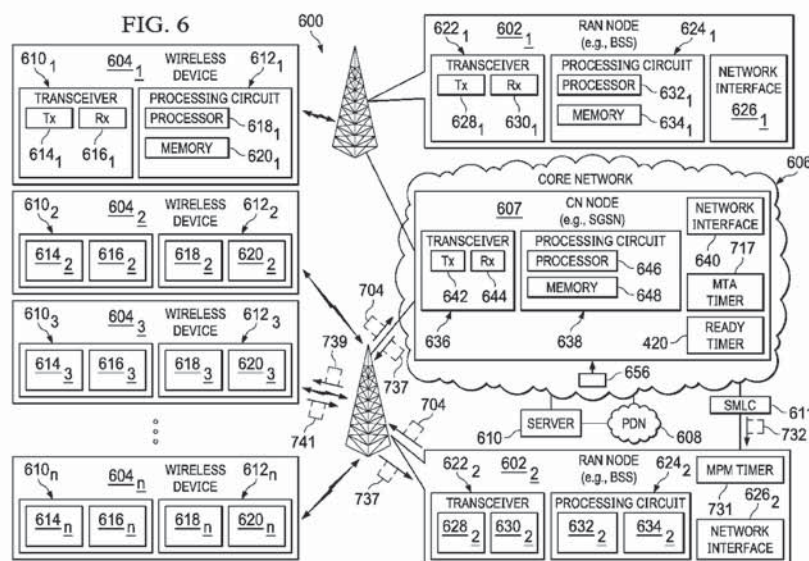




- (51) International Patent Classification:
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- (22) International Filing Date:
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- (71) Applicant: TELEFONAKTIEBOLAGET L M
ERICSSON (PUBL) [SE/SE]; SE-164 83 Stockholm (SE).
- (72) Inventors: JOHANSSON, Nicklas; Lovabacken 1,
SE-590 45 BROKIND (SE). DIACHINA, John; 505
Kristin Drive, GARNER, North Carolina 27529 (US).
- (74) Agent: HERNDERSON, Mymy et al.; 2755 Augustine
Drive, Santa Clara, California 95054 (US).
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KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,
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(54) Title: NOTIFICATION OF ONGOING MULTILATERATION TIMING ADVANCE (MTA) PROCEDURE TO A SERVING GPRS SUPPORT NODE (SGSN)



(57) Abstract: The present disclosure describes various techniques for enabling a Base Station System (BSS) to provide a Serving GPRS Support Node (SGSN) with an indication, e.g., in the form of a flag or a timer, within a BSS General Packet Radio Service (GPRS) Protocol (BSSGP) POSITION-COMMAND Protocol Data Unit (PDU) that a target wireless device is to perform a Multilateration Timing Advance (MTA) procedure. The SGSN upon receipt of the BSSGP POSITION-COMMAND PDU with the indication, e.g., in the form of a flag or a timer, can start a timer during which the SGSN will suspend downlink data delivery and paging to the target wireless device while the target wireless device is performing the MTA procedure.

MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P71285-WO1	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/IB2018/050650	International filing date (day/month/year) 02.02.2018	Priority date (day/month/year) 02.02.2017	
International Patent Classification (IPC) or national classification and IPC INV. H04W64/00			
Applicant Telefonaktiebolaget LM Ericsson (publ)			
1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of <u>7</u> sheets, including this cover sheet. 3. This report is also accompanied by ANNEXES, comprising: a. ☒ (sent to the applicant and to the International Bureau) a total of <u>10</u> sheets, as follows: ☒ sheets of the description, claims and/or drawings which have been amended and/or sheets containing rectifications authorized by this Authority, unless those sheets were superseded or cancelled, and any accompanying letters (see Rules 46.5, 66.8, 70.16, 91.2, and Section 607 of the Administrative Instructions). ☐ sheets containing rectifications, where the decision was made by this Authority not to take them into account because they were not authorized by or notified to this Authority at the time when this Authority began to draw up this report, and any accompanying letters (Rules 66.4bis, 70.2(e), 70.16 and 91.2). ☐ superseded sheets and any accompanying letters, where this Authority either considers that the superseding sheets contain an amendment that goes beyond the disclosure in the international application as filed, or the superseding sheets were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in item 4 of Box No. I and the Supplemental Box (see Rule 70.16(b)). b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing, in the form of an Annex C/ST.25 text file, as indicated in the Supplemental Box Relating to Sequence Listing (see paragraph 3ter of Annex C of the Administrative Instructions).			
4. This report contains indications relating to the following items: ☒ Box No. I Basis of the report ☐ Box No. II Priority ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability ☐ Box No. IV Lack of unity of invention ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement ☐ Box No. VI Certain documents cited ☐ Box No. VII Certain defects in the international application ☐ Box No. VIII Certain observations on the international application			
Date of submission of the demand 30.11.2018		Date of completion of this report 21.12.2018	
Name and mailing address of the international preliminary examining authority:  European Patent Office Gitschiner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840		Authorized officer Eraso Helguera, J Telephone No. +49 30 25901-491	



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/IB2018/050650

Box No. I Basis of the report

1. With regard to the **language**, this report is based on
- ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3(a) and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4(a))
 - ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a) and (b))
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

2-7, 9-19, 21, 22	as originally filed	
1, 8, 8a, 20	filed with the letter of	30-11-2018

Claims, Numbers

1-6	filed with the letter of	30-11-2018
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Drawings, Sheets

1/11-11/11	as originally filed
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- ☐ a sequence listing - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since either they are considered to go beyond the disclosure as filed, or they were not accompanied by a letter indicating the basis for the amendments in the application as filed, as indicated in the Supplemental Box (Rules 70.2(c) and (c-bis)):
- ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
5. ☐ This report has been established:
- ☐ taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rules 66.1(d-bis) and 70.2(e)).
 - ☐ without taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91(Rules 66.4bis and 70.2(e)).

