US009271165B2

(12) **United States Patent**
Xu et al.

(10) **Patent No.: US 9,271,165 B2**
(45) **Date of Patent: Feb. 23, 2016**

(54) **METHOD FOR ESTABLISHING CONNECTION BY HNB**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 866 days.

(21) Appl. No.: **12/673,223**

(22) PCT Filed: **Sep. 16, 2008**

(86) PCT No.: **PCT/KR2008/005445**

§ 371 (c)(1),
(2), (4) Date: **Feb. 12, 2010**

(87) PCT Pub. No.: **WO2009/045007**

PCT Pub. Date: **Apr. 9, 2009**

(65) **Prior Publication Data**

US 2011/0314162 A1 Dec. 22, 2011

(30) **Foreign Application Priority Data**

Sep. 29, 2007 (CN) 2007 1 0164106

(51) **Int. Cl.**
G06F 15/16 (2006.01)
H04W 24/02 (2009.01)
H04W 84/04 (2009.01)

(52) **U.S. Cl.**
CPC ***H04W 24/02*** (2013.01); *H04W 84/045* (2013.01)

(58) **Field of Classification Search**
USPC 709/227
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,990,912	B2 *	8/2011	Nix et al.	370/328
8,050,653	B2 *	11/2011	Brown et al.	455/410
2001/0055285	A1 *	12/2001	Tomoike	370/328
2003/0087648	A1 *	5/2003	Mezhvinsky et al.	455/456
2003/0095520	A1 *	5/2003	Aalbers et al.	370/338
2003/0148771	A1 *	8/2003	de Verteuil	455/456
2006/0073838	A1 *	4/2006	Kamali et al.	455/456.1
2007/0179843	A1 *	8/2007	Eichenbaum et al.	705/14
2008/0049696	A1 *	2/2008	Stewart	370/338
2008/0244148	A1 *	10/2008	Nix et al.	710/313
2008/0316994	A1 *	12/2008	Keevill et al.	370/343
2009/0191844	A1 *	7/2009	Morgan et al.	455/411
2009/0225743	A1 *	9/2009	Nicholls et al.	370/350
2010/0029283	A1 *	2/2010	Iwamura	455/437
2010/0061232	A1 *	3/2010	Zhou et al.	370/230
2010/0265867	A1 *	10/2010	Becker et al.	370/312
2011/0038431	A1 *	2/2011	Frederiksen et al.	375/259

OTHER PUBLICATIONS

Mitsubishi Electric, From large lists of potential neighbor cells to self-optimized neighbor cell lists, R3-071239, 3GPP TSG SA WG5 and RAN WG3 LTE Adhoc, Jun. 2007.

(Continued)

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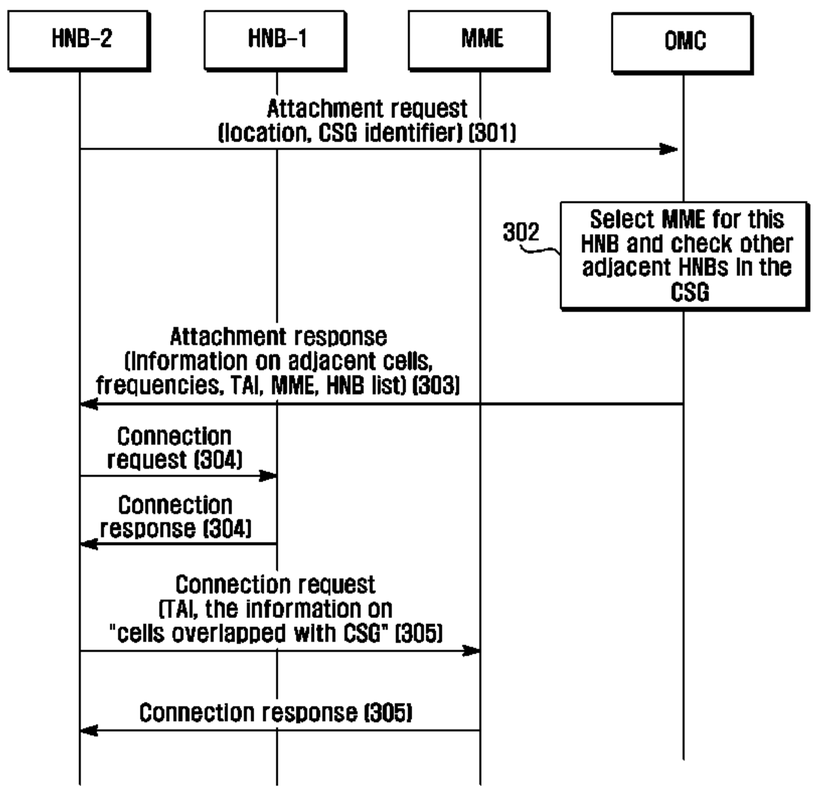
(57) **ABSTRACT**

The method for establishing a connection by a HNB comprising steps of: the HNB transmitting an "attachment request" message to an operation and maintenance center (OMC); the OMC transmitting an "attachment response" message to the HNB; the HNB establishing a connection with an MME indicated by the "attachment response" message. With the method proposed in the present invention, a UE can switch between HNBs in the same CSG through interface X2. Meanwhile, such information as the radio resource management and so on can be exchanged between two HNBs.

25 Claims, 7 Drawing Sheets



(56) **References Cited**

OTHER PUBLICATIONS

Mitsubishi Electric, Whereability of HNBs, R3-071237, 3GPP TSG SA WG5 and RAN WG3 LTE Adhoc, Jun. 2007.

Alcatel-Lucent, Home eNodeB O&M Aspects, R3-071235, 3GPP TSG RAN3 Meeting#56bis, Jun. 2007.

3GPP TSG-RAN WG3 Meeting #57 R3-071359: X2 availability for HNB Configuration, Samsung, Aug. 24, 2007.

