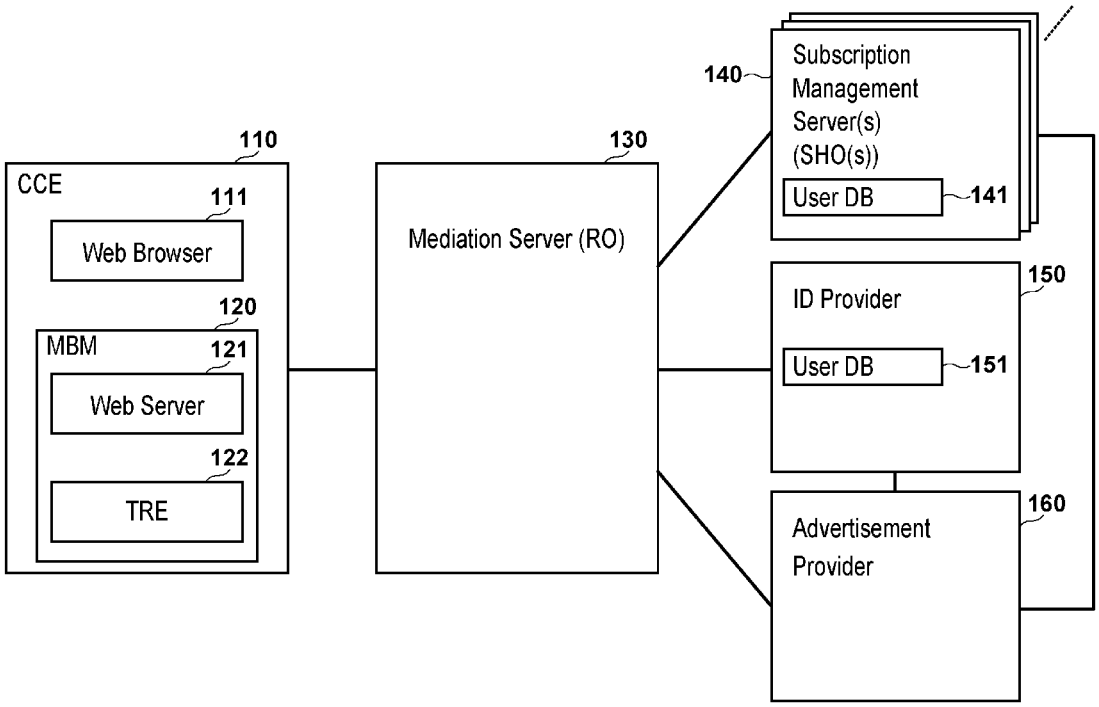


FIG. 1

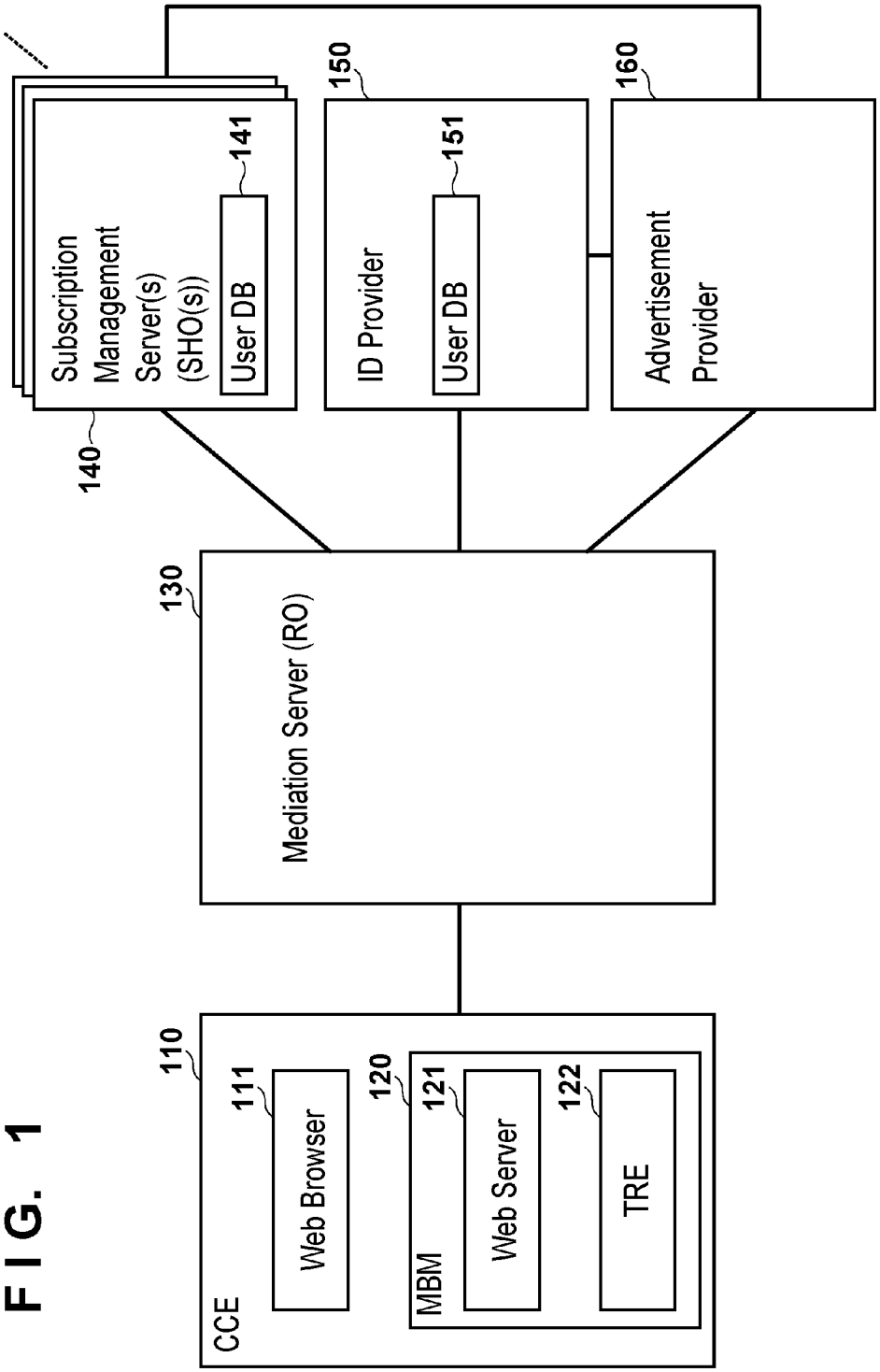

Subscription Management Server(s) (SHO(s))
User DB
141
140
ID Provider
User DB
150
151
Advertisement Provider
160
Mediation Server (RO)
130
CCE
110
Web Browser
111
MBM
120
Web Server
121
TRE
122

FIG. 2

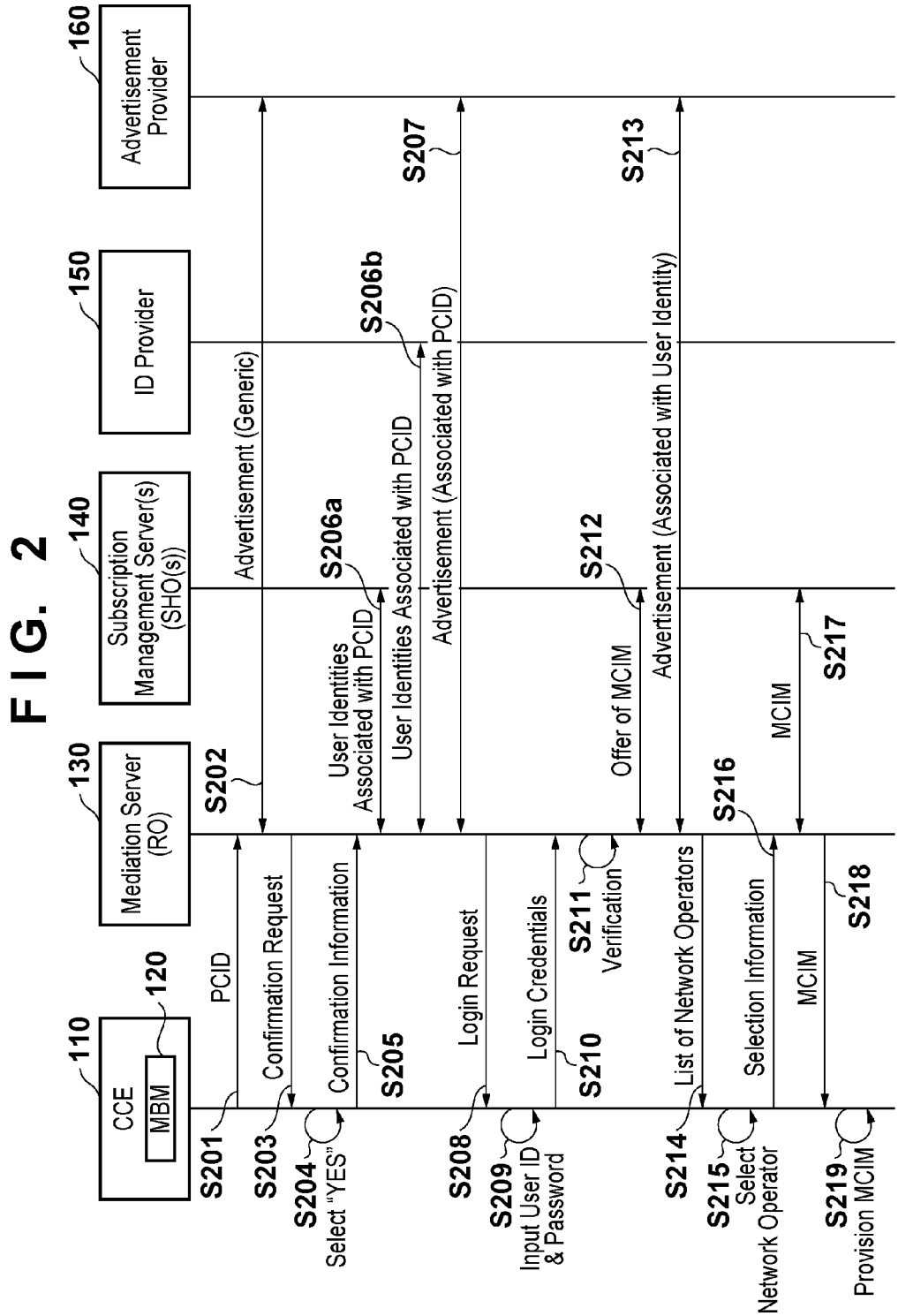

110
CCE
120
MBM
130
Mediation Server (RO)
140
Subscription Management Server(s) (SHO(s))
150
ID Provider
160
Advertisement Provider
S201
PCID
S202
Advertisement (Generic)
S203
Confirmation Request
S204
Select "YES"
S205
Confirmation Information
S206a
User Identities Associated with PCID
S206b
User Identities Associated with PCID
S207
Advertisement (Associated with PCID)
S208
Login Request
S209
Input User ID & Password
S210
Login Credentials
S211
Verification
S212
Offer of MCIM
S213
Advertisement (Associated with User Identity)
S214
List of Network Operators
S215
Select Network Operator
S216
Selection Information
S217
MCIM
S218
MCIM
S219
Provision MCIM

