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(71) Applicant: **TELEFONAKTIEBOLAGET L M ERICSSON (PUBL)** [SE/SE]; S-164 83 Stockholm (SE).

(72) Inventor: **WANG, Xiaohui**; Neversvägen 39, S-224 79 Lund (SE).

(74) Agent: **VALEA AB**; Anna Lindhs plats 4, S-211 19 Malmö (SE).

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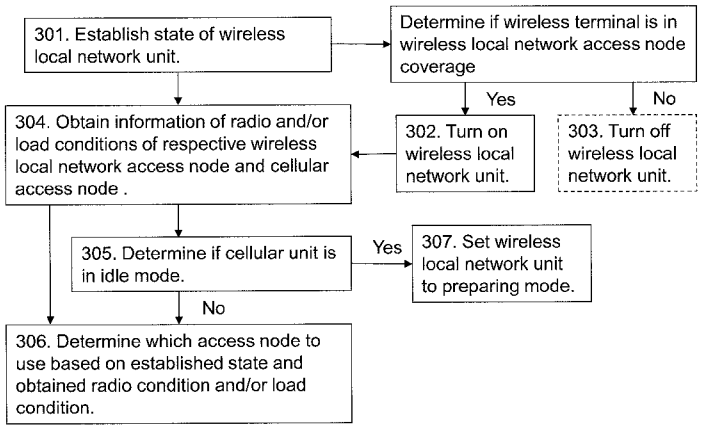

Fig. 3

(57) Abstract: A method in a network node (150) for assisting a wireless terminal (145) to select an access node for a communication in a wireless communication network (100). The wireless communication network comprises a cellular network access node (130) and a wireless local network access node (140). The network node (150) establishes a state of a wireless local network unit (210) in the wireless terminal, obtains information of a radio condition and/or a load condition of the respective wireless local network access node and cellular network access node, and then determines which access node to use out of the wireless local network access node and the cellular network access node for the communication, based on the established state of the wireless local network unit and the obtained radio condition and/or load condition of the respective wireless local network access node and cellular network access node.

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NETWORK NODE AND METHODS FOR SELECTING ACCESS NODE FOR COMMUNICATIONS IN WIRELESS COMMUNICATION NETWORKS

TECHNICAL FIELD

Embodiments herein relate to a network node and methods therein. In particular, it relates to a method in a network node for assisting a wireless terminal to select an access node for communications in a wireless communication network.

BACKGROUND

Communication devices such as wireless terminals are also known as e.g. User Equipments (UE), mobile terminals and/or mobile stations. Wireless terminals are enabled to communicate wirelessly in a cellular communications network or wireless communication network/system, sometimes also referred to as a cellular radio system or cellular network. The communication may be performed e.g. between two wireless terminals, between a wireless terminal and a regular telephone and/or between a wireless terminal and a server via a Radio Access Network (RAN) and possibly one or more core networks, comprised within the cellular communications network.

Wireless terminals may further be referred to as mobile telephones, cellular telephones, laptops, tablet computers or phablets with wireless capability, just to mention some further examples. The wireless terminals in the present context may be, for example, portable, pocket-storable, hand-held, computer-comprised, or vehicle-mounted mobile devices, enabled to communicate voice and/or data, via the RAN, with another entity, such as another wireless terminal or a server.

The cellular communications network covers a geographical area which is divided into cell areas, wherein each cell area being served by a base station, e.g. a Radio Base Station (RBS), which sometimes may be referred to as e.g. "eNB", "eNodeB", "NodeB", "B node", Base Transceiver Station (BTS), depending on the technology and terminology used. Hereafter, base stations in the cellular communications network is in general referred as cellular network access nodes, which comprising Second /Third Generation (2G/3G) network access nodes, 3G Long Term Evolution (LTE) network access nodes, Worldwide interoperability for Microwave Access (WiMAX) network access nodes, etc.

Nowadays, almost all wireless terminals are equipped with a wireless local network unit, such as a Wireless Local Area Network (WLAN) unit. A wireless local network which

may be a part of a wireless communications network, provides a connection for a wireless terminal through an access point to the Internet usually with high bandwidth and low cost. It gives users of the wireless terminal the mobility to move around within a local coverage area and still be connected to the wireless local network. The access point in the wireless local network is referred hereafter as a wireless local network access node.

Rapid growth in data traffic driven by mobile applications on wireless terminals such as smart phones, tablets and the like has continued to strain the capacity of the wireless communications network. To provide the best experience for the users of the wireless terminal regarding quality of service, mobility, security, cost and speed etc., switching or handover between different access nodes, e.g. between a cellular access node and a wireless local network access node is usually performed.

