

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 No. IPR2025-00037

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

**DECLARATION OF DR. MICHAEL KOTZIN, IN SUPPORT OF
PETITION FOR INTER PARTES REVIEW OF
UNITED STATES PATENT NO. 10,616,932**

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CLAIM LISTING

<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, wherein
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.

I, Michael Kotzin, Ph.D., declare as follows:

I. INTRODUCTION

1. I have been retained by 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 referred to as “Petitioners”) to serve as an independent expert consultant in this proceeding before the United States Patent and Trademark Office (“PTO”) against KT Corporation (“Patent Owner”) regarding U.S. Patent No. 10,616,932 B2 (“the ’932 patent”). (Ex. 1001).¹ I have been asked to submit this Declaration on behalf of Petitioner.

2. I have been asked to consider whether certain references disclose or render obvious claims 1-2, 4, 8-9, and 11 (“the challenged claims”) of the ’932 patent, which have been asserted against Petitioners. My opinions are set forth below. Based on my experience and expertise, it is my opinion that the prior art anticipates and/or renders obvious all limitations of the challenged claims, as I discuss in detail below.

¹ Where appropriate, I refer to exhibits that I understand are to be attached to the petition for *Inter Partes* Review of the ’932 patent.

3. I am not, and never have been, an employee of Nokia of America Corporation, Ericsson Inc., AT&T Services, Inc., Cellco Partnership d/b/a Verizon Wireless, or T-Mobile, USA, Inc. I am not receiving compensation for this declaration beyond my normal hourly fees of \$300 based on my time actually spent analyzing and documenting my opinions herein on the '932 patent, the intrinsic record, the asserted prior art references identified in the Petition, and the issues related thereto. My compensation is not related to the outcome of this proceeding, and I will not receive any additional compensation based on the outcome of any IPR or other proceeding involving the '932 patent.

4. All of my opinions set forth below are based on my own personal knowledge and professional judgment. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth in this Declaration.

II. BACKGROUND AND QUALIFICATIONS

5. My academic and professional background is in electrical engineering and computer science, and I have been working in those fields since the completion of my B.S. in electrical engineering almost 50 years ago. My complete qualifications and professional experience are described in my Curriculum Vitae, a copy of which

can be found in Ex. 1012. The following is a brief summary of my relevant qualifications and professional experience.

6. I received a B.S. in chemistry and a B.S. in electrical engineering from the University of Illinois in 1975, an M.S. in electrical engineering from Northwestern University in 1977, and a Ph.D. in electrical engineering and computer science from Northwestern University in 1981. During my graduate study at Northwestern (1975-1981), I performed research on communications and signal processing. My research dissertation was titled “Short Range Communication Using Diffusely Scattered Infrared Radiation.”

7. I worked at Motorola, Inc. in various professional roles between 1975 and 2009. From 1975 to 1989, I worked for several Motorola Research labs in Illinois, where I developed technology related to private and public radio communication systems.

8. Between 1989 and 1998, I was the Vice President of Technical Staff and Director of Research and Advanced Technology in Motorola’s Cellular Infrastructure and Networks division. Between 1998 and 2007, I transitioned to the Office of the Chief Technology Officer for Motorola’s Mobile Devices division. In these roles, I provided leadership and strategic directions for the adoption and creation of new technology for cellular base station and handheld devices.

9. Between 2006 and 2009, I was the Vice President of Technical Staff in the Corporate Law Department of Motorola's Patent Operations division. In this role, I created technology portfolio strategy across businesses including quantitative goals for new and retained intellectual property assets. I also managed processes and corporate-wide teams related to creating and maintaining patent portfolios.

10. In the late 1990s through about 2005, I directly supervised and worked with engineers in the United States and Europe in developing technology focused on radio layer and signaling protocols. As part of this work, we developed and provided technical contributions for the 3rd Generation Partnership Project ("3GPP") meetings.

11. Since 2009, I have been the President of MDK Consulting, Inc., where I regularly provide technical consulting services on all aspects of wireless systems, products, and technology.

12. Over the past several decades I have performed extensive research on various aspects of systems, devices, and networks that acquire, store, process, and transmit information. My research has addressed software, algorithms, hardware, networking, protocols and other aspects of these systems and devices, and has included work on wireless mobile devices and systems, protocols including radio resource control (RRC) processes, signal processing and communications, base stations, hardware design methodologies, and cybersecurity. For example, in the

1970s and 1980s, I worked on technologies—including cellular, public safety, and private mobile—that formed the basis and was essential to several new digital radio systems.

13. This work transitioned in the early 1990s to digital cellular applied research and development on cellular infrastructure and mobile devices. As a senior technologist and leader, first in the cellular infrastructure division and subsequently the mobile device division at Motorola, I was a significant participant and contributor to the development of new and evolving digital systems. Some of these evolutions included the adoption of functional improvements, continuing quality improvements, system generation advancements (e.g., GSM, W-CDMA, LTE, etc.), etc.

14. I am an inventor on approximately 134 issued U.S. patents and over 500 issued patents worldwide in areas including signal processing, data compression, communications, and wireless systems including base stations. I have published approximately 20 technical articles in peer-reviewed engineering journals and conference proceedings.

15. In addition to my professional experience, I have previously taught courses in electrical engineering at Northwestern University as an Adjunct Professor. I have also served as Chairman and member of numerous Motorola patent committees.

16. My Curriculum Vitae (Ex. 1012) lists my publication record in archival journals, international conferences, and workshops and further includes a list of granted patents.

17. Based on my experience and education, I consider myself to be an expert at least in the fields of telecommunications, cellular networking, and mobile devices. As of the earliest priority date of the '932 patent, I was at least a person of ordinary skill in the art of the '932 patent, and I had personal knowledge of the technologies involved in the '932 patent.

III. MATERIALS REVIEWED

18. The opinions contained in this Declaration are based on the documents I reviewed, my professional judgment, as well as my education, knowledge, and experience in the relevant art.

19. In forming my opinions, I reviewed and relied upon the following materials and information:

Exhibit	Description
Ex. 1001	U.S. Patent No. 10,616,932 B2 (“the '932 patent”)
Ex. 1002	Prosecution History of U.S. Patent No. 10,616,932 (“’932 pros history”)
Ex. 1003	English Translation of PCT/CN/2014/089300 and Certificate of Translation (“Lin1”)
Ex. 1004	International Patent Application No. PCT/CN/2014/089300 (“Lin1 Original”)

Exhibit	Description
Ex. 1005	English Translation of PCT/CN/2014/089310 and Certificate of Translation (“Lin2”)
Ex. 1006	International Patent Application No. PCT/CN/2014/089310 (“Lin2 Original”)
Ex. 1007	English Translation of WO 2014/127525 A1 and Certificate of Translation (“Zhang”)
Ex. 1008	International Patent Publication No. WO 2014/127525 A1 (“Zhang Original”)
Ex. 1009	3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Vocabulary for 3GPP Specifications (Release 4) (“TR 21.905”)
Ex. 1010	Sassan Ahmadi, LTE-Advanced A Practical Systems Approach to Understanding the 3GPP LTE Releases 10 and 11 Radio Access Technologies (2014) (“LTE-Advanced”)
Ex. 1011	Declaration of Michael Kotzin
Ex. 1012	<i>Curriculum Vitae</i> of Dr. Michael Kotzin
Ex. 1013	Declaration of Craig Bishop regarding Certification of Publication of TR 21.905
Ex. 1014	<i>Pegasus Wireless Innovation LLC v. Verizon Communications Inc. et al</i> , Nos. 2:23-cv-00640, 2:23-cv-00638, 2:23-cv-00639 (E.D. Tex) First Amended Docket Control Order
Ex. 1015	<i>Pegasus Wireless Innovation LLC v. Verizon Communications Inc. et al</i> , Nos. 2:23-cv-00640, 2:23-cv-00638, 2:23-cv-00639 (E.D. Tex.) Consolidation Order
Ex. 1016	<i>Pegasus Wireless Innovation LLC v. Verizon Communications Inc. et al</i> , Nos. 2:23-cv-00640, 2:23-cv-00638, 2:23-cv-00639 (E.D. Tex.) Protective Order From Non-Jurisdictional Discovery

20. I also reviewed any other materials I refer to in this Declaration in support of my opinions.

21. In forming my opinions, I have considered the materials listed above and any other documents cited in this Declaration. My opinions are based on the documents I reviewed and my knowledge and professional judgment. My opinions have also been guided by my appreciation of how a person of ordinary skill in the art would have understood the state of the art, the prior art, and the claims and the specification of the '932 patent at the time of the alleged invention.

IV. LEGAL STANDARDS

22. I am not an attorney, and do not offer opinions on the law in this Declaration.

23. In forming my analyses and conclusions expressed here in this Declaration, I have applied the legal principles described in the following paragraphs, which were provided to me by counsel for the Petitioners.

24. I used my understanding of the following legal principles set forth in this section in reaching my opinions.

25. I understand that, in this proceeding, Petitioner has the burden of proving that the challenged claims are invalid by a preponderance of the evidence.

A. Obviousness

26. I have been informed that a claim is invalid as obvious under 35 U.S.C. § 103 (AIA) if the differences between the claimed subject matter and the prior art are such that the subject matter as a whole would have been obvious at the time of the invention to a person of ordinary skill in the art. I have been informed that the following matters are relevant to determining whether the claimed invention would have been obvious: (1) the scope and content of the prior art, (2) the difference or differences between the patent claim and the prior art, (3) the level of ordinary skill in the art at the time the invention of the patent, and (4) any secondary considerations or objective indicia of non-obviousness.

27. I have been informed that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results. When a claim simply arranges prior art elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, then such a combination is obvious. When a patent claims a structure already known in the prior art altered by the mere substitution of one element for another known in the field, the combination is likely to be obvious unless the combination yields an unpredictable result.

28. I have been informed that when a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill in the art can

implement a predictable variation, such a variation is likely unpatentable. For the same reason, if a technique has been used to improve one device, and one of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. One question to consider is whether the improvement is more than predictably using prior art elements according to their established functions.

29. I have been informed that it may often be necessary, in a validity analysis, to consider whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. This can be accomplished by looking to interrelated teachings of multiple patents or other publications or pieces of prior art; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by one of ordinary skill in the art.

30. I have been informed that a validity analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim; it is appropriate to take account of the inferences and creative steps that a person of ordinary skill in the art would employ. I have been informed that a person of ordinary skill in the art is a person of ordinary creativity, not an automaton.

31. I have been informed that a claim composed of several elements is not proved obvious merely by demonstrating that each element was, independently,

known in the prior art. I have been informed that it can be important to identify a reason that would have prompted a person of ordinary skill in the art in the relevant field to combine the elements in the way the claimed new invention does. I am told that one way that subject matter can be proved obvious is by noting there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims. I have been informed that any need or problem known in the field of endeavor at the time of the claimed invention and addressed by the patent can provide a reason for combining the elements in the manner claimed.

32. I have been informed that one should not assume that a person of ordinary skill in the art attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem. Instead, I have been informed that since familiar items may have obvious uses beyond their primary purposes, in many cases a person of ordinary skill in the art will be able to fit the teachings of multiple prior art references together like pieces of a puzzle.

33. I have been informed that, when there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, persons of ordinary skill in the art have good reason to pursue the known options within their technical grasp. If this leads to the anticipated success, the product was likely not accomplished by innovation but by using ordinary skill and

common sense. I have been informed that, in such an instance, the fact that the combination was obvious to try may show that the combination was obvious.

34. I have been informed that, when determining whether a claimed combination would have been obvious, the correct analysis is not whether a person of ordinary skill in the art, writing on a blank slate, would have chosen the particular combination of elements described in the claim. Instead, I have been informed that the correct analysis considers whether one of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to selecting the combination claimed.

35. I have been informed that, when determining whether a claimed invention is obvious, any “secondary considerations” of non-obviousness identified by the patentee should also be considered. These secondary considerations can include:

- commercial success of the invention, causally related to the invention itself rather than to companion factors, such as advertising or attractive packaging;
- the invention taught away from the technical direction followed by those skilled in the art;
- a long-felt but unsatisfied need for the invention while the needed implementing arts and elements had long been available;
- the invention achieves results unexpected to those skilled in the

art;

- copying of the invention by competitors as distinguished from their independent development;
- unsuccessful attempts by those skilled in the art to make the invention;
- acquiescence by the industry to the patent's validity by honoring the patent through taking licenses or not infringing the patent, or both; and
- skepticism, disbelief in or incredulity by those skilled in the art that the patentee's approach worked.

36. I have been informed that, for the above information to impact the obviousness of a patent claim, there must be a nexus between the alleged secondary considerations and the claims. In addition, I have been informed that the burden of introducing evidence of secondary considerations generally is on the Patent Owner. If the Patent Owner or its expert should assert secondary considerations of non-obviousness, I reserve the right to provide a Declaration addressing assertions of non-obviousness due to secondary considerations.

B. Claim Construction

37. I have been informed that claim terms are typically given their plain and ordinary meanings, as would have been understood by a person of ordinary skill

in the art at the time of the earliest alleged priority date. I have further been informed that when considering the meaning of any terms in the challenged claims of the '932 patent, I should apply the plain and ordinary meaning of those terms. I have further been informed that in considering the meaning of the claims, one must consider the language of the claims, the specification, and the prosecution history of record.

38. I have been informed that, in general, a preamble limits the invention if it recites essential structure or steps, or if it is necessary to give life, meaning, and vitality to the claim. I have further been informed that a preamble is not limiting where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention. I have further been informed that dependence on a particular disputed preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the preamble and claim body to define the claimed invention. I have further been informed that clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art transforms the preamble into a claim limitation because such reliance indicates use of the preamble to define, in part, the claimed invention.

V. PERSON OF ORDINARY SKILL IN THE ART AT THE TIME OF

THE ALLEGED INVENTION

39. I have been asked to assume that the '932 patent is entitled to its earliest alleged priority date of July 14, 2015 (*see* Ex. 1001, 1 (“Related U.S. Application Data” section)). Based on my knowledge and experience, I was a person of at least ordinary skill in the art as of July 14, 2015, and can provide opinions regarding the knowledge of a person of ordinary skill in the art as of that time. My opinions herein are, where appropriate, based on my understandings as to a person of ordinary skill in the art at that time.

40. I understand that factors that are pertinent to a determination of the level of ordinary skill in the art include: (1) the educational level of the inventor; (2) the type of problems encountered in the art; (3) the prior art solutions to those problems; (4) the rapidity with which innovations are made; (5) the sophistication of the technology; and (6) and the educational level of workers active in the field. Based on the materials and information I have reviewed and based on my experience in the technical areas relevant to the '932 patent, a person of ordinary skill in the art at the time of the alleged invention of the '932 patent would have been a person with a working knowledge of 3GPP technology standards. That person 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. A person

with a different degree but with additional relevant experience could still qualify if the additional experience compensates for the different educational background. 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.

VI. TECHNICAL BACKGROUND

41. Below, I present a brief overview of certain technical concepts and features that would have been known to a person of ordinary skill in the art prior to and at the time of the earliest alleged priority date of the '932 patent. The technical concepts and features that I describe in this Technical Background section reflect the state of the art that a person of ordinary skill in the art would have had knowledge of and would have understood prior to and at the time of the alleged invention of the '932 patent. I rely on, and incorporate as applicable (even if not expressly mentioned below in Section IX), the following disclosures to support my opinions in this Declaration, including those opinions relating to how the prior art discloses and/or suggests the challenged claims of the '932 patent and how (and why) a person of ordinary skill in the art would have been motivated to consider and combine the disclosures and suggestions from one or more prior art references.

A. 3GPP Messaging Terminology

42. At the time of the earliest alleged priority date of the '932 patent, a person of ordinary skill in the art would have been familiar with various terminologies used to describe different messages according to 3GPP technology standards. These terminologies are outlined in published 3GPP ETSI TS documents, such as Exhibit 1009, and Long-Term Evolution (LTE) text books, such as Exhibit 1010, which a person of ordinary skill in the art would have access to and familiar with.

43. In communications systems, such as LTE, the term “user equipment” or “UE” refers to a “device allowing a user access to network devices.” (Ex. 1009, 25). “For the purpose of 3GPP specification the interface between the UE and the network is the radio interface.” (Ex. 1009, 25). Network devices are referred to as “base stations,” which “consists of transmitters generating radio frequency electromagnetic energy and receivers in a cabin or cabinet [that is] connected to antennas by feeder cables.” (Ex. 1009, 7). A base station includes one or more “network nodes.” (Ex. 1010, Chapter 1 Introduction to LTE-Advanced, pp. 20-21). The term “uplink” refers to a “unidirectional radio link for the transmission of signals from the UE to a base station [or network node thereof].” (Ex. 1009, 25). A downlink is a “[u]nidirectional radio link for the transmission of signals from a UTRAN access

point to the UE” also, “in general the direction from Network [or network node thereof] to UE.” (Ex. 1009, 10).

B. E-UTRAN Architecture

44. A E-UTRAN access network consists of a network of eNBs [or base stations].” (Ex. 1010, Chapter 2 Network Architecture, p. 57). “The eNBs are typically interconnected with each other by means of a logical interface known as X2 and to the [evolved packet core] EPC by means of the S1 interface.” (Ex. 1010, Chapter 2 Network Architecture, p. 57). “The E-UTRAN is responsible for all radio-related functions that include [radio resource management] RRM, encompassing all functions related to the radio bearers, such as radio bearer control (RBC), radio admission control (RAC), radio mobility control, scheduling and dynamic allocation of radio resources to UEs in both uplink and downlink,” among others. (Ex. 1010, Chapter 2 Network Architecture, p. 57).

45. “The purpose of the RRM function is to ensure efficient use of the available network resources.” (Ex. 1010, Chapter 2 Network Architecture, p. 75). The “RRM in E-UTRAN provides a means to manage (e.g., assign, reassign, and release) radio resources in single and multi-cell environments [and is] responsible for interworking between different protocols ([radio resource control] RRC, S1AP,

and X2AP) so that messages can be properly transferred to different nodes across Uu, S1, and X2 interfaces.” (Ex. 1010, Chapter 2 Network Architecture, p. 75).

C. Radio Resource Control (RRC) in E-UTRAN Architecture

46. “The radio resource control (RRC) sublayer in E-UTRAN protocol stack performs control-plane functions such as broadcast of system information related to access stratum (AS) and non-access stratum (NAS)” including others. (Ex. 1010, Chapter 5 Radio Resource Control Functions, p. 227). These function are performed through Radio Resource Control (RRC) protocols that include a series of UL RRC messages and DL RRC messages exchanged between the UE and E-UTRAN to establish, modify, and release an RRC connection.

47. The RRC messages are exchanged using one of three types of signaling radio bearers (SRBs). An “SRB is defined as a radio bearer that is only used for transmission of RRC and [non access stratum] NAS messages.” (Ex. 1010, Chapter 5 Radio Resource Control Functions, p. 188). “[T]he following three SRB types are defined in E-UTRA: [1] SRB0 is used for transport of RRC messages associated with the common control logical channel [CCCH]; [2] SRB1 is used for transport of RRC messages including piggybacked NAS messages as well as NAS messages prior to the establishment of SRB2 where all are associated with the dedicated control logical channel [DCCH]; [3] SRB2 is used for transport of NAS messages

using the [DCCH], has a lower priority than SRB1, and is always configured by E-UTRAN after security activation.” (Ex. 1010, Chapter 5 Radio Resource Control Functions, p. 188).

48. An SRB0 is used to exchange the following DL RRC messages: (i) RRC Connection Setup messages, (ii) RRC Connection Reject messages, (iii) RRC Connection Re-Establishment messages, and (iv) RRC Connection Re-Establishment reject messages, and the following the UL RRC messages: (i) RRC Connection Request and (ii) RRC Connection Re-establishment Request. (*see e.g.*, Ex. 1001, FIG. 16; *see also* Ex. 1010, Chapter 5.2 RRC Connection Management, p. 239, FIG. 5.5).

49. An SRB1 and SRB2 may be used to exchange several other UL and DL RRC messages and may encapsulate NAS messages. (*see e.g.*, Ex. 1001, FIG. 16; *see also* Ex. 1010, Chapter 5.2 RRC Connection Management, p. 239, FIG. 5.5). Common uplink RRC messages that use the SRB1 include: (i) RRC Connection Setup Complete messages, (ii) Security Mode Complete messages, (iii) Security Mode Failure messages, (iv) RRC Connection Reconfiguration Complete messages, (v) RRC Connection Re-establishment Complete message, among others. (*see e.g.*, Ex. 1001, FIG. 16; *see also* Ex. 1010, Chapter 5.2 RRC Connection Management, p. 239, FIG. 5.5). Common downlink RRC messages that use the SRB1 include: (i) RRC Connection Reconfiguration messages, (ii) RRC Connection Release

messages, (iii) Security Mode Command messages, among others. (*see e.g.*, Ex. 1001, FIG. 16; *see also* Ex. 1010, Chapter 5.2 RRC Connection Management, p. 239, FIG. 5.5).

50. The SRB0, SRB1, and SRB2 specify different priorities and logical channels that inform how an RRC message is processed. Specifically, as explained above, RRC messages carried by an SRB0 are transmitted/received using a CCCH, whereas RRC messages carried by an SRB1 or SRB2 are transmitted/received using a DCCH. The CCCH and the DCCH are logical channels that are used to transfer data, such as the DL and UL messages, between functional components of a BS. (*see* Ex. 1010, Chapter 3 E-UTRAN and EPC Protocol Structure, p. 140, FIG. 3.17, pp. 142-143, FIGS. 3.19 and 3.20, and Chapter 5 Radio Resource Control Functions, p. 240, Table 5.2).

51. The functional components of a BS are divided into four functional layers, including a Physical of PHY layer, a Medium Access Control (MAC) layer, a Radio Link Control (RLC) layer, and a Packet Data Convergence Protocol (PDCP) layer. (*see* Ex. 1010, Chapter 2 Network Architecture, p. 33, FIG. 2.3, and Chapter 3 E-UTRAN and EPC Protocol Structure, p. 139, FIG. 3.15).

52. The Physical layer transmits and receives data from a UE over the air interface. (*see* Ex. 1010, Chapter 3 E-UTRAN and EPC Protocol Structure, p. 140, FIG. 3.17). It controls the modulation, coding, and synchronization of RRC

messages exchanged between the E-UTRAN and a UE. (*see* Ex. 1010, Chapter 3 E-UTRAN and EPC Protocol Structure, p. 143).

53. The MAC layer communicates with the Physical layer via a transport channel. (*see* Ex. 1010, Chapter 3 E-UTRAN and EPC Protocol Structure, p. 140, FIG. 3.17). It manages access to a shared radio resources by prioritizing and scheduling data transmissions to the UE. (*see* Ex. 1010, Chapter 3 E-UTRAN and EPC Protocol Structure, p. 140).

54. The RLC layer communicates with the MAC layer via several logical layers. (*see* Ex. 1010, Chapter 3 E-UTRAN and EPC Protocol Structure, p. 140, FIG. 3.17). The RLC layer segments and reassembles data packets, among other tasks, to adapt packets to a size that can be transmitted over an air interface. (*see* Ex. 1010, Chapter 3 E-UTRAN and EPC Protocol Structure, p. 140).

55. The PDCP layer is responsible for IP header compression of user-plane data packets in order to reduce the number of information bits transmitted over the air-interface. (Ex. 1010, Chapter 6 Packet Data Convergence Protocol Functions, p. 289). “Each radio bearer is associated with one PDCP entity [of many] PDCP entities [that] are located in the PDCP sublayer”. (Ex. 1010, Chapter 6 Packet Data Convergence Protocol Functions, pp. 289-291, FIG. 6.2).

56. After an RRC connection is established through the control plane, a user plane interface is used to transfer user plane data between the UE and the E-

UTRAN using the PDCP layer, the RLC layer, the MAC layer, and the Physical layer. (see Ex. 1010, Chapter 5 Radio Resource Control Functions, pp. 240-241).

VII. SUMMARY OF THE '932 PATENT

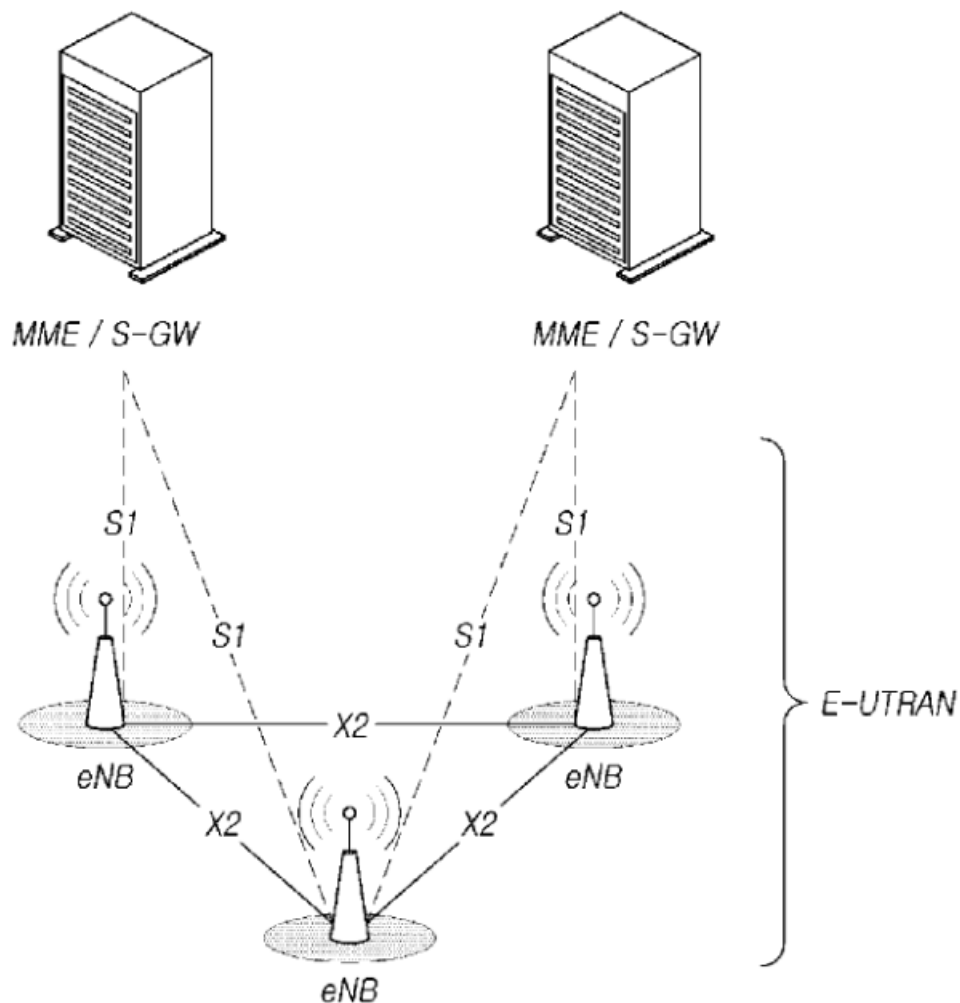
A. The '932 Patent's Specification

57. The '932 patent is titled “Method for Configuring Wireless Connection of Terminal and Apparatus Therefor” and discloses “a system and method for configuring wireless connection of a terminal with a mobile communication network.” (Ex. 1001, Abstract).

Technical Background and Terminology

58. The '932 patent purports to identify problems related to “the concentric deploy of a number of small cells.” (Ex. 1001, 1:44-46).

59. The '932 patent purports to solve the alleged problems by providing “a method of configuring, by an access unit, a wireless connection of a terminal.” (Ex. 1001, 1:66-2:1). The '932 patent purports that the method improves the use of an E-UTRAN architecture, which is illustrated by FIG. 1 of the '932 patent reproduced below. (Ex. 1001, 5:63-6:4).



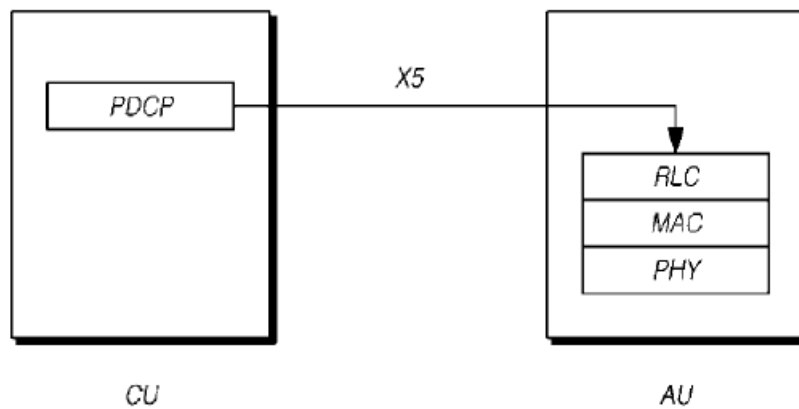
60. With reference to FIG. 1, the '932 patent explains that the E-UTRAN “includes base stations (e.g., eNBs) providing an E-UTRA user plane (PDCP/RLC/MAC/PHY) and a control plane (RRC) protocol termination to user equipment (e.g., terminals).” (Ex. 1001, 5:63-6:5).

61. The '932 patent uses the terms “eNB” and “base station” interchangeably as one of “two types of transmission/reception entities” for realizing the technologies described in the '932 patent. (Ex. 1001, 3:66-4:16).

62. The '932 patent defines a base station as “a station that communicates with user equipment [that] may also be referred to using any other term, such as a node B, an eNB, a sector, a site, a base transceiver system (BTS), an access point (AP), a relay node, a remote radio head (RRH), a radio unit (RU), a small cell, or the like.” (Ex. 1001, 3:34-39).

63. The '932 patent further characterizes a base station as a “comprehensive term indicating a partial area or function covered by a base station controller (BSC)” that “comprehensively indicates a variety of coverage areas, such as a mega cell, a macro cell, a microcell, a picocell, a femtocell, and communications ranges of a relay node, an RRH, an RU, and a small cell.” (Ex. 1001, 3:40-48).

64. The '932 patent describes that “an E-UTRAN eNB of the related art may be defined as nodes providing two different functions. For example, for the transmission of user plane data, a node providing a PDCP function may be separately defined from a node providing an RLC function, a MAC function, and a PHY function,” as shown by the FIG. 4 provided below. (Ex. 1001, 6:60-65).

Ex. 1001, FIG. 4

65. The '932 patent describes that “E-UTRAN L2 functions are divided according to the node providing a PDCP function and the node providing an RLC function, a MAC function, and a PHY function, for the transmission of user plane data. (Ex. 1001, 7:21-26).

66. The '932 patent explains that “the node providing a PDCP function for the transmission of user plane data is referred to as a central unit (CU).” (Ex. 1001, 8:52-54).

67. The '932 patent explains that “the node providing an RLC function, a MAC function, and a PHY function for the transmission of user plane data is referred to as an access unit (AU).” (Ex. 1001, 8:54-57).

68. The '932 patent explains that “an interface between the CU and the AU is denoted by X5.” (Ex. 1001, 8:64-9:1). The '932 patent further explains that “[u]ser plane data between X5 interfaces corresponds to a data packet (e.g., PDCP PDU).”

(Ex. 1001, 8:64-9:1). The '932 patent further explains that the “transport network [between the CU and AU] may be configured by GTP tunneling or any type of tunneling based on header encapsulation (where GTP stands for general packet radio service (GPRS) tunneling protocol. (Ex. 1001, 11:14-26).

Network Architecture

69. The '932 patent refers to the AU and CU as a “wireless access network separation structure” in which a “base station (eNB) is divided into a CU node and an AU node.” (*see e.g.*, Ex. 1001, 9:18-20, 9:28:33, 9:50-55, and 9:36-41).

70. The '932 patent explains that “it is possible to separately transmit and receive data according to UEs or bearers by RRC signaling between nodes configured by dividing base station (eNB) functions or between a base station and a node configured by dividing base station functions.” (Ex. 1001, 22:19-30).

71. The '932 patent goes on to state that it “is therefore possible to effectively transmit or receive a plurality of bearers” which may “reduce costs for constructing a backhaul between nodes configured by dividing base station functions or between a base station and a node configured by separating a base station function.” *Id.*

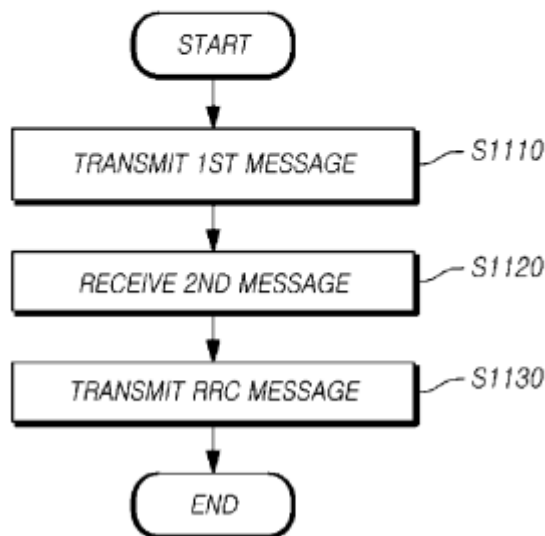
72. The '932 patent explains that a “signaling method for radio resource control is required for the UE, connected to a wireless network (e.g., a connected

UE), to transmit wireless data via the CU and the AU or to configure a wireless bearer provided via the CU and the AU.” (see e.g., Ex. 1001, 11:36-45)

73. The '932 patent explains that “it may be necessary to define an RRC signaling method of generating a final RRC message by a CU and transmitting and receiving the RRC message by the AU,” and shows an example of a signaling method in FIG. 11, which is provided below. (see e.g., Ex. 1001, 11:46-57).

Ex. 1001, FIG. 11

FIG. 11



74. The '932 patent describes that “FIG. 11 illustrates operations of an access unit,” in which the access unit (i) “transmit[s] a first message, including an

[uplink] UL RRC message received from a UE, to a central unit;” (ii) “receive[s] a second message, including a [downlink] DL RRC message, from the central unit;” and (iii) “transmit[s] the DL RRC message to the UE.” (*see* Ex. 1001, 13:4-12).

75. The ’932 patent states that the “first message refers to information that the AU transmits to the CU” and “may include an RRC message received from the UE.” (Ex. 1001, 13:22-24). The first message may also include “information regarding RRC connection of the UE and RRC connection reconfiguration” and “UE identification information or radio bearer identification information. (Ex. 1001, 13:25-31).

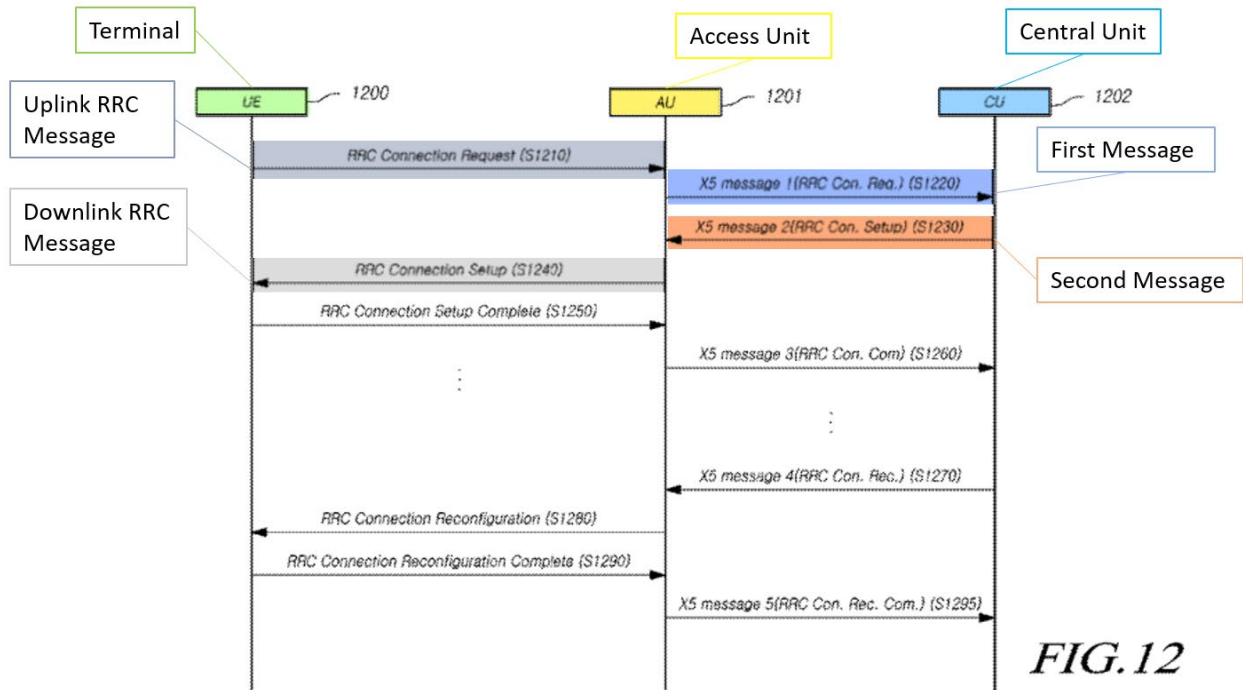
76. The ’932 patent states that the second message may include a DL RRC message and may also “include information related to the RRC connection setup or the RRC connection reconfiguration” and “UE identification information or radio bearer identification information.” (Ex. 1001, 13:33-44).

77. The ’932 patent states that the “access unit may transmit the received DL RRC message to the UE.” (Ex. 1001, 13:58-64).

Wireless Configuration Method

78. The ’932 patent shows the operations of the AU within the context of a UE and CU in FIG. 12, an annotated version of which is provided below. (*see* Ex. 1001, 14:1-9).

Ex. 1001, FIG. 12



79. FIG. 12 shows a “method of generating, by a CU 1202, a final RRC message and transmitting and receiving, by the CU 1202, an RRC message from an AU 1201.” (Ex. 1001, 14:6-9).

