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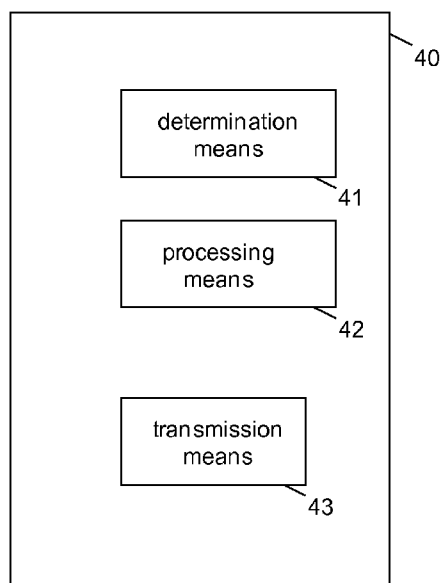
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- (54) **Title:** METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR PROVIDING LOCATION INFORMATION IN CIRCUIT SWITCHED FALLBACK MODE

Fig. 4



(57) **Abstract:** The present invention addresses apparatuses, methods and computer program product for providing improved allocation of location information for a specific location information related function. Thereby, it is determined whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function, and transmission of a Provide Subscriber Information request to a network element is caused. In case it is determined that the Evolved Universal Terrestrial Radio Access Network location information is processable for the specific location information related function, embedding a request for obtaining Evolved Universal Terrestrial Radio Access Network location information from the network element into the Provide Subscriber Information request.

**DESCRIPTION****Title****METHOD, APPARATUS AND COMPUTER PROGRAM PRODUCT FOR PROVIDING  
LOCATION INFORMATION IN CIRCUIT SWITCHED FALLBACK MODE**

5

**Field of the invention**

The present invention generally relates to wireless communication networks, and more specifically relates to a method, apparatus and computer program product for enabling provision of location information in circuit switched fallback mode.

10

**Background**

Mobile data transmission and data services are constantly making progress, wherein such services provide various communication services, such as voice, video, packet data, messaging, broadcast, etc.

15

In recent years, Long Term Evolution LTE<sup>TM</sup> has been specified, which uses the Evolved Universal Terrestrial Radio Access Network E-UTRAN as radio communication architecture. Since LTE<sup>TM</sup> is designed as pure packet switched system, solutions have been proposed so as to also enable legacy circuit switched services in E-UTRAN environment.

20

One of such approaches is the so called circuit switched fallback CSFB to a legacy technology, such as GSM EDGE Radio Access Network GERAN or UMTS Terrestrial Radio Access Network UTRAN.

25

Furthermore, the so called Evolved Packet System EPS is the successor of General Packet Radio System GPRS. It provides new radio interfaces and new packet core network functions for broadband wireless data access. Such EPS core network functions are the Mobility Management Entity MME, Packet Data Network Gateway PDN-GW and Serving Gateway S-GW.

30

The Mobility Management Entity MME is responsible for mobility management procedures in the Evolved Packet System EPS. In particular, it is responsible for knowing the subscriber's location in the E-UTRAN. Thereby, it authenticates the subscriber and supervises the resources granted for subscribers via controlling the Gateways.

Basically, cells of E-UTRAN are grouped into Tracking Areas TA, just like cells in GERAN/UTRAN which are grouped into Location Areas LA. A Tracking Area can be controlled by one or more Mobility Management Entity MME, and are identified by Tracking Area ID TAI. E-UTRAN cells are identified by E-UTRAN Global Cell ID E-CGI.

An user equipment UE can be either allocated to E-UTRAN or UTRAN or GERAN, but may not perform two accesses simultaneously. That is, when the UE is allocated to E-UTRAN, it is not reachable over UTRAN or GERAN.

Circuit Switched Fallback CSFB has been standardized in 3GPP 23.272 to make usual circuit switched CS services like call, SMS, locationing and SS management available for UEs that are allocated to E-UTRAN.

The CSFB is defined in the SGs interface between the Mobility Management Entity MME and the Mobile Switching Center MSC Server/ Visitor Location Register VLR. When a user equipment UE registers in Evolved Packet System EPS, it can indicate its CSFB capability in the request.