* cited by examiner

FIG. 1
(RELATED ART)

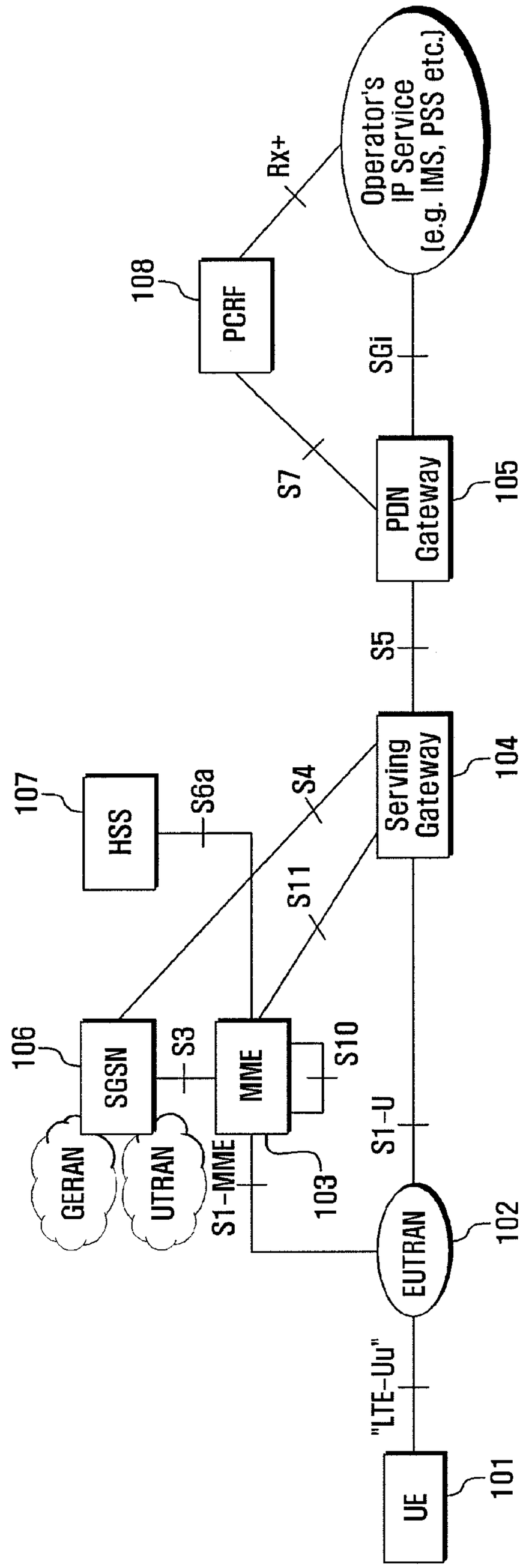


FIG. 2

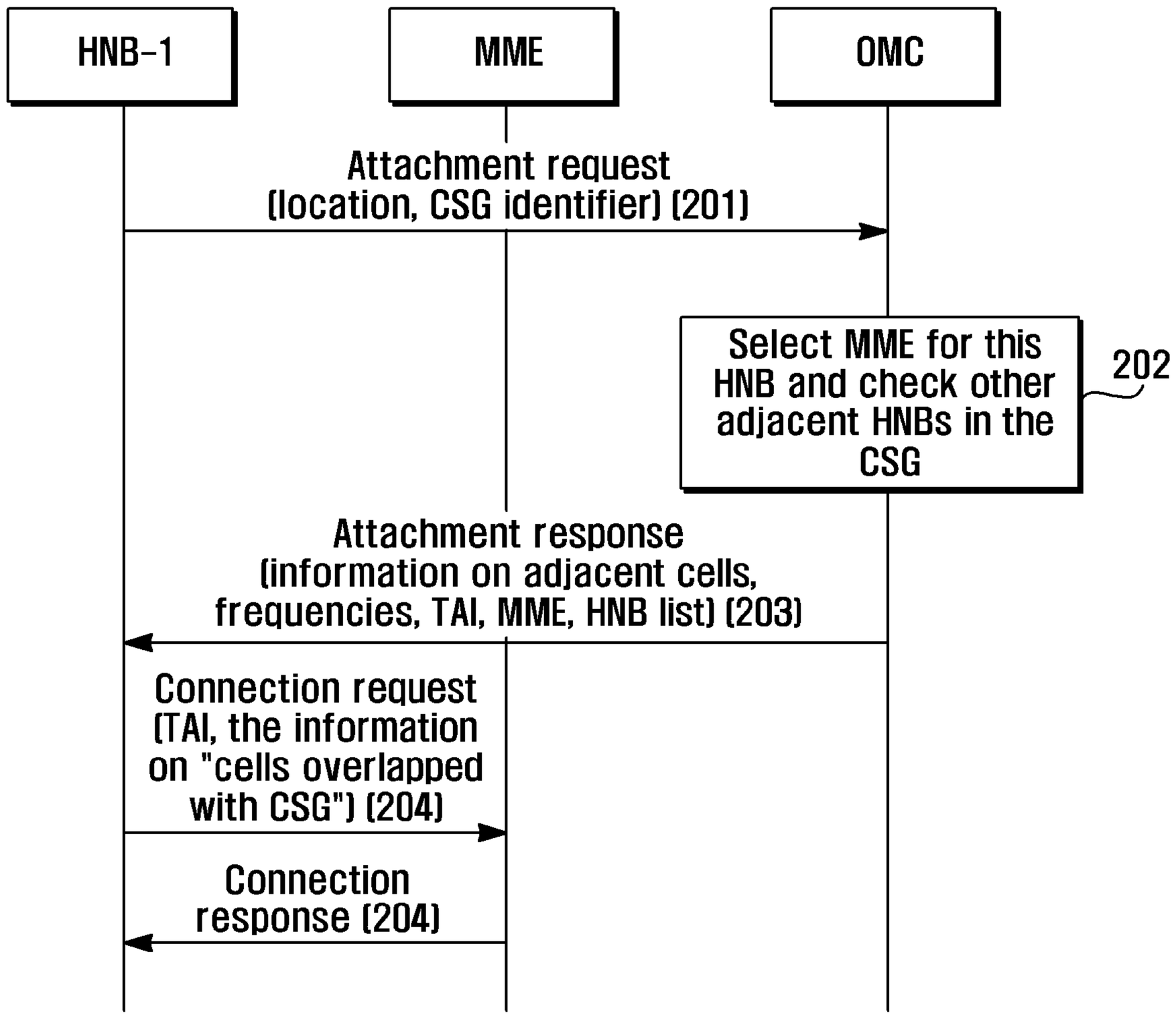

HNB-1
MME
OMC
Attachment request
(location, CSG identifier) (201)
Select MME for this HNB and check other adjacent HNBs in the CSG
202
Attachment response
(information on adjacent cells, frequencies, TAI, MME, HNB list) (203)
Connection request
(TAI, the information on "cells overlapped with CSG") (204)
Connection response (204)

