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(54) **SYSTEM AND METHOD OF ACCESSING MOBILE PHONE NETWORK SUBSCRIBER INFORMATION FROM THE TCP/IP NETWORK**

SYSTEM UND VERFAHREN ZUM ZUGREIFEN AUF MOBILTELEFONNETZWERKTEILNEHMERINFORMATIONEN VON DEM TCP/IP-NETZWERK AUS

SYSTEME ET PROCEDE D'ACCES A L'INFORMATION D'UN ABONNE D'UN RESEAU DE TELEPHONIE MOBILE A PARTIR DU RESEAU TCP/IP

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(73) Proprietor: **Vodafone Group PLC**
Newbury Berkshire RG14 2FN (GB)

(72) Inventors:
- **GARCIA ROBLES, Ana**
  E-28005 Madrid (ES)
- **DE LA FUENTE SALCEDO, Carlos**
  E-28080 Madrid (ES)
- **SANTOS HIDALGO, Juan Miguel**
  E-06800 Merida - Badajoz (ES)

(74) Representative: **Davila Baz, Angel**
c/o Clarke, Modet & Co.,
Goya, 11
28001 Madrid (ES)

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Description

OBJECT OF THE INVENTION

[0001] The present invention consists of a system and process for consulting and/or modifying mobile telephone network subscriber parameters from the TCP/IP network, which has the object of allowing for real time access to the subscriber information contained in the mobile telephone network, by means of network applications that are different from those of the mobile telephone network itself and all this in a way that the access is simple for the subscriber, as if it were a question of accessing a conventional data base.

BACKGROUND OF THE INVENTION

[0002] In a mobile telephone network, subscriber information is stored in a node of said network called HLR (Home Location Register; data register of a set of mobile service users). Network user data is stored in said node, such as their IMSI (International Mobile Subscriber Identification), MSISDN (Mobile Station International ISDN Number using the E.164 numbering plan) and the VLR (Visitor Location Register), which is updated every time a new user enters in a new area.

[0003] It is becoming more and more necessary to have real time access to the information contained in the HLR's by means of applications (network elements) for networks which are different from those of the mobile telephone network itself. Currently, the manner of accessing this information from an outside network, specifically from the TCP/IP network, is through provisioning interfaces and O&M, which are the interfaces through which all subscriber parameters are introduced in an HLR, which have the drawback of being unable to handle a large number of requests in real time.

[0004] In the State of the Art, accessing this information is also known by means of protocol converters, which only convert messages from one protocol to another, it is thereby necessary to know what processes the network follows.

[0005] WO-A-98/44747 discloses an implementation in which a web server either directly contacts an HLR of a mobile telephone network using the TCP/IP protocol or goes via an intermediate interface node to which the HLR is connected by a separate network, for example, an X.25 network.

[0006] EP-A-1009175 discloses an implementation in which a wireless data server is connected to a TCP/IP network and to an SS7-based mobile telehone network. For accessing an HLR in the mobile telephone network, the wireless data server receives a request from the TCP/IP network, converts the TCP/IP protocol on the lower layers of the protocol stack to MTP and forwards the request to the HLR in the SS7-based mobile telephone network in order to obtain stored subscriber data.

DESCRIPTION OF THE INVENTION

[0007] The invention relates to a system for consulting and/or modifying mobile telephone network subscriber parameters from a machine in a TCP/IP network, in accordance with claim 1, and to a process in accordance with claim 15. Preferred embodiments of the invention are defined in the dependent claims.

[0008] Using the system and process of the invention, a mobile telephone network subscriber can access a service which in turn accesses a machine in the TCP/IP network in order to make a request concerning a consultation or modification of at least one mobile telephone network subscriber parameter, said machine directing the request towards the mobile telephone network.

[0009] The system of the invention comprises means for receiving the request made by the machine in the TCP/IP network and means for extracting the parameters included in said request, which are necessary for attending to said request.

[0010] The system of the invention furthermore comprises storage means for at least one parameter pertaining to the different mobile telephone network subscribers and means for sending the response to the request made in order to obtain and send the information regarding said parameter to the machine in the TCP/IP network in the case that the request made is a consultation concerning said at least one stored parameter.

[0011] Therefore, by means of the system of the invention, the consultation can be made directly with said system without the necessity of accessing the mobile telephone network.

[0012] Another fundamental feature of the system of the invention consists of having foreseen means for obtaining the necessary mobile telephone network parameters in order for the request to be attended to by said mobile telephone network, such that when the request made is not contained in the storage means for the at least one parameter pertaining to the different mobile telephone network subscribers, the system makes the request to said mobile telephone network.

[0013] The means for obtaining the necessary mobile telephone network parameters in order for the request to be attended to by said mobile telephone network comprise a request management module by means of which it is detected when the request that has been made cannot be attended to by the storage means of at least one parameter pertaining to the different mobile telephone network subscribers, and after said detection it generates a conventional routing obtainment message of a mobile telephone network message in order to access a node of the mobile telephone network in which the subscriber is registered, such that in response to the generated message, this node sends the routing parameters, including part of the necessary parameters, so that the request can be attended to by the mobile telephone network.

[0014] Furthermore, the means for obtaining the nec-

essary mobile telephone network parameters in order for the request to be attended to by said mobile telephone network can comprise a compose and send message module as well as a module for receiving and breaking down messages to the mobile telephone network, in order to send and receive the different messages of said mobile telephone network.

[0015] In an embodiment of the invention, the routing obtainment message of a message in the mobile telephone network is a routing obtainment message of a short message (srifsm), by means of which the HLR node of the mobile telephone network is accessed. In this message, the system of the invention puts the address of the system so that the HLR sends it the necessary mobile telephone network parameters in order to access it. Therefore, by generating the srifsm signal, the system passes itself off as a short message service center (SMSC), the HLR node thereby permits carrying out access and in response, sends it part of the necessary parameters for accessing the network.

[0016] In another embodiment of the invention, the means for obtaining the mobile telephone network parameters directly receive these parameters by means of a mechanism foreseen in the mobile telephone network itself, which has previously been implemented in said network.

[0017] Furthermore, from the parameters obtained by the system, the means for obtaining the necessary mobile telephone network parameters so that the request is attended to by said mobile telephone network acquire the identity of a node in the mobile telephone network with the authority to access the node of the mobile telephone network in which the subscriber is registered in order to allow consulting or modifying at least one mobile telephone network subscriber parameter in said node in which the subscriber is registered, all this from the means for obtaining the mobile telephone network parameters.

[0018] In an embodiment, the mobile telephone network node identity acquired by the means for obtaining the mobile telephone network parameters is that of the VLR in which the subscriber is registered.

[0019] With regard to the means for receiving the request made by the machine in the TCP/IP network and the means for extracting the necessary parameters in order to attend to said request, they can be determined by at least one protocol interface.

[0020] In an embodiment of the invention, a protocol interface has been foreseen for each one of the protocols foreseen in the TCP/IP network for receiving and extracting the parameters according to the different protocols used in the TCP/IP network.