If the EPS supports CSFB, the MME will perform location update on the SGs interface on behalf of the UE to an MSC Server/VLR. In turn, the MSS/VLR downloads circuit switched CS subscription data from Home Location Register HLR with the normal location update procedure, and the MSS/VLR registers itself in the HLR as serving MSS/VLR for the subscriber.

According to 3GPP standardization, E-UTRAN location information are placed into CAMEL (Customized Applications for Mobile networks Enhanced Logic) InitialDP operation, so MSS/VLR could send E-UTRAN location information to GSM Service Control Function gsmSCF when the subscriber is registered in MSS/VLR over the SGs interface.

3GPP also standardized E-UTRAN location information related information elements IE into Send Routing Information Response, so Gateway MSS could receive such location information from HLR in the SRI Response.

When Gateway MSS sends Send Routing Information (SRI) Request to HLR in a Mobile Terminated call, and the called subscriber has CAMEL T-CSI, and T-CSI setup indicates that "Subscriber information" (Location) is required, HLR sends Provide Subscriber Information request to the registered MSS/VLR in order to fetch the location of the subscriber. HLR then returns this location information to Gateway MSS in the Send Routing Information SRI Response.

However, according to 3GPP standardization, such as 3GPP 23.078, if the HLR sends Provide Subscriber Information PSI request due to Terminating - CAMEL Subscription Information T-CSI setup at SRI request processing, the HLR shall send it with indication that "CS location" is required. Consequently, the MSS/VLR will force CSFB of the subscriber in order to provide 2G/3G location data, though MSS/VLR could provide E-UTRAN location as well, without any fallback.

Also after the fallback, the UE may or may not return to E-UTRAN, which means, that it will be in E-UTRAN, and consequently the provided 2G/3G location is not valid anymore, so that it is not possible for GMSS to receive E-UTRAN location from HLR in SRI Response and to send such location information in InitialDP to gsmSCF.

**Summary of the Invention**

Therefore, in order to overcome the drawbacks of the prior art, it is an object underlying the present invention to provide improved allocation of location information for a specific location information related function.

In particular, it is an object of the present invention to provide a method, apparatus and computer program product for enabling improved provision of location information in circuit switched fallback mode.

According to a first aspect of the present invention, there is provided a method, comprising determining whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function, and causing transmission of a Provide Subscriber Information request to a network element, wherein, in case it is determined that the Evolved Universal Terrestrial Radio Access Network location information is processable for the specific location information related function, embedding a request for obtaining Evolved Universal Terrestrial Radio Access Network location information from the network element into the Provide Subscriber Information request.

According to a second aspect of the present invention, there is provided an apparatus, which comprises a determination means configured to determine whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function, and a processing means configured to cause transmission of a Provide Subscriber Information request to a network element, wherein, in case it is determined that the Evolved Universal Terrestrial Radio Access Network location information is processable for the specific location information related function, the processing means is configured to embed a request for obtaining Evolved Universal Terrestrial Radio Access Network location information from the network element into the Provide Subscriber Information request.

According to a third aspect of the present invention, there is provided a computer program product comprising computer-executable components which, when the program is run, are configured to carry out the method according to the first aspect.

5 According to further embodiments, the determination whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function is based on GSM (Global System for Mobile Communications) Service Control Function information.

10 According to certain embodiments, the determination whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function is based on the GSM Service Control Function address in Terminating - CAMEL (Customised Applications for Mobile networks Enhanced Logic) Subscription Information data.

15

According to further embodiments, the determination whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function is based on at least one of a CAMEL phase, a subscriber category and a service key in CAMEL Subscription Information data.

20

According to other embodiments of the invention, the Evolved Universal Terrestrial Radio Access Network location information is provided in a Send Routening Information response.

25 According to certain embodiments of the invention, the Evolved Universal Terrestrial Radio Access Network location information in the Send Routening Information response is provided for a Mobile Switching Center Server gateway, and is used in Initial Detection Point towards GSM Service Control Function.