The conventional way of going over from a cellular network, e.g. a 3rd Generation Partnership Project (3GPP) network to a wireless local network, e.g. the WLAN is when the signal strength of a WLAN access node is higher than a predefined threshold. The problems of such an approach are possible degradation of the performance, Ping-Pong effect between the WLAN and 3GPP network access nodes, and negative impacts on other wireless terminals already connected to the WLAN. For example, when a wireless terminal enters into a public place, where the wireless local network access node has good radio condition, e.g. the signal strength is high, but there are many users already connected to the access node and have active sessions, handover to this access node will degrade the performance of the communications for this wireless terminal and have negative impacts on other users already connected to this access node. For another example, when a wireless terminal enters into an area where the signal strength of a wireless local network access node is around the predefined threshold. If the wireless terminal moves around, the signal strength will change between above or below the predefined threshold during a short time. This will consequently cause Ping-Pong effect between the cellular network access node and the wireless local network access node.

SUMMARY

Therefor it is an object of embodiments herein to improve handover or handling procedure between cellular access nodes and wireless local network access nodes in a wireless communications network.

According to a first aspect of embodiments herein, the object is achieved by a method in a network node for assisting a wireless terminal to select an access node for a

communication in a wireless communication network. The wireless communication network comprises a cellular network access node and a wireless local network access node. The network node establishes a state of a wireless local network unit in the wireless terminal. The network node further obtains information of a radio condition and/or a load condition of the respective wireless local network access node and cellular network access node. The network node then determines which access node to use out of the wireless local network access node and the cellular network access node for the communication, based on the established state of the wireless local network unit and the obtained radio condition and/or load condition of the respective wireless local network access node and cellular network access node.

According to a second aspect of embodiments herein, the object is achieved by a network node for assisting a wireless terminal to select an access node for a communication in a wireless communication network. The wireless communication network comprises a cellular network access node and a wireless local network access node. The network node comprises an establishing circuit configured to establish a state of a wireless local network unit in the wireless terminal. The network node further comprises an obtaining circuit configured to obtain information of a radio condition and/or a load condition of the respective wireless local network access node and cellular network access node. The network node further comprises a determining circuit configured to determine which access node to use out of the wireless local network access node and the cellular network access node for the communication, based on the established state of the wireless local network unit and the obtained radio condition and/or load condition of the respective wireless local network access node and cellular network access node.

Since the network node actively controls the state of the wireless local network unit in the wireless terminal, obtains information on the radio condition and load condition of the access nodes and then selects which access node to use based on these information, handover procedure between different access nodes is improved and more efficient compared to selecting the access node merely on the measurement reports on the radio condition. In addition, embodiments herein can be used for all wireless terminals with or without active sessions.

Thus, embodiments herein provide an improved handover or handling procedure between different access nodes for the wireless terminal in the wireless communications network.

BRIEF DESCRIPTION OF THE DRAWINGS

Examples of embodiments herein are described in more detail with reference to attached drawings in which:

Figure 1 is a schematic block diagram illustrating a wireless communications network in which embodiments herein may be implemented.

Figure 2 is a schematic block diagram illustrating embodiments of a wireless terminal.

Figure 3 is a flowchart depicting one embodiment of a method in a network node.

Figure 4 is a schematic block diagram illustrating embodiments of a network node.

DETAILED DESCRIPTION

As the wireless local network, e.g. the WLAN is more and more integrated into the cellular communication network, e.g. the 3GPP network, the cellular network access node and the wireless local network access node can both be controlled by a same centre unit, e.g. the network node herein, in the wireless communications network. The network node is connected or communicated to the cellular network access node as well as the wireless local network access node. The network node controls the state of a wireless local network unit in the wireless terminal and selects one of the access node to use for communications between the wireless terminal and the selected access node based on the radio condition and/or load condition of the respective wireless local network access node and cellular access node. Since the network node actively controls the state of the wireless local network unit and the selection is based on radio and/or load conditions of both access nodes, problems identified in the background, such as degradation of the performance, Ping-Pong effect and negative impacts on other wireless terminals can be mitigated, and the best experience is provided for the users.

Figure 1 depicts an example of a **wireless communications network 100** in which embodiments herein may be implemented. The wireless communications network100 comprises any cellular networks or system, such as GSM, GPRS, EDGE, WCDMA,

UMTS, LTE and LTE Advanced networks etc., as well as Wimax, wireless local networks such as WLANs.

The wireless communications network 100 comprises a plurality of network access nodes whereof two, a **cellular network access node 130** and a **wireless local network access node 140** are depicted in Figure 1. The cellular network access node 130 may be an eNB, an eNodeB, or an Home Node B, an Home eNode B or any other network node capable to serve a wireless terminal or a machine type communication device in a wireless communications network. The wireless local network access node 140 may e.g. be an WLAN access point provides a connection to the internet for a wireless terminal or a machine type communication device.

A **wireless terminal 145** operates in the wireless communications network 100. The wireless terminal 145 may e.g. be a wireless device, a mobile wireless terminal, a mobile phone, a computer such as e.g. a laptop, a Personal Digital Assistants (PDAs) or a tablet computer, sometimes referred to as a surf plate, with wireless capability, or any other radio network units, such as a cellular unit, a wireless local network unit, capable to communicate over a radio link in a wireless communications network. As shown in Fig.1, the wireless terminal 145 may communicate with the cellular network access node 130 and the wireless local network access node 140. Please note the term wireless terminal used in this document also covers other wireless devices such as Machine to machine (M2M) devices.

