

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Nokia of America Corp., Ericsson Inc., AT&T Services, Inc., Cellco Partnership
d/b/a Verizon Wireless, and T-Mobile USA, Inc.,

Petitioners

v.

KT Corporation (Patent Owner) and Pegasus Wireless Innovation LLC (Exclusive
Licensee)

Patent Owner

Case: IPR2025-00037

U.S. Patent No. 10,616,932

PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. §312 AND 37 C.F.R. §42.104

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Ex. 1002	Prosecution History of U.S. Pat. No. 10,616,932 (“’932 pros history”)
Ex. 1003	English Translation of Int’l Pat. Appl. No.: PCT/CN2014/089300 and Certificate of Translation (“Lin1”)
Ex. 1004	Int’l Pat. Appl. No.: PCT/CN2014/089300 (“Lin1 Original”)
Ex. 1005	English Translation of Int’l Pat. Appl. No.: PCT/CN2014/089310 and Certificate of Translation (“Lin2”)
Ex. 1006	Int’l Pat. Appl. No.: PCT/CN2014/089310 (“Lin2 Original”)
Ex. 1007	English Translation of Int’l Pat. Pub. No. WO 2014/127525 A1 and Certificate of Translation (“Zhang”)
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Exhibit	Description
	<i>al</i> , Nos. 2:23-cv-00640, 2:23-cv-00638, 2:23-cv-00639 (E.D. Tex.) Protective Order From Non-Jurisdictional Discovery

Nokia of America Corporation (“Nokia”), Ericsson Inc. (“Ericsson”), AT&T Services, Inc. (“AT&T”), Cellco Partnership d/b/a Verizon Wireless (“Verizon”), and T-Mobile USA, Inc. (“T-Mobile”), (collectively “Petitioners”) petition for IPR under 35 U.S.C. §§311–319 and 37 C.F.R. §42 of Claims 1-2, 4, 8-9, and 11 (“the Challenged Claims”) of U.S. Patent No. 10,616,932 (“the ’932 Patent”). Petitioners request cancellation of the Challenged Claims.

As explained in detail herein, at the time of the earliest possible priority date of the Challenged Claims, improving existing radio communications systems by increasing system capacity to handle increasing quantities of user equipment (UE) was a major driver of wireless communication standards development. Ex. 1001, 5:45-49; Ex. 1011, ¶¶95 and 99. One known solution for increasing the capacity of existing radio communications systems was to split the wireless configuration processes between multiple nodes within an E-UTRAN architecture. Ex. 1003, 1:9-11; Ex. 1005, 3:8-10; Ex. 1011, ¶¶95 and 99. This led to the development of many multi-node wireless configuration processes before the earliest possible priority date of the ’932 Patent. *See e.g.*, Ex. 1003, 27:18-20 & FIGS. 7-8; Ex. 1005, 31:24-32:11, FIG. 6; Ex. 1007, 75:19-15, 76:2-8 & 17-20; Ex. 1011, ¶¶95-97, 99-100, and 102-103. The Challenged Claims are broadly written to cover these multi-node wireless configuration processes. Indeed, as will be demonstrated below, there is nothing that

distinguishes the Challenged Claims from the wireless configuration processes described by the references cited herein.

I. STANDING UNDER 37 C.F.R. §42.104(a)

Petitioners certify the '932 Patent is available for IPR, and Petitioners are not barred or estopped from requesting IPR.

II. PAYMENT OF FEES

Petitioners authorize Account No. 16-0605 to be charged.

III. OVERVIEW OF CHALLENGES AND RELIEF REQUESTED

Pursuant to 37 C.F.R. § 42.22(a)(1) and 42.104(b)(1)–(2) Petitioners request cancellation of the Challenged Claims pursuant to the grounds below. Additional support is provided in the Declaration of Michael Kotzin (Ex. 1011).

Ground 1: Claims 1-2, 4, 8-9, and 11 are unpatentable under 35 U.S.C. §103 over Int'l Pat. Appl. No.: PCT/CN2014/089300 ("Lin1").

Ground 2: Claims 1-2, 4, 8-9, and 11 are unpatentable under 35 U.S.C. §103 over Lin1 in view of Int'l Pat. Appl. No.: PCT/CN2014/089310 ("Lin2").

Ground 3: Claims 1-2, 4, 8-9, and 11 are unpatentable under 35 U.S.C. §103 over Lin1 in view of Int'l Pat. Pub. No. WO 2014/127525 A1 ("Zhang").

IV. BACKGROUND

The '932 Patent relates to wireless connection methods in a “wireless access network separation structure in which a “base station (eNB) is divided into a [central unit] CU node and an [access unit] AU node.” Ex. 1001, 9:18-20, 9:28:33, 9:50-55, and 9:36-41; Ex. 1011, ¶¶69-78. The '932 Patent describes a typical “method of configuring, by an access unit, a wireless connection of a terminal” in a wireless access network separation structure. Ex. 1001, 1:66-2:1; Ex. 1011, ¶¶59, and 72-73. The '932 Patent fails to add anything to the then-existing state of the art, and instead merely describes a well-known implementation of multi-node wireless connection techniques. The Board should thus institute review and find each of the Challenged Claims unpatentable.

A. Technical Background

The '932 Patent is directed to a wireless configuration method according to 3GPP technology standards. Ex. 1001, 1:26-36; Ex. 1011, ¶42. According to these standards, radio resource control (RRC) messages are exchanged to establish, modify, and release a wireless connection between a network and UE. Ex. 1011, ¶¶44-46. RRC messages include uplink and downlink messages that are carried by one of three types of signaling radio bearers (SRBs). Ex. 1011, ¶47. An uplink

message is a unidirectional radio link for the transmission of signals from the UE to a network node, whereas a downlink message is a unidirectional radio link for the transmission of signals from a network node to a UE. Ex. 1009, 10 & 25; Ex. 1011, ¶¶43. The three types of SRBs include an SRB0, SRB1, and SRB2. Ex. 1011, ¶¶47-50. Each type of SRB specifies different priorities and logical channels that inform how an RRC message carried by the particular SRB is processed by a network node or a UE. Ex. 1011, ¶¶47-55. After a wireless connection is established through a control plane using the RRC messages, a user plane interface is used to transfer user plane data between the UE and the network using four functional layers, including a Physical (PHY) layer, a Medium Access Control (MAC) layer, a Radio Link Control (RLC) layer, and a Packet Data Convergence Protocol (PDCP) layer. Ex. 1011, ¶¶51-56; *see also* Ex. 1010, Chapter 2 Network Architecture, p. 33, FIG. 2.3, Chapter 3 E-UTRAN and EPC Protocol Structure, p. 139, 140, 143, & FIG. 3.15, 3.17, Chapter 5 Radio Resource Control Functions, pp. 240-241, & Chapter 6 Packet Data Convergence Protocol Functions, p. 289-291, & FIG. 6.2.

B. '932 Patent Prosecution History

U.S. Patent Application No. 15/744,823 (“the ’823 application”) was filed on January 14, 2018, and resulted in U.S. Patent No. 10,616,932. The ’823 application is a National Stage Patent Application of PCT International Patent Application No.

PCT/KR2016/006529, filed on Jun. 20, 2016, under 35 U.S.C. §371, which claims priority to Korean Patent Application No. 10-2015-0099891, filed on Jul. 14, 2015. Ex. 1001, Cover; Ex. 1011, ¶85.

In amending the claims to overcome a non-final office action, a Notice of Allowance was mailed November 27, 2019. Ex. 1002, 458-460, & 465; Ex. 1011, ¶¶89-91.

C. Priority Date

The '932 Patent was filed on January 14, 2018. (Ex. 1001, Cover). The '932 Patent claims foreign priority to Korean Application No. 10-2015-0099891, filed July 14, 2015, by way of a PCT application. *Id.* Petitioners assume (without determining) that the foreign priority claim is proper. If Patent Owner disputes the prior art status of any of Petitioners' cited references, Petitioners reserve the right to challenge the priority date.

D. Claim Construction

The terms should receive their respective plain and ordinary meaning as understood by a person of ordinary skill in the art (POSITA) under *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) .

V. PRIOR ART REFERENCES

A. Lin1 (Ex. 1003)

International Patent Application No. PCT/CN2014/089300 (“Lin1”, Ex. 1003) to Lin (“Lin1”), titled “Radio Resource Control (RRC) Message Processing Method, Apparatus, and System,” was filed on October 23, 2014, and published on April 28, 2016. (Ex. 1003, Cover). Lin1 qualifies as prior art under at least AIA 35 U.S.C. §102(a)(2), based on the PCT application date. *See* 35 U.S.C. §102(d). Lin1 was never addressed or considered by the Examiner during prosecution, nor was it disclosed in any IDS filed by the Applicant.

B. Lin2 (Ex. 1005)

International Patent No. PCT/CN2014/089310 to Lin, et al. (“Lin2”), titled “Method and Apparatus for Establishing Interface,” was filed on October 23, 2014, and published April 28, 2016. Ex. 1005, Cover. Lin2 qualifies as prior art under at least AIA 35 U.S.C. §102(a)(2), based on the PCT application date. *See* 35 U.S.C. §102(d). Lin2 was never addressed or considered by the Examiner during prosecution, nor was it disclosed in any IDS filed by the Applicant.

C. Zhang (Ex. 1007)

International Patent Publication No. WO 2014/127525 A1 to Zhang, et al. (“Zhang”), titled “Method, Device and System for Communication,” was filed on February 22, 2013, and published October 28, 2014. (Ex. 1007, Cover). Zhang qualifies as prior art under at least AIA 35 U.S.C. §102(a)(1) based on its PCT publication date. Zhang was never addressed or considered by the Examiner during prosecution, nor was it disclosed in any IDS filed by the Applicant.

VI. LEVEL OF ORDINARY SKILL IN THE ART

A POSITA pertinent to the '932 Patent would have had a bachelor's degree in electrical engineering, computer engineering, or a related discipline, knowledge of the relevant 3GPP standards as of this time, and at least 2 years of experience working in a field involving wireless communications. Ex. 1011, ¶40. A person with a different degree but with additional relevant experience could still qualify if the additional experience compensates for the different educational background. *Id.* A person with less than 2 years of experience working in a field involving wireless communications could still qualify if the person has additional education that compensates for their lesser experience. *Id.*

VII. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Ground 1: Claims 1-2, 4, 8-9, and 11 are unpatentable under 35 U.S.C. §103 over Lin

1. Overview of Ground 1

Lin1 discloses techniques for establishing a communication interface using two network nodes, an anchor and serving node, that split radio resource control (RRC) functions to jointly process RRC messages for a user terminal. Ex. 1003, 1:9-11, 25:22-26, 27:18-20; Ex. 1011, ¶¶95-97 & 105. As established below, a POSITA would have understood that Lin1's anchor and serving nodes are examples of the central and access units recited by the '932 patent claims. Ex. 1011, ¶¶106 & 116. Lin1 discloses multiple different wireless configuration examples in which its serving node sends and receives the same messages as those required by the access unit in the Challenged Claims. Ex. 1003, FIGS. 7-8; Ex. 1011, ¶¶105, 112, 122, and 131. The Challenged Claims are therefore obvious over Lin1.

2. Claim 1

i. [1.PRE]

To the extent the [1.PRE] is limiting, Lin1 discloses a method of configuring, by an access unit, a wireless connection of a terminal. Ex. 1011, ¶105. Specifically, Lin1 discloses a serving node, which a POSITA would have understood as serving the very same purpose as an access unit, establishing an interface with user

equipment (UE), which a POSITA would have understood as simply another term for a terminal. Ex. 1011, ¶¶106-108.

Lin1's *serving node* (access unit)¹ is described with reference to FIG. 1 (reproduced, annotated, below). With reference to FIG. 1, Lin1 discloses "a network architecture [that] includes a mobility management entity (MME) 101, a serving gateway (SGW) 102, an anchor node 103, a serving node 104, and user equipment (UE) 105." Ex. 1003, 27:1-4; Ex. 1011, ¶106. In the described architecture, the "RRC function is split onto [] two nodes", including an "anchor node 103 and a *serving node 104* [access unit] that jointly process an RRC message of the UE 105." Ex. 1003, 27:18-22; Ex. 1011, ¶106.

¹ The '932 patent claims and Lin1 use different terms to refer to the same concepts. To clarify the correspondences between (i) Lin1 and (ii) the claim terms, bolding and italics is used to emphasize Lin1 terms, and the corresponding claim term is placed in parentheses (or brackets within a quotation) after each emphasized term.

Ex. 1003, FIG. 1 (annotated)

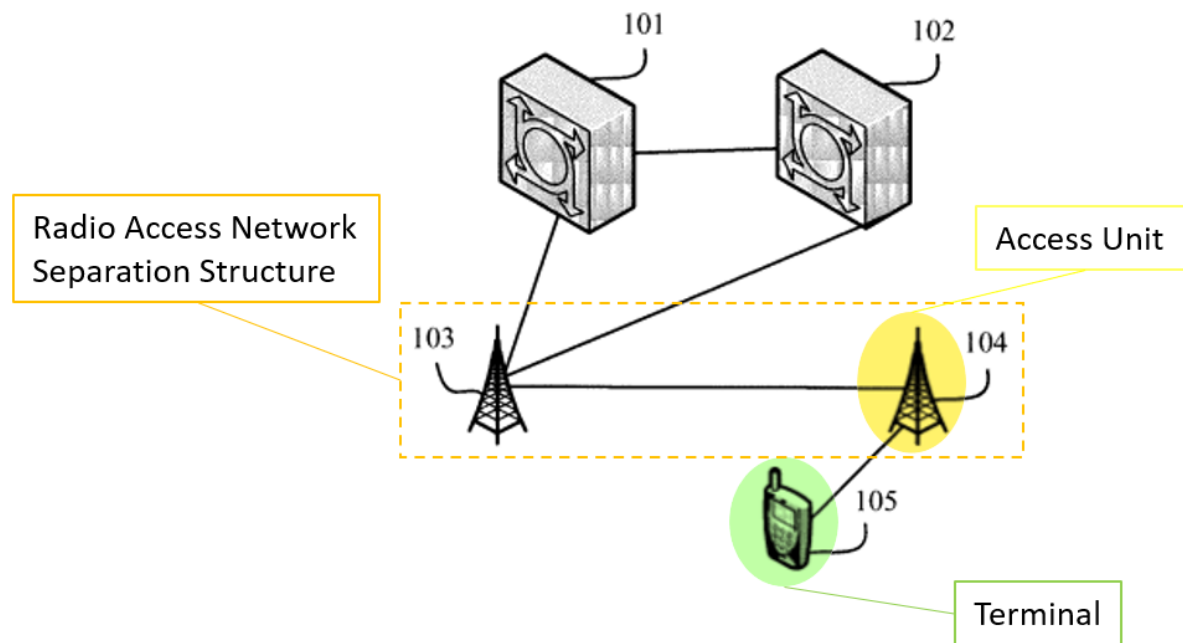


FIG. 1

While not explicitly required in Claim 1, the '932 Patent describes the access unit as a “node providing an *RLC function*, a *MAC function*, and a *PHY function* for the transmission of user plane data.” Ex. 1001, 6:60-65; Ex. 1011, ¶107; *see also* Claim 2. Similarly, Lin1’s **serving node 104** (access unit) performs the functions recited in Claim 1 and “includes an *RLC protocol entity* . . . a Media Access Control *MAC protocol entity* . . . and a physical layer *PHY protocol entity*.” Ex. 1003, 27:31 – 28:3). A POSITA would have understood that a node that includes an *RLC entity*, *MAC entity*, and *PHY entity*, would provide an *RLC function*, a *MAC function*, and a *PHY function* for the transmission of user plane data. Ex. 1011, ¶107. Thus, a

POSITA would have understood that the *serving node 104* (access unit) of Lin1 provides the same functionality as the claimed access unit. *Id.*

Lin1 also discloses *user equipment (UE)* (terminal), which a POSITA would have understood is an example of “terminal” based at least on the ’932 Patent disclosure. Ex. 1011, ¶108; *see also* Ex. 1001, 5:63-6:5 (“In a 3GPP mobile communications network . . . include[es] base stations (eNBs) providing . . . a control plane (RRC) protocol termination to user equipments (terminals).”).

Lin1 discloses that its “*serving node 104* [access unit] may be a network device that provides a *wireless communication service* for the *UE 105* [terminal]” by “set[ting] up a [wireless] connection to the MME 101 [] using the *anchor node 103* [central unit].” Ex. 1003, 1:14-16 & 27:4-11; Ex. 1011, ¶109. While the ’932 patent doesn’t provide a definition for the term “configuring,” it does state that “[a] signaling method for radio (e.g., wireless) resource control is required for the UE to transmit data or to *be connected to a wireless network.*” Ex. 1001, 11:36-45; Ex. 1011, ¶109. Based on this disclosure, a POSITA would have understood that *configuring* a wireless connection of a terminal is describing *setting up a connection* between a UE and a wireless network, as described by Lin1. Ex. 1011, ¶109.

Lin1 therefore discloses configuring, by an access unit, a wireless connection of a terminal.

ii. [1.A]

- a. Lin1 discloses multiple examples of receiving an uplink radio resource control (RRC) message from a terminal.

First, with reference to FIG. 8 (reproduced, annotated, below), Lin1 discloses that a “first *serving node* [access unit] receives an *RRC connection request message* [uplink RRC message] sent by a *UE* [terminal].” Ex. 1003, 45:21-25; Ex. 1011, ¶¶113-114. According to 3GPP standards at the time of the earliest priority date of the '932 patent and confirmed by the '932 patent's disclosure, an *RRC connection request message* (uplink RRC message) is a defined type of uplink RRC message. See e.g., Ex. 1001, FIG. 16 (reproduced below); Ex. 1011, ¶¶48 & 113.

FIG. 16

<i>LTE SRB Type</i>	<i>Direction</i>	<i>RRC message</i>	<i>RLC Mode</i>
<i>LTE SRB0 (CCCH)</i>	<i>Downlink</i>	<i>RRC Connection Setup</i> <i>RRC Connection Reject</i> <i>RRC Connection Re-establishment</i> <i>RRC Connection Re-establishment reject</i>	<i>Transparent</i>
	<i>Uplink</i>	<i>RRC Connection Request</i> <i>RRC Connection Re-establishment Request</i>	
<i>LTE SRB1 (DCCH)</i>	<i>Downlink</i>	<i>RRC Connection Reconfiguration</i> <i>RRC Connection Release</i> <i>Security Mode Command</i> <i>UE Capability Enquiry</i> <i>DL information transfer(if no SRB-2)</i> <i>Mobility from EUTRA Command</i> <i>Handover from EUTRA preparation request</i> <i>CS Fallback parameter response CDMA2000</i> <i>Counter Check</i>	<i>AM</i>
	<i>Uplink</i>	<i>RRC Connection Setup Complete</i> <i>Security Mode Complete</i> <i>Security Mode Failure</i> <i>RRC Connection Reconfiguration Complete</i> <i>RRC Connection Re-establishment Complete</i> <i>Measurement report</i> <i>UE Capability information</i> <i>UL Information Transfer(if no SRB2)</i> <i>UL handover preparation transfer</i> <i>CS fallback parameters request CDMA2000</i> <i>Counter Check response</i>	
<i>LTE SRB2 (DCCH)</i>	<i>Downlink</i>	<i>DL Information Transfer</i>	
	<i>Uplink</i>	<i>DL Information Transfer</i>	

Thus, a POSITA would have understood that Lin1's ***RRC connection request message*** (uplink RRC message) from a ***UE*** (terminal) is an uplink radio resource control (RRC) message from a terminal. Ex. 1011, ¶113.

In addition to the fact that the ***RRC connection request message*** (uplink RRC message) is a defined uplink RRC message, Lin1 explicitly discloses that the "RRC connection request [message] *is an RRC message*." Ex. 1003, 46:3-4; Ex. 1011, ¶114. Lin1 also explains that the ***UE*** (terminal) and the ***serving node*** (access unit) communicate through a "radio link connection [that] is set up between the ***UE 105*** [terminal] and the ***serving node 104*** [access unit]." Ex. 1003, 27:15-17; Ex. 1011, ¶114. A POSITA would have understood that an "uplink" is a unidirectional radio link for the transmission of signals from the UE to a network node. *See supra*, §IV.A Technical Background; Ex. 1009, 25; Ex. 1011, ¶¶43 & 114. Thus, even if an RRC connection request message was not a defined type of uplink RRC message, which it is, the POSITA would have understood that Lin1's disclosure of an ***RRC connection request message*** (uplink RRC message) received over a radio link connection by a ***serving node*** (access unit) and from a ***UE*** (terminal) is referring to an uplink RRC message from a terminal. Ex. 1011, ¶114.

