

DUAL-CHANNEL NETWORK CONNECTION METHOD, TERMINAL, AND SYSTEM

FIELD OF THE INVENTION

[0001] The present invention relates to the field of display technologies, and in particular, to a
5 dual-channel network connection method, terminal, and system.

BACKGROUND OF THE INVENTION

[0002] A SIM (Subscriber Identification Module) card is a chip that stores data such as a digital mobile phone number, subscriber information, subscription data, an encryption key, or a telephone directory of a user. The SIM card can help the user get online. Usually, the SIM card
10 provides a network-accessing service for a region.

[0003] In recent years, communication and learning abroad become more common. A user generally carries some terminal devices when going abroad for communication and learning, and hopes that it is possible to get online anytime and anywhere by the use of a SIM card mounted within the terminal device. The conventional SIM card provides the network-accessing
15 service for a region, but obviously, the conventional SIM card cannot satisfy requirements of the users. In order to reach a possibility of getting online anytime and anywhere, some users purchase several SIM cards, and swap in a corresponding SIM card according to the region where the user is located to get online.

[0004] Although it may be ensured that the user may get online in various regions by means of swapping in the corresponding SIM card, it is inevitable that, whenever the user reaches a
20 place, it takes the user a certain time to purchase a local SIM card from a local business hall, and during this process, a terminal of the user is in an off-line state, which would affect the user experience.

SUMMARY OF THE INVENTION

[0005] On the basis of the foregoing technical problem, an objective of the present invention is to provide a dual-channel network connection method, terminal, and system.
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[0006] According to a first aspect of an embodiment of the present application, there is provided a dual-channel network connection method, including: selecting one card from a SIM card list as a target SIM card according to a preset priority rule and a current state of a terminal, so as to perform network connection, wherein the SIM card list includes at least a group of packet cards, each of which is a SIM card that is usable in several particular countries, and a group of emergency cards, each of which is a SIM card that is usable in any country, and the preset priority rule defines that a priority of a channel card is higher than that of each of the packet cards whose priority is higher than that of each of the emergency cards.

[0007] According to a second aspect of an embodiment of the present application, there is provided a dual-channel network connection system, including a cloud and a terminal, connectable to the cloud, configured to select one card from a SIM card list as a target SIM card according to a preset priority rule and a current state of the terminal, so as to perform network connection, wherein the SIM card list includes at least a group of packet cards, each of which is a SIM card that is usable in several particular countries, and a group of emergency cards, each of which is a SIM card that is usable in any country, and the preset priority rule defines that a priority of a channel card is higher than that of each of the packet cards whose priority is higher than that of each of the emergency cards.

[0008] According to a third aspect of an embodiment of the present application, there is provided a dual-channel network connection terminal, wherein the terminal is configured to select one card from a SIM card list as a target SIM card according to a preset priority rule and a current state of the terminal, so as to perform network connection, wherein the SIM card list includes at least a group of packet cards, each of which is a SIM card that is usable in several particular countries, and a group of emergency cards, each of which is a SIM card that is usable in any country, and the preset priority rule defines that a priority of a channel card is higher than that of each of the packet cards whose priority is higher than that of each of the emergency cards.

[0009] It may be learned from the foregoing technical solutions that embodiments of the present application show a dual-channel network connection method, terminal, and system. According to the method, when powered on, a terminal selects one card from the SIM card list as a target SIM card according to a preset priority rule and a current communication

state of the terminal, where the preset priority rule defines that: a priority of a channel card is higher than that of a packet card whose priority is higher than that of a emergency card. Owing to the selectivity of the target SIM card, even if there is no channel card in the terminal or the channel card in the terminal is determined as invalidity, it is possible for a user to get
5 online through the selected target SIM card. Specifically, the terminal establishes a first communication path by use of the relevant data of the target SIM card; the terminal accesses the cloud through the first communication path to acquire a target VSIM card shared at the cloud, where the target VSIM card is a VSIM card matching with the current state of the terminal; then the terminal establishes a second communication path by use of the
10 relevant data of the target VSIM card, where the terminal can get online through the second communication path. If the channel card in the terminal is determined as validity, the channel card can be used as the target SIM card to get online directly through the first communication path. According to the technical solutions shown in the embodiments of the present application, when a geographical location of the terminal is changed so that a
15 current channel card cannot continue providing a service for the terminal, the terminal can use the first communication path to request, from the cloud, a target VSIM card that can support for use by the terminal at this time. The terminal can get online by use of the target VSIM card.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] In order to more clearly describe the technical solutions of the embodiments of the
20 present invention or in the prior art, the accompanying drawings corresponding to in accordance with the embodiments are briefly described below. Apparently, the accompanying drawings described below illustrate only some embodiments of the present invention, and it is possible that other accompanying drawings may also be derived from these accompanying drawings by one of ordinary skills in the art without an effective effort.