The wireless communications network 100 further comprises a **network node 150**, which may be referred to as an Evolved multiple Radio Access Technologies (RAT) controller, **EvoC 150**. The network node 150 may have the functions of any one or combined of a base station controller, **BSC 151**, a radio network controller, **RNC 152**, and an access point controller, **APC 153** depicted in Fig.1. The cellular network access node 130 may be connected to the BSC 151 or the RNC 152 as shown with dotted lines depending on which type the cellular network access node 130 is of. For example, if the cellular network access node is a 2G/3G network access node, it may be connected to the BSC 151; if the cellular network access node is a WCDMA access node, it may be connected to the RNC 152. The wireless local network access node may be connected to APC154. The BSC 151 and RNC 152 may be connected to a **Core Network**, **CN 160**. The APC 154 may be connected to a Server or Internet Protocol (IP) network, **Server/IP-**

NW 162. The network node EvoC 150 may be used as a controller for multi-standard, 3GPP or non-3GPP, access nodes and as well as a controller for wireless local network nodes.

All dotted lines shown in Fig.1 indicate current interfaces between different nodes in the wireless communications network 100. As seen, the cellular network access node 130 and the wireless local network access node 140 are separated controlled by its own controller. If the handover from the cellular network access node 130 to the wireless local network access node 140 only relies on that the signal strength of the wireless local network access node 140 is higher than a predefined threshold without knowing the load condition of the wireless local network access node 140, it will cause problems as described in the background. To solve these problem, embodiments herein are based on that both the cellular network access node 130 and the wireless local network access node 140 can be controlled by the network node 150. That means the network node 150 may combine any functions of the BSC 151, the RNC 152 and the APC 154 and act as a handling unit or a controller for different Radio Access Technologies, such as a RAT Handling Unit (RATHU). The network node 150 further controls the wireless terminal 145 via different access nodes, provides interfaces between the cellular network access node 130 and the CN 160, as well as interfaces between the wireless local network access node 140 and the Server/IP-NW 162 as shown by the solid lines in Fig.1.

Figure 2 depicts an example of the wireless terminal 145. The wireless terminal 145 comprises a **wireless local network unit 210**, a **cellular unit 220**, a **memory 230** and a **processing unit 240**. The wireless local network unit 210 provides interfaces for the wireless terminal 145 to the wireless local network access node140. The cellular unit 220 provides interfaces for the wireless terminal 145 to the cellular network access node 130.

Example of embodiments of a method in the network node 150 for assisting the wireless terminal 145 to select an access node for a communication in a wireless communication network 100 will now be described with reference to **Figure 3**. As mentioned above, the wireless communication network 100 comprises the cellular network access node 130 and the wireless local network access node 140. The method comprises the following actions, which actions may be taken in any suitable order. Dashed lines of one box in Figure 3 indicate that this action is not mandatory.

Action 301

The network node 150 establishes a state of a wireless local network unit 210 in the wireless terminal 145. To be able to control the wireless local network unit 210, the network node 150 need to know the state of the wireless local network unit 210, such as whether the wireless local network unit 210 is on or off, whether the wireless local network unit 210 is in the coverage of a wireless local network access node.

Action 302

The network node 150 turns on the wireless local network unit 210 by sending a control signal to the wireless local network access node, if the wireless local network unit 210 is off when the wireless terminal 145 is in the wireless local network access node coverage. In this way, the network node 150 actively controls the wireless terminal 145 via the wireless local network access node. The control signal may be contained in a system information or broad cast information sent by the network node 150.

Action 303

This action is optional. In order to save the power of the wireless terminal and minimize it's interference to others, the network node 150 turns off the wireless local network unit 210 by sending a control signal to the wireless local network access node, if the wireless local network unit 210 is on when the wireless terminal 145 is not in the wireless local network access node coverage.

Action 304

To provide the best services for the users of the wireless terminal, the access node having good radio condition and less load should be chosen. Therefor the network node 150 needs to obtain information of a radio condition and/or a load condition of the respective wireless local network access node 140 and cellular network access node 130. In some embodiments, the network node 150 may only need to get the radio condition information for both access nodes. In some embodiments, the network node 150 may only need to get the load condition for both access nodes . In some embodiments, the network node 150 may need to get both radio condition and a load condition for both access nodes. The radio and load condition information is usually available from the measurement reports on the radio signal strength and the load for the access nodes. By merging the measurement reports of the radio conditions of the cellular network and the wireless local network, the load conditions of the access nodes are more accurate.

Action 305

In order to save power and not negatively impact other users in the wireless communication network, the network node 150 determines whether or not a cellular unit 220 in the wireless terminal 145 is in an idle mode and how the wireless local network unit 210 should behave accordingly for the following active mode Action 306 as well as preparing mode Action 307.