According to further embodiments, the invention is implemented in a Home Location Register.

5 According to further embodiments, the invention is implemented in a communication network according to Long Term Evolution architecture

Advantageous further developments or modifications of the aforementioned exemplary aspects of the present invention are set out in the dependent claims.

10 **Brief description of drawings**

For a more complete understanding of example embodiments of the present invention, reference is now made to the following descriptions taken in connection with the accompanying drawings in which:

15

Fig. 1 shows the general EPS architecture according to 3GPP TS 23.401;

Fig. 2 shows the EPS architecture for CS fallback according to 3GPP TS 23.272;

20 Fig. 3. illustrates a method according to certain embodiments of the invention; and

Fig. 4. schematically illustrates an apparatus according to certain embodiments of the invention.

25

**Description of exemplary embodiments**

Exemplary aspects of the present invention will be described herein below. More specifically, exemplary aspects of the present invention are described hereinafter with  
5 reference to particular non-limiting examples and to what are presently considered to be conceivable embodiments of the present invention. A person skilled in the art will appreciate that the invention is by no means limited to these examples, and may be more broadly applied.

10 It is to be noted that the following description of the present invention and its embodiments mainly refers to specifications being used as non-limiting examples for certain exemplary network configurations and deployments. Namely, the present invention and its  
15 embodiments are mainly described in relation to 3GPP specifications being used as non-limiting examples for certain exemplary network configurations and deployments. As such, the description of exemplary embodiments given herein specifically refers to terminology which is directly related thereto. Such terminology is only used in the context of the  
presented non-limiting examples, and does naturally not limit the invention in any way. Rather, any other network configuration or system deployment, etc. may also be utilized  
as long as compliant with the features described herein.

20 Hereinafter, various embodiments and implementations of the present invention and its aspects or embodiments are described using several alternatives. It is generally noted that, according to certain needs and constraints, all of the described alternatives may be  
25 provided alone or in any conceivable combination (also including combinations of individual features of the various alternatives).

Fig. 1 shows the general EPS architecture according to 3GPP TS 23.401. Basically, Evolved Packet System EPS provides new radio interfaces and new packet core network  
30 functions for broadband wireless data access, such as Mobility Management Entity MME, Packet Data Network Gateway PDN-GW and Serving Gateway S-GW, wherein the Mobility Management Entity MME is responsible for mobility management procedures. In particular, it is responsible for knowing the subscriber's location in the E-UTRAN, so that it



authenticates the subscriber and supervises the resources granted for subscribers via controlling the Gateways.

As indicated above, Circuit Switched Fallback CSFB has been standardized in 3GPP 23.272 to make usual circuit switched CS services like call, SMS, locationing and SS management available for UEs that are allocated to E-UTRAN. Fig. 2 shows the EPS architecture for CS fallback according to 3GPP TS 23.272. As is indicated in Fig. 2, the CS fallback in EPS function is realized by using the SGs interface mechanism between the MSC Server and the MME. The SGs reference point is used for the mobility management and paging procedures between EPS and CS domain, and is based on the Gs interface procedures. The SGs reference point is also used for the delivery of both mobile originating and mobile terminating SMS. Additional procedures for alignment with the Gs reference point are not precluded.

According to certain embodiments of the present invention, the Home Location Register HLR should not ask for circuit switched CS location automatically when Provide Subscriber Information PSI is sent due to T-CSI (Terminating - CAMEL Subscription Information) configuration. Instead, HLR should send PSI with the indication that E-UTRAN location is accepted if that is available.

Though, the HLR cannot do this always, because if HLR did it always, the Mobile Switching Center Server MSS/ Visitor Location Register VLR would return E-UTRAN location information in PSI response, and no 2G/3G location is returned in the same PSI response (as per 3GPP specification).

An old GSM Service Control Function gsmSCF cannot work with E-UTRAN location information. Consequently, the HLR should have a logic for determining when to indicate E-UTRAN location acceptance in PSI request and when not to.