FIG. 3A

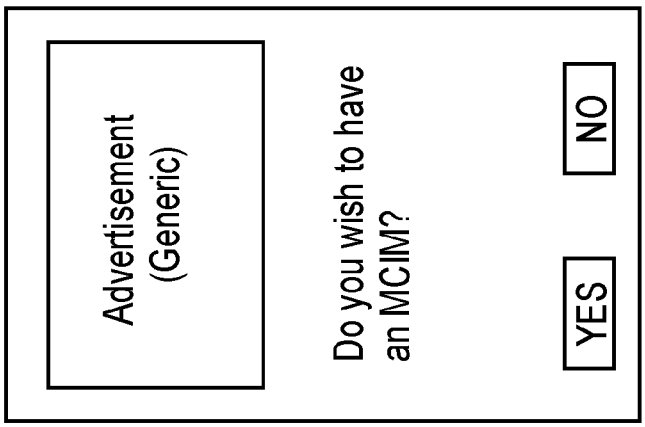


FIG. 3B

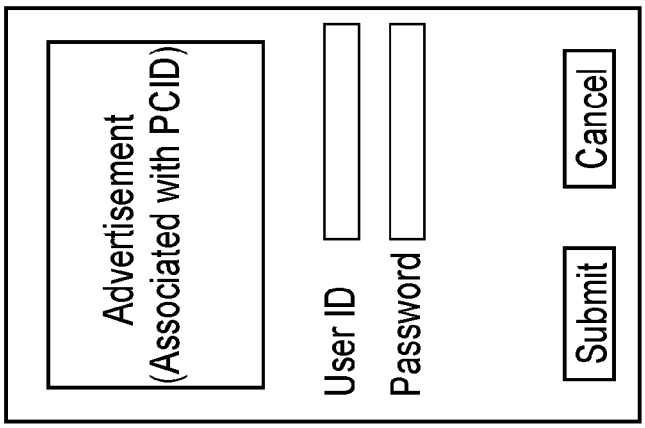


FIG. 3C

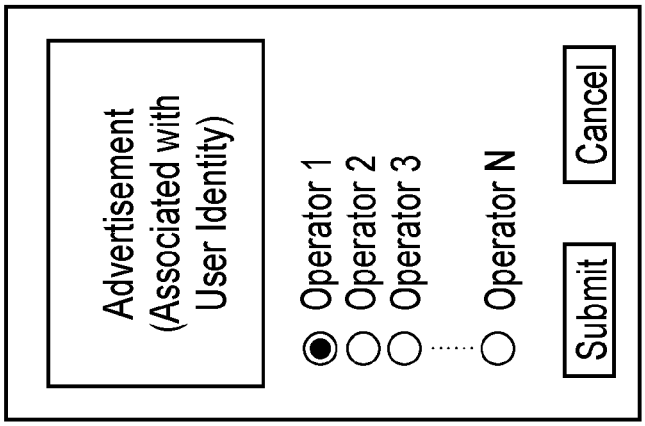


FIG. 4

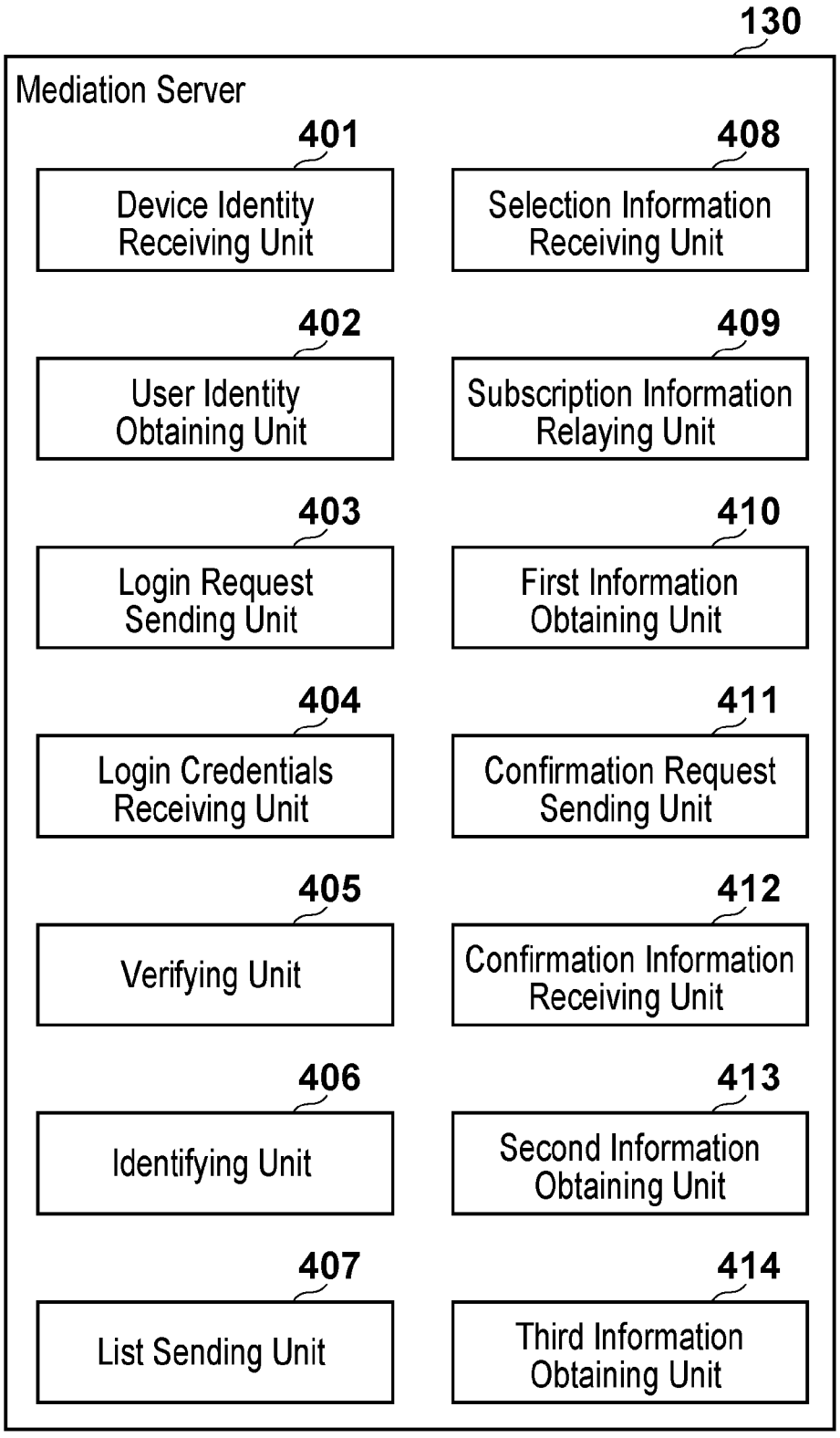

130
Mediation Server
401
Device Identity Receiving Unit
402
User Identity Obtaining Unit
403
Login Request Sending Unit
404
Login Credentials Receiving Unit
405
Verifying Unit
406
Identifying Unit
407
List Sending Unit
408
Selection Information Receiving Unit
409
Subscription Information Relaying Unit
410
First Information Obtaining Unit
411
Confirmation Request Sending Unit
412
Confirmation Information Receiving Unit
413
Second Information Obtaining Unit
414
Third Information Obtaining Unit

FIG. 5

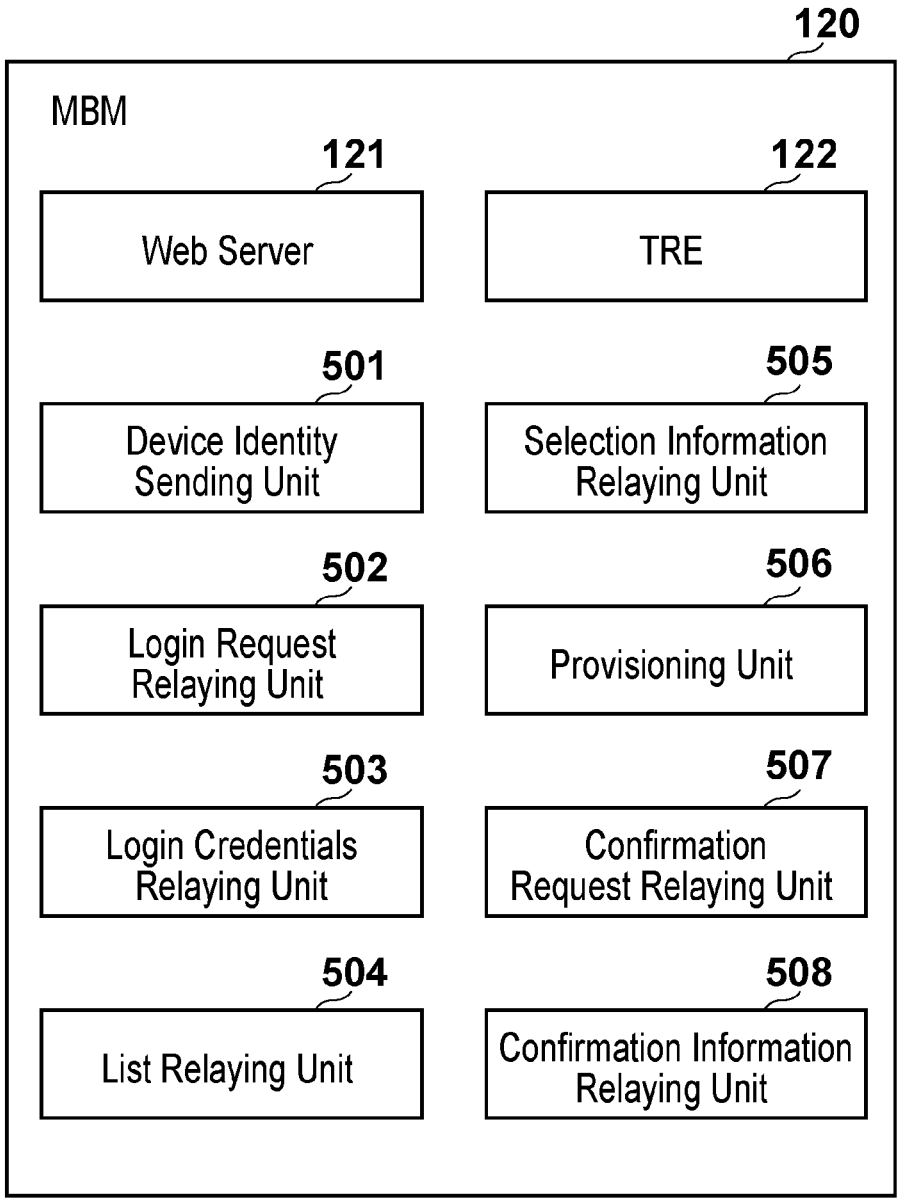

120
MBM
121
Web Server
122
TRE
501
Device Identity Sending Unit
505
Selection Information Relaying Unit
502
Login Request Relaying Unit
506
Provisioning Unit
503
Login Credentials Relaying Unit
507
Confirmation Request Relaying Unit
504
List Relaying Unit
508
Confirmation Information Relaying Unit