Action 306

The network node 150 determines which access node to use out of the wireless local network access node 140 and the cellular network access node 130 for the communication, based on the established state of the wireless local network unit 210 and the obtained radio condition and/or load condition of the respective wireless local network access node 140 and cellular network access node 130.

When the wireless terminal 145 is in active sessions, the network node 150 decides if the traffic to the wireless terminal 145 should be via the cellular network, e.g. a 3GPP network or switched to the wireless local network, e.g. a WLAN, for providing the user of the wireless terminal 145 with the best services depending on the measurement reports of the radio conditions between the wireless terminal 145 and the WLAN access node or the 3GPP network access node as well as their loads condition. The non-chosen one will only perform the measurement of its radio conditions and report it back to the network control node 150 via the chosen one so that the non-chosen one has no impacts on the load of its access node or its neighbors. Compared to the prior art approach, the access node selected by embodiments herein has better performance regarding to the radio condition and the load condition, thereby provides the best services.

In some embodiments, when there is more than one cellular network access node or more than one wireless local network access node, the network node 150 may determine which access node to use between the cellular network access nodes or between the wireless local network access nodes.

Action 307

The network node 150 sets the wireless local network unit 210 to a preparing mode by sending a control signal to the wireless local network access node, when the cellular unit 220 is in the idle mode and there are no active sessions. In this preparing mode the wireless local network unit 210 only performs measurement of radio conditions of the wireless local networks at predefined time instances. The network node 150 further sets

the wireless local network unit 210 to comply with a time pattern of the cellular unit 220 in the wireless terminal 145 for monitoring the paging messages from the network node and performing the measurement and reporting to the network node during the time slots configured in the network node.

When the wireless terminal 145 enters an idle mode after active sessions or Routing (Tracking) Area Update etc., the network node 150 may set the wireless local network unit 210 to the preparing mode so that the power of the wireless terminal 145 will be saved and the negative impact on other wireless terminals already connected to the access node is avoided. Note that such a preparing mode for the wireless local network, e.g. the WLAN, is different from the optional power-saving mode defined in the WLAN Standard 802.11, where the wireless terminal has to wake up periodically to receive the beacon from the AP to see if there is downlink data available for it. This will consequently give false information on the load of the AP, especially when the wireless terminal is running active WLAN scanning schema.

Since the network node 150 actively controls the state of the wireless local network unit 210 in the wireless terminal 145, obtains information on the radio condition and load condition of access nodes and then selects which access node to use based on these information, handling procedure for different RAT access nodes is improved and more efficient compared to selecting the access node merely on the measurement reports on the radio condition. In addition, embodiments herein can be used for all wireless terminals with or without active sessions.

To perform the method actions in the network node 150 for assisting a wireless terminal 145 to select an access node for a communication in a wireless communication network 100, described above in relation to Figure 3, the network node 150 comprises the following circuits depicted in **Figure 4**. As mentioned above, the wireless communication network 100 comprises the cellular network access node 130 and the wireless local network access node 140.

The network node 150 comprises **an establishing circuit 410** configured to establish a state of a wireless local network unit 210 in the wireless terminal 145.

In some embodiments, the establishing circuit 410 is further configured to determine whether or not the wireless terminal 145 is in a wireless local network access node coverage. The establishing circuit 410 may further be configured to turn on the wireless

local network unit 210 if the wireless local network unit 210 is off when the wireless terminal 145 is in the wireless local network access node coverage; and to turn off the wireless local network unit 210 if the wireless local network unit is on when the wireless terminal 145 is not in the wireless local network access node coverage.

In some embodiments, the establishing circuit 410 is further configured to determine whether or not a cellular unit 220 in the wireless terminal 145 is in an idle mode. The establishing circuit 410 may further be configured to set the wireless local network unit 210 to a preparing mode when the cellular unit 220 is in the idle mode, and further set the wireless local network unit 210 to comply with a time pattern of the cellular unit 220 in the wireless terminal 145.

The network node 150 further comprises an **obtaining circuit 420** configured to obtain information of a radio condition and/or a load condition of the respective wireless local network access node 140 and cellular network access node 130.

The network node 150 further comprises a **determining circuit 430** configured to determine which access node to use out of the wireless local network access node 140 and the cellular network access node 130 for the communication, based on the established state of the wireless local network unit 210 and the obtained radio condition and/or load condition of the respective wireless local network access node 140 and cellular network access node 130.

Those skilled in the art will appreciate that establishing circuit 410, obtaining circuit 420 and determining circuit 430 described above may be referred to one circuit, a combination of analog and digital circuits, one or more processors, such as **processor 440**, depicted in Figure 4, configured with software and/or firmware and/or any other digital hardware performing the function of each circuit. One or more of these processors, the combination of analog and digital circuits as well as the other digital hardware, may be included in a single application-specific integrated circuitry (ASIC), or several processors and various analog/digital hardware may be distributed among several separate components, whether individually packaged or assembled into a system-on-a-chip (SoC).