According to certain embodiments of the present invention, the HLR may use gsmSCF address in T-CSI data for this decision, or any other more sophisticated analysis (using

other attributes as well, like CAMEL phase, subscriber category, service key in CSI data, and so on).

Fig. 3 shows a principle flowchart of an example for a method according to certain  
5 embodiments of the present invention.

In Step S31, it is determined whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function.

10 In Step S32, transmission of a Provide Subscriber Information request to a network element is caused.

In Step S33, a request for obtaining Evolved Universal Terrestrial Radio Access Network location information from the network element is embedded into the Provide Subscriber  
15 Information request in case of positive determination in S31.

Fig. 4 shows a principle configuration of an example for an apparatus according to certain embodiments of the present invention. The apparatus 40 comprises a determination means 41 configured to determine whether Evolved Universal Terrestrial Radio Access  
20 Network location information is processable for a specific location information related function, and a processing means 42 configured to cause transmission of a Provide Subscriber Information request to a network element by a transmission means 43. In case it is determined that the Evolved Universal Terrestrial Radio Access Network location information is processable for the specific location information related function, the  
25 processing means is configured to embed a request for obtaining Evolved Universal Terrestrial Radio Access Network location information from the network element into the Provide Subscriber Information request.

According to certain embodiments of the present invention, the invention may be  
30 implemented in the HLR. The advantage thereof is that the HLR could provide E-UTRAN

location information in SRI Response to Gateway MSS GMSS, and GMSS could use it in Initial Detection Point (InitialDP) towards gsmSCF. Also, a fallback from E-UTRAN to 2G/3G on MSS/VLR side may be spared, and a more accurate location information can be provided.

5

In the foregoing exemplary description of the apparatus, only the units that are relevant for understanding the principles of the invention have been described using functional blocks. The apparatuses may comprise further units that are necessary for its respective function. However, a description of these units is omitted in this specification. The arrangement of the functional blocks of the apparatuses is not construed to limit the invention, and the functions may be performed by one block or further split into sub-blocks.

10

According to exemplarily embodiments of the present invention, a system may comprise any conceivable combination of the thus depicted devices/apparatuses and other network elements, which are arranged to cooperate as described above.

15

Embodiments of the present invention may be implemented as circuitry, in software, hardware, application logic or a combination of software, hardware and application logic. In an example embodiment, the application logic, software or an instruction set is maintained on any one of various conventional computer-readable media. In the context of this document, a "computer-readable medium" may be any media or means that can contain, store, communicate, propagate or transport the instructions for use by or in connection with an instruction execution system, apparatus, or device, such as a computer or smart phone, or user equipment.

20

25

As used in this application, the term "circuitry" refers to all of the following: (a) hardware-only circuit implementations (such as implementations in only analog and/or digital circuitry) and (b) to combinations of circuits and software (and/or firmware), such as (as applicable): (i) to a combination of processor(s) or (ii) to portions of processor(s)/software (including digital signal processor(s)), software, and memory(ies) that work together to cause an apparatus, such as a mobile phone or server, to perform various functions) and (c) to circuits, such as a microprocessor(s) or a portion of a microprocessor(s), that require

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software or firmware for operation, even if the software or firmware is not physically present. This definition of 'circuitry' applies to all uses of this term in this application, including in any claims. As a further example, as used in this application, the term "circuitry" would also cover an implementation of merely a processor (or multiple  
5 processors) or portion of a processor and its (or their) accompanying software and/or firmware. The term "circuitry" would also cover, for example and if applicable to the particular claim element, a baseband integrated circuit or applications processor integrated circuit for a mobile phone or a similar integrated circuit in server, a cellular network device, or other network device.

10

The present invention relates in particular but without limitation to mobile communications, for example to environments under LTE<sup>TM</sup>, and can advantageously be implemented also in controllers, base stations, user equipments or smart phones, or personal computers connectable to such networks. That is, it can be implemented e.g. as/in chipsets to  
15 connected devices.

If desired, the different functions discussed herein may be performed in a different order and/or concurrently with each other. Furthermore, if desired, one or more of the above-described functions may be optional or may be combined.