FIG. 6

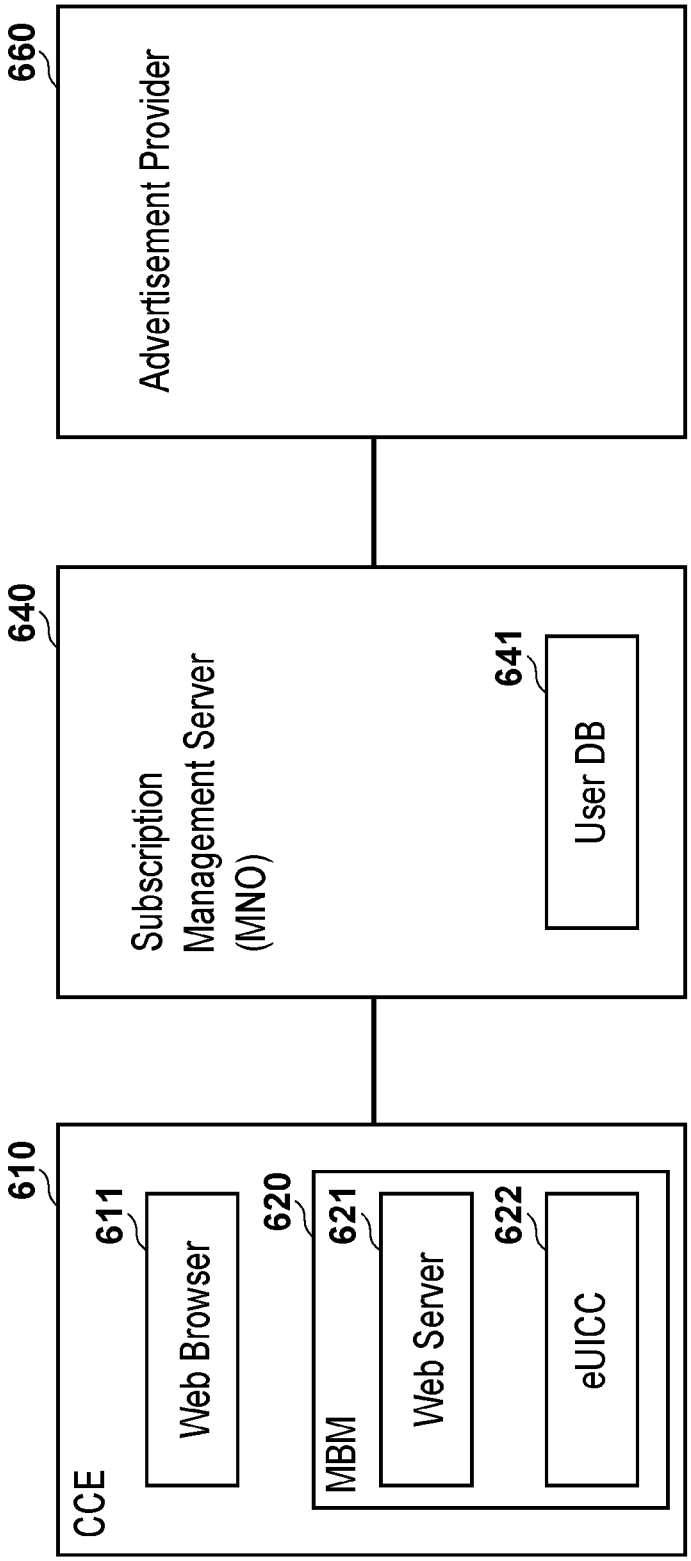

660
Advertisement Provider
640
Subscription Management Server (MNO)
641
User DB
610
CCE
611
Web Browser
620
MBM
621
Web Server
622
eUICC
600

FIG. 7

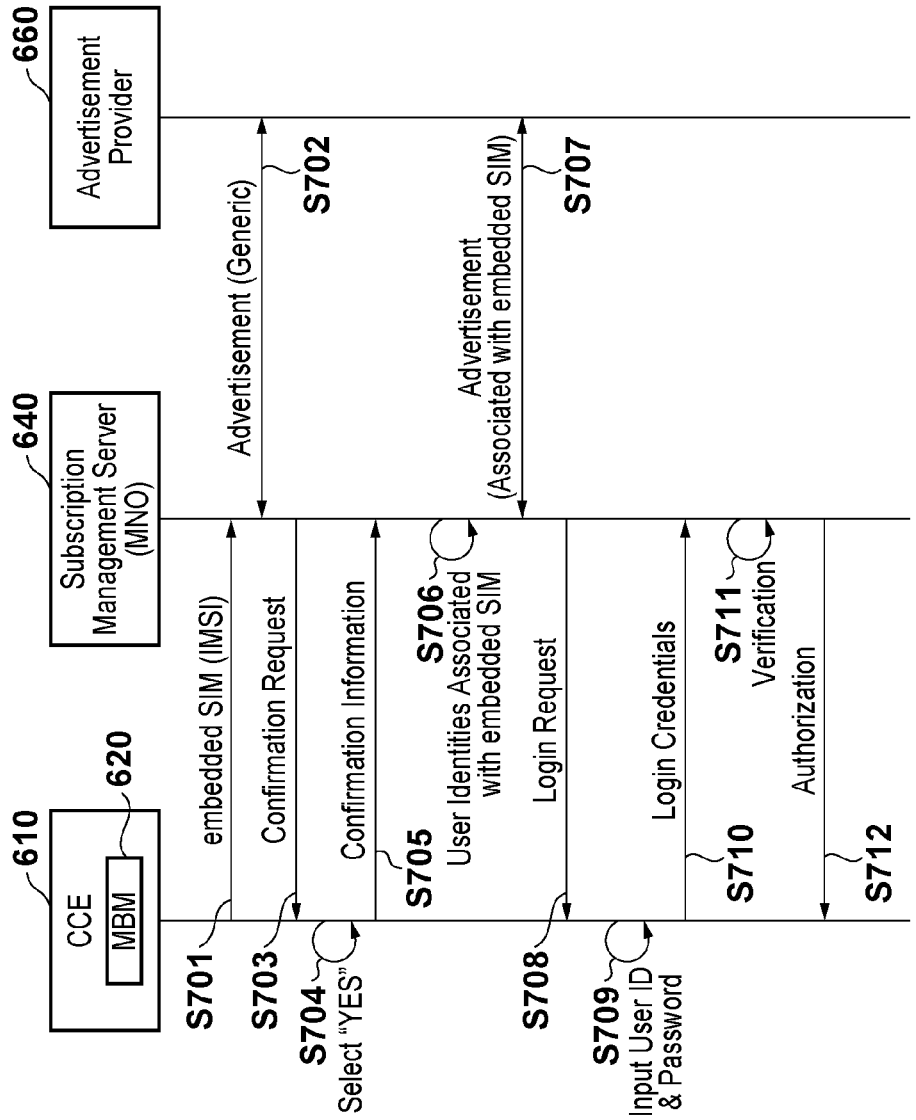

610
CCE
620
MBM
640
Subscription Management Server (MNO)
660
Advertisement Provider
S701
embedded SIM (IMSI)
S702
Advertisement (Generic)
S703
Confirmation Request
S704
Select "YES"
Confirmation Information
S705
S706
User Identities Associated with embedded SIM
Advertisement (Associated with embedded SIM)
S707
S708
Login Request
S709
Input User ID & Password
Login Credentials
S710
S711
Verification
Authorization
S712