The network node 150 may further comprise a **memory 450** comprising one or more memory units. The memory 450 is arranged to be used to store obtained information, such as measurements on radio condition and load condition, and other data,

configurations to perform the methods herein when being executed in the network node 150.

The embodiments herein for assisting a wireless terminal 145 to select an access node for a communication in a wireless communication network 100 may be implemented through one or more processors, such as the processor 440 in the network node 150, together with computer program code for performing the functions and actions of the embodiments herein. The program code mentioned above may also be provided as a computer program product, for instance in the form of a data carrier carrying computer program code for performing the embodiments herein when being loaded into the network node 150. One such carrier may be in the form of a CD ROM disc. It is however feasible with other data carriers such as a memory stick. The computer program code may furthermore be provided as pure program code on a server and downloaded to the network node 150.

When using the word "comprise" or “comprising” it shall be interpreted as non-limiting, i.e. meaning "consist at least of".

The embodiments herein are not limited to the above described preferred embodiments. Various alternatives, modifications and equivalents may be used. Therefore, the above embodiments should not be taken as limiting the scope of the invention, which is defined by the appending claims.

CLAIMS

1. A method in a network node (150) for assisting a wireless terminal (145) to select an access node for a communication in a wireless communication network (100), wherein the wireless communication network (100) comprises a cellular network access node (130) and a wireless local network access node (140), the method comprising:

establishing (301) a state of a wireless local network unit (210) in the wireless terminal (145);

obtaining (304) information of a radio condition and/or a load condition of the respective wireless local network access node (140) and cellular network access node (130);

determining (306) which access node to use out of the wireless local network access node (140) and the cellular network access node (130) for the communication, based on the established state of the wireless local network unit (210) and the obtained radio condition and/or load condition of the respective wireless local network access node (140) and cellular network access node (130).

2. The method according to claim 1, wherein establishing (301) the state of the wireless local network unit (210) in the wireless terminal (145) comprises determining whether or not the wireless terminal (145) is in a wireless local network access node coverage.

3. The method according to claim 2, further comprising:

turning on (302) the wireless local network unit (210) if the wireless local network unit (210) is off when the wireless terminal (145) is in the wireless local network access node coverage.

4. The method according to claim 2, further comprising:

turning off (303) the wireless local network unit (210) if the wireless local network unit is on when the wireless terminal (145) is not in the wireless local network access node coverage.

5. The method according to claims 1-3, further comprising:

determining (305) whether or not a cellular unit (220) in the wireless terminal (145) is in an idle mode;

setting (307) the wireless local network unit (210) to a preparing mode when the cellular unit (220) is in the idle mode.

6. The method according to claim 6, wherein setting the wireless local network unit (210) to the preparing mode further comprises setting the wireless local network unit (210) to comply with a time pattern of the cellular unit (220) in the wireless terminal (145).

7. A network node (150) for assisting a wireless terminal (145) to select an access node for a communication in a wireless communication network (100), wherein the wireless communication network (100) comprises a cellular network access node (130) and a wireless local network access node (140), the network node (150) comprising:

an establishing circuit (410) configured to establish a state of a wireless local network unit (210) in the wireless terminal (145);

an obtaining circuit (420) configured to obtain information of a radio condition and/or a load condition of the respective wireless local network access node (140) and cellular network access node (130);

a determining circuit (430) configured to determine which access node to use out of the wireless local network access node (140) and the cellular network access node (130) for the communication, based on the established state of the wireless local network unit (210) and the obtained radio condition and/or load condition of the respective wireless local network access node (140) and cellular network access node (130).

8. The network node (150) according to claim 7, wherein to establish the state of the wireless local network unit (210) in the wireless terminal (145) comprising to determine whether or not the wireless terminal (145) is in a wireless local network access node coverage.

9. The network node (150) according to claim 8, wherein the establishing circuit (410) is further configured to:

turn on the wireless local network unit (210) if the wireless local network unit (210) is off when the wireless terminal (145) is in the wireless local network access node coverage.

10. The network node (150) according to claim 8, wherein the establishing circuit (410) is further configured to:

turn off the wireless local network unit (210) if the wireless local network unit is on when the wireless terminal (145) is not in the wireless local network access node coverage.

11. The network node (150) according to claims 7-9, wherein the establishing circuit (410) is further configured to:

determine whether or not a cellular unit (220) in the wireless terminal (145) is in an idle mode;

set the wireless local network unit (210) to a preparing mode when the cellular unit (220) is in the idle mode.

12. The network node (150) according to claim 11, wherein to set the wireless local network unit (210) to the preparing mode further comprising to set the wireless local network unit (210) to comply with a time pattern of the cellular unit (220) in the wireless terminal (145).