[0021] The request management module can comprise a request control module which collects the parameters provided by the parameters extraction means, and it can furthermore constitute the means for sending the response to the made request to the protocol interface module. Furthermore, the request management module can have a module for requests to the storage means for al least one parameter pertaining to the different mobile telephone network subscribers in order to obtain the at least one parameter when the request concerns a consultation of said parameter.

[0022] It is worth mentioning that the request management module can also comprise a module for requests to the mobile telephone network in order to carry out said request to the mobile telephone network after receiving a request order from the request control module, said request being carried out through the means for composing and sending messages to the mobile telephone network.

[0023] In an embodiment of the invention, the consulted or changed subscriber parameters are stored in the storage means of at least one parameter pertaining to the different mobile telephone network subscribers. Said storage is maintained for a certain, pre-established time period.

[0024] In order to obtain proper system functioning, it can be provided with a configuration directory which stores the necessary configuration data for its proper functioning.

[0025] It is possible that the parameters sent by the machine in the TCP/IP network contain information regarding if it should access the storage means of at least one parameter pertaining to the different mobile telephone network subscribers or if it should directly access said mobile telephone network, such that after extracting the request parameters, the request control module knows where the request is to be made.

[0026] Obviously, as has been described, in the case that the request made contains no information regarding whether to access the storage means of at least one parameter pertaining to the different mobile telephone network subscribers or the mobile telephone network directly, the request management module first accesses the storage means of at least one parameter pertaining to the different mobile telephone network subscribers, and if it cannot obtain information from these means, it then accesses the mobile telephone network in the previously described manner.

[0027] A process is deduced from the disclosed system; from the request made by the machine in the TCP/IP network, the parameters included in said request are extracted, and storage means of at least one parameter pertaining to the different mobile telephone network subscribers are selectively accessed in order to obtain and send the information regarding said parameter to the machine in the TCP/IP network in the case that the request made is a consultation regarding said at least one stored parameter; or the mobile telephone network is accessed when the request made is not contained in the storage means of the at least one parameter pertaining to the different mobile telephone network subscribers.

[0028] For accessing the mobile telephone network, the mobile telephone network parameters can be ob-

tained by means of acquiring the identity of an SMSC, a routing obtainment message for a short message (srifsm) is therefore generated in order to access the mobile telephone network HLR node, putting the system's address in said srifsm message, so that the HLR node responds by means of sending said parameters to the system, the latter receiving the parameters; from which the identity is acquired of the VLR node in which the mobile telephone network subscriber is registered in order to allow consulting or modifying at least one parameter of the mobile telephone network in said HLR node.

[0029] In order to acquire the identity of the VLR node, the address of the VLR in which the subscriber is registered, which was previously received from the HLR, can be sent at a MAP protocol level (mobile application part, which is a standardized protocol using messages so that calling or sending messages through the mobile telephone network is successfully carried out), and in the scope of the SCCP protocol (signal connection control part), which is a standardized protocol used for transferring information between specialized centers and central stations in a system with SS7 signaling (signaling system number 7, a signaling system used by the mobile telephone network switching centers for exchanging necessary information for controlling and supervising the connections between switching centers), the address is placed of the one which is intended to send the response to the request made, sending the result of the request made to the machine in the TCP/IP network.

[0030] It is also worth mentioning that obtaining the necessary mobile telephone network parameters for the request to be attended to by said mobile telephone network can be directly carried out by means of a pre-established mechanism foreseen in the mobile telephone network.

[0031] Therefore, by means of the system and process of the invention, the consultation or modification of at least one parameter of the mobile telephone network can be performed in real time without said mobile telephone network subscriber being aware of it, since, according to the process and system of the invention, the TCP/IP machine performs the access as if it were a conventional data base.

[0032] In order to aid in better understanding this specification and forming an integral part thereof, a set of drawings are attached below which, with an illustrative and non-limiting character, show the object of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0033]

Figure 1.- Shows a functional block diagram of a possible embodiment example of the system of the invention connected to the mobile telephone network and the TCP/IP network.

Figure 2.- Shows a functional block diagram of the request management module shown in the previous figure.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0034] A description of the invention is made below based on the aforementioned figures.

[0035] It is known that a mobile telephone network **3** subscriber accesses a service which accesses a machine **1** in the TCP/IP network **2** in order to make a request regarding a consultation or modification of at least one subscriber parameter, such as, for example, consulting or modifying one of the services offered by the mobile telephone network, but as previously mentioned in the section on the background of the invention, this is not performed in real time in addition to the fact that it does not accept a large number of requests.

[0036] In order to allow real time access, the system **4** of the invention has a protocol interface **5** for each one of the protocols foreseen in the TCP/IP network, such that the system can be understood in any of the protocols used in said network **2**, therefore, there is a protocol interface **5** for each one of the protocols used in the TCP/IP network **2**.

[0037] The protocol interfaces **5** are connected to a request management module **6**, which in turn is connected to a cache memory **7**, to a compose and send messages module **8** and to a receive and break down messages module **9**. In order for the system to properly function, a configuration directory **10** has been foreseen which is a data base where the necessary configuration data is stored for proper system **4** functioning.

[0038] Thus, the protocol interface **5** corresponding to the protocol used in the network **2** extracts the information from the request of the necessary parameters for attending to said request and passes it on to the request management module **6**. Furthermore, said protocol interface **5** is responsible for composing the response in the corresponding protocol and sending it to the machine in the TCP/IP network **1**

[0039] In a preferred embodiment of the invention, the content of the request made by the machine **1**, previously received from the service to which the mobile telephone network subscriber is accessing, comprises the following parameters:

- Request receiver identifier, i.e., the system **4** identifier.
- Request emitter identifier, i.e., the identifier of the machine **1** through which the request is made.
- Request identifier necessary for relating a request to a response.
- The subscriber for whom the request is made.
- The desired operation to be carried out (for example, consulting subscriber parameters or changing parameters in supplementary services).
- If the request is made by first consulting the cache

memory **7** or is made directly to the mobile telephone network **3**.

- The necessary parameter or parameters depending on the operation to be carried out; for example, if the intention is to carry out a consultation operation, the necessary parameters are those which are being consulted, with the indication of if it is to go to the cache **7** or directly to the mobile telephone network **3**; or in the case of wishing to carry out a supplementary service parameter change, with the indication of what supplementary service parameter is to be changed.

[0040] The cache memory **7** is a data base that stores the subscriber data that is consulted or changed, and in an embodiment of the invention, it has a data model with a tree configuration and furthermore, each time a request is made, the data is updated and stored for a certain period of time, i.e. it has a determined expiration.

[0041] Thus, when the consultation to be made indicates that it is to first be carried out in the cache memory **7**, the request management module **6** accesses the former in order to obtain the data of the requested parameter and sends the response to the corresponding protocol interface so that, as previously mentioned, the latter sends the response to the machine **1** in the TCP/IP network **2**, which in turn sends the result of the consultation to the service that carried it out.

[0042] In order to perform this functionality, the request management module **6** has a request control module **11** connected to the cache memory **7** through a module **12** for requests to the cache in order to allow the aforementioned access.