Ex. 1003, FIG. 8 (annotated)

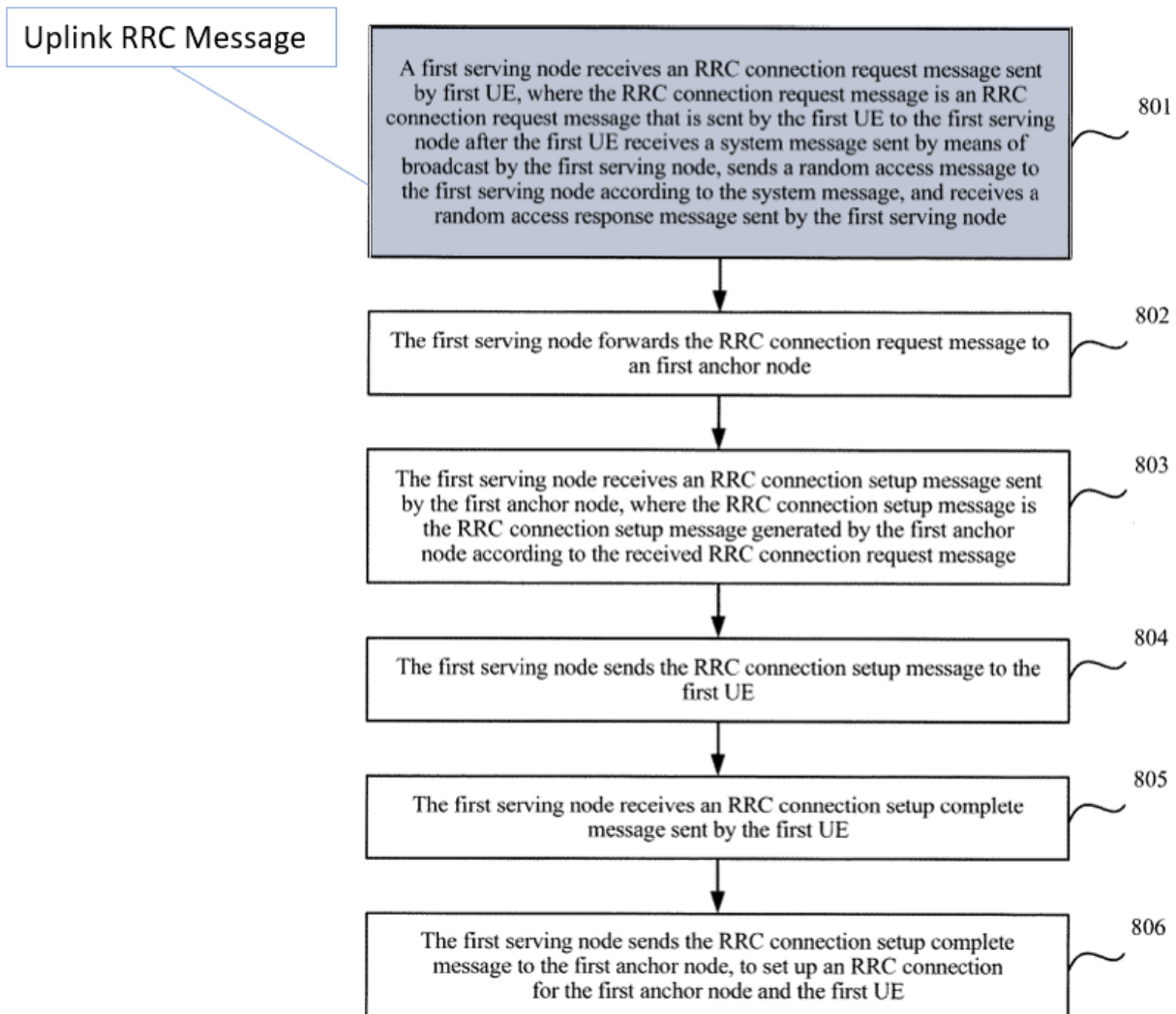


FIG. 8

As a second example, with reference to FIG. 7 (reproduced, annotated, below), Lin1 discloses “receiving, by a first *serving node* [access unit], an *RRC message* [uplink RRC message] sent by a first *UE* [terminal].” Ex. 1003, 41:10-13; Ex. 1011, ¶115. Lin1 discloses that the *RRC message* (uplink RRC message) is

carried by an SRB1 or an SRB2, which a POSITA would have understood includes any of several uplink RRC messages defined by 3GPP standards at the time of the earliest priority date of the '932 Patent and confirmed by the '932 Patent's disclosure. *See e.g.*, Ex. 1001, FIG. 16; Ex. 1011, ¶115.

Ex. 1003, FIG. 7 (annotated)

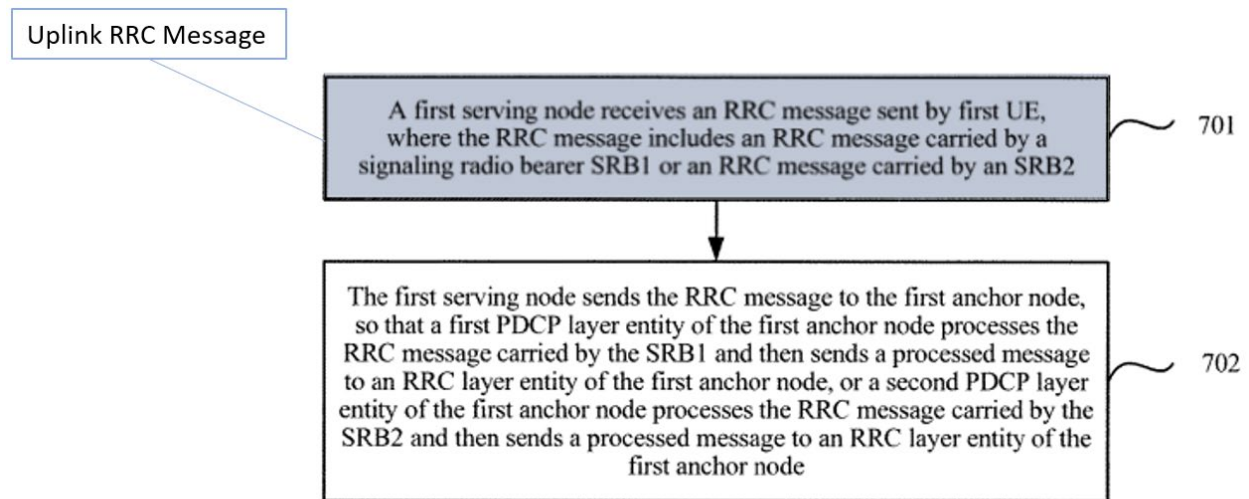


FIG. 7

- b. Lin1 discloses multiple different examples of including the uplink RRC message into a first message and transmitting the first message to a central unit.

As explained herein, a POSITA would have understood that an uplink message, such as the uplink RRC message, is a message between a *UE* (terminal) and a *network node*, such that sending an uplink message between *two network nodes* would entail including the uplink message into a *different message* for transmission between the *two network nodes*. *See supra*, §IV.A Technical Background; Ex. 1009,

25; Ex. 1011, ¶117. A POSITA would have also understood that common techniques for transmitting information, such as uplink or downlink messages, between two network nodes is by including (or “encapsulating”) the information in another message, such as control plane messages, configured for a type of tunneling between the two network nodes. Ex. 1001, 11:14-26; *see* Ex. 1010, Chapter 3 E-UTRAN and EPS Protocol Structure, p. 123; *see also* Ex. 1010, Chapter 3.1 EPS reference model and protocol structure, p. 127 & Chapter 6, Packet Data Convergence Protocol Functions, Table 6.1; Ex. 1011, ¶117. Indeed, for each of the uplink RRC messages identified above, Lin1 discloses multiple different examples of including the uplink RRC message into a first message and transmitting the first message to a central unit. *Id.*

First, with reference again to FIG. 8 (reproduced, annotated, below), Lin1 discloses “forwarding, by the *serving node* [access unit], the *RRC connection request message* [uplink RRC message] to a first *anchor node* [central unit].” Ex. 1003, 45:29-30; Ex. 1011, ¶118. Lin1 also discloses sending the *RRC connection request message* (uplink RRC message) in a control signaling message (first

message). *Id.*² Thus, a POSITA would have understood that to forward the ***RRC connection request message*** (uplink RRC message) to the first ***anchor node*** (central unit), the ***serving node*** (access unit) *would* include the ***RRC connection request message*** (uplink RRC message) into a ***control plane signaling message*** (a first message) and transmit the ***control plane signaling message*** (a first message) to the ***anchor node*** (central unit). *Id.*

² Lin1 describes several names for the control signaling message that carries the RRC connection request message (uplink RRC message), including “SRB0RRCTransfer or InitialRRCTransfer.” Ex. 1003, 46:2-6; Ex. 1011 ¶ 119.

Ex. 1003, FIG. 8 (annotated)

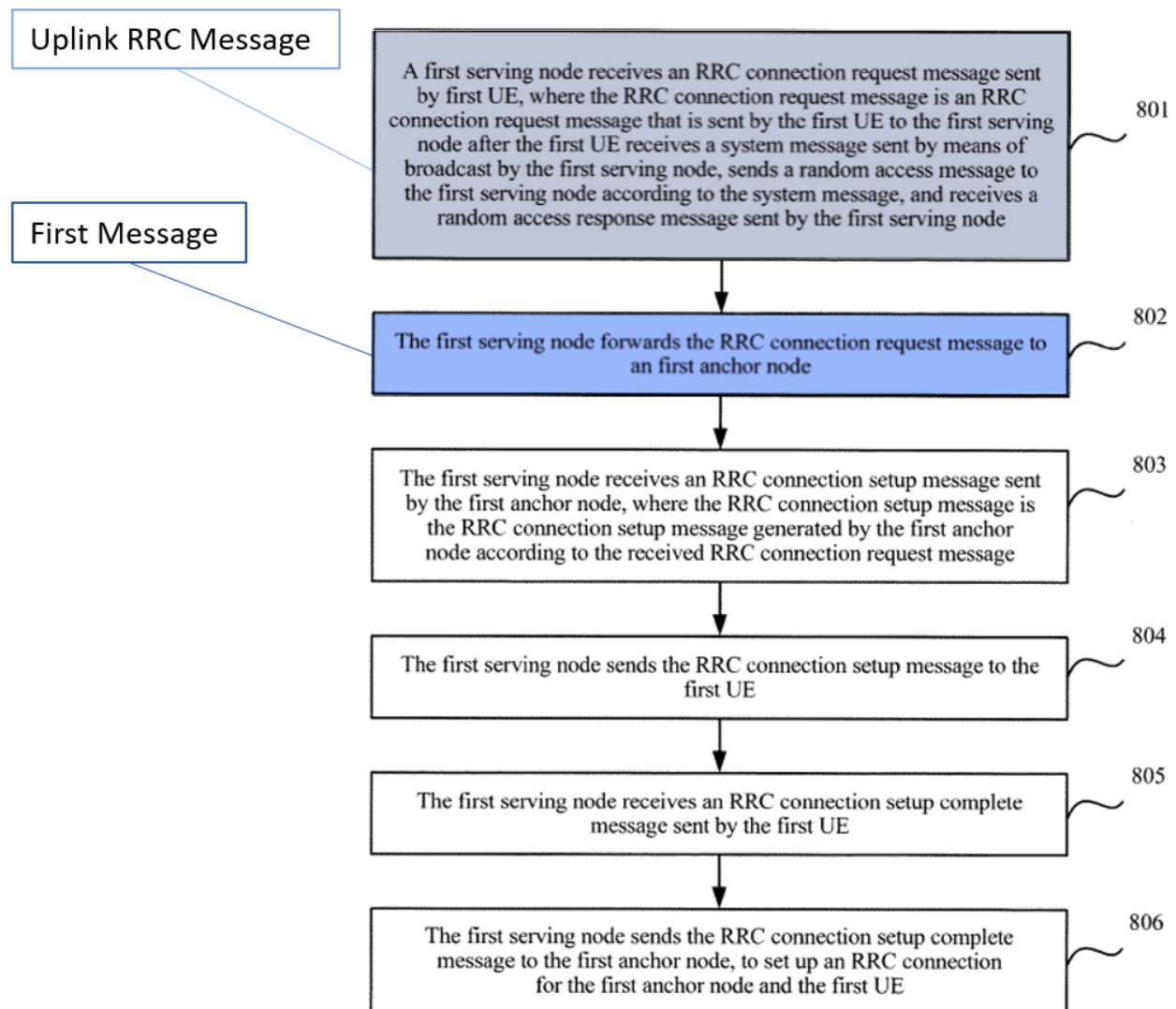


FIG. 8

Second, with reference to FIG. 7 (reproduced, annotated, below), Lin1 discloses “sending, by the first *serving node* [access unit], the *RRC message* [uplink RRC message] to a first *anchor node* [central unit]” using “inter-device control plane interface signaling” that uses “*control plane signaling messages* [first

messages] [to] carr[y] the **RRC message** [uplink RRC message].” Ex. 1003, 42:9-10 & 26-30; Ex. 1011, ¶120.

Ex. 1003, FIG. 7 (annotated)

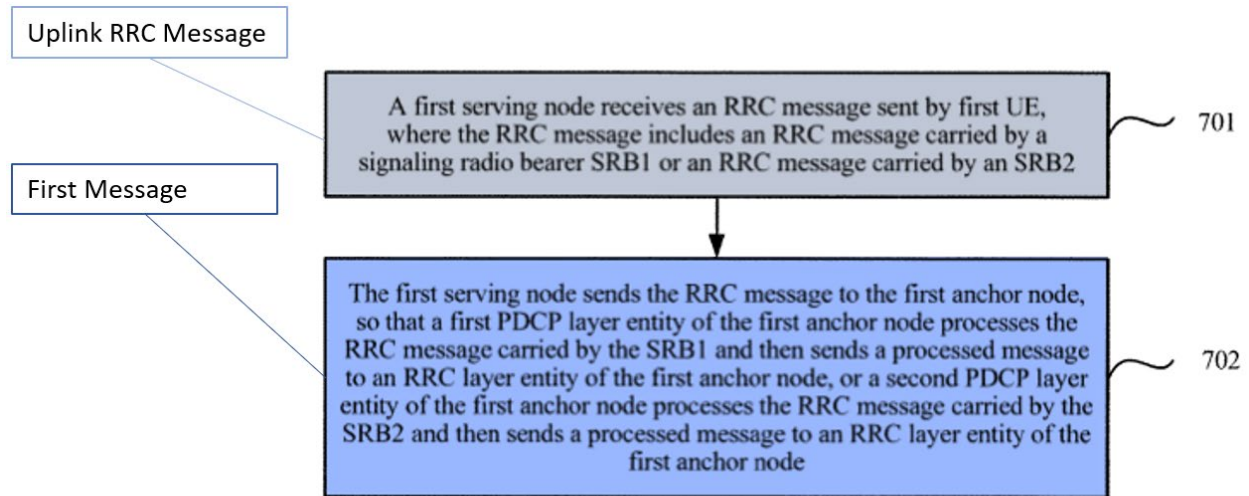


FIG. 7

iii. [1.B]

- a. Lin1 discloses multiple different examples of receiving a second message from the central unit that includes a downlink RRC message.

A POSITA would have understood that a downlink message is a message between a *UE* (terminal) and a *network node*, such that forwarding or otherwise sending a downlink message between *two network nodes* would entail including the downlink message into a *different message* for transmission between the *two network nodes*. See *supra*, §IV.A Technical Background; Ex. 1009, 10; Ex. 1011, ¶¶43 & 122. Indeed, for each of the downlink RRC messages identified below, Lin1

discloses multiple different examples of receiving a second message from the **anchor node** (central unit) that includes the downlink RRC message. *Id.*

First, with reference to FIG. 8 (reproduced, annotated, below), Lin1 discloses that the “**serving node** [access unit] receives an **RRC connection setup message** [downlink RRC message] sent by the first **anchor node** [central unit].” Ex. 1003, 46:15-17; Ex. 1011, ¶123. According to 3GPP standards and confirmed by the ’932 Patent disclosure, an RRC connection setup message is a defined type of downlink RRC message. *See e.g.*, Ex. 1001, FIG. 16. Lin1 also discloses that “the **RRC connection setup message** [downlink RRC message] is carried by a **control plane signaling message** [second message].” Ex. 1003, 46:18-22; Ex. 1011, ¶¶123-124. A POSITA would have understood from this disclosure that Lin1’s **control plane signaling message** (a second message) that carries the **RRC connection setup message** (downlink RRC message) is a second message received from a central unit that includes a downlink RRC message.

Ex. 1003, FIG. 8 (annotated)

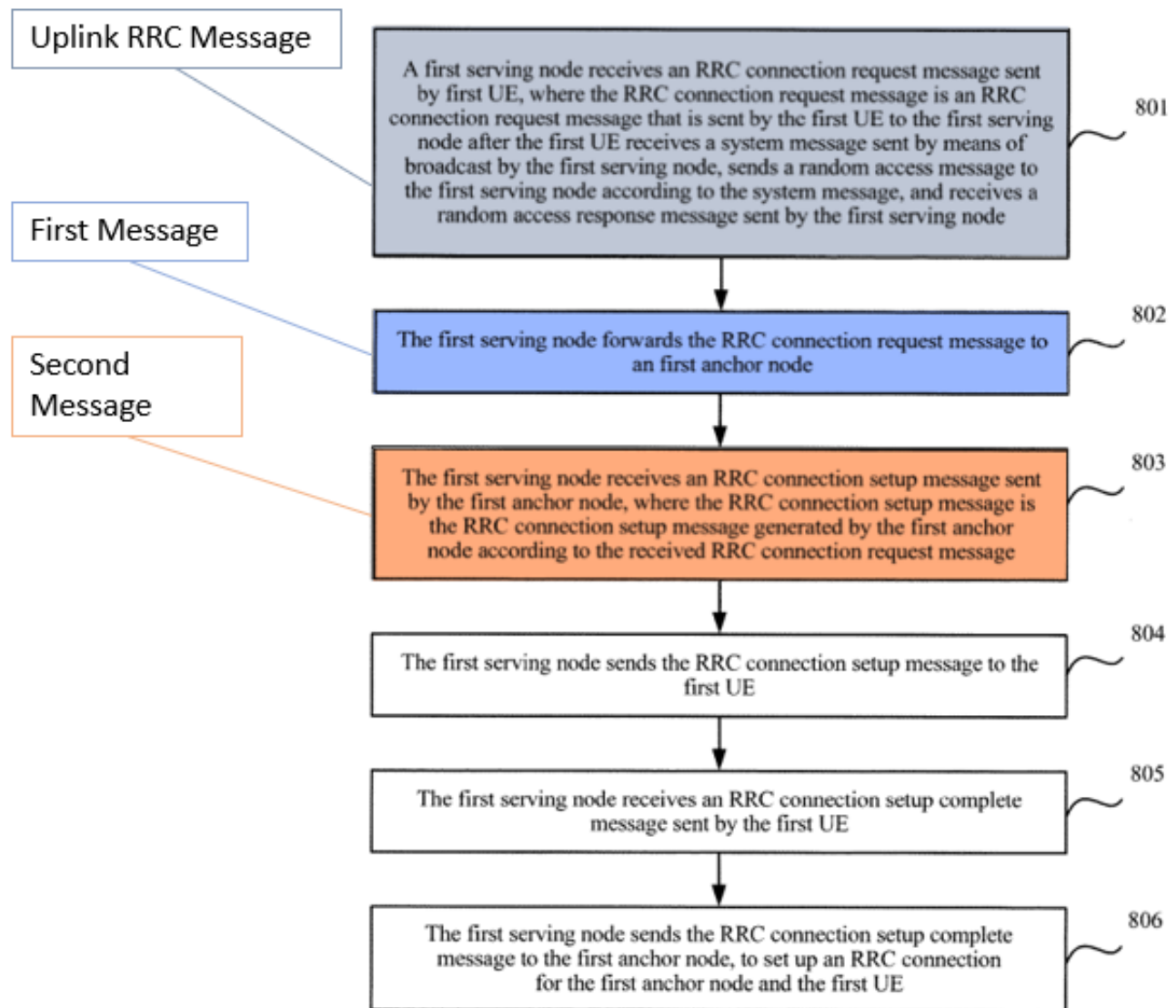


FIG. 8

Second, with reference to FIG. 7, Lin1 discloses “receiving, by the first *serving node* [access unit], an *RRC message* [a downlink RRC message] sent by the first *anchor node* [central unit].” Ex. 1003, 42:14-16; Ex. 1011, ¶125. A POSITA would have understood that the *RRC message* (a downlink RRC message) sent by

the *anchor node* (central unit) is a downlink RRC message because Lin1 later discloses that the *RRC message* (a downlink RRC message) is processed and then sent to a *UE* (terminal). Ex. 1003, 42:14-20; Ex. 1011, ¶125. As noted above, Lin1 states that an *RRC message* (downlink RRC message) is carried by a *control signaling message* (second message). Ex. 1003, 42:21-30; Ex. 1011, ¶126. Thus, a POSITA would have also understood that the received *RRC message* (a downlink RRC message) is included in a *control signaling message* (second message). Ex. 1011, ¶126.