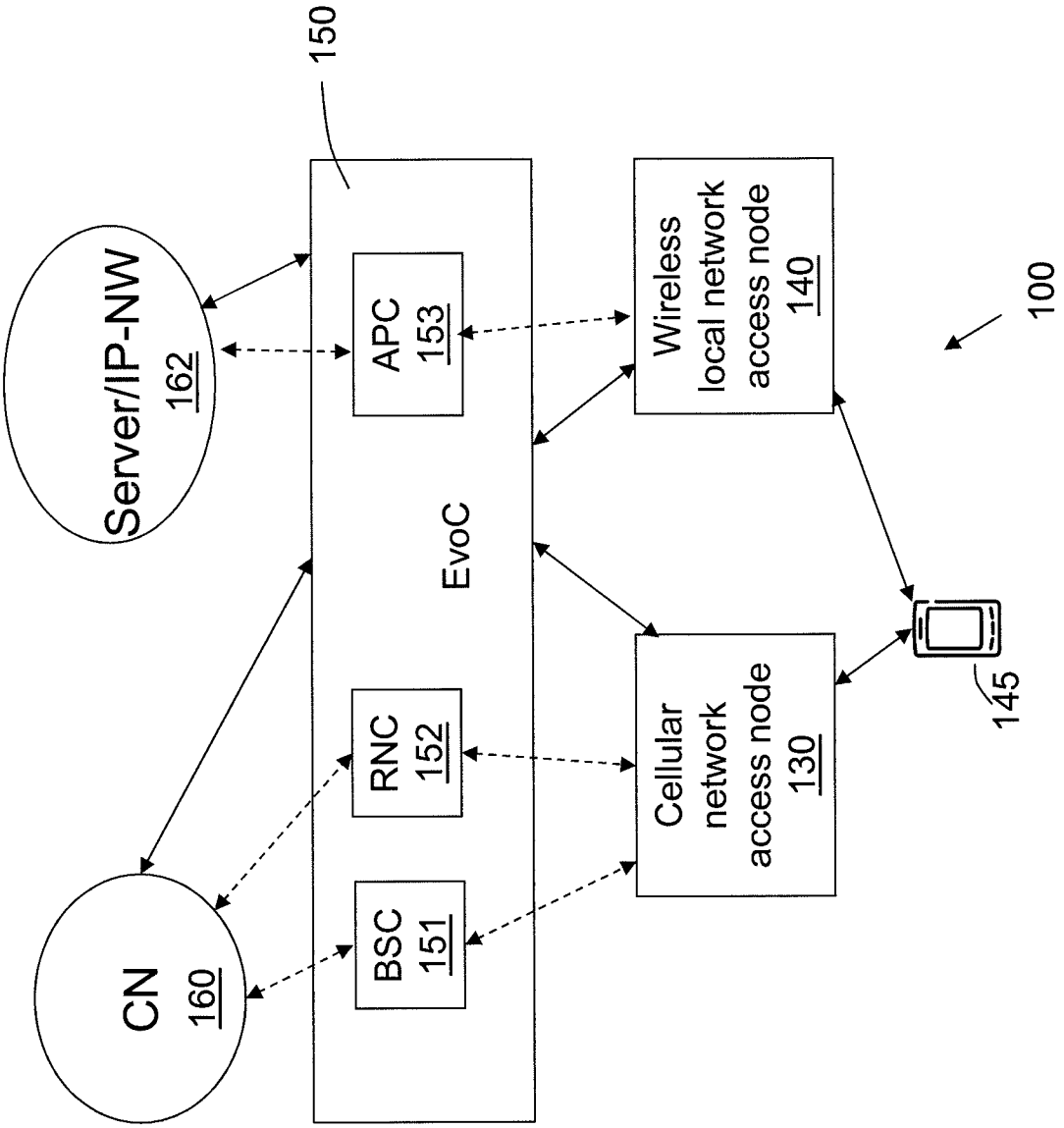
150
Server/IP-NW
162
APC
153
EvoC
Wireless
local network
access node
140
100
RNC
152
Cellular
network
access node
130
145
CN
160
BSC
151

Fig. 1

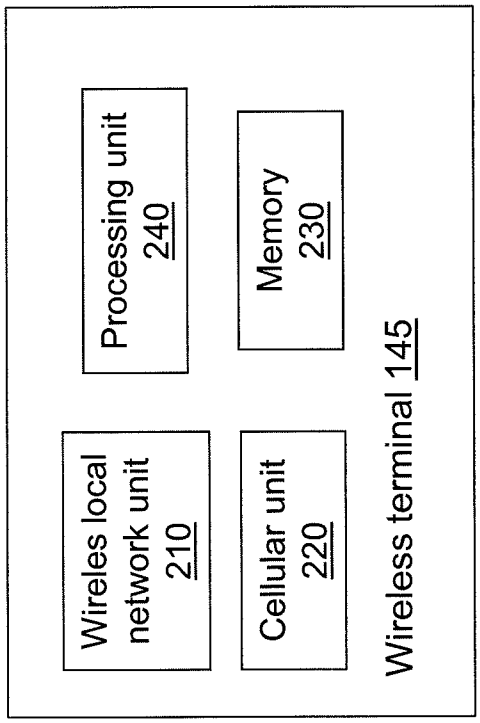
Wireless terminal 145
Wireles local network unit 210
Cellular unit 220
Processing unit 240
Memory 230

