

Description

Method for restoring subscriber-related information in a database system of a communication network.

The invention relates to method for restoring
5 subscriber-related information in a first database system
of a first communication network if the corresponding
subscribers are registered as subscribers both in the
first communication network and in a second communication
network, a second database system for storing subscriber
10 data records containing subscriber-related information
being provided in the second communication network and
there being a possibility that information dependent on
the current location of the subscriber or terminal has to
be restored. Such subscriber- or terminal-related infor-
15 mation can be, for example, information on the current
availability of a subscriber or terminal, or current
terminal-specific facility settings.

In the book by M. Mouly, M.B. Pautet, "The GSM
System for Mobile Communications", 1992, F-91120
20 Paliseau, the updating of the database of the location of
terminals in a mobile radio network and the restoration
of subscriber-related or terminal-related information
within a database after an incident is described
especially on pages 470 to 473. In this case, only
25 information on the availability of a subscriber or
terminal within the mobile radio network is stored and,
respectively, restored. In the method for restoring
information on the location of a terminal within the
mobile radio network, described here, the unsafe, i.e.
30 potentially wrong information is marked as such in a
first step. Then, other units of the mobile radio network
are informed of the unsafe state of this information
whereupon these units, too, mark the corresponding
information as unsafe. To provide

as little load as possible on the signaling load of the communication network, the unsafe data are restored or corrected only if an event related to the subscriber or to the terminal occurs such as, for example, a radio contact initialized by the terminal. To secure such a radio contact within a certain period of time, the information on the location of the subscriber or, respectively, the terminal is updated periodically, for example once a day. The known method, which is only used within a mobile radio network, presupposes that a unit which can provide, for example, information on the current location of a terminal, receives a message that the corresponding data may not be correct because of a fault case. If there is such a message, these data are updated, i.e. corrected if a certain action with respect to the terminal occurs. To secure such an action within a certain period of time, it is known to initiate a periodic radio contact.

It is the object of the present invention to provide a method for restoring subscriber-related or terminal-related information after a fault in a database system of a first communication network for storing such information for the case where a subscriber or terminal can be reached both via the first communication network and via a further communication network, there being a possibility that information dependent on the current location of the subscriber or terminal has to be restored.

This object is achieved by the invention by means of a method having the features of Claim 1. Advantageous embodiments of such a method are the subject matter of subclaims.

To restore subscriber-related information in a first database system of a first communication network

for the case where the corresponding subscribers are registered as subscribers both in the first communication network and in a second communication network, a second database system for storing subscriber data records containing subscriber-related information being provided in the second communication network, a controller for storing in a storage device the subscriber-related information relevant to the first database system from the subscriber data records of the databases of a number of cordless communication systems and for transferring subscriber-related information requested by the first database system to the first communication network is provided in the second communication network. Control of the first database system determines potentially faulty subscriber-related information in the first database system and transfers a request message for requesting the corresponding correct information to the controller of the second communication network.

A development of a method according to the invention provides that the individual cordless communication systems in each case transfer an updating message to the controller if the availability of a terminal allocated to a subscriber via this cordless communication system changes.

The first communication network can be a public communication network comprising a number of cordless communication systems and the second communication network can be a private communication network comprising a number of cordless communication systems. The terminals which can be wirelessly connected are in this case cordless terminals.

The first communication network can be, for example, a mobile radio network. In this case, the terminals which can be wirelessly connected can also be dual-mode terminals comprising a cordless communication part and a mobile radio communication part.

In a preferred embodiment of a method according to the invention, the controller stores in matrix form the subscriber-related information relevant to the first database system.

5 In the text which follows, the invention will be explained in greater detail with reference to an illustrative embodiment and referring to the figure.

The figure shows in a diagrammatic representation a block diagram of a network arrangement consisting of a
10 mobile radio network, a public fixed network and a private network consisting of two cordless communication devices.

The Figure shows in a diagrammatic representation a block diagram of a mobile radio network PLMN comprising
15 a network subsystem NSS for setting up connections between at least one mobile subscriber and other subscribers and for mobility management, and comprising a base station subsystem for controlling the radio links to mobile stations. In the figure, a mobile station is
20 shown as communication terminal KE1 by way of example.

The main unit of the network subsystem NSS is a mobile services switching center (MSC) which communicates with base station controllers (BSC) via an A interface. In the one base station subsystem BSS shown in
25 the Figure, a base station controller BSC is shown which, if needed, connects a number of base stations BTS with the mobile services switching center MSC.

The mobile services switching center MSC is used as the usual switching node and, in addition, provides
30 all functionalities needed for dealing with mobile subscribers such as registration, authentication, updating of the location, call transfer between base stations and

call control to a subscriber registered as present in an area of a base station. The mobile services switching center MSC also establishes connections to the public networks PSTN and, in the example according to the Figure, to another mobile services switching center MSCx and to two cordless communication facilities PINX1, PINX2 of a private network. A home location register HLR and a visitor location register VLR are used, jointly with the mobile services switching center MSC, for call control and location finding of subscriber terminals in the mobile radio network.