FIG. 3

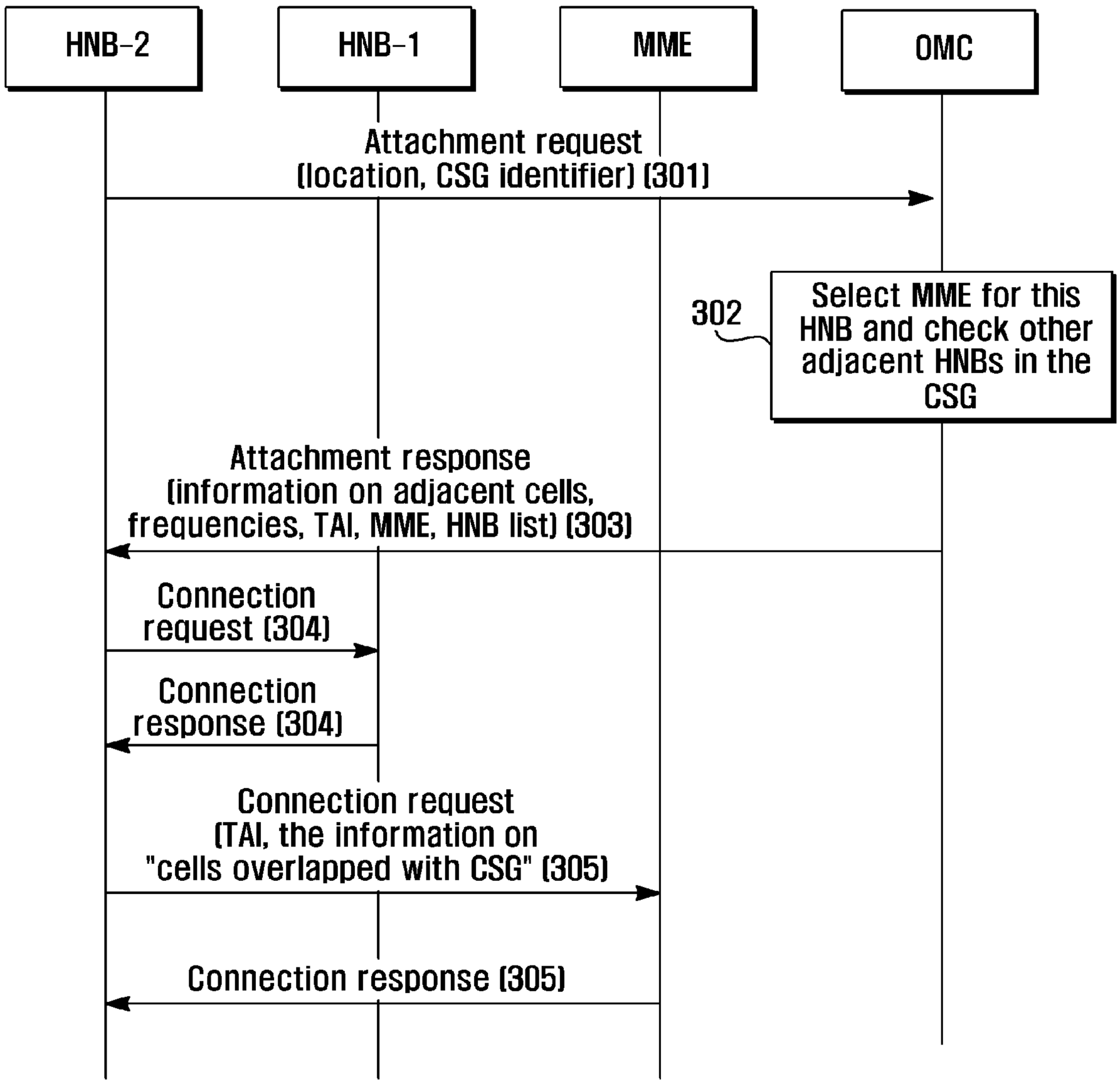

HNB-2
HNB-1
MME
OMC
Attachment request (location, CSG identifier) (301)
302
Select MME for this HNB and check other adjacent HNBs in the CSG
Attachment response (information on adjacent cells, frequencies, TAI, MME, HNB list) (303)
Connection request (304)
Connection response (304)
Connection request (TAI, the information on "cells overlapped with CSG" (305)
Connection response (305)