[0011] FIG. 1 is a schematic structural diagram illustrating a dual-channel network connection system in accordance with a preferred embodiment; and

[0012] FIG. 2 is a flowchart illustrating a workflow of a dual-channel network connection system in accordance with a preferred embodiment.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0013] The technical solutions in accordance with the embodiments of the present invention are clearly and completely described below with reference to the accompanying drawings in accordance with the embodiments of the present invention. Obviously, the described
5 embodiments are only some of embodiments of the present invention, not all of embodiments. In view of the embodiments described in the present invention, all other embodiments derived, without an effective effort, by one of ordinary skills in the art fall into the protection scope of the present invention.

[0014] In order to resolve the technical problem existing in the prior art, according to a first
10 aspect of an embodiment of the present application, there is provided a dual-channel network connection system. For a structure of the system, reference may be made to FIG. 1. It may be learned from FIG. 1 that the system includes a cloud and a terminal. For a workflow of the system, reference may be made to FIG. 2.

[0015] Usually, the terminal can establish a communication link to the cloud by use of
15 relevant data of a SIM card, so as to get online.

[0016] The present application involves three types of SIM cards in total: an emergency card, a packet card, and a channel card. Relevant data of the emergency card and relevant data of the packet card are pre-stored in a SIM card list within the terminal. As for the channel card, the relevant data thereof may be pre-stored in the SIM card list; and alternatively, a channel card is
20 requested by the terminal from the cloud, and then relevant data of the requested channel card are written into the SIM card list.

[0017] Configuration processes of the three types of SIM cards are described below in detail.

[0018] (1) The emergency card in this embodiment of the present application is a SIM card for use regardless of countries. The terminal can get online by use of the relevant data of the
25 emergency card in any country. A group of emergency cards are configured for the terminal during manufacture of the terminal, wherein the relevant data of the emergency cards are written into the SIM card list.

[0019] In a solution shown in this embodiment of the present application, 2-3 emergency cards are randomly selected as a group of emergency cards, according to a ratio that each of the
30 emergency cards supports 1000-2000 terminals. During the manufacture of the terminal,

relevant data of emergency cards included in the group of emergency cards are written into the SIM card list of the terminal.

[0020] By use of an allocation manner of the emergency cards shown in the embodiment of the present application, on one hand, an issue can be avoided that a large amount of emergency cards are in an idle state; and on the other hand, it may be ensured that there is a dedicated emergency card available to each of the terminals for service at any time.

[0021] Specifically, the inventor finds in practices that a proportion of terminals, which are on at the same time, to all terminals is less than 5%. If each of the terminals is configured with a dedicated emergency card, there are 95% of the emergency cards which may be in the idle state at a same moment. By use of the allocation manner shown in the embodiment of the present application that each of the emergency cards supports 1000-2000 terminals, the issue may be avoided that a large amount of emergency cards are in the idle state. Further, 2-3 emergency cards are allocated to each of the terminals to provide services therefor, and any two of the terminals share at most one emergency card. By use of the allocation manner shown in the embodiment of the present application, it may be ensured that there is a dedicated emergency card available to each of the terminals for service at any time. For example, when a first terminal requests for connecting to a network by use of relevant data of a first emergency card, the first emergency card is coincidentally in service for a second terminal. In this case, the first emergency card is released from a SIM card list corresponding to the second terminal. And then the first terminal and the second terminal both select another emergency card, from the respective SIM card lists, to connect the network. Because the first terminal and the second terminal share at most one emergency card, when the first terminal and the second terminal reselect emergency cards, the emergency cards reselected by the first terminal and the second terminal are certainly not the emergency card shared by the first terminal and the second terminal. At this time, the first terminal and the second terminal can access the network by use of their respective selected emergency cards. In view of the above, by use of the allocation manner shown in the embodiment of the present application, it may be ensured that there is a dedicated emergency card available to each of the terminals for service at any time.