Two further registers of the network subsystem NSS, namely an equipment identity register EIR and an authentication register AC are used for authentication and for safety purposes. The equipment identity register EIR contains a list of all mobile sets licensed in the network, each mobile station being identified by its international mobile equipment identity IMEI. In the authentication center AC, copies of all secret keys, stored in each case in the SIM card of the subscriber, are stored which are used for authentication and for encryption via the radio channel.

Accordingly, a database associated with each subscriber is available for each subscriber within the mobile radio network PLM, in which its classes of service, its location and other information are stored retrievably.

The mobile services switching center MSC communicates with the HLR, VLR, AC and EIR registers by using a protocol called MAP (mobile application part protocol). This standardized MAP protocol contains signaling functions which are required for providing services needed in a mobile network.

The figure also shows two cordless communication facilities PINX1, PINX2 of a private network, in each case comprising a switching system VE for setting up and clearing down connections between subscribers. The two
5 cordless communication facilities PINX1, PINX2 are shown to be identical in this figure and will be described only once. The switching system VE contains a switching node SW and a switching controller SC. The switching system VE can be connected to a public communication network PSTN
10 and to the mobile services switching center MSC of the mobile radio network PLMN via a network trunk interface module PLM. The switching system VE can set up connections to communication terminals KE2, KE2' via subscriber line modules SLMD and SLMC. The subscriber
15 line module for digital terminal SLMD shown by way of example in the figure can be connected to a communication terminal KE2 via a line. The cordless subscriber line module SLMC shown in the figure can be connected to a communication terminal KE2' via a base station BS and a
20 radio link.

The figure also shows a storage device MM and a controller SE for storing the subscriber-related information relevant to the first database system DE1 from the subscriber data records of the databases of the
25 cordless communication systems PINX2, PINX1 in the storage device MM.

To restore subscriber-related information in a first database system DE1 of the mobile radio network PLMN for the case where the corresponding subscribers are
30 registered as subscribers both in the mobile radio network PLMN and in the cordless communication network PISN, a controller SE for storing the subscriber-related information relevant to the first database system from the subscriber data records of the databases of a number
35 of cordless communication systems PINX1, PINX2 in the storage device MM is provided in the cordless communication network PISN. The controller SE

is also used for transferring subscriber-related information requested by the first database system DE1 to the mobile radio network PLMN. Control of the first database system DE1 determines potentially faulty subscriber-related information in the first database system DE1 and
5 transfers a request message for requesting the corresponding correct information to the controller SE of the cordless communication network PISN.



Patent claims

1. A method for restoring subscriber-related information in a first database system (DE1) of a first communication network (PLMN) if the corresponding subscribers are registered as subscribers both in the first communication network (PLMN) and in a second communication network (PISN) comprising a number of cordless communication systems (PINX1, PINX2), wherein terminals (KE), which can be wirelessly connected, are allocated to individual subscribers and each of these terminals (KE), which can be wirelessly connected, is registered and can be operated as subscriber terminal in one of the cordless communication systems (PINX1, PINX2) and can be operated as visiting terminal in the remaining cordless communication systems (PINX2, PINX1), and wherein a second database system consisting of a multiplicity of databases of individual cordless communication systems (PINX2, PINX1), of the second communication network (PISN) is provided for storing subscriber data records containing subscriber-related information, characterized in that in the second communication network (PISN), a controller (SE) for storing the subscriber-related information relevant to the first database system from the subscriber data records of the databases of a number of cordless communication systems (PINX2, PINX1) in a storage device (MM) and for transferring subscriber-related information, retrieved from the first database system (DE1), to the first communication network (PLMN) is provided.
2. The method as claimed in claim 1, characterized in that the individual cordless communication systems (PINX2, PINX1) in each case transfer an updating message to the controller (SE) if the availability of a terminal (KE) allocated to a subscriber via this cordless communication system (PINX2, PINX1) changes.
3. The method as claimed in one of the preceding claims, characterized in that the first communication network is a public



communication network comprising a number of cordless communication systems (PINX1, PINX2) and the second communication network (PISN) is a private communication network comprising a number of cordless communication systems (PINX1, PINX2).

4. The method as claimed in one of the preceding claims, characterized in that the terminals (KE) which can be wirelessly connected are cordless terminals.

5. The method as claimed in one of the preceding claims, characterized in that the first communication network is a mobile radio network (PLMN).

6. The method as claimed in one of the preceding claims, characterized in that the terminals (KE) which can be wirelessly connected are dual-mode terminals comprising a cordless communication part and a mobile radio communication part.

7. The method as claimed in one of the preceding claims, characterized in that the subscriber-related information transferred to the controller (DS) of the first database system (DE1) includes at least information on the current availability of the respective subscriber.

8. The method as claimed in one of the preceding claims, characterized in that the controller (SE) stores in matrix form the subscriber-related information relevant to the first database system.