**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/IB2018/050650

6. ☒ With regard to top-up searches (Rules 66.1 *ter* and 70.2(f)):
- ☒ A top-up search was carried out by this Authority on 06.12.2018 (all discovered documents are listed in the Supplemental Box Relating to Top-up Search).
 - ☐ Additional relevant documents have been discovered during the top-up search.
 - ☐ No top-up search was carried out by this Authority because it would serve no useful purpose.
7. ☐ Supplementary international search report(s) from Authority(ies) has/have been received and taken into account in establishing this report (Rule 45bis.8(b) and (c)).

* If item 4 applies, some or all of those sheets may be marked "superseded".

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>1-6</u>
	No: Claims	
Inventive step (IS)	Yes: Claims	<u>1-6</u>
	No: Claims	
Industrial applicability (IA)	Yes: Claims	<u>1-6</u>
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

- D1 LM ERICSSON: "Multilateration Procedure - TA Only",
3GPP DRAFT; R6-160273 - MULTILATERATION PROCEDURE
- TA ONLY (WAS R6-160261), 3RD GENERATION
PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE
CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-
ANTIPOLIS CE
,
no. Reno, Nevada USA; 20161114 - 20161118 18 November
2016 (2016-11-18), XP051198955,
Retrieved from the Internet:
URL:[http://www.3gpp.org/ftp/tsg_ran/WG6_legacyRAN/
TSGR6_02/Docs/](http://www.3gpp.org/ftp/tsg_ran/WG6_legacyRAN/TSGR6_02/Docs/)
[retrieved on 2016-11-18]
- D2 US 2012/063464 A1 (MEHTA PRATIK [IN]) 15 March 2012
(2012-03-15)
- D3 ERICSSON: "Positioning enhancements for GERAN -
introducing Timing Advance trilateration",
3GPP DRAFT; RP-161034 - POSITIONING ENHANCEMENTS
FOR GERAN - INTRODUCING TA TRILATERATION, 3RD
GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE
COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ;
F-06921 SOPHI
,
vol. TSG RAN, no. Busan, Korea; 20160613 - 20160616 12 June
2016 (2016-06-12), XP051103882,
Retrieved from the Internet:
URL:http://www.3gpp.org/ftp/Meetings_3GPP_SYNC/RAN/Docs/
[retrieved on 2016-06-12]
cited in the application

D4 ERICSSON: "On timing advance based multi-leg positioning for NB-IoT",
3GPP DRAFT; R1-167426 - ON TIMING ADVANCE BASED
MULTI-LEG POSITIONING FOR NB-IOT, 3RD GENERATION
PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE
CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-
ANTIPOL

,
vol. RAN WG1, no. Gothenburg, Sweden; 20160822 - 20160826
21 August 2016 (2016-08-21), XP051125896,
Retrieved from the Internet:
URL:[http://www.3gpp.org/ftp/Meetings_3GPP_SYNC/RAN1/](http://www.3gpp.org/ftp/Meetings_3GPP_SYNC/RAN1/Docs/)
Docs/
[retrieved on 2016-08-21]
cited in the application

D5 ERICSSON LM: "Introduction of Multilateration",
3GPP DRAFT; R6-160274 CR 43.059 INTRODUCTION OF
MULTILATERATION USING TIMING ADVANCE, 3RD
GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE
COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ;
F-06921 SOPHIA-ANT

,
vol. TSG RAN, no. Reno, Nevada USA; 20161114 - 20161118
18 November 2016 (2016-11-18), XP051198956,
Retrieved from the Internet:
URL:[http://www.3gpp.org/ftp/tsg_ran/WG6_legacyRAN/](http://www.3gpp.org/ftp/tsg_ran/WG6_legacyRAN/TSGR6_02/Docs/)
TSGR6_02/Docs/
[retrieved on 2016-11-18]
cited in the application

1 D1 is regarded as being the prior art closest to the subject-matter of claim 1,
and discloses:

1.1 A Serving GPRS Support Node, SGSN, (see paragraph 6: *SGSN*) configured
to interact with a Base Station Subsystem, BSS (see paragraph 5: *BSS*), the
SGSN comprising:
a processor; and,
a memory that stores processor-executable instructions, wherein the

processor interfaces with the memory to execute the processor-executable instructions, whereby the SGSN is operable to:

receive (see paragraph 6: *The BSSGP entity in the SGSN extracts the embedded RRLP message (i.e. the "Multilateration Request" component) from the "RRLP APDU" IE received in the "BSSGP POSITION-COMMAND PDU" and sends it to the TOM protocol entity*), from the BSS, a BSS General Packet Radio Service, GPRS, Protocol, BSSGP, POSITION-COMMAND Protocol Data Unit, PDU, (see paragraph 10.5.4: *POSITION-COMMAND PDU*) comprising (i) a Radio Resource Location Services, RRLP, Application Protocol Data Unit, APDU, (see paragraph 11.3.49: *RRLP APDU*) with an embedded Radio Resource Location Services, RRLP, Multilateration Timing Advance, MTA, Request message (see paragraph 6: *embedded RRLP message*) for a target wireless device (see paragraph 6: *MS*), and (ii) an indicator that the target wireless device is to perform a Multilateration Timing Advance procedure (see paragraph 4.8: *MTAO Multilateration Request*).

- 1.2 The subject-matter of claim 1 therefore differs from this known SGSN in that the indicator is a Multilateration Timer Information Element that includes an indication that the SGSN is to start a timer, and is therefore new (Article 33(2) PCT).
- 1.3 The problem to be solved by the present invention may be regarded as how to avoid unsuccessful delivery of downlink data or paging messages when the MS is not reachable while performing MTA procedures
- 1.4 The solution to this problem proposed in claim 1 of the present application is considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

None of the documents available in the prior art teaches or fairly suggest the use of those additional features for the purpose of avoiding unsuccessful delivery of downlink data or paging messages when the MS is not reachable while performing MTA procedures. D3-D5, cited by the applicant, do not mention this problem, let alone a solution. The combination of D1 and D2 (see D2, paragraphs [0031] and [0037]) would render devices and methods where the indicator is obtained by performing deep packet inspection (i.e. so as to infer that an RRLP MTA request is being sent to the MS, and therefore, the MS will be unavailable) rather than including an additional MTA IE for this purpose.