- b. Lin1 discloses multiple different examples of the second message being in response to the uplink RRC message from the terminal.

First, with reference to FIG. 8, Lin1 discloses that “the *RRC connection setup message* [downlink RRC message] [is] generated by the first *anchor node* [central unit] *according to* the received *RRC connection request message* [uplink RRC message],” which clearly discloses that the *RRC connection setup message* (downlink RRC message) is in response to the *RRC connection request message* (uplink RRC message). Ex. 1003, 46:15-17; Ex. 1011, ¶128.

Second, with reference to FIG. 7, Lin1 discloses receiving an *RRC message* (downlink RRC message) from an *anchor node* (central unit) in response to sending the *anchor node* (central unit) a previous *RRC message* (uplink RRC message). Ex. 1011, ¶129; *see also* Ex. 1003, 42:14-16.

iv. [1.C]

- a. Lin1 discloses multiple different examples of transmitting the downlink RRC message to the terminal.

First, with reference to FIG. 8 (reproduced, annotated, below), Lin1 discloses “sending, by the first *serving node* [access unit], [an] *RRC connection setup message* [downlink RRC message] to the first *UE* [terminal].” Ex. 1003, 46:15-17; Ex. 1011, ¶132.

Ex. 1003, FIG. 8 (annotated)

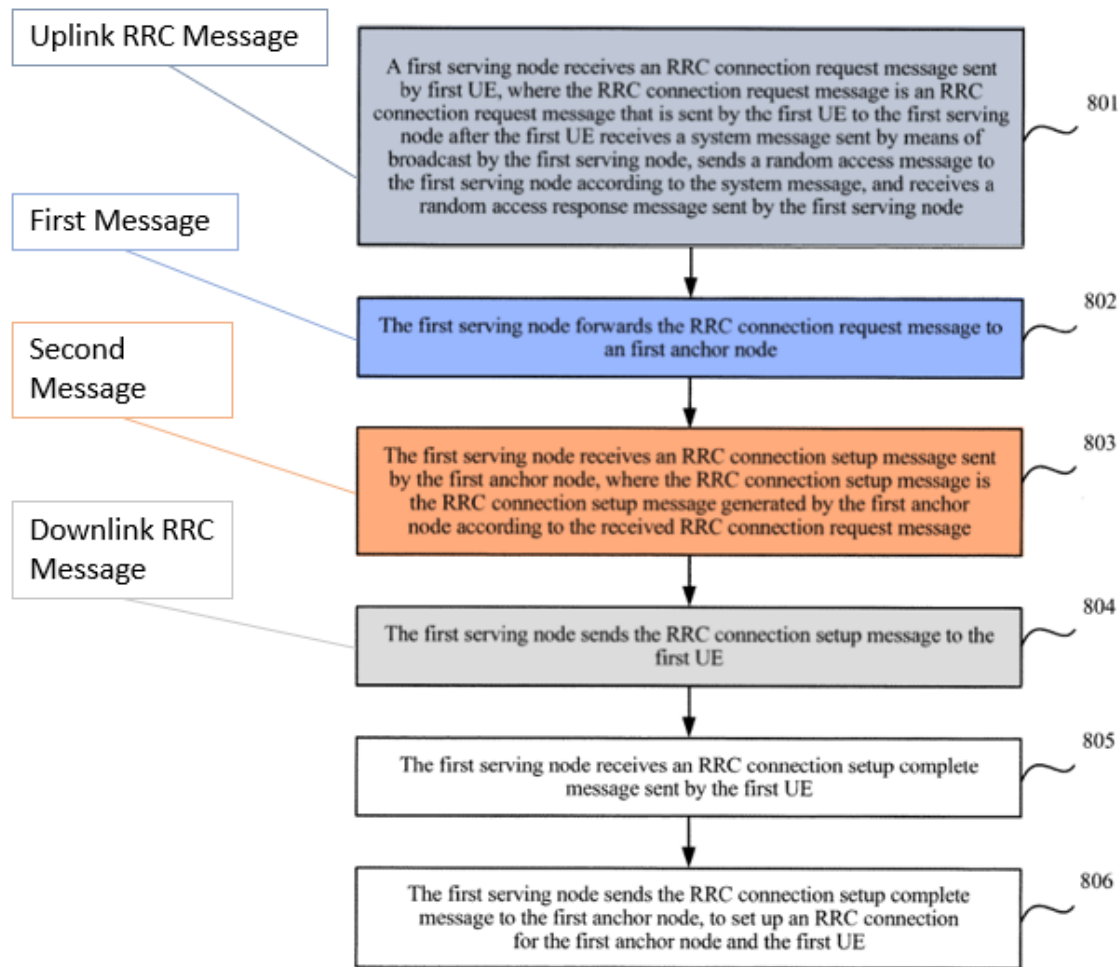


FIG. 8

As a second example, with reference to FIG. 7, Lin1 discloses sending a processed ***RRC message*** [downlink RRC message] to the first ***UE*** [terminal].” Ex. 1003, 42:16-18; Ex. 1011, ¶133.

- b. Lin1 discloses that the ***serving node*** (access unit) and the ***anchor node*** (central unit) “distinguish” signaling radio bearers based on radio bearer identification information-included in ***control***

signaling messages (the first and second messages).

Lin1 discloses (1) indication information that a POSITA would have understood is an example of the “radio bearer identification information” because it identifies a type of signaling radio bearer (SRB), (2) that the **indication information** (radio bearer identification information) is included in **control signaling messages** (both the first and second messages), and (3) that the **serving node** (access unit) and the **anchor node** (central unit) “distinguish” signaling radio bearers based on this **indication information** (radio bearer identification information). With respect to distinguishing the signaling radio bearers, the POSITA would have understood that *distinguishing* signaling radio bearers includes either (i) identifying a type of signaling radio bearer (SRB) or (ii) processing a message based on the identified SRB type and Lin1 discloses using **indication information** (radio bearer identification information) included in **control signaling messages** (the first and second message) to perform both of these functions. Ex. 1011, ¶142.

(i) Lin1 discloses (1) indication information that a POSITA would have understood is an example of the “radio bearer identification information” because it identifies a type of signaling radio bearer (SRB).

Lin1 discloses **indication information** (radio bearer identification information) that a POSITA would have understood is an example of radio bearer identification information based on the disclosure of the '932 Patent. Ex. 1011, ¶134.

While the '932 Patent does not provide a definition of radio bearer identification information, it gives several examples including: (i) “bearer identification information of the signaling radio bearer (i.e. *SRB1*)”, Ex. 1003, 15:58-61, (ii) “bearer identification information of the signaling radio bearer (DRB or *SRB2*)”, Ex. 1003, 17:46-50, and (iii) “bearer identification information (e.g. UP *SRB1* tunnel identification information (TEID))”, Ex. 1003, 17:57-67, that all refer to one of three SRB types (SRB0, SRB1, and SRB2) defined by 3GPP standards at the time of the earliest priority date of the '932 Patent. *See supra* §IV.A Technical Background; Ex. 1003, 19:16-24; Ex. 1011, ¶¶47, 134. Similarly, Lin1’s **indication information** (radio bearer identification information) “identif[ies] an SRB type.” Ex. 1003, 42:21-30; Ex. 1011, ¶¶134-137.

Specifically, Lin1 discloses “in order that the **serving node** [access unit] and the **anchor node** [central unit] can identify an SRB type of a received RRC message, a transmitter may send **indication information** [radio bearer identification information] to a receiver, and indicate the SRB type of the RRC message to the receiver by using the **indication information** [radio bearer identification information], for example, [to] indicate whether the RRC message is specifically an RRC message carried by the SRB1 or an RRC message carried by the SRB2.” Ex. 1003, 42:21-30; Ex. 1011, ¶135. A POSITA would have understood from this disclosure that Lin1’s indication information, like the radio bearer identification

information of the '932 Patent, *identifies a type of radio bearer* (SRB type) of an ***RRC message*** (uplink or downlink RRC messages). Ex. 1003, 2:12-15, 30:6-9, & 64:6-9; Ex. 1011, ¶135.

Lin1 further discloses, and a POSITA would have known, that “different processing methods are used to process [an] ***RRC message*** [uplink or downlink RRC messages] according to different SRB types of the RRC message.” Ex. 1003, 24:20-25; Ex. 1011, ¶136. Thus, a POSITA would have known, and Lin1 confirms, that the SRB type impacts the processing of both a ***serving node*** (access unit) and an ***anchor node*** (central unit) that “jointly process [an] RRC message.” Ex. 1003, 24:20-25; Ex. 1011, ¶136. Due to the known impact of the SRB type on the processing of ***RRC messages*** (uplink or downlink messages) by a ***serving node*** (access unit) and an ***anchor node*** (central unit), a POSITA would have understood that the claimed radio bearer identification information includes Lin1’s ***indication information*** (radio bearer identification information) that *identifies a type of radio bearer*. Ex. 1011, ¶136.

(ii) Lin1 discloses (2) that the ***indication information*** (radio bearer identification information) is included in ***control signaling messages*** (both the first and second messages).

Lin1 discloses that control plane interface signaling is used between the ***serving node*** (access unit) and the ***anchor node*** (central unit) in which the ***serving node*** (access unit) and the anchor node (central unit) communicate using ***control***

plane signaling messages (first and second messages) that carry ***RRC messages*** (uplink and downlink RRC messages). Ex. 1003, 42:21-30; Ex. 1011, ¶137. Lin1 discloses that “the ***indication information*** [radio bearer identification information] may be carried when the ***RRC message*** [uplink or downlink RRC messages] is being sent. Specifically, the ***indication information*** [radio bearer identification information] may be carried in the ***RRC message*** [uplink or downlink RRC message], or the ***indication information*** [radio bearer identification information] may be carried in a ***control plane signaling message*** [first or second message] that carries the ***RRC message*** [uplink or downlink RRC message], or the ***indication information*** [radio bearer identification information] may be sent separately after the ***RRC message*** [uplink or downlink RRC message] is sent.” Ex. 1003, 42:21-30; Ex. 1011, ¶137. Thus, a POSITA would have understood that Lin1’s ***indication information*** (radio bearer identification information) is included in Lin1’s ***control plane signaling messages*** (first and second messages). Ex. 1011, ¶137.

Indeed, Lin1 provides multiple examples of ***indication information*** (radio bearer identification information) included in ***control plane signaling messages*** (first and second messages). Ex. 1011, ¶¶139-141. With reference to FIG. 8, Lin1 discloses (i) “the first ***serving node*** [access unit] may send first ***indication information*** [radio bearer identification information] when forwarding the ***RRC connection request message*** [uplink RRC message] to the first ***anchor node*** [central

unit]” and (ii) “**anchor node** [central unit] may include the **indication information** [radio bearer identification information] in a message when sending the **RRC connection setup message** [downlink RRC message].” Ex. 1003, 46:1-6 & 18-22; Ex. 1011, ¶¶139-140. With reference to FIG. 7, Lin1 discloses that “**indication information** [radio bearer identification information] may be carried in a **control plane signaling message** [first or second message] that carries the **RRC message** [uplink or downlink RRC messages].” Ex. 1003, 42:24-29; Ex. 1011, ¶141.

(iii) Lin1 discloses (3) that the **serving node** (access unit) and the **anchor node** (central unit) “distinguish” signaling radio bearers based on this **indication information** (radio bearer identification information).

Lin1 discloses that both the **serving node** (access unit) and **anchor node** (central unit) use the **indication information** (radio bearer identification information) to (i) identify a type of SRB and (ii) process a message based on the identified SRB type and a POSITA would have considered both of these functions “distinguishing radio signal bearers” as they would both distinguish the SRB of a message *from other types of SRBs*. Ex. 1011, ¶141.

With respect to the **serving node** (access unit) and the **anchor node** (central unit) *identifying* an SRB type of an RRC message, Lin1 discloses multiple examples of identifying the SRB type of an **RRC message** (uplink or downlink RRC message) using **indication information** (radio bearer identification information) included in a

control signaling message (first or second messages). Ex. 1011, ¶139-141 & 145-146.

In a first example, Lin1 discloses that the “*serving node* [access unit] may send *indication information* [radio bearer identification information] when forwarding the *RRC connection request message* [uplink RRC message] to the first *anchor node* [central unit]” to “indicate that the *RRC connection request message* [uplink RRC message] is an RRC message carried by the SRB0 [one of three SRB types].” Ex. 1003, 46:1-8; Ex. 1011, ¶145. Lin1 also discloses that “the first *anchor node* [central unit] identif[ies], according to the *indication information* [bearer identification information], that the *RRC message* [uplink RRC message] is carried by the SRB0 [one of three SRB types].” Ex. 1003, 43:10-13; Ex. 1011, ¶145. Thus, a POSITA would have understood that the *serving node* (access unit) uses the *indication information* (radio bearer identification information) to *indicate* an SRB type of the *RRC connection request message* (uplink RRC message) to an *anchor node* (central unit) and the *anchor node* (central unit) uses the *indication information* (radio bearer identification information) to *identify* the SRB type of the *RRC connection request message* (uplink RRC message). Ex. 1011, ¶145.

In a second example, Lin1 also discloses that “the first *anchor node* [central unit] may include the *indication information* [radio bearer identification information] in a message when sending the *RRC connection setup message*

[downlink RRC message] . . . so that the first *serving node* [access unit] identifies, according to the *indication information* [radio bearer identification information], that the *RRC connection setup message* [downlink RRC message] is the RRC message carried by the SRB0 [one of three SRB types].” Ex. 1003, 46:18-25; Ex. 1011, ¶146. Lin1 further discloses that the “*serving node* [access unit] identifies, according to the *indication information* [bearer identification information], that the *RRC connection setup message* [downlink RRC message] is the RRC message carried by the SRB0 [one of three SRB types].” Ex. 1003, 46:23-25; Ex. 1011, ¶146. Thus, a POSITA would have understood that the *anchor node* (central unit) uses the *indication information* (radio bearer identification information) to *indicate* an SRB type of the *RRC connection setup message* (downlink RRC message) to a *serving node* (access unit) and the *serving node* (access unit) uses the *indication information* (radio bearer identification information) to *identify* the SRB type of the *RRC connection setup message* (downlink RRC message). Ex. 1011, ¶146.

With respect to the *serving node* (access unit) and the *anchor node* (central unit) *processing* a message based on an SRB type of an RRC message, a POSITA would have known, and Lin1 confirms, that “different processing methods are used to process [an] *RRC message* [uplink or downlink RRC message] according to different SRB types of the *RRC message* [uplink or downlink RRC message], *so as to separate an RRC message processing function to two nodes, namely, the first*

serving node and the first anchor node.” Ex. 1003, 24:20-25; Ex. 1011, ¶142. Referring to multiple different RRC message processing functions, including RRC connection and RRC connection re-setup, Lin1 explains that “**indication information** [radio bearer identification information] used to indicate an SRB type may be carried when the RRC message is being sent, or the indication information may be separately sent, *so that the first serving node* [access unit] *and the first anchor node* [central unit] *perform corresponding processing.*” Ex. 1003, 48:5-11, 50:3-8, 52:3-8, 54:3-8, 56: 10-14, 58:27-58:2, 59:26 – 60:2, 60:24-29, 61:16-21, 62:16-21; Ex. 1011, ¶142.

Indeed, Lin1 discloses that “[e]ach time an **RRC message** [uplink or downlink RRC message] is sent between the first **anchor node** [central unit] and the first **serving node** [access unit], whether the RRC message is an RRC message carried by an SRB0 [a first of three SRB types], an RRC message carried by an SRB1 [a second of three SRB types], or an RRC message carried by an SRB2 [a third of three SRB types] needs to be indicated, so that a receiver performs processing.” Ex. 1003, 47:30-48:3; Ex. 1011, ¶147.

Lin1 discloses multiple specific examples of the **serving node** (access unit) and **anchor node** (central unit) processing an RRC message according to a particular SRB type. Ex. 1011, ¶¶147-149.

In a first example that is specific to the *serving node* (access unit), Lin1 discloses that a “RRC message [that] is carried by the SRB0 [a first of three SRB types] [is] process[ed] by using an RRC layer entity of the first *serving node* [access unit],” “a first RLC layer entity [is] used to process an RRC message carried by the SRB1 [a second of three SRB types], and a second RLC layer entity [is] used to process an RRC message carried by the SRB2 [a third of three SRB types].” Ex. 1003, 9:16-19, 15:1-10, 31:14-23, 32:8-12, 43:8-17, 47:1-6, and 56:28-57:6; Ex. 1011, ¶148. Based on this disclosure, a POSITA would have understood that Lin1’s *serving node* (access unit) processes an *RRC message* (e.g., uplink or downlink RRC message) using different processing entities (RRC layer entity, first RLC layer entity, and second RLC entity) according to a specific SRB type identified by the *indication information* (radio bearer identification information) within a message. *Id.*

In a second example that is specific to the *anchor node* (central unit), Lin1 discloses that the *anchor node* (central unit) processes an RRC message carried by an SRB0 (a first of three SRB types) using an RRC layer entity, an RRC message carried by an SRB1 (a second of the three SRB types) using a first PCDP layer, and an RRC message carried by an SRB2 (a third of the three SRB types) using a second PCDP layer. Ex. 1003, 24:10-17, 27:22-32; 30:10-13, 31:14-29, 32:18-23, 42:9-13, 43:8-17, 44:19-29, 46:1-8, and 71:8-17; Ex. 1011, ¶149. Based on this disclosure,

the POSITA would have understood that Lin1's **anchor node** (central unit) processes an **RRC message** (e.g., uplink or downlink RRC message) using different processing entities (RRC layer entity, first PCDP layer entity, and second PCDP entity) according to a specific SRB type identified by the **indication information** (radio bearer identification information) within a message.

3. **Claim 2**

i. [2.PRE]

As set forth above, the method of claim 1 is obvious over Lin1.

ii. [2.A]

Lin1 discloses a **serving node** (access unit) that “includes an RLC protocol entity . . . a Media Access Control MAC protocol entity . . . and a physical layer PHY protocol entity.” Ex. 1003, 27:31-28:10; Ex. 1011, ¶152. The POSITA would have understood that the node that includes these entities, RLC, MAC, PHY, would provide an RLC function, a MAC function, and a PHY function. Ex. 1011, ¶152. Lin1 also discloses “an S1-U user plane interface [is] established between the MME 101 in a core network and the **anchor node 103** [central unit] and between the SGW 102 in the core network and the **anchor node 103** [central unit],” which a POSITA would understand is used to transmit user plane data. Ex. 1003, 27:10-17; Ex. 1011, ¶153. Thus, a POSITA would have understood that Lin1's **serving node** (access unit)

comprises a node configured to provide an RLC function, a MAC function, and a PHY function, for transmission of user plane data.

iii. [2.B]

Lin1 discloses an ***anchor node*** (central unit) that “includes a first Packet Data Convergence Protocol (PDCP) protocol entity” and a “second Packet Data Convergence Protocol (PDCP) protocol entity.” Ex. 1003, 27:20-31; Ex. 1011, ¶156. The POSITA would have understood that the node that includes these entities, first and second PDCP, would perform or otherwise provide a PDCP function. Ex. 1011, ¶156. As discussed above, the ***anchor node*** (central unit) is connected to an S1-U user plane interface with an MEE and SGW through which user plane data is transmitted. *Id.* Thus, the POSITA would have understood that the ***anchor node*** (central unit) is a node configured to provide a PDCP function, for transmission of the user plane data. *Id.*

4. Claim 4

i. [4.PRE]

As set forth above, the method of claim is obvious over Lin1.

ii. [4.A]

Lin1 discloses a second message that comprises an RRC connection setup message and signaling radio bearer identification information. *See supra*, §§VII.A.2.ii, [1.B] & VII.A.2.iv, [1.C]; Ex. 1011, ¶¶160-162. Thus, Lin1 discloses a second message that comprises at least one of an *RRC connection setup message*, a C-RNTI, and *signaling radio bearer identification information*. Ex. 1011, ¶¶160-162.

Lin1 also renders obvious a second message that comprises a C-RNTI. Ex. 1003, 46:9-17; Ex. 1011, ¶¶162-164. Specifically, Lin1 discloses that the ***serving node*** (access unit) may “include a CRNTI and/or an X2AP ID of the ***UE*** [terminal] to the ***RRC connection request message*** [uplink RRC message].” Ex. 1003, 46:9-14; Ex. 1011, ¶162. Lin1 also discloses that the “***serving node*** [access unit] receives an ***RRC connection setup message*** [downlink RRC message] sent by the first ***anchor node*** [central unit], where the ***RRC connection setup message*** [downlink RRC message] is the ***RRC connection setup message*** [downlink RRC message] generated by the first ***anchor node*** [central unit] according to the received ***RRC connection request message*** [uplink RRC message].” Ex. 1003, 46:15-17; Ex. 1011, ¶162. Lin1’s disclosure of generating the ***RRC connection setup message*** (downlink RRC message) *according to* an ***RRC connection request message*** (uplink RRC message) that includes a CRNTI would have suggested to the POSITA that the ***RRC***

connection setup message (downlink RRC message) also includes the CRNTI. Ex. 1011, ¶162.