FIG. 8A

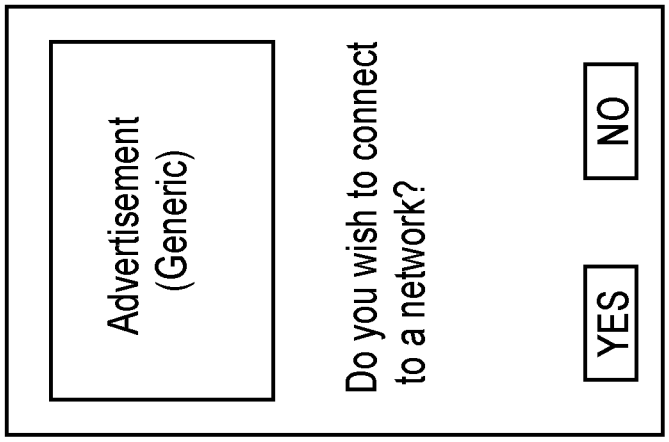

Advertisement
(Generic)
Do you wish to connect
to a network?
YES
NO

FIG. 8B

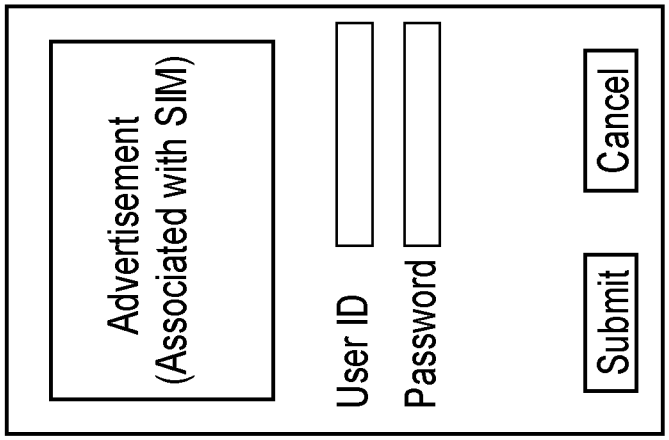

Advertisement
(Associated with SIM)
User ID
Password
Submit
Cancel

FIG. 9

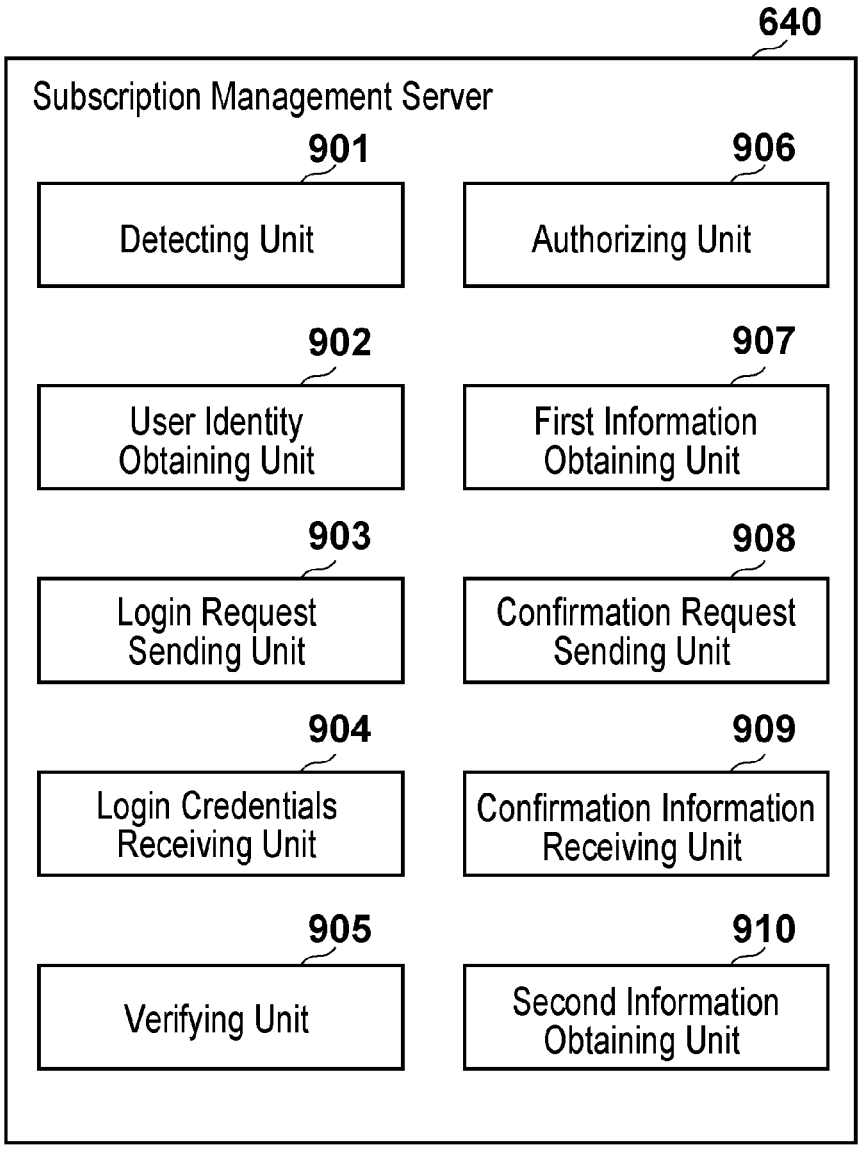
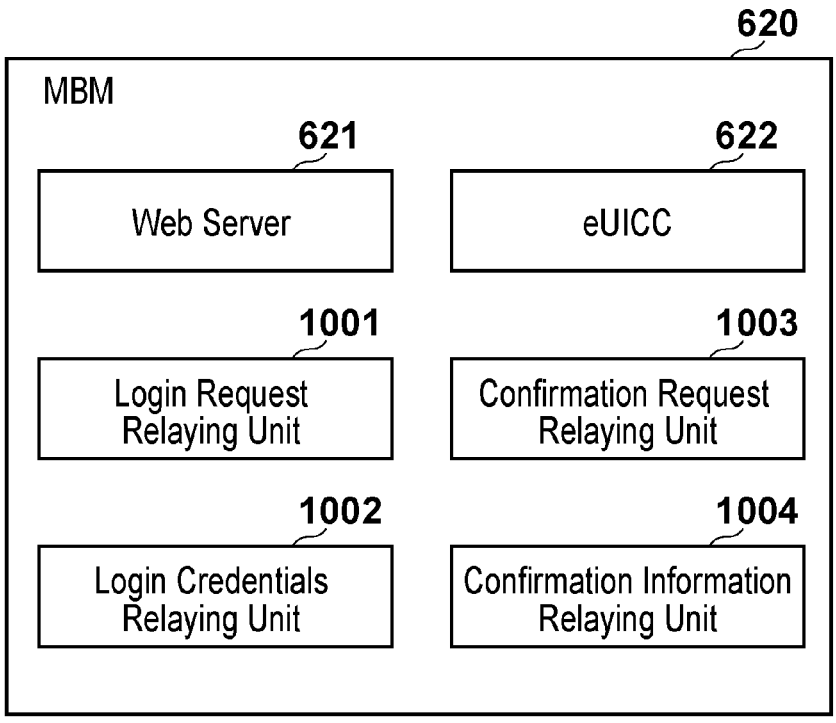

640
Subscription Management Server
901
Detecting Unit
906
Authorizing Unit
902
User Identity Obtaining Unit
907
First Information Obtaining Unit
903
Login Request Sending Unit
908
Confirmation Request Sending Unit
904
Login Credentials Receiving Unit
909
Confirmation Information Receiving Unit
905
Verifying Unit
910
Second Information Obtaining Unit

FIG. 10


620
MBM
621
Web Server
622
eUICC
1001
Login Request Relaying Unit
1003
Confirmation Request Relaying Unit
1002
Login Credentials Relaying Unit
1004
Confirmation Information Relaying Unit

MEDIATION SERVER, CONTROL METHOD THEREFOR, SUBSCRIPTION INFORMATION MANAGING APPARATUS, CONTROL METHOD THEREFOR, SUBSCRIPTION MANAGEMENT SERVER, AND CONTROL METHOD THEREFOR

TECHNICAL FIELD

[0001] The present invention generally relates to a technique for enabling a mediation server to identify a user of a communication device during the procedure of providing the communication device with subscription information such as a Machine Communication Identity Module (MCIM).

BACKGROUND

[0002] The 3rd Generation Partnership Project (3GPP) discusses remote provisioning of subscription information for Machine-to-Machine Equipment (M2ME) (see 3GPP TR 33.812 V9.2.0). According to TR 33.812, an M2ME, which is a kind of a communication device, is provided with a temporary private identity called a Provisional Connectivity ID (PCID). The PCID follows the same format as an International Mobile Subscriber Identity (IMSI), and an authenticating party identified by the PCID is called a Registration Operator (RO). The M2ME accesses the RO using the PCID, and requests for subscription information called a Machine Communication Identity Module (MCIM). Upon request, the RO accesses a network operator called a Selected Home Operator (SHO), receives the MCIM issued by the SHO, and forwards the MCIM to the M2ME.

[0003] In this way, the M2ME is able to obtain the MCIM from the SHO via the RO using the PCID just one time, and thereafter, the M2ME is able to attach to a 3GPP access network using the MCIM.

[0004] The mechanism of TR 33.812 is convenient for a user of a communication device in that it is possible for the user to obtain subscription information for the communication device via a network.

[0005] Although the term "M2ME" is used in TR 33.812, hereinafter the term "Connected Consumer Electronics (CCE)" is used in place of the term "M2ME" because communication devices that can be provided with an MCIM are not limited to a "machine-to-machine" communication device.

[0006] Meanwhile, a PCID is associated with subscription, and therefore, an RO can identify the associated subscriber when a CCE accesses the RO by use of the PCID. However, a user of the CCE is not necessarily the same as the subscriber. For example, assuming that a company purchases a CCE and makes subscription for a PCID of the CCE, and employees of the company share the CCE. In this case, the subscriber is the company, whereas the user of the CCE is one of the employees. Accordingly, although the RO can identify the subscriber of the PCID of the CCE during the procedure of MCIM provisioning, the RO cannot identify the current user of the CCE.

[0007] A similar problem also happens in scenarios where an embedded Subscriber Identity Module (SIM) is activated using Over The Air (OTA) provisioning, which is described as such in the paper titled "Over-The-Air (OTA) technology" found at http://www.3gpp.org/ftp/tsg_sa/wg3_security/TSGS3_30_Povoa/Docs/PDF/S3-030534.pdf.

SUMMARY

[0008] The present invention is intended to address the above-described problem, and it is a feature thereof to introduce a technique for enabling a mediation server (e.g., a server implementing the functionality of an RO) to identify a user of a communication device (e.g., a CCE) during the procedure of providing the communication device with subscription information (e.g., an MCIM). Moreover, it is also a feature of the present invention to introduce a technique for enabling a subscription management server (e.g., a server associated with a mobile network operator (MNO)) to identify a user of a communication device (e.g., a CCE) during the procedure of activating subscription information (e.g., an embedded SIM).

[0009] According to the first aspect of the present invention, there is provided a mediation server. The mediation server comprises: a device identity receiving unit configured to receive, from a communication device, a device identity which enables the communication device to connect to a network operated by a network operator associated with the mediation server; a user identity obtaining unit configured to obtain at least one user identity associated with the device identity; a login request sending unit configured to send, to the communication device, a login request for requesting login credentials for one of the at least one user identity; a login credentials receiving unit configured to receive the login credentials from the communication device; a verifying unit configured to verify the login credentials by comparing the login credentials with login credentials associated with the one of the at least one user identity; an identifying unit configured to, if the login credentials are successfully verified, identify, based on the one of the at least one user identity, network operators that offer to provide the communication device with subscription information which enables the communication device to connect to a network operated by the network operator; a list sending unit configured to send a list of the identified network operators to the communication device; a selection information receiving unit configured to receive selection information indicating one of the network operators in the list from the communication device; and a subscription information relaying unit configured to obtain subscription information for use by the communication device from the network operator indicated by the selection information, and forward the obtained subscription information to the communication device.

[0010] According to the second aspect of the present invention, there is provided a method for controlling a mediation server. The method comprises: a device identity receiving step of receiving, from a communication device, a device identity which enables the communication device to connect to a network operated by a network operator associated with the mediation server; a user identity obtaining step of obtaining at least one user identity associated with the device identity; a login request sending step of sending, to the communication device, a login request for requesting login credentials for one of the at least one user identity; a login credentials receiving step of receiving the login credentials from the communication device; a verifying step of verifying the login credentials by comparing the login credentials with login credentials associated with the one of the at least one user identity; an identifying step of, if the login credentials are successfully verified, identifying, based on the one of the at least one user identity, network operators that offer to provide the communication device with subscription information

which enables the communication device to connect to a network operated by the network operator; a list sending step of sending a list of the identified network operators to the communication device; a selection information receiving step of receiving selection information indicating one of the network operators in the list from the communication device; and a subscription information relaying step of obtaining subscription information for use by the communication device from the network operator indicated by the selection information, and forwarding the obtained subscription information to the communication device.