Fig. 2

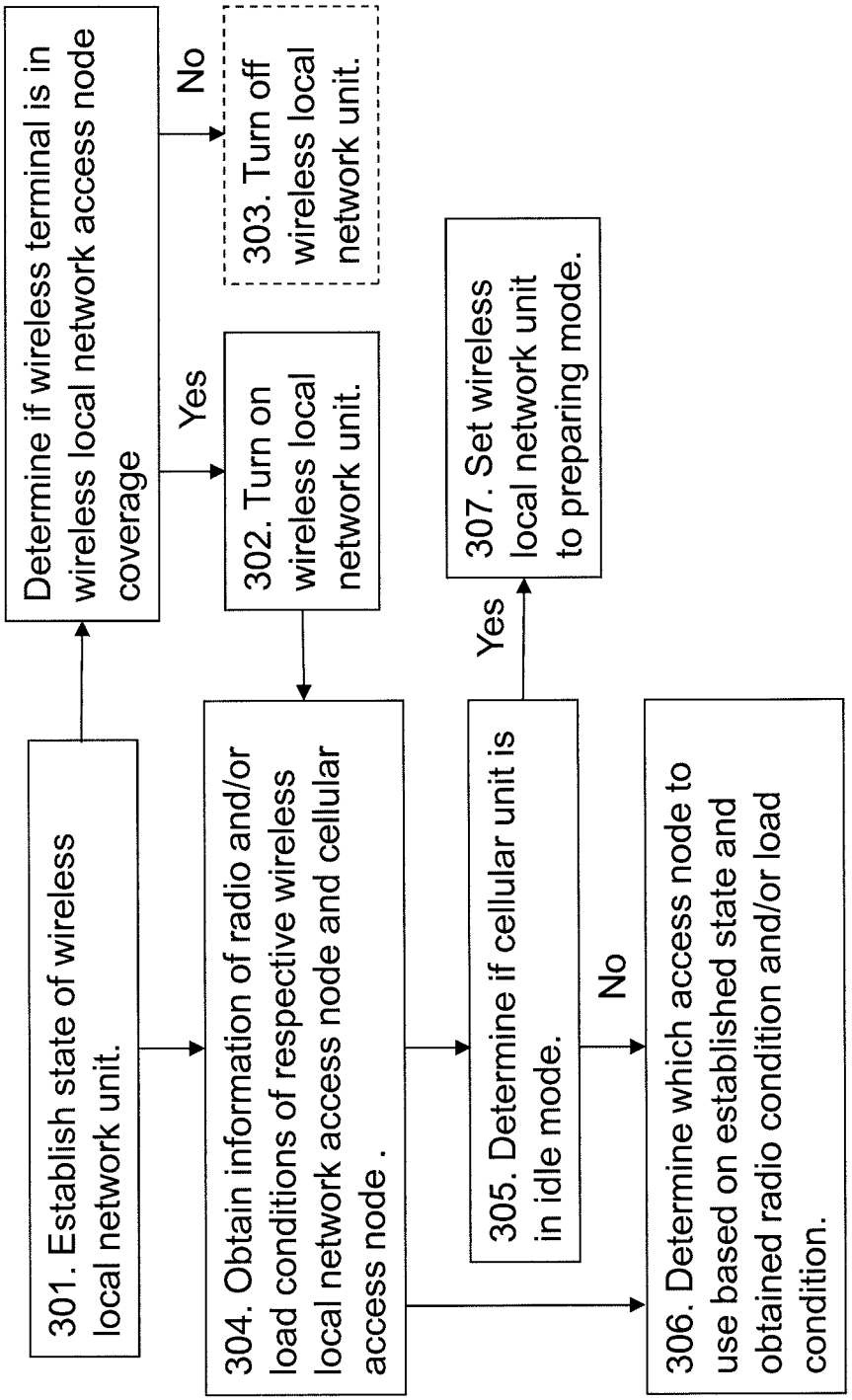
301. Establish state of wireless local network unit.
Determine if wireless terminal is in wireless local network access node coverage
No
Yes
303. Turn off wireless local network unit.
302. Turn on wireless local network unit.
304. Obtain information of radio and/or load conditions of respective wireless local network access node and cellular access node .
305. Determine if cellular unit is in idle mode.
Yes
307. Set wireless local network unit to preparing mode.
No
306. Determine which access node to use based on established state and obtained radio condition and/or load condition.