FIG. 4

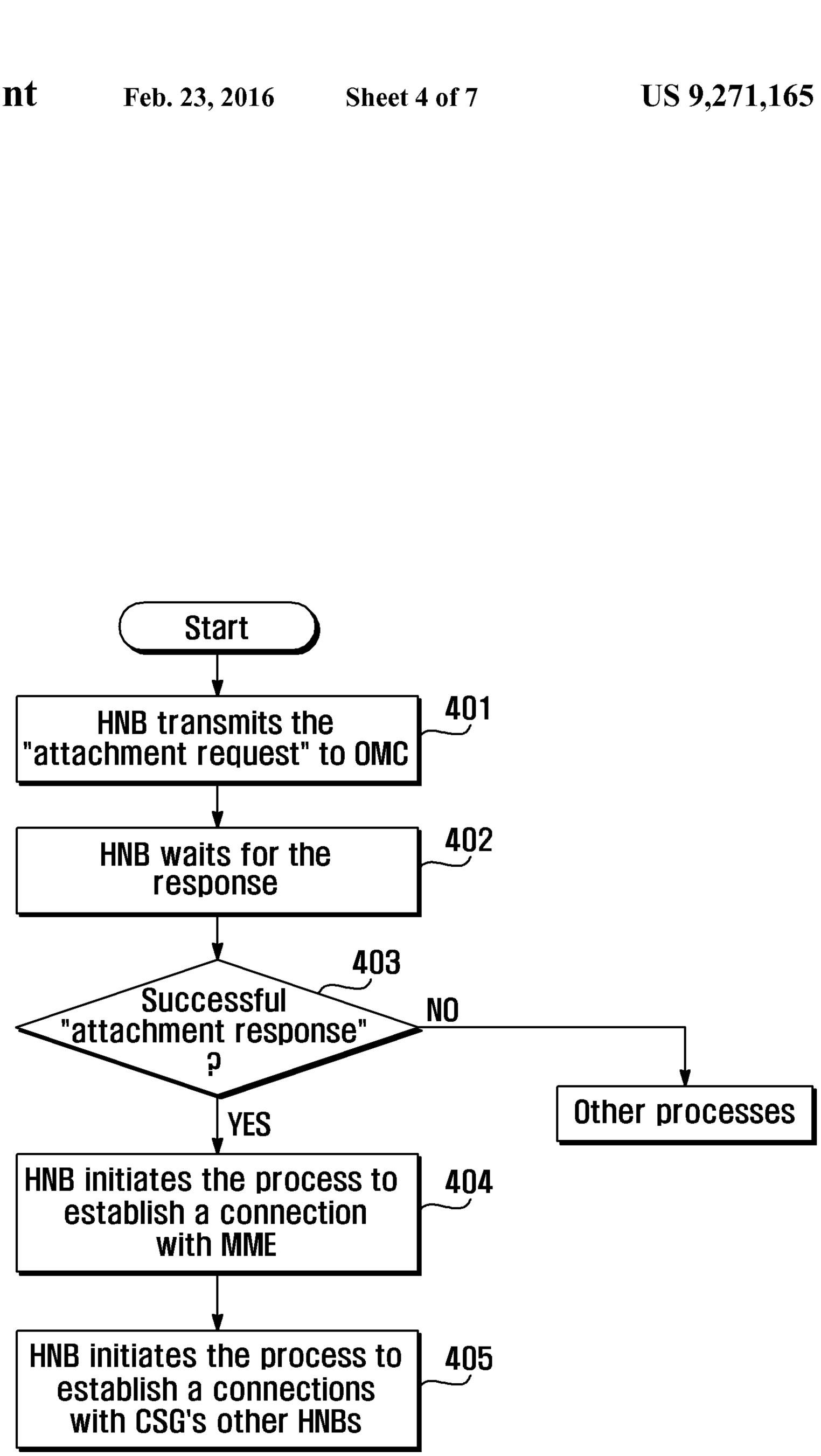

Start
HNB transmits the "attachment request" to OMC
401
HNB waits for the response
402
Successful "attachment response" ?
403
NO
Other processes
YES
HNB initiates the process to establish a connection with MME
404
HNB initiates the process to establish a connections with CSG's other HNBs
405

FIG. 5

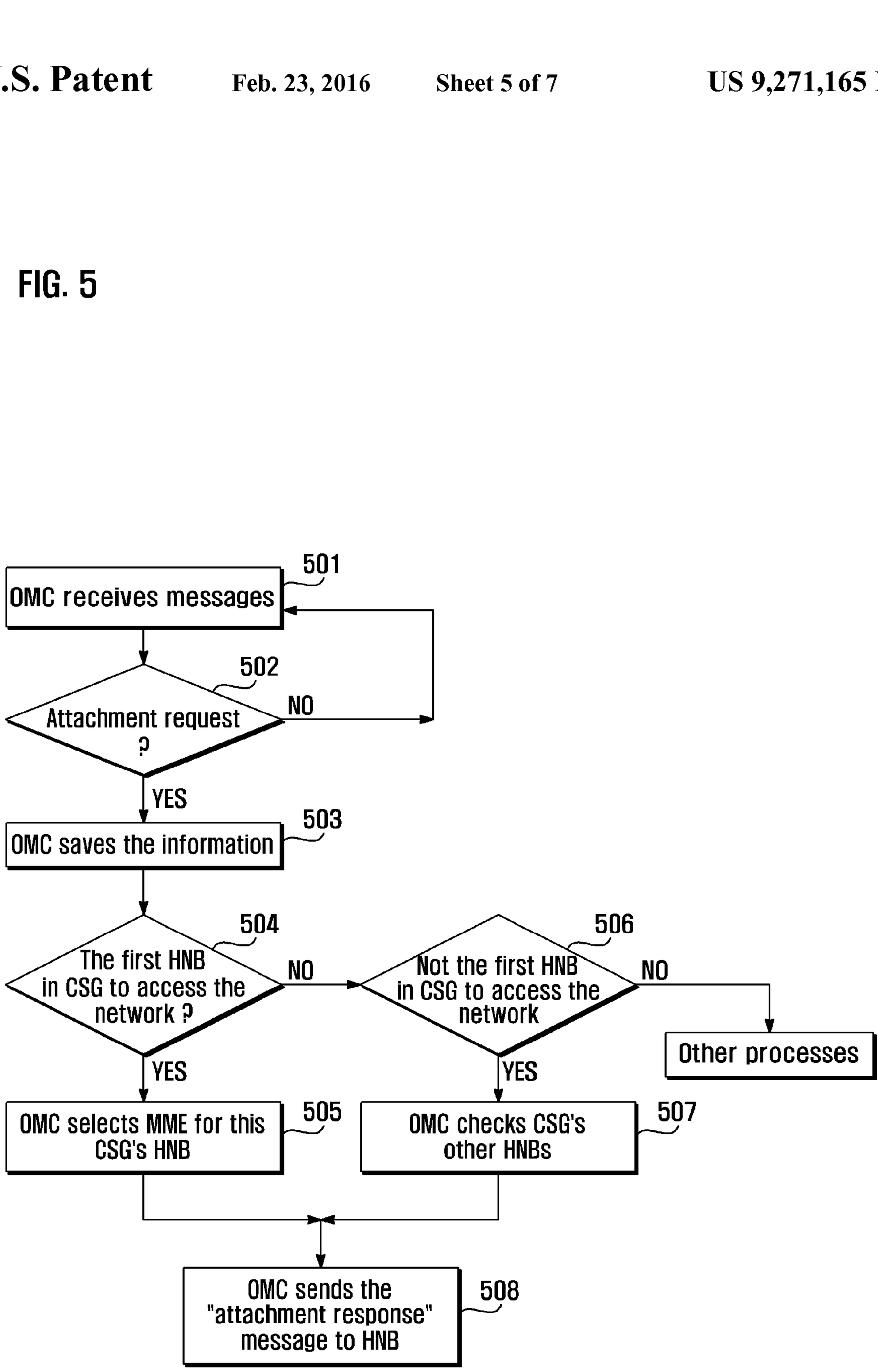

501
OMC receives messages
502
Attachment request ?
NO
YES
503
OMC saves the information
504
The first HNB in CSG to access the network ?
NO
506
Not the first HNB in CSG to access the network
NO
Other processes
YES
YES
505
OMC selects MME for this CSG's HNB
507
OMC checks CSG's other HNBs
508
OMC sends the "attachment response" message to HNB

