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(71) Applicant (for all designated States except US): NOKIA CORPORATION [FI/3]; Kallialahdentie 4, FIN-02150 Espoo (FI).

(72) Inventor; and

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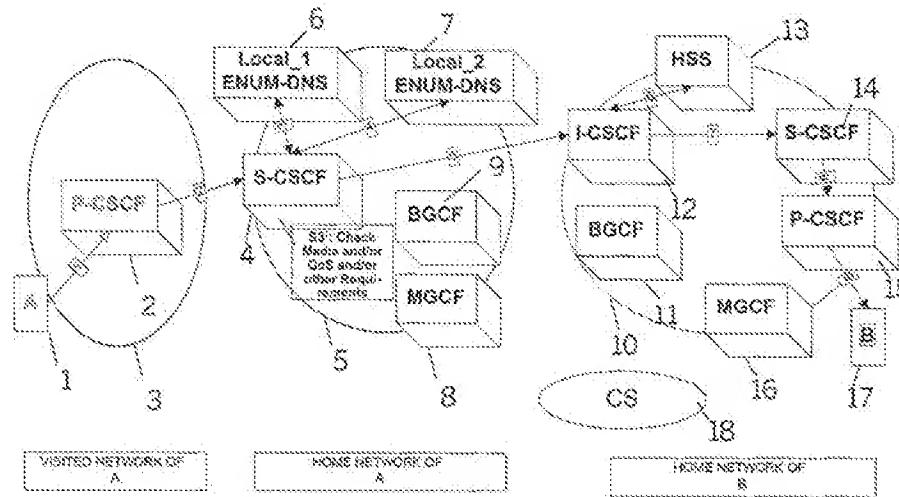
(75) Inventor/Applicant (for US only): TUOHINO, Markku [FI/3]; Kolvusyrjät 23 F, FIN-02150 Espoo (FI).

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(74) Agents: LESON, Thomas, Johannes, Alois et al.; TBK-Patent, Bavariaring 4-6, 80336 München (DE).

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(54) Title: OPTIMIZED ROUTING BETWEEN COMMUNICATION NETWORKS



(57) Abstract: The invention provides a method and system for routing a message or a set of messages or a session from a first equipment connected or registered to a first network, to a second equipment connected or registered to a second network. The first network includes a network entity which checks requirements of the message or set of messages or session, and decides on the routing depending on the check result. The checked requirements may include media requirements of the message or set of messages or requested session. The checked requirements can also include QoS requirements of the message or set of messages or requested session.

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## OPTIMIZED ROUTING BETWEEN COMMUNICATION NETWORKS

## 5 FIELD AND BACKGROUND OF THE INVENTION

The present invention relates to a system and method for routing messages and/or set of messages and/or sessions, in particular E.164 messages and/or set of messages and/or  
10 sessions (E.164 represents the international phone numbering system), to another network or operator. The other network is called foreign network, and the other operator foreign operator. In an E.164 message/session, the party/equipment originating the message/session indicates the E.164 number of  
15 the party/equipment to which the message/session is to be established.

A problem arises in routing messages and/or set of messages and/or sessions such as E.164 messages and/or set of messages  
20 and/or sessions to a foreign operator when one or more of the following three conditions are true concerning the foreign network and operator:

C1) The foreign operator uses the same number range for IMS (IMS = IP Multimedia Subsystem) and non-IMS e.g. CS  
25 (Circuit Switched) networks;

C2) Only individual - not all - customers of the foreign operator have subscribed both the non-IMS and IMS;

C3) The foreign operator does not allow to use its ENUM-DNS database (DNS = Domain Name System, ENUM is specified in  
30 RFC 2916 "E.164 number and DNS") via DNS delegation or as a copy for a trusted operator.

The task of the ENUM-DNS database is to give answer whether the target identifier, i.e. the E.164 number, is a valid IMS  
35 identity and if yes, give one or more NAPTR. There is not

always a correct answer when E.164 belongs to the number range if non-IMS (e.g. GSM) and IMS number ranges overlap. In more detail, the ENUM-DNS database is used to answer the question Q1 "Is the target E.164 a valid IMS identity?" of S-CSCF (S-CSCF = Serving Call State Control Function) in the originating message and/or set of messages and/or session and to return one or more NAPTR (NAPTR = Naming Authority Pointer; RR of DNS; RR = Resource Record of DNS) if the answer is positive. With these NAPTR RRs the E.164 can be converted to a valid IMS routing address that is used to route the message and/or set of messages and/or session to the target network.

As mentioned above, there is not always a correct answer to the question "Q1" above when E.164 belongs to the number range in condition "C1".

ENUM-DNS then may return "not found", "domain unknown" or a similar result. This means that the E.164 number is not a valid IMS identity.

However, it may be that the E.164 number is actually a valid IMS identity but that this information cannot be obtained from the available ENUM-DNS in the originating network (i.e. condition "C3" is true). It can e.g. be obtained only in the trusted networks or possibly only in the target network itself. The answer in these cases is that the E.164 number may be a valid IMS identity.

According to the present IMS standard draft (3GPP TS 23.228 V.5.0.0) the message/session is routed to an own BGCF, and from there to an own MGCF or to a BGCF in the target network that routes the message/session further to a MGCF in the target network. From MGCF the message/session is routed to non-IMS e.g. CS network. If the E.164 message/session is a

multimedia message/session that cannot be routed in non-IMS e.g. CS network, the message/session is released latest at MGCF in the own or in the target network.

5 Reasons of this problem are as follows. The normal way would be to utilize the hierarchical structure of DNS databases. This evidently was the original idea but it was not accepted as such in the standardization i.e. there is no global ENUM-DNS. Some operators are even reluctant to let the other  
10 operators see their IMS subscriber database i.e. ENUM-DNS database.

In the situation described above the "holes" in the ENUM-DNS database are non-IMS e.g. CS (CS = Circuit Switched)  
15 subscribers that have not yet become IMS subscribers.

In addition operators seem to be unwilling to publish not even information of the amount of the subscribers they have. That information (ENUM database and number of IMS  
20 subscribers) can easily be seen from ENUM-DNS if it is publicly available in the situation described above.

In such case, the message/session may be routed to an own BGCF (BGCF = Breakout Gateway Control Function), and from  
25 there to an own MGCF (MGCF = Media Gateway Control Function) or to a BGCF in the target network that routes the message/session further to a MGCF in the target network.

From MGCF the message/session is routed to non-IMS e.g. CS  
30 network. If the E.164 session is a voice session, this is appropriate, and the called party gets a voice session to his non-IMS terminal e.g. to GSM mobile station.

If, however, the E.164 message/session is a multimedia  
35 message/session that cannot be routed in non-IMS e.g. GSM

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