20

Although various aspects of the invention are set out in the independent claims, other aspects of the invention comprise other combinations of features from the described embodiments and/or the dependent claims with the features of the independent claims, and not solely the combinations explicitly set out in the claims.

25

It is also noted herein that while the above describes example embodiments of the invention, these descriptions should not be viewed in a limiting sense. Rather, there are several variations and modifications which may be made without departing from the scope of the present invention as defined in the appended claims.

30

The following meanings for the abbreviations used in this specification apply:

|    |         |                                                            |
|----|---------|------------------------------------------------------------|
|    | EPS     | Evolved Packet System                                      |
|    | E-UTRAN | Evolved Universal Terrestrial Radio Access Network         |
| 5  | UTRAN   | UMTS Terrestrial Radio Access Network                      |
|    | GERAN   | GSM EDGE Radio Access Network                              |
|    | MME     | Mobility Management Entity                                 |
|    | PDN-GW  | Packet Data Network Gateway                                |
|    | S-GW    | Serving Gateway                                            |
| 10 | LA      | Location Area                                              |
|    | TAI     | Tracking Area ID                                           |
|    | E-CGI   | E-UTRAN Global Cell ID                                     |
|    | CSFB    | CS (Communication Service) Fallback                        |
|    | MSC     | Mobile Switching Center                                    |
| 15 | MSS     | Mobile Switching Center Server                             |
|    | VLR     | Visitor Location Register                                  |
|    | HLR     | Home Location Register                                     |
|    | HSS     | Home Subscriber Server                                     |
|    | PSI     | Provide Subscriber Information                             |
| 20 | CAMEL   | Customised Applications for Mobile networks Enhanced Logic |
|    | T-CSI   | Terminating - CAMEL Subscription Information               |
|    | CSI     | Channel State Information                                  |
|    | SRI     | Send Routening Information                                 |
|    | GMSS    | Global Mobile Satellite System                             |

InitialDP

Initial Detection Point

gsmSCF

GSM Service Control Function

**What is claimed is:**

1. A method, comprising:

- 5           determining whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function; and
- causing transmission of a Provide Subscriber Information request to a network element;
- wherein, in case it is determined that the Evolved Universal Terrestrial Radio
- 10   Access Network location information is processable for the specific location information related function, embedding a request for obtaining Evolved Universal Terrestrial Radio Access Network location information from the network element into the Provide Subscriber Information request.
- 15   2. The method according to claim 1, wherein the determination whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function is based on GSM Service Control Function information.
- 20   3. The method according to claim 1, wherein the determination whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function is based on the GSM Service Control Function address in Terminating - CAMEL Subscription Information data.
- 25   4. The method according to claim 1, wherein the determination whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function is based on at least one of a CAMEL phase, a subscriber category and a service key in CAMEL Subscription Information data.

5. The method according to any of claims 1 to 4, wherein the Evolved Universal Terrestrial Radio Access Network location information is provided in a Send Routening Information response.

5 6. The method according to claim 5, wherein the Evolved Universal Terrestrial Radio Access Network location information in the Send Routening Information response is provided for a Mobile Switching Center Server gateway, and is used in Initial Detection Point towards GSM Service Control Function.

10 7. The method according to any of claims 1 to 6, wherein the method is carried out in a Home Location Register.

8. The method according to any of claims 1 to 7, wherein the method is carried out in a communication network according to Long Term Evolution architecture.

15

9. An apparatus, comprising

a determination means configured to determine whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function; and

20 a processing means configured to cause transmission of a Provide Subscriber Information request to a network element;

wherein, in case it is determined that the Evolved Universal Terrestrial Radio Access Network location information is processable for the specific location information related function, the processing means is configured to embed a request for obtaining  
25 Evolved Universal Terrestrial Radio Access Network location information from the network element into the Provide Subscriber Information request.

10. The apparatus according to claim 9, wherein the determination means is configured to perform the determination whether Evolved Universal Terrestrial Radio Access Network



location information is processable for a specific location information related function is based on GSM Service Control Function information.