80. With reference to FIG. 12, the '932 patent describes that “[i]n S1210, the UE 1200 transmits an RRC connection request message [i.e., uplink RRC message] to the AU 1201.” (Ex. 1001, 14:10-13). “When the RRC connection request message is received, the AU 1201 may transmit the received RRC connection request message to the CU 1202.” (Ex. 1001, 14:14-16). “For example . . . the AU 1201 may transmit the RRC connection request message [i.e., uplink RRC

message] to the CU 1202 via a message [i.e., first message] on an interface between the AU 1201 and the CU 1202.” (Ex. 1001, 14:17-22).

81. “In S1230, the CU 1202 transmits an RRC connection setup message [i.e., downlink RRC message] including radio bearer configuration information (e.g., radioResourceConfigDedicated regarding SRB1 configured by the UE and/or entity configuration information regarding entities configured by the AU 1201 with regard to SRB1) to the AU 1201.” (Ex. 1001, 14:36-41). “In addition, the CU 1202 sends the RRC connection setup message, by including the RRC connection setup message in a message (e.g., X5 message 2 in FIG. 12) [i.e., second message], on the interface between the CU 1202 and the AU 1201.” (Ex. 1001, 14:44-50).

82. “The AU 1201 configures a corresponding entity (e.g., an RL entity, a MAC entity, or PHY configuration information) according to the configuration information [and] [i]n S1240 . . . transmits the RRC connection setup message [i.e., downlink RRC message] to the UE 1200.” (Ex. 1001, 15:4-9).

83. The ’932 patent notes that “[i]n S1220 and S1230, the SRB0 RRC message may be transferred by being included in a message on the CU-AU interface.” (Ex. 1001, 17:57-59).

B. The ’932 Patent’s Prosecution History

84. Below is a summary of the ’932 patent’s prosecution history. This

summary is not intended to address or summarize the '932 patent's entire prosecution history. Rather, it is intended to summarize the parts that may be relevant to my analysis below.

85. U.S. Patent Application No. 15/744,823 (the "'823 application") was filed Jan. 14, 2018. (Ex. 1001, Cover). The '823 application was 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).

86. The '823 application was filed with original claims 1-16. (Ex. 1002, 57-59). On the same date, Jan. 14, 2018, the Applicant filed a Preliminary Amendment, which included amendments to all of the original claims as well as the Specification. (Ex. 1002, 125). The amendments to the Specification were entered to add a cross-reference to the PCT application and the Korean application. (Ex. 1002, 126).

87. On March 21, 2019, a Non-Final Office Action (the "Office Action") was issued. (Ex. 1002, 431). The Office Action rejected claims 1-16 as anticipated by U.S. Publication No. 2016/0242080 to Vikberg, et al. ("Vikberg"). (Ex. 1002, 433). Specifically, the Examiner found that an eNB-a, as described by Vikberg, anticipated the central unit recited by the claims, and (ii) an eNB-s, as described by Vikberg, anticipated the access unit recited by the claims. (Ex. 1002, 433).

88. On August 21, 2019, the Applicant filed a Response to the Office Action (the “Response”). (Ex. 1002, 457).

89. In the Response, the Applicant amended claims 1 and 9 and cancelled claims 5 and 13. (Ex. 1002, 458-460). The amendments to claims 1 and 9 added the phrase “wherein the access unit and the central unit distinguish signaling radio bearers on radio bearer identification information included in the first message and the second message.” (Ex. 1002, 458-460). In addition, the Applicant amended claim 1 to add the phrase “receiving an uplink radio resource control (RRC) message from a terminal, including the uplink RRC message into a first message” before the phrase “transmitting the first message to a central unit.” (Ex. 1002, 458-460). The Applicant also added the phrase “in response to the uplink RRC message from the terminal” after the phrase “where the second message includes a downlink RRC message” in both claims 1 and 9. (Ex. 1002, 458-460).

90. The Applicant stated that the “claimed invention is directed to i) a radio access network separation structure where an eNB is divided into an access unit and a central unit and ii) dual connectivity is such a radio access network separation structure.” (Ex. 1002, 461). Separately, the Applicant argued that “Vikberg does not teach [] 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” because Vikberg allegedly failed “to clearly teach i) any messages

including radio bearer identification information and exchanged between the eNB-a and the eNB-s and ii) distinguishing signaling radio bearer based on such messages.” (Ex. 1002, 462).

91. A Notice of Allowance was mailed November 27, 2019 (Ex. 1002, 465).

C. Claim Construction of the '932 Patent

92. I have been informed that claim terms are typically given their plain and ordinary meanings, as would have been understood by a person of ordinary skill in the art at the time of the earliest alleged priority date. I have further been informed that when considering the meaning of any terms in the challenged claims of the '932 patent, I should apply the plain and ordinary meaning of those terms. I have further been informed that in considering the meaning of the claims, one must consider the language of the claims, the specification, and the prosecution history of record.

93. I have been informed that in general, a preamble limits the invention if it recites essential structure or steps, or if it is necessary to give life, meaning, and vitality to the claim. I have further been informed that a preamble is not limiting where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention. I have further been informed that dependence on a particular disputed preamble phrase for

antecedent basis may limit claim scope because it indicates a reliance on both the preamble and claim body to define the claimed invention. I have further been informed that clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art transforms the preamble into a claim limitation because such reliance indicates use of the preamble to define, in part, the claimed invention.

VIII. SUMMARY OF THE PRIOR ART

A. *Lin1* (Ex. 1003)

94. International Patent No. PCT/CN/2014/089300 (“*Lin1*”, Ex. 1003) is titled “Radio Resource Control (RRC) Message Processing Method, Apparatus, and System.” *Lin1* was filed October 23, 2014, and published April 28, 2016 (Ex. 1003, Cover). Thus, I have been informed that I should assume *Lin1* is prior art under at least 35 U.S.C. § 102(a)(2) (AIA).

95. *Lin1* is directed to interface establishing techniques to improve existing radio communications systems by increasing “system capacity” to handle an “increasing quantity of user equipments.” (Ex. 1003, 1:9-11). To do so, *Lin1* describes “two nodes,” a “anchor node and [a] first serving node [such that] an RRC function can be split onto the two nodes via the method” describe therein. (Ex. 1003, 1:11-12, 27:20-24, 45:6-11, and 57:24-29). Specifically, *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 105.” (Ex. 1003, 27:1-2). The network architecture is shown by FIG. 1, which is reproduced below:

Ex. 1003, FIG. 1

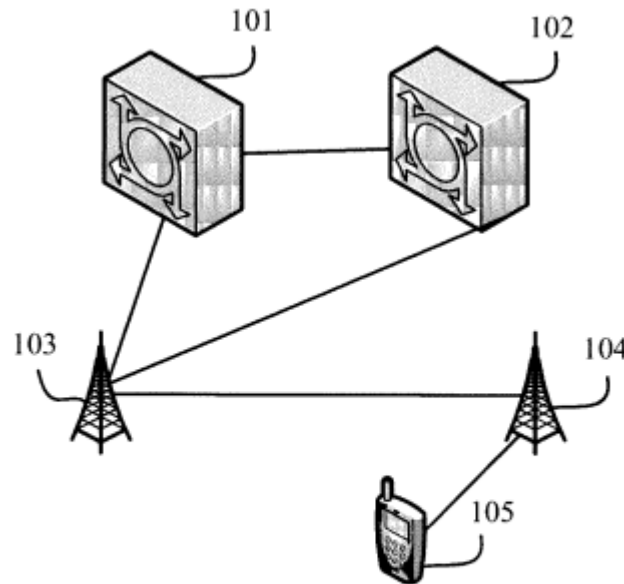


FIG. 1

96. *Lin1* discloses that the architecture splits the RRC function “onto two nodes”, including an “anchor node 103 and a serving node 104 that jointly process an RRC message of the UE 105.” (Ex. 1003, 27:18-20). *Lin1* describes that “the serving node 104 includes an RLC protocol entity, Media Access Control MAC protocol entity, and a physical layer PHY protocol entity and the anchor node 103

includes a first packet data convergence protocol (PDCP) protocol entity used to process a RRC message carried by the SRB1, and a second PDCP protocol entity used to process a RRC message carried by the SRB2.” (Ex. 1003, 25:22-26 and 27:31-28:3).

97. *Lin1* discloses several processes for configuring a wireless network using the serving node within the described architecture. (see e.g., Ex. 1003, FIGs. 7 and 8). For example, *Lin1* discloses that “the serving node 104 may be a network device that provides a wireless communication service for the UE 105.” (Ex. 1003, 1:14-16 and 27:4-6). To do so, “serving node 104 sets up a connection to the anchor node 103, and the anchor node 103 sets up a connection to the MME 101. Therefore, the serving node 104 sets up a connection to the MME 101 by using the anchor node 103.” (Ex. 1003, 27:7-11).

B. *Lin2* (Ex. 1005)

98. International Patent No. PCT/CN/2014/089310 (“*Lin2*”, Ex. 1005) is titled “Method and Apparatus for Establishing Interface.” *Lin2* was filed October 23, 2014, and published April 28, 2016 (Ex. 1005, Cover). Thus, I have been informed that I should assume *Lin2* is prior art under at least 35 U.S.C. § 102(a)(2) (AIA).

99. *Lin2* is directed to “interface establishing” techniques to improve “existing radio communications system[s]” by increasing “system capacity” to handle an “increasing quantity of user equipments.” (Ex. 1005, 3:8-10). To do so, *Lin2* describes a radio communications systems in which “an RRC function is split onto [] two nodes.” (Ex. 1005, 3:10-11 and 16:30-31). Specifically, *Lin2* discloses an “anchor node [that] is a base station [or] a centralized controller” and a “serving node [that] is a radio transceiver function entity with a scheduling capability.” (Ex. 1005, 19:17-22).

100. *Lin2* discloses several processes for configuring a wireless network using the serving node within the described architecture. (*see e.g.*, Ex. 1005, FIGs. 6). For example, *Lin2* discloses that the serving node “receives an uplink RRC message sent by a user terminal,” (Ex. 1005, 31:24-27), the serving node “sends, through the first interface, 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), the anchor node “sends a downlink RRC message carried in the SRB1 or the SRB2 to the serving node through the first interface;” (Ex. 1005, 32:6-7), and “the serving node sends the downlink RRC message carried in the SRB1 or the SRB2 to the user terminal through an air interface connection.” (Ex. 1005, 32:8-11).

C. *Zhang* (Ex. 1007)

101. International Patent Publication No. WO 2014/127525 A1 (“*Zhang*”, Ex. 1007) is titled “Method, Device and System for Communication.” *Zhang* was filed February 22, 2013, and published October 28, 2014 (Ex. 1007, Cover). Thus, I have been informed that I should assume *Zhang* is prior art under at least 35 U.S.C. § 102(a)(1) (AIA).

102. *Zhang* is directed to various communication methods between base stations and user equipment (UE). (Ex. 1007, 1:7-11 and 2:1-3). Specifically, *Zhang* discloses a system that leverages two network nodes to establish a wireless connection with a UE for “reducing access delay of a UE.” (Ex. 1007, 2:1-3, 75:1 – 77:29, and FIG. 13). In this regard, *Zhang* describes two network nodes that perform different E-UTRAN eNB functions. Specifically, *Zhang* discloses (i) a first network node, a micro network node, that “may be a relay node (Relay Node, RN), a home base station (Home eNB or HOME NB), a micro base station (Micro eNB), a pico base station (Pico eNB), a femto base station (Femto eNB), a WiFi access point (Access Point, AP), or the like” and (ii) a second network node, a macro network node, that may be “a base station (Node B, NB), a donor base station (Donor eNB, DeNB), a HeNB gateway, an HNB gateway, or the like.” (Ex. 1007, 37:16-25).

103. *Zhang* discloses several processes for configuring a wireless network using the serving node within the described architecture. (*see e.g.*, Ex. 1007, FIGs.

7-13). In one example, *Zhang* discloses that “user equipment sends uplink signaling or uplink data to a micro network node;” (Ex. 1007, 75:19-25), “the micro network node forwards, to the macro network node, the uplink signaling or uplink data sent by the user equipment;” (Ex. 1007, 76:2-8), “macro network node [i.e., central unit] sends downlink signaling or downlink data to the micro network node;” (Ex. 1007, 76:17-19), and the micro network node forwards, to the user equipment, the downlink signaling or downlink data sent by the macro network node.” (Ex. 1007, 76:19-20).

IX. THE PRIOR ART RENDERS OBVIOUS CLAIMS 1-2, 4, 8-9, AND 11 OF THE '932 PATENT

A. Ground 1: *Lin1* Renders Obvious Claims 1-2, 4, 8-9, and 11 of the '932 Patent.

104. *Lin1* renders obvious all of the limitations of claims 1-2, 4, 8-9, and 11 of the '932 patent.

Independent Claim 1

Claim 1, Element [1.pre]: A method of configuring, by an access unit, a wireless connection of a terminal, the method comprising:

105. To the extent that element [1.pre] is found to be limiting, *Lin1* discloses a method of configuring, by an access unit, a wireless connection of a terminal. As I will detail below with reference to each of the claim elements of Claim 1, *Lin1* discloses a serving node that in at least two different examples sends and receives

the same messages as the claimed access unit to configure a wireless connection of user equipment (i.e., terminal). A person of ordinary skill in the art would therefore understand that *Lin1*'s serving node is an equivalent to or an obvious variation of the claimed access unit and that *Lin1* discloses at least two different examples of the method of configuring, by an access unit, a wireless connection of a terminal recited by Claim 1.

106. *Lin1*'s **serving node** (i.e., access unit) discloses the claimed access unit. *Lin1*'s **serving node** (i.e., access unit) is described with reference to FIG. 1 (reproduced and annotated below).² 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). Specifically, *Lin1* discloses an architecture in which the “RRC function is split onto [] two nodes”, including an “anchor node 103 and a **serving node 104** (i.e., access unit) that jointly process an RRC message of the UE 105.” (Ex. 1003, 27:18-22).

² The '932 patent claims and *Lin1* use different terms to refer to the same concepts. To help track the correspondences between (i) *Lin1* and (ii) the claim terms, I have used bolding and italics to emphasize *Lin1* terms and have placed the corresponding claim term in parentheses after each emphasized term.

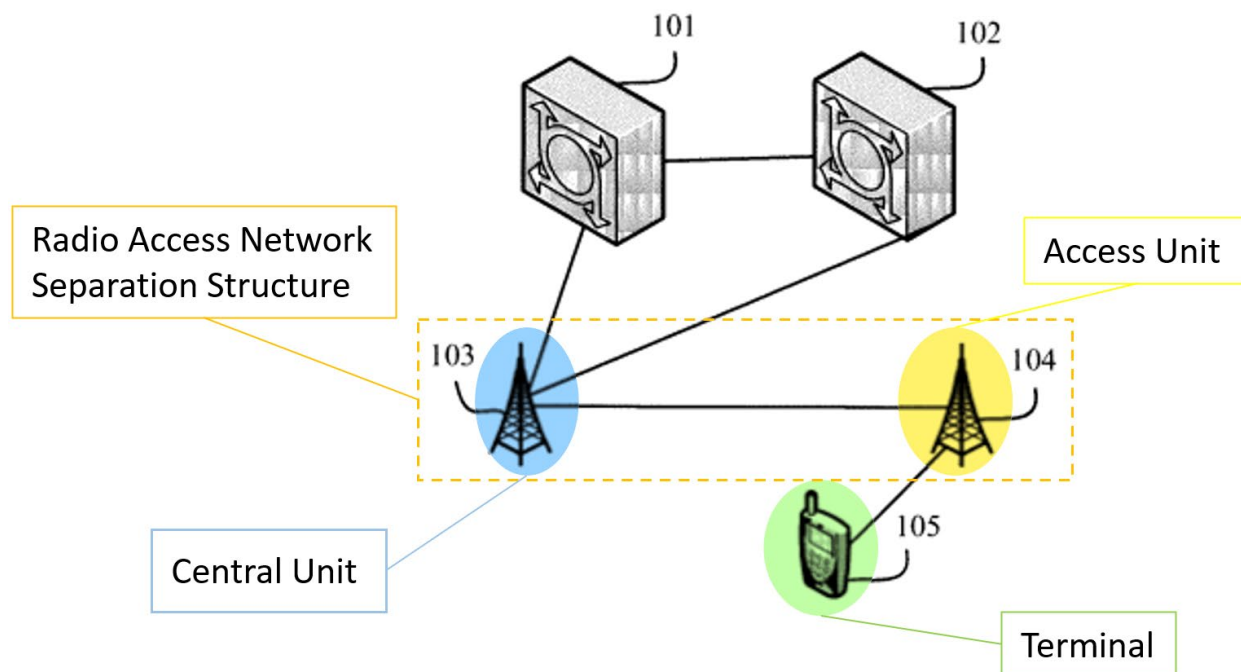


FIG. 1

107. 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; *see also* Claim 2 (“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...”). Similarly, *Lin1* discloses a **serving node 104** (i.e., access unit) that 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). The person of ordinary skill in the art would have understood

that the node that includes *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. Thus, the person of ordinary skill in the art would have understood that the **serving node 104** (i.e., access unit) of *Lin1* provides the same functionality as the claimed access unit.

108. *Lin1* also discloses a terminal. The '932 patent discloses and the person of ordinary skill in the art would have understood that a terminal is an example of “user equipment”. (Ex. 1001, 5:63-6:5). *Lin1* discloses “user equipment 105.” (Ex. 1003, 27:1-5). The person of ordinary skill in the art would have understood from this disclosure that *Lin1*'s **user equipment (UE)** (i.e., terminal) is the claimed terminal.

109. Finally, *Lin1* discloses configuring, by an access unit, a wireless connection of a terminal. As described with reference to FIG. 1, the “**serving node 104** [i.e., access unit] may be a network device that provides **a wireless communication service for the UE 105** [i.e., terminal].” (Ex. 1003, 1:14-16 and 27:4-6). To do so, “**serving node 104** [i.e., access unit] sets up a connection to the anchor node 103, and the anchor node 103 sets up a connection to the MME 101. Therefore, the **serving node 104** [i.e., access unit] sets up a connection to the MME 101 by using the anchor node 103.” (Ex. 1003, 27:7-11). The '932 patent doesn't provide a definition for the term “configuring;” however 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). The ’932 patent also describes that a “UE [may] configure a radio connection using RLC, MAC, and PHY configuration information of the access unit.” (Ex. 1001, 13:32-56). Based at least on this disclosure, a person of ordinary skill in the art would have understood that *configuring* a wireless connection of a terminal is describing *setting up a connection* between a UE and the MME, as described by *Lin1*.

110. Thus, *Lin1* discloses a method of configuring, by an access unit, a wireless connection of a terminal.

Claim 1, Element [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;

111. *Lin1* discloses claim element [1.a].

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

113. In a first example, *Lin1* discloses that its ***serving node*** (i.e., access unit) receives an RRC message from a ***UE*** (i.e., terminal). Specifically, and with reference to FIG. 8 (reproduced and annotated below), *Lin1* discloses that a “first ***serving node*** [i.e., access unit] receives an RRC connection request message sent by a ***UE*** [i.e., terminal].” (Ex. 1003, 45:21-25). An RRC connection request is a defined type of

uplink RRC message. (*see e.g.*, Ex. 1001, FIG. 16). Thus, the person of ordinary skill in the art would have understood that *Lin1*'s **RRC connection request message** (i.e., uplink RRC message) from a **UE** (i.e., terminal) is an uplink radio resource control (RRC) message from a terminal.

114. To the extent it is argued that *Lin1*'s **RRC connection request** (i.e., uplink RRC message) is not a defined uplink radio resource control (RRC) message, *Lin1* explicitly discloses that the “RRC connection request is an RRC message.” (Ex. 1003, 46:3-4). *Lin1* also explains that the **UE** (i.e., terminal) and the **serving node** (i.e., access unit) communicate through a “radio link connection [that] is set up between the **UE 105** [i.e., terminal] and the **serving node 104** [i.e., access unit].” (Ex. 1003, 27:15-17). The person of ordinary skill in the art would have understood that an “uplink” is a unidirectional radio link for the transmission of signals from the UE to a Network, such as a network node, or a base station. (*see supra*, §VI. Technical Background). Thus, even if an RRC connection request was not a defined type of uplink RRC message, the person of ordinary skill in the art would have understood that *Lin1*'s disclosure of an **RRC connection request** (i.e., uplink RRC message) received over a radio link connection by a **serving node** (i.e., access unit) and from a **UE** (i.e., terminal) is referring to an uplink RRC message. The person of ordinary skill in the art would therefore have understood that *Lin1*'s **RRC**

connection request from a *UE* (i.e., terminal) is an uplink radio resource control (RRC) message from a terminal.

Lin1, FIG. 8

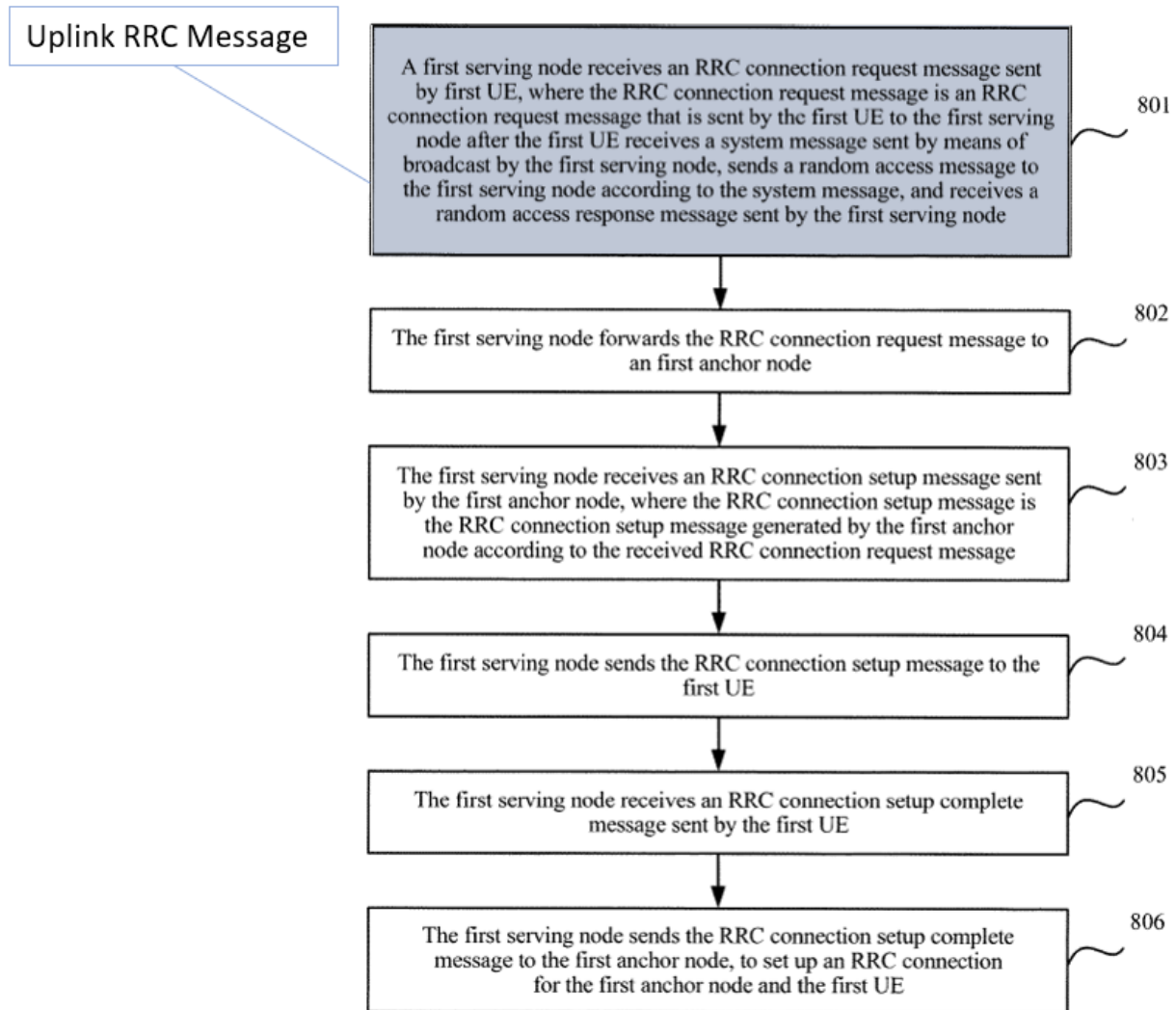


FIG. 8

115. In a second example, *Lin1* also discloses with reference to FIG. 7 (reproduced and annotated below), “receiving, by a first *serving node* [i.e., access

unit], an RRC message sent by a first *UE* [i.e., terminal], the RRC message including an RRC message carried by a signaling radio bearer SRB1 or an RRC message carried by an SRB2.” (Ex. 1003, 41:10-13). As explained above, the person of ordinary skill in the art would have understood that an RRC message received by a *serving node* (i.e., access unit) from a *UE* (i.e., terminal) over a radio link connection is an uplink message. Thus, the person of ordinary skill in the art would have understood that *Lin1*’s *RRC message* received, by a first *serving node* (i.e., access unit) and sent by a first *UE* (i.e., terminal) is an uplink radio resource control (RRC) message from a terminal that used an SRB1. A person of ordinary skill in the art would understand that the uplink radio resource control (RRC) message carried by an SRB1 could include an RRC Connection Setup Complete message, a Security Mode Complete message, a Security Mode Failure message, RRC Connection Reconfiguration Complete message, RRC Connection Re-establishment Complete message, among other commonly defined uplink RRC messages. (*see e.g.*, Ex. 1001, FIG. 16; *see also* Ex. 1010, Chapter 5.2 RRC Connection Management, p. 239, FIG. 5.5).

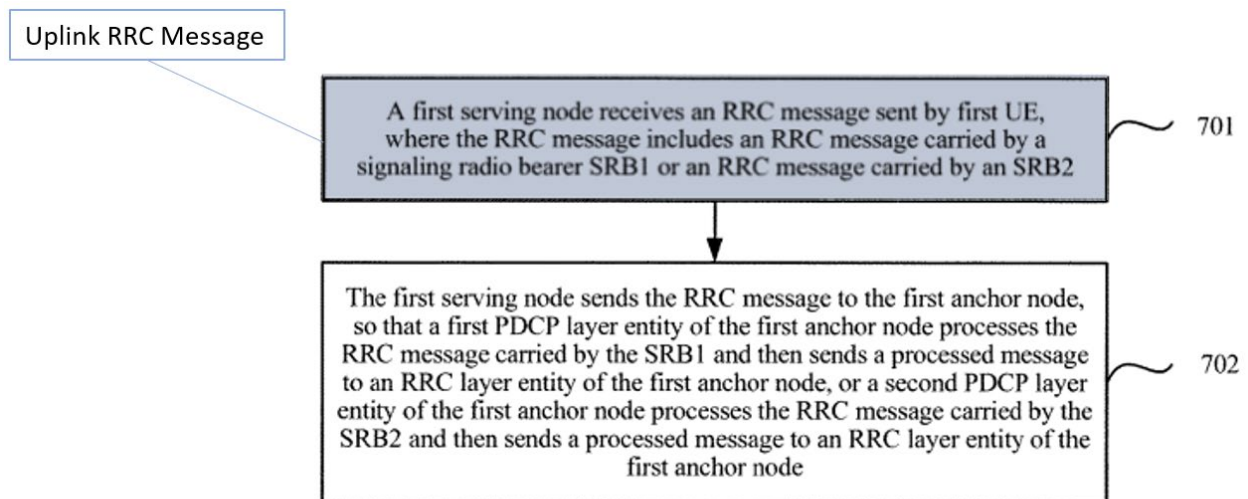
Lin1, FIG. 7

FIG. 7

116. *Lin1* also discloses a central unit. While not explicitly required in Claim 1, the '932 patent describes the “central unit” as a “node providing a *PDCP* function for the transmission of user plane data.” (Ex. 1001, 8:52-54; *see also* Claim 2 (“wherein [] the central unit comprises a node configured to provide a *PDCP* function, for transmission of the user plane data.”)). Similarly, with reference to FIG. 1 (reproduced and annotated below), *Lin1* discloses an architecture in which the “RRC function is split onto [] two nodes”, including an “anchor node 103 and a *serving node 104* [i.e., access unit] that jointly process an RRC message of the *UE 105* [i.e., terminal].” (Ex. 1003, 27:18-22 and 29:16-18). *Lin1* further discloses that the “anchor node 103 may include . . . a *first packet data convergence protocol (PDCP) protocol entity* used to process the RRC message carried by the SRB1, and

a second *PDCP protocol entity* used to process the RRC message carried by the SRB2.” (Ex. 1003, 25:22-26). The person of ordinary skill in the art would have understood that the node that includes a *PDCP entity* would provide a *PDCP function* for the transmission of user plane data. Thus, the person of ordinary skill in the art would have understood that the **anchor node 103** (i.e., central unit) of *Lin1* provides the same functionality as the claimed central unit.

Ex. 1003, FIG. 1

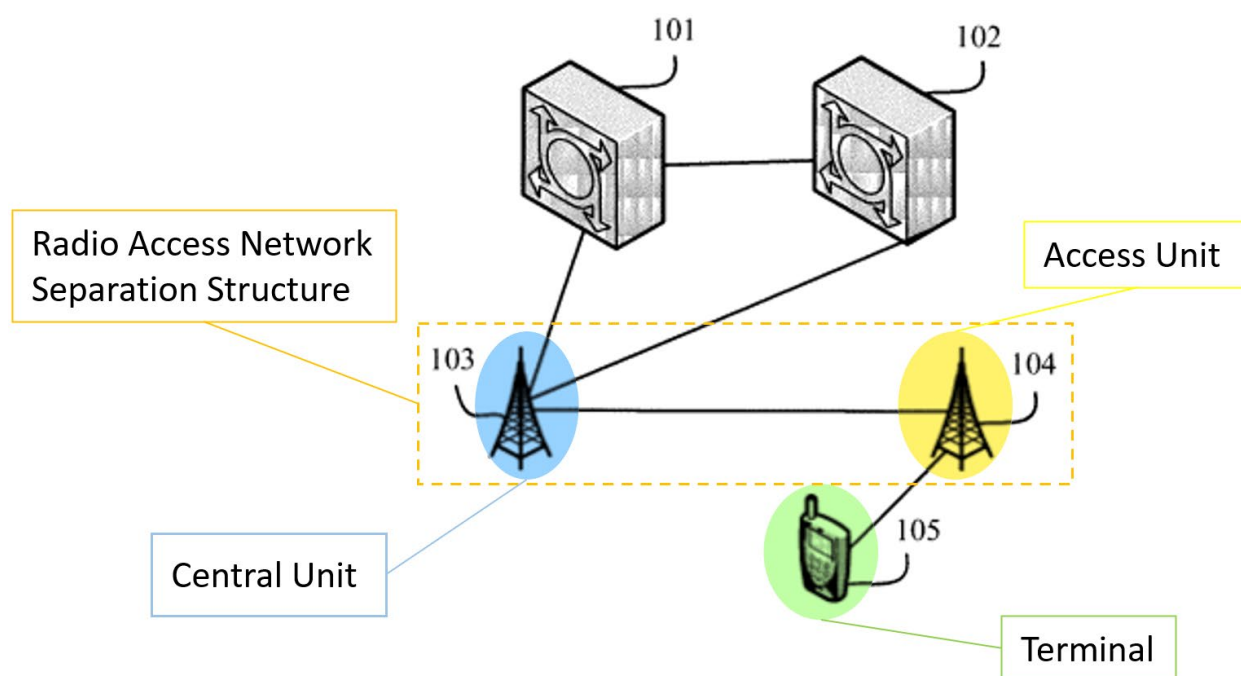


FIG. 1

117. As explained above, the person of ordinary skill in the art would have understood that an uplink message is a message between a **user equipment** (i.e., terminal) and a *network node*. Thus, the person of ordinary skill in the art would

have understood that forwarding or otherwise 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*. A person of ordinary skill in the art would have therefore understood that uplink RRC messages are included in other messages, such as control plane messages, for transmission between *network nodes*. Moreover, a person of ordinary skill in the art would have understood, and the '932 patent confirms, that a common technique for transmitting information, such as uplink or downlink messages, between two network nodes is by encapsulating the information in another message, such a control plane messages, configured for a type of tunneling between the two network nodes. (Ex. 1001, 11:14-26 (stating that “[f]or efficient data transfer, the CU and AU may be connected via a transport network [that] is configured by GTP tunneling . . . based on header encapsulation”); *see* Ex. 1010, Chapter 3 E-UTRAN and EPS Protocol Structure, p. 123 (describing an “encapsulation process” in which “headers/sub-headers and padding bits” are added “to make is possible to get data from a source to a destination); *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). Indeed, for each of the uplink RRC messages identified above, *Lin1* discloses multiple different examples of including (or encapsulating) the uplink RRC message into a first message and transmitting the first message to a central unit.

118. In a first example, with reference again to FIG. 8 (reproduced and annotated below), *Lin1* discloses “forwarding, by the **serving node** [i.e., access unit], the **RRC connection request message** [i.e., uplink RRC message] to a first **anchor node** [i.e., central unit].” (Ex. 1003, 45:29-30). *Lin1* also discloses that “control plane interface signaling is used between the **serving node** [i.e., access unit] and the **anchor node** [i.e., central unit]” in which the **serving node** (i.e., access unit) and the anchor node (i.e., central unit) communicate using “control plane signaling messages that carr[y] [] RRC message[s]”. (Ex. 1003, 42:21-30). Thus, a person of ordinary skill in the art would have understood that to forward the **RRC connection request message** [i.e., uplink RRC message] to the first **anchor node** [i.e., central unit], the **serving node** [i.e., access unit] would include the **RRC connection request message** [i.e., uplink RRC message] into a **control plane signaling message** [i.e., a first message] and transmit the **control plane signaling message** [i.e., a first message] to the **anchor node** (i.e., central unit).

119. With respect to the **RRC connection request message** (i.e., uplink RRC message) specifically, *Lin1* discloses that the **RRC connection request message** (i.e., uplink RRC message) may be forwarded with a message of a particular message name (or “header”), such as “SRB0RRCTransfer or InitialRRCTransfer.” (Ex. 1003, 46:2-6). Because the SRB0RRCTransfer and the InitialRRCTransfer messages are transmitted between the **serving node** (i.e., access unit) and the **anchor node** (i.e.,

central unit), a person of ordinary skill in the art would have understood that these message are examples of *control plane signaling messages* (i.e., first messages) that include the *RRC connection request message* (i.e., uplink RRC message) and are transmitted to the *anchor node* (i.e., central unit).

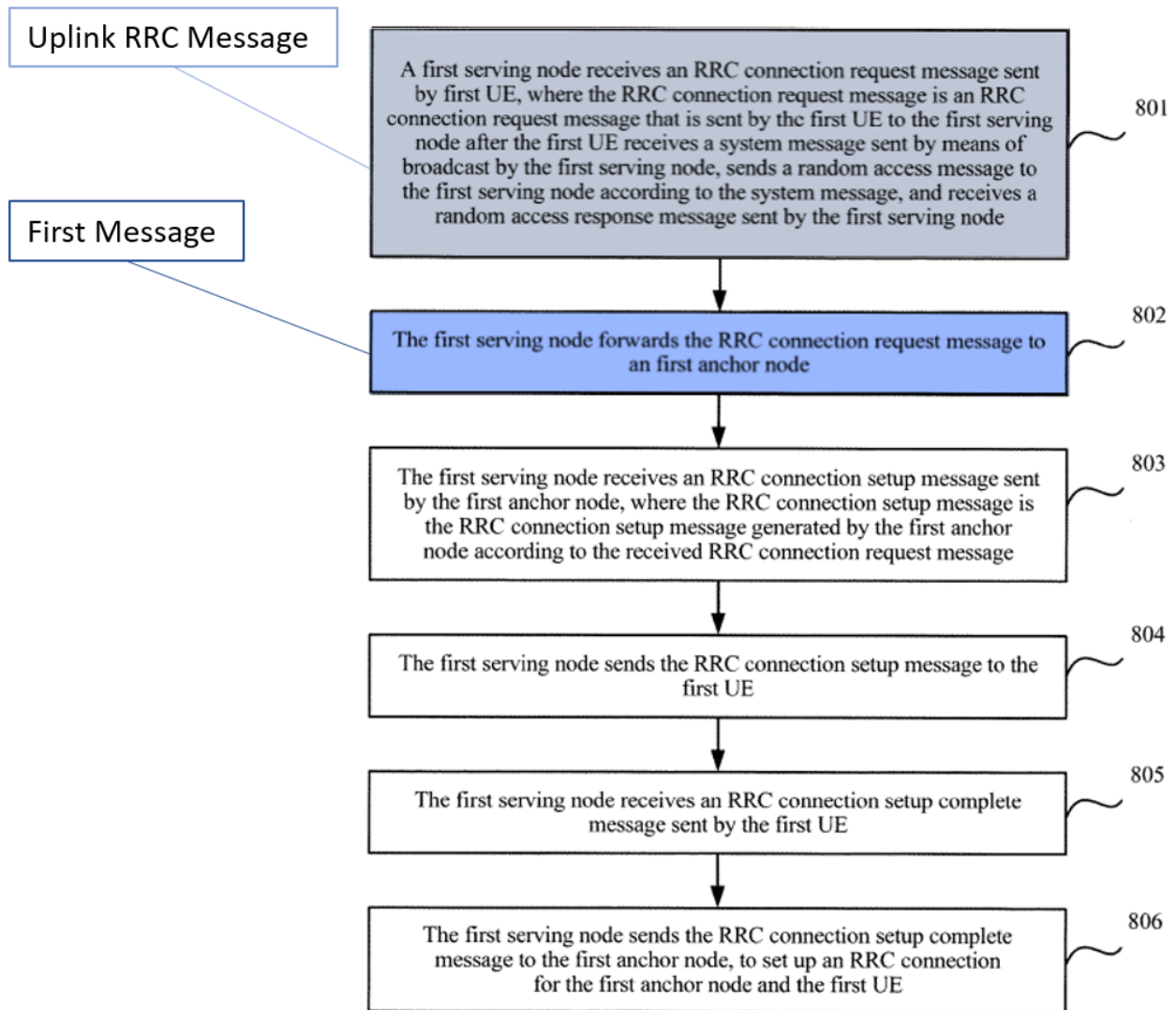
Ex. 1003, FIG. 8

FIG. 8

120. In a second example, *Lin1* discloses with reference to FIG. 7 (reproduced and annotated below), “sending, by the first *serving node* [i.e., access unit], the *RRC message* [i.e., uplink RRC message] to a first *anchor node* [i.e., central unit].” (Ex. 1003, 42:9-10). As described above, *Lin1* explains that “[i]nter-

device control plane interface signaling is used between the *serving node* [i.e., access unit] and the *anchor node* [i.e., central unit],” (Ex. 1003, 42:9-10). Referring to the inter-device control plane interface signaling, *Lin1* discloses a “control plane signaling message that carries the *RRC message* [i.e., uplink RRC message]” to an *anchor node* (i.e., central unit).” (Ex. 1003, 42:26-30). Based on this disclosure, the person of ordinary skill in the art would have understood that the *control plane signaling message* (i.e., first message) that carries the *RRC message* (i.e., uplink RRC message) is a first message that includes an uplink RRC message. Thus, the person of ordinary skill in the art would have understood that a *serving node* (i.e., access unit) includes an *RRC message* (i.e., uplink RRC message) into a *control plane signaling message* (i.e., a first message) and transmits the *control plane signaling message* (i.e., a first message) to an *anchor node* (i.e., central unit).