FIG. 6

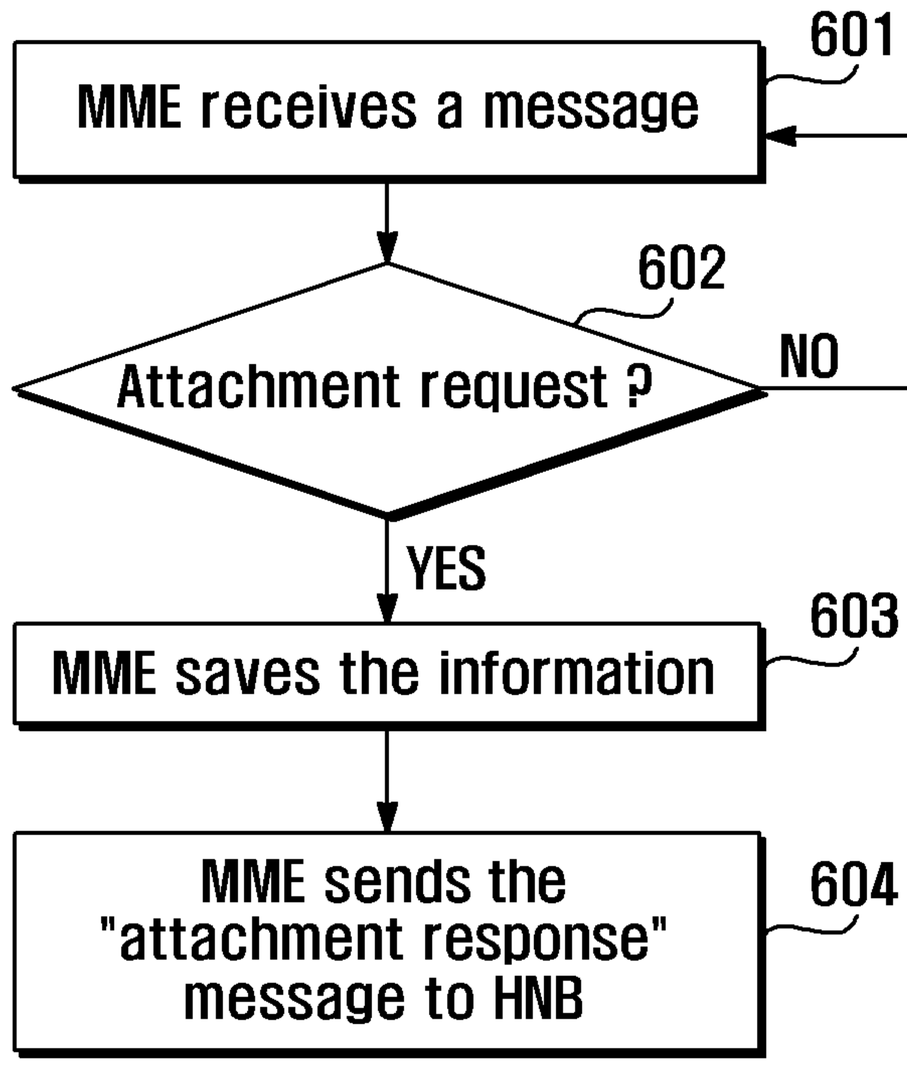
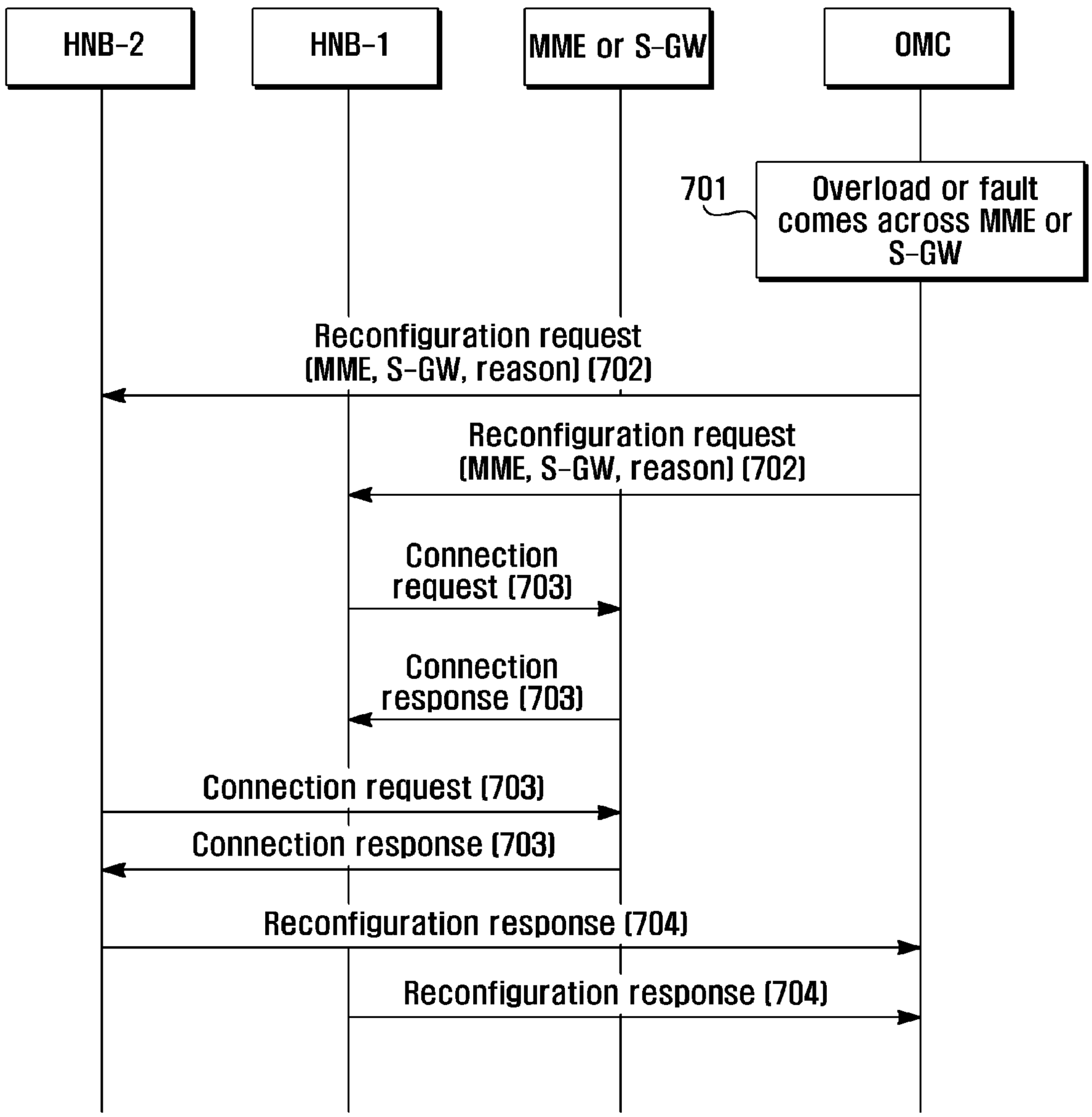

601
MME receives a message
602
Attachment request ?
NO
YES
603
MME saves the information
604
MME sends the "attachment response" message to HNB

FIG. 7


HNB-2
HNB-1
MME or S-GW
OMC
701
Overload or fault comes across MME or S-GW
Reconfiguration request (MME, S-GW, reason) (702)
Reconfiguration request (MME, S-GW, reason) (702)
Connection request (703)
Connection response (703)
Connection request (703)
Connection response (703)
Reconfiguration response (704)
Reconfiguration response (704)

METHOD FOR ESTABLISHING CONNECTION BY HNB

TECHNICAL FIELD

The present invention generally relates to communication technology, especially to a method for accessing a network by an HNB (home Node B).