- 5 11. The apparatus according to claim 9, wherein the determination means is configured to perform the determination whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function is based on the GSM Service Control Function address in Terminating - CAMEL Subscription Information data.
- 10 12. The apparatus according to claim 9, wherein the determination means is configured to perform the determination whether Evolved Universal Terrestrial Radio Access Network location information is processable for a specific location information related function is based on at least one of a CAMEL phase, a subscriber category and a service key in CAMEL Subscription Information data.
- 15 13. The apparatus according to any of claims 9 to 12, wherein the Evolved Universal Terrestrial Radio Access Network location information is provided in a Send Routening Information response.
- 20 14. The apparatus according to claim 13, wherein the Evolved Universal Terrestrial Radio Access Network location information in the Send Routening Information response is provided for a Mobile Switching Center Server gateway, and is used in Initial Detection Point towards GSM Service Control Function.
- 25 15. The apparatus according to any of claims 9 to 14, wherein the apparatus is included in a Home Location Register.
16. The apparatus according to any of claims 9 to 15, wherein the apparatus is part of a communication network according to Long Term Evolution architecture.

17. A computer program product comprising computer-executable components which, when the program is run, are configured to carry out the method according to any of claims 1 to 8.

5

18. The computer program product according to claim 17, wherein the computer program product comprises a computer-readable medium on which the software code portions are stored, or wherein the program is directly loadable into an internal memory of the processing device.

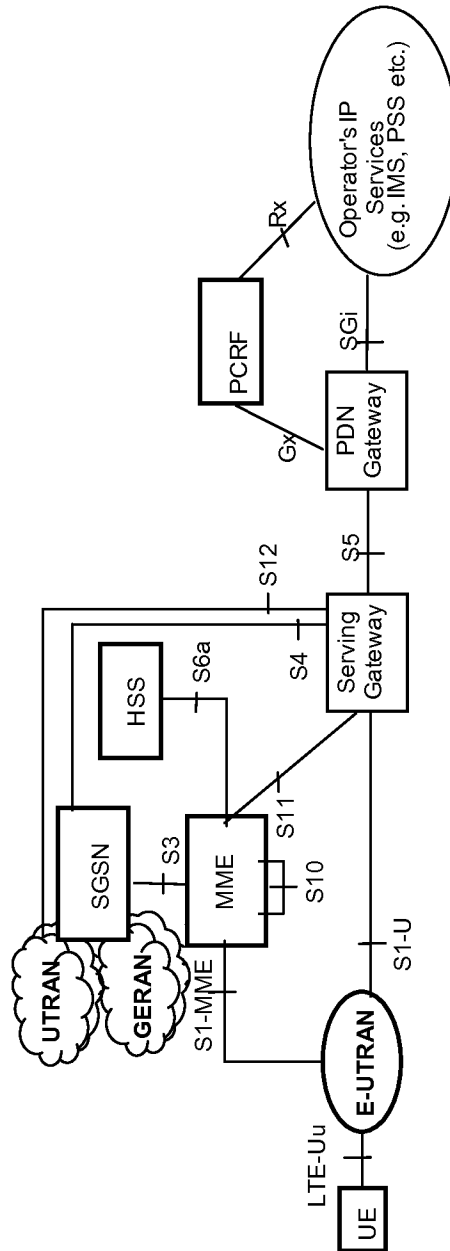
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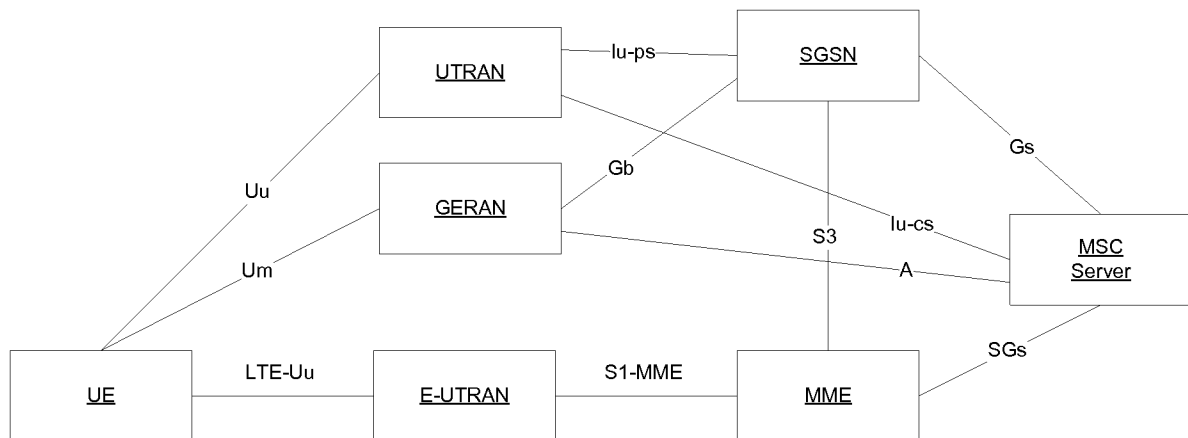
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Fig. 1