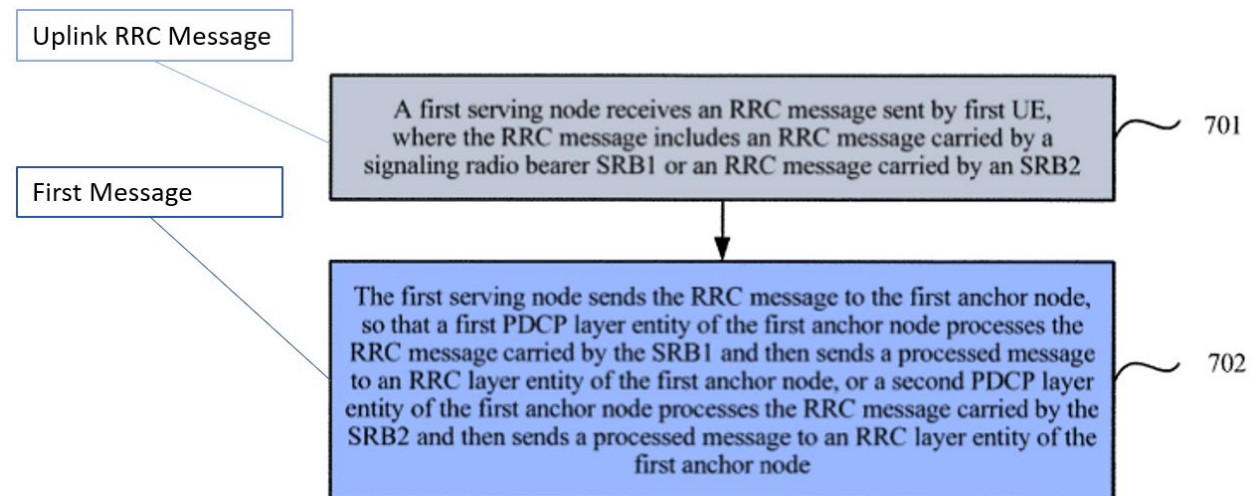


FIG. 7

Claim 1, Element [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

121. *Lin1* discloses claim element [1.b].

122. *Lin1* discloses multiple different examples of downlink RRC messages sent between two network nodes. As explained above, the person of ordinary skill in the art would have understood that a downlink message is a message between a *user equipment* (i.e., terminal) and a *network node*. (see *supra*, §VI. Technical Background). Thus, the person of ordinary skill in the art would have understood 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*. A person of ordinary skill in the art

would have therefore understood that downlink RRC messages are included in other messages, such as control plane messages, for transmission between network nodes. Indeed, for each of the downlink RRC messages identified below, *Lin1* discloses multiple different examples of receiving a second message from the central unit that includes the downlink RRC message.

123. In a first example, with reference to FIG. 8 (reproduced and annotated below), *Lin1* discloses that the “**serving node** [i.e., access unit] receives an RRC connection setup message sent by the first **anchor node** [i.e., central unit].” (Ex. 1003, 46:15-17). An RRC connection setup message is a defined type of downlink RRC message. (see e.g., Ex. 1001, FIG. 16). Thus, the person of ordinary skill in the art would have understood that *Lin1*’s **RRC connection setup message** is a downlink RRC message.

124. *Lin1* also discloses “a control plane signaling message that carries the **RRC connection setup message** [i.e., downlink RRC message].” (Ex. 1003, 46:18-22). The person of ordinary skill in the art would have understood from this disclosure that *Lin1*’s **control plane signaling message** (i.e., a second message) that carries the **RRC connection setup message** (i.e., downlink RRC message) is a second message received from a central unit that includes a downlink RRC message.

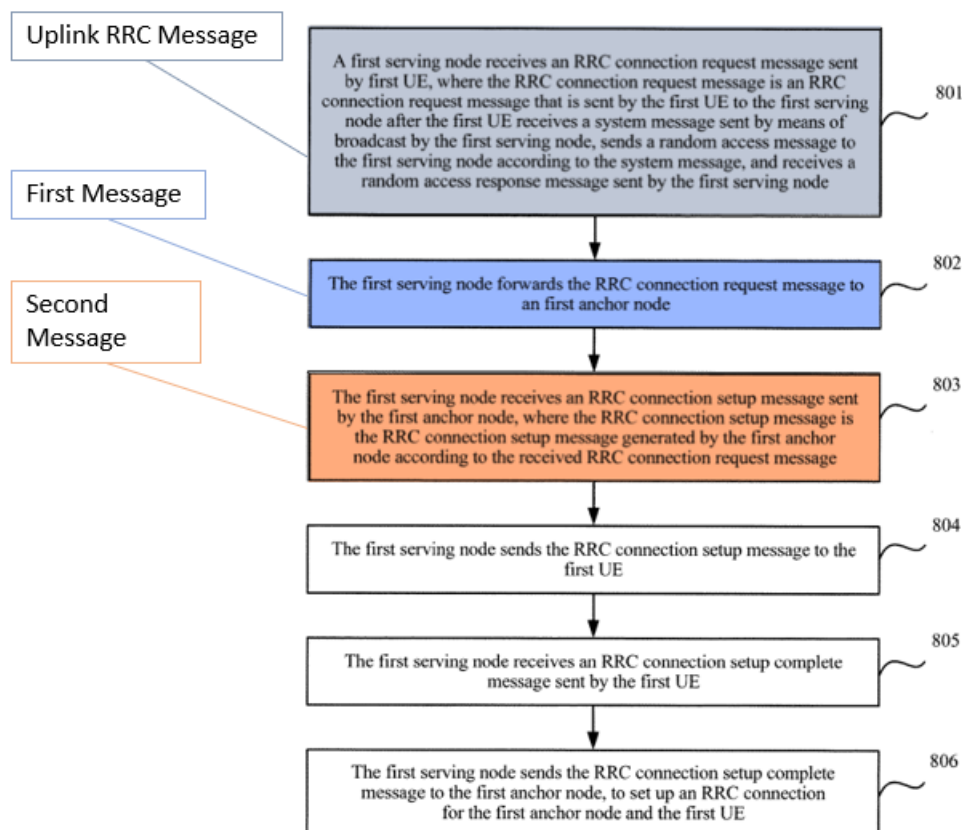
Ex. 1003, FIG. 8

FIG. 8

125. In a second example, with reference to FIG. 7, *Lin1* discloses “receiving, by the first **serving node** [i.e., access unit], an RRC message sent by the first **anchor node** [i.e., central unit], the RRC message including an RRC message carried by an SRB1 or an RRC message carried by an SRB2”. (Ex. 1003, 42:14-16). *Lin1* also discloses “processing, by a first radio link control (RLC) layer entity of the first **serving node** [i.e., access unit], the RRC message” and “then sending [the] processed message to the first **UE** [i.e., terminal].” (Ex. 1003, 42:14-20). As

explained above, a downlink message is a message sent over a radio link interface from a network node to a *UE* [i.e., terminal]. The person of ordinary skill in the art would have understood that an RLC layer is used to process messages for transmission over an air interface. Thus, *Lin*'s disclosure of the *serving node* (i.e., access unit) processing an RRC message with an RLC layer for transmission to a *UE* [i.e., terminal] would have confirmed to the person of ordinary skill in the art that the RRC message is a downlink RRC message. As such, the *RRC message* sent by the first *anchor node* (i.e., central unit) is a downlink RRC message. A person of ordinary skill in the art would understand that the downlink RRC message carried by an SRB1 could include an RRC Connection Reconfiguration message, a RRC Connection Release message, Security Mode Command messages, among other commonly defined uplink RRC messages. (*see e.g.*, Ex. 1001, FIG. 16; *see also* Ex. 1010, Chapter 5.2 RRC Connection Management, p. 239, FIG. 5.5).

126. As explained above, *Lin1* also discloses that the inter-device control plane interface signaling is used between the *serving node* [i.e., access unit] and the *anchor node* [i.e., central unit]" and that an *RRC message* (i.e., downlink RRC message) is carried by a control plane signaling message. (Ex. 1003, 42:21-30). This disclosure would have suggested to the person of ordinary skill in the art that the *RRC message* (i.e., downlink RRC message) sent by the first *anchor node* (i.e., central unit) is carried by a *control plane signaling message* (i.e., a second

message). Thus, the person of ordinary skill in the art would have understood that *Lin1*'s **serving node** (i.e., access unit) receives a **control plane signaling message** (i.e., a second message) that includes an **RRC message** (i.e., downlink RRC message) from an **anchor node** (i.e., central unit).

127. *Lin1* discloses multiple different examples of a second message that includes a downlink RRC message in response to the uplink RRC message from the terminal.

128. In a first example, with reference to FIG. 8, *Lin1* discloses that “the **RRC connection setup message** [i.e., downlink RRC message] [is] generated by the first **anchor node** [i.e., central unit] according to the received **RRC connection request message** [i.e., uplink RRC message].” (Ex. 1003, 46:15-17). Thus, the person of ordinary skill in the art would have understood that the **RRC connection setup message** [i.e., downlink RRC message] is in response to the **RRC connection request message** [i.e., uplink RRC message].

129. In a second example, with reference to FIG. 7, *Lin1* discloses an RRC message processing method that includes “sending, by the first **serving node** [i.e., access unit], the **RRC message** [i.e., uplink RRC message] to a first **anchor node** [i.e., central unit], so that . . . the **anchor node** [i.e., central unit] processes the **RRC message** [i.e., uplink RRC message].” (Ex. 1003, 42:9-13). *Lin1* discloses that the method includes “receiving, by the first **serving node** [i.e., access unit], the **RRC**

message [i.e., downlink RRC message] sent by the first *anchor node* [i.e., central unit].” (Ex. 1003, 42:14-16). *Lin1*’s disclosure of receiving an *RRC message* (i.e., downlink RRC message) from an *anchor node* (i.e., central unit) after sending the *anchor node* (i.e., central unit) a previous *RRC message* (i.e., uplink RRC message) would have suggested to the person of ordinary skill in the art that the received *RRC message* (i.e., downlink RRC message) is in response to the previously sent *RRC message* (i.e., uplink RRC message).

Claim 1, Element [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.

130. *Lin1* discloses claim element [1.c].

131. *Lin1* discloses multiple different examples of transmitting the downlink RRC message to the terminal.

132. In a first example, with reference to FIG. 8 (reproduced and annotated below), *Lin1* discloses “sending, by the first *serving node* [i.e., access unit], [an] *RRC connection setup message* [i.e., downlink RRC message] to the first *UE* [i.e., terminal].” (Ex. 1003, 46:15-17). As described above, the person of ordinary skill in the art would have understood from this disclosure that *Lin1*’s *RRC connection setup message* is a downlink RRC message transmitted to a *UE* (i.e., terminal).

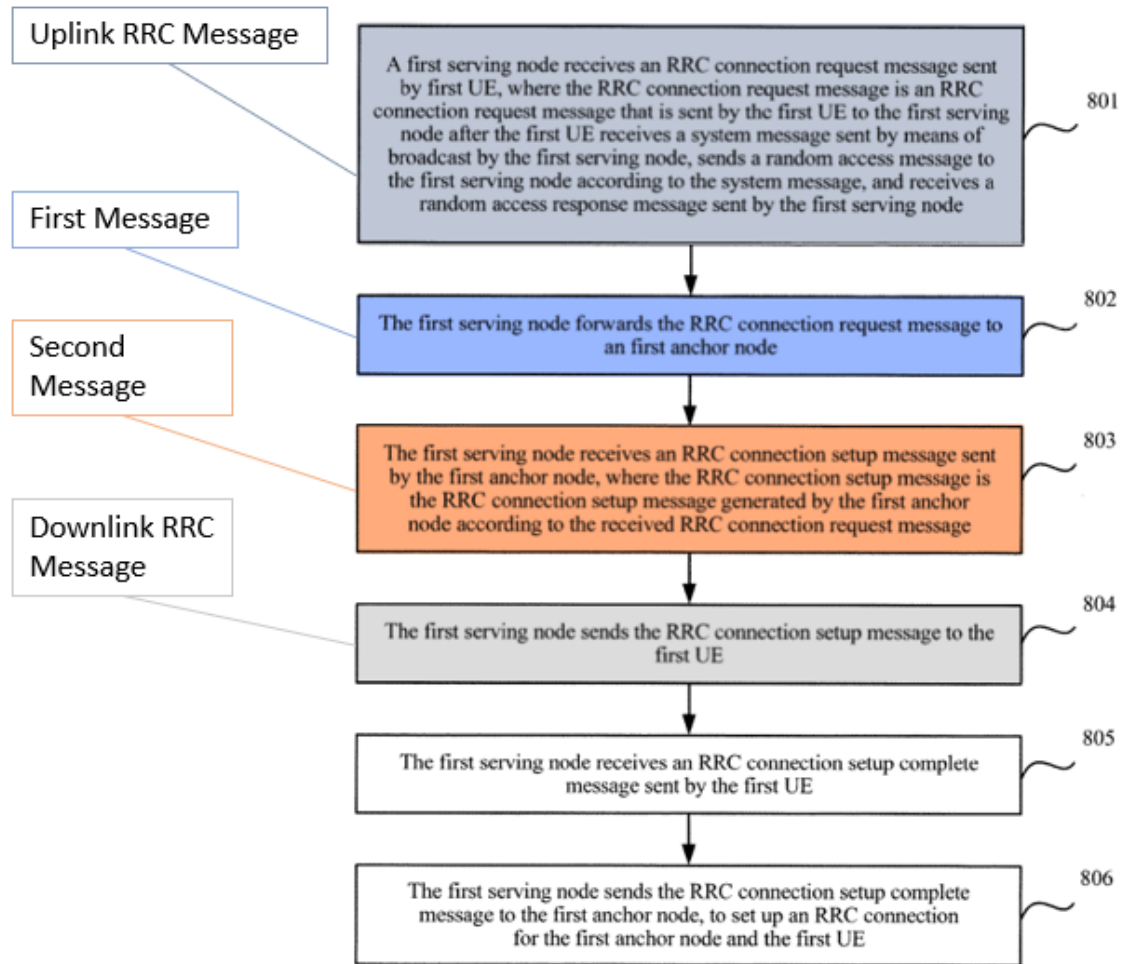
Ex. 1003, FIG. 8

FIG. 8

133. In a second example, with reference to FIG. 7, *Lin1* discloses “processing, by a first radio link control (RLC) layer entity of the first *serving node* [i.e., access unit], the *RRC message* [i.e., downlink RRC message] carried by the SRB1 and then sending a processed message to the first *UE* [i.e., terminal].” (Ex. 1003, 42:16-18). As explained above, *Lin1*’s disclosure of processing an *RRC*

message (i.e., downlink RRC message) with an RLC layer entity would have confirmed to the person of ordinary skill in the art that the ***RRC message*** (i.e., downlink RRC message) is a downlink RRC message. Thus, it would have been obvious to the person of ordinary skill in the art, in view of the above disclosure, that the ***serving node*** (i.e., access unit) transmit a downlink RRC message to the ***UE*** (i.e., terminal).

134. *Lin1* also discloses radio bearer identification information-included in the first message and the second message. While the '932 patent does not provide a definition of radio bearer identification information, it provides various examples of what radio bearer identification information could include. For example, the '932 patent refers to “bearer identification information of the signaling radio bearer (i.e. SRB1)”, (Ex. 1003, 15:58-61), “bearer identification information of the signaling radio bearer (DRB or SRB2)”, (Ex. 1003, 17:46-50), “bearer identification information (e.g. UP SRB1 tunnel identification information (TEID)) may be transferred”, (Ex. 1003, 17:57-67), and “radio bearer context (an E-RAB ID, E-RAB QoS parameters, a transport layer address, and a GTP-TEID).” (Ex. 1003, 19:16-24). Moreover, Claim 6 confirms that “the first message includes SRB1 signaling radio bearer identification information.” In view of these examples and as I demonstrate below, *Lin1* discloses radio bearer identification information.

135. Specifically, *Lin1* discloses “in order that the **serving node** [i.e., access unit] and the **anchor node** [i.e., central unit] can identify an SRB type of a received RRC message, a transmitter may send indication information to a receiver, and indicate the SRB type of the RRC message to the receiver by using the indication information, for example, indicate whether the RRC message is specifically an RRC message carried by the SRB1 or an RRC message carried by the SRB2. In the embodiment of the present invention, the indication information may be carried when the **RRC message** [i.e., uplink or downlink RRC messages] is being sent. Specifically, the indication information may be carried in the **RRC message** [i.e., uplink or downlink RRC messages], or the indication information may be carried in a **control plane signaling message** [i.e., first or second messages] that carries the **RRC message** [i.e., uplink or downlink RRC messages], or the indication information may be sent separately after the **RRC message** [i.e., uplink or downlink RRC messages] is sent.” (Ex. 1003, 42:21-30). A person of ordinary skill in the art would have understood, and *Lin1* confirms, an SRB refers to a radio bearer. (*see e.g.*, Ex. 1003, 2:12-15, 30:6-9, and 64:6-9). Thus, a person of ordinary skill in the art would have understood that *Lin1*’s indication information *identifies a type of radio bearer* (i.e., SRB type) of an **RRC message** (i.e., uplink or downlink RRC messages).

136. *Lin1* further discloses, and the person of ordinary skill in the art would have known, that “different processing methods are used to process [an] **RRC**

message [i.e., uplink or downlink RRC messages] according to different SRB types of the RRC message.” (Ex. 1003, 24:20-25). The person of ordinary skill in the art would have known, and *Lin1* confirms, that the SRB type impacts the processing of both a *serving node* (e.g., access unit) and an *anchor node* (e.g., central unit) that “jointly process [an] RRC message.” (Ex. 1003, 24:20-25). Due to the known impact of the SRB type on the processing of *RRC messages* (i.e., uplink or downlink messages) by a *serving node* (e.g., access unit) and an *anchor node* (e.g., central unit), the person of ordinary skill in the art would have understood that the claimed radio bearer identification information-included in the first and second messages between the access unit and the central unit includes *Lin1*’s *indication information* that *identifies a type of radio bearer* (i.e., radio bearer identification information).

137. Finally, as described above, *Lin1* discloses that “control plane interface signaling is used between the *serving node* [i.e., access unit] and the *anchor node* [i.e., central unit]” in which the *serving node* (i.e., access unit) and the anchor node (i.e., central unit) communicate using *control plane signaling messages* (i.e., first and second messages) that carry *RRC messages* (i.e., uplink and downlink RRC messages). (Ex. 1003, 42:21-30). *Lin1* discloses that “the *indication information* [i.e., radio bearer identification information] may be carried in a *control plane signaling message* [i.e., first and second messages] that carries the *RRC message* [i.e., uplink and downlink RRC messages]”. (Ex. 1003, 42:28-30). Thus, a person of

ordinary skill in the art would have understood that *Lin1*'s **indication information** [i.e., radio bearer identification information] is included in *Lin1*'s **control plane signaling messages** [first message and the second message].

138. *Lin1* discloses multiple additional examples of **indication information** (i.e., radio bearer identification information) included in the first message and a second message. As I will describe in additional detail below, the indication information is used by *Lin1* to distinguish radio signal bearers.

139. In a first example, with reference to FIG. 8, *Lin1* discloses that “the first **serving node** [i.e., access unit] may send first **indication information** [i.e., radio bearer identification information] when forwarding the **RRC connection request message** [i.e., uplink RRC message] to the first **anchor node** [i.e., central unit].” (Ex. 1003, 46:1-5). *Lin1* further discloses that the “first indication information may be an explicit signaling indication or a particular message name” for a SRB0RRCTransfer or InitialRRCTransfer message. (Ex. 1003, 46:4-6). As described above, the SRB0RRCTransfer and InitialRRCTransfer messages are examples of **control plane signaling messages** (i.e., first messages) that include the **RRC connection request message** (i.e., uplink RRC message). (*see supra*, §IX.A, Claim 1, Element [1.a]). Thus, a person of ordinary skill in the art would have understood that the **indication information** [i.e., radio bearer identification information], such as the explicit signaling indication or a particular message name

for a SRB0RRCTransfer or InitialRRCTransfer message, is radio bearer identification information-included in the first message.

140. With reference to FIG. 8, *Lin1* also discloses that “first ***anchor node*** [i.e., central unit] may include the ***indication information*** [i.e., radio bearer identification information] in a message when sending the ***RRC connection setup message*** [i.e., downlink RRC message], and specifically, may include the ***indication information*** [i.e., bearer identification information] in the ***RRC connection setup message*** [i.e., downlink RRC message] or include the ***indication information*** [i.e., bearer identification information] in a ***control plane signaling message*** [i.e., a second message] that carries the ***RRC connection setup message*** [i.e., downlink RRC message].” (Ex. 1003, 46:18-22). The person of ordinary skill in the art would have understood that the ***indication information*** [i.e., bearer identification information] in a ***control plane signaling message*** [i.e., a second message] that carries the ***RRC connection setup message*** [i.e., downlink RRC message] is radio bearer identification information-included in the second message.

141. In a second example, with reference to FIG. 7, *Lin1* discloses that “***indication information*** [i.e., bearer identification information] may be carried in a ***control plane signaling message*** [i.e., a first or second message] that carries the ***RRC message*** [i.e., uplink or downlink RRC messages].” (Ex. 1003, 42:24-29). Thus, the person of ordinary skill in the art would have understood that *Lin1*’s

indication information (i.e., radio bearer identification information) that may be carried in a *control plane signaling message* [i.e., a first or second message] that carries the *RRC message* [i.e., uplink and downlink RRC message] is radio bearer identification information-included in the first message and second message.

142. *Lin1* discloses multiple ways 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. In this regard, the person of ordinary skill in the art would have understood that distinguish 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. More particularly, the person of ordinary skill in the art would have understood that an *RRC message* [i.e., uplink or downlink RRC message] may be carried by one of three types of signaling radio bearers (SRBs), including an SRB0, an SRB1, and an SRB2. (*see supra*, §VI. Technical Background). Thus, a person of ordinary skill in the art would have understood that identifying an SRB type of an *RRC message* (i.e., uplink or downlink RRC message) would distinguish the signaling radio bearer of the *RRC message* (i.e., uplink or downlink RRC message) *from other types of signaling radio bearers (SRBs)*. Additionally, the person of ordinary skill in the art would have known, and *Lin1* confirms, that “different processing methods are used to process [an] *RRC message* [i.e., uplink or downlink RRC message] according to different

SRB types of the **RRC message** [i.e., 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). Referring to multiple different RRC message processing functions, including RRC connection, RRC connection re-setup, and others, *Lin1* explains that “indication 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 and the first anchor node 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). Based on this disclosure, a person of ordinary skill in the art would have understood that processing an **RRC message** (i.e., uplink or downlink RRC message) according to a particular SRB type would include distinguishing the signaling radio bearer of the **RRC message** (i.e., uplink or downlink RRC message) *from other types of signaling radio bearers (SRBs).*

143. A person of ordinary skill in the art would have therefore concluded that either identifying an SRB type of an **RRC message** (i.e., uplink or downlink RRC message) or processing an **RRC message** (i.e., uplink or downlink RRC message) according to the identified SRB type would include distinguishing signaling radio bearers based on the indication information stored therein. As shown below, *Lin1* discloses both concepts. Specifically, *Lin1* discloses that the **serving**

node (i.e., access unit) and the *anchor node* (i.e., central unit) both identify an SRB type of an *RRC message* (i.e., uplink or downlink RRC message) and process an *RRC message* (i.e., uplink or downlink RRC message) according to the SRB type of the *RRC message* (i.e., uplink and downlink RRC message) based on *indication information* (i.e., radio bearer identification information) in the first message and the second message.

144. First, *Lin1* discloses an access unit and a central unit that identify an SRB type of an RRC message based on radio bearer identification information in a first message and a second message.

145. Specifically, *Lin1* discloses that the “*serving node* [i.e., access unit] may send *indication information* [i.e., bearer identification information] when forwarding the *RRC connection request message* [i.e., uplink RRC message] to the first *anchor node* [i.e., central unit]” to “indicate that the *RRC connection request message* [i.e., uplink RRC message] is an RRC message carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 46:1-8). *Lin1* also discloses that “the first *anchor node* [i.e., central unit] identif[ies], according to the *indication information* [i.e., bearer identification information], that the *RRC message* (i.e., uplink RRC message) is carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 43:10-13). Thus, a person of ordinary skill in the art would have understood that the *serving node* (i.e., access unit) *indicates* an SRB type of the *RRC connection request*

message (i.e., uplink RRC message) to an *anchor node* (i.e., central unit) and the *anchor node* (i.e., central unit) *identifies* the SRB type of the *RRC connection request message* (i.e., uplink RRC message) based on *indication information* (i.e., bearer identification information). As explained above, *Lin1* discloses forwarding the *RRC connection request message* (i.e., uplink RRC message) in a *control plane signaling message* (i.e., first message) carrying the *RRC connection request message* (i.e., uplink RRC message). Thus, a person of ordinary skill in the art would have understood that the *indication information* (i.e., bearer identification information) used to indicate/identify the SRB type is in the *control plane signaling message* (i.e., first message).

146. *Lin1* also discloses that “the first *anchor node* [i.e., central unit] may include the *indication information* [i.e., radio bearer identification information] in a message when sending the *RRC connection setup message* [i.e., downlink RRC message] . . . so that the first *serving node* [i.e., access unit] identifies, according to the *indication information* [i.e., radio bearer identification information], that the *RRC connection setup message* [i.e., downlink RRC message] is the RRC message carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 46:18-25). *Lin1* further discloses that the “*serving node* [i.e., access unit] identifies, according to the *indication information* [i.e., bearer identification information], that the *RRC connection setup message* [i.e., downlink RRC message] is the RRC message

carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 46:23-25). Thus, a person of ordinary skill in the art would have understood that the *anchor node* (i.e., central unit) *indicates* an SRB type of the *RRC connection setup message* (i.e., downlink RRC message) to a *serving node* (i.e., access unit) and the *serving node* (i.e., access unit) *identifies* the SRB type of the *RRC connection setup message* (i.e., downlink RRC message) based on *indication information* (i.e., bearer identification information). As explained above, *Lin1* discloses forwarding the *RRC connection setup message* (i.e., downlink RRC message) in a *control plane signaling message* (i.e., second message) carrying the *RRC connection setup message* (i.e., downlink RRC message). Thus, a person of ordinary skill in the art would have understood that the *indication information* (i.e., bearer identification information) used to indicate/identify the SRB type is in the *control plane signaling message* (i.e., second message).

147. Second, *Lin1* discloses an access unit and a central unit that process an RRC message according to an SRB type identified by radio bearer identification information in a first message and a second message. For example, *Lin1* discloses that “[e]ach time an *RRC message* [e.g., uplink or downlink RRC message] is sent between the first *anchor node* [i.e., central unit] and the first *serving node* [i.e., access unit], whether the RRC message is an RRC message carried by an SRB0 [i.e., a first of three SRB types], an RRC message carried by an SRB1 [i.e., a second of

three SRB types], or an RRC message carried by an SRB2 [i.e., a third of three SRB types] needs to be indicated, so that a receiver performs processing.” (Ex. 1003, 47:30-48:3). As separately explained for the *serving node* (i.e., access unit) and the *anchor node* (i.e., central unit) below, both *Lin1*’s *serving node* (i.e., access unit) and *anchor node* (i.e., central unit) perform different processing according to the SRB type indicated for an RRC message.

148. With respect to the processing performed by the *serving node* (i.e., access unit), *Lin1* discloses that a “RRC message [that] is carried by the SRB0 [i.e., a first of three SRB types] [is] process[ed] by using an RRC layer entity of the first *serving node* [i.e., access unit],” “a first RLC layer entity [is] used to process an RRC message carried by the SRB1 [i.e., a second of three SRB types], and a second RLC layer entity [is] used to process an RRC message carried by the SRB2 [i.e., 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). Based on this disclosure, the person of ordinary skill in the art would have understood that *Lin1*’s *serving node* (i.e., access unit) processes an *RRC message* (e.g., uplink or downlink RRC message) using different processing entities (i.e., RRC layer entity, first RLC layer entity, and second RLC entity) according to a specific SRB type identified by the *indication information* (i.e., radio bearer identification information) within a message.

149. With respect to the processing performed by the **anchor node** (i.e., central unit), *Lin1* discloses that the first **anchor node** (i.e., central unit) processes an RRC message carried by an SRB0 (i.e., a first of three SRB types) using an RRC layer entity, an RRC message carried by an SRB1 (i.e., a second of the three SRB types) using a first PCDP layer, and an RRC message carried by an SRB1 (i.e., 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). Based on this disclosure, the person of ordinary skill in the art would have understood that *Lin1*'s **anchor node** (i.e., central unit) processes an **RRC message** (e.g., uplink or downlink RRC message) using different processing entities (i.e., RRC layer entity, first PCDP layer entity, and second PCDP entity) according to a specific SRB type identified by the **indication information** (i.e., radio bearer identification information) within a message.

Dependent Claim 2

Claim 2, Element [2.pre]: The method of claim 1

150. As set forth above, *Lin1* renders obvious all of the claim elements of claim 1. Thus, *Lin1* renders obvious claim element [2.pre].

Claim 2, Element [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

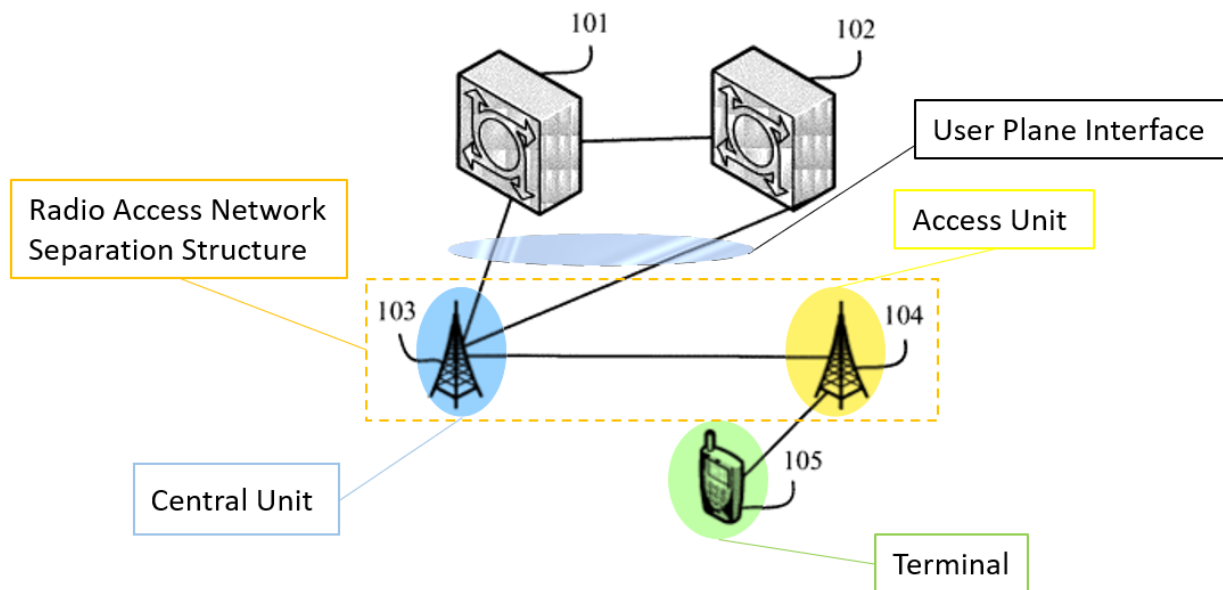
151. *Lin1* discloses claim element [2.a].

152. *Lin1* discloses the access unit comprises a node configured to provide an RLC function, a MAC function, and a PHY function. Specifically, *Lin1* discloses a **serving node** (i.e., 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). The person of ordinary skill in the art 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. Thus, the person of ordinary skill in the art would have understood that the **serving node** (i.e., access unit) comprises a node configured to provide an RLC function, a MAC function, and a PHY function.

153. *Lin1* discloses that the RLC function, the MAC function, and the PHY function are configured for transmission of user plane data. Specifically, with reference to FIG. 1, (reproduced and annotated below), *Lin1* discloses “an S1-U user plane interface [is] established between the MME 101 in a core network and the **anchor node 103** [i.e., central unit] and between the SGW 102 in the core network and the **anchor node 103** [i.e., central unit]. The **anchor node 103** [i.e., central unit] and the **serving node 104** [i.e., access unit] are connected by using a signal tunnel (backhaul) to establish an interface. The interface may be specifically an enhanced X2 interface or may be an interface of another type. A radio link connection is set up between the **UE 105** [i.e., terminal] and the **serving node 104** [i.e., access unit].”

(Ex. 1003, 27:10-17). A person of ordinary skill in the art would have understood that an “S1-U user plane interface” is an interface used to transmit user plane data. (see Ex. 1010, Abbreviations and Acronyms, p. xxvii). Thus, the person of ordinary skill in the art would have understood the RLC function, the MAC function, and the PHY function of *Lin1*’s **serving node** (i.e., access unit) are configured for transmission of user plane data.

Ex. 1003, FIG. 1



154. Thus, *Lin1* discloses claim element [2.a].

Claim 2, Element [2.b]: wherein the central unit comprises a node configured to provide a PDCP function, for transmission of the user plane data.

155. *Lin1* discloses claim element [2.b].

156. *Lin1* discloses the central unit comprises a node configured to provide a PDCP function, for transmission of the user plane data. Specifically, *Lin1* discloses an ***anchor node*** (i.e., 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). The person of ordinary skill in the art would have understood that the node that includes these entities, first and second PDCP, *would* perform or otherwise provide a PDCP function. As discussed above, the ***anchor node*** (i.e., central unit) is connected to an S1-U user plane interface with an MEE and SGW through which user plane data is transmitted. Thus, the person of ordinary skill in the art would have understood that the ***anchor node*** (i.e., central unit) is a node configured to provide a PDCP function, for transmission of the user plane data.

157. Thus, *Lin1* discloses claim element [2.b].

Dependent Claim 4

Claim 4, Element [4.pre]: The method according to claim 1,

158. As set forth above, *Lin1* renders obvious all of the claim elements of claim 1. Thus, *Lin1* renders obvious claim element [4.pre].

Claim 4, Element [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.

159. *Lin1* renders obvious claim element [4.a].

160. First, *Lin1* discloses a second message that comprises a RRC connection setup message. (*see supra*, §IX.A, Claim 1, Element [1.b]). As such, *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.

161. Second, *Lin1* discloses a second message that comprises signaling radio bearer identification information. (*see supra*, §IX.A, Claim 1, Element [1.c]). As such, *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*.

162. Third, *Lin1* renders obvious a second message that comprises a C-RNTI. Specifically, *Lin1* discloses that the ***serving node*** (i.e., access unit) may “include a CRNTI and/or an X2AP ID of the ***UE*** (i.e., terminal) to the ***RRC connection request message*** [i.e., uplink RRC message].” (Ex. 1003, 46:9-14). *Lin1* also discloses that the “***serving node*** [i.e., access unit] receives an ***RRC connection setup message*** [i.e., downlink RRC message] sent by the first ***anchor node*** [i.e., central unit], where the ***RRC connection setup message*** [i.e., downlink RRC message] is the ***RRC connection setup message*** [i.e., downlink RRC message]

generated by the first **anchor node** [i.e., central unit] according to the received **RRC connection request message** [i.e., uplink RRC message].” (Ex. 1003, 46:15-17). *Lin1*’s disclosure of generating the **RRC connection setup message** [i.e., downlink RRC message] *according to* an **RRC connection request message** [i.e., uplink RRC message] that includes a CRNTI would have suggested to the person of ordinary skill in the art that the **RRC connection setup message** [i.e., downlink RRC message] also includes the CRNTI.

163. Moreover, *Lin1* further discloses “sending, by the first **serving node** [i.e., access unit], the RRC connection setup message to the first **UE** [i.e., terminal].” (Ex. 1003, 46:26-27). The person of ordinary skill in the art would have understood that a CRNTI is used to identify a **UE** [i.e., terminal] for transmission of a downlink message. (*see* Ex. 1009, 8). *Lin1*’s disclosure of sending the RRC connection setup message to a **UE** (i.e., terminal) would have motivated the person of ordinary skill in the art to include the CRNTI in the **RRC connection setup message** [i.e., downlink RRC message] or a **signaling control message** [i.e., second message] carrying the **RRC connection setup message** [i.e., downlink RRC message]. 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*.