- 2 D1 also discloses the method carried out by the SGSN, as well as a corresponding BSS (see paragraph 5: *BSS*) and configured to send the message received by the SGSN.

The same reasoning applies correspondingly to the subject-matter of independent claims 3 and 5, which is therefore new (Article 33(2) PCT) and involves an inventive step (Article 33(3) PCT).

- 3 Claims 2, 4, 6 are dependent on one or more independent claims whose subject-matter is considered as being new and inventive, as discussed above, and as such said dependent claims also meet the requirements of the PCT with respect to novelty and inventive step.

30 November 2018

VIA ePCT

Authorized Officer Eraso Helguera, J.
European Patent Office
P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk – Pays Bas
NETHERLANDS

**RE: NOTIFICATION OF ONGOING MULTILATERATION TIMING ADVANCE
(MTA) PROCEDURE TO A SERVING GPRS SUPPORT NODE (SGSN)**

Applicant: Telefonaktiebolaget LM Ericsson (publ)
PCT Appl.: PCT/IB2018/050650
Filed: 02 February 2018
Priority Date: 02 February 2017
Our Ref.: P71285-WO1

RESPONSE TO THE FIRST WRITTEN OPINION

Dear Authorized Officer Eraso Helguera, J.:

In response to the First Written Opinion dated 29 March 2018, Applicant respectfully requests the Authorized Officer to reconsider the claims of this application in view of the amendments and comments set forth below.

Enclosures

- Replacement claim pages numbered 23-26 (in marked version) and replacement claim pages numbered 23-24 (in clean version) containing claims 1-6.
- Replacement specification pages numbered 1, 8-8a, and 20 (in marked and clean versions).

Summary of Written Opinion

The Written Opinion of the International Searching Authority set forth a reasoned statement with regard to original claims 1-20 of the patent application. The original claims 2-5, 7-10, 12-15, and 17-20 were found to be novel. In addition, the original claims 2-4, 7-9, 12-15, and 17-20 were found to have an inventive step.

However, the original claims 1, 6, 11, and 16 were found to have lacked novelty in view of document D1. Further, the original claims 1, 5-6, 10-11, and 16 were found to have lacked an inventive step in view of documents D1 and D2.

Cited References

Document D1: LM Ericsson: "Multilateration Procedure – TA Only". 3GPP Draft: R6-160273 – Multilateration Procedure – TA Only (was R6-160261), 3rd Generation Partnership Project (3GPP), MOBILE COMPETENCE CENTRE; 650, ROUTE DES LUCIOLES; F-06921 SOPHIA-ANTIPOLIS CEDEX; F-06921 Sophia-Antipolis CE, no. Reno, Nevada, USA; 20161114-20161118 18 November 2016 (2016-11-18), XP051198955.

Document D1 discloses where a BSS transmits a BSSGP POSITION-COMMAND PDU to a SGSN. The BSSGP POSITION-COMMAND PDU comprises a RRLP MTA Request Message which includes a MTAO Multilateration Request.

Document D2: U.S. Patent Publication No. 2012/063464 A1 (Mehta Pratik [IN]) 15 March 2012 (2012-03-15)

Document D2 discloses a system and method for providing a mechanism for control page requests sent in a wireless communication network. The paging control mechanism can be implemented in a gateway through a combination of hardware and software to determine whether packets received at a gateway trigger a page. The packets received at the gateway are intended for user equipment that is indicated to be in an idle state with no bearer connection. The paging mechanism controls paging when paging requests need to be sent. In some communication networks, page requests can be sent that are not needed because a bearer connection or link is in the process of being established. The control can be asserted by adding intelligence to the gateway to determine--on receipt of downlink data or signaling--how to proceed based on the state of the user equipment and the bearer connection.

Summary of Amendments

The original independent claim 1 has been amended to recite original dependent claim 2 (now cancelled), which was indicated as having novelty, inventive step, and industrial applicability. No new subject matter has been added to the claim.

The original dependent claims 2-4 have been cancelled (without prejudice). The original dependent claim 5 has been re-numbered as dependent claim 2.

The re-numbered independent claim 3 (original independent claim 6) has been amended to recite the original dependent claim 7 (now cancelled), which was indicated as having novelty, inventive step, and industrial applicability. No new subject matter has been added to the claim.

The original dependent claims 7-9 have been cancelled (without prejudice). The original dependent claim 10 has been re-numbered as dependent claim 4, and its dependency has been updated to re-numbered independent claim 3.

The re-numbered independent claim 5 (original independent claim 11) has been amended to recite the original dependent claim 12 (now cancelled), which was indicated as having novelty, inventive step, and industrial applicability. No new subject matter has been added to the claim.

The original dependent claims 12-15 have been cancelled (without prejudice).

The re-numbered independent claim 6 (original independent claim 16) has been amended to recite the original dependent claim 17 (now cancelled), which was indicated as having novelty, inventive step, and industrial applicability. No new subject matter has been added to the claim.

The original dependent claims 17-20 have been cancelled (without prejudice).

The replacement specification on page 1 has been amended as follows:

This application is related to the co-filed U.S. Patent Application No. 15/886,727 entitled "Notification of Delivery of a RRLP Multilateration Timing Advance Request Message to a Base Station Subsystem (BSS)" (~~P71354-US2~~), which claims the benefit of priority to U.S. Provisional Application Serial Nos. 62/453,843 and 62/456,991, respectively filed on February 2, 2017 and February 9, 2017.

The replacement specification on page 20 has been amended in a similar manner as the amendment on page 1.

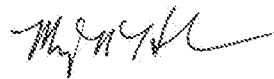
The replacement specification on page 8 has a reference to the prior art document D1.

Explanation of the Patentability

The pending amended independent claims 1, 3, and 5-6 all recite subject matter that has been indicated by the Authorized Officer as having novelty, inventive step, and industrial applicability. Amended dependent claims 2 and 4 also have novelty, inventive step, and industrial applicability at least by virtue of their dependence on amended independent claims 1, 3, and 5-6.

Accordingly, Applicant respectfully requests a favourable examination report for the pending claims 1-6.