Moreover, Lin1 discloses “sending, by the first *serving node* [access unit], the *RRC connection setup message* [downlink RRC message] to the first *UE* [terminal].” Ex. 1003, 46:26-27; Ex. 1011, ¶163. The POSITA would have understood that a CRNTI is used to identify a *UE* (terminal) for transmission of a downlink message. Ex. 1011, ¶163; *see also* Ex. 1009, 8. Lin1’s disclosure of sending the *RRC connection setup message* (downlink RRC message) to a *UE* (terminal) would have motivated the POSITA to include the CRNTI in the *RRC connection setup message* (downlink RRC message) or a *signaling control message* (second message) carrying the *RRC connection setup message* (downlink RRC message). Ex. 1011, ¶163. Thus, a second message that comprises at least one of an RRC connection setup message, a *C-RNTI*, and signaling radio bearer identification information is obvious in view of Lin1. *Id.*

5. *Claim 8*

i. [8.PRE]

Lin1 discloses a *serving node* (access unit) for configuring a wireless connection of a *UE* (terminal). *See supra*, §VII.A.2.i, [1.PRE]; Ex. 1011, ¶165.

ii. [8.A]

As shown by FIG. 5 (reproduced, annotated, below), Lin1's *serving node* (access unit) includes a transmitter configured to transmit a first message to an *anchor node* (central unit). Ex. 1011, ¶¶167-168. The “transmitter 501 is configured to: send [an] RRC message received by the receiver 502 to the first *anchor node* [central unit].” Ex. 1003, 40:8-22; Ex. 1011, ¶¶168-169.

Ex. 1003, FIG. 5 (annotated)

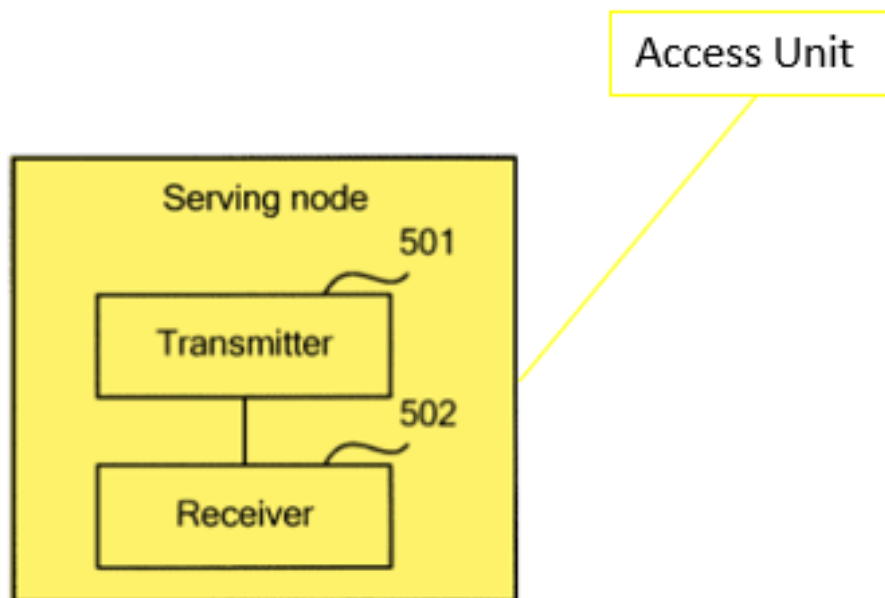


FIG. 5

As described in Claim 1.A, Lin1 discloses a first message that includes an uplink RRC message received from a terminal. *See supra*, §VII.A.2.ii, [1.A]; Ex. 1011, ¶¶113-120 & 170-171.

iii. [8.B1]

As shown by FIG. 5 (reproduced, annotated, below), Lin1's *serving node* (access unit) also includes a receiver 502. Ex. 1003, 40:8-22; Ex. 1011, ¶173.

Ex. 1003, FIG. 5 (annotated)

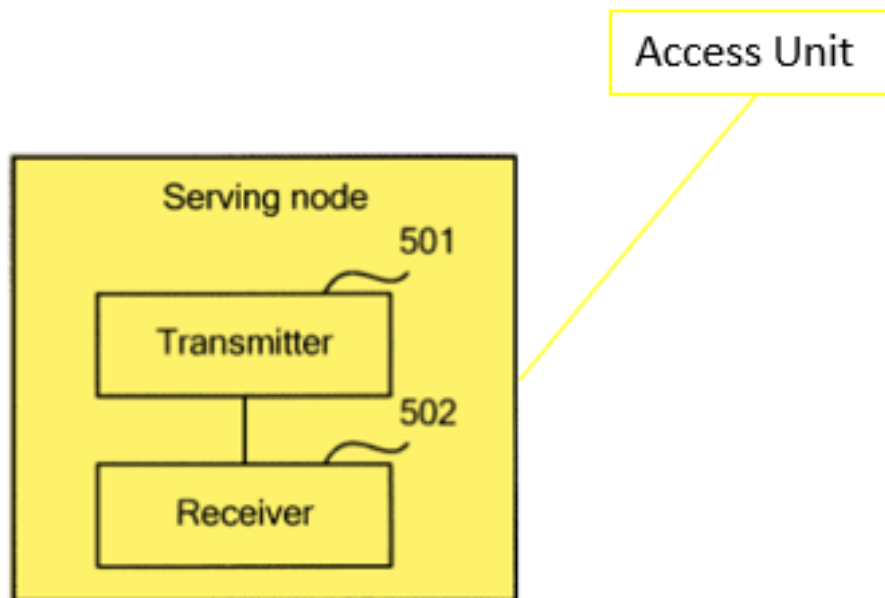


FIG. 5

As described in Claim 1.B, Lin1 discloses receiving a second message from an *anchor node* (central unit) that includes a downlink RRC message in response to the uplink RRC message from the terminal. *See supra*, §VII.A.2.iii, [1.B]; Ex. 1011, ¶¶122-129 & 174.

iv. [8.B2]

As described with reference to Claim 1.C, Lin1 discloses that the *serving node* (access unit) and the *anchor node* (central unit) distinguish signaling radio bearers

based on radio bearer identification information included in the first message and the second message. *See supra*, §VII.A.2.iv, [1.C]; Ex. 1011, ¶¶132-149.

6. Claim 9

i. [9.PRE]

As set forth above, the access unit of claim 8 is obvious over Lin1.

ii. [9.A]

As described with reference to Claim 2.A, Lin1 discloses a *serving node* (access unit) that comprises a node configured to provide an RLC function, a MAC function, and a PHY function, for transmission of user plane data. *See supra*, §VII.A.3.ii, [2.A]; Ex. 1011, ¶¶152-153 & 181.

iii. [9.B]

As described with reference to Claim 2.B, Lin1 discloses an *anchor node* (central unit) that comprises a node configured to provide a PDCCP function, for transmission of the user plane data. *See supra*, §VII.A.3.iii, [2.B]; Ex. 1011, ¶¶156 & 182.

7. Claim 11

i. [11.PRE]

As set forth above, the access unit of claim 8 is obvious over Lin1.

ii. [11.A]

As described with reference to Claim 4.A, Lin1 discloses a second message that comprises (i) an RRC connection setup message and (ii) signaling radio bearer identification information and a POSITA would have been further motivated to include a CRNTI in a second message. *See supra*, §VII.A.4.ii, [4.A]; Ex. 1011, ¶¶161-163.

B. Ground 2: Claims 1-2, 4, 8-9, and 11 are rendered obvious by Lin1 and Lin2.

1. Overview of Ground 2

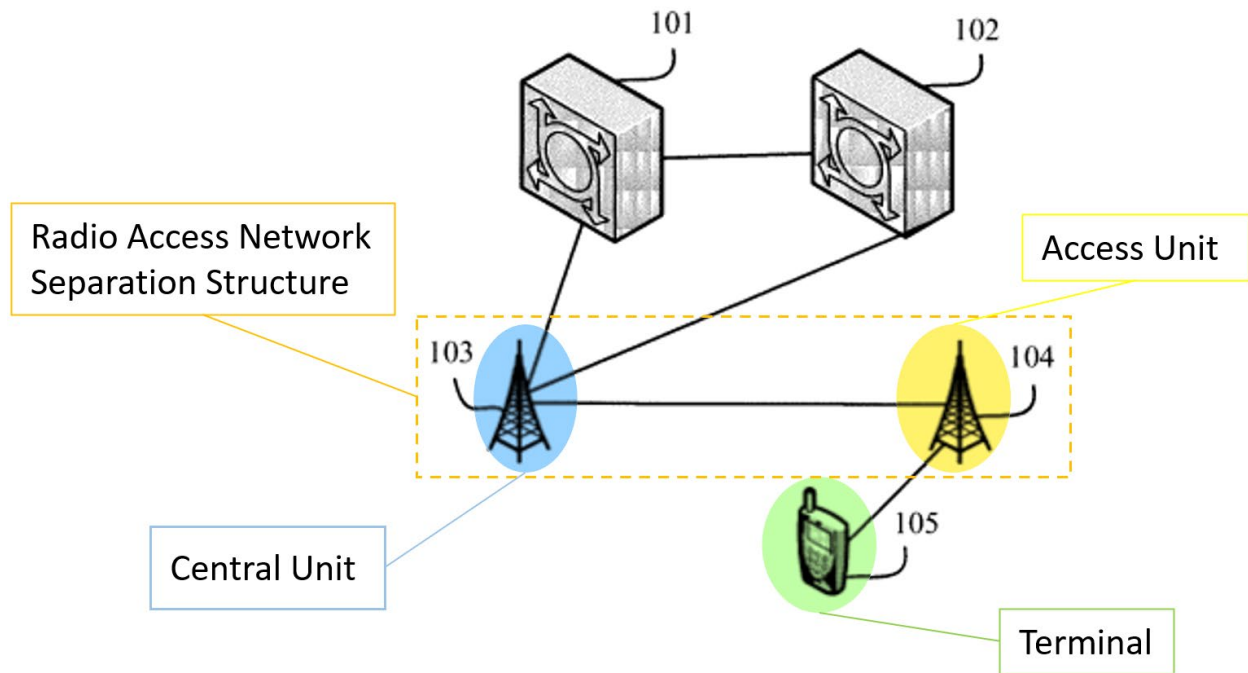
Lin1 and Lin2 disclose wireless configurations in which a serving node sends and receives the same messages as those required by the access unit in the Challenged Claims. Ex. 1003, FIGS. 7-8; Ex. 1011, ¶¶105, 112, 122, and 131; Ex. 1005, FIGS. 6; Ex. 1011, ¶¶205, 211-212, 219, 223-224 and 229. The Challenged Claims are therefore obvious over Lin1 and Lin2.

2. Motivation to Combine Lin1 and Lin2

Lin1 and Lin2 share a common inventor, Bo Lin, they were filed on the same day, and they describe the same network architecture. With respect to the network architecture, Lin1 and Lin2 both disclose interface establishing techniques using the same two network nodes that split RRC functions to jointly process RRC messages for a user terminal. Ex. 1003, 1:9-11, 25:22-26, 27:18-20; Ex. 1005, 3:8-11, 16:30-

31, & 19:17-22; Ex. 1011, ¶¶189-191. Annotated versions of both architectures are reproduced below for reference.

Ex. 1003, FIG. 1 (annotated)



Ex. 1005, FIG. 1 (annotated)

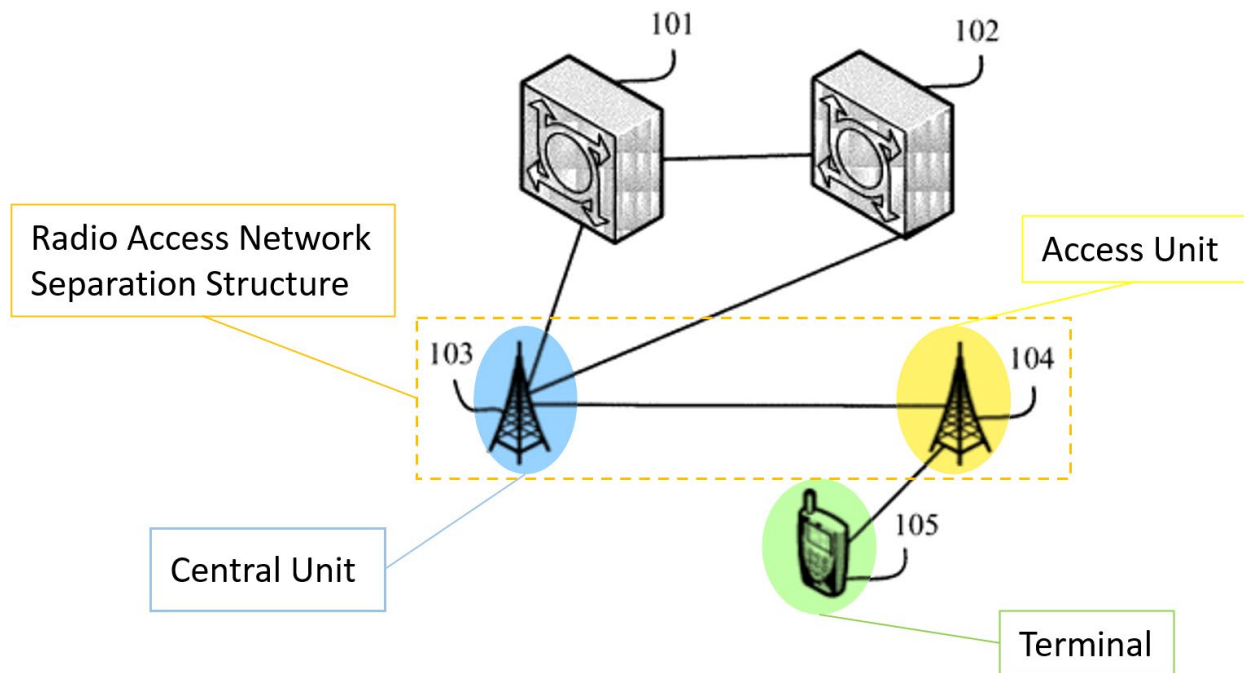


FIG. 1

A POSITA, at the time of the earliest possible priority date, would have been motivated to combine Lin1 and Lin2 to improve existing radio communications systems by increasing system capacity to handle an “increasing quantity of user equipments.” Ex. 1003, 1:9-11; Ex. 1005, 3:8-10; Ex. 1011, ¶189. For example, a POSITA in possession of Lin1 would have recognized the same architecture of Lin2 and, based on the similarities, would have been motivated to look to the interface establishing techniques of Lin2 to inform ways to further increase system capacity in Lin1. Ex. 1011, ¶190.

A POSITA would have been motivated by the teachings of Lin2, which describes that “it is urgent to increase a system capacity of the radio communications system” and such capacity can be accomplished “by adding a base station.” Ex. 1005, 3:9-11; Ex. 1011, ¶190. Lin2 describes that “[w]hen density of deployed base stations increases, switching [between base stations] increases sharply, and causes signaling load of a core network to increase sharply.” Ex. 1005, 3:25-27; Ex. 1011, ¶190. As the POSITA would have understood, the increased signaling load is caused by one node controlling both an “S1 control plane connection” and an “S1 user plane connection.” *See* Ex. 1005, 3:17-25; Ex. 1011, ¶190. To reduce signaling load, and thereby increase system capacity, Lin2 discloses interface establishing techniques in which “no direct connection is established between a serving node and an MME. Instead, the serving node is connected to an anchor node, and the anchor node is connected to the MME, so that the serving node is connected to the MME by means of the anchor node.” Ex. 1005, 16:18-22; Ex. 1011, ¶190. Specifically, Lin2 discloses “[t]he serving node serves an RRC message carried in an SRB0 of a user terminal, and the anchor node serves an RRC message carried in an SRB1 or an SRB2 of the user terminal. In this way, a radio connection between the terminal and the serving node can terminate at the anchor node, and when the terminal changes the serving node of a same anchor node, an interface of the terminal does not need to be changed, thereby reducing signaling load of a core network caused by

switching.” Ex. 1005, 33:7-12; Ex. 1011, ¶192. In light of this disclosure, a POSITA would have been motivated to optimize the network architecture of Lin1 by implementing the interface establishing methods, such as those described in Figure 6 and outlined below, of Lin2 to reduce signaling load of a core network caused by switching and, in doing so, increase system capacity. Ex. 1011, ¶192.

Moreover, the POSITA would have had a reasonable expectation of success combining Lin1 and Lin2 because both describe interface establishing techniques that split an RRC function between two network nodes to improve system capacity. Ex. 1011, ¶193. Indeed, as explained above, the described interface establishing techniques of Lin1 and Lin2 are described by overlapping inventors, at the same time, using the same system configuration of a serving node and an anchor node. Ex. 1011, ¶193. Given these similarities, the POSITA would have had a reasonable expectation that implementing the interface establishing techniques of Lin2 using the specific architecture described by Lin1 would further optimize system capacity. Ex. 1011, ¶193. Accordingly, a POSITA would have been motivated to combine, and would have had a reasonable expectation of success in combining, Lin1 and Lin2. Ex. 1011, ¶193.

3. *Claim 1*

i. [1.PRE]

Lin1 discloses a method of configuring, by a ***serving node*** (access unit), a wireless connection of a terminal for the same reasons as explained in Ground 1, 1.PRE.³ *See supra*, §VII.A.2.i, [1.PRE]; *see also* Ex. 1011, ¶¶194-199.

ii. [1.A]

As explained in Ground 1, 1.A, Lin1 discloses multiple examples of receiving an uplink radio resource control (RRC) message from a terminal, including the uplink RRC message into a first message, and transmitting the first message to a central unit. *See supra*, §VII.A.2.ii, [1.A]; *see also* Ex. 1011, ¶¶201, 204-205, & 207-211.

To the extent it is argued that Lin1 does not disclose receiving an uplink radio resource control (RRC) message from a terminal, Lin2 explicitly discloses, with reference to FIG. 6, S604 (reproduced, annotated, below), that a ***serving node*** (an

³ The '932 patent claims use different terms than Lin1 & Lin2 to refer to the same concepts. To clarify the correspondences between (i) Lin1 & Lin2 and (ii) the claim terms, bolding and italics is used to emphasize Lin1 & Lin2 terms, and the corresponding claim term is placed in parentheses (or brackets within a quotation) after each emphasized term.

access unit) “receives an uplink RRC message sent by a user terminal” Ex. 1005, 31:24-27; Ex. 1011, ¶205. As is shown below in annotated Figure 6, receiving an uplink radio resource control (RRC) message from a terminal is performed in S604.bEx. 1005, 31:24-27 (“Step S604: The serving node receives an uplink RRC message sent by a user terminal. The uplink RRC message includes: the RRC message carried in the SRB0, the RRC message carried in the SRB1, or the RRC message carried in the SRB2.”); Ex. 1011, ¶205.