164. Thus, *Lin1* renders obvious claim element [4.a].

Independent Claim 8

Claim 8, Element [8.pre]: An access unit for configuring a wireless connection of a terminal, comprising:

165. To the extent that element [1.pre] is found to be limiting, *Lin1* discloses an access unit for configuring a wireless connection of a terminal. Specifically, *Lin1* discloses a ***serving node*** that provides the same functionality as the claimed access unit. (*see supra*, §IX.A, Claim 1, Element [1.pre]). *Lin1* also discloses ***user equipment (UE)*** that provides the same functionality as the claimed terminal. (*see supra*, §IX.A, Claim 1, Element [1.pre]). Finally, *Lin1* discloses multiple examples of a ***serving node*** (i.e., access unit) that configures a wireless connection of a ***UE*** (i.e., terminal). (*see supra*, §IX.A, Claim 1, Element [1.pre]).

Claim 8, Element [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

166. *Lin1* discloses claim element [8.a].

167. *Lin1* discloses an ***anchor node*** that provides the same functionality as the claimed central unit. (*see supra*, §IX.A, Claim 1, Element [1.a]).

168. *Lin1* discloses an access unit that includes a transmitter configured to transmit a first message to a central unit. Specifically, with reference to FIG. 5 (reproduced and annotated below), *Lin1* discloses a ***serving node*** (i.e., access unit) that includes a transmitter 501 and a receiver 502. (Ex. 1003, 40:8-22).

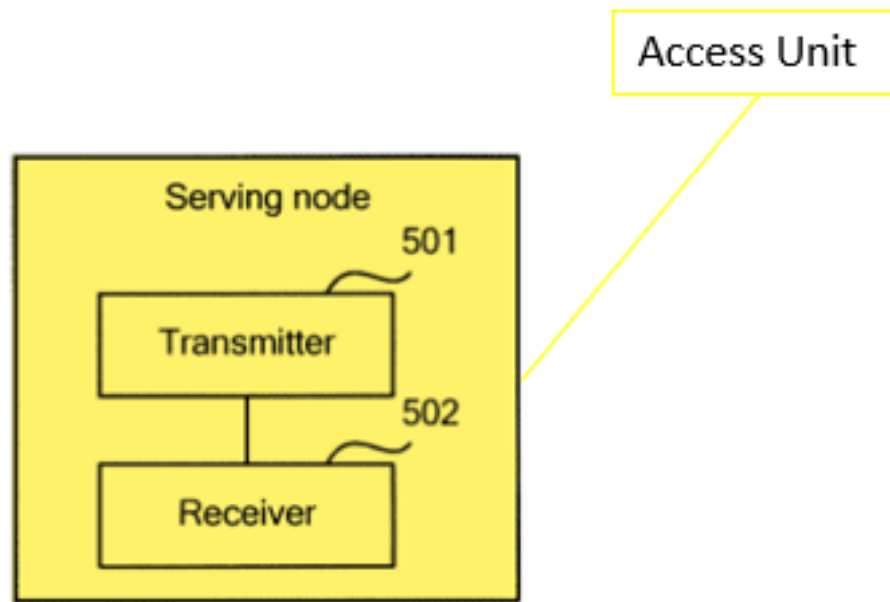


FIG. 5

169. *Lin1* discloses that “transmitter 510 is configured to: send the RRC message received by the receiver 502 to the first *anchor node* [i.e., central unit]”. (Ex. 1003, 40:8-22). Thus, *Lin1* discloses a transmitter configured to transmit a first message to a central unit.

170. *Lin1* discloses an uplink RRC message received from a terminal. Specifically, *Lin1* discloses an *RRC connection request message* that is a defined type of uplink RRC message received from a *UE* (i.e., terminal). (*see supra*, §IX.A, Claim 1, Element [1.a]).

171. *Lin1* discloses several examples of a first message that includes an uplink RRC message received from a terminal. Specifically, *Lin1* discloses a SRB0RRCTransfer, an InitialRRCTransfer, and a control plane signaling message that each include an ***RRC connection request message*** (i.e., uplink RRC message) and are transmitted to an ***anchor node*** (i.e., central unit). (*see supra*, §IX.A, Claim 1, Element [1.a]).

Claim 8, Element [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

172. *Lin1* discloses claim element [8.b1].

173. *Lin1* discloses an access unit that includes a receiver. Specifically, with reference to FIG. 5 (reproduced and annotated below), *Lin1* discloses a ***serving node*** (i.e., access unit) that includes a transmitter 501 and a receiver 502. (Ex. 1003, 40:8-22).

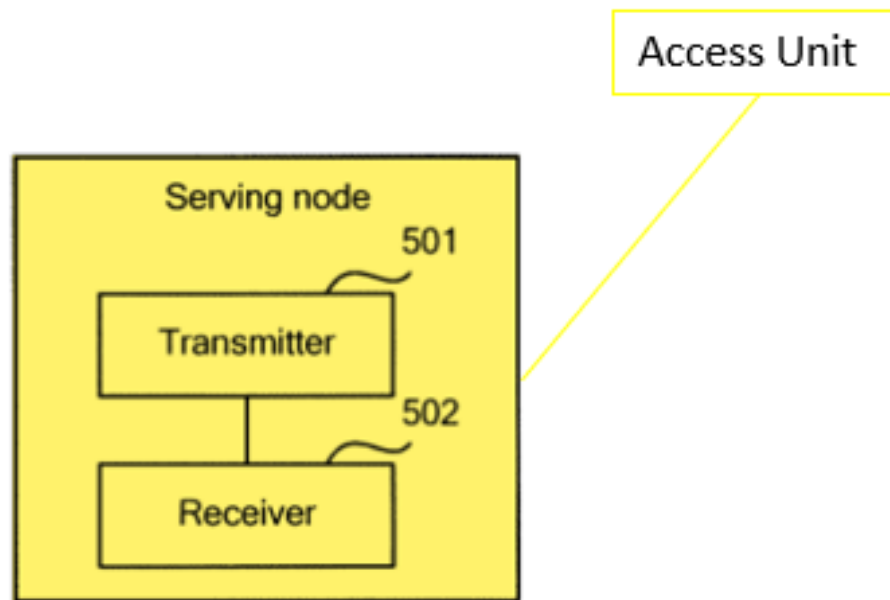


FIG. 5

174. *Lin1* discloses multiple different examples of receiving a second message from the central unit that includes a downlink RRC message in response to the uplink RRC message from the terminal. Specifically, *Lin1* discloses ***RRC connection setup message*** that is a defined type of downlink RRC message. (*see supra*, §IX.A, Claim 1, Element [1.b]). *Lin1* discloses receiving a control plane signaling message that includes an ***RRC connection setup message*** (i.e., downlink RRC message) that is in response to an ***RRC connection request message*** (i.e., uplink RRC message). (*see supra*, §IX.A, Claim 1, Element [1.b]).

Claim 8, Element [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.

175. *Lin1* discloses claim element [8.b2].

176. As described above, *Lin1* discloses a ***serving node*** (i.e., access unit) that includes a transmitter. (Ex. 1003, 40:8-22).

177. *Lin1* also discloses multiple different examples of the ***serving node*** (i.e., access unit) transmitting a downlink RRC message to a terminal. Specifically, *Lin1* discloses sending an ***RRC connection setup message*** (i.e., downlink RRC message) to a ***UE*** (e.g., terminal). (*see supra*, §IX.A, Claim 1, Element [1.c]).

178. *Lin1* discloses radio bearer identification information included in the first message and the second message. Specifically, *Lin1* discloses ***indication information*** that is included in ***control plane signaling messages*** (i.e., first and second messages) and that a person of ordinary skill in the art would consider radio bearer identification information. (*see supra*, §IX.A, Claim 1, Element [1.c]).

179. *Lin1* also discloses multiple ways 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. Specifically, *Lin1* discloses that the ***serving node*** (i.e., access unit) and the ***anchor node*** (i.e., central unit) distinguish signaling radio bearers by either identifying an

SRB type of an **RRC message** (i.e., uplink and downlink RRC message) or processing an **RRC message** (i.e., uplink and downlink RRC message) according to the SRB type of the **RRC message** (i.e., uplink and downlink RRC message) based on **indication information** (i.e., radio bearer identification information) in the first message and the second message. (*see supra*, §IX.A, Claim 1, Element [1.c]).

Dependent Claim 9

Claim 9, Element [9.pre]: The access unit according to claim 8,

180. As set forth above, *Lin1* discloses all of the claim elements of claim 8.

Thus, *Lin1* discloses [9.pre].

Claim 9, Element [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

181. *Lin1* discloses an 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. Specifically, *Lin1* discloses a **serving node** (i.e., access unit) that provides an RLC function, a MAC function, and a PHY function that are configured for transmission of user plane data. (*see supra*, §IX.A, Claim 2, Element [2.a]).

Claim 9, Element [9.b]: wherein the central unit comprises a node configured to provide a PDCP function, for transmission of the user plane data.

182. *Lin1* discloses a central unit that comprises a node configured to provide a PDCP function, for transmission of the user plane data. Specifically, *Lin1* discloses an ***anchor node*** (i.e., central unit) that performs or otherwise provides a PDCP function, for transmission of user plane data. (*see supra*, §IX.A, Claim 2, Element [2.b]).

Dependent Claim 11

Claim 11, Element [11.pre]: The access unit according to claim 8,

183. *Lin1* discloses claim element [11.pre]. As set forth above, *Lin1* discloses all of the claim elements of claim 8. Thus, *Lin1* discloses [11.pre].

Claim 11, Element [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.

184. *Lin1* discloses claim element [11.a].

185. First, *Lin1* discloses a second message that comprises a RRC connection setup message. (*see supra*, §IX.A, Claim 1, Element [1.b]). As such, *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.

186. Second, *Lin1* discloses a second message that comprises signaling radio bearer identification information. (*see supra*, §IX.A, Claim 1, Element [1.c]). As such, *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*.

187. Third, *Lin1* would have motivated the person of ordinary skill in the art to include a CRNTI in a second message. (*see supra*, §IX.A, Claim 4, Element [4.a]). As such, 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*.

B. Ground 2: *Lin1* and *Lin2* Render Obvious Claims 1-2, 4, 8-9, and 11 of the '932 patent.

188. *Lin1* and *Lin2* render obvious claims 1-2, 4, 8-9, and 11 of the '932 patent.

Motivation to Combine Lin1 and Lin2

189. There are numerous reasons why a person of ordinary skill in the art would have been motivated to combine *Lin1* and *Lin2*. First, both *Lin1* and *Lin2* relate to the field of communications. (Ex. 1003, 1:6-7; Ex. 1005, 3:4-5). Both are directed to interface establishing techniques 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). Moreover, *Lin1* and *Lin2* both improve existing radio communications systems by splitting an RRC function between two network nodes. (Ex. 1003, 1:11-12 and 27:20-22; Ex. 1005, 3:10-11 and 16:30-31). *Lin1*, for example, discloses an architecture in which the RRC function is split between two nodes, including an “anchor node 103 and a serving node 104 that jointly process an RRC message of the UE 105.” (Ex. 1003, 27:18-20). Similarly, *Lin2* discloses an “anchor node [that] is a base station [or] a centralized controller” and a “serving node [that] is a radio transceiver function entity with a scheduling capability.” (Ex. 1005, 19:17-22).

190. The person of ordinary skill in the art in possession of *Lin1* would have recognized the similar architecture of *Lin2* and, based on these similarities, would have been motivated to look to the interface establishing techniques of *Lin2* to inform ways to further increase system capacity. *Lin2*, for example, 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). *Lin2* describes what the person of ordinary skill in the art would have known, 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). As the person of ordinary skill in the art 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). 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).

191. Specifically, with reference to FIGS. 6 (reproduced below), *Lin2* discloses an interface establishing method in which a “first interface between the serving node and the anchor node is established according to the first instruction information, so that a radio connection is established between the serving node and the anchor node through the established first interface.” (Ex. 1005, 33:5-7). The interface establishing method includes receiving an uplink radio resource control (RRC) message from a terminal [at Step S604], sending, through the first interface, the RRC message to the anchor node (at Step S606), receiving, through the first interface, a downlink RRC message from the anchor node (at Step S610), and sending the downlink RRC message to the terminal (at Step S611). (Ex. 1005, 31:24-32:11).

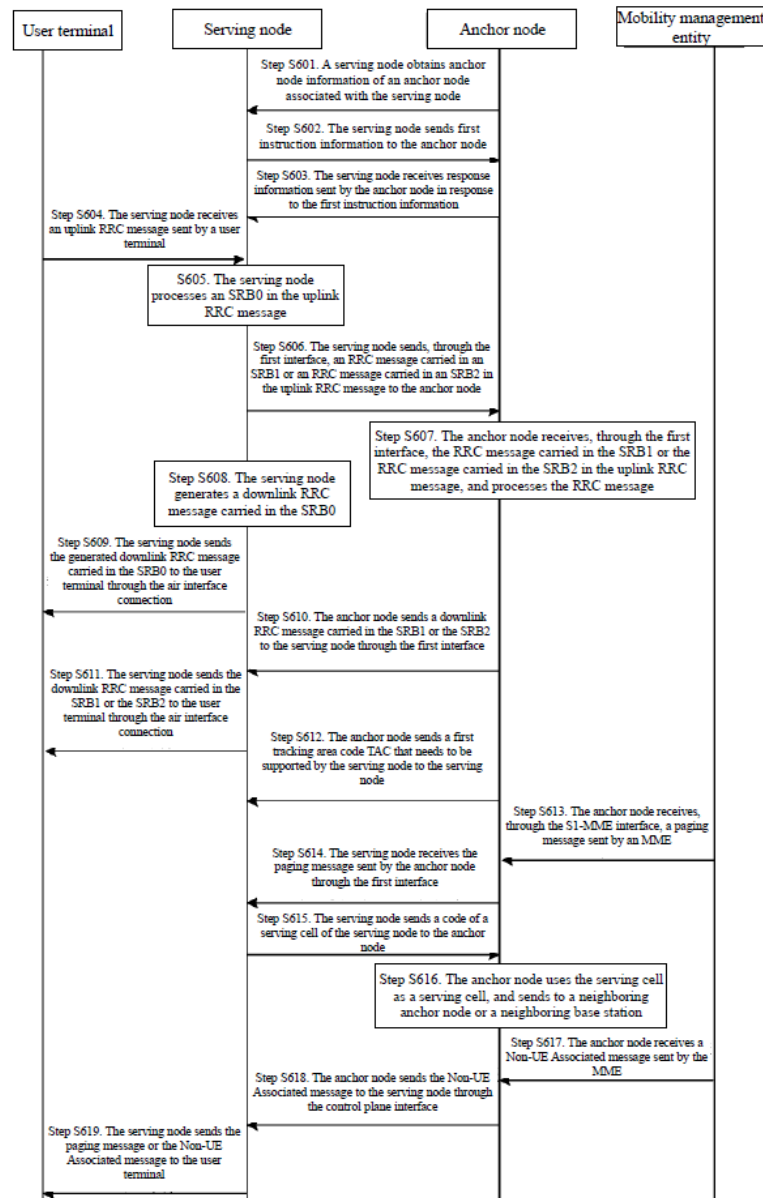


FIG. 6

192. Referencing the interface establishing methods of FIGS. 6, *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). In light of this disclosure, a person of ordinary skill in the art would have been motivated to optimize the network architecture of *Lin1* by implementing the interface establishing methods of *Lin2* to reduce signaling load of a core network caused by switching and, in doing so, increase system capacity.

193. Moreover, the person of ordinary skill in the art would have also 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. Indeed, 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. Given these similarities, the person of ordinary skill in the art 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. Accordingly, a person of ordinary skill in the art would have been motivated to combine, and would have had a reasonable expectation of success in combining, *Lin1* and *Lin2*.

Independent Claim 1

Claim 1, Element [1.pre]: A method of configuring, by an access unit, a wireless connection of a terminal, the method comprising:

194. To the extent that element [1.pre] is found to be limiting, *Lin1* discloses a method of configuring, by an access unit, a wireless connection of a terminal. As I will detail below with reference to each of the claim elements of Claim 1, *Lin1* discloses a serving node that in at least two different examples sends and receives the same messages as the claimed access unit to configure a wireless connection of user equipment (i.e., terminal). A person of ordinary skill in the art would therefore understand that *Lin1*'s serving node is an equivalent to or an obvious variation of the claimed access unit and that *Lin1* discloses at least two different examples of the method of configuring, by an access unit, a wireless connection of a terminal recited by Claim 1.

195. *Lin1*'s ***serving node*** (i.e., access unit) discloses the claimed access unit. *Lin1*'s ***serving node*** (i.e., access unit) is described with reference to FIG. 1 (reproduced and annotated below).³ With reference to FIG. 1, *Lin1* discloses “a

³ The '932 patent claims, *Lin1*, and *Lin2* each use different terms to refer to the same concepts. To help track the correspondences between (i) *Lin1* and *Lin2* terms and (ii) the claim terms, I have used bolding and italics to emphasize *Lin1* and *Lin2* terms and have placed the corresponding claim term in parentheses after each emphasized term.

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). Specifically, *Lin1* discloses an architecture in which the “RRC function is split onto [] two nodes”, including an “anchor node 103 and a **serving node 104** [i.e., access unit] that jointly process an RRC message of the UE 105.” (Ex. 1003, 27:18-22).

Ex. 1003, FIG. 1

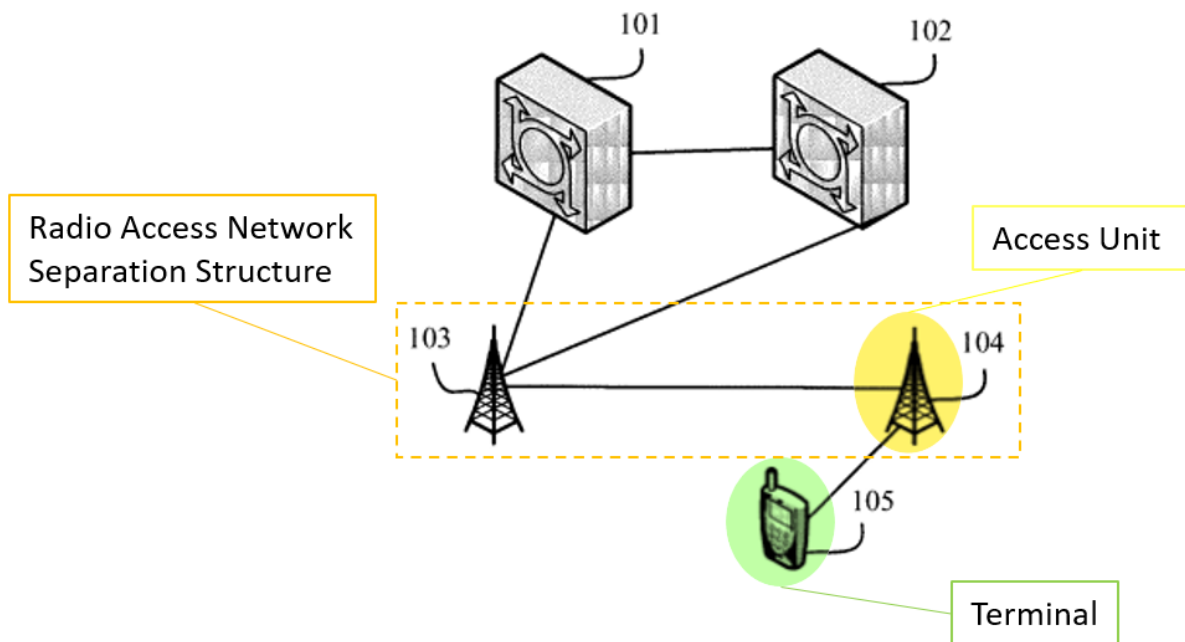


FIG. 1

196. 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; *see also* Claim

2 (“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...”). Similarly, *Lin1* discloses a **serving node 104** (i.e., access unit) that 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). The person of ordinary skill in the art would have understood that the node that includes *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. Thus, the person of ordinary skill in the art would have understood that the **serving node 104** (i.e., access unit) of *Lin1* provides the same functionality as the claimed access unit.

197. *Lin1* also discloses a terminal. The ’932 patent discloses and the person of ordinary skill in the art would have understood that a terminal is an example of “user equipment”. (Ex. 1001, 5:63 – 6:5). *Lin1* discloses “user equipment 105.” (Ex. 1003, 27:1-5). The person of ordinary skill in the art would have understood from this disclosure that *Lin1*’s **user equipment (UE)** (i.e., terminal) is the claimed terminal.

198. Finally, *Lin1* discloses configuring, by an access unit, a wireless connection of a terminal. As described with reference to FIG. 1, the “**serving node 104** [i.e., access unit] may be a network device that provides **a wireless**

communication service for the UE 105 [i.e., terminal].” (Ex. 1003, 1:14-16 and 27:4-6). To do so, “*serving node 104* [i.e., access unit] sets up a connection to the anchor node 103, and the anchor node 103 sets up a connection to the MME 101. The ’932 patent doesn’t provide a definition for the term “configuring;” however 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). The ’932 patent also describes that a “UE [may] configure a radio connection using RLC, MAC, and PHY configuration information of the access unit.” (Ex. 1001, 13:32-56). Based at least on this disclosure, a person of ordinary skill in the art would have understood that *configuring* a wireless connection of a terminal is describing *setting up a connection* between a UE and the MME, as described by *Lin1*. Therefore, the *serving node 104* [i.e., access unit] sets up a connection to the MME 101 by using the anchor node 103.” (Ex. 1003, 27:7-11).

199. Thus, *Lin1* discloses a method of configuring, by an access unit, a wireless connection of a terminal.

Claim 1, Element [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;

200. *Lin1* and *Lin2* render obvious claim element [1.a].

201. *Lin1* discloses at least two different examples of receiving an uplink radio resource control (RRC) message from a terminal.

202. In a first example, *Lin1* discloses that its **serving node** (i.e., access unit) receives an RRC message from a **UE** (i.e., terminal). Specifically, and with reference to FIG. 8 (reproduced and annotated below), *Lin1* discloses that a “first **serving node** [i.e., access unit] receives an RRC connection request message sent by a **UE** [i.e., terminal].” (Ex. 1003, 45:21-25). An RRC connection request is a defined type of uplink RRC message. (*see e.g.*, Ex. 1001, FIG. 16). Thus, the person of ordinary skill in the art would have understood that *Lin1*’s **RRC connection request** (i.e., uplink RRC message) from a **UE** (i.e., terminal) is an uplink radio resource control (RRC) message from a terminal.

203. If it is argued that *Lin1*’s **RRC connection request** is not a defined uplink radio resource control (RRC) message, *Lin1* explicitly discloses that the “RRC connection request is an RRC message.” (Ex. 1003, 46:3-4). *Lin1* also explains that the **UE** (i.e., terminal) and the **serving node** (i.e., access unit) communicate through a “radio link connection [that] is set up between the **UE 105** [i.e., terminal] and the **serving node 104** [i.e., access unit].” (Ex. 1003, 27:15-17). A person of ordinary skill in the art would have understood that an “uplink” is a unidirectional radio link for the transmission of signals from the UE to a Network, such as a network node, or a base station. (*see supra*, §VI. Technical Background). Thus, even if an RRC connection request was not a defined type of uplink RRC message, the person of ordinary skill in the art would have understood that *Lin1*’s

disclosure of an ***RRC connection request*** received over a radio link connection by a ***serving node*** (i.e., access unit) and from a ***UE*** (i.e., terminal) is referring to an uplink RRC message. The person of ordinary skill in the art would therefore have understood that *Lin1*'s ***RRC connection request*** from a ***UE*** (i.e., terminal) is an uplink radio resource control (RRC) message from a terminal.

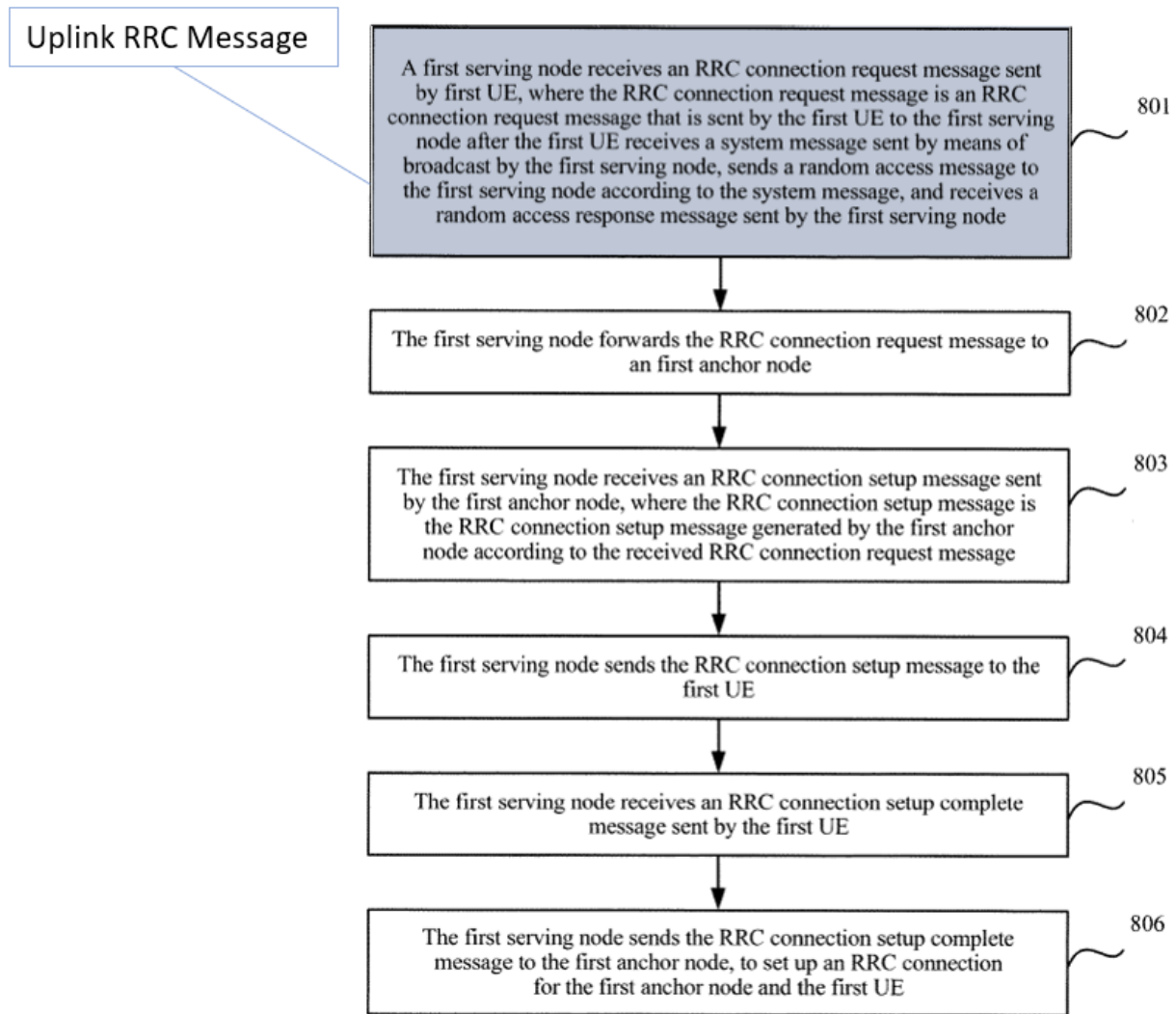


FIG. 8

204. In a second example, *Lin1* also discloses with reference to FIG. 7 (reproduced and annotated below), “receiving, by a first *serving node* [i.e., access unit], an RRC message sent by a first *UE* [i.e., terminal], the RRC message including an RRC message carried by a signaling radio bearer SRB1 or an RRC message

carried by an SRB2.” (Ex. 1003, 41:10-13). As explained above, the person of ordinary skill in the art would have understood that an RRC message received by a *serving node* (i.e., access unit) from a *UE* (i.e., terminal) over a radio link connection is an uplink message. Thus, the person of ordinary skill in the art would have understood that *Lin1*’s *RRC message* received, by a first *serving node* (i.e., access unit) and sent by a first *UE* (i.e., terminal) is an uplink radio resource control (RRC) message from a terminal that used an SRB1. A person of ordinary skill in the art would understand that the uplink radio resource control (RRC) message carried by an SRB1 could include an RRC Connection Setup Complete message, a Security Mode Complete message, a Security Mode Failure message, RRC Connection Reconfiguration Complete message, RRC Connection Re-establishment Complete message, among other commonly defined uplink RRC messages. (*see e.g.*, Ex. 1001, FIG. 16; *see also* Ex. 1010, Chapter 5.2 RRC Connection Management, p. 239, FIG. 5.5).

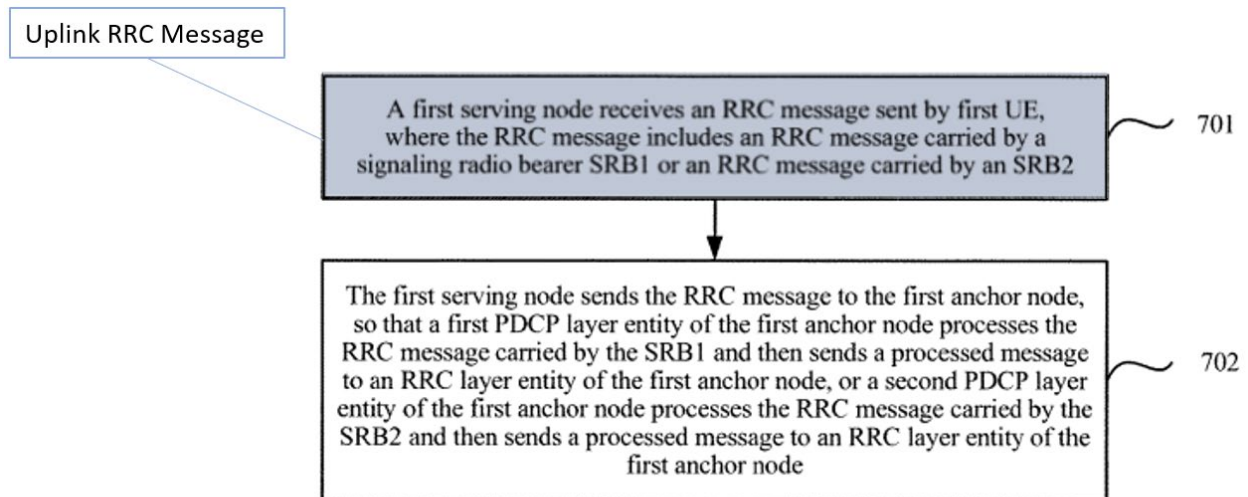
Ex. 1003, FIG. 7

FIG. 7

205. 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 yet another different example of receiving an uplink radio resource control (RRC) message from a terminal. Specifically, *Lin2* discloses, with reference to FIG. 6 (reproduced and annotated below), that a **serving node** (i.e., an access unit) “receives an uplink RRC message sent by a user terminal” (Ex. 1005, 31:24). As is shown below in annotated Figure 6, receiving an uplink radio resource control (RRC) message from a terminal is performed in S604. (Ex. 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. 1005, FIG. 6

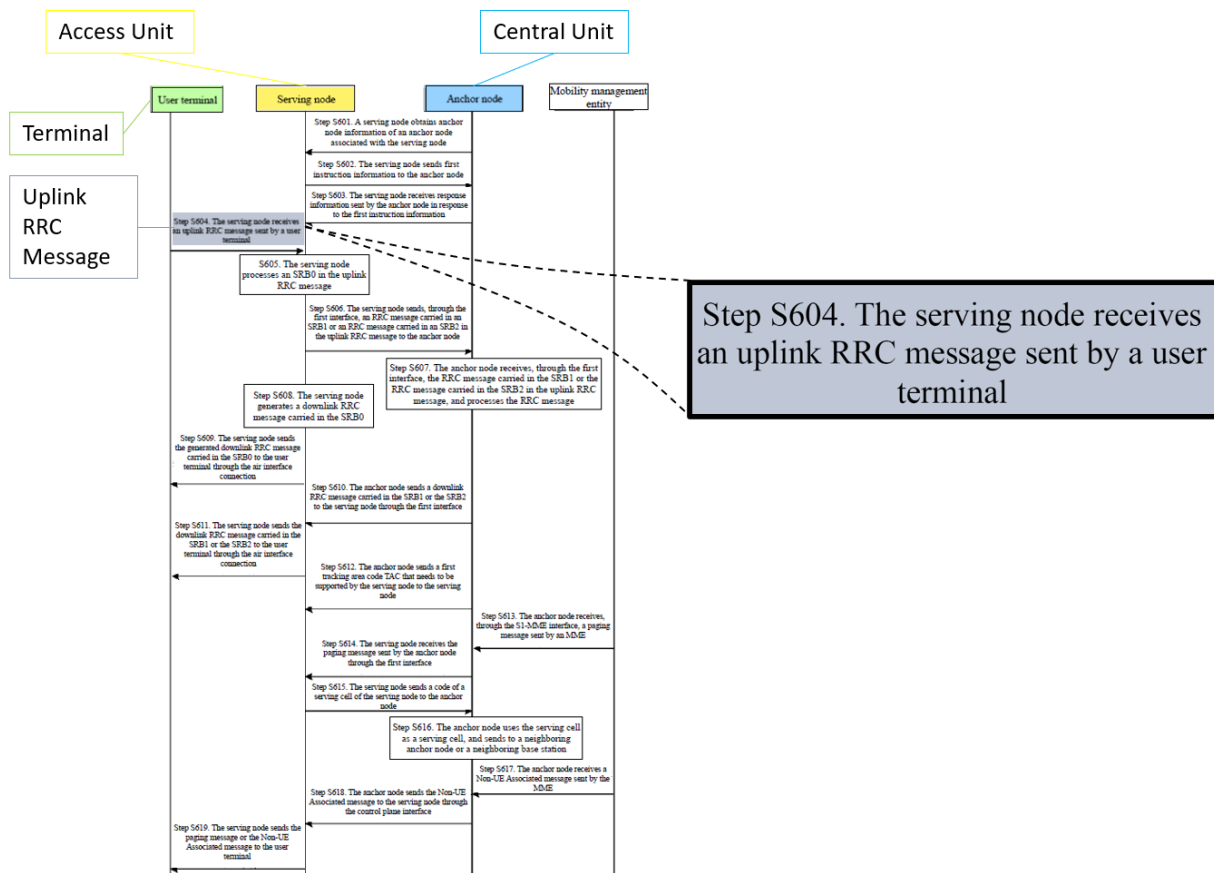


FIG. 6

206. *Lin1* also discloses a central unit. While not explicitly required in Claim 1, the '932 patent describes the “central unit” as a “node providing a *PD*CP function for the transmission of user plane data.” (Ex. 1001, 8:52-54; *see also* Claim 2 (“wherein [] the central unit comprises a node configured to provide a *PD*CP function, for transmission of the user plane data.”)). Similarly, with reference to FIG. 1 (reproduced and annotated below), *Lin1* discloses an architecture in which the “RRC function is split onto [] two nodes”, including an “anchor node 103 and a

serving node 104 [i.e., access unit] that jointly process an RRC message of the *UE 105* [i.e., terminal].” (Ex. 1003, 27:18-22 and 29:16-18). *Lin1* further discloses that the “anchor node 103 may include . . . a *first packet data convergence protocol (PDCP) protocol entity* used to process the RRC message carried by the SRB1, and a second *PDCP protocol entity* used to process the RRC message carried by the SRB2.” (Ex. 1003, 25:22-26). The person of ordinary skill in the art would have understood that the node that includes a *PDCP entity* would provide a *PDCP function* for the transmission of user plane data. Thus, the person of ordinary skill in the art would have understood that the ***anchor node 103*** (i.e., central unit) of *Lin1* provides the same functionality as the claimed central unit.

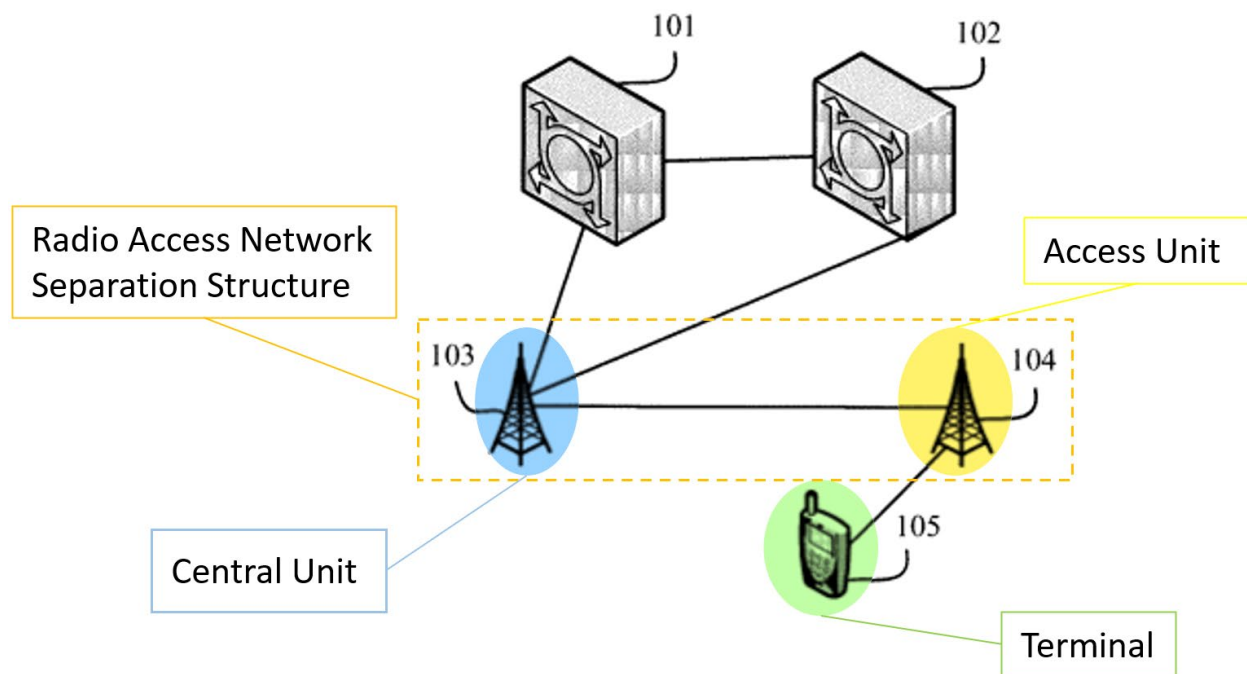


FIG. 1

207. As explained above, the person of ordinary skill in the art would have understood that an uplink message is a message between a *user equipment* (i.e., terminal) and a *network node*. Thus, the person of ordinary skill in the art would have understood that forwarding or otherwise 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*. A person of ordinary skill in the art would have therefore understood that uplink RRC messages are included in other messages, such as control plane messages, for transmission between *network nodes*. Moreover, a person of ordinary skill in the art would have understood, and

the '932 patent confirms, that a common technique for transmitting information, such as uplink or downlink messages, between two network nodes is by encapsulating the information in another message, such as a control plane message, configured for a type of tunneling between the two network nodes. (Ex. 1001, 11:14-26 (stating that “[f]or efficient data transfer, the CU and AU may be connected via a transport network [that] is configured by GTP tunneling . . . based on header encapsulation”); see Ex. 1010, Chapter 3 E-UTRAN and EPS Protocol Structure, p. 123 (describing an “encapsulation process” in which “headers/sub-headers and padding bits” are added “to make it possible to get data from a source to a destination”); 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). Indeed, for each of the uplink RRC messages identified above, *Lin1* discloses multiple different examples of including (or encapsulating) the uplink RRC message into a first message and transmitting the first message to a central unit.