[0043] When accessing the cache **7**, if the parameter to be consulted is not found, or if the previously mentioned different parameters sent by the subscriber indicate to directly access the mobile telephone network in order to make the request, this is detected by the request control module **11** that sends an order to a module **13** for requests to the mobile telephone network, forming part of the request management module **6** (figure 2).

[0044] When it should happen that the mobile telephone network **3** is to be accessed in order to attend to the subscriber's request, the request module **13** is responsible for making the request to the mobile telephone network **3** through the compose and send messages module **8**, which composes and sends the message indicated by the request module **13** in order to access the network.

[0045] Consulting the mobile telephone network **3** begins when the request control module **11** sends to the request module **13** the order to make a request to the mobile telephone network **3**, thereby providing the necessary information to do so (subscriber for whom the request is made, operation to be carried out and necessary parameters for attending to the request).

[0046] In order to make the request to the mobile telephone network **3**, it is necessary to obtain the parameters of said network **3** in order to be able to access the information contained therein. To do so, the system **4** takes on the identity of an SMSC by means of sending an srifsm message (Send Routing Info For Short Messages) which is the message typically used for an SMSC to consult an HLR, which responds to said received message by obtaining the routing information for the short message.

[0047] It is worth mentioning that by sending the srifsm message to the network, the portability is consulted by means of the latter, i.e., it is capable of distinguishing if a subscriber is from another network, the system of the invention will thereby send the message through an STP (Signaling Transfer Point), which is the network node responsible for transferring all network signaling and is therefore responsible for routing the message to the corresponding destination, i.e. to the HLR that can attend to the routing request for a short message, as is conventionally performed.

[0048] Furthermore, in order to allow the system **4** of the invention to receive the routing information pertaining to the network parameters after taking on the identity of an SMSC, in the sent srifsm message it is necessary for the request module **13** to put the address of the system **4** of the invention, obviously stored in the configuration directory **10**, at MAP level (protocol previously mentioned in the section on the description of the invention), such that the response provided by the HLR is directly sent to the system **4** of the invention.

[0049] The response message is collected by the receive and break down messages module **9,** which obtains the VLR, IMSI and HLR network parameters in which the subscriber data is stored, passing this data to the request module **13** which performs the consultation with the mobile telephone network after processing the received information. This operation is carried out by tricking the network **3** such that the latter believes that the operation is carried out by a network node with the authority to carry out this operation that can attend to the subscriber request. It is thereby necessary to carry out a UL (Update-Location) MAP protocol operation, which is the message used for updating the subscriber's position, such that this message makes an HLR return information of the subscriber updating his position to a VLR. In order to perform this operation, it is necessary for the system **4** of the invention to simulate being the VLR in which the subscriber is located. The compose and send messages module **8** is therefore sent information about the operation to carry out a UL, the address of said VLR, the subscriber's IMSI and the HLR to which the operation must be sent, which were obtained in the previous step.

[0050] In order for the network **3** to believe that it is really the VLR performing the operation, the VLR address is placed at the MAP protocol level, and the address of the system **4** of the invention is placed at the SCCP protocol level, such that the network detects that the operation is carried out by the real VLR, but none-

theless, it detects that the response is to be sent to the system **4** of the invention. In this manner, the HLR attends to the request made by sending the response to the system **4,** a response that is collected by the receive and break down messages module **9** which obtains the delivered parameters and passes them to the request management module **6**. Thus, for example, if the TCP/IP machine were to request a supplementary services change instead of requesting subscriber parameters, after obtaining the previously described parameters from the srifsm message, instead of performing a MAP protocol UL operation, it would perform a supplementary service register, erase, activate or deactivate operation, depending on the operation the subscriber wishes to perform. For example, in the case in which the subscriber wishes to register a supplementary service, he sends a conventional register SS message, to erase he sends an erase SS message, to activate he sends an activate SS message, or deactivate SS in the case that he wishes to deactivate a supplementary service.

[0051] Once the request has been made in the case of a parameters consultation, the response corresponds to the value of the requested parameters, and in the case of a supplementary services change, the response is a confirmation that the change has been properly carried out. In either case, as previously mentioned, the request management module **6** returns the response to the protocol interface **5** corresponding to the protocol with which the request was initiated in the TCP/IP network **2**.

[0052] Therefore, by means of the invention, a consultation or modification of at least one mobile telephone network subscriber parameter can be made in real time, and all this focused on the service as if it were accessing a conventional data base.

Claims

1. System for consulting and/or modifying mobile telephone network (3) subscriber parameters from a machine (1) in a TCP/IP network (2), by means of a request regarding a consultation and/or modification of at least one mobile telephone network (3) subscriber parameter stored in a first node of said mobile telephone network and accessible from a second node of said mobile telephone network, said second node being authorized to consult and/or modify said at least one subscriber parameter in said first node, the system (4) comprising:

means (5) for receiving a request made by the machine (1) in the TCP/IP network (2);
means (5) for extracting request parameters included in said request and which are necessary in order to attend to said request;
storage means (7) of at least one subscriber parameter pertaining to each one of the different mobile telephone network subscribers;
means (5) for sending, to the machine (1), a response to the request made, in the case that the request made is a consultation concerning at least one subscriber parameter;
means for obtaining necessary mobile telephone network parameters for obtaining access to the at least one subscriber parameter in said mobile telephone network (3), in order to consult and/or modify said at least one subscriber parameter in said mobile telephone network (3) when said at least one subscriber parameter to be consulted and/or modified is not contained in the storage means (7);

characterized in that

the means for obtaining necessary mobile telephone network parameters comprise:

a request management module (6) arranged to detect when the request made cannot be attended to by the storage means (7) and to, after such detection, generate a routing information obtainment message to the mobile telephone network in order to access said first node of the mobile telephone network, in which the subscriber is registered, so as to obtain, in response, from said first node, routing parameters including the necessary mobile telephone network parameters;

and **in that**

said necessary mobile telephone network parameters include the identity of a second node of the mobile telephone network, said second node having authority to access the first node to consult and/or modify said at least one subscriber parameter,

the system being arranged to acquire from the obtained necessary mobile telephone network parameters, said identity of the second node, and to use said identity for obtaining access to said first node for consulting and/or modifying said at least one subscriber parameter in said first node.

2. System according to claim 1, wherein the means for obtaining the necessary mobile telephone network parameters further comprise a compose and send messages module (8), as well as a module (9) for receiving and breaking down messages, from and to the mobile telephone network, respectively, for sending and receiving different signals to said mobile telephone network.

3. System according to any of the preceding claims, wherein the routing obtainment message is a routing obtainment message for a short message sent to the first node, said routing obtainment message

indicating as an address of sender an address of the system (4), in order that the first node send the routing parameters to said system (4).

4. System according to claim 3, wherein said routing obtainment message for a short message is the message *Send Routing Info For Short Messages srifsm*.

5. System according to any of the preceding claims, wherein the first node is a Home Location Register HLR node of the mobile telephone network (3).

6. System according to any of the preceding claims, wherein access to said first node for consulting and/or modifying said at least one subscriber parameter in said first node is obtained using the *Update-Location* MAP protocol operation or any Supplementary Service MAP protocol operation.