Ex. 1005, FIG. 6 (annotated)

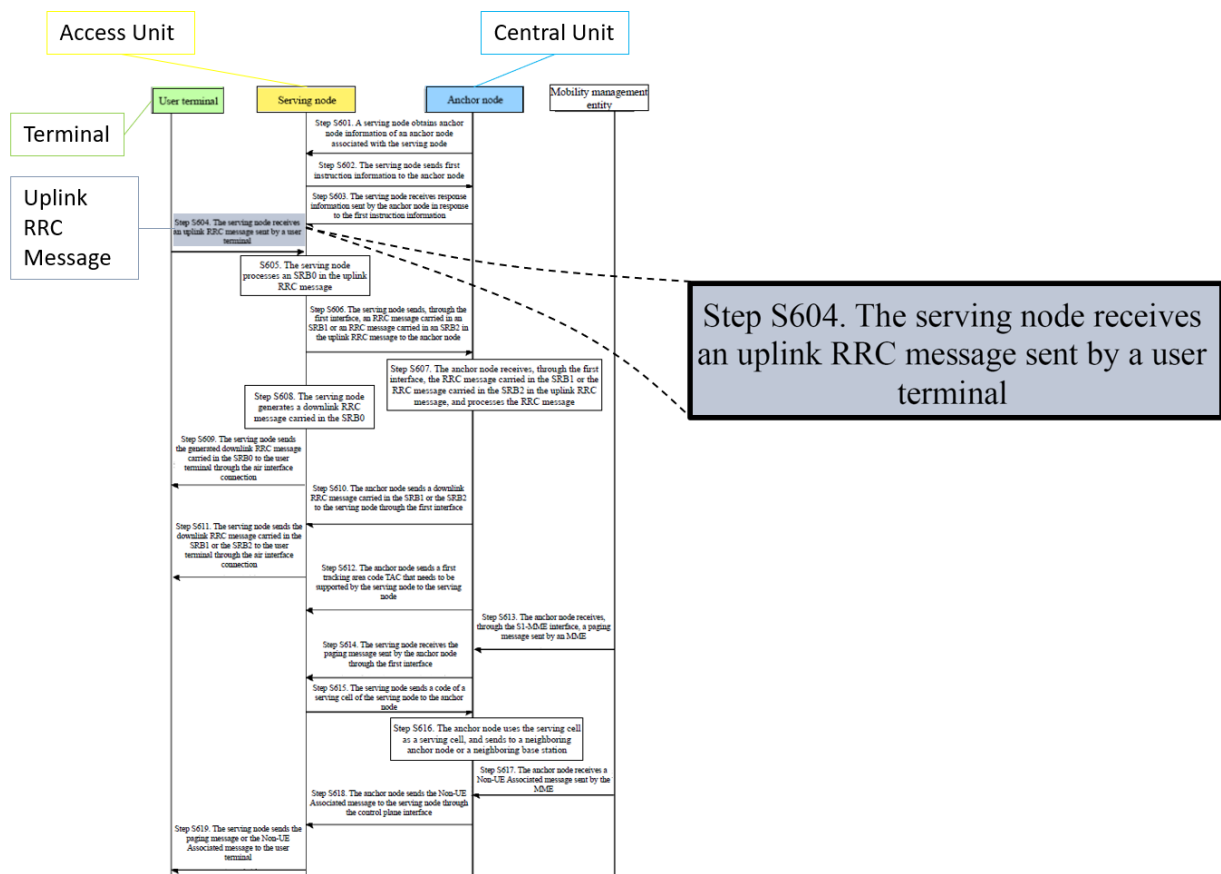


FIG. 6

To the extent it is argued that Lin1 does not disclose including the uplink RRC message into a first message and transmitting the first message to a central unit, Lin2 discloses, with reference to FIG. 6, S606 (reproduced, annotated, below), that a *serving node* (an access unit) “sends, through the first interface, an RRC message . . . in the uplink RRC message to the *anchor node* [central unit] for processing.” Lin2 explains that “the first interface includes a control plane interface between the serving node and the anchor node.” Ex. 1005, 29:1-2; Ex. 1011, ¶212. Because the

first interface is between two network nodes and not a *UE* (terminal), a POSITA would understand that a message sent through the first interface is not an uplink RRC message alone, but an RRC message included in another message. Ex. 1011, ¶212. Thus, Lin2's disclosure of sending an RRC message in the uplink RRC message through the first interface would suggest to the POSITA that the RRC message is included in another message and then sent to the *anchor node* (central unit). *Id.* Due to the similar architectures of Lin1 and Lin2, a POSITA would have relied on the architecture in the system of Lin1 to implement the interface establishing techniques of Lin2, as explained in §VII.B.2, Motivation to Combine Lin1 and Lin2. *See supra*, §VII.B.2, Motivation to Combine Lin1 and Lin2.

Ex. 1005, FIG. 6 (annotated)

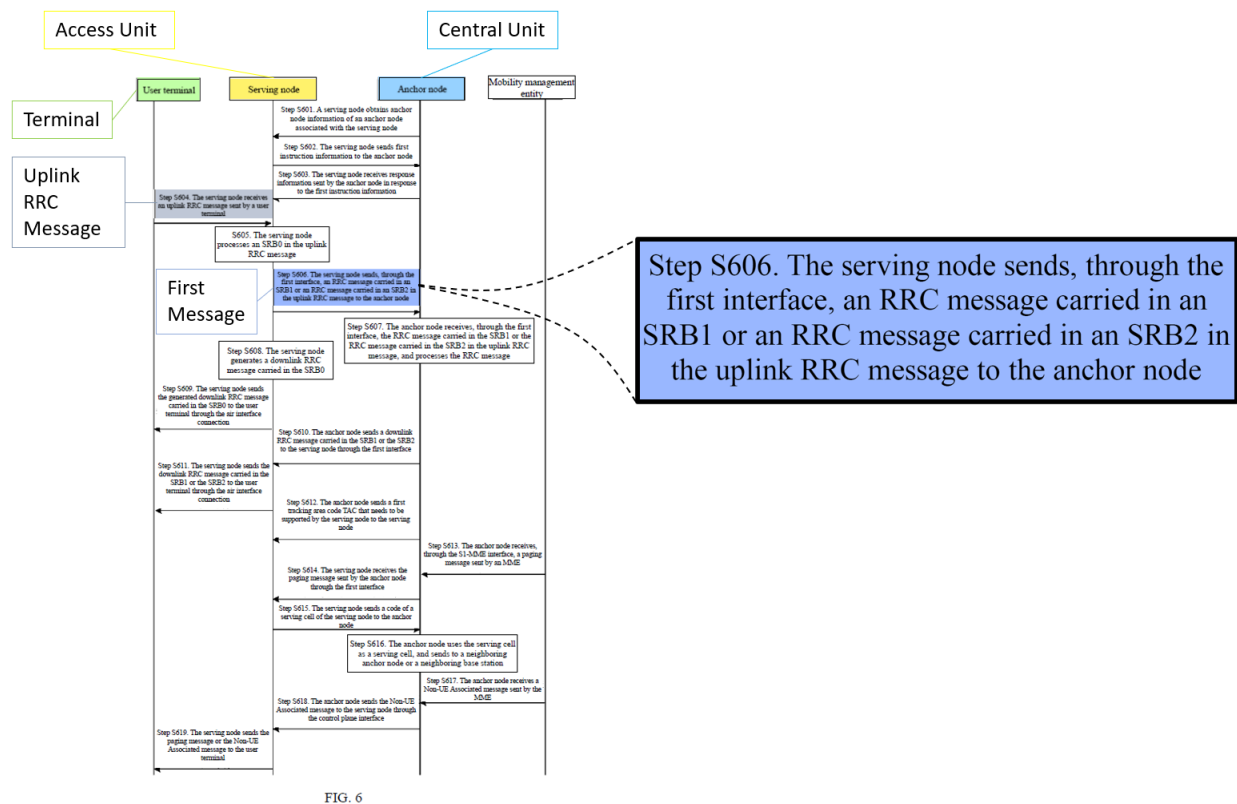


FIG. 6

iii. [1.B]

Lin1 discloses receiving a second message from the central unit, where the second message includes a downlink RRC message in response to the uplink RRC message from the terminal for the same reasons as explained in Ground 1, 1.B. *See supra*, §VII.A.2.iii, [1.B]; *see also* Ex. 1011, ¶¶214-218.

To the extent it is argued that Lin1 does not disclose receiving a second message from the central unit that includes a downlink RRC message, Lin2 suggests, with reference to FIG. 6, S610 (reproduced, annotated, below), that “the **anchor**

node [central unit] sends a downlink RRC message . . . to the *serving node* [access unit] through the first interface.” Ex. 1005, 32:6-7; Ex. 1011, ¶219. As described above, because the first interface is between two network nodes and not a *UE* (terminal), a POSITA would understand that a message sent through the first interface is not a downlink RRC message alone, but an RRC message included in another message. Ex. 1011, ¶219. Thus, Lin2’s disclosure of sending a downlink RRC message through the first interface would suggest to the POSITA that the downlink RRC message is included in a second message that is received by the *serving node* (access unit) from the *anchor node* (central unit).

Ex. 1005, FIG. 6 (annotated)

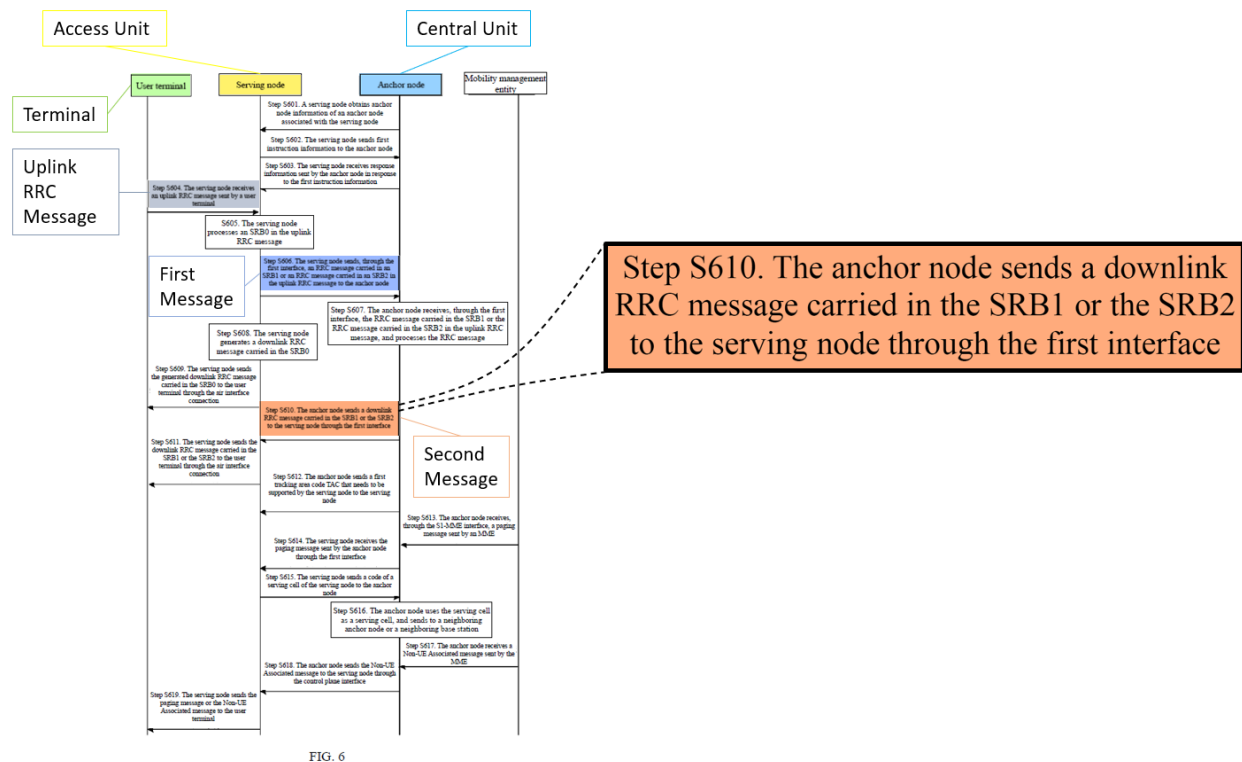


FIG. 6

To the extent it is argued that Lin1 does not disclose a second message that includes a downlink RRC message “in response” to the uplink RRC message from the terminal, Lin2 discloses a second message that includes a downlink RRC message in response to the uplink RRC message from the terminal. Ex. 1011, ¶223. Specifically, with reference to FIG. 6 S610 (reproduced, annotated, below), Lin2 discloses that “the **anchor node** [central unit] sends a downlink RRC message carried in the SRB1 or the SRB2 to the **serving node** [access unit] through the first interface.” Ex. 1005, 32:6-7; Ex. 1011, ¶223. As explained above, a POSITA would understand that a downlink RRC message sent through an interface between two

network nodes *would* be included in second message. Ex. 1011, ¶223. Moreover, Lin2 discloses that the step of sending the downlink RRC message is performed at step S610 after step S606 where the *serving node* (access unit) receives an uplink RRC message sent by a user terminal and sends the uplink RRC message to the *anchor node* (central unit), would have suggested to a POSITA that the downlink RRC message is in response to the uplink RRC message from the terminal. Ex. 1011, ¶224.

Ex. 1005, FIG. 6 (annotated)

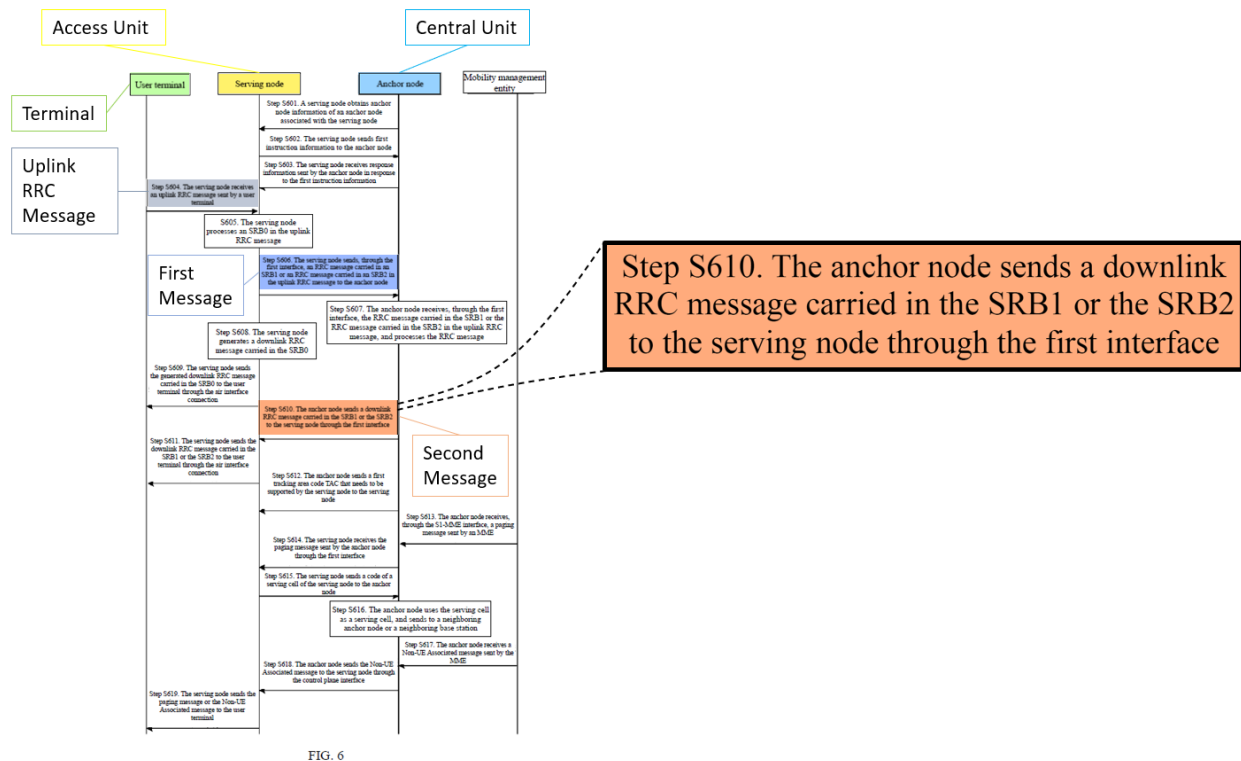


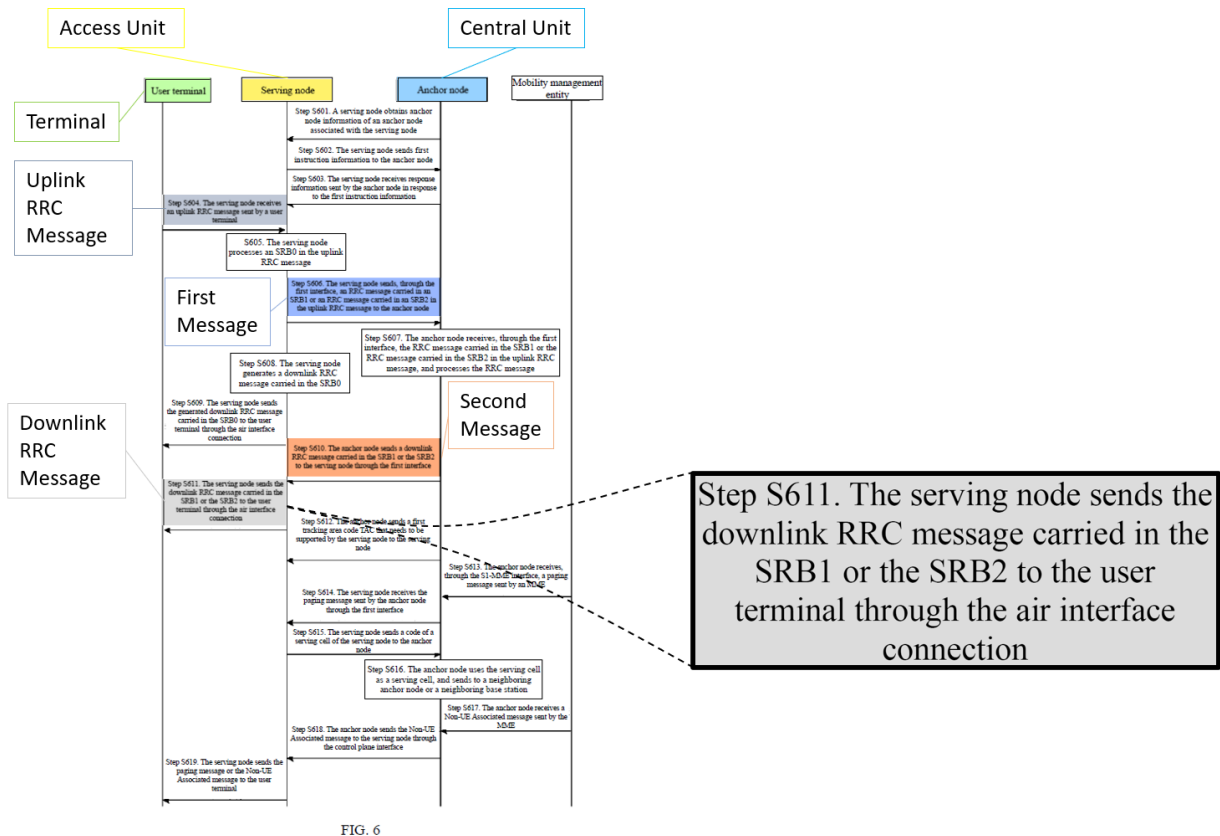
FIG. 6

iv. [1.C]

Lin1 discloses transmitting the downlink RRC message to the terminal for the same reasons explained in Ground 1, 1.C. *See supra*, §VII.A.2.iv, [1.C]; *see also* Ex. 1011, ¶¶226-229.

To the extent it is argued that Lin1 does not disclose transmitting the downlink RRC message to the terminal, Lin2 discloses with reference to FIG. 6, Step S611 (reproduced, annotated, below), that “the *serving node* [access unit] sends the downlink RRC message carried in the SRB1 or the SRB2 to the user terminal through the air interface connection.” Ex. 1005, 32:8-11; Ex., ¶229.

Ex. 1005, FIG. 6 (annotated)



Lin1 discloses wherein the access unit and the central unit distinguish signaling radio bearers based on radio bearer identification information-included in the first message and the second message for the same reasons explained in Ground 1, 1.C. *See supra*, §VII.A.2.iv, [1.C]; *see also* Ex. 1011, ¶¶234-248.

To the extent it is argued that Lin1 does not disclose “radio bearer identification information included in the first message and the second message,” Lin2 suggests another example of radio bearer identification information included in the first message and a second message. Ex. 1011, ¶238. Specifically, Lin2

discloses sending an “RRC message *carried in an SRB1* or an RRC message carried *in an SRB2* in the uplink RRC message to the anchor node for processing.” Ex. 1005, 31:28-30; Ex. 1011, ¶238. Lin2 also discloses receiving a downlink RRC message *carried in the SRB1 or the SRB2* and sent by the anchor node. Ex. 1005, 7:11-15, 29:22-26, 36:31-37:4; Ex. 1011, ¶238. A POSITA would have known that the *SRB1* and the *SRB2* are different types of signaling radio bearers. Ex. 1011, ¶238. Thus, a POSITA would have understood that Lin2’s ***anchor node*** (central unit) and ***serving node*** (access unit) send and receive uplink and downlink RRC messages of different SRB types.

Lin2 also discloses that a “radio resource control (RRC) function is to split a function of processing RRC messages in the SRB0, the SRB1, and the SRB2 onto two nodes. The SRB0 is processed by the ***serving node*** [access unit], and SRB1 and SRB2 are processed by the ***anchor node*** [central unit].” Ex. 1005, 18:18-21; Ex. 1011, ¶239. “The ***serving node*** [access unit] does not process RRC messages independently, but the ***anchor node*** [central unit] and the ***serving node*** [access unit] jointly process the RRC messages.” Ex. 1005, 16:27-29. Lin2 states that “***serving node*** [access unit] serves an RRC message carried in an SRB0 of a user terminal, and the ***anchor node*** [central unit] serves an RRC message carried in an SRB1 or an SRB2 of the user terminal. In this way, a radio connection between the terminal and the ***serving node*** [access unit] can terminate at the ***anchor node*** [central unit], and

when the terminal changes the *serving node* [access unit] of a same *anchor node* [central unit], an interface of the terminal does not need to be changed, thereby reducing signaling load of a core network caused by handover.” Ex. 1005, 4:11-17, 17:2-13, 21:23-22:3, 24:11-25; Ex. 1011, ¶239. A POSITA would have understood, based on the above disclosure of Lin2, that radio bearer identification information identifying an SRB type of an RRC message is included in a first message and a second message between an *anchor node* (central unit) and a *serving node* (access unit) in order to serve and process the RRC messages carried by the first and second message. Ex. 1011, ¶239.