208. In a first example, with reference again to FIG. 8 (reproduced and annotated below), *Lin1* discloses “forwarding, by the **serving node** [i.e., access unit], the **RRC connection request message** [i.e., uplink RRC message] to a first **anchor node** [i.e., central unit].” (Ex. 1003, 45:29-30). *Lin1* also discloses that “control plane interface signaling is used between the **serving node** [i.e., access unit] and the **anchor node** [i.e., central unit]” in which the **serving node** (i.e., access unit) and the

anchor node (i.e., central unit) communicate using “control plane signaling messages that carr[y] [] RRC message[s]”. (Ex. 1003, 42:21-30). Thus, a person of ordinary skill in the art would have understood that to forward the ***RRC connection request message*** [i.e., uplink RRC message] to the first ***anchor node*** [i.e., central unit], the ***serving node*** [i.e., access unit] would include the ***RRC connection request message*** [i.e., uplink RRC message] into a ***control plane signaling message*** [i.e., a first message] and transmit the ***control plane signaling message*** [i.e., a first message] to the ***anchor node*** (i.e., central unit).

209. With respect to the ***RRC connection request message*** (i.e., uplink RRC message) specifically, *Lin1* discloses that the ***RRC connection request message*** (i.e., uplink RRC message) may be forwarded with a message of a particular message name (or “header”), such as “SRB0RRCTransfer or InitialRRCTransfer.” (Ex. 1003, 46:2-6). Because the SRB0RRCTransfer and the InitialRRCTransfer messages are transmitted between the ***serving node*** (i.e., access unit) and the ***anchor node*** (i.e., central unit), a person of ordinary skill in the art would have understood that these message are examples of ***control plane signaling messages*** (i.e., first messages) that include the ***RRC connection request message*** (i.e., uplink RRC message) and are transmitted to the ***anchor node*** (i.e., central unit).

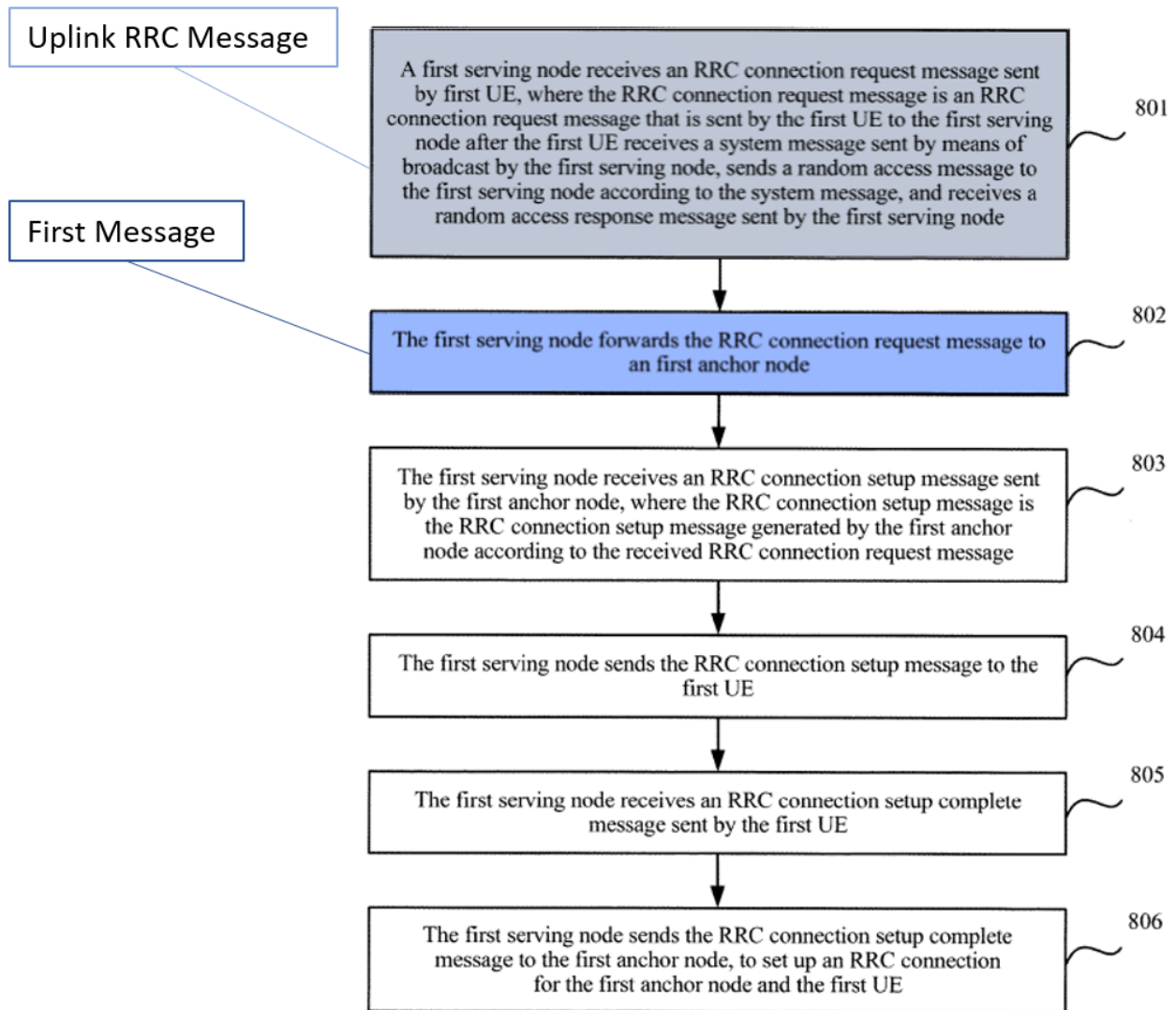


FIG. 8

210. In a second example, *Lin1* discloses with reference to FIG. 7 (reproduced and annotated below), “sending, by the first *serving node* [i.e., access unit], the *RRC message* [i.e., uplink RRC message] to a first *anchor node* [i.e., central unit].” (Ex. 1003, 42:9-10). As described above, *Lin1* explains that “[i]nter-

device control plane interface signaling is used between the *serving node* [i.e., access unit] and the *anchor node* [i.e., central unit],” (Ex. 1003, 42:9-10). Referring to the inter-device control plane interface signaling, *Lin1* discloses a “control plane signaling message that carries the *RRC message* [i.e., uplink RRC message]” to an *anchor node* (i.e., central unit). Based on this disclosure, the person of ordinary skill in the art would have understood that the *control plane signaling message* (i.e., first message) that carries the *RRC message* (i.e., uplink RRC message) is a first message that includes an uplink RRC message. Thus, the person of ordinary skill in the art would have understood that a *serving node* (i.e., access unit) includes an *RRC message* (i.e., uplink RRC message) into a *control plane signaling message* (i.e., a first message) and transmits the *control plane signaling message* (i.e., a first message) to an *anchor node* (i.e., central unit).

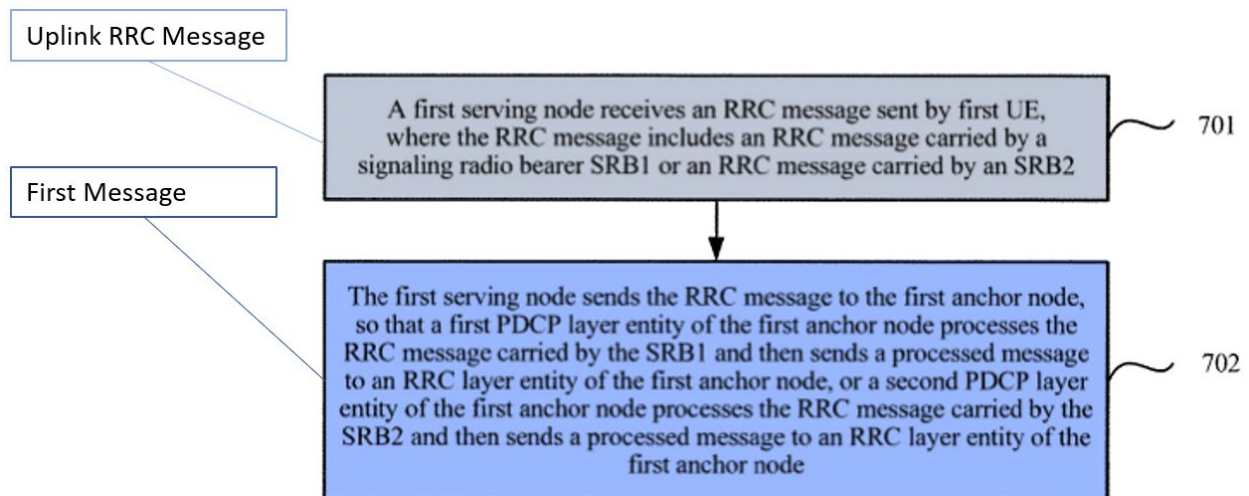
Ex. 1003, FIG. 7

FIG. 7

211. 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* suggests yet another different example of including the uplink RRC message into a first message and transmitting the first message to a central unit. Specifically, *Lin2* discloses, with reference to FIG. 6, S606 (reproduced and annotated below), that a **serving node** (i.e., an access unit) “sends, through the first interface, an RRC message carried in an SRB1 or an RRC message carried in an SRB2 in the uplink RRC message to the **anchor node** [i.e., central unit] for processing.” (Ex. 1005, 31:28-30).

Ex. 1005, FIG. 6

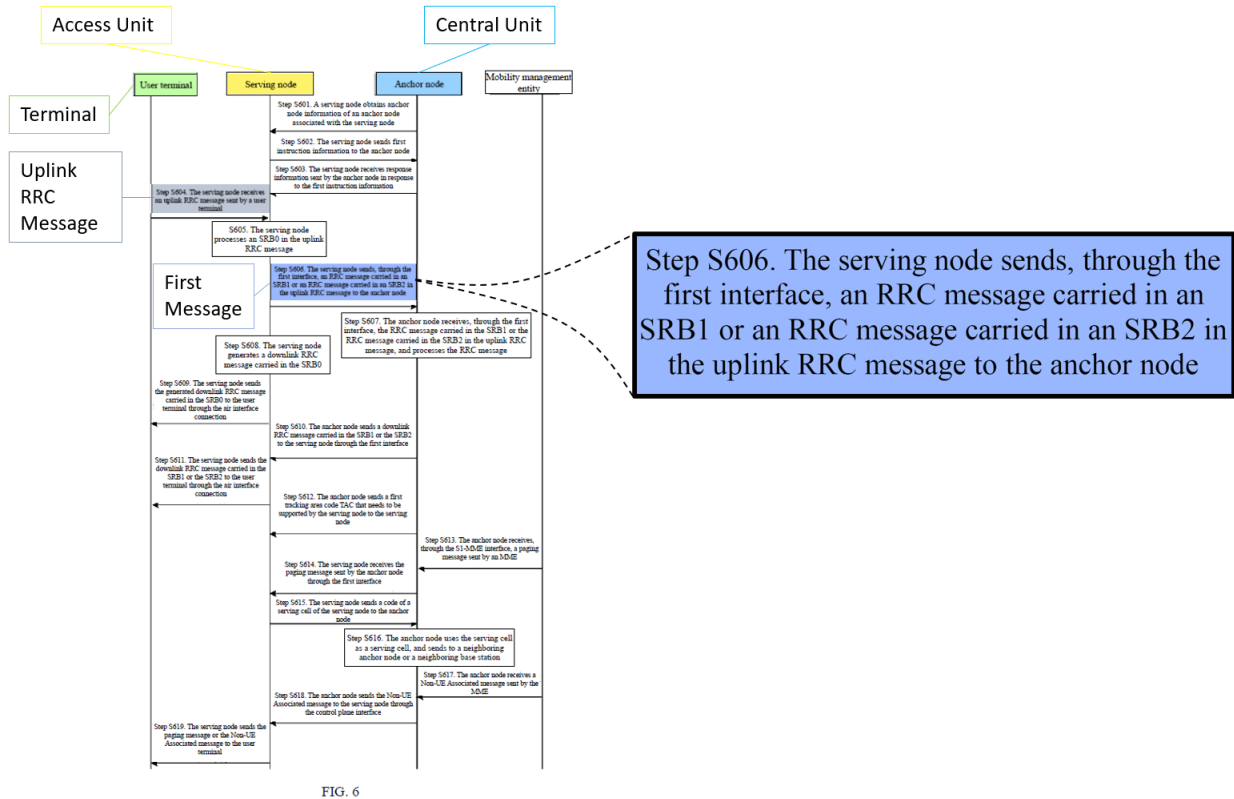


FIG. 6

212. *Lin2* explains that “the first interface includes a control plane interface between the serving node and the anchor node.” (Ex. 1005, 29:1-2). Because the first interface is between two network nodes and not a *UE* (i.e., terminal), a person of ordinary skill in the art would understand that a message sent through the first interface is not an uplink RRC message. Thus, *Lin2*’s disclosure of sending an RRC message in the uplink RRC message through the first interface would suggest to the person of ordinary skill in the art that the RRC message is included in another message and then sent to the *anchor node* (i.e., central unit).

Claim 1, Element [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

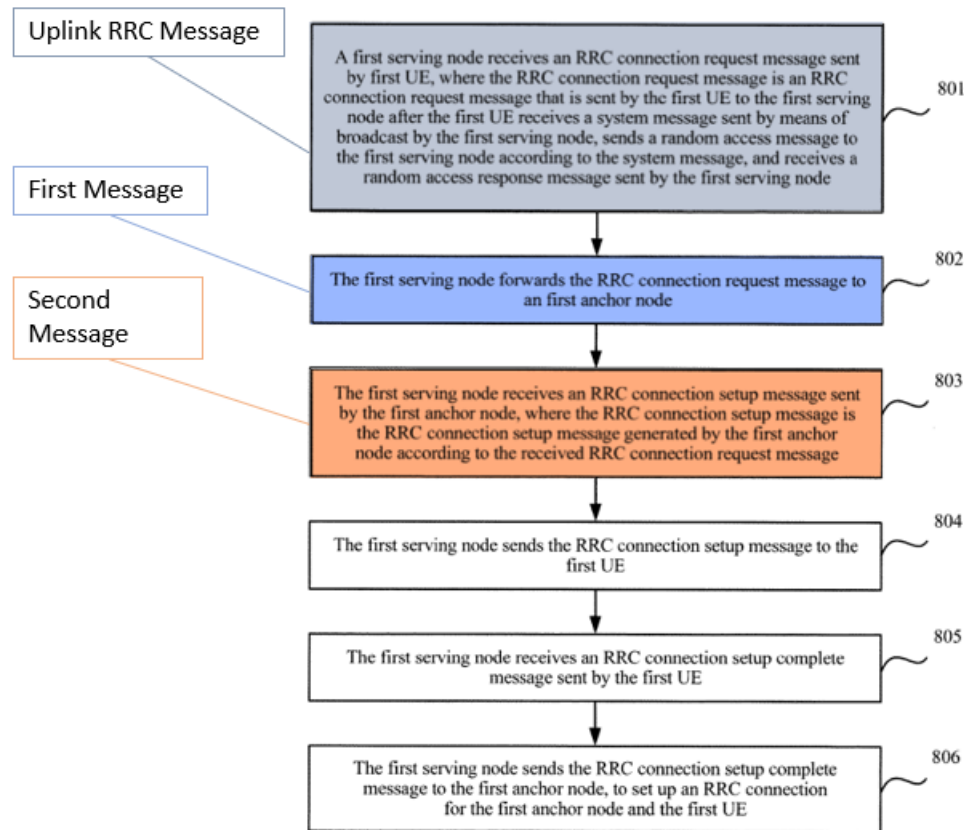
213. *Lin1* and *Lin2* render obvious claim element [1.b].

214. *Lin1* discloses multiple different examples of downlink RRC messages sent between two network nodes. As explained above, the person of ordinary skill in the art would have understood that a downlink message is a message between a ***user equipment*** (i.e., terminal) and a *network node*. (see *supra*, §VI. Technical Background). Thus, the person of ordinary skill in the art would have understood 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*. A person of ordinary skill in the art would have therefore understood that downlink RRC messages are included in other messages, such as control plane messages, for transmission between network nodes. Indeed, for each of the downlink RRC messages identified below, *Lin1* discloses multiple different examples of receiving a second message from the central unit that includes the downlink RRC message.

215. In a first example, with reference to FIG. 8 (reproduced and annotated below), *Lin1* discloses that the “***serving node*** [i.e., access unit] receives an RRC connection setup message sent by the first ***anchor node*** [i.e., central unit].” (Ex.

1003, 46:15-17). An RRC connection setup message is a defined type of downlink RRC message. (*see e.g.*, Ex. 1001, FIG. 16). Thus, the person of ordinary skill in the art would have understood that *Lin1*’s ***RRC connection setup message*** is a downlink RRC message.

216. *Lin1* also discloses “a control plane signaling message that carries the ***RRC connection setup message*** [i.e., downlink RRC message].” (Ex. 1003, 46:18-22). The person of ordinary skill in the art would have understood from this disclosure that *Lin1*’s ***control plane signaling message*** (i.e., a second message) that carries the ***RRC connection setup message*** (i.e., downlink RRC message) is a second message received from a central unit that includes a downlink RRC message.

Ex. 1003, FIG. 8**FIG. 8**

217. In a second example, with reference to FIG. 7, *Lin1* discloses “receiving, by the first **serving node** [i.e., access unit], an RRC message sent by the first **anchor node** [i.e., central unit], the RRC message including an RRC message carried by an SRB1 or an RRC message carried by an SRB2”. (Ex. 1003, 42:14-16). *Lin1* also discloses “processing, by a first radio link control (RLC) layer entity of the first **serving node** [i.e., access unit], the RRC message” and “then sending [the] processed message to the first **UE** [i.e., terminal].” (Ex. 1003, 42:14-20). As

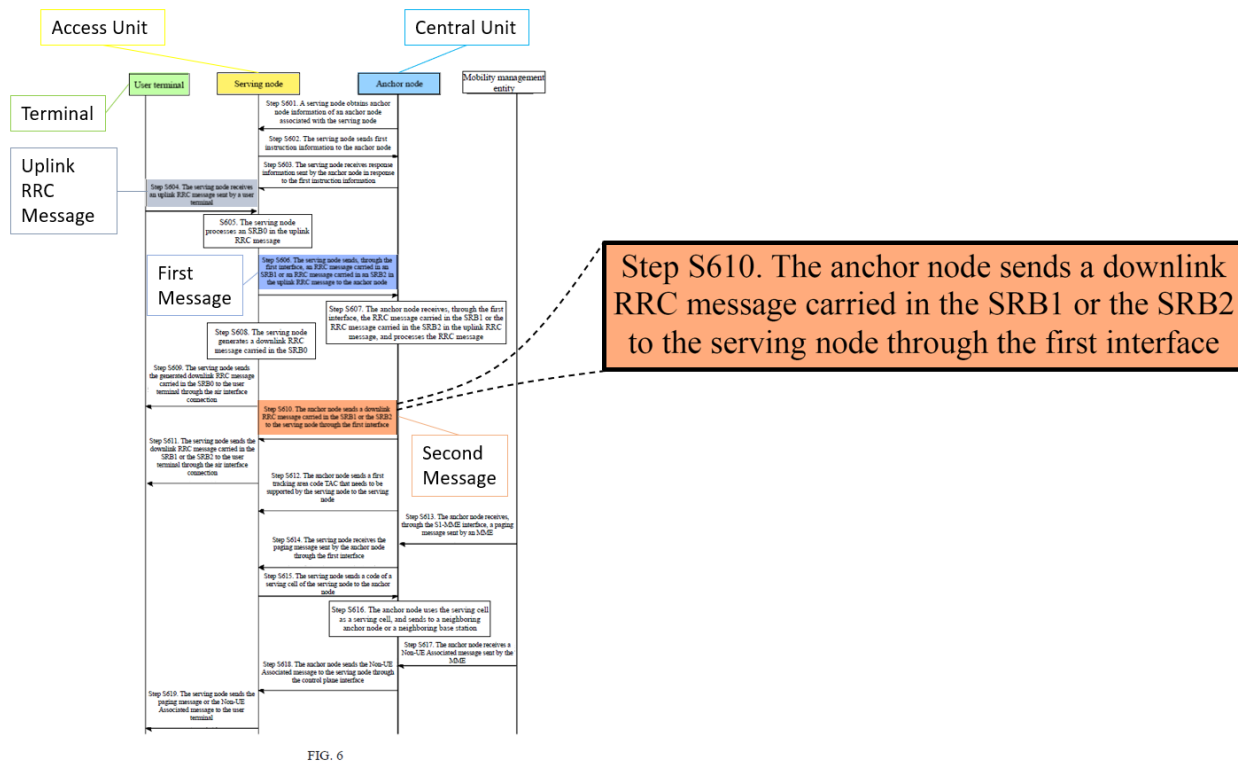
explained above, a downlink message is a message sent over a radio link interface from a network node to a *UE* [i.e., terminal]. The person of ordinary skill in the art would have understood that an RLC layer is used to process messages for transmission over an air interface. Thus, *Lin*'s disclosure of the *serving node* (i.e., access unit) processing an RRC message with an RLC layer for transmission to a *UE* [i.e., terminal] would have confirmed to the person of ordinary skill in the art that the RRC message is a downlink RRC message. As such, the *RRC message* sent by the first *anchor node* (i.e., central unit) is a downlink RRC message. A person of ordinary skill in the art would understand that the downlink RRC message carried by an SRB1 could include an RRC Connection Reconfiguration message, a RRC Connection Release message, Security Mode Command messages, among other commonly defined uplink RRC messages. (*see e.g.*, Ex. 1001, FIG. 16; *see also* Ex. 1010, Chapter 5.2 RRC Connection Management, p. 239, FIG. 5.5).

218. As explained above, *Lin1* also discloses that the inter-device control plane interface signaling is used between the *serving node* [i.e., access unit] and the *anchor node* [i.e., central unit]" and that an *RRC message* (i.e., downlink RRC message) is carried by a control plane signaling message. (Ex. 1003, 42:21-30). This disclosure would have suggested to the person of ordinary skill in the art that the *RRC message* (i.e., downlink RRC message) sent by the first *anchor node* (i.e., central unit) is carried by a *control plane signaling message* (i.e., a second

message). Thus, the person of ordinary skill in the art would have understood that *Lin1*'s **serving node** (i.e., access unit) receives a **control plane signaling message** (i.e., second message) that includes an **RRC message** (i.e., downlink RRC message) from an **anchor node** (i.e., central unit).

219. 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 a further different example of receiving a second message from the central unit that includes a downlink RRC message. Specifically, *Lin2* discloses, with reference to FIG. 6, S610 (reproduced and annotated below), that “the **anchor node** [i.e., central unit] sends a downlink RRC message carried in the SRB1 or the SRB2 to the **serving node** [i.e., access unit] through the first interface.” (Ex. 1005, 32:6-7). As described above, because the first interface is between two network nodes and not a **UE** (i.e., terminal), a person of ordinary skill in the art would understand that a message sent through the first interface is not a downlink RRC message. Thus, *Lin2*'s disclosure of sending a downlink RRC message through the first interface would suggest to the person of ordinary skill in the art that the downlink RRC message is included in a second message that is received by the **serving node** (i.e., access unit) from the **anchor node** (i.e., central unit).

Ex. 1005, FIG. 6



220. *Lin1* discloses multiple different examples of a second message that includes a downlink RRC message in response to the uplink RRC message from the terminal.

221. In a first example, with reference to FIG. 8, *Lin1* discloses that “the ***RRC connection setup message*** [i.e., downlink RRC message] [is] generated by the first ***anchor node*** [i.e., central unit] according to the received ***RRC connection request message*** [i.e., uplink RRC message].” (Ex. 1003, 46:15-17). Thus, the person of ordinary skill in the art would have understood that the ***RRC connection***

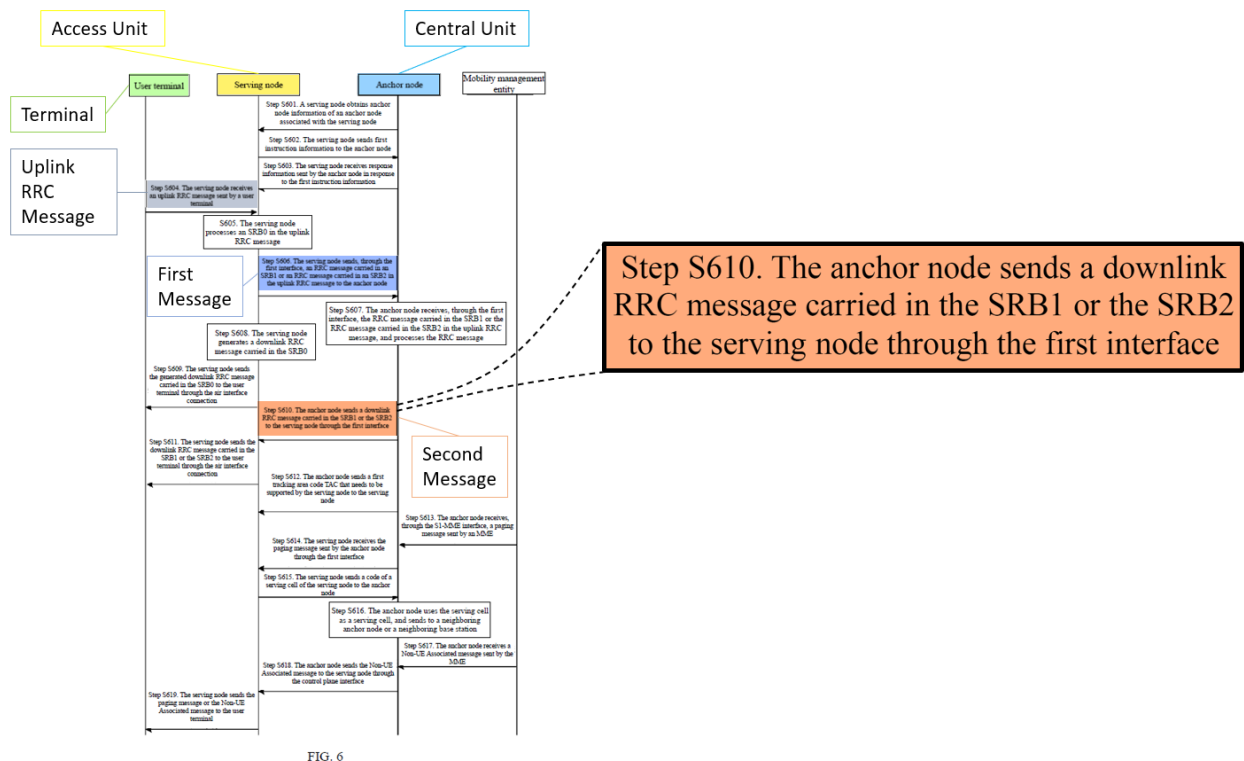
setup message [i.e., downlink RRC message] is in response to the ***RRC connection request message*** [i.e., uplink RRC message].”

222. In a second example, with reference to FIG. 7, *Lin1* discloses an RRC message processing method that includes “sending, by the first ***serving node*** [i.e., access unit], the ***RRC message*** [i.e., uplink RRC message] to a first ***anchor node*** [i.e., central unit], so that . . . the ***anchor node*** [i.e., central unit] processes the ***RRC message*** [i.e., uplink RRC message].” (Ex. 1003, 42:9-13). *Lin1* discloses that the method includes “receiving, by the first ***serving node*** [i.e., access unit], the ***RRC message*** [i.e., downlink RRC message] sent by the first ***anchor node*** [i.e., central unit].” *Lin1*’s disclosure of receiving an ***RRC message*** [i.e., downlink RRC message] from an ***anchor node*** (i.e., central unit) after sending the ***anchor node*** (i.e., central unit) a previous ***RRC message*** (i.e., uplink RRC message) would have suggested to the person of ordinary skill in the art that the received ***RRC message*** [i.e., downlink RRC message] is in response to the previously sent ***RRC message*** [i.e., uplink RRC message].

223. 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 further different example of a second message that includes a downlink RRC message in response to the uplink RRC message from the terminal. Specifically, with reference to FIG. 6 S610 (reproduced and annotated

below), *Lin2* discloses that “the **anchor node** [i.e., central unit] sends a downlink RRC message carried in the SRB1 or the SRB2 to the **serving node** [i.e., access unit] through the first interface.” (Ex. 1005, 32:6-7). As explained above, a person of ordinary skill in the art would understand that a downlink RRC message sent through an interface between two network nodes *would* be included in second message.

Ex. 1005, FIG. 6



224. Moreover, *Lin2* discloses that the step of sending the downlink RRC message is performed at step S610 after step S606 where the **serving node** (i.e., access unit) receives an uplink RRC message sent by a user terminal and sends the uplink RRC message to the **anchor node** [i.e., central unit]. This would suggest to a

person of ordinary skill in the art that the downlink RRC message is in response to the uplink RRC message from the terminal.

Claim 1, Element [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.

225. *Lin1* and *Lin2* render obvious claim element [1.c].

226. *Lin1* discloses multiple different examples of transmitting the downlink RRC message to the terminal.

227. In a first example, with reference to FIG. 8 (reproduced and annotated below), *Lin1* discloses “sending, by the first ***serving node*** [i.e., access unit], [an] ***RRC connection setup message*** [i.e., downlink RRC message] to the first ***UE*** [i.e., terminal].” (Ex. 1003, 46:15-17). As described above, the person of ordinary skill in the art would have understood from this disclosure that *Lin1*’s ***RRC connection setup message*** is a downlink RRC message transmitted to a ***UE*** (i.e., terminal).

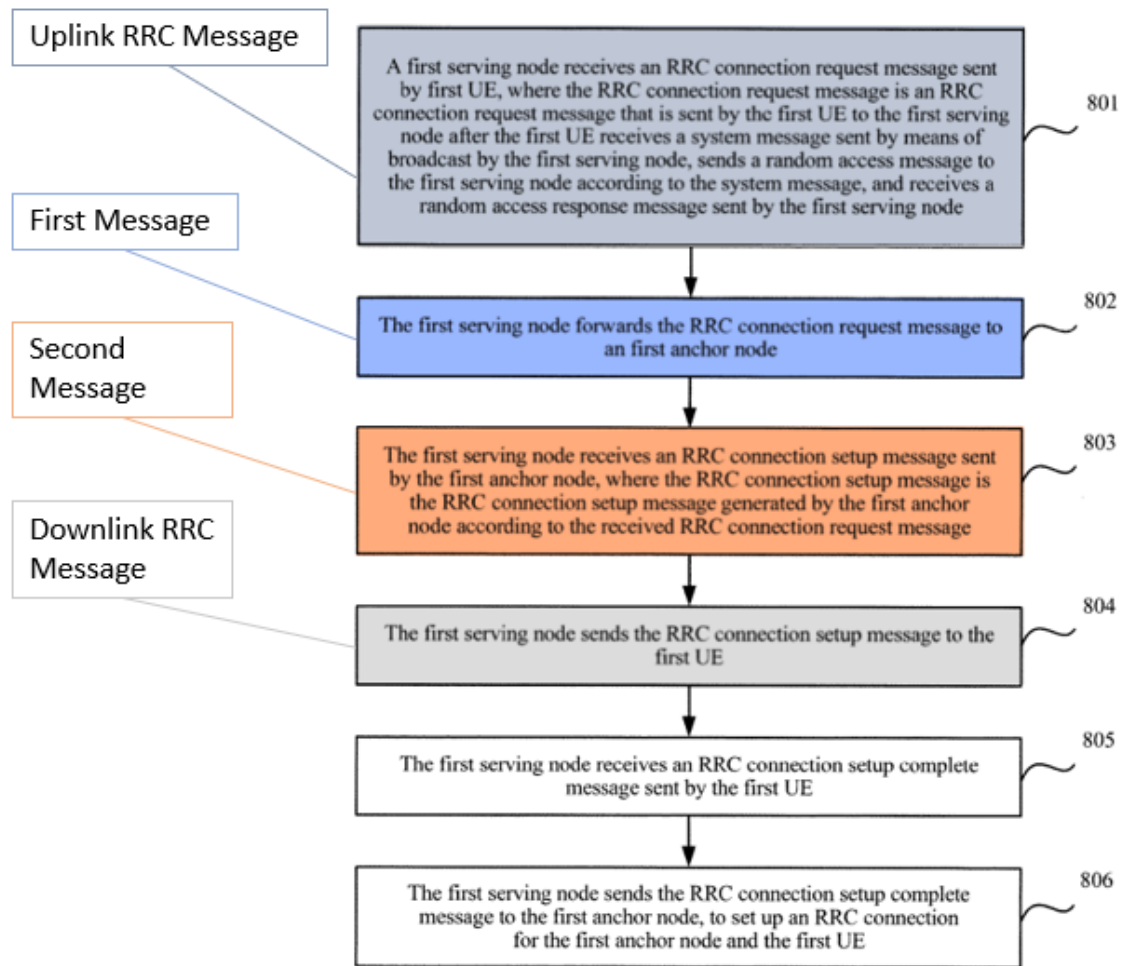
Ex. 1003, FIG. 8

FIG. 8

228. In a second example, with reference to FIG. 7, *Lin1* discloses “processing, by a first radio link control (RLC) layer entity of the first *serving node* [i.e., access unit], the *RRC message* [i.e., downlink RRC message] carried by the SRB1 and then sending a processed message to the first *UE* [i.e., terminal].” (Ex. 1003, 42:16-18). As explained above, *Lin1*’s disclosure of processing an *RRC*

message [i.e., downlink RRC message] with an RLC layer entity would have confirmed to the person of ordinary skill in the art that the **RRC message** [i.e., downlink RRC message] is a downlink RRC message. Thus, it would have been obvious to the person of ordinary skill in the art, in view of the above disclosure, that the **serving node** (i.e., access unit) transmit a downlink RRC message to the **UE** (i.e., terminal).

229. To the extent it is argued that *Lin1* does not disclose transmitting the downlink RRC message to the terminal, *Lin2* discloses yet another example of transmitting the downlink RRC message to the terminal. Specifically, *Lin2* explicitly discloses, with reference to FIG. 6, Step S611 (reproduced and annotated below), that “the **serving node** [e.g., 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. 1005, FIG. 6

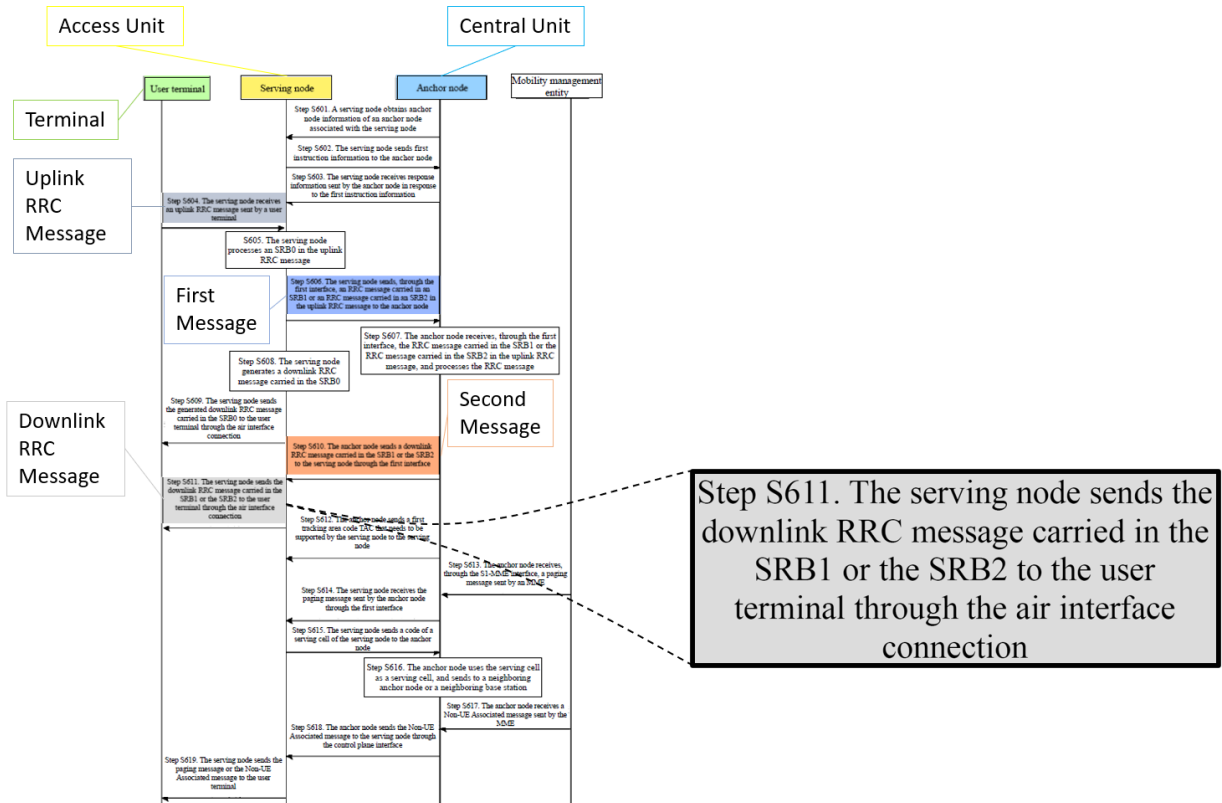


FIG. 6

230. *Lin1* also discloses radio bearer identification information-included in the first message and the second message. While the '932 patent does not provide a definition of radio bearer identification information, it provides various examples of what radio bearer identification information could include. For example, the '932 patent refers to "bearer identification information of the signaling radio bearer (i.e. SRB1)", (Ex. 1003, 15:58-61), "bearer identification information of the signaling radio bearer (DRB or SRB2)", (Ex. 1003, 17:46-50), "bearer identification information (e.g. UP SRB1 tunnel identification information (TEID)) may be

transferred”, (Ex. 1003, 17:57-67), and “radio bearer context (an E-RAB ID, E-RAB QoS parameters, a transport layer address, and a GTP-TEID)” (Ex. 1003, 19:16-24). Moreover, Claim 6 confirms that “the first message includes SRB1 signaling radio bearer identification information.” In view of these examples and as I demonstrate below, *Lin1* discloses radio bearer identification information.