BACKGROUND ART

A system structure of System Architecture Evolution (SAE) is illustrated in FIG. **1**. The system structure of SAE in FIG. **1** is described as following.

User Equipment **101** (hereinafter referred to as UE) is a terminal device used to receive data. **102** EUTRAN, also called ENB, is a radio access network of the LTE SAE, for providing interface through which an LTE mobile station accesses the radio network. Through interface S1, EUTRAN connects to a mobility management entity (MME) **103** and a user plane entity Serving Gateway (S-GW) **104** in the mobile station. **103** MME is adapted for managing mobile context, session context for the UE, and holding user information on security. **104** Serving Gateway primarily provides a function of user plane. An interface S1-MME is adapted for establishing radio access bearer, forwarding messages from UE to MME through a wireless access network. The combination of **103** MME and **104** Serving Gateway is similar to the original **106** SGSN (general packet radio service (GPRS) supporting node). It is possible that both MME and Serving Gateway locate at the same physical entity. **105** PDN Gateway is adapted for the functions like accounting, legally monitoring, etc. And it is possible that both the Serving Gateway and the PDN Gateway locate at the same physical entity. **106** SGSN provides routing for data transmission in existing UMTS. An existing SGSN finds a corresponding gateway GPRS supporting node (GGSN) according to an access point name (APN). **107** HSS is a home subscription sub-system for the UE and is adapted for storing user information such as the current location of UE, address of the serving node, security information on the user, activated packet data protocol (PDP) context for the UE and so on. **108** PCRF provides QoS policy and accounting rules through interface S7.

In general, a user data stream reaches the **104** Serving Gateway through **105** PDN Gateway. Then, through the GPRS tunnel protocol (GTP) channel, data is sent by the Serving Gateway to the ENB where the UE locates in, and now it is sent by the ENB to corresponding UE.

HNB refers to a Node B applied in a home. It also can be applied in such site as a university, a company and so on. HNB is a plug and play device. Difference between an HNB and a general macro node B is that: in general not all UEs can access an HNB. For example, only the UEs in a user's home or that are allowed to access the HNB can access the corresponding HNB. And for the HNB in a company, only the company's staff and its allowed partners can access the HNB. The HNB group (e.g., the HNB in a company) bearing the same access subscriber cluster is called CSG (closed subscriber group). No interface X2 (interface between Node Bs in SAE) exists between general HNBs (e.g., the HNBs in homes) or between an HNB and a macro Node B. Through interface S1, a UE switches between HNBs or between an HNB and a macro Node B.

For an HNB applied in a company or university or the like, a UE frequently moves between two HNBs in the same company. In this case, the switch is always implemented through interface S1 so that great delay causes and efficiency is very poor. In addition, information such as radio resource management and so on can not be exchanged between two HNBs in the same company so that resources can not be utilized effectively.

DISCLOSURE OF INVENTION

Technical Problem

The object of this invention is to provide a method for establishing a connection by a Home Node B HNB.

Technical Solution

To achieve the object mentioned above, a method for establishing a connection by a HNB comprising steps of:

the HNB transmitting an "attachment request" message to an operation and maintenance center (OMC);

the OMC transmitting an "attachment response" message to the HNB;

the HNB establishing a connection with an MME indicated by the "attachment response" message;

With the method proposed in the present invention, a UE can switch between HNBs in the same CSG through interface X2. Meanwhile, such information as the radio resource management and so on can be exchanged between two HNBs.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will be more apparent from the following detailed description in conjunction with the accompanying drawings, in which:

FIG. **1** shows a network structure of SAE;

FIG. **2** shows a process that a connection is established for HNB in embodiment 1 of present invention;

FIG. **3** shows the process that a connection is established for HNB in embodiment 2 of present invention;

FIG. **4** shows an operation flows at HNB according to embodiment 1 and embodiment 2 respectively;

FIG. **5** shows an operation flows at OMC according to embodiment 1 and embodiment 2 respectively;

FIG. **6** shows an operation flows at MME according to embodiment 1 and embodiment 2 respectively; and

FIG. **7** shows a process of reconfiguring MME or S-GW.

BEST MODE FOR CARRYING OUT THE INVENTION

An embodiment 1 of the present invention is illustrated in FIG. **2**. Following is a detailed description with reference to FIG. **2**. Detailed technical description for the known components is omitted. In this embodiment, within a CSG, HNB**1** is a first HNB that accesses the network.

MODE FOR THE INVENTION

In Step **201**, HNB**1** transmits an "attachment request" message to the OMC. This message contains information on a location of the HNB. Optionally, the "attachment request" message contains an identifier of the CSG to which the HNB belongs. Optionally, the network assigns the CSG identifier to HNB (the first HNB or the first group of HNBs within the CSG) when HNB signs in, or knows the identifier of the CSG to which the HNB (not the first signed in group of HNBs in the CSG) belongs when HNB signs in.

In Step **202**, OMC selects an MME for the HNB. Within the CSG, the HNB is the first one that accesses the network. OMC selects an MME for it among the MMEs adjacent to the HNB according to a certain rule such as for balancing the load, reducing a possibility of changing MME when UE moves, and so on. Optionally, OMC may select an S-GW for the HNB according to the same rule as on the selection of MME. HNB and OMC check other HNBs in the CSG which need to establish X2 connection with the HNB. According to the CSG identifier, OMC checks other HNBs in the CSG which need to establish X2 connection with the HNB. Optionally, the addresses of the HNBs are considered when OMC checks other HNBs in the CSG which need to establish X2 connection with the HNB. For example, it is not necessary to establish interface X2 between two HNBs if the two HNBs that are in different countries but in the same company belong to the same CSG. In this embodiment, no other HNB exists in the CSG.

The process of selecting S-GW for HNB can be implemented by the MME connected to the HNB when data is transferred through the HNB. Therefore, the HNBs in the same CSG connect to the same S-GW. If it is necessary for the first HNB in the CSG to establish the user plane, MME selects an S-GW for the CSG according to such rules as to balance load or to reduce the possibility of changing S-GW when a UE moves, and so on.

In Step **203**, OMC transmits an "attachment response" message to the HNB. This message indicates the MME selected by the OMC for the HNB. Optionally, this message indicates other HNBs necessary to establish X2 connection and adjacent to the HNB. Optionally, the message contains the frequency for using the HNB. The "attachment response" message contains the information on adjacent cells. The "attachment response" message contains a track area identifier (TAI) for the HNB. The "attachment response" message contains the identifier assigned to the HNB. Optionally, the message contains an address of the S-GW that OMC selected for the HNB.

