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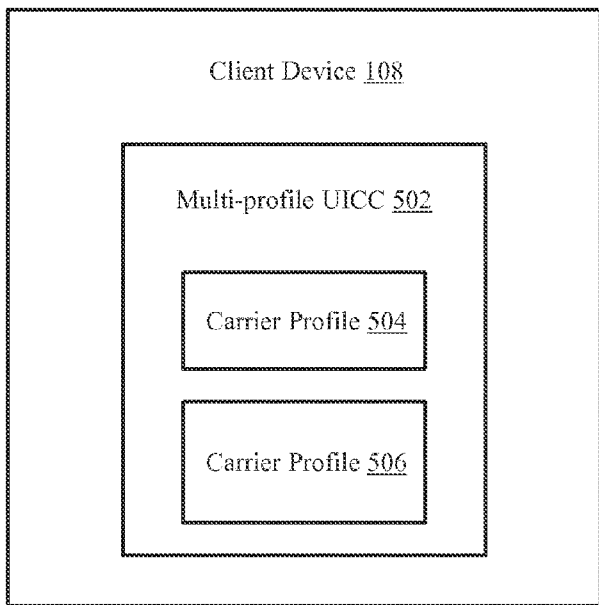


FIG. 5

(57) Abstract: A system and method for accessing a carrier network by a client device. The method includes: receiving a selection of a first plan from a carrier marketplace that includes at least the first plan and a second plan, wherein the first plan corresponds to a first set of services provided by a first carrier network, and the second plan corresponds to a second set of services provided by a second carrier network; downloading a carrier profile from the server device to a multi-profile UICC (Universal Integrated Circuit Card) included in the client device, wherein the carrier profile is associated with the first plan; and storing the carrier profile in the multi-profile UICC.





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SYSTEM AND METHOD FOR RETAIL SIM MARKETPLACE

BACKGROUND

[0001] Mobile devices that connect to wireless communication subscriber networks typically are identified to the network prior to being granted authorization to access network services. One method of providing the identification is through the use of a Subscriber Identity Module (SIM) card. A typical SIM card contains a memory device and associated circuitry such that the memory device of the SIM card can be read by the mobile device. Typically, the SIM card contains a unique serial number such as an Integrated Circuit Card Identifier (ICCID), an International Mobile Subscriber Identity (IMSI), security authentication and ciphering information, temporary information related to any local network, a list of the services to which the mobile device has access, user contact information, and two passwords: a personal identification number (PIN) for ordinary use and a Personal Unlocking Code (PUK) for PIN unlocking.

[0002] During operation, a mobile device utilizes the SIM card to access the subscriber network. In doing so, the mobile device accesses the SIM card to obtain the information stored thereon required to utilize services from the subscriber network. In order to access the stored content, the mobile device typically has the SIM card inserted into a physical holder located within the mobile device. Accordingly, the mobile device is typically designed with an external slot or SIM card holder capable of receiving the SIM card. Further, the mobile device typically is designed with the attendant circuitry to read the stored contents from the SIM card.

[0003] In conventional systems, the SIM card provides the mobile device access to a single carrier network. To overcome this limitation, some mobile devices provide the ability to insert two SIM cards into the mobile device so as to be able to access two different carrier networks corresponding to the two SIM cards. However, this solution has the drawback of requiring two SIM cards as well as specialized hardware (i.e., a specialized mobile device) capable of accepting multiple SIM cards.

SUMMARY

[0004] One embodiment provides a method for accessing a carrier network by a client device. The method includes: receiving a selection of a first plan from a carrier marketplace that includes at least the first plan and a second plan, wherein the first plan corresponds to a first set of services provided by a first carrier network, and the second plan corresponds to a

second set of services provided by a second carrier network; downloading a carrier profile from the server device to a multi-profile UICC (Universal Integrated Circuit Card) included in the client device, wherein the carrier profile is associated with the first plan; and storing the carrier profile in the multi-profile UICC.

[0005] Another embodiment provides a computer-readable storage medium storing instructions that, when executed by a processor, cause a client device to access a carrier network, by performing the steps of: receiving a selection of a first plan from a carrier marketplace that includes at least the first plan and a second plan, wherein the first plan corresponds to a first set of services and the second plan corresponds to a second set of services; transmitting a signal associated with the first plan to a server device; downloading a carrier profile from the server device to a multi-profile UICC (Universal Integrated Circuit Card) included in the client device, wherein the carrier profile is associated with the first plan; and storing the carrier profile in the multi-profile UICC.

[0006] Another embodiment provides a system for accessing a carrier network. The system includes a client device and a server device. The server device is configured to: cause a listing of available carrier network plans to be displayed in a carrier marketplace, wherein a first plan in the carrier marketplace corresponds to a first set of services provided by a first carrier network, and a second plan in the carrier marketplace corresponds to a second set of services provided by a second carrier network, receive a selection of the first plan, provision a carrier profile for the client device associated with the first plan, and transmit a signal to the client device to add the carrier profile to a multi-profile UICC (Universal Integrated Circuit Card) included in the client device.

[0007] Other aspects, objectives and advantages of the disclosure will become more apparent from the following detailed description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] The accompanying drawings incorporated in and forming a part of the specification illustrate several aspects of the present disclosure and, together with the description, serve to explain the principles of the disclosure.

[0009] FIG. 1 is a block diagram of an example communications system in which various embodiments of the present disclosure may be implemented.

[0010] FIG. 2 is a conceptual diagram illustrating an example client device, according to embodiments of the disclosure.

[0011] FIG. 3 is a block diagram of basic functional components for a server or cluster of servers 106, according to embodiments of the disclosure.

[0012] FIG. 4 is a screenshot of a carrier marketplace, according to one embodiment of the disclosure.

[0013] FIG. 5 is a conceptual diagram of a client device that includes a multi-profile SIM card, according to one embodiment of the disclosure.

[0014] FIG. 6 is a flow diagram of method steps performed by a client device for accessing a carrier network, according to one embodiment of the disclosure.

[0015] FIG. 7 is a flow diagram of method steps performed by a server or cluster of servers for providing access to a carrier network, according to one embodiment of the disclosure.

DETAILED DESCRIPTION

[0016] As described above, in conventional systems where the SIM card in a mobile device is associated with a single carrier network, the mobile device has limited options regarding access to the services of the various carrier networks. For example, when a user and the user's mobile device travel internationally, the mobile device could continue to use the mobile device's current carrier plan that is associated with the SIM card of the mobile device. However, the user of the mobile device may not have any understanding of the cost of roaming data, phone, or messaging use, which could be very expensive.