Respectfully submitted,



Mymy Henderson
Attorney for Applicant

Enclosures:

- Replacement claim pages numbered 23-26 (in marked version) and replacement claim pages numbered 23-24 (in clean version) containing claims 1-6.
- Replacement specification pages numbered 1, 8-8a, and 20 (in marked and clean versions).

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REPLACEMENT SHEET

PCT/IB2018/050650

**NOTIFICATION OF ONGOING MULTILATERATION TIMING ADVANCE (MTA)
PROCEDURE TO A SERVING GPRS SUPPORT NODE (SGSN)**

CLAIM OF PRIORITY

5 This application claims the benefit of priority to U.S. Provisional Application Serial No. 62/453,843, filed on February 2, 2017, and U.S. Application Serial No. 15/886,616 filed on February 1, 2018, the entire contents of which are hereby incorporated herein by reference for all purposes.

10 **RELATED PATENT APPLICATION**

 This application is related to the co-filed U.S. Patent Application No. 15/886,727 entitled "Notification of Delivery of a RRLP Multilateration Timing Advance Request Message to a Base Station Subsystem (BSS)", which claims the benefit of priority to U.S. Provisional Application Serial Nos. 62/453,843 and 62/456,991, respectively filed on February 2, 2017 and February 9, 2017. The entire contents of each of these documents are hereby
15 incorporated herein by reference for all purposes.

TECHNICAL FIELD

 The present disclosure relates generally to the wireless telecommunications field and, more particularly, to various techniques for enabling a Base Station System (BSS) to provide a Serving GPRS Support Node (SGSN) with an indication, e.g., in the form of a flag or a timer, within a BSS General Packet Radio Service (GPRS) Protocol (BSSGP) POSITION-COMMAND Protocol Data Unit (PDU) that a target wireless device is to perform a Multilateration Timing Advance (MTA) procedure. The SGSN upon receipt of the BSSGP
20 POSITION-COMMAND PDU with the indication, e.g., in the form of a flag or a timer, can start a timer during which the SGSN will suspend downlink data delivery and paging to the target wireless device while the target wireless device is performing the MTA procedure.

BACKGROUND

30 The following abbreviations and term are herewith defined, at least some of which are referred to within the following description of the present disclosure.

3GPP 3rd-Generation Partnership Project

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REPLACEMENT SHEET

PCT/IB2018/050650

procedure and will therefore not be reachable on the control channel of the specific cell that the SGSN 112 associates with the MS 104 for which the ready timer 420 is running).

Problem 2: While the ready timer 420 is not running for a given MS 104, the SGSN 112 is not aware if the MS 104 is still performing a previously triggered Multilateration Timing Advance procedure. This is a problem because if the MS 104 is currently performing the previously triggered MTA procedure and the ready timer 420 is not running, then this means that the MS 104 is not reachable in its current paging area and that the paging procedure should therefore not be triggered by the SGSN 112. That is, if the SGSN 112 does trigger the paging procedure while the MS 104 is currently performing the previously triggered MTA procedure then the associated paging message will not be received by the MS 104 because the MS 104 is not listening for pages while performing the MTA procedure (i.e., the MS 104 will be going from cell to cell while performing the MTA procedure and will therefore not be reachable on the control channels of the cells comprising the paging area that the SGSN 112 associates with the MS 104 for which the ready timer 420 is not running).

In view of the foregoing, it can be appreciated that there is a need to address the aforementioned problems associated with the transparent tunneling between the BSS 108 and the SGSN 112 when the target MS 104 is being requested to perform a Multilateration Timing Advance (MTA) procedure. These needs and other needs are addressed by the present disclosure.

LM Ericsson: "Multilateration Procedure – TA Only", 3GPP Draft: R6-160273 – Multilateration Procedure – TA Only (was R6-160261), 3rd Generation Partnership Project (3GPP), MOBILE COMPETENCE CENTRE; 650, ROUTE DES LUCIOLES; F-06921 SOPHIA-ANTIPOLIS CEDEX; F-06921 Sophia-Antipolis CE no. Reno, Nevada, USA; 20161114-20161118 18 November 2016 (2016-11-18), XP051198955 discloses where a BSS transmits a BSSGP POSITION-COMMAND PDU to a SGSN. The BSSGP POSITION-COMMAND PDU comprises a RRLP MTA Request Message which includes a MTAO Multilateration Request.

SUMMARY

A SGSN, a BSS, and various methods for addressing the aforementioned problems are described in the independent claims. Advantageous embodiments of the SGSN, the BSS, and the various methods are further described in the dependent claims.

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REPLACEMENT SHEET

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In one aspect, the present disclosure provides a SGSN configured to interact with a BSS. The SGSN comprises a processor and a memory that stores processor-executable instructions, wherein the processor interfaces with the memory to execute the processor-executable instructions, whereby the SGSN is operable to perform a receive operation. In the
5 receive operation, the SGSN receives from the BSS, a BSSGP POSITION-COMMAND PDU comprising (i) a RRLP APDU with an embedded RRLP MTA Request message for a target wireless device, and (ii) an indicator that the target wireless device is to perform a MTA procedure. An advantage of the SGSN implementing the receive operation is that when the

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REPLACEMENT SHEET

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634₂ stores machine-readable program code executable by the processor 632₂ to cause the BSS 602₂ to perform the step of the above-described method 1300.

In view of the foregoing, it will be appreciated by those skilled in the art that an objective of the present disclosure is to enable the BSS 602₂ to provide the SGSN 607 with an indication 720, 730 (e.g., in the form of a flag 707 or a timer 709), within the BSSGP POSITION-COMMAND PDU 704 that a target wireless device 604₃ (for example) has been triggered to perform a MTA procedure. An advantage of the present disclosure is that the SGSN 607 will be aware of when the target wireless device 604₃ is performing the MTA procedure and can as such suspend downlink data delivery and paging to the target wireless device 604₃ while the target wireless device 604₃ is performing the MTA procedure. Another advantage of the present disclosure is to provide the SGSN 607 with the information (i.e., that the wireless device 604₃ is being asked to perform a MTA procedure) so that the SGSN 607 can send a BSSGP DL UNITDATA PDU 737 to the BSS 602₂ that indicates advanced positioning procedures are to be used when receiving a PACCH ack(s) 741 from the target wireless device 604₃. For more details about this advantage, reference is made to the co-filed U.S. Patent Application No. 15/886,727 entitled "Notification of Delivery of a RRLP Multilateration Timing Advance Request Message to a Base Station Subsystem (BSS)" which claims the benefit of priority to U.S. Provisional Application Serial Nos. 62/453,843 and 62/456,991, respectively filed on February 2, 2017 and February 9, 2017. The entire contents of each of these documents are hereby incorporated herein by reference for all purposes.