7. System according to any of the preceding claims, wherein the second node is a Visitor Location Register VLR in which the subscriber is registered.

8. System according to any of the preceding claims, wherein the means for receiving a request and the means for extracting request parameters comprise at least one protocol interface (5) for allowing the system (4) to receive and extract the request parameters in the request from the TCP/IP network.

9. System according to claim 8, **characterized in that** it comprises a protocol interface for each one of the protocols foreseen in the TCP/IP network, so as to allow the system to receive and extract the parameters according to the different protocols used in the TCP/IP network.

10. System according to any of claims 8 and 9, **characterized in that** the request management module (6) comprises a request control module (11) arranged to collect the parameters provided by the parameter extraction means (5), said request management module furthermore constituting the means for sending the response to the request made to the protocol interface (5) module; the request management module (6) furthermore comprising a module (12) for requests to the storage means (7) of at least one subscriber parameter in order to obtain said at least one subscriber parameter when the request is a consultation of the latter.

11. System according to claim 10, **characterized in that** the request management module also comprises a module (13) for requests to the mobile telephone network for making said request to the mobile telephone network after receiving a request order from the request control module (11), carrying out said request through the module (8) for composing and sending messages to the mobile telephone network.

12. System according to any of the previous claims, **characterized in that** the storage means (7) is arranged to store the consulted or changed subscriber parameters during a certain time period.

13. System according to any of the previous claims, **characterized in that** it comprises a configuration directory (10) wherein configuration data are stored for proper system functioning.

14. System according to any of the previous claims, **characterized in that** the request parameters received from the machine (1) in the TCP/IP network contain information regarding whether to access the storage means (7) or whether to access the mobile telephone network directly by means of sending said routing information obtainment message.

15. Process for consulting and/or modifying mobile telephone network subscriber parameters from a machine (1) in a TCP/IP network (2), wherein a mobile telephone network subscriber accesses a service by means of his mobile telephone, which in turn accesses the machine (1) in the TCP/IP network (2) in order to make a request regarding a consultation and/or modification of at least one mobile telephone network subscriber parameter, the process comprising the following steps:

extracting request parameters included in said request made by the machine (1), from said request;
selectively accessing storage means (7) of at least one subscriber parameter pertaining to the mobile telephone network subscribers in order to obtain and send the information regarding said subscriber parameter to the machine (1), in the case that the request made is a consultation regarding said subscriber parameter;

characterised in that it further comprises the steps of:

when the subscriber parameter is not contained in the storage means (7),accessing the mobile telephone network by means of sending a routing information obtainment message to the mobile telephone network in order to access a first node of the mobile telephone network, in which the subscriber is registered and in which said at least one subscriber parameter is stored;
obtaining, in response to said routing information obtainment message, from said first node, routing parameters including necessary mobile

telephone network parameters for obtaining access to the at least one subscriber parameter in said first node, said necessary mobile telephone network parameters including the identity of a second mobile telephone network node with authority to access the first node;
acquiring, from said routing parameters, said identity of the second mobile telephone network node;
obtaining, using said identity, access to said first node for consulting and/or modifying at least one subscriber parameter in said first node.

16. Process according to claim 15, **characterized in that** the routing information obtainment message is sent using, as sender identity, the identity of a Short Message Service Center SMSC.

17. Process according to any of claims 15 and 16, wherein the routing information obtainment message is a routing obtainment message for a short message.

18. Process according to claim 17, wherein said routing obtainment message for a short message is the message *Send Routing Info For Short Messages (srifsm).*

19. Process according to any of claims 15-18, wherein the first node is a Home Location Register (HLR) node of the mobile telephone network (3).

20. Process according to any of claims 15-19, wherein access to said first node for consulting and/or modifying said at least one subscriber parameter in said first node is obtained using the *Update-Location* MAP protocol operation or any Supplementary Service MAP protocol operation.

21. Process according to any of claims 15-20, wherein the second node is a Visitor Location Register (VLR) node of the mobile telephone network (3).

22. Process according to any of claims 15-21, wherein, in the step of obtaining, using said identity, access to said first node for consulting and/or modifying at least one subscriber parameter in said first node, the address of the second node, received from the first node, is sent at the Mobile Application Part MAP protocol level, and an address to which a response should be sent, is sent in the area of the Signal Connection Control Part SCCP protocol.

Patentansprüche

1. System zum Abfragen und/oder Modifizieren von Teilnehmerparametern eines Mobiltelefon-Netzwerks (3) von einer Maschine (1) in einem TCP/IP-Netzwerk (2) mittels einer Anforderung in Bezug auf eine Abfrage und/oder Modifizierung von mindestens einem Teilnehmerparameter eines Mobiltelefon-Netzwerks (3), der in einem ersten Knoten des Mobiltelefon-Netzwerks gespeichert und von einem zweiten Knoten des Mobiltelefon-Netzwerks aus zugänglich ist, wobei der zweite Knoten berechtigt ist, mindestens einen Teilnehmerparameter in dem ersten Knoten abzufragen und/oder zu modifizieren, wobei das System (4) umfasst:

Mittel (5) zum Empfangen einer Anforderung, die durch die Maschine (1) in dem TCP/IP-Netzwerk (2) vorgenommen wurde;

Mittel (5) zum Extrahieren von Anforderungsparametem, die in der Anforderung enthalten sind, und die erforderlich sind, um die Anforderung zu bedienen;

Speichermittel (7) für mindestens einen Teilnehmerparameter, der zu jedem der verschiedenen Teilnehmer eines Mobiltelefon-Netzwerks gehört;

Mittel (5), um an die Maschine (1) eine Antwort auf die getätigte Anforderung zu senden in dem Fall, das die getätigte Anforderung eine Abfrage ist, die mindestens einen Teilnehmerparameter betrifft;

Mittel zum Erhalten erforderlicher Parameter des Mobiltelefon-Netzwerks, um Zugriff auf den mindestens einen Teilnehmerparameter in dem Mobiltelefon-Netzwerk (3) zu erhalten, um mindestens einen Teilnehmerparameter in dem Mobiltelefon-Netzwerk (3) abzufragen und/oder zu modifizieren, wenn der mindestens eine Teilnehmerparameter, der abgefragt und/oder modifiziert werden soll, nicht in den Speichermitteln (7) enthalten ist;

dadurch gekennzeichnet, dass
die Mittel zum Erhalten erforderlicher Parameter für ein Mobiltelefon-Netzwerk umfassen:

ein Anforderungsverwaltungs-Modul (6), das so gestaltet ist, dass es erfasst, wenn die getätigte Anforderung durch die Speichermittel (7) nicht bedient werden kann, und das nach einer derartigen Erfassung eine Nachricht zum Erlangen einer Leitweginformation an das Mobiltelefon-Netzwerk generiert, um auf den ersten Knoten des Mobiltelefon-Netzwerks zuzugreifen, in dem der Teilnehmer registriert ist, um als Antwort von dem ersten Knoten Leitwegpara-

meter zu erhalten, einschließlich der erforderlichen Parameter der Mobiltelefon-Netzwerks;

und **dadurch**, dass
die erforderlichen Parameter des Mobiltelefon-Netzwerks die Identität eines zweiten Knotens in dem Mobiltelefon-Netzwerk enthalten, wobei der zweite Knoten die Berechtigung besitzt, auf den ersten Knoten zuzugreifen, um den mindestens einen Teilnehmerparameter abzufragen und/oder zu modifizieren,
wobei das System so ausgelegt ist, dass es aus den erhaltenen erforderlichen Parametern des Mobiltelefon-Netzwerks die Identität des zweiten Knotens erlangt und die Identität verwendet, um Zugang zu dem ersten Knoten zu erhalten, um den mindestens einen Teilnehmerparameter in dem ersten Knoten abzufragen und/oder zu modifizieren.