To the extent it is argued that Lin1 does not disclose the access unit and the central unit “distinguish” signaling radio bearers based on the radio bearer identification information-included in the first message and the second message, Lin2 suggests another way in which the access unit and the central unit distinguish signaling radio bearers based on the radio bearer identification information-included in the first message and the second message. Ex. 1011, ¶248. Specifically, Lin2 discloses that the “RRC message corresponding to the SRB1 [one of three SRB types] or the SRB2 [one of three SRB types] in the RRC message of the user terminal is served by the *anchor node* [central unit], and the RRC message corresponding to the SRB0 [one of three SRB types] of the user terminal is served by the *serving node* [access unit]. *That is, to serve is to process an uplink RRC message or generate a*

downlink RRC message.” Ex. 1005, 18:3-6; Ex. 1011, ¶248. Based on the above disclosure, the POSITA would have understood that Lin2’s **serving node** (access unit) and **anchor node** (central unit) perform different operations for an RRC message (received via first or second messages) depending on the SRB type of the RRC message. In order to perform different operations for an RRC message according to the SRB type of the RRC message, a POSITA would have understood that Lin2’s **serving node** (access unit) and **anchor node** (central unit) distinguish the SRB type of the RRC message based on the radio bearer identification information included in the first message and the second message.

4. Claim 2

i. [2.PRE]

As set forth above, the method of claim 1 is obvious over Lin1 and Lin2.

ii. [2.A]

Lin1 discloses a **serving node** (access unit) that comprises a node configured to provide an RLC function, a MAC function, and a PHY function, for transmission of user plane data for the same reasons as explained in Ground 1, 2.A. *See supra*, §VII.A.3.ii, [2.A]; *see also* Ex. 1011, ¶¶251-252.

iii. [2.B]

Lin1 discloses an **anchor node** (central unit) that comprises a node with a PDCP entity configured to provide a PDCP function, for transmission of the user

plane data for the same reasons as explained in Ground 1, 2.B. *See supra*, §VII.A.3.iii, [2.B]; *see also* Ex. 1011, ¶255.

5. Claim 4

i. [4.PRE]

As set forth above, the method of claim 1 is obvious over Lin1 and Lin2.

ii. [4.A]

Lin1 discloses a second message that comprises (i) an RRC connection setup message and (ii) signaling radio bearer identification information and a POSITA would have been further motivated to include a CRNTI in a second message for the same reasons as explained in Ground 1, 4.A. *See supra*, §VII.A.4.ii, [4.A]; Ex. 1011, ¶¶258-261.

6. Claim 8

i. [8.PRE]

Lin1 discloses a **serving node** (access unit) for configuring a wireless connection of a **UE** (terminal). *See supra*, §VII.B.3.i, [1.PRE]; Ex. 1011, ¶262.

ii. [8.A]

Lin1 discloses a **serving node** (access unit) that includes a transmitter configured to transmit a first message to an **anchor node** (central unit). Ex. 1011, ¶¶264-265. Specifically, with reference to FIG. 5 (reproduced, annotated, below), Lin1 discloses a “transmitter 510 is configured to: send [an] RRC message received

by the receiver 502 to the first *anchor node* [central unit]”. Ex. 1003, 40:8-22; Ex. 1011, ¶¶265-266.

Ex. 1003, FIG. 5 (annotated)

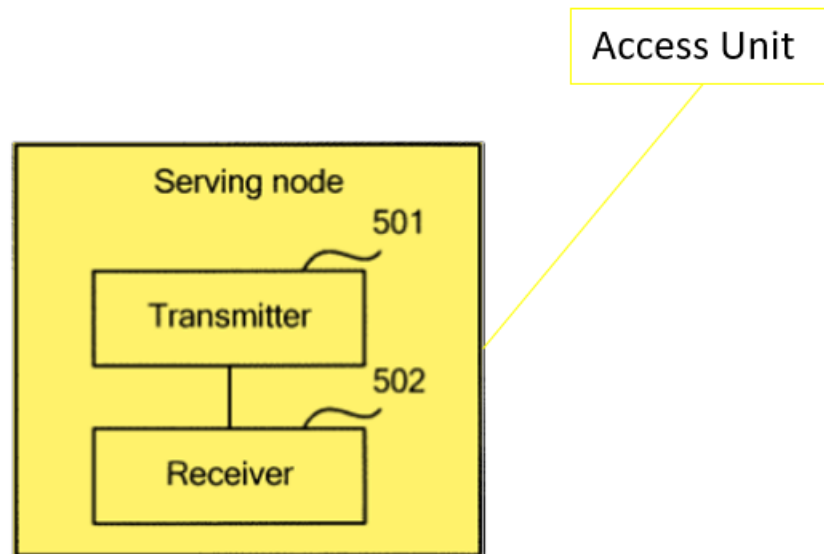


FIG. 5

As described in Claim 1.A, Lin1 and Lin2 disclose a first message that includes an uplink RRC message received from a terminal. *See supra*, §VII.B.3.ii, [1.A]; Ex. 1011, ¶¶263-268

iii. [8.B1]

Lin1 discloses, with reference to FIG. 5 (reproduced, annotated, below), a *serving node* (access unit) that includes a transmitter 501 and a receiver 502. Ex. 1003, 40:8-22; Ex. 1011, ¶270.

Ex. 1003, FIG. 5 (annotated)

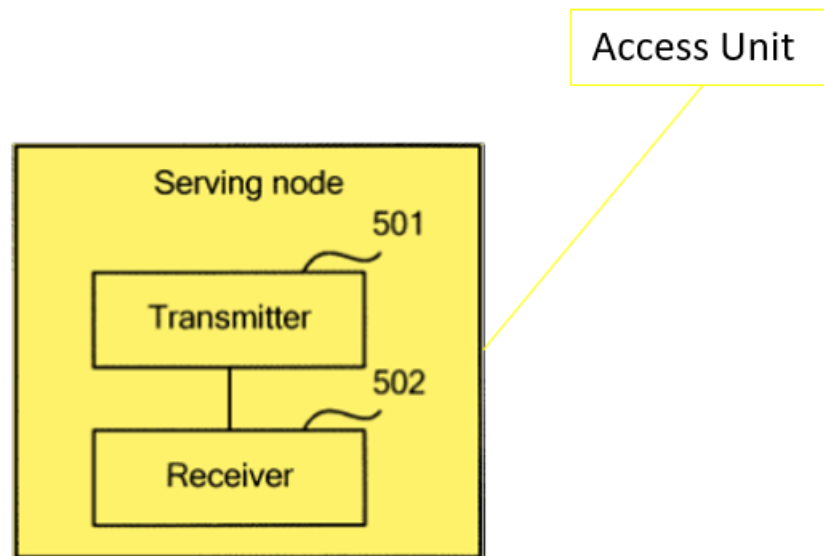


FIG. 5

As described in Claim 1.B1, Lin1 and Lin2 disclose a second message that includes a downlink RRC message in response to the uplink RRC message from the terminal. *See supra*, §VII.B.3.iii, [1.B1]; Ex. 1011, ¶¶214-222 & 271-272.

iv. [8.B2]

As described above, Lin1 discloses a ***serving node*** (access unit) that includes a transmitter. Ex. 1003, 40:8-22. As described with reference to Claim 1.C, Lin1 and Lin2 also disclose that the access unit and the central unit distinguish signaling radio bearers based on radio bearer identification information included in the first message and the second message. *See supra*, §VII.B.3.iv, [1.C]; Ex. 1011, ¶¶230-247, 278-280, 374 & 376.

7. Claim 9

i. [9.PRE]

As set forth above, the access unit of claim 8 is obvious over Lin1 and Lin2.

ii. [9.A]

Lin1 discloses a **serving node** (access unit) that comprises a node configured to provide an RLC function, a MAC function, and a PHY function, for transmission of user plane data for at least the reasons provided in Claim 2.A. *See supra*, §VII.B.4.ii, [2.A]; Ex. 1011, ¶¶251-252 & 282.

iii. [9.B]

Lin1 discloses an **anchor node** (central unit) that comprises a node configured to provide a PDCCP function, for transmission of the user plane data for at least the reasons provided in Claim 2.B. *See supra*, §VII.B.4.iii, [2.B]; Ex. 1011, ¶¶255 & 283.

8. Claim 11

i. [11.PRE]

As set forth above, the access unit of claim 8 is obvious over Lin1 and Lin2.

ii. [11.A]

As described with reference to Claim 4.A, Lin1 discloses a second message that comprises (i) an RRC connection setup message and (ii) signaling radio bearer identification information and a POSITA would have been further motivated to

include a CRNTI in a second message. *See supra*, §VII.B.5.ii, [4.A]; Ex. 1011, ¶¶260-261.

C. Ground 3: Claims 1-2, 4, 8-9, and 11 are rendered obvious by Lin1 and Zhang

1. Overview of Ground 3

Lin1 and Zhang both describe interface establishing techniques between two network nodes that handle RRC messages. Ex. 1003, 1:11-12, 27:20-22, 41:4–48:11, FIG. 7, & FIG. 8; Ex. 1007, 75:1–77:29 & FIG. 13; Ex. 1011, ¶293. Each reference describes one network node that sends and receives the same messages as those required by the access unit in the Challenged Claims. Ex. 1003, FIGS. 7-8; Ex. 1011, ¶¶105, 112, 122, and 131; Ex. 1007, FIG. 13; Ex. 1011, ¶¶305, 311, 318, 322, & 327. The Challenged Claims are therefore obvious over Lin1 and Zhang.

2. Motivation to Combine Lin1 and Zhang

Lin1 and Zhang share a common inventor, Bo Lin, and describe a similar network architecture. With respect to the network architecture, Lin1 and Zhang both disclose interface establishing techniques using two network nodes that split RRC functions to jointly process RRC messages for a user terminal. Ex. 1003, 1:11-12, 27:20-22, 41:4 – 48:11, FIG. 7, and FIG. 8; Ex. 1007, 75:1 – 77:29 and FIG. 13; Ex.

1011, ¶291-293. Annotated versions of both architectures are reproduced below for reference.

Ex. 1003, FIG. 1 (annotated)

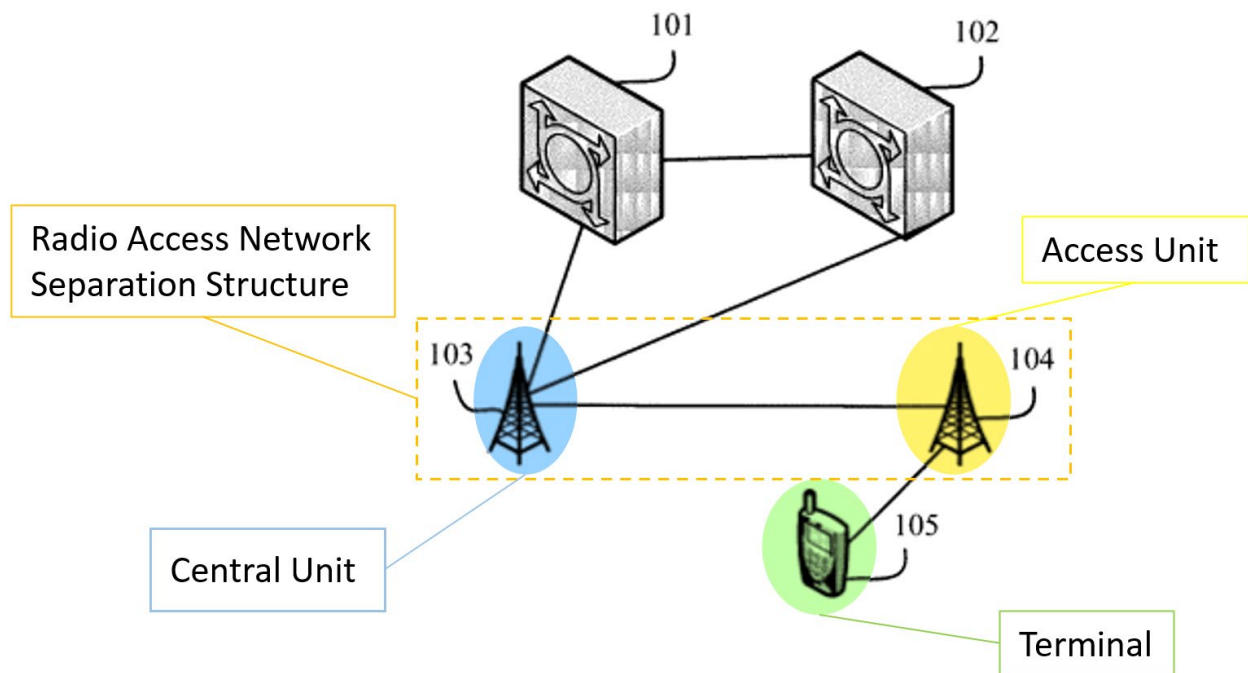
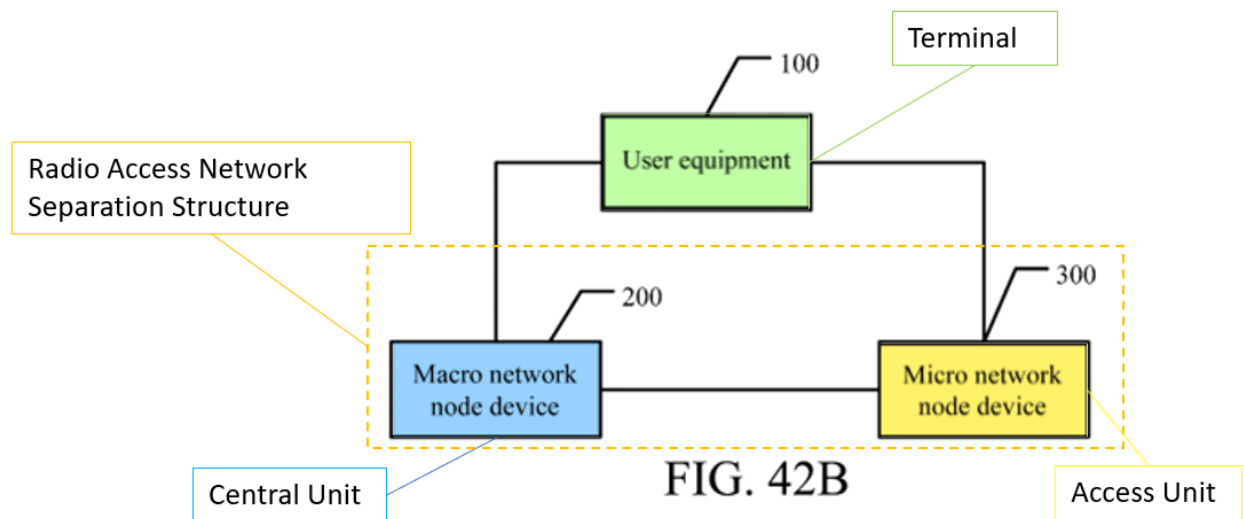


FIG. 1

Ex. 1007, FIG. 1 (annotated)



Given the similar architectures, a POSITA, at the time of the earliest possible priority date, would have been motivated to combine Lin1 and Zhang to improve existing radio communications systems to increase system capacity by reducing access delay of user equipment. Ex. 1003, 1:9-11; Ex. 1007, 2:1-3; Ex. 1011, ¶290-291. A POSITA in possession of Lin1 would have recognized the similar architecture of Zhang and, based on its similarities, would have been motivated to look to the interface establishing techniques of Zhang to inform ways to further increase system capacity, for example, by “reducing access delay of the UE.” Ex. 1007, 2:1-3; Ex. 1011, ¶291-293.

A POSITA would have been motivated by the teachings of Zhang, which describes that the use of two different types of network nodes in a network deployment scenario leads to several scenarios requiring “a contention-based

random-access procedure [that] has a very long access delay.” *See* Ex. 1007, 1:7-26; Ex. 1011, ¶291). Zhang describes a method for communication, “which can ensure that a UE rapidly accesses a network, reducing the access delay of the UE.” Ex. 1007, 2:1-3; Ex. 1011, ¶292. Zhang recognizes, and a POSITA would have known, that sending uplink and downlink data between two network nodes requires an identification of a radio bearer that carries the messages. Ex. 1011, ¶292. To address this, Zhang discloses that the control information transmitted between network nodes “includes an identifier of a radio bearer (RB), and values of the identifier of the radio bearer (RB) are ‘SRB 1’ and ‘DRB 2.’” Ex. 1007, 68:1-5; *see also* Ex. 1007, 5:16-24, 9:8-16, 47:3-15, 58:26-59:5, and 75:7-9; Ex. 1011, ¶292. By doing so, Zhang enables a communication method in which a second network node, a micro network node, may be added. Ex. 1011, ¶292. Zhang explains that “[c]ompared with the prior art, the user equipment [of Zhang] more rapidly accesses a network with the participation of the micro network node, thereby reducing an access delay.” Ex. 1007, 62:17-24; Ex. 1011, ¶292. In light of this disclosure, a POSITA would have been motivated to implement the communication method and the control information of Zhang with the network architecture of Lin1 to reduce access delay and, in doing so, further increase system capacity of the Lin1’s network architecture. Ex. 1011, ¶292.

Moreover, the POSITA would have had a reasonable expectation of success combining Lin1 and Zhang because both describe interface establishing techniques between two network nodes that handle RRC messages. Ex. 1011, ¶293. Lin1 and Zhang both leverage two network nodes to establish a wireless connection with a UE. Ex. 1003, 1:11-12, 27:20-22, 41:4 – 48:11, FIG. 7, and FIG. 8; Ex. 1007, 75:1 – 77:29 and FIG. 13; Ex. 1011, ¶292. Given these similarities, the POSITA would have had a reasonable expectation of success in the combination of Lin1 and Zhang based on the explicit teachings of the references and the knowledge of the POSITA. Accordingly, a POSITA would have been motivated to combine, and would have had a reasonable expectation of success in combining, Lin1 and Zhang.

3. Claim 1

i. [1.PRE]

Lin1 discloses a method of configuring, by a ***serving node*** (access unit), a wireless connection of a terminal for the same reasons as explained in Ground 1, 1.PRE.⁴ *See supra*, §VII.A.2.i, [1.PRE]; *see also* Ex. 1011, ¶¶294-299.

⁴ The '932 patent claims use different terms than Lin1 & Zhang to refer to the same concepts. To clarify the correspondences between (i) Lin1 & Zhang and (ii) the claim terms, bolding and italics is used to emphasize Lin1 & Zhang terms, and the

ii. [1.A]

As explained in Ground 1, 1.A, Lin1 discloses receiving an uplink radio resource control (RRC) message from a terminal, including the uplink RRC message into a first message, and transmitting the first message to a central unit. *See supra*, §VII.A.2.ii, [1.A]; *see also* Ex. 1011, ¶¶301-304 & 308-310.

To the extent it is argued that Lin1 does not disclose receiving an uplink radio resource control (RRC) message from a terminal, Zhang discloses, with reference to FIG. 13 (reproduced, annotated, below), that “user equipment sends uplink signaling or uplink data to the *micro network node* [access unit].” Ex. 1007,75:19-25; Ex. 1011, ¶305. Zhang discloses that “the uplink signaling may be an u[p]link radio resource control (RRC) message.” *Id.*

corresponding claim term is placed in parentheses (or brackets within quotations) after each emphasized term.