[0017] Another option in conventional systems when the user travels internationally is for the user to purchase a pre-paid SIM card in the country the user is visiting. However, this solution has the added inconvenience of having to purchase a new SIM card in each country that the user visits and install the new SIM card.

[0018] Embodiments of the disclosure provide a new way for users to gain access to other carrier networks and/or service other plans without any of the hassles described above in conventional approaches.

[0019] Embodiments of the disclosure provide for a multi-profile UICC (Universal Integrated Circuit Card). The multi-profile UICC is a SIM card for mobile devices that can multiple store carrier profiles from one or more carriers. The multi-profile UICC can therefore be used to grant access to multiple carrier networks without needing multiple physical SIM cards. Examples of carrier networks include T-Mobile®, Sprint, etc. The mobile device is configured to access one of the carrier profiles stored on the multi-profile SIM card, referred to as the "active carrier profile," which identifies the carrier network that

can be accessed by the mobile device. The mobile device is also configured to add or remove carrier profiles from the SIM card and switch between the carrier profiles to access different carrier networks and/or different carrier plans.

[0020] Some embodiments provide a marketplace for carrier networks to provide access to the services of different carrier networks using a multi-profile UICC. In an example use case, a mobile device has a multi-profile UICC installed therein. A user of the mobile device then travels internationally with the mobile device. Instead of purchasing a replacement SIM card, the user accesses an online marketplace that displays available carrier network offers. For example, the marketplace might show a first option for unlimited talk, text, and data from Carrier 1 for \$50 and a second option for unlimited talk, text, with 1 GB of data for \$40 from Carrier 2. In another example, both options can be offered by the same carrier.

[0021] Continuing with the example, the user may select either the first or second option, and pay for the plan using any technically feasible method. In one implementation, the user can pay for the new carrier plan on the user's current monthly bill, e.g., with the user's primary cell phone provider, or through a third-party. The amount owed can be relayed to the new carrier by the user's primary cell phone provider or the third-party at a later time. In other words, the user continues to pay just one bill, and payment is remitted behind-the-scenes to the carriers used. Once an option is selected by the user in the marketplace, a server then causes a new carrier profile to be installed or activated on the multi-profile UICC in the user's mobile device, which provisions the mobile device with new credentials corresponding to the selected option and carrier network. In some embodiments, the provisioning step is done wirelessly, i.e., "over the air," without the user needing to remove the SIM card from the mobile device. The user can then start using the mobile phone as if the user had purchased a pre-paid SIM for the selected network.

[0022] Also, in some embodiments, two or more of the available plans could be offered by the same carrier. For example, if a user travelled to a region where only one carrier provides service (or one carrier offers service through the marketplace), then the user might be provided with only a single plan or with multiple plans from a single carrier.

[0023] Advantageously, embodiments of the disclosure improve access to different carrier networks and plans on a mobile device. International travelers gain the benefit of competition in the marketplace without any trouble of purchasing new SIM cards. In addition, embodiments of the disclosure increase competition in the wireless marketplace, especially for international travelers.

[0024] FIG. 1 is a block diagram of an example communications system 100 in which various embodiments of the present disclosure may be implemented. The communications system 100 includes a client device 108, wireless networks 102A-102B, and server(s) 106.

[0025] The client device 108 may be a mobile device such as a smart phone, a tablet computer, a laptop computer, a watch with a computer operating system, a personal digital assistant (PDA), a video game console, a wearable or embedded digital device(s), or any one of a number of additional devices capable of communicating over a plurality of wireless networks. Although only one client device is shown in FIG. 1, multiple client devices are within the scope of the disclosure.

[0026] The wireless networks 102A-102B provide services to the client device 108, such as voice, text, and data services. The wireless networks 102A-102B may provide data service (i.e., "Internet" service), cellular phone service, text messaging service, SMS (Short Message service), and/or any other services. For example, mobile device 102 may transmit information to the wireless networks 102A-102B and receive information from the wireless networks 102A-102B. The wireless networks 102A-102B may include a set of cell towers, as well as a set of base stations and/or mobile switching centers (MSCs).

[0027] In one embodiment, each wireless network 102A, 102B is associated with a different cellular carrier network. In some embodiments, the client device 108 can connect to the wireless network via a multi-profile SIM card on the client device 108 that securely stores the international mobile subscriber identity (IMSI) and related key used to identify and authenticate the subscriber of the client device 108. Although only two wireless networks are shown in FIG. 1, multiple additional wireless networks are within the scope of the disclosure.

[0028] The wireless networks 102A-102B include but are not limited to Wide Area Networks (WAN) such as a Long Term Evolution (LTE) network, a Global System for Mobile Communications (GSM) network, a Code Division Multiple Access (CDMA) network, a Wideband Code Division Multiple Access (WCDMA) network, Wireless Local Area Networks (WLAN) such as the various Wi-Fi networks operating under the various IEEE 802.11 standards, or any other kind of wireless network.

[0029] As an aside, whether because of technological limitations or geographic limitations, not every client device of the plurality of client devices will be able to connect to each of the plurality of wireless networks. For ease of description, embodiments of the disclosure described herein will refer to the client devices 108 communicating with a plurality of wireless networks 102A, 102B, even though it is understood that not every client device will communicate with every wireless network.

[0030] The communications system 100 also includes server 106. Although server 106 is illustrated as a single server, the server 106 could be implemented as a plurality of servers servicing specified geographic locations. Server 106 could also be implemented as a cloud server. A singular server 106 is illustrated for ease of description. This singular server illustration is not intended to limit the disclosure contained herein.

[0031] As the discussion of the various devices, systems and methods contained herein progresses, at points only a singular client device 108 or a singular wireless network may be discussed. In this regard, client device 108 or wireless networks 102A-102B are only referenced as being generally representative of a plurality of client devices and a plurality of wireless networks, respectively. Therefore, the functionality of client device 108 can be imported to the plurality of client devices, and the functionality of wireless networks 102A-102B can be imported to the plurality of wireless networks.

[0032] Additionally, in certain embodiments, the client device 108 may collect location data that indicates a location of the client device 108. In certain embodiments, the location data includes a latitude, a longitude, and a timestamp of when the location data is determined. Generally, the latitude and longitude are collected to a certain precision that allows the location of client device 108 to be determined to within 5 – 100 meters. In doing so, the latitude and longitude data will be coarsened to the sixth decimal digit. One such technique to coarsen the longitude and latitude data is to multiply a raw latitude or longitude measurement by 1,000,000 and truncate any places in the resulting number beyond six digits after the decimal. If collected, the location data may be used to provide access to one or more available plans offered by one or more carrier networks.

[0033] As an aside, the location data will only be collected if a user of the client device 108 has indicated that location data may be collected from the client device 108. In this regard, if the user configures the client device 108 such that location data is not to be collected, then location data for the client device 108 will not be collected.