Fig. 3

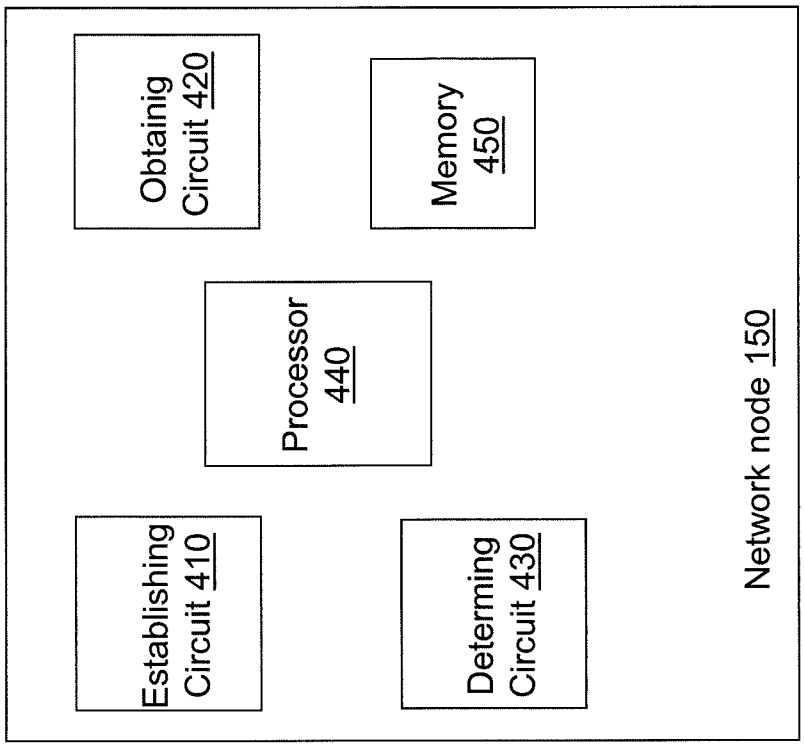
Obtainig Circuit 420
Memory 450
Processor 440
Establishing Circuit 410
Determing Circuit 430
Network node 150

Fig. 4

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2013/074491

A. CLASSIFICATION OF SUBJECT MATTER
INV. H04W48/20
ADD. H04W48/18

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)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ETRI: "Analysis on requirement fulfilment of network selection solutions", 3GPP DRAFT; R2-132485_ANALYSIS ON REQUIREMENT FULFILMENT OF NETWORK SELECTION SOLUTIONS, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA- , 9 August 2013 (2013-08-09), XP050718189, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_83/Docs/ [retrieved on 2013-08-09]	1,2,7,8
Y	the whole document	3-6,9-12

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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"A" document defining the general state of the art which is not considered to be of particular relevance

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Date of the actual completion of the international search	Date of mailing of the international search report
24 July 2014	31/07/2014

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Stefan, Andrei

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2013/074491

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	LG ELECTRONICS INC: "Comparison of access network selection solutions", 3GPP DRAFT; R2-132055 COMPARISON OF ACCESS NETWORK SELECTION SOLUTIONS, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; , vol. RAN WG2, no. Fukuoka, Japan; 20130520 - 20130524 11 May 2013 (2013-05-11), XP050700143, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_82/Docs/ [retrieved on 2013-05-11] the whole document	1,7
X	WO 2005/060294 A1 (ERICSSON TELEFON AB L M [SE]; MAGNUSSON PER [SE]; WALLENTIN PONTUS [SE]) 30 June 2005 (2005-06-30) page 9 - page 10; figure 2	1,7
Y	WO 2008/127162 A1 (ERICSSON TELEFON AB L M [SE]; TURINA DALIBOR [SE]) 23 October 2008 (2008-10-23) page 4 - page 5; figure 2	3,9
Y	EP 2 173 135 A2 (VODAFONE PLC [GB]) 7 April 2010 (2010-04-07) paragraphs [0033], [0055]; claims 1-4	4,10
Y	HUAWEI ET AL: "Further clarifications on solution 3", 3GPP DRAFT; R2-132780 FURTHER CLARIFICATIONS ON SOLUTION3, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOLIS CEDEX ; FRANCE , vol. TSG RAN, no. Barcelona, Spain; 20130819 - 20130823 9 August 2013 (2013-08-09), XP050718305, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_83/Docs/ [retrieved on 2013-08-09] the whole document	5,6,11, 12

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Y	NEW POSTCOM: "Consideration on WLAN scanning and power consumption", 3GPP DRAFT; R2-131715_CONSIDERATIONS ON WLAN SCANNING AND POWER CONSUMPTION V1.0, 3RD GENERATION PARTNERSHIP PROJECT (3GPP), MOBILE COMPETENCE CENTRE ; 650, ROUTE DES LUCIOLES ; F-06921 SOPHIA-ANTIPOL , vol. RAN WG2, no. Fukuoka, Japan; 20130520 - 20130524 11 May 2013 (2013-05-11), XP050700029, Retrieved from the Internet: URL:http://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_82/Docs/ [retrieved on 2013-05-11] the whole document -----	5,6,11, 12

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