[0022] (2) The packet card in the embodiment of the present application is a SIM card for use in several particular countries, and only when the terminal is located in any one of the several

particular countries, the terminal can achieve a function of getting online by use of relevant data of the packet card. Usually, a group of packet cards are configured for the terminal when the terminal is to leave the factory for operation, and the relevant data of the packet cards are written into the SIM card list of the terminal.

5 **[0023]** (3) The channel card in the embodiment of the present application is a SIM card that is usable in one particular country, and only when the terminal is located in this country, the terminal can achieve a function of getting online by use of relevant data of the channel card. Usually, within a geographic range of this country, the channel card can be used for a plurality of carriers. Usually, during a use process, the terminal is configured with one channel card, and
10 the relevant data of the channel card are written into the SIM card list.

[0024] On the basis of the foregoing configuration processes, in some feasible embodiments, the SIM card list corresponding to a terminal includes the relevant data of one channel card, the relevant data of a plurality of packet cards, and the relevant data of a plurality of emergency cards. In some other feasible embodiments, the SIM card list includes only the relevant data of
15 the plurality of packet cards and the relevant data of the plurality of emergency cards.

[0025] The terminal can select a target SIM card so that a network can be accessed by use of the target SIM card. Specifically, processes for the terminal to select one target SIM card to access the network are described as follows.

[0026] In this embodiment, after being powered on, the terminal first determines whether
20 there are relevant data of a channel card stored in the SIM card list, and determines whether the channel card is valid if there is a channel card. If there are the relevant data of the channel card stored in the SIM card list, the terminal first establishes, by use of the relevant data of the channel card, a first communication path to a carrier server to which the channel card is most recently accessed, and tries to access the network through the first communication path. If the
25 terminal cannot access the network, it is further determined whether the present channel card of the terminal can be used in the location of the terminal. In this case, the terminal may select a target SIM card from the relevant data of the packet cards and the emergency cards to access the network by use of the relevant data of the target SIM card so as to determine whether the present channel card of the terminal can be used in the location of the terminal. If it is
30 determined that the present channel card can be used in the location of the terminal, the terminal

establishes a first communication path to another carrier server still by use of the relevant data of the channel card so as to access the network through the first communication path. If the channel card cannot successfully access the network, it is proved that the terminal is transferred to a different country or the channel card is invalid. If there are not the relevant data of the channel card in the SIM card list or the channel card is determined as invalidity, the terminal may select one card, as a target SIM card, from the packet cards and the emergency cards according to a preset priority rule, and request for a target VSIM card (virtual SIM, which implements functions of the SIM card based on pure software of an operating system) for the terminal by accessing the network through a first communication path established by use of the relevant data of the target SIM card, so that the terminal can establish a second communication path by use of relevant data of the target VSIM card, and can achieve a function of getting online by accessing network through the second communication path. In addition, after the network is connected through the second communication path, the target SIM card in use may be released so that the target SIM card may be usable by other terminals. When the packet card or the emergency card selected as the target SIM card is released, the terminal may request for a channel card from the cloud, which can be used in the location of the terminal, and establish a first communication path based on relevant data of the channel card and keep the first communication path to be in an online state all the time until two cases occur, in one of which the terminal is powered off and in the other of which the location of the terminal is changed. For the case in which the terminal is powered off, the channel card may be retained in the SIM card list for a period of time, and if a shutdown duration of the terminal is longer than a preset retention duration of the channel card, the relevant data of this channel card is released from the SIM card list so as to be usable by other terminals.

[0027] A process of selecting one card, as a target SIM card, from the packet cards and the emergency cards according to a preset priority rule when there are not the relevant data of the channel card in the SIM card list or the channel card is determined as invalidity is described below in detail.

[0028] Referring to Fig. 1, which is a schematic structural diagram illustrating a dual-channel network connection system in accordance with a preferred embodiment. The terminal in this embodiment of the present application is configured with a main control module 21, a

secondary card channel module 22, and a SIM card virtualizer 23. The main control module 21 includes a selection module, a VSIM card acquirement module, and a state analysis module. The main control module 21 stores a SIM card list for recording the relevant data of each of SIM cards.