231. Specifically, *Lin1* discloses “in order that the **serving node** [i.e., access unit] and the **anchor node** [i.e., central unit] can identify an SRB type of a received RRC message, a transmitter may send indication information to a receiver, and indicate the SRB type of the RRC message to the receiver by using the indication information, for example, indicate whether the RRC message is specifically an RRC message carried by the SRB1 or an RRC message carried by the SRB2. In the embodiment of the present invention, the indication information may be carried when the **RRC message** [i.e., uplink or downlink RRC messages] is being sent. Specifically, the indication information may be carried in the **RRC message** [i.e., uplink or downlink RRC messages], or the indication information may be carried in a **control plane signaling message** [i.e., first or second messages] that carries the **RRC message** [i.e., uplink or downlink RRC messages], or the indication information may be sent separately after the **RRC message** [i.e., uplink or downlink RRC messages] is sent.” (Ex. 1003, 42:21-30). A person of ordinary skill in the art would have understood, and *Lin1* confirms, an SRB refers to a radio bearer. (*see e.g.*,

Ex. 1003, 2:12-15, 30:6-9, and 64:6-9). Thus, a person of ordinary skill in the art would have understood that *Lin1*'s indication information *identifies a type of radio bearer* (i.e., SRB type) of an **RRC message** (i.e., uplink or downlink RRC messages).

232. *Lin1* further discloses, and the person of ordinary skill in the art would have known, that “different processing methods are used to process [an] **RRC message** [i.e., uplink or downlink RRC messages] according to different SRB types of the RRC message.” (Ex. 1003, 24:20-25). The person of ordinary skill in the art would have known, and *Lin1* confirms, that the SRB type impacts the processing of both a **serving node** (e.g., access unit) and an **anchor node** (e.g., central unit) that “jointly process [an] RRC message.” (Ex. 1003, 24:20-25). Due to the known impact of the SRB type on the processing of **RRC messages** (i.e., uplink or downlink messages) by a **serving node** (e.g., access unit) and an **anchor node** (e.g., central unit), the person of ordinary skill in the art would have understood that the claimed radio bearer identification information-included in the first and second messages between the access unit and the central unit includes *Lin1*'s **indication information** that *identifies a type of radio bearer* (i.e., radio bearer identification information).

233. Finally, as described above, *Lin1* discloses that “control plane interface signaling is used between the **serving node** [i.e., access unit] and the **anchor node** [i.e., central unit]” in which the **serving node** (i.e., access unit) and the anchor node (i.e., central unit) communicate using **control plane signaling messages** (i.e., first

and second messages) that carry **RRC messages** (i.e., uplink and downlink RRC messages). (Ex. 1003, 42:21-30). *Lin1* discloses that “the **indication information** [i.e., radio bearer identification information] may be carried in a **control plane signaling message** [i.e., first and second messages] that carries the **RRC message** [i.e., uplink and downlink RRC messages]”. (Ex. 1003, 42:28-30). Thus, a person of ordinary skill in the art would have understood that *Lin1*’s **indication information** [i.e., radio bearer identification information] is included in *Lin1*’s **control plane signaling messages** [first message and the second message].

234. *Lin1* discloses multiple additional examples of **indication information** (i.e., radio bearer identification information) included in the first message and a second message. As I will describe in additional detail below, the indication information is used by *Lin1* to distinguish radio signal bearers.

235. In a first example, with reference to FIG. 8, *Lin1* discloses that “the first **serving node** [i.e., access unit] may send first **indication information** [i.e., radio bearer identification information] when forwarding the **RRC connection request message** [i.e., uplink RRC message] to the first **anchor node** [i.e., central unit].” (Ex. 1003, 46:1-5). *Lin1* further discloses that the “first indication information may be an explicit signaling indication or a particular message name” for a SRB0RRCTransfer or InitialRRCTransfer message. (Ex. 1003, 46:4-6). As described above, the SRB0RRCTransfer and InitialRRCTransfer messages are

examples of *control plane signaling messages* (i.e., first messages) that include the *RRC connection request message* (i.e., uplink RRC message). (*see supra*, §IX.B, Claim 1, Element [1.a]). Thus, a person of ordinary skill in the art would have understood that the *indication information* [i.e., radio bearer identification information], such as the explicit signaling indication or a particular message name for a SRB0RRCTransfer or InitialRRCTransfer message, is radio bearer identification information-included in the first message.

236. With reference to FIG. 8, *Lin1* also discloses that “first *anchor node* [i.e., central unit] may include the *indication information* [i.e., radio bearer identification information] in a message when sending the *RRC connection setup message* [i.e., downlink RRC message], and specifically, may include the *indication information* [i.e., bearer identification information] in the *RRC connection setup message* [i.e., downlink RRC message] or include the *indication information* [i.e., bearer identification information] in a *control plane signaling message* [i.e., a second message] that carries the *RRC connection setup message* [i.e., downlink RRC message].” (Ex. 1003, 46:18-22). The person of ordinary skill in the art would have understood that the *indication information* [i.e., bearer identification information] in a *control plane signaling message* [i.e., a second message] that carries the *RRC connection setup message* [i.e., downlink RRC message] is radio bearer identification information-included in the second message.

237. In a second example, with reference to FIG. 7, *Lin1* discloses that “**indication information** [i.e., bearer identification information] may be carried in a **control plane signaling message** [i.e., a first or second message] that carries the **RRC message** [i.e., uplink or downlink RRC messages].” (Ex. 1003, 42:24-29). Thus, the person of ordinary skill in the art would have understood that *Lin1*’s **indication information** (i.e., radio bearer identification information) that may be carried in a **control plane signaling message** [i.e., a first or second message] that carries the **RRC message** [i.e., uplink and downlink RRC message] is radio bearer identification information-included in the first message and second message.

238. To the extent it is argued that *Lin1* does not disclose radio bearer identification information included in the first message and a second message, *Lin2* suggests a further example of radio bearer identification information included in the first message and a second message. 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). *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). As described herein, a person of ordinary skill in the art would have known that the *SRB1* and the *SRB2* are different types of signaling radio bearers. Thus, a person of ordinary skill in the art would have understood that *Lin2*’s **anchor node** (i.e., central unit) and

serving node (i.e., access unit) send and receive uplink and downlink RRC messages of different SRB types.

239. *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* [i.e., access unit], and SRB1 and SRB2 are processed by the *anchor node* [i.e., central unit].” (Ex. 1005, 18:18-21). “The *serving node* [i.e., access unit] does not process RRC messages independently, but the *anchor node* [i.e., central unit] and the *serving node* [i.e., access unit] jointly process the RRC messages.” (Ex. 1005, 16:27-29). As explained above, the person of ordinary skill in the art would have known that the SRB type impacts the processing of both a *serving node* (e.g., access unit) and an *anchor node* (e.g., central unit) that “jointly process [an] RRC message.” (Ex. 1005, 16:27-29). *Lin2* confirms this by stating that “*serving node* [i.e., access unit] serves an RRC message carried in an SRB0 of a user terminal, and the *anchor node* [i.e., 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* [i.e., access unit] can terminate at the *anchor node* [i.e., central unit], and when the terminal changes the *serving node* [i.e., access unit] of a same *anchor node* [i.e., central unit], an interface of the terminal does not need to be changed, thereby reducing signaling load of a core network caused by switching.” (Ex. 1005, 4:11-17,

17:2-13, 21:23-22:3, 24:11-25). The person of ordinary skill in the art would have therefore concluded, 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*** (i.e., central unit) and a ***serving node*** (i.e., access unit) in order to serve and process the RRC messages carried by the first and second message.

240. *Lin1* discloses multiple ways 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. In this regard, the person of ordinary skill in the art would have understood that distinguish 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. More particularly, the person of ordinary skill in the art would have understood that an ***RRC message*** [i.e., uplink or downlink RRC message] may be carried by one of three types of signaling radio bearers (SRBs), including an SRB0, an SRB1, and an SRB2. (*see supra*, §VI. Technical Background). Thus, a person of ordinary skill in the art would have understood that identifying an SRB type of an ***RRC message*** (i.e., uplink or downlink RRC message) would distinguish the signaling radio bearer of the ***RRC message*** (i.e., uplink or downlink RRC message) *from other types of signaling radio bearers (SRBs)*. Additionally, the person of ordinary skill in the art would have

known, and *Lin1* confirms, that “different processing methods are used to process [an] **RRC message** [i.e., uplink or downlink RRC message] according to different SRB types of the **RRC message** [i.e., 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). Referring to multiple different RRC message processing functions, including RRC connection, RRC connection re-setup, and others, *Lin1* explains that “indication 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 and the first anchor node 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). Based on this disclosure, a person of ordinary skill in the art would have understood that processing an **RRC message** (i.e., uplink or downlink RRC message) according to a particular SRB type would include distinguishing the signaling radio bearer of the **RRC message** (i.e., uplink or downlink RRC message) *from other types of signaling radio bearers (SRBs).*

241. A person of ordinary skill in the art would have therefore concluded that either identifying an SRB type of an **RRC message** (i.e., uplink or downlink RRC message) or processing an **RRC message** (i.e., uplink or downlink RRC message) according to the identified SRB type would include distinguishing

signaling radio bearers based on the indication information stored therein. As shown below, *Lin1* discloses both concepts. Specifically, *Lin1* discloses that the **serving node** (i.e., access unit) and the **anchor node** (i.e., central unit) both identify an SRB type of an **RRC message** (i.e., uplink or downlink RRC message) and process an **RRC message** (i.e., uplink or downlink RRC message) according to the SRB type of the **RRC message** (i.e., uplink and downlink RRC message) based on **indication information** (i.e., radio bearer identification information) in the first message and the second message.

242. First, *Lin1* discloses an access unit and a central unit that identify an SRB type of an RRC message based on radio bearer identification information in a first message and a second message.

243. Specifically, *Lin1* discloses that the “**serving node** [i.e., access unit] may send **indication information** [i.e., bearer identification information] when forwarding the **RRC connection request message** [i.e., uplink RRC message] to the first **anchor node** [i.e., central unit]” to “indicate that the **RRC connection request message** [i.e., uplink RRC message] is an RRC message carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 46:1-8). *Lin1* also discloses that “the first **anchor node** [i.e., central unit] identif[ies], according to the **indication information** [i.e., bearer identification information], that the **RRC message** (i.e., uplink RRC message) is carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 43:10-

13). Thus, a person of ordinary skill in the art would have understood that the *serving node* (i.e., access unit) *indicates* an SRB type of the *RRC connection request message* (i.e., uplink RRC message) to an *anchor node* (i.e., central unit) and the *anchor node* (i.e., central unit) *identifies* the SRB type of the *RRC connection request message* (i.e., uplink RRC message) based on *indication information* (i.e., bearer identification information). As explained above, *Lin1* discloses forwarding the *RRC connection request message* (i.e., uplink RRC message) in a *control plane signaling message* (i.e., first message) carrying the *RRC connection request message* (i.e., uplink RRC message). Thus, a person of ordinary skill in the art would have understood that the *indication information* (i.e., bearer identification information) used to indicate/identify the SRB type is in the *control plane signaling message* (i.e., first message).

244. *Lin1* also discloses that “the first *anchor node* [i.e., central unit] may include the *indication information* [i.e., radio bearer identification information] in a message when sending the *RRC connection setup message* [i.e., downlink RRC message] . . . so that the first *serving node* [i.e., access unit] identifies, according to the *indication information* [i.e., radio bearer identification information], that the *RRC connection setup message* [i.e., downlink RRC message] is the RRC message carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 46:18-25). *Lin1* further discloses that the “*serving node* [i.e., access unit] identifies, according to the

indication information [i.e., bearer identification information], that the **RRC connection setup message** [i.e., downlink RRC message] is the RRC message carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 46:23-25). Thus, a person of ordinary skill in the art would have understood that the *anchor node* (i.e., central unit) *indicates* an SRB type of the **RRC connection setup message** (i.e., downlink RRC message) to a *serving node* (i.e., access unit) and the *serving node* (i.e., access unit) *identifies* the SRB type of the **RRC connection setup message** (i.e., downlink RRC message) based on *indication information* (i.e., bearer identification information). As explained above, *Lin1* discloses forwarding the **RRC connection setup message** (i.e., downlink RRC message) in a *control plane signaling message* (i.e., second message) carrying the **RRC connection setup message** (i.e., downlink RRC message). Thus, a person of ordinary skill in the art would have understood that the *indication information* (i.e., bearer identification information) used to indicate/identify the SRB type is in the *control plane signaling message* (i.e., second message).

245. Second, *Lin1* discloses an access unit and a central unit that process an RRC message according to an SRB type identified by radio bearer identification information in a first message and a second message. For example, *Lin1* discloses that “[e]ach time an **RRC message** [e.g., uplink or downlink RRC message] is sent between the first *anchor node* [i.e., central unit] and the first *serving node* [i.e.,

access unit], whether the RRC message is an RRC message carried by an SRB0 [i.e., a first of three SRB types], an RRC message carried by an SRB1 [i.e., a second of three SRB types], or an RRC message carried by an SRB2 [i.e., a third of three SRB types] needs to be indicated, so that a receiver performs processing.” (Ex. 1003, 47:30-48:3). As separately explained for the *serving node* (i.e., access unit) and the *anchor node* (i.e., central unit) below, both *Lin1*’s *serving node* (i.e., access unit) and *anchor node* (i.e., central unit) perform different processing according to the SRB type indicated for an RRC message.

246. With respect to the processing performed by the *serving node* (i.e., access unit), *Lin1* discloses that a “RRC message [that] is carried by the SRB0 [i.e., a first of three SRB types] [is] process[ed] by using an RRC layer entity of the first *serving node* [i.e., access unit],” “a first RLC layer entity [is] used to process an RRC message carried by the SRB1 [i.e., a second of three SRB types], and a second RLC layer entity [is] used to process an RRC message carried by the SRB2 [i.e., 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). Based on this disclosure, the person of ordinary skill in the art would have understood that *Lin1*’s *serving node* (i.e., access unit) processes an *RRC message* (e.g., uplink or downlink RRC message) using different processing entities (i.e., RRC layer entity, first RLC layer entity, and second RLC entity)

according to a specific SRB type identified by the *indication information* (i.e., radio bearer identification information) within a message.

247. With respect to the processing performed by the *anchor node* (i.e., central unit), *Lin1* discloses that the first *anchor node* (i.e., central unit) processes an RRC message carried by an SRB0 (i.e., a first of three SRB types) using an RRC layer entity, an RRC message carried by an SRB1 [i.e., a second of the three SRB types]” using a first PCDP layer, and an RRC message carried by an SRB1 [i.e., 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). Based on this disclosure, the person of ordinary skill in the art would have understood that *Lin1*’s *anchor node* (i.e., central unit) processes an *RRC message* (e.g., uplink or downlink RRC message) using different processing entities (i.e., RRC layer entity, first PCDP layer entity, and second PCDP entity) according to a specific SRB type identified by the *indication information* (i.e., radio bearer identification information) within a message.

248. 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. Specifically, *Lin2* discloses that the “RRC message corresponding to the SRB1 [i.e., one of three SRB types] or the SRB2 [i.e., one of three SRB types] in the RRC message of the user terminal is served by the ***anchor node*** [i.e., central unit], and the RRC message corresponding to the SRB0 [i.e., one of three SRB types] of the user terminal is served by the ***serving node*** [i.e., access unit]. *That is, to serve is to process an uplink RRC message or generate a downlink RRC message.*” (Ex. 1005, 18:3-6). *Lin2* further discloses that “[d]epending on types of the RRC messages, the ***anchor node*** [i.e., central unit] processes some of the RRC messages, and the ***serving node*** [i.e., access unit] processes remaining RRC messages, so that an RRC function is split onto the two nodes.” (Ex. 1005, 16:25-31). Based on the above disclosure, the person of ordinary skill in the art would have understood that *Lin2*’s ***serving node*** (i.e., access unit) and ***anchor node*** (i.e., central unit) perform different operations for an RRC message (e.g., 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 person of ordinary skill in the art would have understood that *Lin2*’s ***serving node*** (i.e., access unit) and ***anchor node*** (i.e., 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.

Dependent Claim 2

Claim 2, Element [2.pre]: The method of claim 1

249. As set forth above, *Lin1* and *Lin2* render obvious all of the elements of claim 1. Thus, *Lin1* and *Lin2* render obvious [2.pre].

Claim 2, Element [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

250. *Lin1* discloses claim element [2.a].

251. *Lin1* discloses the access unit comprises a node configured to provide an RLC function, a MAC function, and a PHY function. Specifically, *Lin1* discloses a ***serving node*** (i.e., 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). The person of ordinary skill in the art 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. Thus, the person of ordinary skill in the art would have understood that the ***serving node*** (i.e., access unit) comprises a node configured to provide an RLC function, a MAC function, and a PHY function.

252. *Lin1* discloses that the RLC function, the MAC function, and the PHY function are configured for transmission of user plane data. Specifically, with reference to FIG. 1, (reproduced and annotated below), *Lin1* discloses “an S1-U user plane interface [is] established between the MME 101 in a core network and the

anchor node 103 [i.e., central unit] and between the SGW 102 in the core network and the *anchor node 103* [i.e., central unit]. The *anchor node 103* [i.e., central unit] and the *serving node 104* [i.e., access unit] are connected by using a signal tunnel (backhaul) to establish an interface. The interface may be specifically an enhanced X2 interface or may be an interface of another type. A radio link connection is set up between the *UE 105* [i.e., terminal] and the *serving node 104* [i.e., access unit].”

A person of ordinary skill in the art would have understood that an “S1-U user plane interface” is an interface used to transmit user plane data. (see Ex. 1010, Abbreviations and Acronyms, p. xxvii). Thus, the person of ordinary skill in the art would have understood the RLC function, the MAC function, and the PHY function of *Lin1’s serving node* (i.e., access unit) are configured for transmission of user plane data.

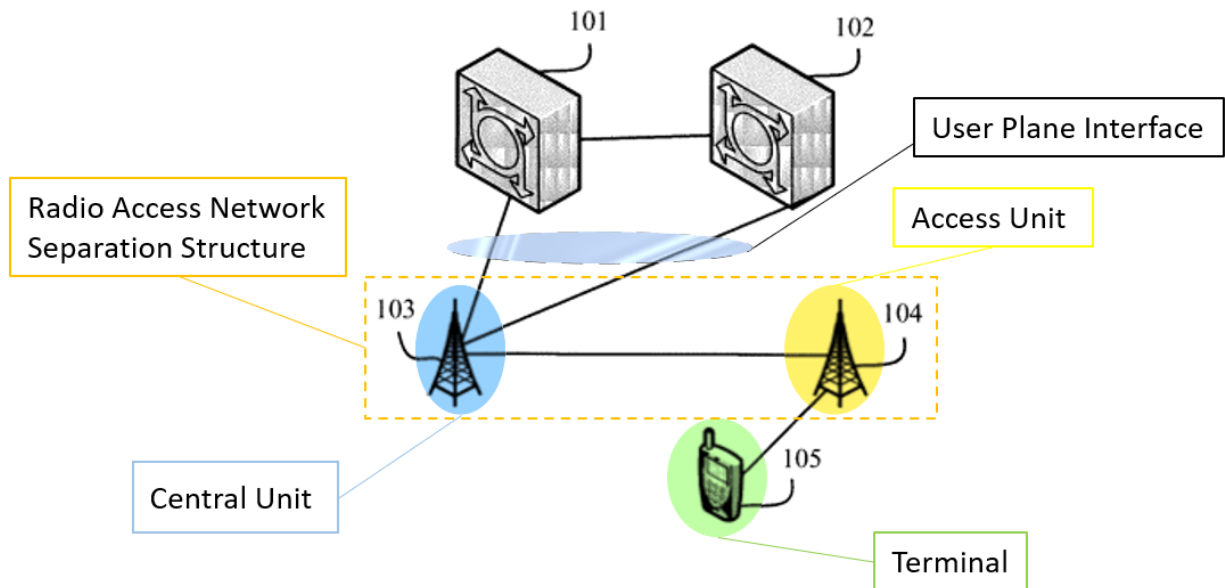


FIG. 1

253. Thus, *Lin1* discloses claim element [2.a].

Claim 2, Element [2.b]: wherein the central unit comprises a node configured to provide a PDCP function, for transmission of the user plane data.

254. *Lin1* discloses claim element [2.b].

255. *Lin1* discloses the central unit comprises a node configured to provide a PDCP function, for transmission of the user plane data. Specifically, *Lin1* discloses an ***anchor node*** (i.e., 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). The person of ordinary skill in the art would have understood that the node that includes these entities, first and second

PDCP, *would* perform or otherwise provide a PDCP function. As discussed above, the ***anchor node*** (i.e., central unit) is connected to an S1-U user plane interface with an MME and SGW through which user plane data is transmitted. Thus, the person of ordinary skill in the art would have understood that the ***anchor node*** (i.e., central unit) is a node configured to provide a PDCP function, for transmission of the user plane data.

Dependent Claim 4

Claim 4, Element [4.pre]: The method according to claim 1

256. As set forth above, *Lin1* and *Lin2* render obvious all of the claim elements of claim 1. Thus, *Lin1* and *Lin2* render obvious [4.pre].

Claim 4, Element [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.

257. *Lin1* discloses claim element [4.a].

258. First, *Lin1* discloses a second message that comprises a RRC connection setup message. (*see supra*, §IX.B, Claim 1, Element [1.b]). As such, *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.

259. Second, *Lin1* discloses a second message that comprises signaling radio bearer identification information. (*see supra*, §IX.B, Claim 1, Element [1.c]). As such, *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*.

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

261. Moreover, *Lin1* further discloses “sending, by the first **serving node** [i.e., access unit], the RRC connection setup message to the first **UE** [i.e., terminal].” (Ex. 1003, 46:26-27). The person of ordinary skill in the art would have understood

that a CRNTI is used to identify a *UE* [i.e., terminal] for transmission of a downlink message. Thus, *Lin1*'s disclosure of sending the RRC connection setup message to a *UE* (i.e., terminal) would have motivated the person of ordinary skill in the art to include the CRNTI in the *RRC connection setup message* [i.e., downlink RRC message] or a *signaling control message* [i.e., second message] carrying the *RRC connection setup message* [i.e., downlink RRC message]. 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*.

Independent Claim 8

Claim 8, Element [8.pre]: An access unit for configuring a wireless connection of a terminal, comprising:

262. To the extent that element [1.pre] is found to be limiting, *Lin1* discloses claim element [8.pre]. Specifically, *Lin1* discloses a *serving node* that provides the same functionality as the claimed access unit. (*see supra*, §IX.B, Claim 1, Element [1.pre]). *Lin1* also discloses *user equipment (UE)* that provides the same functionality as the claimed terminal. (*see supra*, §IX.B, Claim 1, Element [1.pre]). Finally, *Lin1* discloses a *serving node* (i.e., access unit) that configures a wireless connection of a *UE* (i.e., terminal). (*see supra*, §IX.B, Claim 1, Element [1.pre]).

Claim 8, Element [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

263. *Lin1* and *Lin2* render obvious claim element [8.a].

264. *Lin1* discloses an ***anchor node*** that provides the same functionality as the claimed *central* unit. (*see supra*, §IX.B, Claim 1, Element [1.a]).

265. *Lin1* discloses an access unit that includes a transmitter configured to transmit a first message to a central unit. Specifically, with reference to FIG. 5 (reproduced and annotated below), *Lin1* discloses a ***serving node*** (i.e., access unit) that includes a transmitter 501 and a receiver 502. (Ex. 1003, 40:8-22).

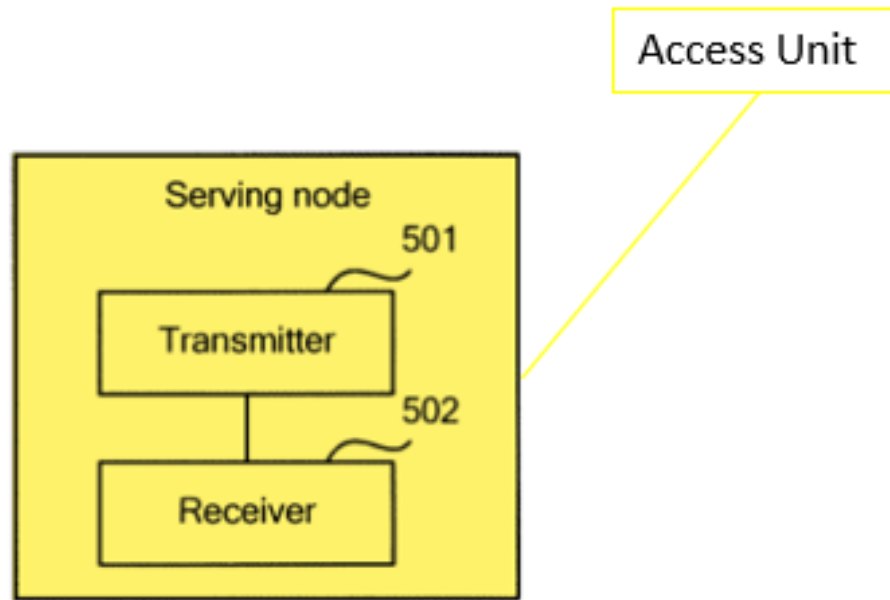


FIG. 5

266. *Lin1* discloses that “transmitter 510 is configured to: send the RRC message received by the receiver 502 to the first ***anchor node*** [i.e., the central unit]”. (Ex. 1003, 40:8-22). Thus, *Lin1* discloses a transmitter configured to transmit a first message to a central unit.

267. *Lin1* discloses an uplink RRC message received from a terminal. Specifically, *Lin1* discloses an ***RRC connection request message*** that is a defined type of uplink RRC message received from a ***UE*** (i.e., terminal). (*see supra*, §IX.B, Claim 1, Element [1.a]).

268. *Lin1* discloses several examples of a first message that includes an uplink RRC message received from a terminal. Specifically, *Lin1* discloses a SRB0RRCTransfer, an InitialRRCTransfer, and a control plane signaling message that each include an ***RRC connection request message*** (i.e., uplink RRC message) and are transmitted to an ***anchor node*** (i.e., central unit). (*see supra*, §IX.B, Claim 1, Element [1.a]). To the extent it is argued that *Lin1* does not disclose a first message that includes an uplink RRC message received from a terminal, *Lin2* further discloses sending an uplink RRC message through a first interface between the ***serving node*** (i.e., access unit) and the ***anchor node*** (i.e., central unit). (*see supra*, §IX.B, Claim 1, Element [1.a]).

Claim 8, Element [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,

269. *Lin1* and *Lin2* render obvious claim element [8.b1].

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

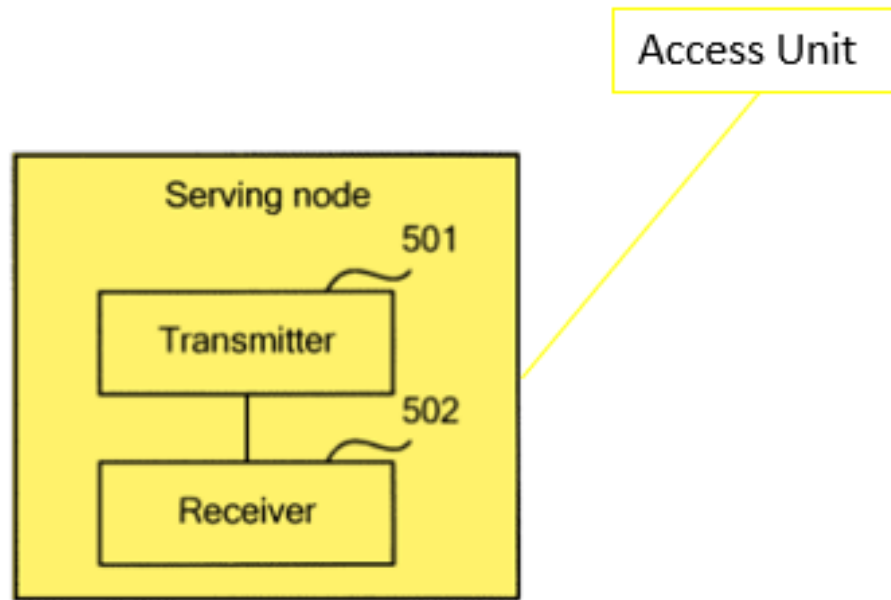


FIG. 5

271. *Lin1* discloses multiple different examples of receiving a second message from the central unit that includes a downlink RRC message in response to the uplink RRC message from the terminal. Specifically, *Lin1* discloses ***RRC connection setup message*** that is a defined type of downlink RRC message. (*see supra*, §IX.B, Claim 1, Element [1.b]). *Lin1* discloses receiving a control plane signaling message includes an ***RRC connection setup message*** (i.e., downlink RRC message) and is in response to an ***RRC connection request message*** (i.e., uplink RRC message). (*see supra*, §IX.B, Claim 1, Element [1.b]).

272. 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 in response to the uplink RRC message from the terminal, *Lin2* discloses sending a downlink RRC message through the first interface, which would suggest to the person of ordinary skill in the art that the downlink RRC message is included in a second message and then received from an **anchor node** (i.e., central unit). (*see supra*, §IX.B, Claim 1, Element [1.b]). *Lin2* also discloses that the step of sending the downlink RRC message is performed after receiving an uplink RRC message, which would suggest to a person of ordinary skill in the art that the downlink RRC message is in response to the uplink RRC message from the terminal. (*see supra*, §IX.B, Claim 1, Element [1.b]).

Claim 8, Element [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.

273. *Lin1* and *Lin2* render obvious claim element [8.b2].

274. As described above, *Lin1* discloses a **serving node** (i.e., access unit) that includes a transmitter. (Ex. 1003, 40:8-22).

275. *Lin1* discloses multiple different examples of the **serving node** (i.e., access unit) transmitting a downlink RRC message to a terminal. Specifically, *Lin1*

discloses sending an **RRC connection setup message** (i.e., downlink RRC message) to a **UE** (e.g., terminal). (*see supra*, §IX.B, Claim 1, Element [1.c]). *Lin1* also discloses sending a processed PDCP PDU to the **UE** [i.e., terminal]. (*see supra*, §IX.B, Claim 1, Element [1.c]).

276. To the extent it is argued that *Lin1* does not disclose transmitting a downlink RRC message to a terminal, *Lin2* discloses sending the downlink RRC message carried in the SRB1 or the SRB2 to the user terminal through the air interface connection. (*see supra*, §IX.B, Claim 1, Element [1.c]).

277. *Lin1* discloses radio bearer identification information included in the first message and the second message. Specifically, *Lin1* discloses **indication information** that is included in **control plane signaling messages** (i.e., first and second messages) and that a person of ordinary skill in the art would consider radio bearer identification information. (*see supra*, §IX.B, Claim 1, Element [1.c]).

278. To the extent that it is argued that *Lin1* does not disclose radio bearer identification information included in the first message and the second message, *Lin2*'s disclosure of a **serving node** (e.g., access unit) and an **anchor node** (e.g., central unit) that jointly process an RRC message would have suggested to a person of ordinary skill in the art that that radio bearer identification information is included in first and second messages between the **serving node** (e.g., access unit) and the **anchor node** (e.g., central unit). (*see supra*, §IX.B, Claim 1, Element [1.c]).

279. *Lin1* also discloses multiple ways 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. Specifically, *Lin1* discloses that the **serving node** (i.e., access unit) and the **anchor node** (i.e., central unit) distinguish signaling radio bearers by either identifying an SRB type of an **RRC message** (i.e., uplink and downlink RRC message) or processing an **RRC message** (i.e., uplink and downlink RRC message) according to the SRB type of the **RRC message** (i.e., uplink and downlink RRC message) based on **indication information** (i.e., radio bearer identification information) in the first message and the second message. (*see supra*, §IX.B, Claim 1, Element [1.c]).

280. To the extent that 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* discloses a **serving node** (i.e., access unit) and **anchor node** (i.e., central unit) that perform different operations for an RRC message (e.g., received via first or second messages) depending on the SRB type of the RRC message, which would have suggested to a person of ordinary skill in the art that *Lin2*'s **serving node** (i.e., access unit) and **anchor node** (i.e., 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. (*see supra*, §IX.B, Claim 1, Element [1.c]).

Dependent Claim 9

Claim 9, Element [9.pre]: The access unit according to claim 8,

281. As set forth above, *Lin1* and *Lin2* discloses all of the claim elements of claim 8. Thus, *Lin1* and *Lin2* render obvious [9.pre].

Claim 9, Element [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

282. *Lin1* discloses an 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. Specifically, *Lin1* discloses a ***serving node*** (i.e., access unit) that provides an RLC function, a MAC function, and a PHY function that are configured for transmission of user plane data. (*see supra*, §IX.B, Claim 1, Element [2.a]).

Claim 8, Element [9.b]: wherein the central unit comprises a node configured to provide a PDCP function, for transmission of the user plane data.

283. *Lin1* discloses a central unit that comprises a node configured to provide a PDCP function, for transmission of the user plane data. Specifically, *Lin1* discloses an ***anchor node*** (i.e., central unit) that performs or otherwise provides a PDCP function, for transmission of user plane data. (*see supra*, §IX.B, Claim 1, Element [2.b]).

Dependent Claim 11

Claim 11, Element [11.pre]: The access unit according to claim 8,

284. As set forth above, *Lin1* and *Lin2* discloses all of the claim elements of claim 8. Thus, *Lin1* and *Lin2* render obvious [9.pre].

Claim 11, Element [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.

285. *Lin1* and *Lin2* disclose claim element [11.a].

286. First, *Lin1* discloses a second message that comprises a RRC connection setup message. (*see supra*, §IX.B, Claim 1, Element [1.b]). As such, *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.

287. Second, *Lin1* discloses a second message that comprises signaling radio bearer identification information. (*see supra*, §IX.B, Claim 1, Element [1.c]). As such, *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*.

288. Third, *Lin1* would have motivated the person of ordinary skill in the art to include a CRNTI in a second message. (*see supra*, §IX.B, Claim 1, Element [4.a]). As such, 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*.

C. Ground 3: *Lin1* and *Zhang* Render Obvious Claims 1-2, 4, 8-9, and 11 of the '932 patent.

289. *Lin1* and *Zhang* render obvious claims 1-2, 4, 8-9, and 11 of the '932 patent.

Motivation to Combine Lin1 and Zhang

290. There are numerous reasons why a person of ordinary skill in the art would have been specifically motivated to combine *Lin1* and *Zhang*. First, both *Lin1* and *Zhang* relate to the field of communications and cover various communication methods between base stations and user equipment (UE). (Ex. 1003, 1:9-16; Ex. 1007, 1:7-11 and 2:1-3). *Lin1* is directed to methods for establishing an interface to improve existing radio communications systems by increasing system capacity to handle an “increasing quantity of user equipments.” (Ex. 1003, 1:9-11). *Zhang* is directed to methods for “reducing access delay of the UE.” (Ex. 1007, 2:1-3). A person of ordinary skill in the art would have known that reducing access delay of the UE would increase system capacity to handle an “increasing quantity of user equipments.”

291. The person of ordinary skill in the art in possession of *Lin1* would have been motivated to look to other communication methods, such as *Zhang*, to inform ways to better handle an increasing quantity of user equipment, including by reducing access delay of the UE as proposed by *Zhang*. Specifically, *Zhang* describes that the use two different types of network nodes in a network deployment scenario leads to several cases, such as the expiration of a time alignment timer (TAT), a lack of a resource for sending a scheduling request (SR), and a failure to send a dynamic scheduling request (DSR), that require “a contention-based random access procedure [that] has a very long access delay.” (*see* Ex. 1007, 1:7-26). *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). To do so, *Zhang* describes, with reference to FIG. 13 (reproduced below), a “communication method” in which the “user equipment sends uplink signaling or uplink data to the micro network node”, “the micro network node forwards, to the macro network node, the uplink signaling or uplink data sent by the user equipment”, “the macro network node sends downlink signaling or downlink data to the micro network node”, and “the micro network node forwards, to the user equipment, the downlink signaling or downlink data sent by the macro network node.” (Ex. 1007, 75:19 – 76:20).