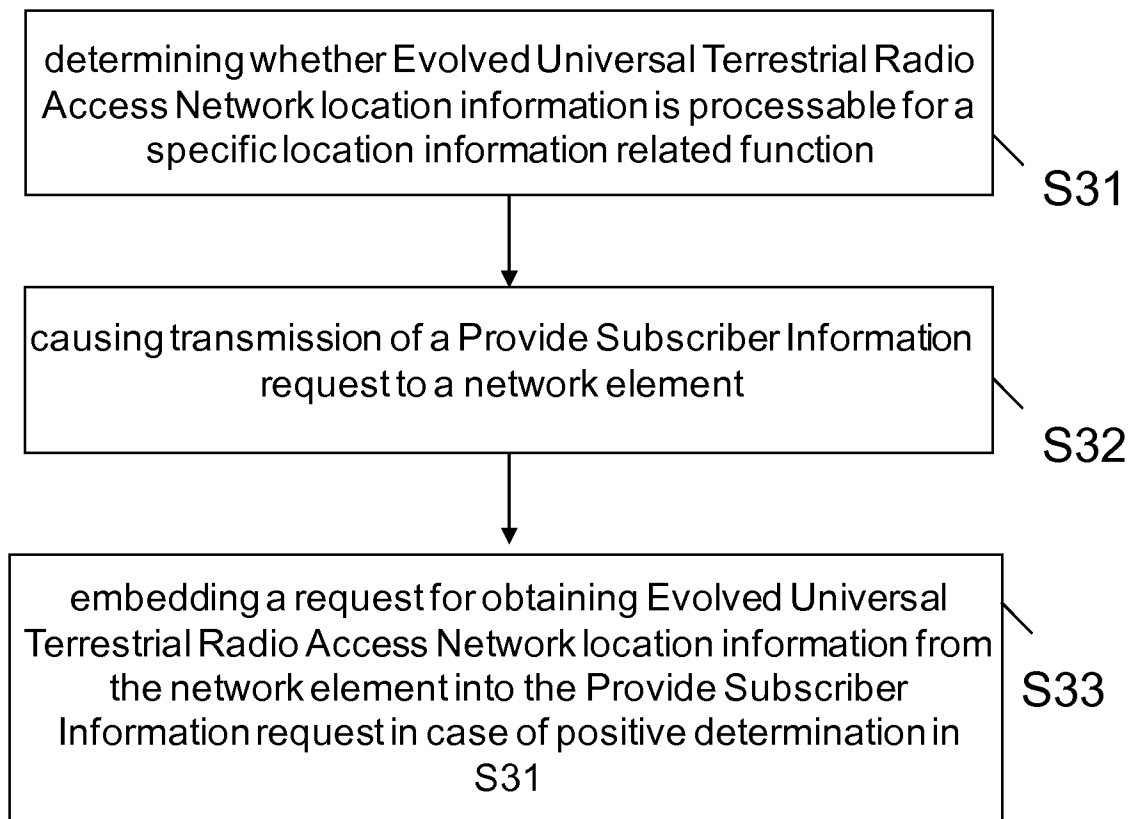
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Fig. 2