5 **[0029]** The secondary card channel module 22 is configured to establish a first communication path by use of the relevant data of the target SIM card.

10 **[0030]** The VSIM card acquirement module in the main control module 21 is configured to access a cloud through the first communication path, to acquire a target VSIM card shared at the cloud, where the target VSIM card is a VSIM card matching with the current state of the terminal.

15 **[0031]** The SIM card virtualizer 23 is configured to establish a second communication path by use of relevant data of the target VSIM card.

20 **[0032]** The state analysis module in the main control module 21 is configured to acquire the current state of the terminal in a real time manner, and send the current state to the selection module. The current state may include a current location information of the terminal, strength of a network signal corresponding to each carrier, or a message about network connectivity.

25 **[0033]** After receiving information about the current state of the terminal, the state analysis module analyzes the information about the current state to acquire an analyzed current state, and sends the analyzed current state to the selection module.

30 **[0034]** Finally, the selection module selects a most appropriate target SIM card for the terminal according to the analyzed current state and a preset priority rule. The preset priority rule defines that: a priority of the packet card is higher than that of the emergency card.

35 **[0035]** The process of the selecting of the target SIM card from the packet cards is as follows. The selection module first analyses information about a location where the terminal is located according to the current state reported by the state analysis module so as to acquire a "country code"; subsequently, packet cards are screened out based on the SIM card list, so as to acquire a packet card list which records regions for which each packet card provides services; and finally, packet cards matching with the "country code" are searched out from the packet card list as candidate packet cards, all of which form a candidate packet card set, and normalized service attributes of all candidate packet cards are stored in the candidate packet card set. The selection

module selects, from the candidate packet card set, a candidate packet card with an optimal service attribute as a to-be-accessed SIM card.

[0036] The selecting of the candidate packet card with the optimal service attribute includes processes as follows. According to the technical solutions shown in the embodiments of the present application, the respective service attributes are normalized. For example, a data tariff of each of packet cards is converted into a fee per megabyte of data so as to acquire the normalized service attribute, which is stored in the SIM card list. A packet card with minimum charge per megabyte of data is the candidate packet card with the optimal service attribute.

[0037] The selecting of the candidate packet card with the optimal service attribute may alternatively include processes as follows. The service attributes of the packet cards in the candidate packet card set may be classified into three types: static state first, charge rate first, and performance first. The selection module can select different preference strategies as allocation strategies according to different service requirements. As for the static state first, a matching degree of each packet card is calculated by matching a corresponding condition specified manually, where a higher matching degree generally indicates a higher priority of the candidate packet card. As for the charge rate first, a series of available candidate packet cards in the SIM card list are ranked according to charge rates, where a lower charge rate generally indicates a higher priority of the candidate packet card. As for the performance first, a series of available candidate packet cards are ranked according to network performance information from the SIM card list, where a higher performance generally indicates a high priority of the candidate packet card. A packet card having a highest priority is the candidate packet card with the optimal service attribute.

[0038] The main control module screens out the candidate packet card with the optimal service attribute as the to-be-accessed packet card. By use of relevant data of the to-be-accessed packet card, the secondary card channel module establishes the first communication path, through which the main control module tries to access the network.

[0039] If the main control module receives, within a preset time, a feedback message indicating that the network is connected, the to-be-accessed packet card is determined as the target SIM card. The main control module accesses the cloud through the first communication path, so as to acquire the target VSIM card shared at the cloud. The SIM card virtualizer

establishes the second communication path by use of the target VSIM card. After the second communication path successfully accesses the network, the target SIM card in use may be released, which is now a packet card, so that the packet card may be usable by other terminals. After the packet card is released, the main control module requests for, from the cloud, a channel card that can be for use in the location where the terminal is. A first communication path is established by use of the relevant data of the channel card, and is kept in an online state all the time.

[0040] If the feedback message indicating that the network is connected is not received within the preset time, the candidate packet card with the optimal service attribute is removed out of the candidate packet card set. Subsequently, the number of the candidate packet cards in the candidate packet card set is counted so as to determine whether the number is greater than zero. If the number is greater than zero, it is proved that there is a packet card in the candidate packet card set that may be used to access the network. In this case, the main control module continues to search the candidate packet card set to screen out the candidate packet card with the optimal service attribute as the to-be-accessed packet card. This operation is repeated until the number of the candidate packet cards in the candidate packet card set becomes zero, or a network-accessing function can be implemented by use of the relevant data of one of the candidate packet cards.