It should be appreciated that in the above described embodiments that these embodiments are exemplary and not mutually exclusive. For example, components from one embodiment may be tacitly assumed to be present in another embodiment and it will be obvious to a person skilled in the art how those components may be used in the other exemplary embodiments.

The exemplary embodiments described herein have been exemplified with Global System for Mobile telephony (GSM) / Enhanced Data rates for GSM Evolution (EDGE) as the communications network 600. The core network node 607 has been exemplified herein as being a Serving GPRS Support Node (SGSN) 607, but generally the core network node 607 may be any type of core network node that is serving the wireless device as well. For example, for NB-IoT the applicable core network node 607 may also be a Mobility Management Entity (MME). The radio access network node 602₂ (controller node 602₂) has been exemplified

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REPLACEMENT SHEET

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CLAIMS:

1. A Serving GPRS Support Node (SGSN) (607) configured to interact with a Base Station Subsystem (BSS) (602₂), the SGSN comprising:

5 a processor (646); and,
a memory (648) that stores processor-executable instructions, wherein the processor interfaces with the memory to execute the processor-executable instructions, whereby the SGSN is operable to:

receive (1102), from the BSS, a BSS General Packet Radio Service (GPRS) Protocol (BSSGP) POSITION-COMMAND Protocol Data Unit (PDU) (704) comprising (i) a Radio Resource Location Services (RRLP) Application Protocol Data Unit (APDU) (702) with an embedded Radio Resource Location Services (RRLP) Multilateration Timing Advance (MTA) Request message (706) for a target wireless device (604₃), and (ii) an indicator (720, 735) that the target wireless device is to perform a Multilateration Timing Advance procedure, wherein
15 the indicator is a Multilateration Timer Information Element (720) that includes an indication (707) that the SGSN is to start a timer (708).

2. The SGSN of claim 1, wherein the SGSN is further operable to:

use (1104) the indicator to suspend downlink data delivery and paging to the target
20 wireless device when the target wireless device is expected to be unavailable due to performing the Multilateration Timing Advance procedure.

3. A method (1100) implemented by a Serving GPRS Support Node (SGSN) (607) configured to interact with a Base Station Subsystem (BSS) (602₂), the method comprising:

25 receiving (1102), from the BSS, a BSS General Packet Radio Service (GPRS) Protocol (BSSGP) POSITION-COMMAND Protocol Data Unit (PDU) (704) comprising (i) a Radio Resource Location Services (RRLP) Application Protocol Data Unit (APDU) (702) with an embedded Radio Resource Location Services (RRLP) Multilateration Timing Advance (MTA) Request message (706) for a target wireless device (604₃), and (ii) an indicator (720, 735) that
30 the target wireless device is to perform a Multilateration Timing Advance procedure, wherein the indicator is a Multilateration Timer Information Element (720) that includes an indication (707) that the SGSN is to start a timer (708).

4. The method of claim 3, further comprising:

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using (1104) the indicator to suspend downlink data delivery and paging to the target wireless device when the target wireless device is expected to be unavailable due to performing the Multilateration Timing Advance procedure.

5 5. A Base Station Subsystem (BSS) (602₂) configured to interact with a Serving GPRS Support Node (SGSN) (607), the BSS comprising:

a processor (632₂); and,

a memory (634₂) that stores processor-executable instructions, wherein the processor interfaces with the memory to execute the processor-executable instructions, whereby the BSS
10 is operable to:

transmit (1302), to the SGSN, a BSS General Packet Radio Service (GPRS) Protocol (BSSGP) POSITION-COMMAND Protocol Data Unit (PDU) (704) comprising (i) a Radio Resource Location Services (RRLP) Application Protocol Data Unit (APDU) (702) with an embedded Radio Resource Location Services (RRLP) Multilateration Timing Advance (MTA)
15 Request message (706) for a target wireless device (604₃), and (ii) an indicator (720, 735) that the target wireless device is to perform a Multilateration Timing Advance procedure, wherein the indicator is a Multilateration Timer Information Element (720) that includes an indication (707) that the SGSN is to start a timer (708).

20 6. A method (1300) implemented in a Base Station Subsystem (BSS) (602₂) configured to interact with a Serving GPRS Support Node (SGSN) (607), the method comprising:

transmitting (1302), to the SGSN, a BSS General Packet Radio Service (GPRS) Protocol (BSSGP) POSITION-COMMAND Protocol Data Unit (PDU) (704) comprising (i)
25 a Radio Resource Location Services (RRLP) Application Protocol Data Unit (APDU) (702) with an embedded Radio Resource Location Services (RRLP) Multilateration Timing Advance (MTA) Request message (706) for a target wireless device (604₃), and (ii) an indicator (720, 735) that the target wireless device is to perform a Multilateration Timing Advance procedure, wherein the indicator is a Multilateration Timer Information Element (720) that includes an
30 indication (707) that the SGSN is to start a timer (708).

DESCRIPCIÓN ENMENDADA CAPITULO II

NOTIFICACIÓN DEL PROCEDIMIENTO EN CURSO DE AVANCE DE TEMPORIZACIÓN DE MULTILATERACIÓN (MTA) A UN NODO DE SOPORTE DEL GPRS DE SERVICIO (SGSN)

REIVINDICACIÓN DE PRIORIDAD

Esta solicitud reivindica el beneficio de prioridad de la Solicitud Provisional de los EE.UU. N° de Serie 62/453.843 presentada el 2 de febrero de 2017 y la Solicitud de los EE.UU. N° de Serie 15/886.616 presentada el 1 de febrero de 2018, cuyos contenidos completos se incorporan por este medio a la presente a modo de referencia para todo propósito.