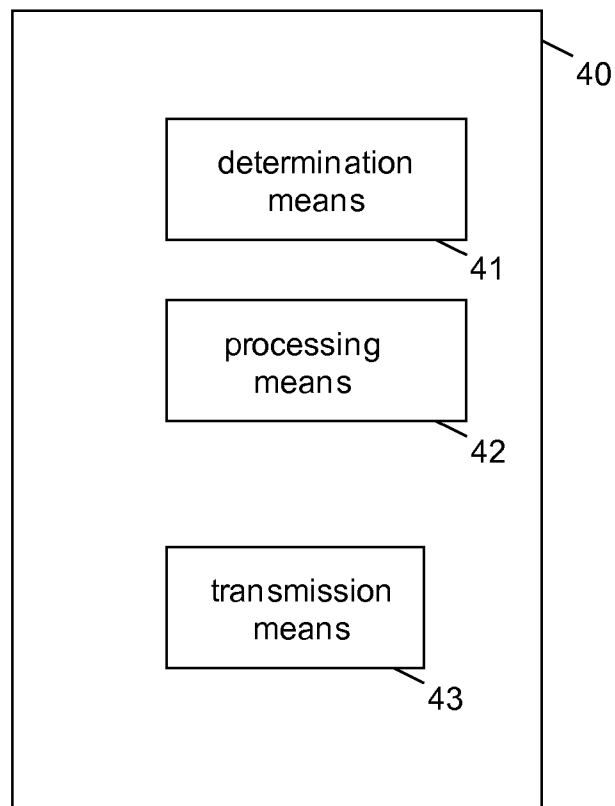
3/4

Fig. 3



4/4

Fig. 4



## INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2013/050874A. CLASSIFICATION OF SUBJECT MATTER  
INV. H04W8/10  
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
H04W

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                                                                                                                                                                                                                                                                           | Relevant to claim No. |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X         | ALCATEL-LUCENT: "Provide Subscriber Information handling for UE under LTE", 3GPP DRAFT; C4-112279, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE,<br>vol. CT WG4, no. Hyderabad; 20111010, 1 October 2011 (2011-10-01), pages 1-3, XP050536154,<br>[retrieved on 2011-10-01]<br>the whole document<br>-----<br>-/- | 1-18                  |



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See patent family annex.

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## INTERNATIONAL SEARCH REPORT

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Relevant to claim No. |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| A         | <p>ALCATEL-LUCENT: "Provide Subscriber Information handling for UE under LTE", 3GPP DRAFT; C4-112926, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE,<br/>vol. CT WG4, no. San Francisco, US; 20111114 - 20111118,<br/>18 November 2011 (2011-11-18), XP050559458,<br/>[retrieved on 2011-11-18]<br/>paragraphs [Reason_for_change],<br/>[11.3.3.1.2]</p> <p>-----</p>                                                                                     | 1-18                  |
| A         | <p>"3rd Generation Partnership Project; Technical Specification Group Core Network and Terminals; Mobility Management Entity (MME) - Visitor Location Register (VLR) SGs interface specification (Release", 3GPP STANDARD; 3GPP TS 29.118, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE,<br/>vol. CT WG1, no. V11.5.0,<br/>19 December 2012 (2012-12-19), pages 1-66, XP050691328,<br/>[retrieved on 2012-12-19]<br/>paragraph [5.12.3]</p> <p>-----</p> | 1-18                  |
| A         | <p>"3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Circuit Switched (CS) fallback in Evolved Packet System (EPS); Stage 2 (Release 11)", 3GPP STANDARD; 3GPP TS 23.272, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE,<br/>vol. SA WG2, no. V11.3.0,<br/>18 December 2012 (2012-12-18), pages 1-91, XP050691110,<br/>[retrieved on 2012-12-18]<br/>paragraph [07.5]; figures 7.5-1</p> <p>-----</p>       | 1-18                  |