[0034] In some embodiments, the listing of available plans offered by one or more carrier networks can be determined based on which networks are “visible” to the client device, i.e., as a result of a scan performed by the client device. For example, if the user travels to a certain region (e.g., a foreign country), then the marketplace offers that are relevant to the user are limited to only those for carriers that are visible and usable by the user’s client device in the region. In these embodiments, the list can be determined by scanning for available cellular networks, and not by using a location-based database. As such, some

embodiments provide the ability to filter offers based on what carrier networks are visible to the device as a result of a network scan.

[0035] FIG. 2 is a conceptual diagram illustrating an example client device 108, according to embodiments of the disclosure. In one example, client device 108 shown in FIG. 2 is the same as client device 108 shown in FIG. 1. According to various embodiments, many other embodiments of the client device 108 may be used. In the illustrated embodiment of FIG. 2, the client device 108 includes one or more processors 202, memory 204, a network interface 206, one or more storage devices 208, power source 210, one or more output devices 212, one or more input devices 214, and a multi-profile UICC 218. The client device 108 also includes an operating system 216. Each of the components including the processor 202, memory 204, network interface 206, storage device 208, power source 210, output device 212, input device 214, the multi-profile UICC 218, and the operating system 216 is interconnected physically, communicatively, and/or operatively for inter-component communications. In some embodiments, the operating system 216 is stored in the storage device(s) 208 and/or memory 204. In FIG. 2, the operating system 216 is shown outside of the storage device(s) 208 and memory 204 for ease of description.

[0036] As illustrated, processor 202 is configured to implement functionality and/or process instructions for execution within client device 108. For example, processor 202 executes instructions stored in memory 204 or instructions stored on a storage device 208. Memory 204, which may be a non-transient, computer-readable storage medium, is configured to store information within client device 108 during operation. In some embodiments, memory 204 includes a temporary memory, an area for information not to be maintained when the client device 108 is turned off. Examples of such temporary memory include volatile memories such as random access memories (RAM), dynamic random access memories (DRAM), and static random access memories (SRAM). Memory 204 also maintains program instructions for execution by the processor 202.

[0037] Storage device 208 also includes one or more non-transient computer-readable storage media. The storage device 208 is generally configured to store larger amounts of information than memory 204. The storage device 208 may further be configured for long-term storage of information. In some examples, the storage device 208 includes non-volatile storage elements. Non-limiting examples of non-volatile storage elements include magnetic hard discs, optical discs, floppy discs, flash memories, or forms of electrically programmable memories (EPROM) or electrically erasable and programmable (EEPROM) memories.

[0038] The client device 108 uses network interface 206 to communicate with external devices via one or more networks, such as wireless networks 102A-102B in FIG.1, and other types of networks through which a communication with the client device 108 may be established. Network interface 206 may be a network interface card, such as an Ethernet card, an optical transceiver, a radio frequency transceiver, or any other type of device that can send and receive information. Other non-limiting examples of network interfaces include Bluetooth®, 3G and Wi-Fi radios in client computing devices, and USB.

[0039] The client device 108 includes one or more input devices 214. Input devices 214 are configured to receive input from a user or a surrounding environment of the user through tactile, audio, and/or video feedback. Non-limiting examples of input device 214 include a presence-sensitive screen, a mouse, a keyboard, a voice responsive system, video camera, microphone, or any other type of input device. In some examples, a presence-sensitive screen includes a touch-sensitive screen.

[0040] One or more output devices 212 are also included in client device 108. Output devices 212 are configured to provide output to a user using tactile, audio, and/or video stimuli. Output device 212 may include a display screen (part of the presence-sensitive screen), a sound card, a video graphics adapter card, or any other type of device for converting a signal into an appropriate form understandable to humans or machines. Additional examples of output device 212 include a speaker such as headphones, a cathode ray tube (CRT) monitor, a liquid crystal display (LCD), or any other type of device that can generate intelligible output to a user.

[0041] The client device 108 includes one or more power sources 210 to provide power to the client device 108. Non-limiting examples of power source 210 include single-use power sources, rechargeable power sources, and/or power sources developed from nickel-cadmium, lithium-ion, or other suitable material.

[0042] The client device 108 includes an operating system 216. The operating system 216 controls operations of the components of the client device 108. For example, the operating system 216 facilitates the interaction of the processor(s) 202, memory 204, network interface 206, storage device(s) 208, input device 214, output device 212, and power source 210.

[0043] As described in greater detail herein, the client device 108 also includes a multi-profile UICC (Universal Integrated Circuit Card) 218. The UICC 218 includes a SIM circuit that is configured to have stored thereon multiple carrier profiles. Each carrier profile includes the necessary data to allow the client device 108 to access a different carrier

network. The client device 108 may also include software (as a stand-alone application or as part of the operating system 216) that allows the mobile device 108 to switch which carrier profile of the multiple profiles is the active carrier profile that is currently being used by the mobile device 108 to access a carrier network. For example, the user may choose to use the application to switch to a different active carrier profile when the user travels internationally with the client device 108 or travels outside of the coverage area of the previously current active carrier profile.

[0044] According to various embodiments, the client device 108 may include other elements not shown in FIG. 2, such as a GPS (Global Positioning System) transceiver, an accelerometer, a compass, a light, among other elements.

[0045] FIG. 3 is a block diagram of basic functional components for a server or cluster of servers 106, according to embodiments of the disclosure. In some embodiments, server 106 is configured to be the computer or computers operated by one or more carrier networks to provision and implement the disclosed techniques involving a multi-profile UICC. In other embodiments, the server 106 may be operated by a third-party other than the carrier networks to provision and implement the disclosed techniques involving a multi-profile UICC.

[0046] The server 106 includes one or more processors 302, memory 304, and network interface 306. In some embodiments, each of the components including the processor(s) 302, memory 304, and network interface 306 is interconnected physically, communicatively, and/or operatively for inter-component communications.

[0047] As illustrated, processors 302 are configured to implement functionality and/or process instructions for execution within server 106. For example, processors 302 execute instructions stored in memory 304. Memory 304, which may be a non-transient, computer-readable storage medium, is configured to store information within server 106 during operation. In some embodiments, memory 304 includes a temporary memory, i.e., an area for information not to be maintained when the server 106 is turned off. Examples of such temporary memory include volatile memories such as random access memories (RAM), dynamic random access memories (DRAM), and static random access memories (SRAM). Memory 304 also maintains program instructions for execution by the processors 302.