2. System nach Anspruch 1, wobei die Mittel zum Erhalten der erforderlichen Parameter des Mobiltelefon-Netzwerks des Weiteren ein Modul (8) zum Verfassen und Senden von Nachrichten sowie ein Modul (9) zum Empfangen und Aufschlüsseln von Nachrichten von und zu dem Mobiltelefon-Netzwerk bzw. zum Senden und Empfangen verschiedener Signale zu und von dem Mobiltelefon-Netzwerk aufweisen.

3. System nach irgendeinem der vorhergehenden Ansprüche, wobei die Nachricht zum Erlangen eines Leitwegs eine Nachricht zum Erlangen eines Leitwegs für eine Kurznachricht ist, die an den ersten Knoten gesendet wird, wobei die Nachricht zum Erlangen eines Leitwegs als eine Absenderadresse eine Adresse des Systems (4) angibt, damit der erste Knoten die Leitwegparameter an das System (4) sendet.

4. System nach Anspruch 3, wobei die Nachricht zum Erlangen eines Leitwegs für eine Kurznachricht die Nachricht *Send Routing Info For Short Messages srifsm* ist.

5. System nach irgendeinem der vorhergehenden Ansprüche, wobei der erste Knoten ein Heimatregister- HLR Knoten des Mobiltelefon-Netzwerks (3) ist.

6. System nach irgendeinem der vorhergehenden Ansprüche, wobei der Zugriff auf den ersten Knoten zum Abfragen und/oder Modifizieren des mindestens einen Teilnehmerparameters in dem ersten Knoten erhalten wird, indem der *Update-Location* MAP-Protokollvorgang oder irgendein Supplementary Service MAP-Protokollvorgang verwendet wird.

7. System nach irgendeinem der vorhergehenden Ansprüche, wobei der zweite Knoten ein Besucherregister- VLR Knoten ist, in dem der Teilnehmer registriert ist.

8. System nach irgendeinem der vorhergehenden Ansprüche, wobei die Mittel zum Empfangen einer Anforderung und die Mittel zum Extrahieren von Anforderungsparametem mindestens eine Protokollschnittstelle (5) aufweisen, um es dem System (4) zu gestatten, die Anforderungsparameter in der Anforderung aus dem TCP/IP-Netzwerk zu extrahieren.

9. System nach Anspruch 8, **dadurch gekennzeichnet, dass** es eine Protokollschnittstelle für jedes der Protokolle aufweist, die in dem TCP/IP-Netzwerk vorgesehen sind, um es dem System zu gestatten, die Parameter gemäß den verschiedenen Protokollen zu empfangen und zu extrahieren, die in dem TCP/IP-Netzwerk verwendet werden.

10. System nach irgendeinem der Ansprüche 8 und 9, **dadurch gekennzeichnet, dass** das Anforderungsverwaltungs-Modul (6) ein Anforderungssteuermodul (11) aufweist, das so ausgelegt ist, dass es die Parameter sammelt, die von den Parameter-Extrahierungsmitteln (5) bereitgestellt werden, wobei das Anforderungsverwaltungs-Modul des Weiteren die Mittel zum Senden der Antwort auf die Anforderung bildet, die an das Modul der Protokollschnittstelle (5) getätigt wurde; das Anforderungsverwaltungs-Modul (6) weist des Weiteren ein Modul (12) für Anforderungen an die Speichermittel (7) von mindestens einem Teilnehmerparameter auf, um den mindestens einen Teilnehmerparameter zu erhalten, wenn die Anforderung eine Abfrage des Letzteren ist.

11. System nach Anspruch 10, **dadurch gekennzeichnet, dass** das Anforderungsverwaltungs-Modul auch ein Modul (13) für Anforderungen an das Mobiltelefon-Netzwerk aufweist, um die Anforderung an das Mobiltelefon-Netzwerk vorzunehmen, nachdem ein Anforderungsbefehl von dem Anforderungssteuermodul (11) empfangen wurde, das die Anforderung über das Modul (8) zum Verfassen und Senden von Nachrichten an das Mobiltelefon-Netzwerk ausführt.

12. System nach irgendeinem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Speichermittel (7) so ausgelegt sind, dass sie die abgefragten oder geänderten Teilnehmerparameter während einer gewissen Zeitdauer speichern.

13. System nach irgendeinem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** es ein

Konfigurationsverzeichnis (10) aufweist, in dem Konfigurationsdaten für den einwandfreien Systembetrieb gespeichert sind.

14. System nach irgendeinem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Anforderungsparameter, die von der Maschine (1) in dem TCP/IP-Netzwerk empfangen werden, Informationen enthalten in Bezug darauf, ob auf die Speichermittel (7) zugegriffen werden soll, oder ob direkt auf das Mobiltelefon-Netzwerk zugegriffen werden soll, indem die Nachricht zum Erlangen der Leitweginformationen gesendet wird.

15. Verfahren zum Abfragen und/oder Modifizieren von Teilnehmerparametern eines Mobiltelefon-Netzwerks von einer Maschine (1) in einem TCP/IP-Netzwerk (2), wobei ein Teilnehmer eines Mobiltelefon-Netzwerks auf einen Dienst über sein Mobiltelefon zugreift, das wiederum auf die Maschine (1) in dem TCP/IP-Netzwerk (2) zugreift, um eine Anforderung vorzunehmen in Bezug auf eine Abfrage und/oder Modifizierung von mindestens einem Teilnehmerparameter des Mobiltelefon-Netzwerks, wobei das Verfahren die folgenden Schritte aufweist:

Extrahieren von Anforderungsparametern, die in der Anforderung enthalten sind, die durch die Maschine (1) vorgenommen wurde, aus der Anforderung;

selektives Zugreifen auf Speichermittel (7) von mindestens einem Teilnehmerparameter, der zu den Teilnehmern des Mobiltelefon-Netzwerks gehört, um Informationen, die sich auf den Teilnehmerparameter beziehen, zu erhalten und an die Maschine (1) zu senden in dem Fall, dass die getätigte Anforderung eine Abfrage in Bezug auf den Teilnehmerparameter ist,

dadurch gekennzeichnet, dass es des Weiteren die folgenden Schritte aufweist:

wenn der Teilnehmerparameter nicht in den Speichermitteln (7) enthalten ist, Zugreifen auf das Mobiltelefon-Netzwerk mittels Senden einer Nachricht zum Erlangen einer Leitweginformation zu dem Mobiltelefon-Netzwerk, um auf einen ersten Knoten des Mobiltelefon-Netzwerks zuzugreifen, in dem der Teilnehmer registriert ist und in dem der mindestens eine Teilnehmerparameter gespeichert ist;

Erhalten, als Antwort auf die Nachricht zum Erlangen einer Leitweginformation von dem ersten Knoten, von Leitwegparametern, einschließlich erforderlicher Parameter des Mobiltelefon-Netzwerks zum Erhalten von Zugriff auf den mindestens einen Teilnehmerparameter in dem ersten Knoten, wobei die erforderlichen Parameter des Mobiltelefon-Netzwerks die Identität eines zweiten Knotens des Mobiltelefon-Netzwerks mit Zugriffsberechtigung auf den ersten Knoten enthalten;

Erfassen der Identität des zweiten Knotens des Mobiltelefon-Netzwerks aus den Leitwegparametern;

Erhalten von Zugriff unter Verwendung der Identität auf den ersten Knoten zum Abfragen und/oder Modifizieren von mindestens einem Teilnehmerparameter in dem ersten Knoten.