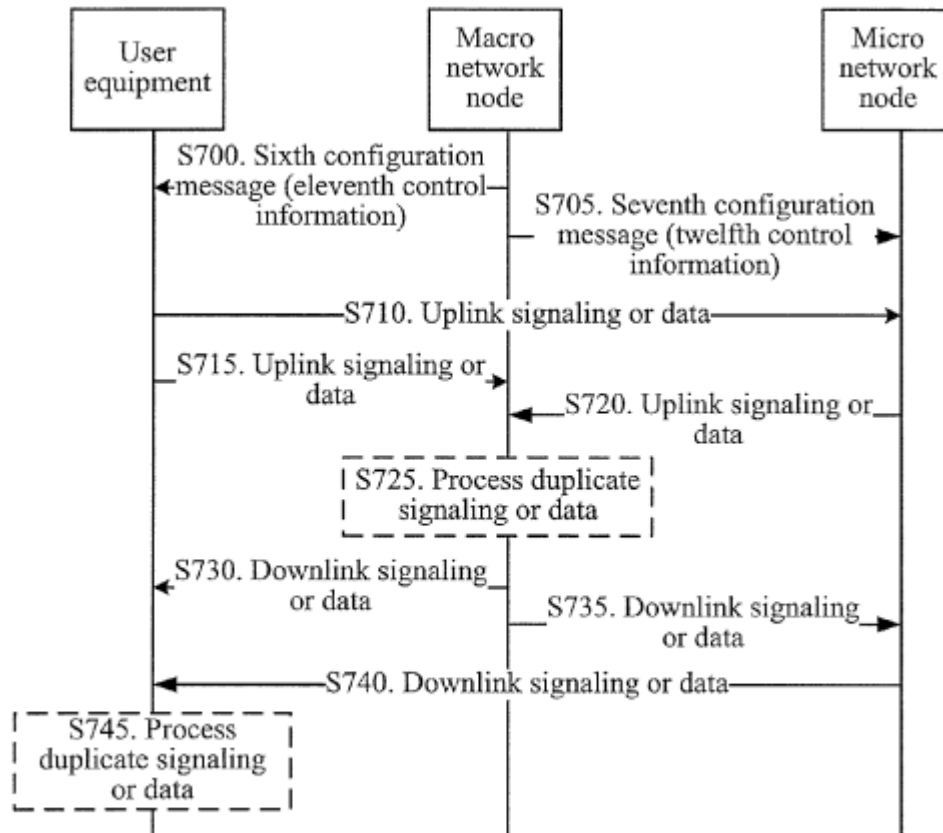


FIG. 13

292. *Zhang* discloses that uplink signaling or uplink data and downlink signaling or downlink data are transmitted on “a default logical channel corresponding to a radio bearer” that carries the data. (*see* Ex. 1007, 59:6-9, 63:7-26). The person of ordinary skill in the art would have understood, and the above disclosure of *Zhang* confirms, that the radio bearer of downlink and uplink data impacts the logical channel used by a network node to process the data. (*see* Ex. 1007, 59:6-9, 63:7-26). Thus, *Zhang* recognizes, and a person of ordinary skill in the

art would have known, that sending uplink and downlink data between two network nodes, as shown in the communication method of FIG. 13, requires an identification of a radio bearer that carries the messages. 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). By doing so, *Zhang* enables a communication method in which a second network node, a micro network node, may be added. *Zhang* explains that “[c]ompared with the prior art, the user equipment provided in the embodiment of the present invention more rapidly accesses a network with the participation of the micro network node, thereby reducing an access delay.” (Ex. 1007, 62:17-24). In light of this disclosure, the person of ordinary skill in the art 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.

293. Moreover, the person of ordinary skill in the art would have also had a reasonable expectation of success combining *Lin1* and *Zhang* because both describe interface establishing techniques between two network nodes that handle RRC messages. Indeed, *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). *Lin1*, for example, discloses an architecture in which the RRC function is split onto two nodes, including an “anchor node 103 and a serving node 104 that jointly process an RRC message of the UE 105.” (Ex. 1003, 27:18-20). Similarly, *Zhang* describes two network nodes that perform different E-UTRAN eNB functions. Specifically, *Zhang* discloses (i) a first network node, a micro network node, that “may be a relay node (Relay Node, RN), a home base station (Home eNB or HOME NB), a micro base station (Micro eNB), a pico base station (Pico eNB), a femto base station (Femto eNB), a WiFi access point (Access Point, AP), or the like” and (ii) a second network node, a macro network node, that may be “a base station (Node B, NB), a donor base station (Donor eNB, DeNB), a HeNB gateway, an HNB gateway, or the like.” (Ex. 1007, 37:16-25). Indeed, the described communication techniques of *Lin1* and *Zhang* are described by overlapping inventors using a similar, two node, system configuration. Given these similarities, the person of ordinary skill in the art 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 person of ordinary skill in the art. Accordingly, a person of ordinary skill in the art would have been motivated to combine, and would have had a reasonable expectation of success in combining, *Lin1* and *Zhang*.

Independent Claim 1

Claim 1, Element [1.pre]: A method of configuring, by an access unit, a wireless connection of a terminal, the method comprising:

294. To the extent that element [1.pre] is found to be limiting, *Lin1* discloses a method of configuring, by an access unit, a wireless connection of a terminal. As I will detail below with reference to each of the claim elements of Claim 1, *Lin1* discloses a serving node that in at least two different examples sends and receives the same messages as the claimed access unit to configure a wireless connection of user equipment (i.e., terminal). A person of ordinary skill in the art would therefore understand that *Lin1*'s serving node is an equivalent to or an obvious variation of the claimed access unit and that *Lin1* discloses at least two different examples of the method of configuring, by an access unit, a wireless connection of a terminal recited by Claim 1.

295. *Lin1*'s ***serving node*** (i.e., access unit) discloses the claimed access unit. *Lin1*'s ***serving node*** (i.e., access unit) is described with reference to FIG. 1 (reproduced and annotated below).⁴ With reference to FIG. 1, *Lin1* discloses “a network architecture [that] includes a mobility management entity (MME) 101, a

⁴ The '932 patent claims, *Lin1*, and *Zhang* each use different terms to refer to the same concepts. To help track the correspondences between (i) *Lin1* and *Zhang* terms and (ii) the claim terms, I have used bolding and italics to emphasize *Lin1* and *Zhang* terms and have placed the corresponding claim term in parentheticals after each emphasized term.

serving gateway (SGW) 102, an anchor node 103, a serving node 104, and user equipment (UE) 105.” (Ex. 1003, 27:1-4). Specifically, *Lin1* discloses an architecture in which the “RRC function is split onto [] two nodes”, including an “anchor node 103 and a **serving node 104** [i.e., access unit] that jointly process an RRC message of the UE 105.” (Ex. 1003, 27:18-22).

Ex. 1003, FIG. 1

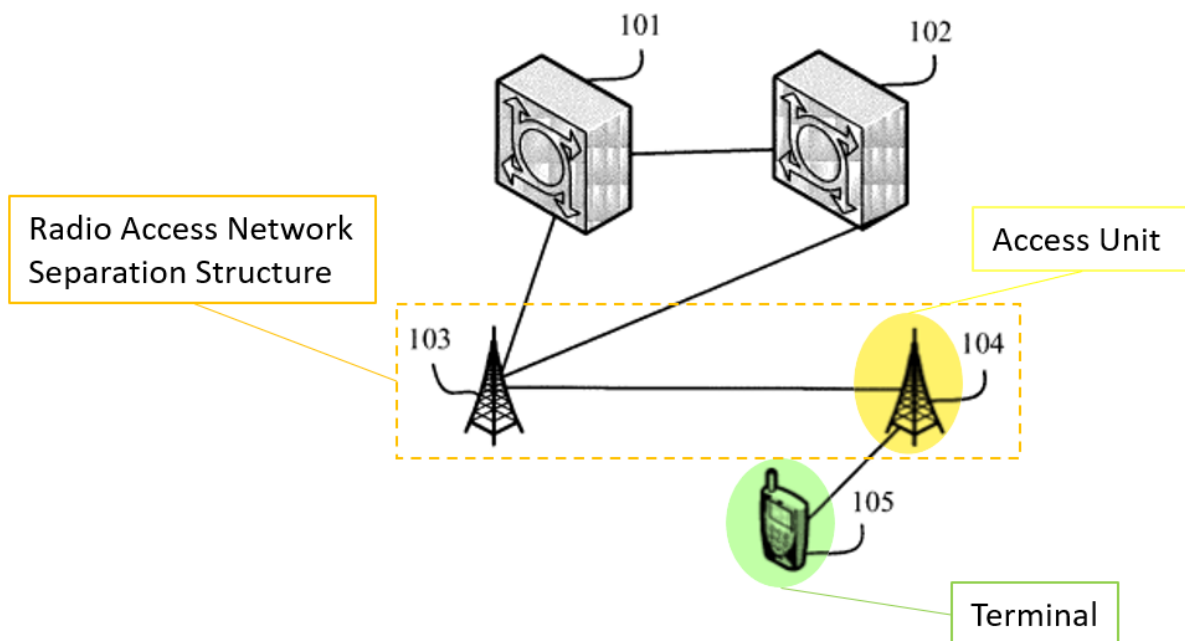


FIG. 1

296. 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; *see also* Claim 2 (“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...”). Similarly, *Lin1* discloses a **serving node 104** (i.e., access unit) that 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). The person of ordinary skill in the art would have understood that the node that includes *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. Thus, the person of ordinary skill in the art would have understood that the **serving node 104** (i.e., access unit) of *Lin1* provides the same functionality as the claimed access unit.

297. *Lin1* also discloses a terminal. The ’932 patent discloses and the person of ordinary skill in the art would have understood that a terminal is an example of “user equipment”. (Ex. 1001, 5:63 – 6:5). *Lin1* discloses “user equipment 105.” (Ex. 1003, 27:1-5). The person of ordinary skill in the art would have understood from this disclosure that *Lin1*’s **user equipment (UE)** (i.e., terminal) is the claimed terminal.

298. Finally, *Lin1* discloses configuring, by an access unit, a wireless connection of a terminal. As described with reference to FIG. 1, the “**serving node 104** [i.e., access unit] may be a network device that provides **a wireless communication service for the UE 105** [i.e., terminal].” (Ex. 1003, 1:14-16 and

27:4-6). To do so, “*serving node 104* [i.e., access unit] sets up a connection to the anchor node 103, and the anchor node 103 sets up a connection to the MME 101. The ’932 patent doesn’t provide a definition for the term “configuring;” however 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). The ’932 patent also describes that a “UE [may] configure a radio connection using RLC, MAC, and PHY configuration information of the access unit.” (Ex. 1001, 13:32-56). Based at least on this disclosure, a person of ordinary skill in the art would have understood that *configuring* a wireless connection of a terminal is describing *setting up a connection* between a UE and the MME, as described by *Lin1*. Therefore, the *serving node 104* [i.e., access unit] sets up a connection to the MME 101 by using the anchor node 103.” (Ex. 1003, 27:7-11).

299. Thus, *Lin1* discloses a method of configuring, by an access unit, a wireless connection of a terminal.

Claim 1, Element [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;

300. *Lin1* and *Zhang* render obvious claim element [1.a].

301. *Lin1* discloses at least two different examples of receiving an uplink radio resource control (RRC) message from a terminal.

302. In a first example, *Lin1* discloses that its **serving node** (i.e., access unit) receives an RRC message from a **UE** (i.e., terminal). Specifically, and with reference to FIG. 8 (reproduced and annotated below), *Lin1* discloses that a “first **serving node** [i.e., access unit] receives an RRC connection request message sent by a **UE** [i.e., terminal].” (Ex. 1003, 45:21-25). An RRC connection request is a defined type of uplink RRC message. (*see e.g.*, Ex. 1001, FIG. 16). Thus, the person of ordinary skill in the art would have understood that *Lin1*’s **RRC connection request** (i.e., uplink RRC message) from a **UE** (i.e., terminal) is an uplink radio resource control (RRC) message from a terminal.

303. If it is argued that *Lin1*’s **RRC connection request** is not a defined uplink radio resource control (RRC) message, *Lin1* explicitly discloses that the “RRC connection request *is an RRC message*.” (Ex. 1003, 46:3-4). *Lin1* also explains that the **UE** (i.e., terminal) and the **serving node** (i.e., access unit) communicate through a “radio link connection [that] is set up between the **UE 105** [i.e., terminal] and the **serving node 104** [i.e., access unit].” (Ex. 1003, 27:15-17). A person of ordinary skill in the art would have understood that an “uplink” is a unidirectional radio link for the transmission of signals from the UE to a Network, such as a network node, or a base station. (*see supra*, §VI. Technical Background). Thus, even if an RRC connection request was not a defined type of uplink RRC message, the person of ordinary skill in the art would have understood that *Lin1*’s

disclosure of an ***RRC connection request*** received over a radio link connection by a ***serving node*** (i.e., access unit) and from a ***UE*** (i.e., terminal) is referring to an uplink RRC message. The person of ordinary skill in the art would therefore have understood that *Lin1*'s ***RRC connection request*** from a ***UE*** (i.e., terminal) is an uplink radio resource control (RRC) message from a terminal.

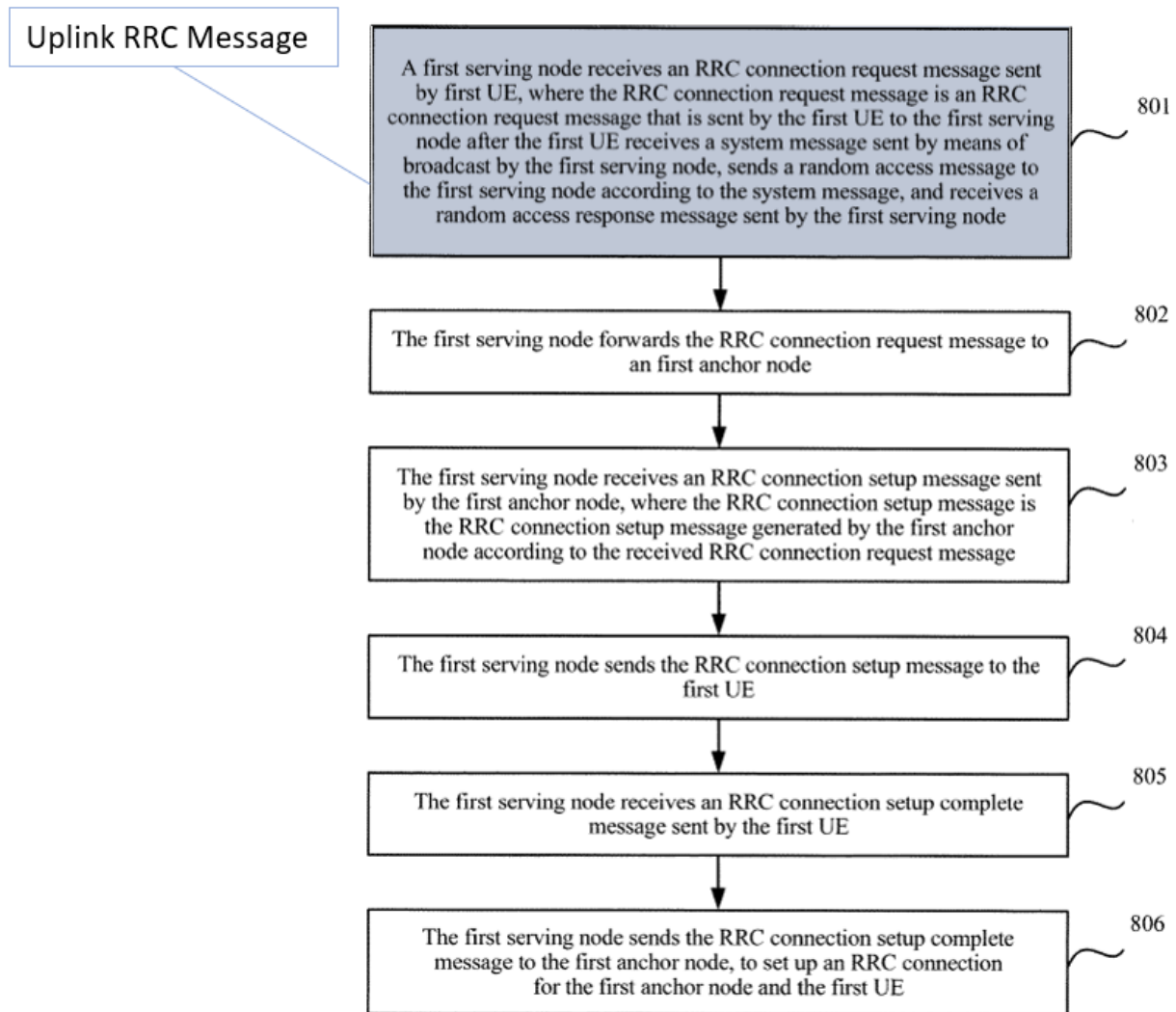


FIG. 8

304. In a second example, *Lin1* also discloses with reference to FIG. 7 (reproduced and annotated below), “receiving, by a first *serving node* [i.e., access unit], an RRC message sent by a first *UE* [i.e., terminal], the RRC message including an RRC message carried by a signaling radio bearer SRB1 or an RRC message

carried by an SRB2.” (Ex. 1003, 41:10-13). As explained above, the person of ordinary skill in the art would have understood that an RRC message received by a *serving node* (i.e., access unit) from a *UE* (i.e., terminal) over a radio link connection is an uplink message. Thus, the person of ordinary skill in the art would have understood that *Lin1*’s *RRC message* received, by a first *serving node* (i.e., access unit) and sent by a first *UE* (i.e., terminal) is an uplink radio resource control (RRC) message from a terminal that used an SRB1. A person of ordinary skill in the art would understand that the uplink radio resource control (RRC) message carried by an SRB1 could include an RRC Connection Setup Complete message, a Security Mode Complete message, a Security Mode Failure message, RRC Connection Reconfiguration Complete message, RRC Connection Re-establishment Complete message, among other commonly defined uplink RRC messages. (*see e.g.*, Ex. 1001, FIG. 16; *see also* Ex. 1010, Chapter 5.2 RRC Connection Management, p. 239, FIG. 5.5).

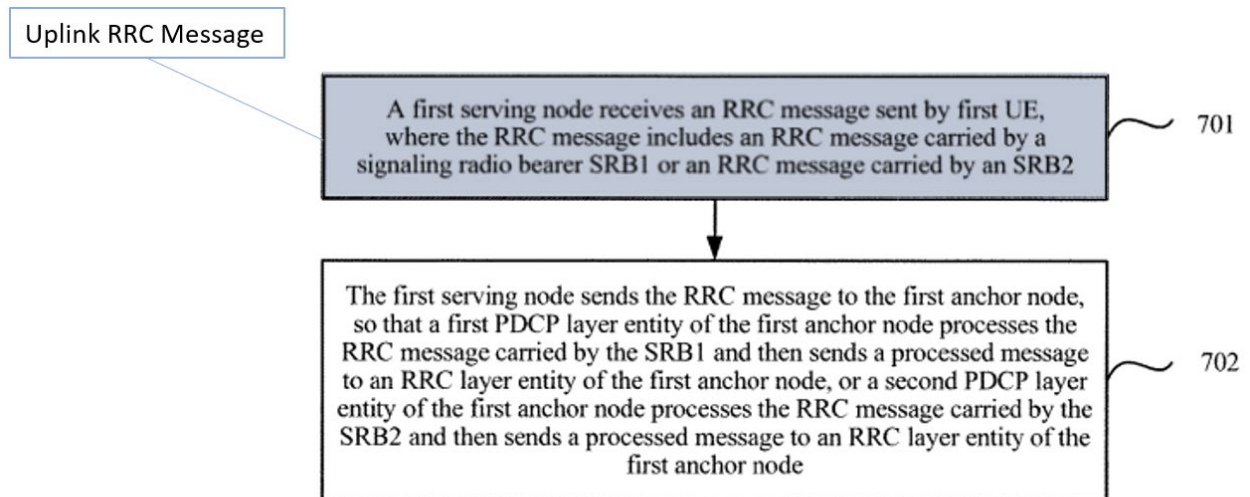
Ex. 1003, FIG. 7

FIG. 7

305. To the extent it is argued that *Lin1* does not disclose receiving an uplink radio resource control (RRC) message from a terminal, *Zhang* discloses yet another different example of receiving an uplink radio resource control (RRC) message from a terminal. Specifically, *Zhang* discloses, with reference to FIG. 13 (reproduced and annotated below), that “user equipment sends uplink signaling or uplink data to the micro network node.” (Ex. 1007,75:19-25). *Zhang* further discloses that “the uplink signaling may be an u[p]link radio resource control (RRC) message.” (Ex. 1007, 75:26-28). Thus, the person of ordinary skill in the art would understand that *Zhang’s micro network node* [i.e., access unit] receives an uplink radio resource control (RRC) message from the *user equipment* [i.e., terminal].

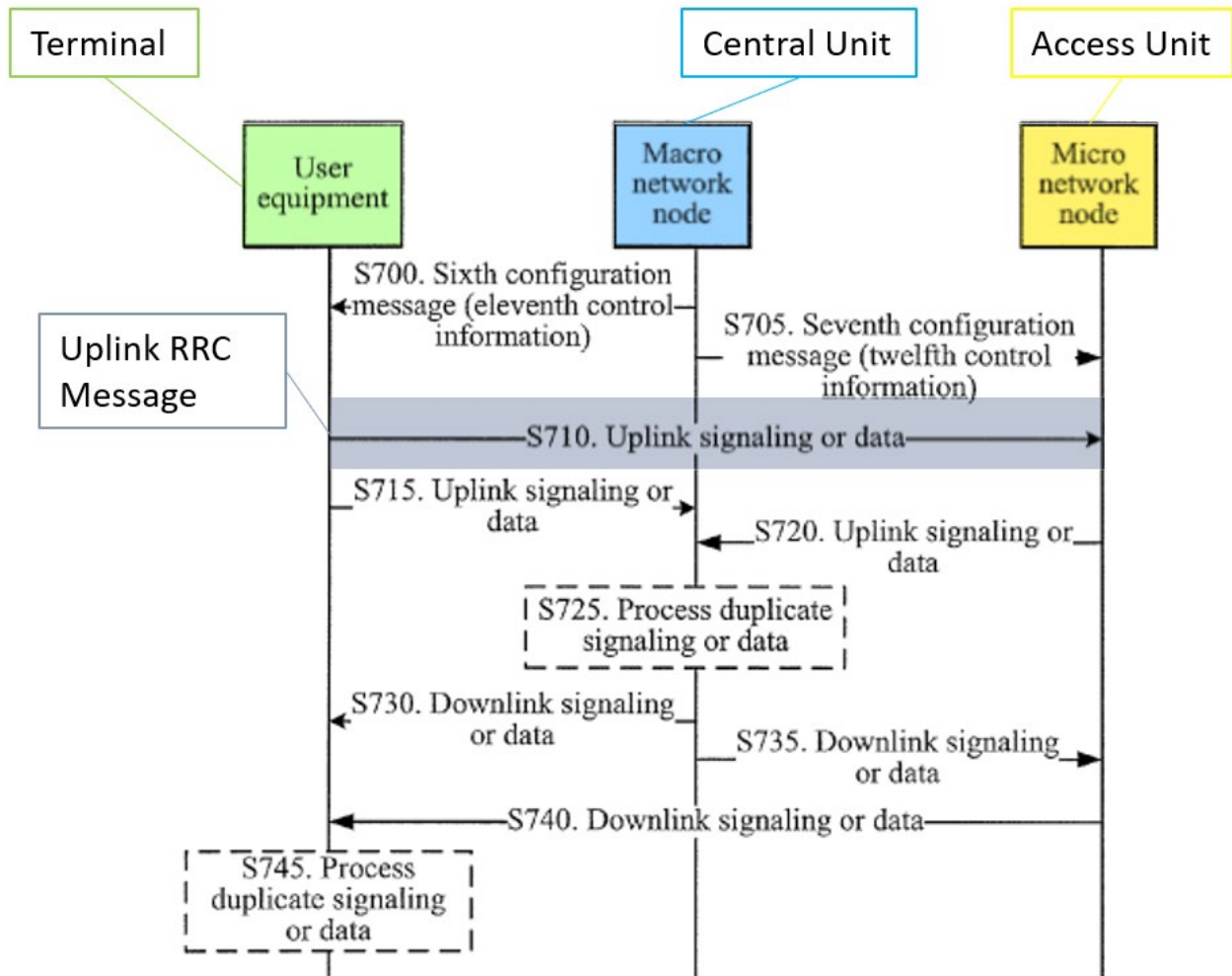


FIG. 13

306. *Lin1* also discloses a central unit. While not explicitly required in Claim 1, the '932 patent describes the “central unit” as a “node providing a *PDCP* function for the transmission of user plane data.” (Ex. 1001, 8:52-54; *see also* Claim 2 (“wherein [] the central unit comprises a node configured to provide a *PDCP*

function, for transmission of the user plane data.”)). Similarly, with reference to FIG. 1 (reproduced and annotated below), *Lin1* discloses an architecture in which the “RRC function is split onto [] two nodes”, including an “anchor node 103 and a **serving node 104** [i.e., access unit] that jointly process an RRC message of the **UE 105** [i.e., terminal].” (Ex. 1003, 27:18-22 and 29:16-18). *Lin1* further discloses that the “anchor node 103 may include . . . a *first packet data convergence protocol (PDCP) protocol entity* used to process the RRC message carried by the SRB1, and a second *PDCP protocol entity* used to process the RRC message carried by the SRB2.” (Ex. 1003, 25:22-26). The person of ordinary skill in the art would have understood that the node that includes a *PDCP entity* would provide a *PDCP function* for the transmission of user plane data. Thus, the person of ordinary skill in the art would have understood that the **anchor node 103** (i.e., central unit) of *Lin1* provides the same functionality as the claimed central unit.

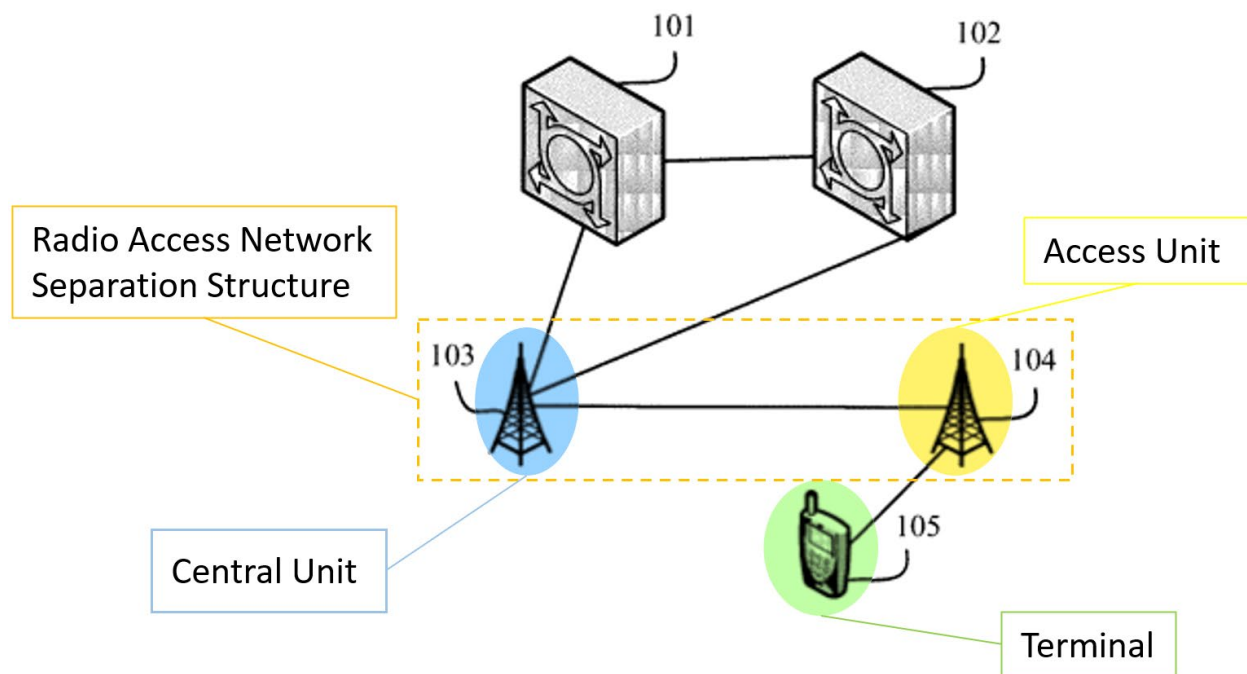


FIG. 1

307. As explained above, the person of ordinary skill in the art would have understood that an uplink message is a message between a *user equipment* (i.e., terminal) and a *network node*. Thus, the person of ordinary skill in the art would have understood that forwarding or otherwise 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*. A person of ordinary skill in the art would have therefore understood that uplink RRC messages are included in other messages, such as control plane messages, for transmission between *network nodes*. Moreover, a person of ordinary skill in the art would have understood, and

the '932 patent confirms, that a common technique for transmitting information, such as uplink or downlink messages, between two network nodes is by 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 (stating that “[f]or efficient data transfer, the CU and AU may be connected via a transport network [that] is configured by GTP tunneling . . . based on header encapsulation”); see Ex. 1010, Chapter 3 E-UTRAN and EPS Protocol Structure, p. 123 (describing an “encapsulation process” in which “headers/sub-headers and padding bits” are added “to make it possible to get data from a source to a destination”); 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). Indeed, for each of the uplink RRC messages identified above, *Lin1* discloses multiple different examples of including (or encapsulating) the uplink RRC message into a first message and transmitting the first message to a central unit.

308. In a first example, with reference again to FIG. 8 (reproduced and annotated below), *Lin1* discloses “forwarding, by the **serving node** [i.e., access unit], the **RRC connection request message** [i.e., uplink RRC message] to a first **anchor node** [i.e., central unit].” (Ex. 1003, 45:29-30). *Lin1* also discloses that “control plane interface signaling is used between the **serving node** [i.e., access unit] and the **anchor node** [i.e., central unit]” in which the **serving node** (i.e., access unit) and the

anchor node (i.e., central unit) communicate using “control plane signaling messages that carr[y] [] RRC message[s]”. (Ex. 1003, 42:21-30). Thus, a person of ordinary skill in the art would have understood that to forward the ***RRC connection request message*** [i.e., uplink RRC message] to the first ***anchor node*** [i.e., central unit], the ***serving node*** [i.e., access unit] would include the ***RRC connection request message*** [i.e., uplink RRC message] into a ***control plane signaling message*** [i.e., a first message] and transmit the ***control plane signaling message*** [i.e., a first message] to the ***anchor node*** (i.e., central unit).

309. With respect to the ***RRC connection request message*** (i.e., uplink RRC message) specifically, *Lin1* discloses that the ***RRC connection request message*** (i.e., uplink RRC message) may be forwarded with a message of a particular message name (or “header”), such as “SRB0RRCTransfer or InitialRRCTransfer.” (Ex. 1003, 46:2-6). Because the SRB0RRCTransfer and the InitialRRCTransfer messages are transmitted between the ***serving node*** (i.e., access unit) and the ***anchor node*** (i.e., central unit), a person of ordinary skill in the art would have understood that these message are examples of ***control plane signaling messages*** (i.e., first messages) that include the ***RRC connection request message*** (i.e., uplink RRC message) and are transmitted to the ***anchor node*** (i.e., central unit).

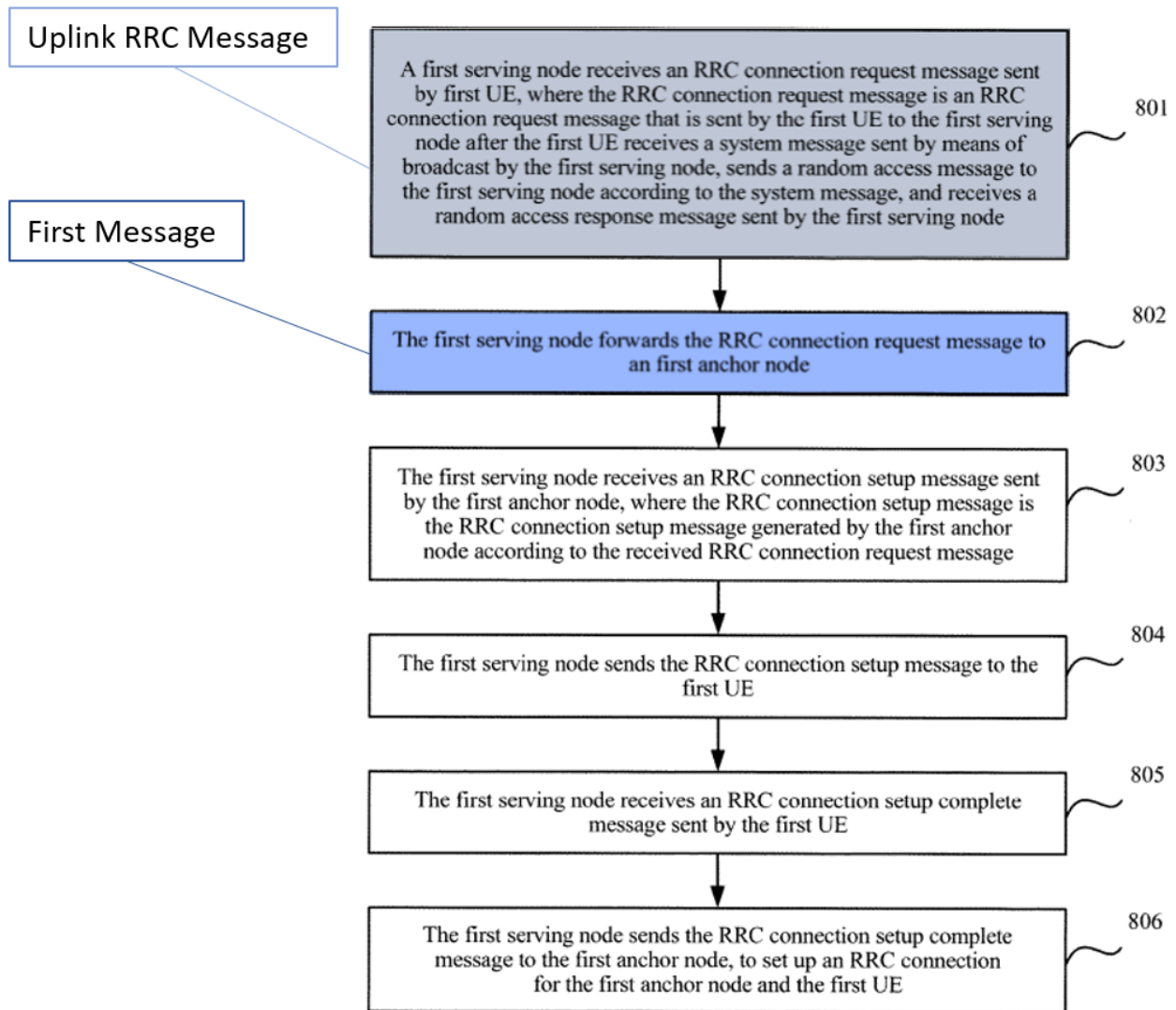
Ex. 1003, FIG. 8

FIG. 8

310. In a second example, *Lin1* discloses with reference to FIG. 7 (reproduced and annotated below), “sending, by the first *serving node* [i.e., access unit], the *RRC message* [i.e., uplink RRC message] to a first *anchor node* [i.e., central unit].” (Ex. 1003, 42:9-10). As described above, *Lin1* explains that “[i]nter-

device control plane interface signaling is used between the *serving node* [i.e., access unit] and the *anchor node* [i.e., central unit],” (Ex. 1003, 42:9-10). Referring to the inter-device control plane interface signaling, *Lin1* discloses a “control plane signaling message that carries the *RRC message* [i.e., uplink RRC message]” to an *anchor node* (i.e., central unit). Based on this disclosure, the person of ordinary skill in the art would have understood that the *control plane signaling message* (i.e., first message) that carries the *RRC message* (i.e., uplink RRC message) is a first message that includes an uplink RRC message. Thus, the person of ordinary skill in the art would have understood that a *serving node* (i.e., access unit) includes an *RRC message* (i.e., uplink RRC message) into a *control plane signaling message* (i.e., a first message) and transmits the *control plane signaling message* (i.e., a first message) to an *anchor node* (i.e., central unit).

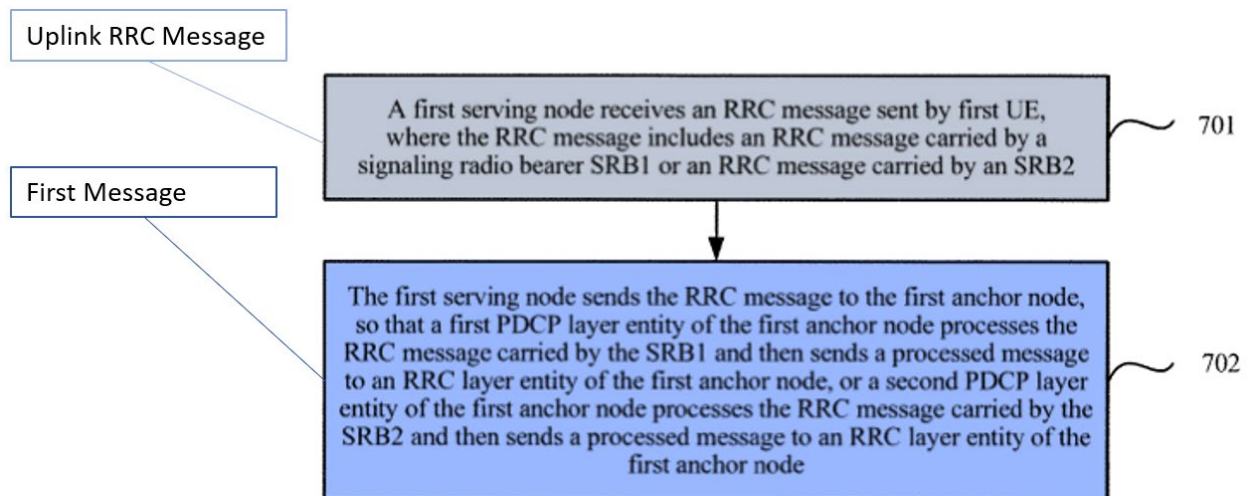
Ex. 1003, FIG. 7

FIG. 7

311. 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* suggests yet another different example of including the uplink RRC message into a first message and transmitting the first message to a central unit. Specifically, *Zhang* discloses, with reference to FIG. 13 (reproduced and annotated below), that a “*micro network node* [i.e., access unit] forwards, to the *macro network node* [i.e., central unit], the uplink signaling or uplink data [i.e., uplink RRC message] sent by the *user equipment* [i.e., terminal].” (Ex. 1007, 76:2-8). Because the uplink signaling or uplink data is sent between two network nodes and not a *UE* (i.e., terminal), a person of ordinary skill in the art would have understood that uplink signaling or uplink data is sent within a message configured for network node

communication (i.e., not an uplink or downlink message). Thus, *Zhang's* disclosure of forwarding the uplink signaling or uplink data from a *micro network node* (i.e., access unit) to a *macro network node* (i.e., central unit) would confirm to the person of ordinary skill in the art that an uplink RRC message is included in another message and then sent to the *macro network node* (i.e., central unit).