[0011] According to the third aspect of the present invention, there is provided a subscription information managing apparatus for use in a communication device. The subscription information managing apparatus comprises: a subscription information maintaining unit configured to store a device identity which enables the communication device to connect to a network operated by a network operator associated with a mediation server; a device identity sending unit configured to send the device identity to the mediation server; a login request relaying unit configured to receive, from the mediation server, a login request for requesting login credentials for a certain user identity associated with the device identity, and forward the received login request to the communication device; a login credentials relaying unit configured to receive the login credentials from the communication device, and forward the received login credentials to the mediation server; a list relaying unit configured to receive, from the mediation server, a list of network operators identified by the mediation server based on the certain user identity, and forward the list to the communication device; a selection information relaying unit configured to receive, from the communication device, selection information indicating one of the network operators in the list, and forward the received selection information to the mediation server; and a provisioning unit configured to receive, from the mediation server, subscription information which enables the communication device to connect to a network operated by the network operator indicated by the selection information, and provision the received subscription information in the subscription information maintaining unit.

[0012] According to the fourth aspect of the present invention, there is provided a method for controlling subscription information managing apparatus for use in a communication device. The subscription information managing apparatus has a subscription information maintaining unit configured to store a device identity which enables the communication device to connect to a network operated by a network operator associated with a mediation server. The method comprises: a device identity sending step of sending the device identity to the mediation server; a login request relaying step of receiving, from the mediation server, a login request for requesting login credentials for a certain user identity associated with the device identity, and forwarding the received login request to the communication device; a login credentials relaying step of receiving the login credentials from the communication device, and forwarding the received login credentials to the mediation server; a list relaying step of receiving, from the mediation server, a list of network operators identified by the mediation server based on the certain user identity, and forwarding the list to the communication device; a selection information relaying step of receiving, from the communication device, selection information indicating one of the network operators in the list, and forwarding the received selection information to the mediation server; and a provisioning step of receiving, from the mediation server, subscription information which enables the communication device to connect to a network operated by the network operator indicated by the selection information, and provisioning the received subscription information in the subscription information maintaining unit.

[0013] According to the fifth aspect of the present invention, there is provided a subscription management server. The subscription management server comprises: a detecting unit configured to detect a communication device which tries to connect to a network by use of subscription information issued by a network operator associated with the subscription management server; a user identity obtaining unit configured to obtain at least one user identity associated with the subscription information; a login request sending unit configured to send, to the communication device, a login request for requesting login credentials for one of the at least one user identity; a login credentials receiving unit configured to receive the login credentials from the communication device; a verifying unit configured to verify the login credentials by comparing the login credentials with login credentials associated with the one of the at least one user identity; and an authorizing unit configured to, if the login credentials are successfully verified, authorize the communication device to connect to the network by use of the subscription information.

[0014] According to the sixth aspect of the present invention, there is provided a method for controlling a subscription management server. The method comprises: a detecting step of detecting a communication device which tries to connect to a network by use of subscription information issued by a network operator associated with the subscription management server; a user identity obtaining step of obtaining at least one user identity associated with the subscription information; a login request sending step of sending, to the communication device, a login request for requesting login credentials for one of the at least one user identity; a login credentials receiving step of receiving the login credentials from the communication device; a verifying step of verifying the login credentials by comparing the login credentials with login credentials associated with the one of the at least one user identity; and an authorizing step of, if the login credentials are successfully verified, authorizing the communication device to connect to the network by use of the subscription information.

[0015] According to the seventh aspect of the present invention, there is provided a subscription information managing apparatus for use in a communication device. The subscription information managing apparatus comprises: a subscription information maintaining unit configured to store subscription information issued by a network operator associated with a subscription management server; a login request relaying unit configured to receive, from the subscription management server, a login request for requesting login credentials for a certain user identity associated with the subscription information, and forward the received login request to the communication device; and a login credentials relaying unit configured to receive the login credentials from the communication device, and forward the received login credentials to the subscription management server.

[0016] According to the eighth aspect of the present invention, there is provided a method for controlling a subscription information managing apparatus for use in a communication device. The subscription information managing apparatus has

a subscription information maintaining unit configured to store subscription information issued by a network operator associated with a subscription management server. The method comprises: a login request relaying step of receiving, from the subscription management server, a login request for requesting login credentials for a certain user identity associated with the subscription information, and forwarding the received login request to the communication device; and a login credentials relaying step of receiving the login credentials from the communication device, and forwarding the received login credentials to the subscription management server.

[0017] By virtue of the first to fourth aspects of the present invention, the mediation server receives, from the communication device, login credentials for a certain user identity during the procedure of providing the communication device with subscription information. Accordingly, it is possible for the mediation server to identify the user of the communication device. Moreover, by virtue of the fifth to eighth aspects of the present invention, the subscription management server receives, from the communication device, login credentials for a certain user identity during the procedure of activating subscription information. Accordingly, it is possible for the subscription management server to identify the user of the communication device.

[0018] Further features of the present invention will become apparent from the following description of exemplary embodiments with reference to the attached drawings, in which like reference characters designate the same or similar parts throughout the figures thereof.

BRIEF DESCRIPTION OF DRAWINGS

[0019] FIG. **1** illustrates an overview of an MCIM provisioning system **100** according to the first embodiment of the present invention;

[0020] FIG. **2** is a sequence diagram illustrating a procedure of MCIM provisioning according to the first embodiment of the present invention;

[0021] FIG. **3**A illustrates an example of the display of the confirmation request including the advertisement;

[0022] FIG. **3**B illustrates an example of the display of the login request including the advertisement;

[0023] FIG. **3**C illustrates an example of the display of the list of network operators including the advertisement;

[0024] FIG. **4** is a functional block diagram of the mediation server **130** according to the first embodiment of the present invention;

[0025] FIG. **5** is a functional block diagram of the MBM **120** according to the first embodiment of the present invention;

[0026] FIG. **6** illustrates an overview of a SIM activating system **600** according to the second embodiment of the present invention;

[0027] FIG. **7** is a sequence diagram illustrating a procedure of activating an embedded SIM according to the second embodiment of the present invention;

[0028] FIG. **8**A illustrates an example of the display of the confirmation request including the advertisement;

[0029] FIG. **8**B illustrates an example of the display of the login request including the advertisement;

[0030] FIG. **9** is a functional block diagram of the subscription management server **640** according to the second embodiment of the present invention; and

[0031] FIG. **10** is a functional block diagram of the MBM **620** according to the second embodiment of the present invention.

DETAILED DESCRIPTION

First Embodiment

[0032] FIG. **1** illustrates an overview of an MCIM provisioning system **100** according to the first embodiment of the present invention. In the MCIM provisioning system **100**, a CCE **110** comprises a Web browser **111** and a mobile broadband module (MBM) **120**.

[0033] The MBM **120** comprises a Web server **121** and a trusted environment (TRE) **122** which stores a PCID, and also comprises a communication interface (not shown) toward a mobile network. The CCE **110** accesses a mediation server **130** by use of the PCID in order to obtain an MCIM and provision it in the TRE **122**. The Web server **121** may be implemented in accordance with the OMA Smartcard Web Server specification found at http://www.openmobilealliance.org/technical/release_program/SCWS_v1_0.aspx. Because the MBM **120** comprises the Web server **121**, it is possible for the MBM **120** to provide the CCE **110** (in particular, the Web browser **111**) with various data or information.

[0034] It should be noted that, in the present application, a PCID is also referred to as a "device identity", because the PCID can be used to identify a CCE.

[0035] The mediation server **130** is a server for implementing the functionality of an RO. The mediation server **130** accesses a subscription management server **140** (or more than one subscription management servers **140**) in order to mediate the MCIM between the CCE **110** and the subscription management server **140**.

[0036] The subscription management server **140** is a server associated with an SHO, and provides the CCE **110** with the MCIM associated with the SHO through the mediation server **130**. In some embodiments, the subscription management server **140** comprises a user database (DB) **141** which maintains the association between user identities and PCIDs. To be more specific, an owner (e.g., a company) of the CCE **110** subscribes to the subscription management server **140** for the PCID stored in the TRE **122** at an appropriate timing (typically, when the owner purchases the CCE **110**). Then, the subscription management server **140** stores user identities of potential users (e.g., the employees of the company) of the CCE **110** in the user DB **141** in association with this PCID. The subscription management server **140** also maintains user credentials for each user identity in the user DB **141**. These user credentials may be a password, and will be used as login credentials later. Because the subscription management server **140** maintains the association between user identities and PCIDs in the user DB **141**, by inquiring of the subscription management server **140**, the mediation server **130** can identify the user identities associated with the PCID received from the CCE **110** during the procedure of MCIM provisioning.

[0037] In an alternative embodiment, an identity (ID) provider **150** may maintain the association between user identities and PCIDs, as well as user credentials for each user identity, in a user DB **151**. In this case, the owner of the CCE **110** registers the potential users (e.g., the employees of the company) with the ID provider **150** in association with the PCID, and the mediation server **130** inquires of the ID pro-

vider **150** of the user identities associated with the PCID received from the CCE **110** during the procedure of MCIM provisioning.

[0038] In some embodiments, the mediation server **130** may obtain an advertisement (or information object, to be more general) from an advertisement provider **160**. The advertisement may be associated with a PCID or a user identity, either directly, or through the demographic or other characteristic information about the user. In the former case, for example, the advertisement may be optimized for the group of the users of the CCE **110**, because the PCID is associated with the subscription or registration made by the owner of the CCE **110**. In the latter case, for example, the advertisement may be personalized for a specific user corresponding to a specific user identity. It should be noted that the mediation server **130** may obtain the advertisement from the advertisement provider **160** directly or by way of the subscription management server **140** or the ID provider **150**.

[0039] FIG. **2** is a sequence diagram illustrating a procedure of MCIM provisioning according to the first embodiment of the present invention. In the following description, because the MBM **120** is comprised in the CCE **110**, in cases where it is not necessary to exactly distinguish the communication between the MBM **120** and the mediation server **130** from the communication between the CCE **110** and the mediation server **130**, the communication between the MBM **120** and the mediation server **130** may sometimes be referred to as the communication between the CCE **110** and the mediation server **130**. Accordingly, for example, the phrase "the mediation server **130** receives some information from the CCE **110**" may refer to the situation that the mediation server **130** receives some information from the MBM **120**, depending on the context.

[0040] In step S**201**, the MBM **120** sends the PCID to the mediation server **130** to initiate the procedure of MCIM provisioning.

[0041] In step S**202**, the mediation server **130** obtains an advertisement from the advertisement provider **160**. In this step, the advertisement is not personalized or optimized based on a user identity or the PCID. In this sense, the obtained advertisement is generic. It should be noted that the target to be obtained is not limited to an advertisement. More generally, the mediation server **130** may obtain an information object from an information provider.

[0042] In step S**203**, the mediation server **130** sends a confirmation request including the advertisement to the MBM **120**. The confirmation request is a request for requesting the CCE **110** to confirm that a user of the CCE **110** wishes to have an MCIM (i.e., to initiate the procedure of MCIM provisioning).