[0041] The selecting of the target SIM card from the emergency cards includes processes as follows. When the number of the candidate packet cards in the candidate packet card set is zero, invoke any of emergency cards from the SIM card list to serve as the target SIM card,. The secondary card channel module establishes the first communication path by use of the relevant data of the target SIM card. And the main control module accesses the cloud through the first communication path, so as to acquire the target VSIM card shared at the cloud. The SIM card virtualizer establishes the second communication path by use of the target VSIM card. After the second communication path successfully accesses the network, the target SIM card in use may be released, which now returns to be an emergency card and may be usable by another terminal. After the emergency card is released, the main control module requests for, from the cloud, a channel card that may be used in the location where the terminal is. A first communication path is established by use of the relevant data of the channel card, and is kept in an online state all

the time.

[0042] Optionally, the terminal further includes a RJ45 interface communication module configured to establish, through a network cable, a service channel, for accessing the Internet, between the main control module and the cloud.

5 **[0043]** In actual applications, the embodiments of the present invention may further support a solution of network roaming based on network cables, so that Wi-Fi access can be implemented by the RJ45 interface communication module of the network roaming terminal when there is a network cable in the location of the terminal. That is, the embodiments of the present invention provide solutions of providing Wi-Fi based on a plurality of network accessing manners. The
10 solutions can be selected and used according to actual situations. Preferably, when the network cable is used, the 2G, 3G, 4G or 5G network can be turned off to further reduce power consumption.

[0044] In view of the above, according to the present application, owing to selectivity of the target SIM card, even if there is no channel card in the terminal or the channel card in the
15 terminal is determined as invalidity, it is possible for a user to get online through the selected target SIM card. Specifically, the terminal establishes a first communication path by use of the relevant data of the target SIM card; the terminal accesses the cloud through the first communication path to acquire a target VSIM card shared at the cloud; and the terminal establishes a second communication path by use of the relevant data of the target
20 VSIM card, where the terminal can get online through the second communication path. The first communication path may provide communication links for loading and authentication of the VSIM card. After the network is connected through the second communication path, the target SIM card in use may be released so that it may be usable by other terminals. When the packet card or the emergency card selected as the target SIM card is released, the terminal may
25 request for a channel card from the cloud, which can be used in the location of the terminal, and establish a first communication path based on relevant data of the channel card and keep the first communication path to be in an online state all the time. The first communication path is kept in an online state all the time, and always provides an efficient and reliable communication link for the terminal. Even if a user location is changed, the user does not need to expend time
30 in purchasing a SIM card for use in this location from a local business hall and may request for

a target VSIM card for the terminal through the first communication path, thus time is saved, and communication efficiency is improved.

[0045] According to a second aspect of an embodiment of the present application, there is provided a dual-channel network connection method, including:

- 5 **[0046]** selecting one card as a target SIM card from a SIM card list according to a preset priority rule and a current state of a terminal, so as to connect to the network, wherein in the SIM card list there are at least a group of packet cards, each of which is a SIM card for use in several particular countries, and a group of emergency cards, each of which is a SIM card for use regardless of countries, and the preset priority rule defines that a priority of a channel card is
- 10 higher than that of each of the packet cards which is higher than that of each of the emergency cards.

[0047] Preferably, the step of the selecting one card, as a target SIM card, from a SIM card list according to a preset priority rule and a current state of a terminal includes:

[0048] detecting whether there is relevant data of the channel card stored in the SIM card list,

- 15 **[0049]** if there is the relevant data of the channel card, determining whether the channel card is valid,

[0050] wherein if there is no relevant data of the channel card in the SIM card list or the channel card is determined as invalidity, the packet card or the emergency card is selected as the target SIM card from the SIM card list according to the preset priority rule and the current state

20 of the terminal, and if the channel card is determined as validity, the channel card is selected as the target card.

[0051] Preferably, if the packet card or the emergency card is selected as the target SIM card, the method further comprises steps of:

[0052] establishing a first communication path by use of relevant data of the target SIM card;

- 25 **[0053]** accessing a cloud through the first communication path to acquire a target VSIM card shared at the cloud, wherein the target VSIM card is a VSIM card matching with the current state of the terminal; and

[0054] establishing a second communication path by use of relevant data of the target VSIM card so as to perform network connection through the second communication path.