SOLICITUD DE PATENTE RELACIONADA

Esta solicitud está relacionada con la Solicitud de Patente de los EE.UU. N° 15/886.727 presentada conjuntamente y cuyo título es "Notificación de Entrega de un Mensaje de Solicitud de Avance de Temporización de Multilateración de RRLP a un Subsistema de la Estación de Base (BSS) (Notification of Delivery of a RRLP Multilateration Timing Advance Request Message to a Base Station Subsystem (BSS))" que reivindica el beneficio de prioridad de las Solicitudes Provisionales de los EE.UU. N° de Serie 62/453.843 y 62/456.991 presentadas respectivamente el 2 de febrero de 2017 y el 9 de febrero de 2017. Los contenidos completos de cada uno de estos documentos se incorporan por este medio a la presente a modo de referencia para todo propósito.

CAMPO TÉCNICO

La presente divulgación se relaciona en general con el campo de las

telecomunicaciones inalámbricas y más en particular con diversas técnicas para permitir que un Sistema de la Estación de Base (BSS por Base Station Subsystem) provea un Nodo de Soporte del GPRS de Servicio (por General Packet Radio Service, Servicio General de Radiocomunicaciones por Paquetes) (SGSN por Serving GPRS Support Node) con una indicación, por ejemplo, en la forma de una bandera o un temporizador, dentro de una Unidad de Datos de Protocolo (PDU por Protocol Data Unit) de COMANDO DE POSICIÓN del Protocolo GPRS del BSS (BSSGP por Base Station Subsystem GPRS Protocol) de que un dispositivo inalámbrico blanco está por realizar un procedimiento de Avance de Temporización de Multilateración (MTA por Multilateration Timing Advance). SGSN tras recibir PDU de COMANDO DE POSICIÓN de BSSGP con la indicación, por ejemplo, en la forma de una bandera o un temporizador, puede iniciar un temporizador durante el cual SGSN suspenderá la entrega de datos de enlace descendente y la radiobúsqueda para el dispositivo inalámbrico blanco mientras el dispositivo inalámbrico blanco está realizando el procedimiento MTA.

ANTECEDENTES

Las siguientes abreviaturas y términos se definen en la presente y al menos algunos de los mismos son referenciados dentro de la siguiente descripción de la presente divulgación.

3GPP Proyecto de Asociación de Tercera Generación

procedimiento y por lo tanto no será alcanzable en el canal de control de la celda específica que SGSN 112 asocia con MS 104 para la cual está ejecutándose el temporizador preparado 420).

Problema 2: Mientras el temporizador preparado 420 no se está ejecutando

para una MS 104 determinada, SGSN 112 no tiene conocimiento si MS 104 todavía está realizando un procedimiento de Avance de Temporización de Multilateración previamente activado. Esto es un problema porque si MS 104 está actualmente realizando el procedimiento MTA previamente activado y no se está ejecutando el temporizador preparado 420, entonces esto significa que MS 104 no es alcanzable en su área de radiobúsqueda actual y entonces el procedimiento de radiobúsqueda no debería ser activado por SGSN 112. Es decir, si SGSN 112 activa el procedimiento de radiobúsqueda mientras MS 104 está actualmente realizando el procedimiento MTA previamente activado, entonces MS 104 no recibirá el mensaje de radiobúsqueda asociado, porque MS 104 no está escuchando las páginas mientras realiza el procedimiento MTA (es decir, MS 104 irá de celda en celda mientras realiza el procedimiento MTA y, por lo tanto, no será alcanzable en los canales de control de las celdas que comprenden el área de radiobúsqueda que SGSN 112 asocia con MS 104 para el cual no se está ejecutando el temporizador preparado 420).

En vista de lo anterior, se puede apreciar que existe la necesidad de abordar los problemas antes mencionados asociados con la tunelización transparente entre BSS 108 y SGSN 112 cuando se solicita a MS 104 objetivo que realice procedimiento de un avance de sincronización de multilateración (MTA). Estas necesidades y otras necesidades son abordadas en la presente divulgación.

LM Ericsson: "Procedimiento de Multilateración – Solo TA (Multilateration Procedure – TA Only)", Borrador de 3GPP: R6-160273 – Procedimiento de Multilateración – Solo TA (era R6-160261), Proyecto de Asociación de Tercera Generación (3GPP), MOBILE COMPETENCE CENTRE; 650, ROUTE DES

LUCIOLES; F-06921 SOPHIA-ANTIPOLIS CEDEX; F-06921 Sophia-Antipolis CE no. Reno, Nevada, USA; 20161114-20161118 18 de noviembre de 2016 (18-11-2016), XP051198955 divulga donde un BSS transmite una PDU de COMANDO DE POSICIÓN de BSSGP a SGSN. PDU de COMANDO DE POSICIÓN de BSSGP comprende un Mensaje de Solicitud MTA de RRLP que incluye una Solicitud de Multilateración MTAO.

SÍNTESIS

Un SGSN, un BSS y diversos métodos para abordar los problemas antes mencionados se describen en las reivindicaciones independientes. Además se describen formas de realización ventajosas de SGSN, BSS y diversos métodos en las reivindicaciones dependientes.

En un aspecto, la presente divulgación provee un SGSN configurado para interactuar con un BSS. SGSN comprende un procesador y una memoria que almacena instrucciones ejecutables por procesador, en donde el procesador hace interfase con la memoria para ejecutar las instrucciones ejecutables por procesador, por lo que SGSN es operativo para realizar una operación de recepción. En la operación de recepción, SGSN recibe del BSS, una PDU de COMANDO DE POSICIÓN de BSSGP que comprende (i) una APDU de RRLP con un mensaje de Solicitud MTA de RRLP incorporado para un dispositivo inalámbrico blanco, y (ii) un indicador de que el dispositivo inalámbrico blanco está por realizar un procedimiento MTA. Una ventaja de que SGSN implemente la operación de recepción es que cuando 634₂ almacena el código de programación legible por máquina y ejecutable por el procesador 632₂ hace que BSS 602₂ realice el paso del metodo 1300 descrito anteriormente.