[0043] In step S**204**, the Web server **121** of the MBM **120** sends the confirmation request including the advertisement to the Web browser **111** of the CCE **110**. The confirmation request is, for example, sent in the form of an HTML document, and the Web browser **111** displays the confirmation request including the advertisement as shown in FIG. **3**A, for example. Because the advertisement is included in the confirmation request, it is expected that the user of the CCE **110** actually sees the advertisement.

[0044] In step S**205**, if the user selects the "YES" button shown in FIG. **3**A, the Web server **121** of the MBM **120** sends, to the mediation server **130**, confirmation information indicating that the user actually wishes to have an MCIM.

[0045] In step S**206***a* or S**206***b*, the mediation server **130** obtains at least one user identity associated with the PCID received in step S**201**. In one embodiment, as described above, the subscription management server **140** maintains the user identities in the user DB **141** in association with the PCID. In this case, in step S**206***a*, the mediation server **130** obtains the user identities associated with the PCID from the subscription management server **140**. In another embodiment, as described above, the ID provider **150** maintains the user identities in the user DB **151** in association with the PCID. In this case, in step S**206***b*, the mediation server **130** obtains the user identities associated with the PCID from the ID provider **150**. In step S**206***a* or S**206***b*, the mediation server **130** also obtains user credentials for the user identities from the subscription management server **140** or the ID provider **150**. These user credentials may be a password, and will be used as login credentials later.

[0046] In some embodiments, the mediation server **130** may select one of the obtained user identities based on certain business criteria in step S**206***a* or S**206***b*. These criteria can involve whether there is a business relationship between the operator of the mediation server **130** and the owner of the system providing the user identity; whether the operator of the mediation server **130** gets remunerated for providing an additional user; whether the ID provider **150** is currently maintaining a campaign which includes offers to the user; etc.

[0047] In step S**207**, the mediation server **130** obtains an advertisement associated with the PCID from the advertisement provider **160**. Because the PCID is associated with the potential users (e.g., employees of a company) of the CCE **110**, the advertisement associated with the PCID can also be associated with a group of the users of the CCE **110**. Accordingly, the advertisement obtained in this step may be optimized for the group of the users of the CCE **110**. Moreover, in cases where the mediation server **130** selects one of the user identities in step S**206***a* or S**206***b*, the mediation server **130** may obtain the advertisement associated with the selected user identity. In other words, the advertisement may be personalized for the user associated with the selected user identity.

[0048] In step S**208**, the mediation server **130** sends a login request including the advertisement, which was obtained in step S**207**, to the MBM **120**. The login request is a request for requesting login credentials for one of the user identities obtained in step S**206***a* or S**206***b*.

[0049] In step S**209**, the Web server **121** of the MBM **120** sends the login request including the advertisement to the Web browser **111** of the CCE **110**. The login request is, for example, sent in the form of an HTML document, and the Web browser **111** displays the login request including the advertisement as shown in FIG. **3**B, for example. Because the advertisement is included in the login request, it is expected that the user of the CCE **110** actually sees the advertisement. The user of the CCE **110** inputs his/her user identity in the "User ID" field. The user also inputs a password for the input user identity as the login credentials in the "Password" field. It should be noted that in cases where the mediation server **130** selects one of the user identities in step S**206***a* or S**206***b*, the "User ID" filed may be replaced by a text showing the selected user identity, and the user can only input the password for the selected user identity.

[0050] In step S**210**, if the user selects the "Submit" button shown in FIG. **3**B after inputting the user identity and pass-

word, the Web server **121** of the MBM **120** sends, to the mediation server **130**, the input user identity and password.

[0051] In step S**211**, the mediation server **130** verifies the received password by comparing it with the password (user credentials) which is associated with the received user identity (or the user identity selected in step S**206***a* or S**206***b*) and which was obtained in step S**206***a* or S**206***b*. As a result of this step, in contrast to the conventional art, the mediation server **130** can identify the user of the CCE **110** during the procedure of MCIM provisioning, even if there are a plurality of potential users associated with the PCID.

[0052] In step S**212**, if the login credentials are successfully verified in step S**211**, the mediation server **130** asks one or more subscription management servers **140** for offers of MCIMs to the user identified by the user identity received in step S**210** (or selected in step S**206***a* or S**206***b*). These subscription management servers **140** may be associated with one or more network operators (SHO), and provide one or more offers from them. The subscription management servers **140** consider the user identity, the subscription associated with the user identity, their capacity, and so on, and generate a suitable offer. Because the subscription management servers **140** are associated with network operators, in this way, the mediation server **130** may identify network operators that offer to provide the CCE **110** with an MCIM.

[0053] In step S**213**, the mediation server **130** obtains an advertisement associated with the user identity received in step S**210** (or selected in step S**206***a* or S**206***b*) from the advertisement provider **160**. The advertisement obtained in this step may be personalized for the user associated with the user identity.

[0054] In step S**214**, the mediation server **130** sends a list of the network operators, as well as their offers, identified in step S**212**. The list may include the advertisement obtained in step S**213**.

[0055] In step S**215**, the Web server **121** of the MBM **120** sends the list including the advertisement to the Web browser **111** of the CCE **110**. The list is, for example, sent in the form of an HTML document, and the Web browser **111** displays the list including the advertisement as shown in FIG. **3**C, for example. Because the advertisement is included in the list of network operators, it is expected that the user of the CCE **110** actually see the advertisement. The user of the CCE **110** selects one of the network operators through the radio buttons shown in FIG. **3**C.

[0056] In step S**216**, if the user selects the "Submit" button shown in FIG. **3**C after selecting one of the network operators, the Web server **121** of the MBM **120** sends, to the mediation server **130**, selection information indicating the selected network operator.

[0057] In step S**217**, the mediation server **130** obtains an MCIM from the subscription management server **140** associated with the network operator indicated in the selection information received in step S**216**.

[0058] In step S**218**, the mediation server **130** forwards the obtained MCIM to the MBM **120**.

[0059] In step S**219**, the MBM **120** provisions the MCIM in the TRE **122**.

[0060] As a result of the above procedure, the CCE **110** has an MCIM in the TRE **122** of the MBM **120**, and the CCE **110** can connect to a network operated by the network operator associated with the MCIM.

[0061] FIG. **4** is a functional block diagram of the mediation server **130** according to the first embodiment of the present invention. The mediation server **130** comprises a device identity receiving unit **401**, a user identity obtaining unit **402**, a login request sending unit **403**, a login credentials receiving unit **404**, a verifying unit **405**, an identifying unit **406**, a list sending unit **407**, a selection information receiving unit **408**, and a subscription information relaying unit **409**.

[0062] The device identity receiving unit **401** is configured to receive the PCID in step S**201**. The user identity obtaining unit **402** is configured to obtain the user identities in step S**206***a or S***206***b*. The login request sending unit **403** is configured to send the login request in step S**208**. The login credentials receiving unit **404** is configured to receive the login credentials in step S**210**. The verifying unit **405** is configured to verify the login credentials in step S**211**. The identifying unit **406** is configured to identify the network operators in step S**217**. The list sending unit **407** is configured to send the list in step S**214**. The selection information receiving unit **408** is configured to receive the selection information in step S**216**. The subscription information relaying unit **409** is configured to receive the MCIM in step S**217** and forward the MCIM in step S**218**.

[0063] The mediation server **130** may also comprise a first information obtaining unit **410**, a confirmation request sending unit **411**, a confirmation information receiving unit **412**, a second information obtaining unit **413**, and a third information obtaining unit **414**.

[0064] The first information obtaining unit **410** is configured to obtain the advertisement in step S**202**. The confirmation request sending unit **411** is configured to send the confirmation request in step S**203**. The confirmation information receiving unit **412** is configured to receive the confirmation information in step S**205**. The second information obtaining unit **413** is configured to obtain the advertisement in step S**207**. The third information obtaining unit **414** is configured to obtain the advertisement in step S**213**.

[0065] It should be noted that the functionality of each unit in the mediation server **130** may be implemented using dedicated hardware, using software executed by a processor (not shown), or a combination thereof.

[0066] FIG. **5** is a functional block diagram of the MBM **120** according to the first embodiment of the present invention. The MBM **120** comprises the Web server **121**, the TRE **122**, a device identity sending unit **501**, a login request relaying unit **502**, a login credentials relaying unit **503**, a list relaying unit **504**, a selection information relaying unit **505**, and a provisioning unit **506**.

[0067] The device identity sending unit **501** is configured to send the PCID in step S**201**. The login request relaying unit **502** is configured to receive the login request in step S**208** and forward the login request through the Web server **121** in step S**209**. The login credentials relaying unit **503** is configured to receive the login credentials through the Web server **121** in step S**209** and forward the login credentials in step S**210**. The list relaying unit **504** is configured to receive the list in step S**214** and forward the list through the Web server **121** in step S**215**. The selection information relaying unit **505** is configured to receive the selection information through the Web server **121** in step S**215** and forwards the selection information in step S**216**. The provisioning unit **506** is configured to receive the MCIM in step S**218** and provision the MCIM in step S**219**.

[0068] The MBM **120** may also comprise a confirmation request relaying unit **507**, and a confirmation information relaying unit **508**.

[0069] The confirmation request relaying unit **507** is configured to receive the confirmation request in step S**203** and forward the confirmation request through the Web server **121** in step S**204**. The confirmation information relaying unit **508** is configured to receive the confirmation information through the Web server **121** in step S**204** and forward the confirmation information in step S**205**.

[0070] It should be noted that the functionality of the Web server **121** and each unit in the MBM **120** may be implemented using dedicated hardware, using software executed by a processor (not shown), or a combination thereof. Moreover, the TRE **122** may be implemented using a memory and software executed by a processor (not shown).

[0071] As described above, according to the first embodiment of the present invention, the mediation server **130** or the user selects one of the user identities associated with the PCID in step S**206***a*, S**206***b*, or S**209**. Then, the mediation server **130** receives the login credentials for the selected user identity in step S**210** and verifies the login credentials in step S**211**.

[0072] Accordingly, it is possible for the mediation server **130** to identify the user of the CCE **110** during the procedure of MCIM provisioning, even if there are a plurality of potential users associated with the PCID.

Second Embodiment

[0073] The first embodiment is described in the context of MCIM provisioning according to TR 33.812. However, the concept of the present invention can also be applied to scenarios where an embedded SIM is activated using Over The Air (OTA) provisioning.

[0074] FIG. **6** illustrates an overview of a SIM activating system **600** according to the second embodiment of the present invention. In the SIM activating system **600**, a CCE **610** comprises a Web browser **611** and a mobile broadband module (MBM) **620**. The MBM **620** comprises a Web server **621** and an embedded Universal Integrated Circuit Card (eUICC) **622** which stores an embedded SIM issued by a network operator associated with a subscription management server **640**, and also comprises a communication interface (not shown) toward a mobile network. The CCE **610** tries to connect to a network by use of the embedded SIM as subscription information. The Web server **621** may be implemented in accordance with the OMA Smartcard Web Server specification. Because the MBM **620** comprises the Web server **621**, it is possible for the MBM **620** to provide the CCE **610** (in particular, the Web browser **611**) with various data or information.