16. Verfahren nach Anspruch 15, **dadurch gekennzeichnet, dass** die Nachricht zum Erlangen der Leitweginformationen gesendet wird, indem als Absenderidentität die Identität eines Short Message Service Center SMSC verwendet wird.

17. Verfahren nach irgendeinem der Ansprüche 15 und 16, wobei die Nachricht zum Erlangen eines Leitwegs eine Nachricht zum Erlangen eines Leitwegs für eine Kurznachricht ist.

18. System nach Anspruch 17, wobei die Nachricht zum Erlangen eines Leitwegs für eine Kurznachricht die Nachricht *Send Routing Info For Short Messages srifsm* ist.

19. System nach irgendeinem der Ansprüche 15 - 18, wobei der erste Knoten ein Heimatregister- (HLR) Knoten des Mobiltelefon-Netzwerks (3) ist.

20. System nach irgendeinem der Ansprüche 15 - 19, wobei der Zugriff auf den ersten Knoten zum Abfragen und/oder Modifizieren des mindestens einen Teilnehmerparameters in dem ersten Knoten erhalten wird, indem der *Update-Location* MAP-Protokollvorgang oder irgendein Supplementary Service MAP-Protokollvorgang verwendet wird.

21. System nach irgendeinem der Ansprüche 15 - 20, wobei der zweite Knoten ein Besucherregister- (VLR) Knoten ist, in dem der Teilnehmer registriert ist.

22. Verfahren nach irgendeinem der Ansprüche 15 - 21, wobei in dem Schritt des unter Verwendung der Identität Erhaltens des Zugriffs auf den ersten Knoten zum Abfragen und/oder Modifizieren von mindestens einem Teilnehmerparameter in dem ersten Knoten die Adresse des zweiten Knotens, die von dem ersten Knoten empfangen wurde, an die Mobile Application Part MAP Protokollebene gesendet

wird, und eine Adresse, an die eine Antwort gesendet werden soll, wird in dem Bereich des Signal Connection Control Part SCCP-Protokolls gesendet.

Revendications

1. Système destiné à consulter et/ou modifier des paramètres d'abonné d'un réseau téléphonique mobile (3) depuis une machine (1) dans un réseau à protocole TCP/IP (2), au moyen d'une demande se rapportant à une consultation et/ou une modification d'au moins un paramètre d'abonné du réseau téléphonique mobile (3) mémorisé dans un premier noeud dudit réseau téléphonique mobile et accessible depuis un second noeud dudit réseau téléphonique mobile, ledit second noeud étant autorisé à consulter et/ou modifier ledit au moins un paramètre d'abonné dans ledit premier noeud, le système (4) comprenant :

un moyen (5) destiné à recevoir une demande faite par la machine (1) dans le réseau à protocole TCP/IP (2),
un moyen (5) destiné à extraire des paramètres de demande inclus dans ladite demande et qui sont nécessaires pour traiter ladite demande,
un moyen de mémorisation (7) d'au moins un paramètre d'abonné se rapportant à chacun des différents abonnés du réseau téléphonique mobile,
un moyen (5) destiné à envoyer, à la machine (1), une réponse à la demande effectuée, dans le cas où la demande effectuée est une consultation concernant au moins un paramètre d'abonné,
un moyen destiné à obtenir des paramètres de réseau téléphonique mobile nécessaires afin d'obtenir un accès au au moins un paramètre d'abonné dans ledit réseau téléphonique mobile (3), de manière à consulter et/ou modifier ledit au moins un paramètre d'abonné dans ledit réseau téléphonique mobile (3) lorsque ledit au moins un paramètre d'abonné à consulter et/ou modifier n'est pas contenu dans le moyen de mémorisation (7),

caractérisé en ce que

le moyen destiné à obtenir des paramètres de réseau téléphonique mobile nécessaires comprend :

un module de gestion de demande (6) agencé pour détecter les moments où la demande effectuée ne peut pas être traitée par le moyen de mémorisation (7) et pour engendrer, après une telle détection, un message d'obtention d'informations de routage pour le réseau téléphonique mobile de manière à accéder audit premier noeud du réseau téléphonique mobile, dans lequel l'abonné est enregistré, de manière à obtenir, en réponse, depuis ledit premier noeud, des paramètres de routage comprenant les paramètres de réseau téléphonique mobile nécessaires,

et **en ce que**

lesdits paramètres de réseau téléphonique mobile nécessaires comprennent l'identité d'un second noeud du réseau téléphonique mobile, ledit second noeud ayant le droit d'accéder au premier noeud afin de consulter et/ou de modifier ledit au moins un paramètre d'abonné,

le système étant agencé pour acquérir, à partir des paramètres de réseau téléphonique mobile nécessaires obtenus, ladite identité du second noeud et pour utiliser ladite identité afin d'obtenir un accès audit premier noeud en vue d'une consultation et/ou d'une modification dudit au moins un paramètre d'abonné dans ledit premier noeud.

2. Système selon la revendication 1, dans lequel le moyen destiné à obtenir les paramètres de réseau téléphonique mobile nécessaires comprend en outre un module de composition et d'envoi de messages (8), de même qu'un module (9) destiné à recevoir et décomposer les messages, depuis et vers le réseau téléphonique mobile, respectivement, en vue de l'envoi et de la réception de différents signaux vers et depuis ledit réseau téléphonique mobile.

3. Système selon l'une quelconque des revendications précédentes, dans lequel le message d'obtention de routage est un message d'obtention de routage destiné à un message court envoyé au premier noeud, ledit message d'obtention de routage indiquant, en tant qu'adresse de l'expéditeur, une adresse du système (4), de manière à ce que le premier noeud envoie les paramètres de routage audit système (4).

4. Système selon la revendication 3, dans lequel ledit message d'obtention de routage destiné à un message court est le message *SRIFSM* d'envoi d'informations de routage pour messages courts.

5. Système selon l'une quelconque des revendications précédentes, dans lequel le premier noeud est un noeud de registre de localisation de rattachement HLR du réseau téléphonique mobile (3).