Ex. 1007, FIG. 13 (annotated)

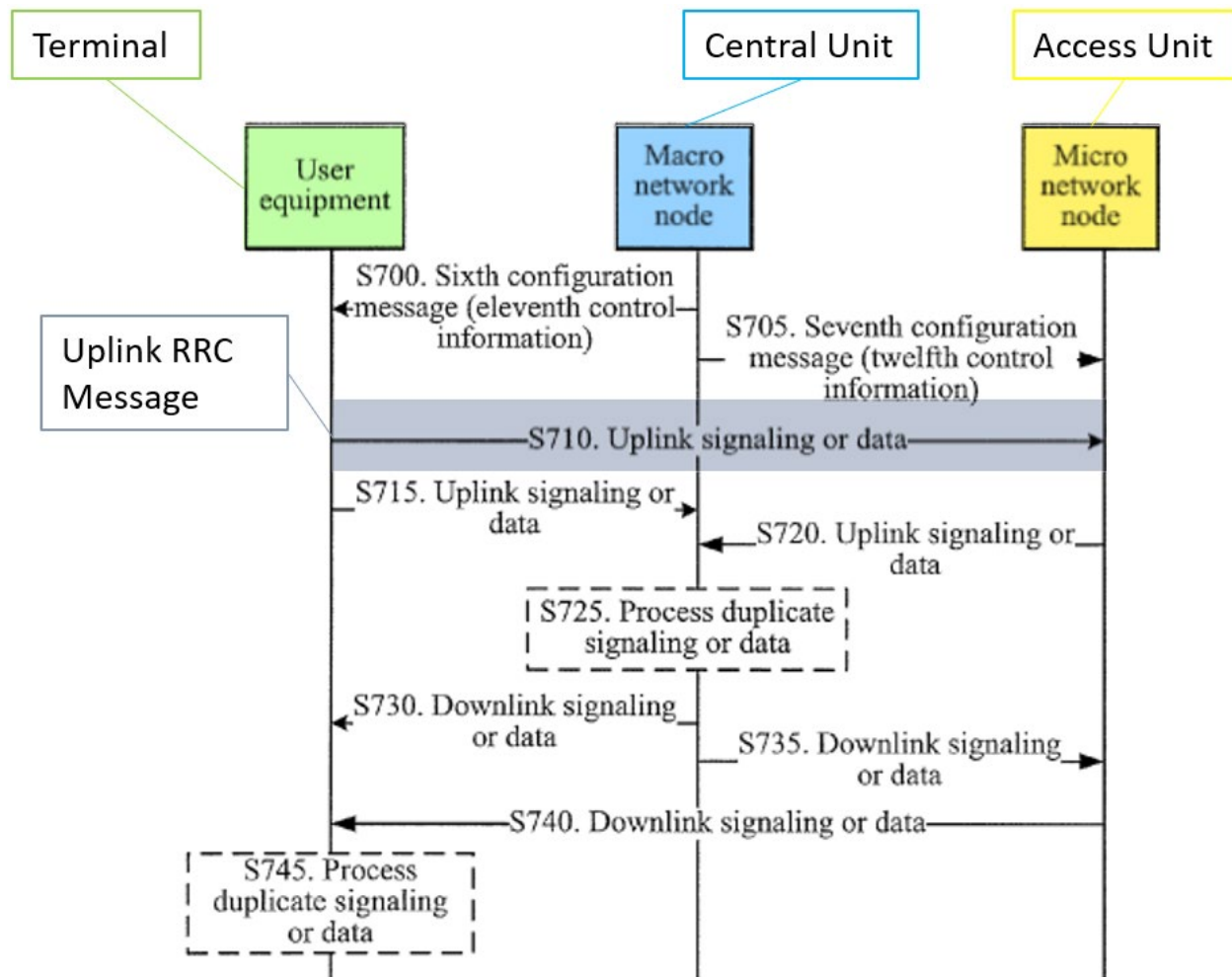


FIG. 13

To the extent it is argued that Lin1 does not disclose including the uplink RRC message into a first message and transmitting the first message to a central unit, Zhang discloses, with reference to FIG. 13 (reproduced, annotated, below), that a “*micro network node* [access unit] forwards, to the *macro network node* [central unit], the *uplink signaling or uplink data* [uplink RRC message] sent by the *user*

equipment [terminal].” Ex. 1007, 76:2-8; Ex. 1011, ¶311. Because the uplink signaling or uplink data is sent between two network nodes and not a *UE* (terminal), a POSITA would have understood that uplink signaling or uplink data is sent within a message configured for network node communication (not an uplink or downlink message). Ex. 1011, ¶311. Thus, Zhang’s disclosure of forwarding the uplink signaling or uplink data from a *micro network node* (access unit) to a *macro network node* (central unit) would confirm to the POSITA that an uplink RRC message is included in another message and then sent to the *macro network node* (central unit).
Id.

Ex. 1007, FIG. 13 (annotated)

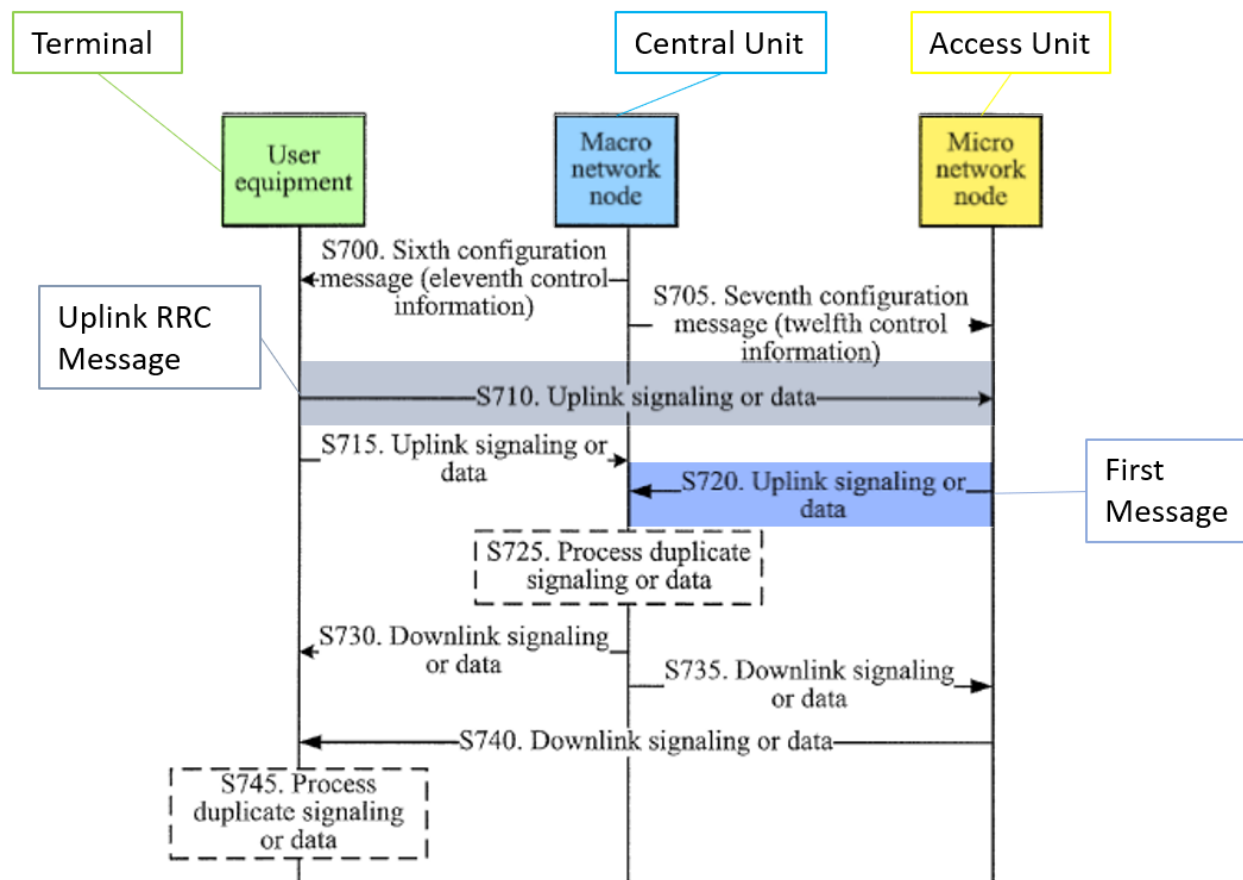


FIG. 13

iii. [1.B]

Lin1 discloses receiving a second message from the central unit, where the second message includes a downlink RRC message in response to the uplink RRC message from the terminal for the same reasons as explained in Ground 1, 1.B. *See supra*, §VII.A.2.iii, [1.B]; *see also* Ex. 1011, ¶¶313-317 & 320-322.

To the extent it is argued that Lin1 does not disclose receiving a second message from the central unit that includes a downlink RRC message, Zhang discloses that the “**macro network node** [central unit] sends **downlink signaling or downlink data** [downlink RRC message] to the **micro network node** [access unit].” Ex. 1007, 76:17-19; Ex. 1011, ¶318. Zhang further discloses that “the downlink signaling may be a downlink radio resource control (RRC) message.” Ex. 1007, 76:14-16; Ex. 1011, ¶318. Because the downlink signaling or downlink data is sent between two network nodes and not a **UE** (terminal), a POSITA would have understood that downlink signaling or uplink data is sent within a message configured for network node communication (not an uplink or downlink message). Ex. 1011, ¶318.

Ex. 1007, FIG. 13 (annotated)

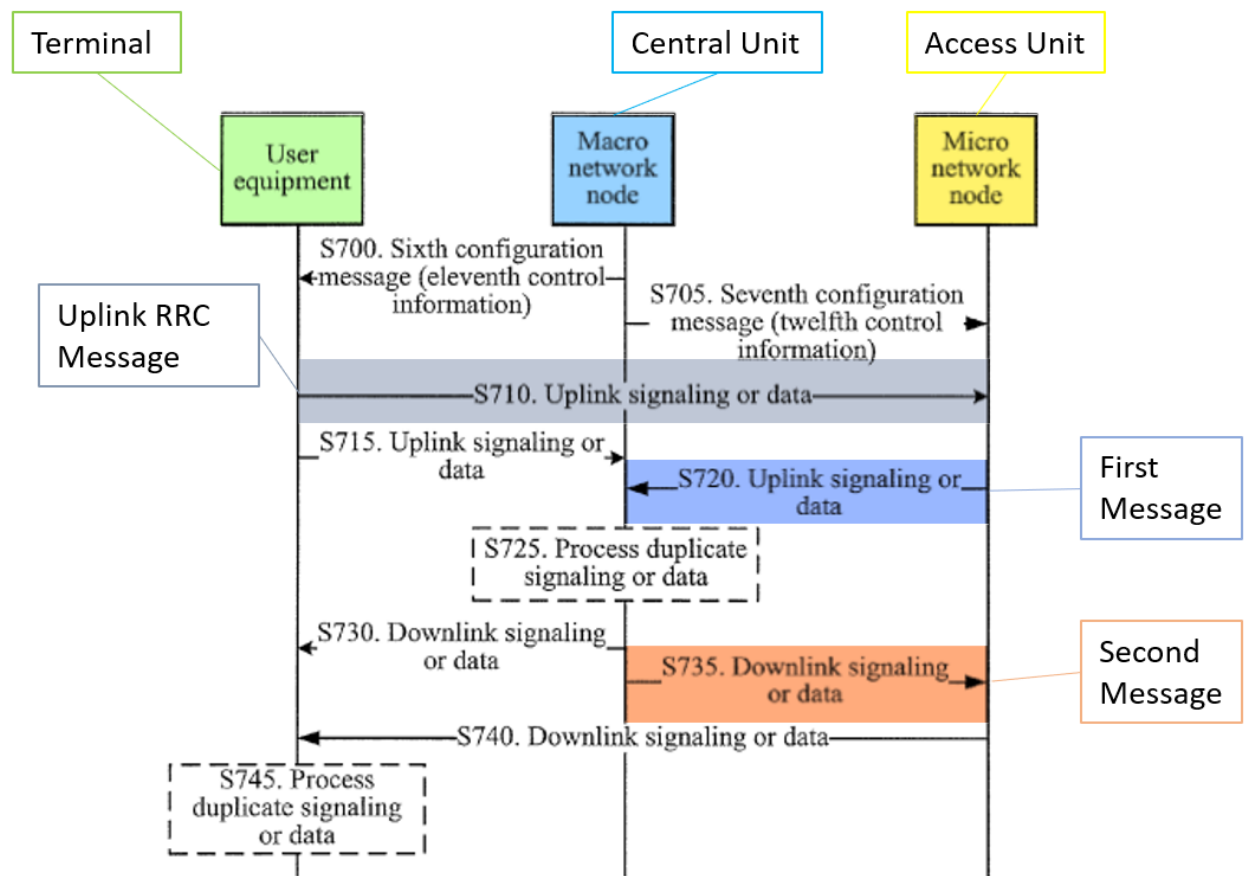


FIG. 13

To the extent it is argued that Lin1 does not disclose a second message that includes a downlink RRC message “in response to” the uplink RRC message from the terminal, Zhang discloses, with reference to FIG. 13, Step S735 (reproduced, annotated, below), that a “*macro network node* [central unit] sends *downlink signaling or downlink data* [downlink RRC message carried in a second message] to the *micro network node* [access unit]” in response to *uplink signaling or uplink*

data (uplink RRC message carried in a first message) received at Step S720. Ex. 1007, 75:19-76:19 & 76:17-19; Ex. 1011, ¶322.

Ex. 1007, FIG. 13 (annotated)

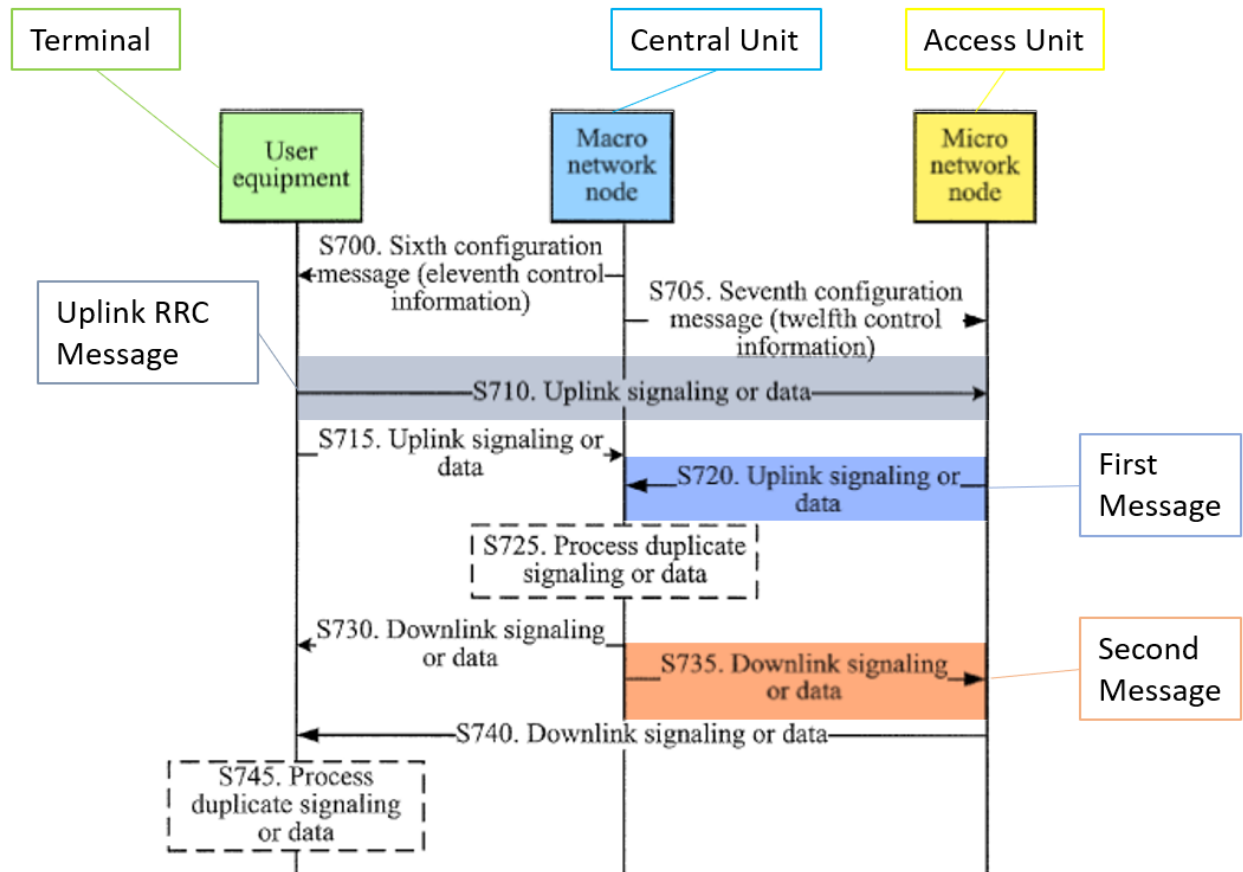


FIG. 13

iv. [1.C]

Lin1 discloses transmitting the downlink RRC message to the terminal for the same reasons explained in Ground 1, 1.C. *See supra*, §VII.A.2.iv, [1.C]; *see also* Ex. 1011, ¶¶324-326.

To the extent it is argued that Lin1 does not disclose transmitting the downlink RRC message to the terminal, Zhang discloses, with reference to FIG. 13 (reproduced, annotated, below), that “the *micro network node* [access unit] forwards, to the *user equipment* [terminal], the *downlink signaling or downlink data* [downlink RRC message] sent by the *macro network node* [central unit].” Ex. 1007, 76:19-20; Ex. 1011, ¶327.

Ex. 1007, FIG. 13 (annotated)

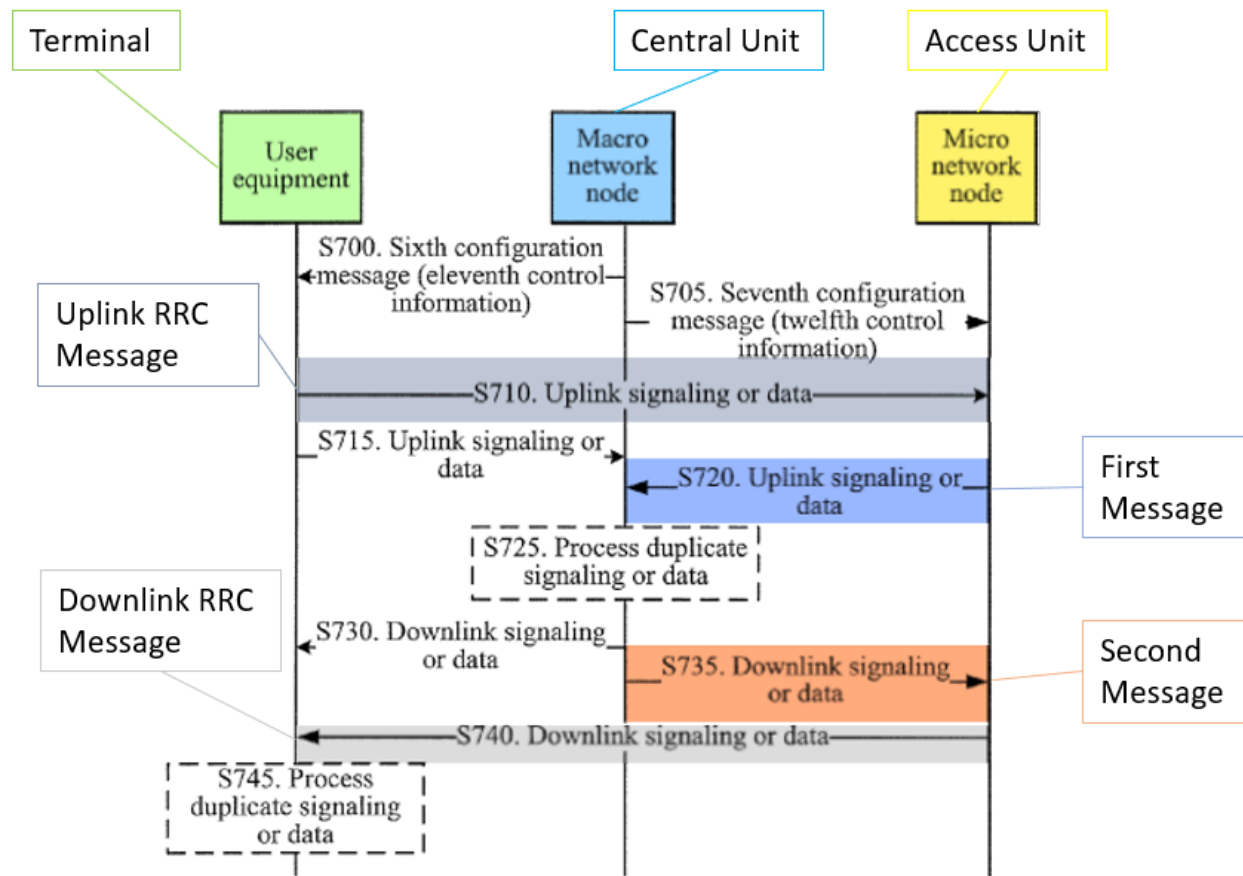


FIG. 13

Lin1 discloses wherein the access unit and the central unit distinguish signaling radio bearers based on radio bearer identification information-included in the first message and the second message for the same reasons explained in Ground 1, 1.C. *See supra*, §VII.A.2.iv, [1.C]; *see also* Ex. 1011, ¶¶328-335.

To the extent it is argued that Lin1 does not disclose radio bearer identification information included in the first message and a second message, Zhang discloses that the control information transmitted between network nodes “includes an

identifier of a radio bearer (RB), and values of the identifier of the radio bearer (RB) are ‘SRB 1’ and ‘DRB 2.’” Ex. 1007, 68:1-5; *see also* Ex. 1007, 5:16-24, 9:8-16, 47:3-15, 58:26-59:5, and 75:7-9; Ex. 1011, ¶¶336 & 345. As explained above, a POSITA would have understood that identifying an SRB would distinguish an SRB from other types of SRBs. *See supra*, §VII.A.2.iv, [1.C]. A POSITA would have understood that Zhang’s *micro network node* (access unit) and *macro network node* (central unit) distinguish signaling radio bearers based on the *control information* (radio bearer identification information) that includes an identifier of an RB and is transmitted between network nodes. Ex. 1011, ¶¶336 & 345.