[0075] The subscription management server **640** is a server associated with a mobile network operator (MNO) which has issued the embedded SIM. The subscription management server **640** comprises a user database (DB) **641** which maintains the association between user identities and the embedded SIM. To be more specific, an owner (e.g., a company) of the CCE **610** makes subscription to the subscription management server **640** for the embedded SIM at an appropriate timing (typically, when the owner purchases the CCE **610**). Then, the subscription management server **640** stores user identities of potential users (e.g., the employees of the company) of the CCE **610** in the user DB **641** in association with this PCID. The subscription management server **640** also maintains user credentials for each user identity in the user DB **641**. These user credentials may be a password, and will be used as login credentials later. Because the subscription management server **640** maintains the association between user identities and embedded SIMs in the user DB **641**, the subscription management server **640** can identify the user identities associated with the embedded SIM (to be exact, an IMSI) received from the CCE **610** during the procedure of activating the embedded SIM.

[0076] In some embodiments, the subscription management server **640** may obtain an advertisement (or information object, to be more general) from an advertisement provider **660**. The advertisement may be associated with an embedded SIM or a user identity. In the former case, for example, the advertisement may be optimized for the group of the users of the CCE **610**, because the embedded SIM is associated with the subscription made by the owner of the CCE **610**. In the latter case, for example, the advertisement may be personalized for a specific user corresponding to a specific user identity.

[0077] FIG. **7** is a sequence diagram illustrating a procedure of activating an embedded SIM according to the second embodiment of the present invention. In the following description, because the MBM **620** is comprised in the CCE **610**, in cases where it is not necessary to exactly distinguish the communication between the MBM **620** and the subscription management server **640** from the communication between the CCE **610** and the subscription management server **640**, the communication between the MBM **620** and the subscription management server **640** may sometimes be referred to as the communication between the CCE **610** and the subscription management server **640**. Accordingly, for example, the phrase "the subscription management server **640** receives some information from the CCE **610**" may refer to the situation that the subscription management server **640** receives some information from the MBM **620**, depending on the context.

[0078] In step S**701**, the CCE **610** tries to connect to a network by use of the embedded SIM stored in the eUICC **622** of the MBM **620**. The subscription management server **640**, which is associated with the network operator that issued the embedded SIM, detects the CCE **610** trying to connect to the network.

[0079] In step S**702**, the subscription management server **640** obtains an advertisement from the advertisement provider **660**. In this step, the advertisement is not personalized or optimized based on a user identity or the embedded SIM. In this sense, the obtained advertisement is generic. It should be noted that the target to be obtained is not limited to an advertisement. More generally, the subscription management server **640** may obtain an information object from an information provider.

[0080] In step S**703**, the subscription management server **640** sends a confirmation request including the advertisement to the MBM **620**. The confirmation request is a request for requesting the CCE **610** to confirm that a user of the CCE **610** wishes to activate the embedded SIM (i.e., to connect the CCE **610** to the network by use of the embedded SIM).

[0081] In step S**704**, the Web server **621** of the MBM **620** sends the confirmation request including the advertisement to the Web browser **611** of the CCE **610**. The confirmation request is, for example, sent in the form of an HTML document, and the Web browser **611** displays the confirmation request including the advertisement as shown in FIG. **8**A, for example. Because the advertisement is included in the confirmation request, it is expected that the user of the CCE **610** actually see the advertisement.

[0082] In step S**705**, if the user selects the "YES" button shown in FIG. **8**A, the Web server **621** of the MBM **620** sends, to the subscription management server **640**, confirmation information indicating that the user actually wishes to activate the embedded SIM.

[0083] In step S**706**, the subscription management server **640** obtains, from the user DB **641**, at least one user identity associated with the embedded SIM (to be exact, an IMSI) received in step S**701**.

[0084] In some embodiments, the subscription management server **640** may select one of the obtained user identities based on certain business criteria in step S**706**.

[0085] In step S**707**, the subscription management server **640** obtains an advertisement associated with the embedded SIM from the advertisement provider **660**. Because the embedded SIM is associated with the potential users (e.g., employees of a company) of the CCE **610**, the advertisement associated with the embedded SIM can also be associated with a group of the users of the CCE **610**. Accordingly, the advertisement obtained in this step may be optimized for the group of the users of the CCE **610**. Moreover, in cases where the subscription management server **640** selects one of the user identities in step S**706**, the subscription management server **640** may obtain the advertisement associated with the selected user identity. In other words, the advertisement may be personalized for the user associated with the selected user identity.

[0086] In step S**708**, the subscription management server **640** sends a login request including the advertisement, which was obtained in step S**707**, to the MBM **620**. The login request is a request for requesting login credentials for one of the user identities obtained in step S**706**.

[0087] In step S**709**, the Web server **621** of the MBM **620** sends the login request including the advertisement to the Web browser **611** of the CCE **610**. The login request is, for example, sent in the form of an HTML document, and the Web browser **611** displays the login request including the advertisement as shown in FIG. **8**B, for example. Because the advertisement is included in the login request, it is expected that the user of the CCE **610** actually see the advertisement. The user of the CCE **610** inputs his/her user identity in the "User ID" field. The user also inputs a password for the input user identity as the login credentials in the "Password" field. It should be noted that in cases where the subscription management server **640** selects one of the user identities in step S**706**, the "User ID" filed may be replaced by a text showing the selected user identity, and the user can only input the password for the selected user identity.

[0088] In step S**710**, if the user selects the "Submit" button shown in FIG. **8**B after inputting the user identity and password, the Web server **621** of the MBM **620** sends, to the subscription management server **640**, the input user identity and password.

[0089] In step S**711**, the subscription management server **640** verifies the received password by comparing it with the password (user credentials) which is associated with the received user identity (or the user identity selected in step S**706**) and which is stored in the user DB **641**. As a result of this step, in contrast to the conventional art, the subscription management server **640** can identify the user of the CCE **610** during the procedure of activating an embedded SIM, even if there are a plurality of potential users associated with the embedded SIM.

[0090] In step S**712**, if the login credentials are successfully verified in step S**711**, the subscription management server **640** authorizes the CCE **610** to connect to the network by use of the embedded SIM stored in the eUICC **622** of the MBM **620**.

[0091] As a result of the above procedure, the embedded SIM stored in the eUICC **622** of the MBM **620** is activated, and the CCE **610** can now connect to the network operated by the network operator associated with the embedded SIM.

[0092] In the above procedure, the communication between MBM **620** and the subscription management server **640** may be performed through, for example, a Short Message Service message, an IP message, an Unstructured Supplementary Service Data message, a Wireless Messaging Teleservice message, a Wireless Enhanced Messaging Teleservice message, an Enhanced Messaging Service message, or a Multimedia Messaging Service message.

[0093] In an alternative embodiment, the CCE **610** contains pre-installed various advertisements. In this case, the confirmation request and the login request may not include the advertisement, and may instead include an advertisement identity (such as a numerical value) identifying a specific advertisement. In this case, in steps S**704** and S**709**, the Web server **621** inserts the advertisement corresponding to the advertisement identity. This alternative embodiment is advantageous because it is not necessary to transfer a bandwidth-consuming advertisement from the subscription management server **640** to the CCE **610**.

[0094] FIG. **9** is a functional block diagram of the subscription management server **640** according to the second embodiment of the present invention. The subscription management server **640** comprises a detecting unit **901**, a user identity obtaining unit **902**, a login request sending unit **903**, a login credentials receiving unit **904**, a verifying unit **905**, and an authorizing unit **906**.

[0095] The detecting unit **901** is configured to detect the CCE **610** trying to connect to the network in step S**701**. The user identity obtaining unit **902** is configured to obtain the user identities in step S**706**. the login request sending unit **903** is configured to send the login request in step S**708**. The login credentials receiving unit **904** is configured to receive the login credentials in step S**710**. The verifying unit **905** is configured to verify the login credentials in step S**711**. The authorizing unit **906** is configured to authorize the CCE **610** to connect to the network by use of the embedded SIM in step S**712**.

[0096] The subscription management server **640** may also comprise a first information obtaining unit **907**, a confirmation request sending unit **908**, a confirmation information receiving unit **909**, and a second information obtaining unit **910**.

[0097] The first information obtaining unit **907** is configured to obtain the advertisement in step S**702**. The confirmation request sending unit **908** is configured to send the confirmation request in step S**703**. The confirmation information receiving unit **909** is configured to receive the confirmation information in step S**705**. The second information obtaining unit **910** is configured to obtain the advertisement in step S**707**.

[0098] It should be noted that the functionality of each unit in the subscription management server **640** may be implemented using dedicated hardware, using software executed by a processor (not shown), or a combination thereof.

[0099] FIG. **10** is a functional block diagram of the MBM **620** according to the second embodiment of the present invention. The MBM **620** comprises the Web server **621**, the eUICC **622**, a login request relaying unit **1001**, and a login credentials relaying unit **1002**.

[0100] The login request relaying unit **1001** is configured to receive the login request in step S**708** and forward the login request through the Web server **621** in step S**709**. The login credentials relaying unit **1002** is configured to receive the login credentials through the Web server **621** in step S**709** and forward the login credentials in step S**710**.

[0101] The MBM **620** may also comprise a confirmation request relaying unit **1003** and a confirmation information relaying unit **1004**.

[0102] The confirmation request relaying unit **1003** is configured to receive the confirmation request in step S**703** and forward the confirmation request through the Web server **621** in step S**704**. The confirmation information relaying unit **1004** is configured to receive the confirmation information through the Web server **621** in step S**704** and forward the confirmation information in step S**705**.

[0103] It should be noted that the functionality of the Web server **621** and each unit in the MBM **620** may be implemented using dedicated hardware, using software executed by a processor (not shown), or a combination thereof. Moreover, the eUICC **622** may be implemented using a memory and software executed by a processor (not shown).

[0104] As described above, according to the second embodiment of the present invention, the subscription management server **640** or the user selects one of the user identities associated with the embedded SIM in step S**706** or S**709**. Then, the subscription management server **640** receives the login credentials for the selected user identity in step S**710** and verifies the login credentials in step S**711**.

[0105] Accordingly, it is possible for the subscription management server **640** to identify the user of the CCE **610** during the procedure of activating the embedded SIM, even if there are a plurality of potential users associated with the embedded SIM.

[0106] While the present invention has been described with reference to exemplary embodiments, it is to be understood that the invention is not limited to the disclosed exemplary embodiments. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions.