6. Système selon l'une quelconque des revendications précédentes, dans lequel l'accès audit premier noeud, en vue d'une consultation et/ou d'une

modification dudit au moins un paramètre d'abonné dans ledit premier noeud, est obtenu en utilisant l'opération de mise à jour de localisation du protocole MAP ou toute opération de service supplémentaire du protocole MAP.

7. Système selon l'une quelconque des revendications précédentes, dans lequel le second noeud est un registre de localisation de visiteur VLR dans lequel l'abonné est enregistré.

8. Système selon l'une quelconque des revendications précédentes, dans lequel le moyen destiné à recevoir une demande et le moyen destiné à extraire les paramètres de demande comprennent au moins une interface de protocole (5) destinée à permettre au système (4) de recevoir et d'extraire les paramètres de demande dans la demande provenant du réseau à protocole TCP/IP.

9. Système selon la revendication 8, **caractérisé en ce qu'**il comprend une interface de protocole pour chacun des protocoles prévus dans le réseau à protocole TCP/IP, de façon à permettre au système de recevoir et d'extraire les paramètres conformément aux différents protocoles utilisés dans le réseau à protocole TCP/IP.

10. Système selon l'une quelconque des revendications 8 et 9, **caractérisé en ce que** le module de gestion de demande (6) comprend un module de commande de demande (11) agencé pour recueillir les paramètres fournis par le moyen d'extraction de paramètres (5), ledit module de gestion de demande constituant en outre le moyen destiné à envoyer la réponse à la demande effectuée au module d'interface de protocole (5), le module de gestion de demande (6) comprenant en outre un module (12) destiné à des demandes au moyen de mémorisation (7) d'au moins un paramètre d'abonné de manière à obtenir ledit au moins un paramètre d'abonné lorsque la demande est une consultation de celui-ci.

11. Système selon la revendication 10, **caractérisé en ce que** le module de gestion de demande comprend également un module (13) destiné à des demandes au réseau téléphonique mobile, destiné à effectuer ladite demande au réseau téléphonique mobile après la réception d'un ordre de demande provenant du module de commande de demande (11), exécutant ladite demande grâce au module (8) destiné à composer et envoyer des messages au réseau téléphonique mobile.

12. Système selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le moyen de mémorisation (7) est agencé pour mémoriser les paramètres d'abonné consultés ou modifiés pendant un certain intervalle de temps.

13. Système selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'**il comprend un répertoire de configuration (10) dans lequel des données de configuration sont mémorisées en vue d'un bon fonctionnement du système.

14. Système selon l'une quelconque des revendications précédentes, **caractérisé en ce que** les paramètres de demande reçus depuis la machine (1) dans le réseau à protocole TCP/IP contiennent des informations relatives au fait d'accéder au moyen de mémorisation (7) ou d'accéder au réseau téléphonique mobile directement au moyen de l'envoi dudit message d'obtention d'informations de routage.

15. Procédé de consultation et/ou de modification de paramètres d'abonné d'un réseau téléphonique mobile depuis une machine (1) dans un réseau à protocole TCP/IP (2) où un abonné d'un réseau téléphonique mobile accède à un service au moyen de son téléphone mobile, qui à son tour, accède à la machine (1) dans le réseau à protocole TCP/IP (2) de manière à effectuer une demande concernant une consultation et/ou une modification d'au moins un paramètre d'abonné du réseau téléphonique mobile, le procédé comprenant les étapes suivantes consistant à :

extraire les paramètres de demande inclus dans ladite demande effectuée par la machine (1) de ladite demande,
accéder sélectivement au moyen de mémorisation (7) d'au moins un paramètre d'abonné se rapportant aux abonnés du réseau téléphonique mobile de manière à obtenir et envoyer les informations concernant ledit paramètre d'abonné à la machine (1), dans le cas où la demande effectuée est une consultation concernant ledit paramètre d'abonné,

caractérisé en ce qu'il comprend en outre les étapes consistant à :

lorsque le paramètre d'abonné n'est pas contenu dans le moyen de mémorisation (7), accéder au réseau téléphonique mobile au moyen de l'envoi d'un message d'obtention d'informations de routage au réseau téléphonique mobile de manière à accéder à un premier noeud du réseau téléphonique mobile, dans lequel l'abonné est enregistré et dans lequel ledit au moins un paramètre d'abonné est mémorisé,
obtenir, en réponse audit message d'obtention d'informations de routage, depuis ledit premier

noeud, des paramètres de routage comprenant les paramètres de réseau téléphonique mobile nécessaire en vue d'obtenir un accès à l'au moins un paramètre d'abonné dans ledit premier noeud, lesdits paramètres de réseau téléphonique mobile nécessaires comprenant l'identité d'un second noeud du réseau téléphonique mobile ayant le droit d'accéder au premier noeud,
acquérir, à partir desdits paramètres de routage, ladite identité du second noeud du réseau téléphonique mobile,
obtenir, en utilisant ladite identité, un accès audit premier noeud en vue d'une consultation et/ou d'une modification d'au moins un paramètre d'abonné dans ledit premier noeud.

16. Procédé selon la revendication 15, **caractérisé en ce que** le message d'obtention d'informations de routage est envoyé en utilisant, en tant qu'identité d'expéditeur, l'identité d'un centre de service de messages courts SMSC.

17. Procédé selon l'une quelconque des revendications 15 et 16, dans lequel le message d'obtention d'informations de routage est un message d'obtention du routage pour un message court.

18. Procédé selon la revendication 17, dans lequel ledit message d'obtention du routage pour un message court est le message d'envoi d'informations de routage pour des messages courts (*SRIFSM*).

19. Procédé selon l'une quelconque des revendications 15 à 18, dans lequel le premier noeud est un noeud de registre de localisation de rattachement (HLR) du réseau téléphonique mobile (3).

20. Procédé selon l'une quelconque des revendications 15 à 19, dans lequel l'accès audit premier noeud en vue d'une consultation et/ou d'une modification dudit au moins un paramètre d'abonné dans ledit premier noeud est obtenu en utilisant l'opération de mise à jour de localisation du protocole MAP ou toute opération de service supplémentaire du protocole MAP.

21. Procédé selon l'une quelconque des revendications 15 à 20, dans lequel le second noeud est un noeud de registre de localisation de visiteur (VLR) du réseau téléphonique mobile (3).

22. Procédé selon l'une quelconque des revendications 15 à 21, dans lequel, dans l'étape d'obtention d'utilisation de ladite identité, d'accès audit premier noeud en vue d'une consultation et/ou d'une modification d'au moins un paramètre d'abonné dans ledit premier noeud, l'adresse du second noeud, reçue depuis le premier noeud, est envoyée au niveau du protocole de la partie d'application mobile MAP, et une adresse à laquelle une réponse devrait être envoyée, est envoyée dans la zone du protocole de la partie de commande de connexion de signaux SCCP.