[0048] The server 106 uses network interface 306 to communicate with external devices via one or more networks, such as the wireless networks 102A-102B of FIG. 1. Such networks may include one or more cellular networks, wireless networks, wired networks, fiber optics networks, and other types of networks through which communication between the server 106 and an external device may be established. Network interface 306 may be a

network interface card, such as an Ethernet card, an optical transceiver, a radio frequency transceiver, or any other type of device that can send and receive information.

[0049] As mentioned above, the server 106 is configured to interact with the wireless networks 102A-102B of FIG. 1 to provision and implement the multi-profile UICC systems and methods disclosed herein. According to certain embodiments, the server 106 is configured to provide a marketplace for wireless carriers to sell their services via service plans. Each plan that is provided by the different wireless carriers may include a certain amount of talk time, number of text messages, and amount of data transfers for a certain price for a certain time frame (e.g., price per month, price per week, etc.). A user can access the marketplace online, by phone, by email or by any other technically feasible technique. In some embodiments, the marketplace can be a physical marketplace, such as a store or a kiosk in a shopping mall.

[0050] A user who desires to add a plan for a certain carrier network to their mobile device can access the marketplace provided by the server 106 and select the desired plan. The server 106 then provisions a carrier profile for the user to be added to the user's mobile device. The carrier profile includes a set of data that provides the necessary information for the user's mobile device to access the carrier network associated with the plan. The server then sends a signal to the mobile device to add or activate the carrier profile on a multi-profile UICC included in the mobile device. In one embodiment, the signal from the server to the client device is in the form of an email to an account associated with the user that provides a link to download the carrier profile. Alternatively, data for the carrier profile can be sent directly to the mobile device, e.g., via Wi-Fi or via NFC (near field communication). In yet another embodiment, the carrier profile for the given carrier network may already be saved on the multi-profile UICC, but may be inactive or deactivated. The signal sent by the server 106 may be an activation signal to activate the carrier profile for the given wireless carrier.

[0051] FIG. 4 is a screenshot of a carrier marketplace, according to one embodiment of the disclosure. As shown, the carrier marketplace in FIG. 4 is a web-based marketplace. A user can access a web address 402 to enter the marketplace. According to various embodiments, the marketplace can be accessed via the mobile device that would gain access to the network of a given wireless carrier if a plan is purchased. In other embodiments, the marketplace can be accessed through another device, such as the user's personal computer.

[0052] As shown in the example in FIG. 4, the marketplace includes options for two plans 404, 406. Plan 404 is associated with Carrier 1, includes features 408 (e.g., unlimited

talk, unlimited text, and unlimited data), and is associated with price 412. Plan 406 is associated with Carrier 2, includes features 410 (e.g., unlimited talk, unlimited text, and 1 GB (gigabyte) data), and is associated with price 414. A user can select one of plans 404, 406 by selecting one of the purchase links 416. As described, in some embodiments, two or more plans can be offered by the same carrier.

[0053] In some embodiments, the choices for which carriers and/or plans are available to be purchased at the marketplace may be based on the country of the user and/or client device that is accessing the marketplace. In some cases, the user browsing the marketplace may be asked to select a country (or a country is selected by default), and the available plans correspond to plans available in that country. For example, the location of the client device may be based on a GPS location of the client device.

[0054] Once the user selects a plan, a server provisions a carrier profile for access to the carrier network associated with the plan. The carrier profile is then delivered to the client device and stored on a multi-profile UICC included in the client device. The client device can then access the services of the carrier network using the carrier profile.

[0055] FIG. 5 is a conceptual diagram of a client device 108 that includes a multi-profile UICC 502, according to one embodiment of the disclosure. As shown, multi-profile UICC 502 includes multiple carrier profiles 504, 506. Additional carrier profiles may also be included on the multi-profile UICC card 502. Each carrier profile provides the necessary information to allow the client device 108 to access a wireless carrier network associated with the carrier profile.

[0056] In some embodiments, the multi-profile UICC 502 is physical SIM card that is inserted into the client device 108. A SIM card can come in various dimensions.

Traditionally, SIM cards are considered a Full-size SIM, a Mini-SIM, a Micro-SIM or a Nano-SIM. The Full-size SIM is approximately 85.6 mm in height, 53.98 mm in width and 0.76 mm in depth. The Mini-SIM is approximately 25 mm in height, 15 mm in width and 0.76 mm in depth. The Micro-SIM is approximately 15 mm in height, 12 mm in width and 0.76 mm in depth. The Nano-SIM is approximately 12.3 mm in height, 8.8 mm in width and 0.67 mm in depth.

[0057] In certain embodiments of the disclosure, the multi-profile UICC 502 is not designed to be inserted into mobile device 102. Rather, the mobile device 108 includes the dedicated memory configured to store a data representation of the multi-profile UICC 502 and the carrier profiles included therein. The dedicated memory may be a separate memory device integrated into the electrical architectural design of the mobile device 108 or may be a

dedicated portion of memory 204 or a dedicated portion of storage device 208, as shown in FIG. 2. The dedicated memory is configured to store the carrier profiles 504, 506 on the multi-profile UICC 502. As the carrier profile data is secure data required for a mobile device 108 to access a subscriber network, the carrier profile data should be stored in a location within the mobile device 108 that will not be corrupted by other programs or applications operating on the mobile device 108. The dedicated memory provides such a secure location for the mobile device 108 to store the carrier profile data such that the carrier profile data can be accessed when necessary in order to provide the client device 108 with access credentials to the carrier network. In this regard, the dedicated memory is a secured dedicated memory.

[0058] As an aside, beyond having the carrier profile data stored in a secure location, the carrier profile data may be encrypted prior to storage. In this regard, an unauthorized user of the mobile device 108 will not be able to read the encrypted carrier profile data from the dedicated memory.

[0059] As described in greater detail herein, in some embodiments, the carrier profiles 504, 506 may be downloaded from a server configured to provision the carrier profiles. In other embodiments, the carrier profiles 504, 506 may be permanently stored on the SIM card 502, but can be deactivated. The deactivated carrier profiles can be activated by the server, e.g., after a user pays for and subscribes for a plan associated with the wireless network and the carrier profile.

[0060] FIG. 6 is a flow diagram of method steps performed by a client device for accessing a carrier network, according to one embodiment of the disclosure. As shown, the method 600 begins at step 602, where a client device accesses a carrier marketplace. In one embodiment, the client device of FIG. 6 is the client device 108 in FIG. 1. As described, the carrier marketplace can be accessed online, over the phone, via email, etc. In another embodiment, another device other than the client device is used to access the carrier marketplace.

[0061] At step 604, the client device selects a plan from the available options in the carrier marketplace. As described, the available options may be based on country or location of the client device, e.g., a GPS location of the client device.

[0062] At step 606, the client device transmits a signal corresponding to the selection of a plan to a server. In some embodiments, the server may be server 106 shown in FIG. 1. The server is configured to provision a carrier profile for the client device to access the carrier network associated with selected plan.