In Step **204**, HNB initiates a process to establish a connection with the MME indicated by the message. HNB transmits a "connection request" message to MME. The message contains the information on "cells which are overlapped with HNB or CSG". Optionally, the message contains an information element of the identifier of the TAI where HNB locates in. Optionally, the message contains the information element of the identifier of HNB. Optionally, the message contains the information element of the identifier of the CSG where HNB locates. MME transmits a "connection response" message to HNB.

Embodiment 2 of the present invention is illustrated in FIG. **3**. Following is detailed description to the figure. Detailed technical description for known components is omitted. In this embodiment, HNB**1** and HNB**2** belong to the same CSG. HNB**1** has accessed the network. And HNB**2** begins to accessing the network for a first time.

In Step **301**, HNB**2** transmits the "attachment request" message to the OMC. This message contains the information on the location of HNB**2**. Optionally, the "attachment request" message contains the identifier of the CSG to which the HNB**2** belongs. Optionally, the network knows the identifier of the CSG to which the HNB belongs when HNB signs in.

Step **302**, OMC selects an MME for the HNB. If the HNB is not the first to access the network in the CSG, the MME selected by OMC for other HNBs in this CSG is just the one that the HNB should connect to. In this embodiment, OMC assigns both the MME and the S-GW selected for HNB**1** to the HNB. Optionally, the address the HNB should be considered when OMC selects MME for the HNB. For example, if two HNBs that are in different countries but in the same company belong to the same CSG, they may not be able to connect to the same MME. In this case, if no adjacent HNB accesses the network, OMC thinks that this HNB is the first one which accesses the network in the CSG and selects an MME for it according to rules such as balancing load or reducing possibility of changing MME when a UE moves, and so on. Optionally, selection of S-GW for the HNB can be implemented by OMC according to the same rules on the selection of MME. OMC checks other HNBs in the CSG which need to establish X2 connection with the HNB. And according to the CSG identifier, OMC checks other HNBs in the CSG which need to establish X2 connection with the HNB. Optionally, the addresses of the HNBs, as well as whether the HNBs share the same CSG or not, are considered when OMC checks other HNBs in the CSG which need to establish X2 connection with the HNB. For example, it is not necessary to establish interface X2 between two HNBs if the two HNBs that are in different countries but in the same company belong to the same CSG. In this embodiment, for example, it is necessary to establish X2 connection between HNB**1** and HNB**2**.

The process of selecting S-GW for HNB can be implemented by the MME connected to the HNB when data is transferred through the HNB. Therefore, the HNBs in the same CSG connect to the same S-GW. If it is necessary for the first HNB in the CSG to establish the user plane, MME selects an S-GW for the CSG according to such rules as to balance load or to reduce the possibility of changing S-GW when a UE moves, and so on. If the HNB is not the first necessary to establish a user plane in the CSG, the S-GW selected by MME for other HNBS in this CSG is just the one that the HNB should connect to.

In Step **303**, OMC transmits the "attachment response" message to the HNB**2**. This message indicates the MME that the OMC selected for the HNB. And the MME information included in the message may be the IP address of the MME. Optionally, this message contains a list of other HNBs necessary to establish X2 and adjacent to the HNB. The HNB list information included in the message is an IP address list for the HNB. Optionally, the message contains a frequency for using the HNB. The "attachment response" message contains the information on adjacent cells. The "attachment response" message contains the track area identifier (TAI) for the HNB. The "attachment response" message contains the identifier assigned to the HNB. Optionally, the message contains the address of the S-GW that OMC selected for the HNB.

In Step **304**, HNB**2** initiates a process to establish a connection with the HNB indicated by the message. HNB**2** transmits the "connection request" message to the other HNB (e.g., HNB**1**). HNB**1** transmits the "connection response" message to HNB**2**.

In Step **305**, HNB**2** initiates a process to establish a connection with the MME indicated by the message. HNB**2** transmits the "connection request" message to MME. The message contains the information on "cells which are overlapped with the HNB or CSG". The message contains the information element of the identifier of the TAI where HNB locates. Optionally, the message contains the information element of the identifier of HNB. Optionally, the message contains the information element of the identifier of the CSG where HNB locates. MME transmits the "connection response" message to HNB**2**.

The sequence of performing step **304** and step **305** is not limited.

In this embodiment, the operation flow of HNB is illustrated in FIG. **4**. Here, detailed technical description for known components is omitted.

In **401**, HNB transmits the "attachment request" message to the OMC. This message contains the information on the location of HNB. Optionally, the "attachment request" message contains the identifier of the CSG to which the HNB**2** belongs. In **402**, HNB waits for the response message. In **403**, if HNB receives a "successful attachment response" message, it saves the information that is included in the message, such as information on MME and the information on other HNBs, TAI, the HNB identifier and so on. In **404**, HNB initiates the process to establish a connection with the MME indicated by the message. HNB transmits the "connection request" message to MME. Optionally, the message contains the information on "cells which are overlapped with the HNB or CSG". Optionally, the message contains the information element of the identifier of the TAI where HNB locates. Optionally, the message contains the information element of the identifier of HNB. Optionally, the message contains the information element of the identifier of the CSG where HNB locates. MME transmits the "connection response" message to HNB. **405** Optionally, if the "attachment response" message contains information on other HNBs, such as HNB IP address list, HNB initiates the process to establish connections with other HNBs. HNB transmits the "connection request" to another HNB. An another HNB transmits the "connection response" message to the HNB.

The sequence of performing step **404** and step **405** is not limited.

In this embodiment, the operation flow of OMC is illustrated in FIG. **5**. Here, detailed technical description for known components is omitted.

In **501**, OMC receives messages. In **502**, if OMC receives the "attachment request" message from HNB, in **503** it saves HNB related information. And if the message contains the location information for HNB, OMC saves this information. And if the message contains the identifier of the CSG where the HNB belongs, OMC saves this information.

In **504**, if the HNB is the first to access the network in corresponding CSG, in **505**, OMC selects an MME for HNB in this CSG. OMC selects the MME according to either the address of HNB, or the rule to balance load or to reduce the possibility of changing MME when a UE moves, etc. Optionally, OMC can select an S-GW for the HNB according to the same rule as on the selection of MME.

In Step **506**, if HNB is not the first to access the network in the CSG, **507** OMC checks other HNBs in the CSG. **508** OMC transmits the "attachment response" message to the requesting HNB. And information on the MME OMC selected for HNB in this CSG is included in the message. Optionally, the "attachment response" message contains the information on the S-GW selected by OMC for HNB in this CSG. Optionally, the message contains the information on other HNBs in this CSG, such as the IP address list for the HNB. Optionally, the message contains the identifier of the TAI where the HNB locates. Optionally, the message contains the HNB identifier allocated to the HNB. The case described above is for that the HNBs in the CSG are not far away from one another. In another case, for example, two HNBs belong to the same CSG in different countries but in the same company, if no adjacent HNB accesses the network, OMC thinks that this HNB is the first one which accesses the network in the CSG and selects an MME for it according to such rules as to balance load or to reduce possibility of changing MME when a UE moves, and so on. Optionally, OMC can select an S-GW for the HNB according to the same rule as on the selection of MME. In this case, OMC finds the other HNB is the one necessary to establish a X2 connection with the HNB in the CSG according to not only the CSG ID. Meanwhile, it should consider the location of the HNB. For example, it is not necessary to establish interface X2 between two HNBs if the two HNBs that are in different countries but in the same company belong to the same CSG.