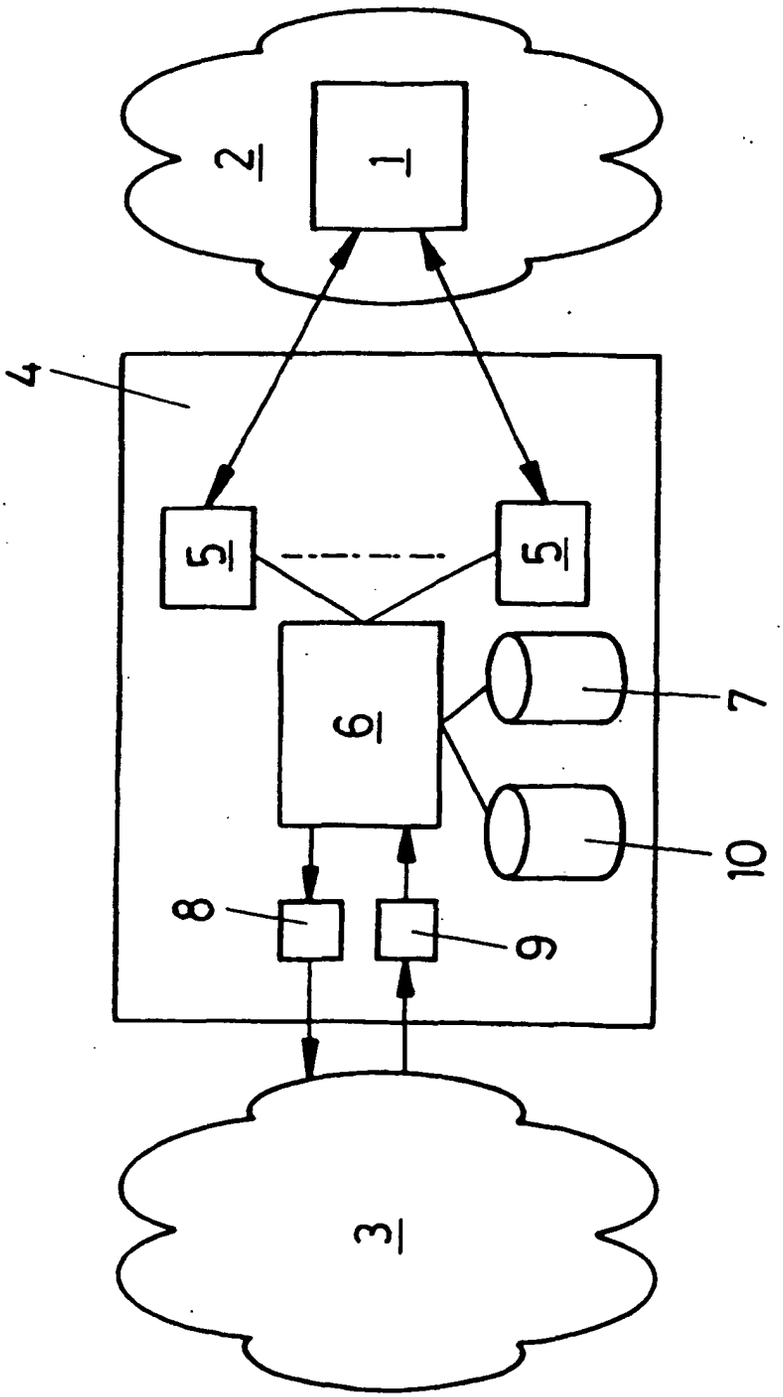

FIG.1

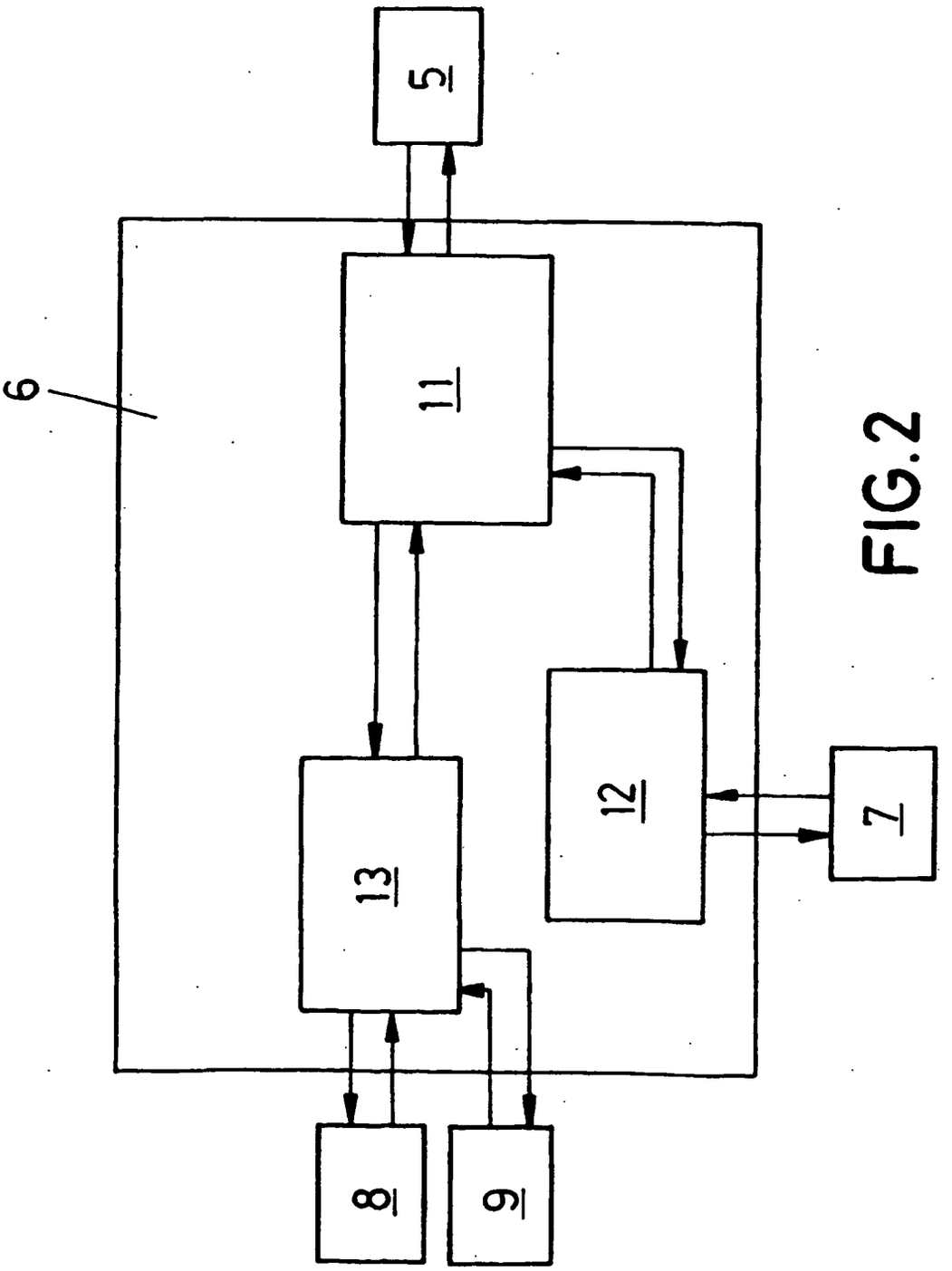

FIG.2