En vista de lo anterior, los expertos en la técnica pueden apreciar que un

objetivo de la presente divulgación es permitir que BSS 602₂ provea al SGSN 607 una indicación 720, 730 (por ejemplo, en la forma de una bandera 707 o un temporizador 709), dentro de PDU 704 POSICIÓN DE COMANDO de BSSGP que (por ejemplo) un dispositivo inalámbrico 604₃ blanco se ha activado para realizar un procedimiento MTA. Una ventaja de la presente divulgación es que SGSN 607 estará al tanto de cuándo el dispositivo inalámbrico 604₃ blanco está realizando el procedimiento MTA y por lo tanto puede suspender la entrega de datos de enlace descendente y la radiobúsqueda para el dispositivo inalámbrico 604₃ blanco mientras el dispositivo inalámbrico 604₃ blanco está realizando el procedimiento MTA. Otra ventaja de la presente divulgación es proveer al SGSN 607 con la información (es decir, que se le está pidiendo al dispositivo inalámbrico 604₃ que realice un procedimiento MTA) de modo que SGSN 607 pueda enviar una PDU 737 DATOS UNIDAD de DL de BSSGP al BSS 6022 que indica que se deben utilizar procedimientos de posicionamiento avanzados cuando se recibe uno o unos acuses de recibo PACCH 741 del dispositivo inalámbrico 604₃ blanco. Para obtener más detalles acerca de esta ventaja, se hace referencia a la Solicitud de Patente de los EE.UU. N° 15/886.727 presentada conjuntamente y cuyo título es "Notification of Delivery of a RRLP Multilateration Timing Advance Request Message to a Base Station Subsystem (BSS)" que reivindica el beneficio de prioridad de las Solicitudes Provisionales de los EE.UU. N° de Serie 62/453.843 y 62/456.991 presentadas respectivamente el 2 de febrero de 2017 y el 9 de febrero de 2017. Los contenidos completos de cada uno de estos documentos se incorporan por este medio a la presente a modo de referencia para todo propósito.

Se debe apreciar que en las formas de realización descritas anteriormente

estas formas de realización son ejemplificativas y no se excluyen mutuamente. Por ejemplo, se puede suponer tácitamente que los componentes de una forma de realización están presentes en otra forma de realización y será obvio para una persona experta en la técnica cómo esos componentes se pueden usar en las otras formas de realización ejemplificativas.

Las formas de realización ejemplificativas descritas en la presente se han ejemplificado con el Sistema Global de Comunicaciones Móviles (GSM)/Tasas de Datos Mejoradas para la Evolución de GSM (EDGE) como la red de comunicaciones 600. El nodo de red central 607 se ha ejemplificado en la presente como un Nodo de Soporte de Servicio GPRS (SGSN) 607, pero en general, el nodo de red central 607 puede ser cualquier tipo de nodo de red central que también da servicio al dispositivo inalámbrico. Por ejemplo, para NB-IoT, el nodo de red central aplicable 607 también puede ser una Entidad de Gestión Móvil (MME). El nodo 602₂ de la red de acceso de radio (nodo controlador 602₂) se ha ejemplificado

REIVINDICACIONES ENMENDADAS CAPITULO II

1. Un Nodo de Soporte del GPRS de Servicio (SGSN) (607) configurado para interactuar con un Subsistema de la Estación de Base (BSS) (602₂), en donde SGSN comprende:

un procesador (646), y

una memoria (648) que almacena instrucciones ejecutables por procesador, en donde el procesador hace interfase con la memoria para ejecutar las instrucciones ejecutables por procesador, por lo que SGSN es operativo para:

recibir (1102) del BSS, una Unidad de Datos de Protocolo (PDU) (704) de COMANDO DE POSICIÓN del Protocolo del Servicio General de Radiocomunicaciones por Paquetes (GPRS) del BSS (BSSGP) que comprende (i) una Unidad de Datos de Protocolo de la Aplicación (APDU) (702) de Servicios de Localización de Recursos Radioeléctricos (RRLP) con un mensaje de Solicitud de Avance de Temporización de Multilateración (MTA) de Servicios de Localización de Recursos Radioeléctricos (RRLP) incorporado para un dispositivo inalámbrico blanco (6043), y (ii) un indicador (720, 735) de que el dispositivo inalámbrico blanco está por realizar un procedimiento de Avance de Temporización de Multilateración, en donde el indicador es un Elemento de Información del Temporizador de Multilateración (720) que incluye una indicación (707) de que SGSN está por iniciar un temporizador (708).

2. El SGSN de acuerdo con la reivindicación 1, en donde SGSN es además operativo para:

usar (1104) el indicador para suspender la entrega de datos de enlace descendente y la radiobúsqueda para el dispositivo inalámbrico blanco cuando

se espera que el dispositivo inalámbrico blanco no esté disponible debido a la realización del procedimiento de Avance de Temporización de Multilateración.

3. Un método (1100) implementado por un Nodo de Soporte del GPRS de Servicio (SGSN) (607) configurado para interactuar con un Subsistema de la Estación de Base (BSS) (6022), en donde el método comprende:

recibir (1102) del BSS, una Unidad de Datos de Protocolo (PDU) (704) de COMANDO DE POSICIÓN del Protocolo del Servicio General de Radiocomunicaciones por Paquetes (GPRS) del BSS (BSSGP) que comprende (i) una Unidad de Datos de Protocolo de la Aplicación (APDU) (702) de Servicios de Localización de Recursos Radioeléctricos (RRLP) con un mensaje de Solicitud de Avance de Temporización de Multilateración (MTA) de Servicios de Localización de Recursos Radioeléctricos (RRLP) incorporado para un dispositivo inalámbrico blanco (604₃), y (ii) un indicador (720, 735) de que el dispositivo inalámbrico blanco está por realizar un procedimiento de Avance de Temporización de Multilateración, en donde el indicador es un Elemento de Información del Temporizador de Multilateración (720) que incluye una indicación (707) de que SGSN está por iniciar un temporizador (708).