[0063] At step 608, the client device receives a signal at the client device from the server to add or activate a carrier profile for the carrier network associated with the selected plan. The carrier profile can be set as the active carrier profile that will be used by the client device to access a corresponding carrier network.

[0064] At step 610, the client device accesses the carrier network associated with the selected plan via the added or activated carrier profile.

[0065] FIG. 7 is a flow diagram of method steps performed by a server or cluster of servers for providing access to a carrier network, according to one embodiment of the disclosure. As shown, the method 700 begins at step 702, where the server causes a listing of available plans offered by one or more wireless carriers to be displayed in a carrier marketplace.

[0066] At step 704, the server receives a selection of a plan from the available plans in the carrier marketplace. As described, the available plans may be based on country or location of a client device.

[0067] At step 706, the server transmits a signal to a client device to add or activate a carrier profile for the carrier network associated with the selected plan. In one embodiment, the client device may be the client device 108 in FIG. 1. The carrier profile can be set as the active carrier profile that will be used by the client device to access the carrier network associated with the selected plan. The client device then can begin accessing the carrier network associated with the selected plan via the added carrier profile.

[0068] In sum, embodiments of the disclosure provide a marketplace for carriers to sell plans on their respective networks. Users can access the marketplace to select a plan for purchase. A server then provisions a carrier profile for the carrier network associated with the plan. The carrier profile is stored onto a multi-profile UICC included in the mobile device. As described, the multi-profile UICC may not be physical, but rather may be a software construct made up of data stored in the client device that represents a carrier profile stored on a physical SIM card. Once the carrier profile is added to the multi-profile UICC and activated, the client device may begin accessing the carrier network via the added carrier profile.

[0069] Advantageously, embodiments of the disclosure improve access to different carrier networks on mobile devices. For example, international travelers gain the benefit of competition in the marketplace without any added trouble of purchasing and installing new SIM cards. In addition, embodiments of the disclosure can increase competition in the wireless marketplace.

[0070] In situations in which the systems discussed here collect personal information about users, or may make use of personal information, the users may be provided with an opportunity to control whether programs or features collect user information (*e.g.*, information about a user's social network, social actions or activities, profession, a user's preferences, or a user's current location), or to control whether and/or how to receive content from a server that may be more relevant to the user. In addition, certain data may be treated in one or more ways before it is stored or used, so that personally identifiable information is removed. For example, a user's identity may be treated so that no personally identifiable information can be determined for the user, or a user's geographic location may be generalized where location information is obtained (such as to a city, ZIP code, or state level), so that a particular location of a user cannot be determined. Thus, the user may have control over how information is collected about the user and used by a server.

[0071] All references, including publications, patent applications, and patents, cited herein are hereby incorporated by reference to the same extent as if each reference were individually and specifically indicated to be incorporated by reference and were set forth in its entirety herein.

[0072] The use of the terms "a" and "an" and "the" and "at least one" and similar referents in the context of describing the disclosure (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The use of the term "at least one" followed by a list of one or more items (for example, "at least one of A and B") is to be construed to mean one item selected from the listed items (A or B) or any combination of two or more of the listed items (A and B), unless otherwise indicated herein or clearly contradicted by context. The terms "comprising," "having," "including," and "containing" are to be construed as open-ended terms (*i.e.*, meaning "including, but not limited to,") unless otherwise noted. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples provided herein, is intended merely to better illuminate the disclosure and does not pose a limitation on the scope of the disclosure unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the disclosure.

[0073] Preferred embodiments of this disclosure are described herein, including the best mode known to the inventors for carrying out the objectives of the disclosure. Variations of those preferred embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventors expect skilled artisans to employ such variations as appropriate, and the inventors intend for the disclosed embodiments to be practiced otherwise than as specifically described herein. Accordingly, this disclosure includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the disclosure unless otherwise indicated herein or otherwise clearly contradicted by context.

CLAIMS:

1. A method for accessing a carrier network by a client device, the method comprising:
 - receiving a selection of a first plan from a carrier marketplace that includes at least the first plan and a second plan, wherein the first plan corresponds to a first set of services provided by a first carrier network, and the second plan corresponds to a second set of services provided by a second carrier network;
 - transmitting a signal associated with the first plan to a server device;
 - downloading a carrier profile from the server device to a multi-profile UICC (Universal Integrated Circuit Card) included in the client device, wherein the carrier profile is associated with the first plan; and
 - storing the carrier profile in the multi-profile UICC.
2. The method of claim 1, further comprising:
 - accessing a service included in the first set of services from the client device via the first carrier network based on the carrier profile stored in the multi-profile UICC.
3. The method of claim 1, wherein the carrier profile is stored in a dedicated memory device configured for storing the carrier profile separately from other data stored locally at the client device.
4. The method of claim 1, wherein the first plan is associated with a first price and the second plan is associated with a second price in the carrier marketplace.
5. The method of claim 1, wherein the first set of services includes an amount of talk time, a number of text messages, and an amount of data that can be accessed via the client device using the first carrier network during a first time period.
6. The method of claim 1, wherein the multi-profile UICC comprises SIM (Subscriber Identity Module) circuitry.
7. The method of claim 1, wherein the client device is a mobile phone.

8. The method of claim 1, wherein the first carrier network comprises a cellular carrier network.
9. A computer-readable storage medium storing instructions that, when executed by a processor, cause a client device to access a carrier network, by performing the steps of:
 - receiving a selection of a first plan from a carrier marketplace that includes at least the first plan and a second plan, wherein the first plan corresponds to a first set of services and the second plan corresponds to a second set of services;
 - transmitting a signal associated with the first plan to a server device;
 - downloading a carrier profile from the server device to a multi-profile UICC (Universal Integrated Circuit Card) included in the client device, wherein the carrier profile is associated with the first plan; and
 - storing the carrier profile in the multi-profile UICC.
10. The computer-readable storage medium of claim 9, further comprising:
 - accessing a service included in the first set of services from the client device via a first carrier network associated with the first set of services based on the carrier profile stored in the multi-profile UICC.
11. The computer-readable storage medium of claim 9, wherein the carrier profile is stored in a dedicated memory device configured for storing the carrier profile separately from other data stored locally at the client device.
12. The computer-readable storage medium of claim 9, wherein the first plan is associated with a first price and the second plan is associated with a second price in the carrier marketplace.
13. The computer-readable storage medium of claim 9, wherein the first set of services includes an amount of talk time, a number of text messages, and an amount of data that can be accessed via the client device using a first carrier network during a first time period.
14. The computer-readable storage medium of claim 9, wherein the multi-profile UICC comprises SIM (Subscriber Identity Module) circuitry.