1-25. (canceled)

26. A mediation server comprising:

a device identity receiving unit configured to receive, from a communication device, a device identity which enables the communication device to connect to a network operated by a network operator associated with the mediation server;

a user identity obtaining unit configured to obtain at least one user identity associated with the device identity;

a login request sending unit configured to send, to the communication device, a login request for requesting login credentials for one of the at least one user identity;

a login credentials receiving unit configured to receive the login credentials from the communication device;

a verifying unit configured to verify the login credentials by comparing the login credentials with login credentials associated with said one of the at least one user identity;

an identifying unit configured to, if the login credentials are successfully verified, identify, based on said one of the at least one user identity, network operators that offer to provide the communication device with subscription information which enables the communication device to connect to a network operated by the network operator;

a list sending unit configured to send a list of the identified network operators to the communication device;

a selection information receiving unit configured to receive selection information indicating one of the network operators in the list from the communication device; and

a subscription information relaying unit configured to obtain subscription information for use by the communication device from the network operator indicated by the selection information, and forward the obtained subscription information to the communication device.

27. The mediation server according to claim **26**, further comprising:

a first information obtaining unit configured to obtain a first information object;

a confirmation request sending unit configured to send a confirmation request including the first information object to the communication device, the confirmation request being a request for requesting the communication device to confirm that a user of the communication device wishes to have subscription information; and

a confirmation information receiving unit configured to receive, from the communication device, confirmation information indicating that the user of the communication device wishes to have subscription information, and

wherein the login request sending unit sends the login request after the confirmation information receiving unit receives the confirmation information.

28. The mediation server according to claim **26**, further comprising a second information obtaining unit configured to obtain a second information object associated with the device identity, wherein the login request sending unit includes the second information object in the login request to be sent to the communication device.

29. The mediation server according to claim **26**, further comprising a third information obtaining unit configured to obtain a third information object associated with said one of the at least one user identity, wherein the list sending unit includes the third information object in the list to be sent to the communication device.

30. The mediation server according to claim **26**, wherein the user identity obtaining unit obtains the at least one user identity from an identity provider which maintains the at least one user identity in association with the device identity.

31. The mediation server according to claim **26**, wherein the user identity obtaining unit obtains the at least one user identity from a network operator which maintains the at least one user identity in association with the device identity.

32. The mediation server according to claim **26**, wherein said one of the at least one user identity is decided by a user of the communication device in response to the login request, and the login credentials receiving unit receives user identity information indicating the decided user identity.

33. A method for controlling a mediation server, comprising:

a device identity receiving step of receiving, from a communication device, a device identity which enables the

communication device to connect to a network operated by a network operator associated with the mediation server;

a user identity obtaining step of obtaining at least one user identity associated with the device identity;

a login request sending step of sending, to the communication device, a login request for requesting login credentials for one of the at least one user identity;

a login credentials receiving step of receiving the login credentials from the communication device;

a verifying step of verifying the login credentials by comparing the login credentials with login credentials associated with said one of the at least one user identity;

an identifying step of, if the login credentials are successfully verified, identifying, based on said one of the at least one user identity, network operators that offer to provide the communication device with subscription information which enables the communication device to connect to a network operated by the network operator;

a list sending step of sending a list of the identified network operators to the communication device;

a selection information receiving step of receiving selection information indicating one of the network operators in the list from the communication device; and

a subscription information relaying step of obtaining subscription information for use by the communication device from the network operator indicated by the selection information, and forwarding the obtained subscription information to the communication device.

34. A subscription information managing apparatus for use in a communication device, comprising:

a subscription information maintaining unit configured to store a device identity which enables the communication device to connect to a network operated by a network operator associated with a mediation server;

a device identity sending unit configured to send the device identity to the mediation server;

a login request relaying unit configured to receive, from the mediation server, a login request for requesting login credentials for a certain user identity associated with the device identity, and forward the received login request to the communication device;

a login credentials relaying unit configured to receive the login credentials from the communication device, and forward the received login credentials to the mediation server;

a list relaying unit configured to receive, from the mediation server, a list of network operators identified by the mediation server based on said certain user identity, and forward the list to the communication device;

a selection information relaying unit configured to receive, from the communication device, selection information indicating one of the network operators in the list, and forward the received selection information to the mediation server; and

a provisioning unit configured to receive, from the mediation server, subscription information which enables the communication device to connect to a network operated by the network operator indicated by the selection information, and provision the received subscription information in the subscription information maintaining unit.

35. The subscription information managing apparatus according to claim **34**, further comprising:

a confirmation request relaying unit configured to receive a confirmation request including a first information object from the mediation server, and forward the confirmation request to the communication device, the confirmation request being a request for requesting the communication device to confirm that a user of the communication device wishes to have subscription information; and

a confirmation information relaying unit configured to receive, from the communication device, confirmation information indicating that the user of the communication device wishes to have subscription information, and forward the confirmation information to the mediation server,

wherein the login request relaying unit receives the login request after the confirmation information relaying unit forwards the confirmation information to the mediation server.

36. The subscription information managing apparatus according to claim **34**, wherein the login request received and forwarded by the login request relaying unit includes a second information object associated with the device identity.

37. The subscription information managing apparatus according to claim **34**, wherein the list received and forwarded by the list relaying unit includes a third information object associated with said certain user identity.

38. The subscription information managing apparatus according to claim **34**, wherein the login credentials relaying unit receives, from the communication device, user identity information indicating a user identity decided as said certain user identity, and forwards the user identity information to the mediation server.

39. A method for controlling subscription information managing apparatus for use in a communication device, the subscription information managing apparatus having a subscription information maintaining unit configured to store a device identity which enables the communication device to connect to a network operated by a network operator associated with a mediation server, the method comprising:

a device identity sending step of sending the device identity to the mediation server;

a login request relaying step of receiving, from the mediation server, a login request for requesting login credentials for a certain user identity associated with the device identity, and forwarding the received login request to the communication device;

a login credentials relaying step of receiving the login credentials from the communication device, and forwarding the received login credentials to the mediation server;

a list relaying step of receiving, from the mediation server, a list of network operators identified by the mediation server based on said certain user identity, and forwarding the list to the communication device;

a selection information relaying step of receiving, from the communication device, selection information indicating one of the network operators in the list, and forwarding the received selection information to the mediation server; and

a provisioning step of receiving, from the mediation server, subscription information which enables the communication device to connect to a network operated by the network operator indicated by the selection information, and provisioning the received subscription information in the subscription information maintaining unit.

40. A subscription management server comprising:

a detecting unit configured to detect a communication device which tries to connect to a network by use of subscription information issued by a network operator associated with the subscription management server;

a user identity obtaining unit configured to obtain at least one user identity associated with the subscription information;

a login request sending unit configured to send, to the communication device, a login request for requesting login credentials for one of the at least one user identity;

a login credentials receiving unit configured to receive the login credentials from the communication device;

a verifying unit configured to verify the login credentials by comparing the login credentials with login credentials associated with said one of the at least one user identity; and

an authorizing unit configured to, if the login credentials are successfully verified, authorize the communication device to connect to the network by use of the subscription information.

41. The subscription management server according to claim **40**, further comprising:

a first information obtaining unit configured to obtain a first information object;

a confirmation request sending unit configured to send a confirmation request including the first information object to the communication device, the confirmation request being a request for requesting the communication device to confirm that a user of the communication device wishes to connect the communication device to the network by use of the subscription information; and

a confirmation information receiving unit configured to receive, from the communication device, confirmation information indicating that the user of the communication device wishes to connect the communication device to the network by use of the subscription information,

wherein the login request sending unit sends the login request after the confirmation information receiving unit receives the confirmation information.

42. The subscription management server according to claim **40**, further comprising a second information obtaining unit configured to obtain a second information object associated with the subscription information,

wherein the login request sending unit includes the second information object in the login request to be sent to the communication device.

43. The subscription management server according to claim **40**, wherein said one of the at least one user identity is decided by a user of the communication device in response to the login request, and the login credentials receiving unit receives user identity information indicating the decided user identity.

44. The subscription management server according to claim **40**, wherein the login request is sent and the login credentials are received through a Short Message Service message, an IP message, an Unstructured Supplementary Service Data message, a Wireless Messaging Teleservice message, a Wireless Enhanced Messaging Teleservice message, an Enhanced Messaging Service message, or a Multimedia Messaging Service message.

45. A method for controlling a subscription management server, the method comprising:

a detecting step of detecting a communication device which tries to connect to a network by use of subscription information issued by a network operator associated with the subscription management server;

a user identity obtaining step of obtaining at least one user identity associated with the subscription information;

a login request sending step of sending, to the communication device, a login request for requesting login credentials for one of the at least one user identity;

a login credentials receiving step of receiving the login credentials from the communication device;

a verifying step of verifying the login credentials by comparing the login credentials with login credentials associated with said one of the at least one user identity; and

an authorizing step of, if the login credentials are successfully verified, authorizing the communication device to connect to the network by use of the subscription information.

46. A subscription information managing apparatus for use in a communication device, comprising:

a subscription information maintaining unit configured to store subscription information issued by a network operator associated with a subscription management server;

a login request relaying unit configured to receive, from the subscription management server, a login request for requesting login credentials for a certain user identity associated with the subscription information, and forward the received login request to the communication device; and

a login credentials relaying unit configured to receive the login credentials from the communication device, and forward the received login credentials to the subscription management server.

47. The subscription information managing apparatus according to claim **46**, further comprising:

a confirmation request relaying unit configured to receive a confirmation request including a first information object from the subscription management server, and forward the confirmation request to the communication device, the confirmation request being a request for requesting the communication device to confirm that a user of the communication device wishes to connect the communication device to a network operated by the network operator by use of the subscription information; and

a confirmation information relaying unit configured to receive, from the communication device, confirmation information indicating that the user of the communication device wishes to connect the communication device to the network by use of the subscription information, and forward the confirmation information to the subscription management server,

wherein the login request relaying unit receives the login request after the confirmation information relaying unit forwards the confirmation information to the subscription management server.

48. The subscription information managing apparatus according to claim **46**, wherein the login request received and forwarded by the login request relaying unit includes a second information object associated with the subscription information.

49. The subscription information managing apparatus according to claim **46**, wherein the login credentials relaying unit receives, from the communication device, user identity

information indicating a user identity decided as said certain user identity, and forwards the user identity information to the subscription management server.

50. A method for controlling a subscription information managing apparatus for use in a communication device, the subscription information managing apparatus having a subscription information maintaining unit configured to store subscription information issued by a network operator associated with a subscription management server, the method comprising:

a login request relaying step of receiving, from the subscription management server, a login request for requesting login credentials for a certain user identity associated with the subscription information, and forwarding the received login request to the communication device; and

a login credentials relaying step of receiving the login credentials from the communication device, and forwarding the received login credentials to the subscription management server.

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