In this embodiment, the operation flow of MME is illustrated in FIG. **6**. Here, detailed technical description for the known components is omitted.

In **601** MME receives messages. In **602** if MME receives the "connection request" message from HNB, in **603** MME saves the information which is included in this message, such as the information on "cells which is overlapped with the HNB or CSG", the identifier of the TAI where HNB locates, the HNB identifier. **604** MME transmits the "connection response" message to HNB.

FIG. **7** illustrates the process that OMC reconfigures CSG's MME or S-GW when overload or fault comes across the MME or the S-GW.

In Step **701**, OMC finds that overload or fault comes across the MME or S-GW connected to a certain CSG.

In Step **702**, OMC transmits a "reconfiguration request" message to the HNB in CSG. In this message, the information on the reconfigured MME or S-GW and the reason for the reconfiguration are included. And the reconfiguration can be done to the IP address of the MME or the S-GW.

In Step **703**, the HNB that has received the "reconfiguration request" message transmits the "connection request" message to the new MME or S-GW. Optionally, the "connection request" message sent to MME includes the information on "cells which are overlapped with the HNB or CSG". Optionally, the "connection request" message sent to MME contains the information element of the identifier of the TAI where HNB locates. The new MME or S-GW transmits the "connection response" message to the HNB.

In Step **704**, the HNB transmits a "reconfiguration response" message to OMC.

Optionally, if the reconfiguration results from the overload of MME or S-GW, HNB initiates the process of releasing the connection with original MME or S-GW.

INDUSTRIAL APPLICABILITY

While the invention has been shown and described with reference to certain exemplary embodiments of the present invention thereof, it will be understood by those skilled in the art that various changes in form and details may be made therein without departing from the spirit and scope of the present invention as defined by the appended claims and their equivalents.

The invention claimed is:

1. A method for establishing a connection in a network by a base station, the method including:

transmitting, by the base station, a first message to a server, the first message including first identification information on the base station and information on a location of the base station, wherein the information on the location of the base station is verified by the server;

receiving, by the base station, a second message including information on a mobility management entity (MME) in response to the first message from the server, wherein the MME is assigned based on the first message; and

transmitting, by the base station, a third message to the MME based on the information on the MME, the third message including second identification information on the base station,

wherein the MME is configured to manage a signaling related to mobility and security, and

wherein the first identification information is different than the second identification information.

2. The method according to claim **1**, wherein the first message includes an identifier of a closed subscriber group (CSG) of the base station.

3. The method according to claim **1**, wherein, the MME for the base station is selected by the server based on the first message.

4. The method according to claim **1**, wherein the second message includes information on one of the MME and a serving gateway (S-GW) selected by the server for the base station.

5. The method according to claim **1**, wherein the second message includes information on other base stations adjacent to the base station, the information on other base stations used to establish connections with the other base stations.

6. The method according to claim **5**, wherein the server selects the other base stations adjacent to the base station according to an identifier of a closed subscriber group (CSG) to which the base station belongs.

7. The method according to claim **5**, wherein the server selects the other base stations adjacent to the base station according to a location of the base station.

8. The method according to claim **1**, wherein, a serving gateway (S-GW) for the base station is selected by the server.

9. The method according to claim **1**, wherein, if the base station is a first base station to access the server in a closed subscriber group (CSG) in a certain area, the MME for the base station is selected by the server.

10. The method according to claim **1**, wherein, if the base station is one of a first base station to access the server in a closed subscriber group (CSG) and a first base station to access the network in the CSG in a certain area, one of the MME and a serving gateway (S-GW) is selected by the server according to the location of the base station.

11. The method according to claim **1**, wherein, if the base station is one of a first base station to access the server in a closed subscriber group (CSG) and a first base station to access the network in the CSG in a certain area, one of the MME and a serving gateway (S-GW) is selected by the server according to load balancing.

12. The method according to claim **1**, wherein, if the base station is one of a first base station to access the server in a closed subscriber group (CSG) and a first base station to access the network in the CSG in a certain area, one of the MME and a serving gateway (S-GW) is selected by the server according to a rule of reducing a possibility of changing the one of the MME and the S-GW if a terminal moves.

13. The method according to on claim **1**, wherein, if the base station is not a first base station to access the server in a closed subscriber group (CSG), one of the MME and a serving gateway (S-GW) for the base station is selected by the server that is the same one of the MME and the S-GW selected by the server for other base stations in the CSG.

14. The method according to claim **1**, further including:

transmitting a connection setup request message to other base stations based on the second message.

15. The method according to claim **1**, wherein the second message includes information on the MME to which the base station in a closed subscriber group (CSG) connects.

16. The method according to claim **15**, wherein the second message includes an internet protocol (IP) address of the MME.

17. The method according to claim **1**, wherein the second message includes information on a serving gateway (S-GW) to which the base station in a closed subscriber group (CSG) connects.

18. The method according to claim **17**, wherein the information on the S-GW to which the base station in the CSG connects includes an internet protocol (IP) address of the S-GW.

19. The method according to claim **1**, wherein the second message includes information on other base stations in a closed subscriber group (CSG).

20. The method according to claim **19**, wherein the information on other base stations in the CSG includes an internet protocol (IP) address list of the other base stations.

21. The method according to claim **1**, further including:

receiving a fourth message from the MME in response to the third message.

22. The method according to claim **21**, wherein the third message includes a track area identifier (TAI) for the base station.

23. The method according to claim **21**, wherein the third message includes information on cells which are overlapped with the base station or a closed subscriber group (CSG).

24. The method according to claim **1**, wherein the information on the MME comprises an internet protocol (IP) address of the MME.

25. A base station in a communication system, the base station including:

a transceiver for transmitting and receiving a signal; and

a controller configured to transmit a first message including first identification information on the base station and information on a location of the base station to a server, to receive a second message including information on a mobility management entity (MME) assigned based on the first message from the server in response to the first message, and to transmit a third message to the MME based on the information on the MME, the third message including second identification information on the base station,

wherein the information on the location of the base station is verified by the server,

wherein the first identification information is different than the second identification information, and

wherein the MME is configured to manage a signaling related to mobility and security.

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