4. Claim 2

i. [2.PRE]

As set forth above, the method of claim 1 is obvious over Lin1 and Zhang.

ii. [2.A]

Lin1 discloses a *serving node* (access unit) that comprises a node configured to provide an RLC function, a MAC function, and a PHY function, for transmission of user plane data for the same reasons as explained in Ground 1, 2.A. *See supra*, §VII.A.3.ii, [2.A]; *see also* Ex. 1011, ¶¶348-349.

iii. [2.B]

Lin1 discloses an *anchor node* (central unit) that comprises a node with a PDCP entity configured to provide a PDCP function, for transmission of the user

plane data for the same reasons as explained in Ground 1, 2.B. *See supra*, §VII.A.3.iii, [2.B]; *see also* Ex. 1011, ¶352.

5. Claim 4

i. [4.PRE]

As set forth above, the method of claim 1 is obvious over Lin1 and Zhang.

ii. [4.A]

Lin1 discloses a second message that comprises (i) an RRC connection setup message and (ii) signaling radio bearer identification information and a POSITA would have been further motivated to include a CRNTI in a second message for the same reasons as explained in Ground 1, 4.A. *See supra*, §VII.A.4.ii, [4.A]; Ex. 1011, ¶¶355-358.

6. Claim 8

i. [8.PRE]

Lin1 discloses a **serving node** (access unit) for configuring a wireless connection of a **user equipment** (terminal). *See supra*, §VII.C.3.i, [1.PRE]; Ex. 1011, ¶359.

ii. [8.A]

Lin1 discloses a **serving node** (access unit) that includes a transmitter configured to transmit a first message to an **anchor node** (central unit). Ex. 1011,

¶¶361-362. Specifically, with reference to FIG. 5 (reproduced, annotated, below), Lin1 discloses a “transmitter 510 is configured to: send [an] RRC message received by the receiver 502 to the first *anchor node* [central unit]”. Ex. 1003, 40:8-22; Ex. 1011, ¶¶362-363.

Ex. 1003, FIG. 5 (annotated)

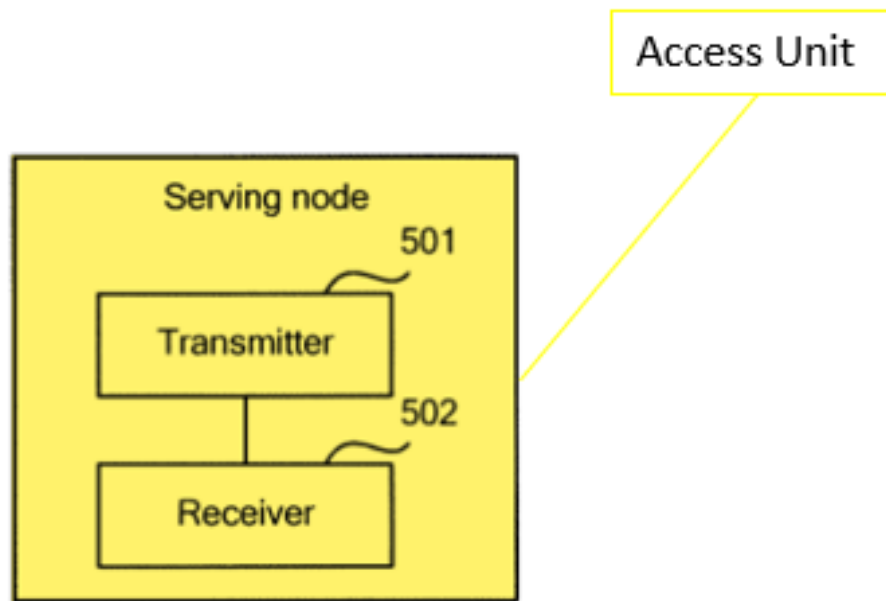


FIG. 5

As described in Claim 1.A, Lin1 and Zhang disclose a first message that includes an uplink RRC message received from a terminal. *See supra*, §VII.C.3.ii, [1.A]; Ex. 1011, ¶¶360-366.

iii. [8.B1]

Lin1 discloses, with reference to FIG. 5 (reproduced and annotated above), a *serving node* (access unit) that includes a transmitter 501 and a receiver 502. Ex. 1003, 40:8-22; Ex. 1011, ¶368.

Ex. 1003, FIG. 5 (annotated)

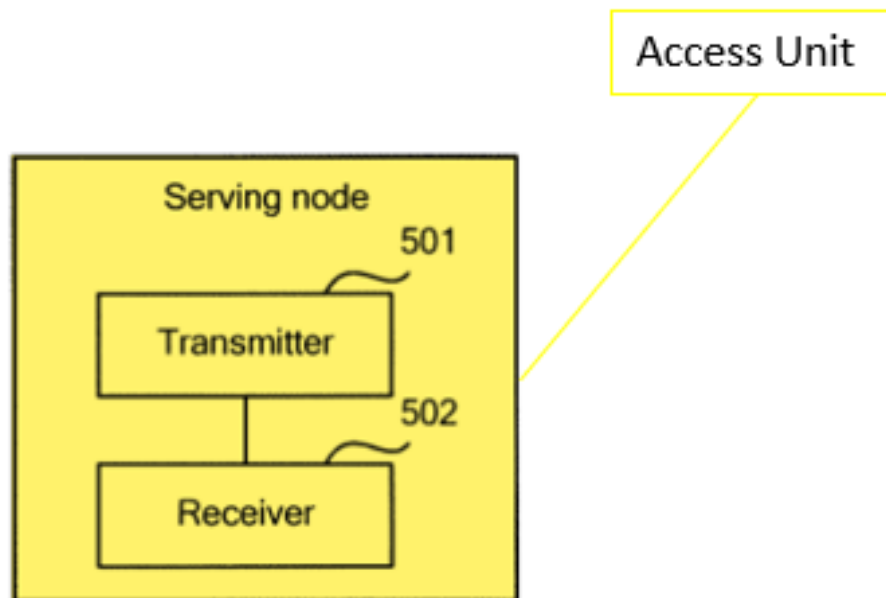


FIG. 5

As described in Claim 1.B1, Lin1 and Zhang disclose a second message that includes a downlink RRC message in response to the uplink RRC message from the terminal. *See supra*, §VII.C.3.iii, [1.B1]; Ex. 1011, ¶¶313-321 & 369-370.

iv. [8.B2]

As described above, Lin1 discloses a **serving node** (access unit) that includes a transmitter. Ex. 1003, 40:8-22. As described with reference to Claim 1.C, Lin1 and Lin2 also disclose that the access unit and the central unit distinguish signaling radio bearers based on radio bearer identification information included in the first message and the second message. *See supra*, §VII.C.3.iv, [1.C]; Ex. 1011, ¶¶325-326, 328-345, 280, 374 and 376.

7. Claim 9

i. [9.PRE]

As set forth above, the access unit of claim 8 is obvious over Lin1 and Zhang.

ii. [9.A]

Lin1 discloses a **serving node** (access unit) that comprises a node configured to provide an RLC function, a MAC function, and a PHY function, for transmission of user plane data for at least the reasons provided in Claim 2.A. *See supra*, §VII.C.4.ii, [2.A]; Ex. 1011, ¶¶348-349 & 380.

iii. [9.B]

Lin1 discloses an **anchor node** (central unit) that comprises a node configured to provide a PDCCP function, for transmission of the user plane data for at least the

reasons provided in Claim 2.B. *See supra*, §VII.C.4.iii, [2.B]; Ex. 1011, ¶¶352 & 381.

8. Claim 11

i. [11.PRE]

As set forth above, the access unit of claim 8 is obvious over Lin1 and Zhang.

ii. [11.A]

As described with reference to Claim 4.A, Lin1 discloses a second message that comprises (i) an RRC connection setup message and (ii) signaling radio bearer identification information and a POSITA would have been further motivated to include a CRNTI in a second message. *See supra*, §VII.B.5.ii, [4.A]; Ex. 1011, ¶¶355-358.

VIII. DISCRETIONARY ISSUES

A. The Petition Does Not Present the Same References Addressed in Prosecution

Institution should not be denied under §325(d). Under *Advanced Bionics*, the Board uses a two-part framework in determining whether to exercise its discretion under §325(d), specifically:

(1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office; and

(2) if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential). The Board has held that the first prong of *Advanced Bionics* is not met where “neither [the combination references] nor similar prior art was before the examiner and ... the prosecution history does not include any overlapping arguments directed to this prior art.” *Godbersen-Smith Constr. Co. v. Guntert & Zimmerman Const. Div., Inc.*, IPR2021-00050, Paper 24 at 19-21 (PTAB May 7, 2021).

Under the first prong, no combination of Lin1, Lin2, or Zhang was before the Examiner, and the prosecution history does not include any overlapping arguments to this Petition. For example, Lin1 was never considered by the Examiner as it was not discussed during prosecution or cited on the face of the '932 Patent. And there are no overlapping arguments because no argument presented by the Examiner addressed the radio bearer identification information, which, as previously discussed, is taught by Lin1, Lin2, and Zhang. In this respect, each of Lin1, Lin2, and Zhang address the exact limitations the Examiner argued was missing in the prior art—“wherein the access unit and the central unit distinguish signaling radio bearers based on radio bearer identification information included in the first message and the second message.” Ex. 1002, 470; *see also Amphenol Corporation v. PPC*

Broadband, Inc., IPR2023-01363, Paper 9 at 30-31 (PTAB Mar. 20, 2024) (holding that a combination could not have been “extensively evaluated during prosecution prior to allowance of the claims” when it addressed the limitation that the Examiner relied upon in a notice of allowance).

Accordingly, the combination of references used in this Petition cannot be cumulative of the art and/or arguments raised during prosecution as there are material differences between the grounds herein and what was previously presented. *Tianma Microelectronics Co., v. Japan Display Inc.*, IPR2021-01058, Paper 16 at 31 (PTAB Jan. 5, 2022); *Samsung Elecs. Co. v. Dodots Licensing Sols. LLC*, IPR2023-00756, Paper 9 at 21-22 (PTAB Oct. 11, 2023). Because the first prong is not met, the Board need not move to the second prong. *See id.* at 21; *Oticon Med. AB v. Cochlear Ltd.*, IPR2019-00975, Paper 15 at 20 (PTAB Oct. 16, 2019).

For at least these reasons, the Board should not deny institution under §325(d).

B. The Board Should Not Deny Institution Under *Fintiv*

The claims of the '932 Patent have never been tested in view of the most relevant prior art. In view of these strong and compelling challenges and the three separate district court proceedings, institution should not be discretionarily denied under §314(a). *See NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 19-20 (PTAB Sept. 12, 2018) (precedential); *Apple v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 13-14 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”).

Factor 1—a potential stay of the district court litigation—weighs against discretionary denial. In the district court litigation, counterclaim defendant and patent owner KT Corporation (“KT”) has disputed jurisdiction. The parties are engaged in jurisdictional discovery, and KT is seeking a protective order from (or stay of) non-jurisdictional discovery. Ex. 1016. If granted, KT’s requested relief could extend the district court trial date, which “allays concerns about inefficiency and duplication of efforts” in the PTAB. *Fintiv* at 8.

Factor 2—the district court trial date and the Board’s statutory deadline—should be considered at least neutral because jury selection is far in the future and is not set to begin until at least September 8, 2025. Even if jury selection were to proceed on September 8, 2025, jury selection would proceed with respect to only one of the three cases (e.g., the Verizon case, the AT&T case, and the T-Mobile case, *see* §X.B *infra*). Each of the defendant Petitioners are entitled to separate trials, which will necessarily proceed on separate dates. As such, there are explicit and inherent uncertainties with this case given the number of parties involved and the number of trials regarding this patent. In addition, and because much can change in eleven months, the current trial date does not support denial. *See Dish Network v. Broadband iTV*, IPR2020-01280, Paper 17 at 16 (PTAB Feb. 4, 2021) (“We cannot

ignore the fact that the currently scheduled trial date is more than nine months away and much can change during this time”).⁵

Moreover, given the existence of three cases each with multiple parties, to include multiple intervenors, the likelihood that any trials will be scheduled serially, the potential length of the trials given the number of patents at issue (11) and claims at issue, and post-trial motions, it is likely that the district court proceedings will not be complete before the final written decision in this matter. Indeed, these cases additionally will likely be delayed because (as explained earlier) counterclaim defendant and patent owner KT has disputed jurisdiction and is seeking a protective order from (or stay of) non-jurisdictional discovery. Altogether, this factor weighs against discretionary denial.

Factor 3—investment in the district court proceedings—weighs against discretionary denial. The district court cases are in their early stages and the district court has not issued any substantive rulings in either case with respect to the '932 Patent. Specifically, infringement contentions were served on March 18, 2024, invalidity contentions were served on May 17, 2024, and the claim construction

⁵ For these reasons, the “statistics on median time-to-trial for civil actions in the district court in which the parallel litigation resides” do not apply to this case given the number of cases and number of defendants.

hearing is not scheduled until March 11, 2025. Ex. 1014, Ex. 1015. In fact, the parties have not yet exchanged claim terms for construction and will not do so until November 5. In addition, counter claim defendant and patent owner, KT Corporation has not yet filed an answer, which will likely further delay progress on the merits.

Altogether, there is much work to be done in the district court and most, if not all, of the work will be well in the future. Accordingly, the district court will not invest significant resources related to the challenged patent prior to the issuance of an institution decision. *See Fintiv*, IPR2020-00019, Paper 11 at 9-12; *DISH Network*, IPR2020-01280, Paper 17 at 18-21.

Factor 4—overlap between this proceeding and the district court proceedings—favors institution. Indeed, there will not be complete overlap between this IPR and the district court cases because there are 6 claims asserted in this case and a total of 113 asserted in the related district court cases. The district court will likely reduce the asserted claims prior to trial. This factor thus weighs against the Board exercising its discretion to deny.

Factor 5—overlapping parties—is neutral as it is “far from an unusual circumstance that a petitioner in *inter partes* review and a defendant in a parallel district court proceeding are the same.” *Sand Revolution*, IPR2019-01393, Paper 24 at 12-13.

The final *Fintiv* factor—other considerations—weighs strongly against discretionary denial. As detailed herein, this is a compelling case, and the merits of the Petition are strong. For example, this petition includes multiple grounds that are each independently suitable for finding the Challenged Claims invalid. The Lin1, Lin2, and Zhang references, for example, each disclose the features argued as being distinctive from the prior art during examination of the '823 application. Moreover, none of the grounds asserted herein were previously considered by either the Office or the district courts. *Cf. Comcast Cable Commn's, LLC v. Rovi Guides, Inc.*, IPR2019-00231, Paper 14 at 11 (PTAB May 20, 2019) (obviousness challenges not “previously considered by the Office or any court” weigh in favor of not denying institution). Moreover, the '932 Patent is currently asserted in three district court cases. Institution of this IPR provides the opportunity for narrowing and simplifying the litigations for the district court.

C. The Board Should Not Deny Institution Under *General Plastic*

The *General Plastic* factors do not apply because this is the first and only *inter partes* review (“IPR”) petition filed by any Petitioner with respect to the '932 Patent.

IX. CONCLUSION

Petitioners respectfully request cancellation of the Challenged Claims.

X. MANDATORY NOTICES UNDER 37 C.F.R. §42.8

A. Real Party in Interest Under 37 C.F.R. §42.8(b)(1)

The real parties in interest are Cellco Partnership d/b/a Verizon Wireless, Verizon Business Network Services LLC, Verizon Corporate Services Group Inc., TracFone Wireless, Inc., AT&T Corp., AT&T Services, Inc., AT&T Mobility LLC, AT&T Mobility II LLC, New Cingular Wireless PCS, LLC, Cricket Wireless LLC, T-Mobile USA, Inc., Sprint Solutions LLC, Sprint Spectrum LLC, Ericsson Inc., Telefonaktiebolaget LM Ericsson, and Nokia of America Corporation.

Out of an abundance of caution, Petitioners have identified all current defendants in the below cases, as well as additional involved parties, as potential real parties in interest only for the purpose of this proceeding and only to the extent that Patent Owner contends that these separate legal entities should be named real parties in interest in this IPR. Petitioners do so to avoid the potential expenditure of resources to resolve such a challenge. Petitioners also acknowledge that each petitioner has a number of affiliates. No unnamed entity is funding, controlling, or otherwise has an opportunity to control or direct this Petition or Petitioners' participation in any resulting IPR. Petitioners are also not aware of any affiliate that would be barred from filing this Petition under 35 U.S.C. §315(e).

B. Related Matters Under 37 C.F.R. §42.8(b)(2)

The '932 Patent is the subject of the following litigation:

- *Pegasus Wireless Innovation LLC. v. AT&T Inc. et al.*, No. 2:23-cv-00638 (E.D. Tex) (hereafter, “AT&T Case”);
- *Pegasus Wireless Innovation LLC. v. T-Mobile US, Inc. et al.*, No. 2:23-cv-00639 (E.D. Tex) (hereafter, “T-Mobile Case”); and
- *Pegasus Wireless Innovation LLC. v. Verizon Communications Inc. et al.*, No. 2:23-cv-00640 (E.D. Tex) (hereafter, “Verizon Case”).

The above cases, which include defendants AT&T, T-Mobile, and Verizon and intervenors Nokia and Ericsson, have been consolidated into the Verizon Case for all pretrial issues. Ex. 1015. Petitioners are not aware of any other judicial or administrative matter that would affect or be affected by a decision in this IPR.

C. Designation of Counsel Under 37 C.F.R. §42.8(b)(3)

Petitioners provide the following designation of counsel.

Lead Counsel	Backup Counsel
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Pursuant to 37 C.F.R. §42.8(b)(4), counsel agrees to service by mail as detailed above, and to electronic service by email at the following addresses:

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Pursuant to 37 C.F.R. §42.10(b), a Power of Attorney executed by Petitioners accompanies this Petition.

D. Service Information

Please address all correspondence and service to the addresses listed above.

Petitioners consent to electronic service at the addresses above.

Date: October 18, 2024

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CLAIMS APPENDIX

<u>Claim</u>	<u>Recitation</u>
1.PRE	A method of configuring, by an access unit, a wireless connection of a terminal, the method comprising:
1.A	receiving an uplink radio resource control (RRC) message from a terminal, including the uplink RRC message into a first message, and transmitting the first message to a central unit;
1.B	receiving a second message from the central unit, where the second message includes a downlink RRC message in response to the uplink RRC message from the terminal; and
1.C	transmitting the downlink RRC message to the terminal, wherein the access unit and the central unit distinguish signaling radio bearers based on radio bearer identification information-included in the first message and the second message.
2.PRE	The method according to claim 1,
2.A	wherein the access unit comprises a node configured to provide an RLC function, a MAC function, and a PHY function, for transmission of user plane data, and
2.B	wherein the central unit comprises a node configured to provide a PDCP function, for transmission of the user plane data.
4.PRE	The method according to claim 1,
4.A	wherein the second message comprises at least one of an RRC connection setup message, a C-RNTI, and signaling radio bearer identification information.
8.PRE	An access unit for configuring a wireless connection of a terminal, comprising:
8.A	a transmitter configured to transmit a first message to a central unit, where the first message includes an uplink RRC message received from a terminal; and
8.B1	a receiver configured to receive a second message from the central unit, where the second message includes a downlink RRC message in response to the uplink RRC message from the terminal,

<u>Claim</u>	<u>Recitation</u>
8.B2	wherein the transmitter transmits the downlink RRC message to the terminal, and wherein the access unit and the central unit distinguish signaling radio bearers based on radio bearer identification information included in the first message and the second message.
9.PRE	The access unit according to claim 8,
9.A	wherein the access unit comprises a node configured to provide an RLC function, a MAC function, and a PHY function, for transmission of user plane data, and
9.B	wherein the central unit comprises a node configured to provide a PDCP function, for transmission of the user plane data.
11.PRE	The access unit according to claim 8,
11.A	wherein the second message comprises at least one of an RRC connection setup message, a C-RNTI, and signaling radio bearer identification information.

CERTIFICATION UNDER 37 C.F.R. §42.24

Petitioners certify that the word count in this Petition is 13,832 words, as counted by the word-processing program (Microsoft Word for Office 365) used to generate this Petition, where such word count excludes the table of contents, table of authorities, mandatory notices, certificate of service, appendix of exhibits, and this certificate of word count. This Petition is in compliance with the 14,000-word limit set in 37 C.F.R. §42.24(a)(1)(i).

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§42.6(e), 42.105 and in view of the agreement between the Parties under 37 C.F.R. §42.105(b), the undersigned hereby certifies that true and correct copies of the above-captioned PETITION FOR INTER PARTES REVIEW OF U.S. PATENT NO. 10,616,932, all associated exhibits, and Petitioners' Power of Attorney were served in their entireties on October 18, 2024, upon the Patent Owner at the following addresses via USPS Priority Mail Express®:

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