4. El método de acuerdo con la reivindicación 3, que además comprende:

usar (1104) el indicador para suspender la entrega de datos de enlace descendente y la radiobúsqueda para el dispositivo inalámbrico blanco cuando se espera que el dispositivo inalámbrico blanco no esté disponible debido a la realización del procedimiento de Avance de Temporización de Multilateración.

5. Un Subsistema de la Estación de Base (BSS) (602₂)

configurado para interactuar con un Nodo de Soporte del GPRS de Servicio (SGSN) (607), en donde BSS comprende:

un procesador (632₂), y

una memoria (634₂) que almacena instrucciones ejecutables por procesador, en donde el procesador hace interfase con la memoria para ejecutar las instrucciones ejecutables por procesador, por lo que BSS es operativo para:

transmitir (1302) al SGSN una Unidad de Datos de Protocolo (PDU) (704) de COMANDO DE POSICIÓN del Protocolo del Servicio General de Radiocomunicaciones por Paquetes (GPRS) del BSS (BSSGP) que comprende (i) una Unidad de Datos de Protocolo de la Aplicación (APDU) (702) de Servicios de Localización de Recursos Radioeléctricos (RRLP) con un mensaje de Solicitud de Avance de Temporización de Multilateración (MTA) de Servicios de Localización de Recursos Radioeléctricos (RRLP) incorporado para un dispositivo inalámbrico blanco (604₃), y (ii) un indicador (720, 735) de que el dispositivo inalámbrico blanco está por realizar un procedimiento de Avance de Temporización de Multilateración, en donde el indicador es un Elemento de Información del Temporizador de Multilateración (720) que incluye una indicación (707) de que SGSN está por iniciar un temporizador (708).

6. Un método (1300) implementado en un Subsistema de Estación de Base (BSS) (602₂) configurado para interactuar con un Nodo de Soporte del GPRS de Servicio (SGSN) (607), en donde el método comprende:

transmitir (1302) al SGSN una Unidad de Datos de Protocolo (PDU) (704) de COMANDO DE POSICIÓN del Protocolo del Servicio General de Radiocomunicaciones por Paquetes (GPRS) del BSS (BSSGP) que comprende (i) una Unidad de Datos de Protocolo de la Aplicación (APDU) (702) de Servicios

de Localización de Recursos Radioeléctricos (RRLP) con un mensaje de Solicitud de Avance de Temporización de Multilateración (MTA) de Servicios de Localización de Recursos Radioeléctricos (RRLP) incorporado para un dispositivo inalámbrico blanco (604₃), y (ii) un indicador (720, 735) de que el dispositivo inalámbrico blanco está por realizar un procedimiento de Avance de Temporización de Multilateración, en donde el indicador es un Elemento de Información del Temporizador de Multilateración (720) que incluye una indicación (707) de que SGSN está por iniciar un temporizador (708).

From the INTERNATIONAL BUREAU

PCTNOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

HENDERSON, Mymy
6300 Legacy Drive, MS EVR 1-C-11
Plano, Texas 75024
ÉTATS-UNIS D'AMÉRIQUE

Date of mailing (day/month/year) 04 December 2018 (04.12.2018)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference P71285-WO1	
International application No. PCT/IB2018/050650	International filing date (day/month/year) 02 February 2018 (02.02.2018)

1. The following indications appeared on record concerning:		
☒ the applicant	☐ the inventor	☐ the agent
☐ the common representative		
Name and Address TELEFONAKTIEBOLAGET L M ERICSSON (PUBL) SE-164 83 Stockholm Sweden	State of Nationality SE	State of Residence SE
	Telephone No.	
	Facsimile No.	
	E-mail address patent.development@ericsson.com	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
☐ the person	☒ the name	☐ the address
☐ the nationality		
☐ the residence		
Name and Address TELEFONAKTIEBOLAGET LM ERICSSON (PUBL) SE-164 83 Stockholm Sweden	State of Nationality SE	State of Residence SE
	Telephone No.	
	Facsimile No.	
	E-mail address patent.development@ericsson.com ☐ Notifications by e-mail authorized	
3. Further observations, if necessary:		
4. A copy of this notification has been sent to:		
☐ the receiving Office	☒ the International Preliminary Examining Authority	
☒ the International Searching Authority	☒ the designated Offices concerned	
☐ the Authority(ies) specified for supplementary search	☐ the elected Offices concerned	
	☐ other:	

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 910 06 10	Authorized officer DELBARD Sabine e-mail ro.ib@wipo.int Telephone No. +4122 338 9484
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From the INTERNATIONAL BUREAU

PCTNOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

To:

HENDERSON, Mymy
6300 Legacy Drive, MS EVR 1-C-11
Plano, Texas 75024
ÉTATS-UNIS D'AMÉRIQUE

Date of mailing (day/month/year) 16 July 2019 (16.07.2019)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference P71285-WO1	
International application No. PCT/IB2018/050650	International filing date (day/month/year) 02 February 2018 (02.02.2018)

1. The following indications appeared on record concerning:		
☐ the applicant	☒ the inventor	☐ the agent
☐ the common representative		
Name and Address DIACHINA, John 505 Kristin Drive GARNER, North Carolina 27529 United States of America	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	E-mail address	
2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning:		
☐ the person	☒ the name	☐ the address
☐ the nationality		
☐ the residence		
Name and Address DIACHINA, John Walter 505 Kristin Drive GARNER, North Carolina 27529 United States of America	State of Nationality	State of Residence
	Telephone No.	
	Facsimile No.	
	E-mail address ☐ Notifications by e-mail authorized	
3. Further observations, if necessary:		
4. A copy of this notification has been sent to:		
☐ the receiving Office	☒ the International Preliminary Examining Authority	
☒ the International Searching Authority	☐ the designated Offices concerned	
☐ the Authority(ies) specified for supplementary search	☒ the elected Offices concerned	
	☐ other:	

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Diot Sylvie e-mail ro.ib@wipo.int Telephone No. +4122 338 9608
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