- 30 **[0055]** Preferably, if the channel card is selected as the target card, the method further

comprises establishing a first communication path by use of relevant data of the target SIM card so as to perform network connection through the first communication path.

[0056] Preferably, the step of determining whether the channel card is valid comprises:

[0057] reading network-accessing data by use of a carrier server which the channel card most recently accesses, and accessing the network by use of the network-accessing data;

[0058] if a feedback message indicating that the network is connected is received within a preset time, determining the channel card as validity;

[0059] if the feedback message is not received within the preset time, determining whether the channel card can be used in the location where the terminal is; and if it is determined that the channel card cannot be used in the location of the terminal, determining the channel card as invalidity.

[0060] Preferably, the selecting of the packet card or the emergency card, as a target SIM card, from a SIM card list according to a preset priority rule and a current state comprises steps of:

[0061] screening out, from the SIM card list, packet cards as candidate packet cards, that can be used in the location where the terminal is, to acquire a first candidate packet card set;

[0062] invoking service attributes of the candidate packet cards respectively in the first candidate packet card set, for the location of the terminal, and screening out a candidate packet card with an optimal service attribute as a to-be-accessed packet card;

[0063] accessing a network by use of relevant data of the to-be-accessed packet card; and

[0064] if a feedback message indicating that the network is connected is received within a preset time, determining the to-be-accessed packet card as the target SIM card.

[0065] If the feedback message is not received within the preset time, the method further comprises:

[0066] removing the candidate packet card with the optimal service attribute out of the first candidate packet card set, to acquire a second candidate packet card set;

[0067] counting the number of the candidate packet cards in the second candidate packet card set, and determining whether the number is greater than zero;

[0068] if the number is greater than zero, going through the second candidate packet card set to screen out a candidate packet card with an optimal service attribute as a to-be-accessed packet card; and

[0069] if the number is equal to zero, invoking any one of the emergency cards in the SIM card list as the target SIM card.

[0070] Preferably, the step of invoking any one of the emergency cards in the SIM card list as the target SIM card comprises steps of:

5 **[0071]** invoking any one of the emergency cards in the SIM card list as a to-be-accessed emergency card;

[0072] accessing the network by use of relevant data of the to-be-accessed emergency card; and

[0073] if a feedback information indicating that the to-be-accessed emergency card is occupied is received, releasing the to-be-accessed emergency card, and re-invoking any one of the emergency cards in the SIM card list as the target SIM card.

[0074] By use of an allocation manner shown in this embodiment of the present application, it may be ensured that there is a dedicated emergency card or packet card available to each of the terminals for service at any time.

15 **[0075]** Preferably, a group of emergency cards comprises 2-3 emergency cards, and each of which provides services for 1000-2000 terminals; and any two of the terminals share at most one emergency card.

[0076] By use of the allocation manner shown in this embodiment of the present application that each of the emergency cards supports 1000-2000 terminals, it can be avoided that a large amount of emergency cards may be in an idle state. Further, 2-3 emergency cards are allocated to each of the terminals to provide services therefor. Moreover, any two of the terminals share at most one emergency card. By use of the allocation manner shown in this embodiment of the present application, it may be ensured that there is a dedicated emergency card available to each of the terminals for service at any time.

25 **[0077]** According to a third aspect of an embodiment of the present application, there is provided a dual-channel network connection terminal, where the terminal includes:

[0078] a main control module, configured to select a target SIM card from a SIM card list according to a preset priority rule and a current state of the terminal, where the preset priority rule defines that: a priority of a packet card is higher than that of an emergency card;

30 **[0079]** a secondary card channel module, configured to establish a first communication path

by use of relevant data of the target SIM card;

[0080] wherein the main control module is further configured to access a cloud through the first communication path to acquire a target VSIM card shared at the cloud, where the target VSIM card is a VSIM card matching with the current state of the terminal; and

- 5 **[0081]** a SIM virtualizer, configured to establish a second communication path by use of relevant data of the target VSIM card.