15. The computer-readable storage medium of claim 9, wherein the first set of services is provided by a first carrier network; and wherein the second set of services is provided by a second carrier network.
16. The computer-readable storage medium of claim 9, wherein the first set of services and the second set of services are both provided by a first carrier network.
17. A system for accessing a carrier network, the system comprising:
 - a client device; and
 - a server device configured to:
 - cause a listing of available carrier network plans to be displayed in a carrier marketplace, wherein a first plan in the carrier marketplace corresponds to a first set of services provided by a first carrier network, and a second plan in the carrier marketplace corresponds to a second set of services provided by a second carrier network,
 - receive a selection of the first plan,
 - provision a carrier profile for the client device associated with the first plan,and
 - transmit a signal to the client device to add the carrier profile to a multi-profile UICC (Universal Integrated Circuit Card) included in the client device.
18. The system of claim 17, wherein the multi-profile UICC comprises SIM (Subscriber Identity Module) circuitry.
19. The system of claim 17, wherein the carrier profile is stored on the client device in a dedicated memory device configured for storing the carrier profile separately from other data stored locally at the client device.
20. The system of claim 17, wherein the client device is a mobile phone.

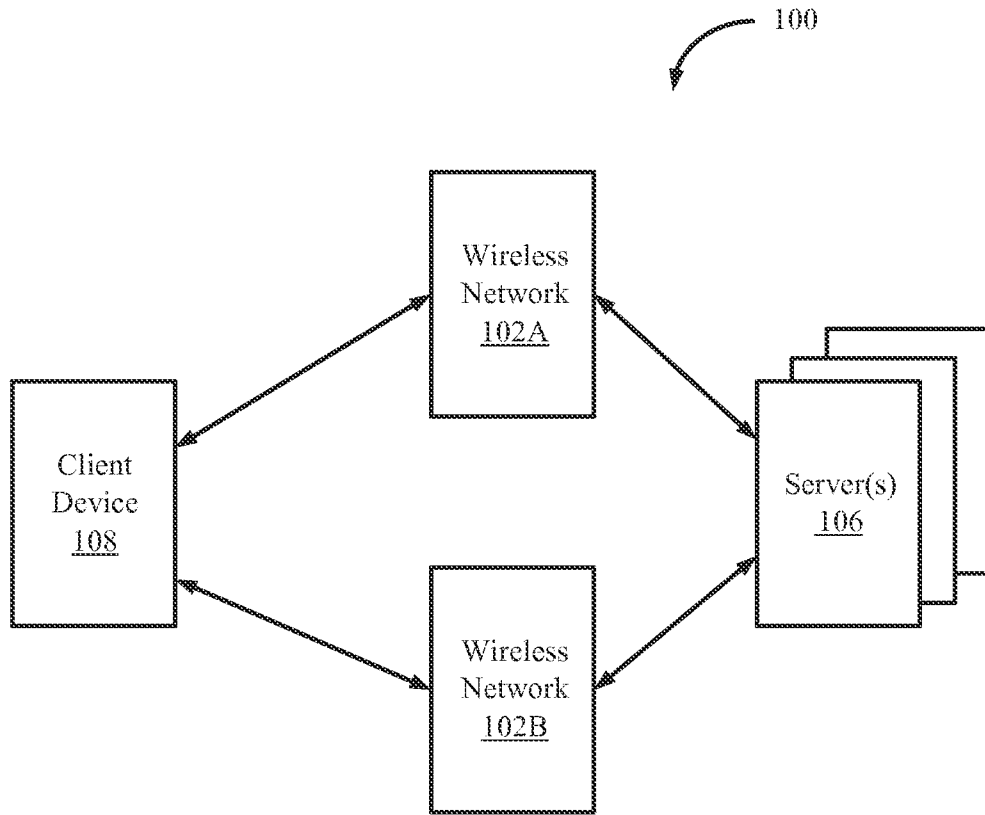


FIG. 1

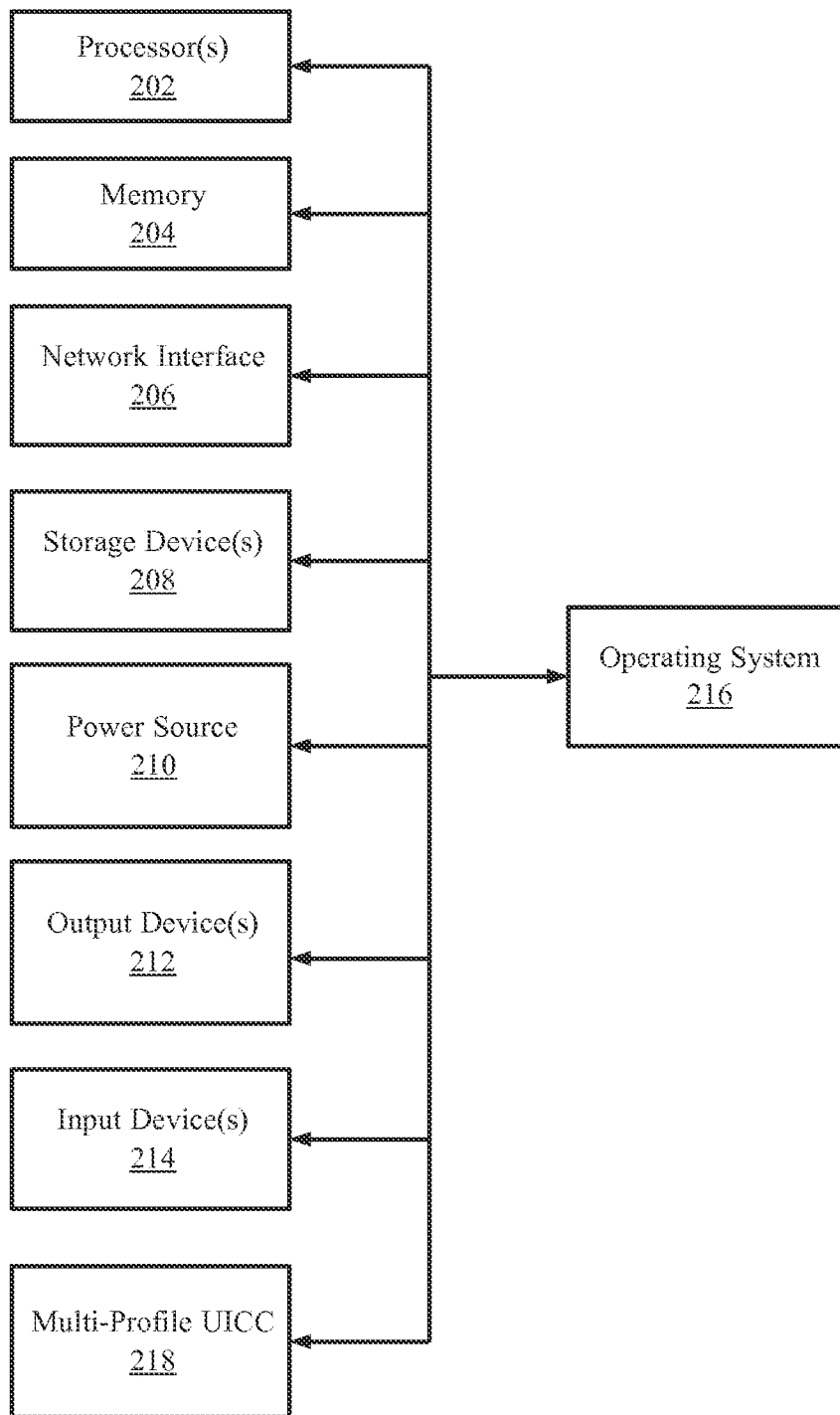


FIG. 2

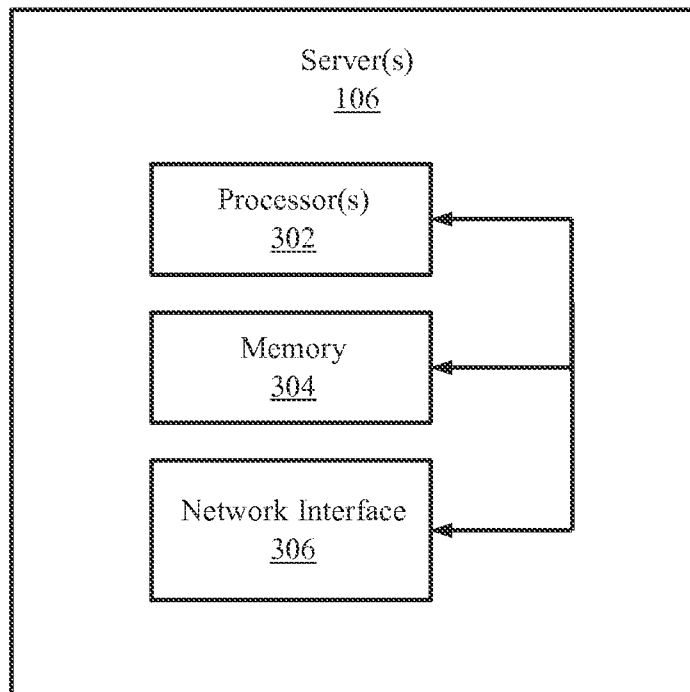


FIG. 3

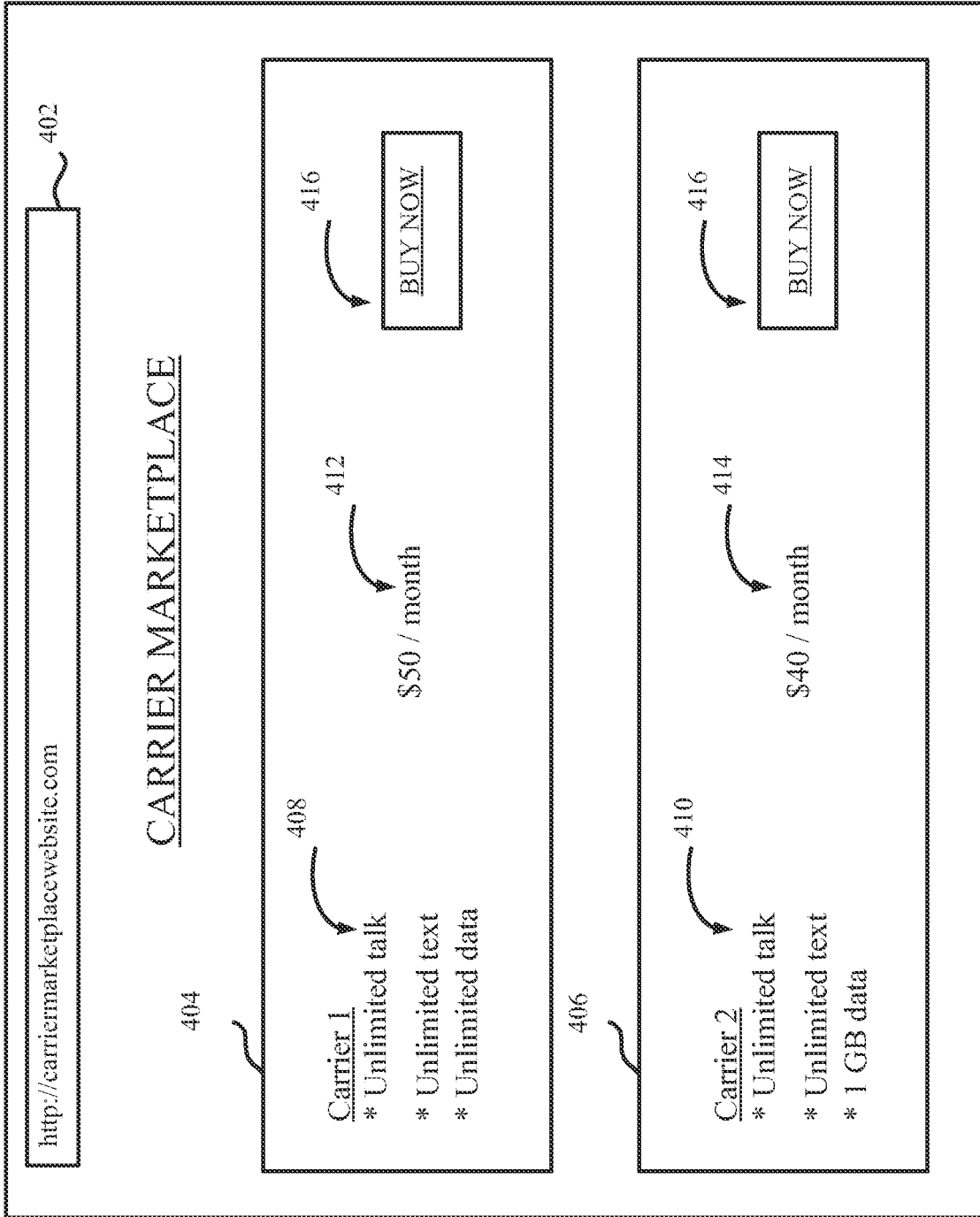


FIG. 4

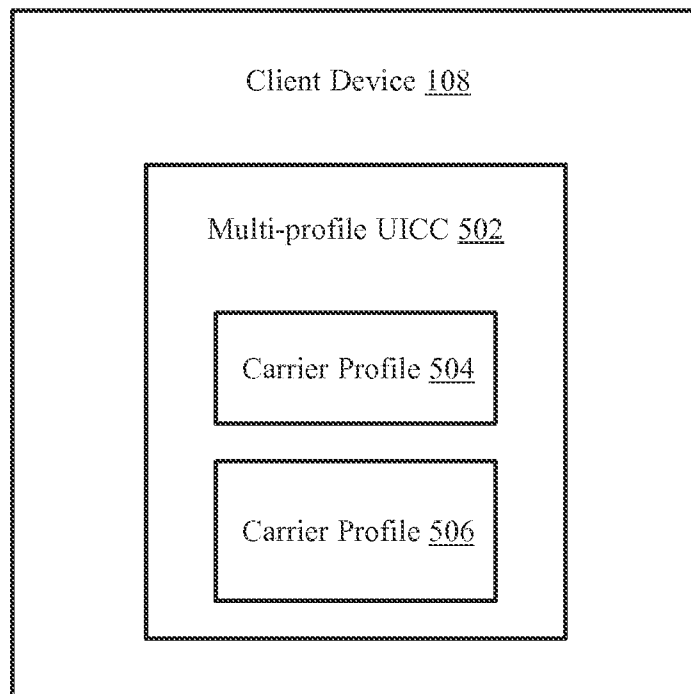


FIG. 5

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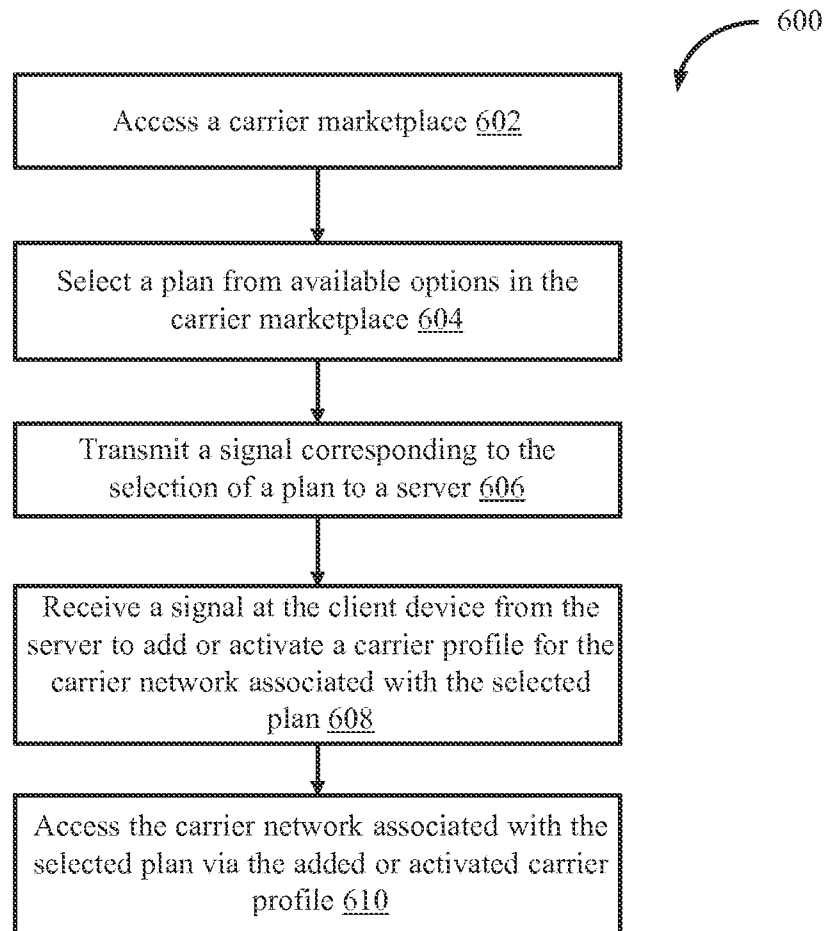
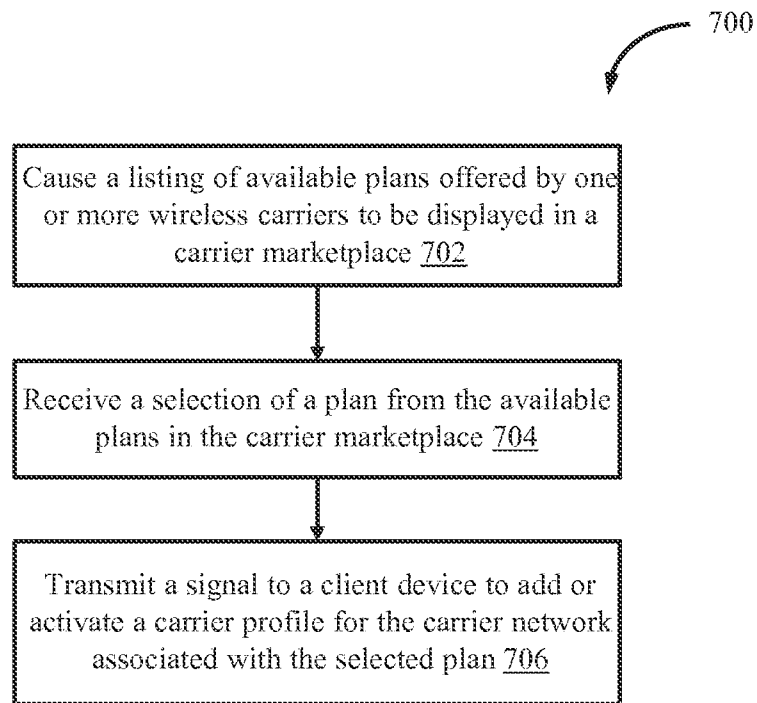


FIG. 6

**FIG. 7**

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2015/040326

A. CLASSIFICATION OF SUBJECT MATTER
 INV. H04W12/06 H04W8/18 H04W48/00 G06Q20/16
 ADD.
 According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
 Minimum documentation searched (classification system followed by classification symbols)
 H04W G06Q

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|---|-----------------------|
| X | US 2013/310001 A1 (MIDKIFF DAVID [US]) 21 November 2013 (2013-11-21) paragraphs [0014], [0020], [0028], [0056] - [0058] ----- | 1-20 |

Further documents are listed in the continuation of Box C.

See patent family annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent but published on or after the international filing date
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- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "&" document member of the same patent family

Date of the actual completion of the international search
 10 September 2015

Date of mailing of the international search report
 18/09/2015

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2015/040326

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|----------------------------|---------------------|
| US 2013310001 | A1 | NONE | |