[0082] It may be learned from the foregoing technical solutions that embodiments of the present application provide a dual-channel network connection method, terminal, and system. According to the method, when powered on, a terminal selects one card from the SIM card
10 list, as a target SIM card, according to a preset priority rule and a current communication state of the terminal, where the preset priority rule defines that: a priority of channel card is higher than a priority of a packet card which is higher than that of the emergency card. Owing to selectivity of the target SIM card, even if there is no channel card in the terminal or the channel card in the terminal is determined as invalidity, it is possible for a user to get
15 online through the selected target SIM card. Specifically, the terminal establishes a first communication path by use of the relevant data of the target SIM card; the terminal accesses the cloud through the first communication path to acquire a target VSIM card shared at the cloud, where the target VSIM card is a VSIM card matching with the current state of the terminal; and the terminal establishes a second communication path by use of the
20 relevant data of the target VSIM card, where the terminal can get online through the second communication path. If the channel card in the terminal is determined as validity, the channel card can be used as the target SIM card to get online directly through the first communication path. According to the technical solutions shown in the embodiments of the present application, when a geographical location of the terminal is changed so that a
25 current channel card cannot continue providing a service for the terminal, the terminal can use the first communication path to request, from the cloud, a target VSIM card that can support for use by the terminal at this time. The terminal can get online by use of the target VSIM card. Although the user is in a new region, the user does not need to expend time in purchasing, from a local business hall, a SIM card for use in this location, and may request for a VSIM card for
30 the terminal through the first communication path, thus time is saved, and communication

efficiency is improved.

[0083] It should be understood that the present invention is not limited to the exact structure that is described above and is shown in the Drawings, and various modifications and changes can be made thereto, without departing from the scope thereof. The scope of the present

5 invention is defined only by the appended claims.

Claims

1. A dual-channel network connection method, comprising a step of:

selecting one card, as a target SIM card, from a SIM card list according to a preset priority
5 rule and a current state of a terminal,

wherein the SIM card list comprises at least a group of packet cards, each of which is a SIM
card that is usable in several particular countries, and a group of emergency cards, each of which
is a SIM card that is usable in any country, and the preset priority rule defines that a priority of
a channel card is higher than that of each of the packet cards whose priority is higher than that
10 of each of the emergency cards,

wherein if the packet card or the emergency card is selected as the target SIM card, the
method further comprises steps of:

establishing a first communication path by use of relevant data of the target SIM card;

accessing a cloud through the first communication path to acquire a target VSIM card
15 shared at the cloud, wherein the target VSIM card is a VSIM card matching with the
current state of the terminal; and

establishing a second communication path by use of relevant data of the target VSIM
card so as to perform network connection through the second communication path.

20 2. The method according to claim 1, wherein the step of the selecting one card, as a target SIM
card, from a SIM card list according to a preset priority rule and a current state of a terminal
comprises steps of:

detecting whether there are relevant data of the channel card stored in the SIM card list,

if there are the relevant data of the channel card, determining whether the channel card is
25 valid,

if there are no relevant data of the channel card in the SIM card list or the channel card is
determined as invalidity, selecting the packet card or the emergency card, as the target SIM card,
from the SIM card list according to the preset priority rule and the current state of the terminal,
and

30 if the channel card is determined as validity, selecting the channel card as the target card.

3. The method according to claim 1 or 2, wherein if the channel card is selected as the target card, the method further comprises establishing a first communication path by use of relevant data of the target SIM card so as to perform network connection through the first communication path.

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4. The method according to claim 2, wherein the step of determining whether the channel card is valid comprises steps of:

reading network-accessing data by use of a carrier server which the channel card most recently accesses, and accessing the network by use of the network-accessing data;

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if a feedback message indicating that the network is connected is received within a preset time, determining the channel card as validity;

if the feedback message is not received within the preset time, determining whether the channel card is usable in a location where the terminal is; and

15

if it is determined that the channel card is not usable in the location of the terminal, determining the channel card as invalidity.

5. The method according to claim 2, wherein the step of selecting the packet card or the emergency card, as a target SIM card, from a SIM card list according to a preset priority rule and a current state comprises steps of:

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screening out, from the SIM card list, packet cards as candidate packet cards, that are usable in a location where the terminal is, to acquire a first candidate packet card set;

invoking service attributes of the respective candidate packet cards in the first candidate packet card set, for the location of the terminal, and screening out a candidate packet card with an optimal service attribute as a to-be-accessed packet card;

25

accessing a network by use of relevant data of the to-be-accessed packet card; and

if a feedback message indicating that the network is connected is received within a preset time, determining the to-be-accessed packet card as the target SIM card.

6. The method according to claim 5, further comprising:

if the feedback message is not received within the preset time, removing the candidate packet card with the optimal service attribute out of the first candidate packet card set, to acquire a second candidate packet card set;

5 counting a number of the candidate packet cards in the second candidate packet card set, and determining whether the number is greater than zero;

if the number is greater than zero, going through the second candidate packet card set to screen out a candidate packet card with an optimal service attribute as a to-be-accessed packet card; and

10 if the number is equal to zero, invoking any one of the emergency cards in the SIM card list as the target SIM card.

7. The method according to claim 6, wherein the step of invoking any one of the emergency cards from the SIM card list as the target SIM card comprises steps of:

15 invoking any one of the emergency cards in the SIM card list as a to-be-accessed emergency card;

accessing the network by use of relevant data of the to-be-accessed emergency card; and

if a feedback information indicating that the to-be-accessed emergency card is occupied is received, releasing the to-be-accessed emergency card, and re-invoking any one of the
20 emergency cards in the SIM card list as the target SIM card.

8. The method according to claim 1, wherein the group of emergency cards comprises 2-3 emergency cards, and each of which provides services for 1000-2000 terminals; and any two of the terminals share at most one emergency card.

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9. The method according to claim 8, wherein

the 2-3 emergency cards are randomly selected as the group of emergency cards. [0019]

10. The method according to claim 1, wherein

30 the relevant data of the target SIM card is pre-stored in the SIM card list within the terminal.

11. The method according to claim 2, wherein

the relevant data of the channel card is written into the SIM card list after requesting the channel card from a cloud by the terminal.

5 12. The method according to claim 1, wherein if the packet card or the emergency card is selected as the target SIM card, the method further comprises the steps of

releasing the target SIM card after establishing the second communication path; and

requesting another channel card from the cloud for establishing another first communication path.

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13. The method according to claim 1, further comprising a step of

retaining the channel card in the SIM card list within a preset retention duration of the channel card.

15 14. A dual-channel network connection terminal, wherein the terminal is configured to select one card, as a target SIM card, from a SIM card list according to a preset priority rule and a current state of the terminal, so as to perform network connection,

wherein the SIM card list comprises at least a group of packet cards, each of which is a SIM card that is usable in several particular countries, and a group of emergency cards, each of which
20 is a SIM card that is usable in any country, and the preset priority rule defines that a priority of a channel card is higher than that of each of the packet cards whose priority is higher than that of each of the emergency cards,

wherein if the packet card or the emergency card is selected as the target SIM card, the method further comprises steps of:

25

establishing a first communication path by use of relevant data of the target SIM card;

accessing a cloud through the first communication path to acquire a target VSIM card shared at the cloud, wherein the target VSIM card is a VSIM card matching with the current state of the terminal; and

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establishing a second communication path by use of relevant data of the target VSIM card so as to perform network connection through the second communication path.

15. The dual-channel network connection terminal according to claim 14, wherein the SIM card list comprises first relevant data of the packet cards and second relevant data of the emergency cards.

- 5 16. The dual-channel network connection terminal according to claim 14, further comprising
- a main control module configured to store the SIM card list;
 - a secondary card channel module configured to establish a first communication path by the target SIM card; and
 - a SIM card virtualizer configured to establish a second communication path by a
- 10 target VSIM card, wherein the wherein the target VSIM card is a VSIM card matching with the current state of the terminal,

17. The dual-channel network connection terminal according to claim 16, wherein the main control module further comprises

- 15
- a selection module for selecting a most appropriate target SIM card for the terminal according to the current state thereof and the present priority rule;
 - a VSIM card acquirement module configured to access the cloud through the first communication path for acquiring the target VSIM card shared at the cloud; and
 - a state analysis module configured to acquire the current state of the terminal in
- 20 a real time manner and sending the current state to the selection module.

18. The dual-channel network connection terminal according to claim 16 or 17 further comprising a RJ45 interface communication module configured between the main control module and the cloud for establishing access to an Internet.

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19. A dual-channel network connection system, comprising
a cloud; and
a terminal according to any of the claims 14 to 18.