Ex. 1007, FIG. 13

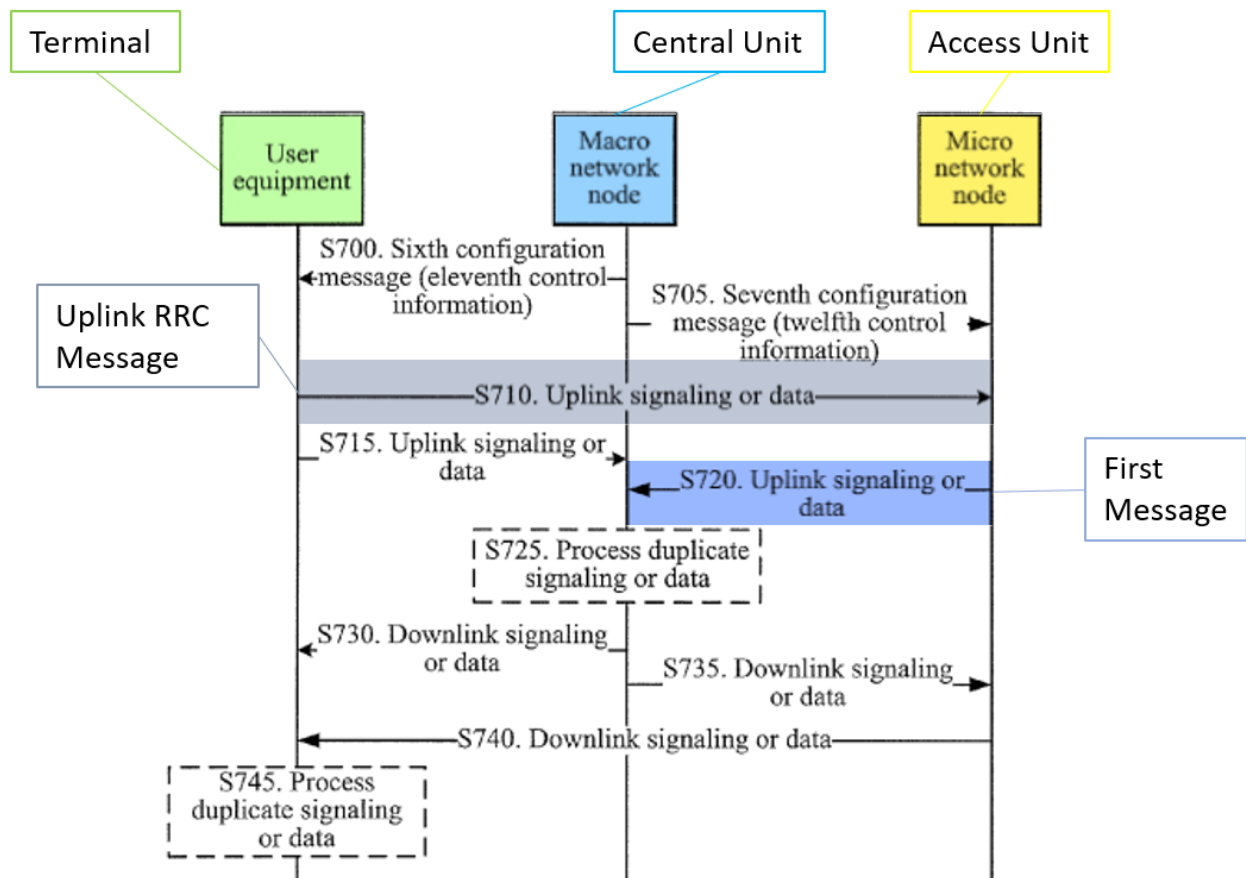


FIG. 13

Claim 1, Element [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

312. *Lin1* and *Zhang* render obvious claim element [1.b].

313. *Lin1* discloses multiple different examples of downlink RRC messages sent between two network nodes. As explained above, the person of ordinary skill in the art would have understood that a downlink message is a message between a *user equipment* (i.e., terminal) and a *network node*. (see *supra*, §VI. Technical Background). Thus, the person of ordinary skill in the art would have understood 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*. A person of ordinary skill in the art would have therefore understood that downlink RRC messages are included in other messages, such as control plane messages, for transmission between network nodes. Indeed, for each of the downlink RRC messages identified below, *Lin1* discloses multiple different examples of receiving a second message from the central unit that includes the downlink RRC message.

314. In a first example, with reference to FIG. 8 (reproduced and annotated below), *Lin1* discloses that the “*serving node* [i.e., access unit] receives an RRC connection setup message sent by the first *anchor node* [i.e., central unit].” (Ex.

1003, 46:15-17). An RRC connection setup message is a defined type of downlink RRC message. (*see e.g.*, Ex. 1001, FIG. 16). Thus, the person of ordinary skill in the art would have understood that *Lin1*’s ***RRC connection setup message*** is a downlink RRC message.

315. *Lin1* also discloses “a control plane signaling message that carries the ***RRC connection setup message*** [i.e., downlink RRC message].” (Ex. 1003, 46:18-22). The person of ordinary skill in the art would have understood from this disclosure that *Lin1*’s ***control plane signaling message*** (i.e., a second message) that carries the ***RRC connection setup message*** (i.e., downlink RRC message) is a second message received from a central unit that includes a downlink RRC message.

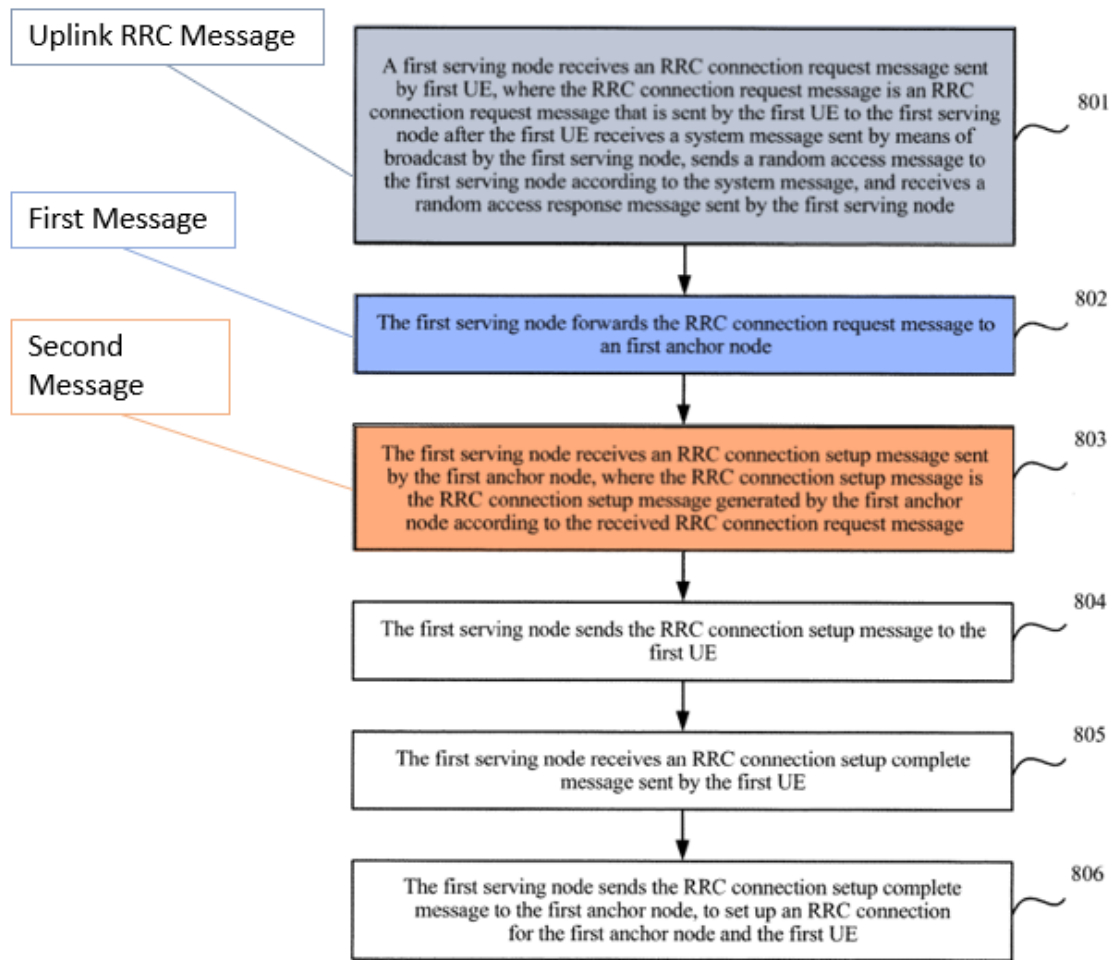


FIG. 8

316. In a second example, with reference to FIG. 7, *Lin1* discloses “receiving, by the first **serving node** [i.e., access unit], an RRC message sent by the first **anchor node** [i.e., central unit], the RRC message including an RRC message carried by an SRB1 or an RRC message carried by an SRB2”. (Ex. 1003, 42:14-16). *Lin1* also discloses “processing, by a first radio link control (RLC) layer entity of

the first **serving node** [i.e., access unit], the RRC message” and “then sending [the] processed message to the first **UE** [i.e., terminal].” (Ex. 1003, 42:14-20). As explained above, a downlink message is a message sent over a radio link interface from a network node to a **UE** [i.e., terminal]. The person of ordinary skill in the art would have understood that an RLC layer is used to process messages for transmission over an air interface. Thus, *Lin*’s disclosure of the **serving node** (i.e., access unit) processing an RRC message with an RLC layer for transmission to a **UE** [i.e., terminal] would have confirmed to the person of ordinary skill in the art that the RRC message is a downlink RRC message. As such, the **RRC message** sent by the first **anchor node** (i.e., central unit) is a downlink RRC message. A person of ordinary skill in the art would understand that the downlink RRC message carried by an SRB1 could include an RRC Connection Reconfiguration message, a RRC Connection Release message, Security Mode Command messages, among other commonly defined uplink RRC messages. (*see e.g.*, Ex. 1001, FIG. 16; *see also* Ex. 1010, Chapter 5.2 RRC Connection Management, p. 239, FIG. 5.5).

317. As explained above, *Lin1* also discloses that the inter-device control plane interface signaling is used between the **serving node** [i.e., access unit] and the **anchor node** [i.e., central unit]” and that an **RRC message** (i.e., downlink RRC message) is carried by a control plane signaling message. (Ex. 1003, 42:21-30). This disclosure would have suggested to the person of ordinary skill in the art that the

RRC message (i.e., downlink RRC message) sent by the first **anchor node** (i.e., central unit) is carried by a **control plane signaling message** (i.e., a second message). Thus, the person of ordinary skill in the art would have understood that *Lin1*'s **serving node** (i.e., access unit) receives a **control plane signaling message** (i.e., a second message) that includes an **RRC message** (i.e., downlink RRC message) from an **anchor node** (i.e., central unit).

318. 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* suggests a further different example of receiving a second message from the central unit that includes a downlink RRC message. Specifically, with reference to FIG. 13 (reproduced and annotated below), *Zhang* discloses that the “**macro network node** [i.e., central unit] sends downlink signaling or downlink data to the **micro network node** [i.e., access unit].” (Ex. 1007, 76:17-19). *Zhang* further discloses that “the downlink signaling may be a downlink radio resource control (RRC) message.” (Ex. 1007, 76:14-16). Thus, the person of ordinary skill in the art would have understood that *Zhang*'s the **micro network node** (i.e., access unit) receives a downlink RRC message from the **macro network node** [i.e., central unit]. Because the downlink signaling or downlink data is sent between two network nodes and not a **UE** (i.e., terminal), a person of ordinary skill in the art would have understood that downlink signaling or uplink data is sent within a message configured for network node

communication (i.e., not an uplink or downlink message). Thus, *Zhang's* disclosure of sending the downlink signaling or uplink data to a ***micro network node*** (i.e., access unit) from a ***macro network node*** (i.e., central unit) would confirm to the person of ordinary skill in the art that a downlink RRC message is included in another message (i.e., a second message and then sent to the ***macro network node*** (i.e., central unit).

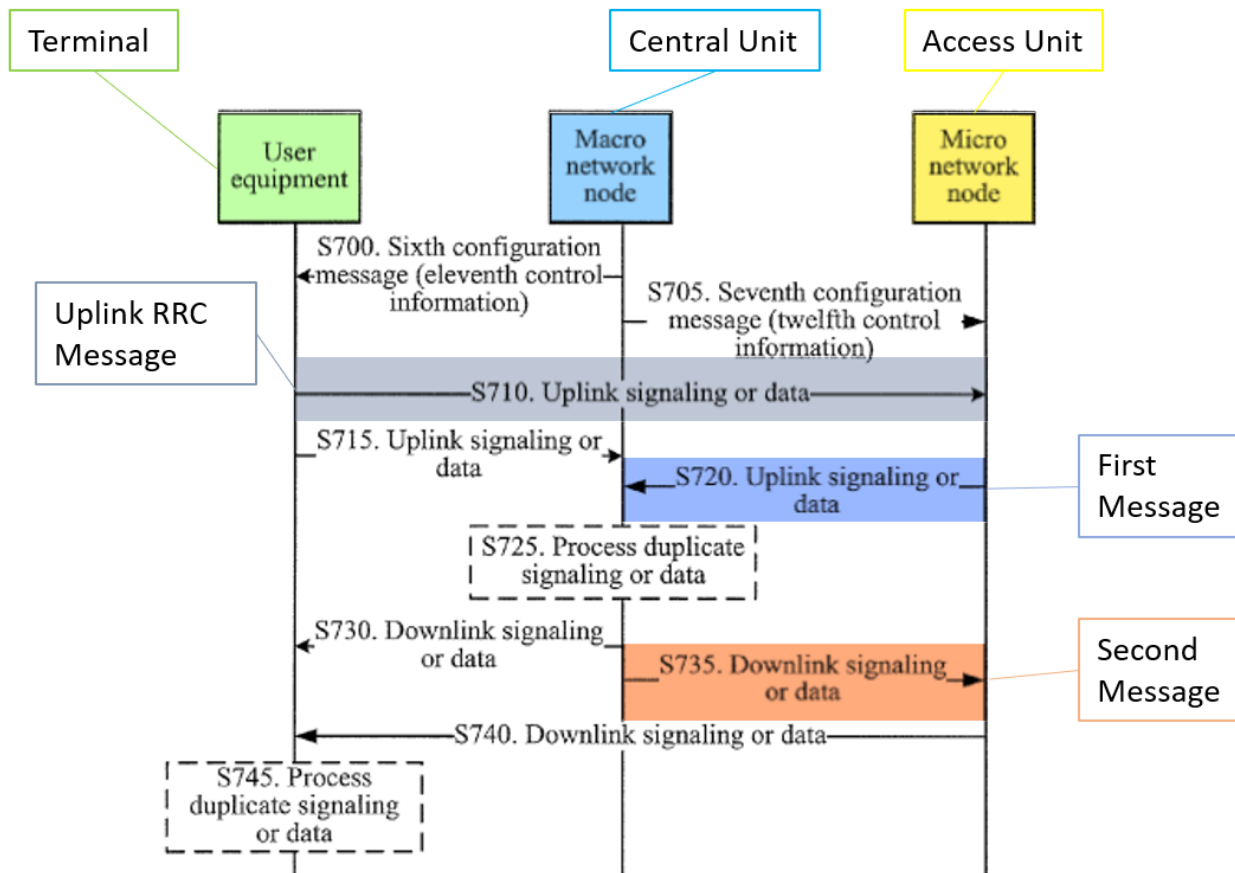


FIG. 13

319. *Lin1* discloses multiple different examples of a second message that includes a downlink RRC message in response to the uplink RRC message from the terminal.

320. In a first example, with reference to FIG. 8, *Lin1* discloses that “the **RRC connection setup message** [i.e., downlink RRC message] [is] generated by the first **anchor node** [i.e., central unit] according to the received **RRC connection request message** [i.e., uplink RRC message].” (Ex. 1003, 46:15-17). Thus, the

person of ordinary skill in the art would have understood that the ***RRC connection setup message*** [i.e., downlink RRC message] is in response to the ***RRC connection request message*** [i.e., uplink RRC message].”

321. In a second example, with reference to FIG. 7, *Lin1* discloses an RRC message processing method that includes “sending, by the first ***serving node*** [i.e., access unit], the ***RRC message*** [i.e., uplink RRC message] to a first ***anchor node*** [i.e., central unit], so that . . . the ***anchor node*** [i.e., central unit] processes the ***RRC message*** [i.e., uplink RRC message].” (Ex. 1003, 42:9-13). *Lin1* discloses that the method includes “receiving, by the first ***serving node*** [i.e., access unit], the ***RRC message*** [i.e., downlink RRC message] sent by the first ***anchor node*** [i.e., central unit].” *Lin1*’s disclosure of receiving an ***RRC message*** [i.e., downlink RRC message] from an ***anchor node*** (i.e., central unit) after sending the ***anchor node*** (i.e., central unit) a previous ***RRC message*** (i.e., uplink RRC message) would have suggested to the person of ordinary skill in the art that the received ***RRC message*** [i.e., downlink RRC message] is in response to the previously sent ***RRC message*** [i.e., uplink RRC message].

322. 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 a further different example of a second message that includes a downlink RRC message in response to the uplink RRC message from the

terminal. Specifically, with reference to FIG. 13 Step S735 (reproduced and annotated below), *Zhang* discloses that a “**macro network node** [i.e., central unit] sends **downlink signaling or downlink data** [i.e., downlink RRC message carried in a second message] to the **micro network node** [i.e., access unit].” (Ex. 1007, 76:17-19). *Zhang* discloses that the **downlink signaling or downlink data** [i.e., downlink RRC message carried in a second message] is sent after **uplink signaling or uplink data** [i.e., uplink RRC message carried in a first message] is received, at Step S710. (Ex. 1007, 75:19-76:19). Thus, a person of ordinary skill in the art would have understood that the second message of *Zhang* includes a **downlink signaling or downlink data** [i.e., downlink RRC message carried in a second message] in response to the **uplink signaling or uplink data** [i.e., uplink RRC message carried in a first message] from the terminal.

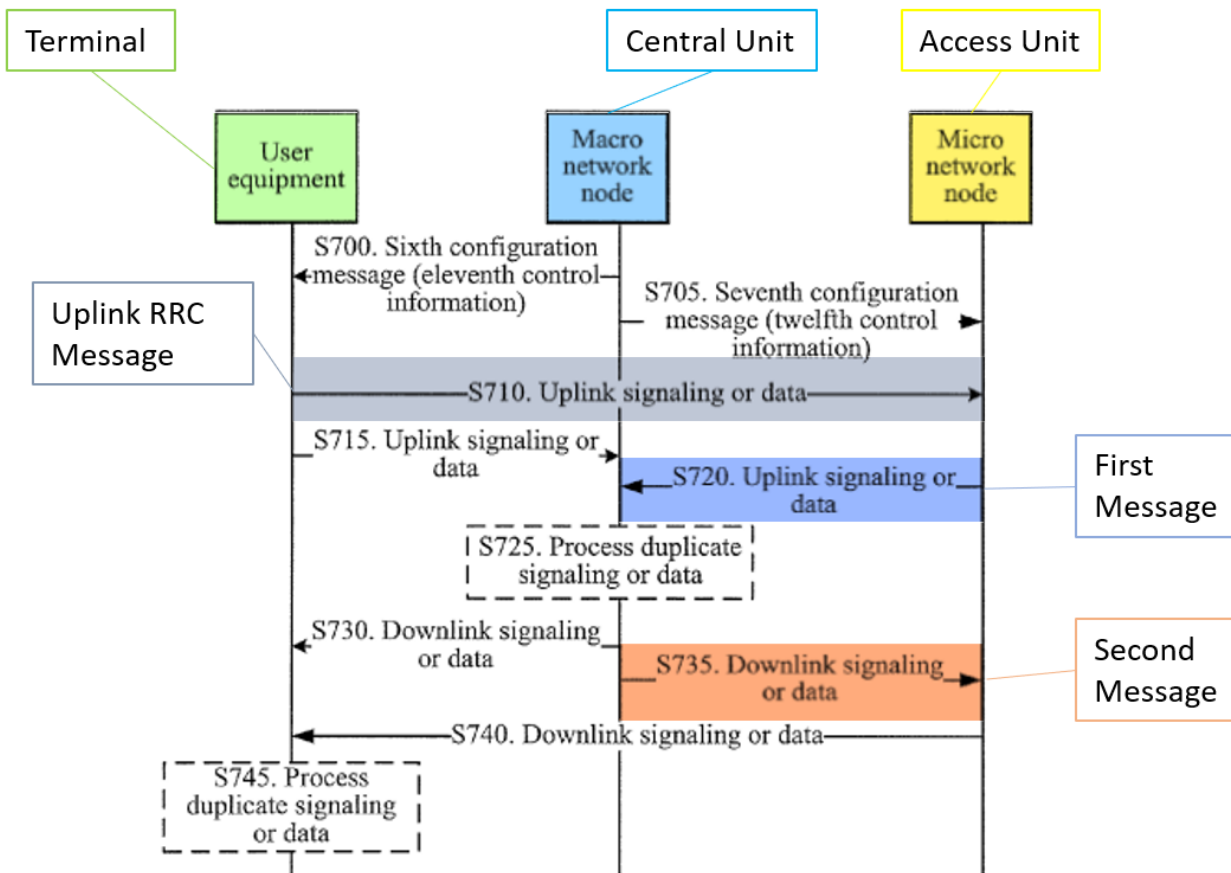


FIG. 13

Claim 1, Element [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.

323. *Lin1* and *Zhang* render obvious claim element [1.c].

324. *Lin1* discloses multiple different examples of transmitting the downlink RRC message to the terminal.

325. In a first example, with reference to FIG. 8 (reproduced and annotated below), *Lin1* discloses “sending, by the first ***serving node*** [i.e., access unit], [an] ***RRC connection setup message*** [i.e., downlink RRC message] to the first ***UE*** [i.e., terminal].” (Ex. 1003, 46:15-17). As described above, the person of ordinary skill in the art would have understood from this disclosure that *Lin1*’s ***RRC connection setup message*** is a downlink RRC message transmitted to a ***UE*** (i.e., terminal).

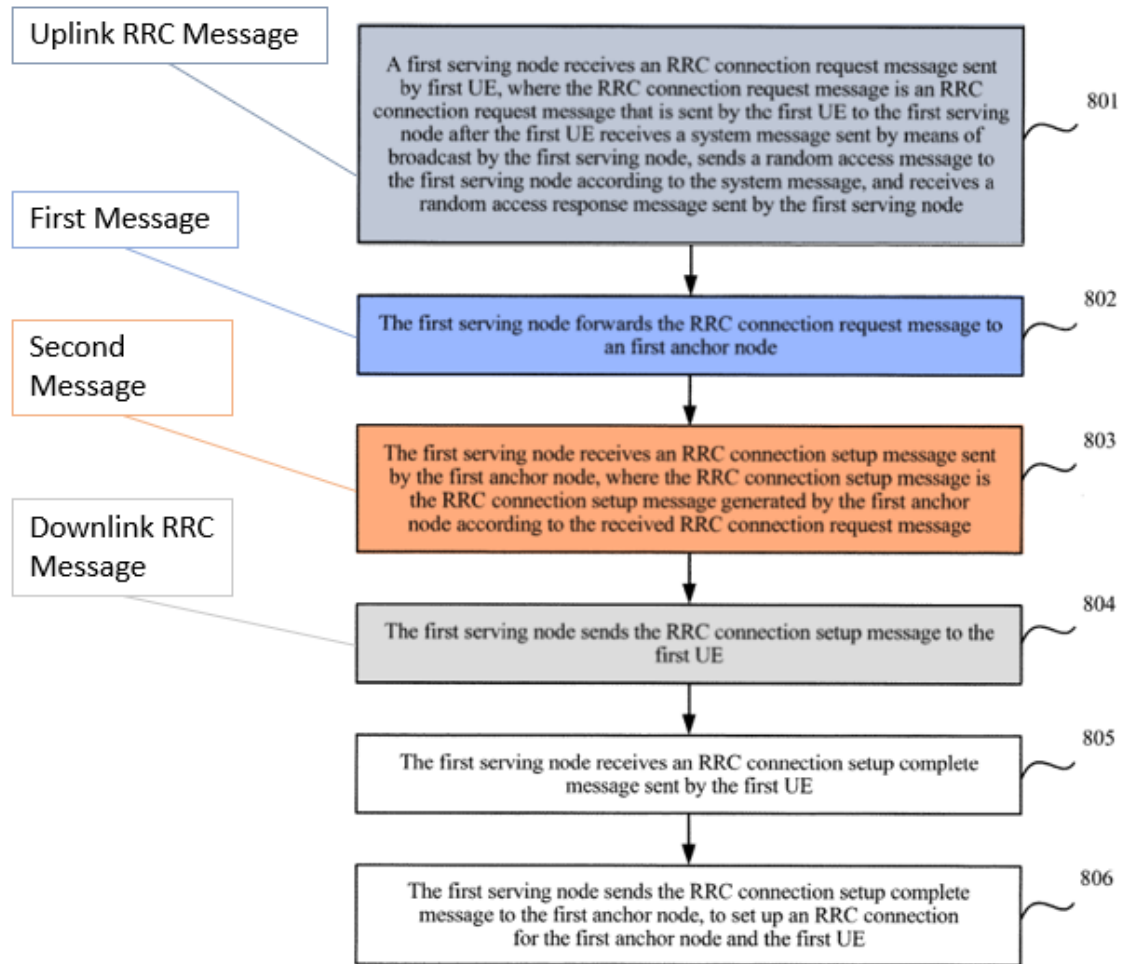
Ex. 1003, FIG. 8

FIG. 8

326. In a second example, with reference to FIG. 7, *Lin1* discloses “processing, by a first radio link control (RLC) layer entity of the first *serving node* [i.e., access unit], the *RRC message* [i.e., downlink RRC message] carried by the SRB1 and then sending a processed message to the first *UE* [i.e., terminal].” (Ex. 1003, 42:16-18). As explained above, *Lin1*’s disclosure of processing an *RRC*

message [i.e., downlink RRC message] with an RLC layer entity would have confirmed to the person of ordinary skill in the art that the ***RRC message*** [i.e., downlink RRC message] is a downlink RRC message. Thus, it would have been obvious to the person of ordinary skill in the art, in view of the above disclosure, that the ***serving node*** (i.e., access unit) transmit a downlink RRC message to the ***UE*** (i.e., terminal).

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

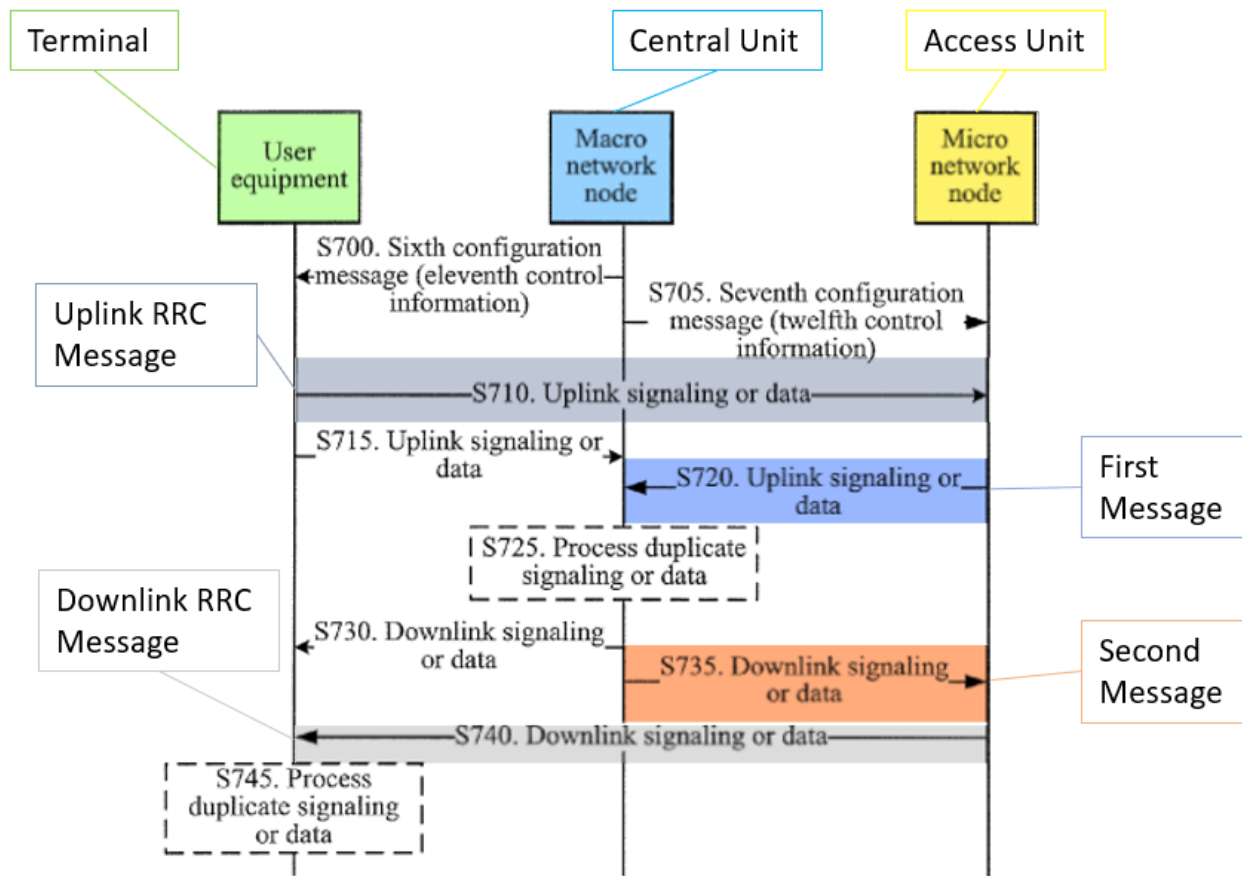


FIG. 13

328. *Lin1* also discloses radio bearer identification information-included in the first message and the second message. While the '932 patent does not provide a definition of radio bearer identification information, it provides various examples of what radio bearer identification information could include. For example, the '932 patent refers to “bearer identification information of the signaling radio bearer (i.e. SRB1)”, (Ex. 1003, 15:58-61), “bearer identification information of the signaling radio bearer (DRB or SRB2)”, (Ex. 1003, 17:46-50), “bearer identification

information (e.g. UP SRB1 tunnel identification information (TEID)) may be transferred”, (Ex. 1003, 17:57-67), and “radio bearer context (an E-RAB ID, E-RAB QoS parameters, a transport layer address, and a GTP-TEID)” (Ex. 1003, 19:16-24). Moreover, Claim 6 confirms that “the first message includes SRB1 signaling radio bearer identification information.” In view of these examples and as I demonstrate below, *Lin1* discloses radio bearer identification information.

329. Specifically, *Lin1* discloses “in order that the **serving node** [i.e., access unit] and the **anchor node** [i.e., central unit] can identify an SRB type of a received RRC message, a transmitter may send indication information to a receiver, and indicate the SRB type of the RRC message to the receiver by using the indication information, for example, indicate whether the RRC message is specifically an RRC message carried by the SRB1 or an RRC message carried by the SRB2. In the embodiment of the present invention, the indication information may be carried when the **RRC message** [i.e., uplink or downlink RRC messages] is being sent. Specifically, the indication information may be carried in the **RRC message** [i.e., uplink or downlink RRC messages], or the indication information may be carried in a **control plane signaling message** [i.e., first or second messages] that carries the **RRC message** [i.e., uplink or downlink RRC messages], or the indication information may be sent separately after the **RRC message** [i.e., uplink or downlink RRC messages] is sent.” (Ex. 1003, 42:21-30). A person of ordinary skill in the art

would have understood, and *Lin1* confirms, an SRB refers to a radio bearer. (*see e.g.*, Ex. 1003, 2:12-15, 30:6-9, and 64:6-9). Thus, a person of ordinary skill in the art would have understood that *Lin1*'s indication information *identifies a type of radio bearer* (i.e., SRB type) of an **RRC message** [i.e., uplink or downlink RRC messages].

330. *Lin1* further discloses, and the person of ordinary skill in the art would have known, that “different processing methods are used to process [an] **RRC message** [i.e., uplink or downlink RRC messages] according to different SRB types of the RRC message.” (Ex. 1003, 24:20-25). The person of ordinary skill in the art would have known, and *Lin1* confirms, that the SRB type impacts the processing of both a **serving node** (e.g., access unit) and an **anchor node** (e.g., central unit) that “jointly process [an] RRC message.” (Ex. 1003, 24:20-25). Due to the known impact of the SRB type on the processing of **RRC messages** (i.e., uplink or downlink messages) by a **serving node** (e.g., access unit) and an **anchor node** (e.g., central unit), the person of ordinary skill in the art would have understood that the claimed radio bearer identification information-included in the first and second messages between the access unit and the central unit includes *Lin1*'s **indication information** that *identifies a type of radio bearer* (i.e., radio bearer identification information).

331. Finally, as described above, *Lin1* discloses that “control plane interface signaling is used between the **serving node** [i.e., access unit] and the **anchor node** [i.e., central unit]” in which the **serving node** (i.e., access unit) and the anchor node

(i.e., central unit) communicate using *control plane signaling messages* (i.e., first and second messages) that carry *RRC messages* (i.e., uplink and downlink RRC messages). (Ex. 1003, 42:21-30). *Lin1* discloses that “the *indication information* [i.e., radio bearer identification information] may be carried in a *control plane signaling message* [i.e., first and second messages] that carries the *RRC message* [i.e., uplink and downlink RRC messages]”. (Ex. 1003, 42:28-30). Thus, a person of ordinary skill in the art would have understood that *Lin1*’s *indication information* [i.e., radio bearer identification information] is included in *Lin1*’s *control plane signaling messages* [first message and the second message].

332. *Lin1* discloses multiple additional examples of *indication information* (i.e., radio bearer identification information) included in the first message and a second message. As I will describe in additional detail below, the indication information is used by *Lin1* to distinguish radio signal bearers.

333. In a first example, with reference to FIG. 8, *Lin1* discloses that “the first *serving node* [i.e., access unit] may send first *indication information* [i.e., radio bearer identification information] when forwarding the *RRC connection request message* [i.e., uplink RRC message] to the first *anchor node* [i.e., central unit].” (Ex. 1003, 46:1-5). *Lin1* further discloses that the “first indication information may be an explicit signaling indication or a particular message name” for a SRB0RRCTransfer or InitialRRCTransfer message. (Ex. 1003, 46:4-6). As

described above, the SRB0RRCTransfer and InitialRRCTransfer messages are examples of *control plane signaling messages* (i.e., first messages) that include the *RRC connection request message* (i.e., uplink RRC message). (see *supra*, §IX.A, Claim 1, Element [1.a]). Thus, a person of ordinary skill in the art would have understood that the *indication information* [i.e., radio bearer identification information], such as the explicit signaling indication or a particular message name for a SRB0RRCTransfer or InitialRRCTransfer message, is radio bearer identification information-included in the first message.

334. With reference to FIG. 8, *Lin1* also discloses that “first *anchor node* [i.e., central unit] may include the *indication information* [i.e., radio bearer identification information] in a message when sending the *RRC connection setup message* [i.e., downlink RRC message], and specifically, may include the *indication information* [i.e., bearer identification information] in the *RRC connection setup message* [i.e., downlink RRC message] or include the *indication information* [i.e., bearer identification information] in a *control plane signaling message* [i.e., a second message] that carries the *RRC connection setup message* [i.e., downlink RRC message].” (Ex. 1003, 46:18-22). The person of ordinary skill in the art would have understood that the *indication information* [i.e., bearer identification information] in a *control plane signaling message* [i.e., a second message] that

carries the *RRC connection setup message* [i.e., downlink RRC message] is radio bearer identification information-included in the second message.

335. In a second example, with reference to FIG. 7, *Lin1* discloses that “*indication information* [i.e., bearer identification information] may be carried in a *control plane signaling message* [i.e., a first or second message] that carries the *RRC message* [i.e., uplink or downlink RRC messages].” (Ex. 1003, 42:24-29). Thus, the person of ordinary skill in the art would have understood that *Lin1*’s *indication information* (i.e., radio bearer identification information) that may be carried in a *control plane signaling message* [i.e., a first or second message] that carries the *RRC message* [i.e., uplink and downlink RRC message] is radio bearer identification information-included in the first message and second message.

336. To the extent it is argued that that *Lin1* does not disclose radio bearer identification information included in the first message and a second message, *Zhang* suggests a further example of radio bearer identification information included in the first message and a second message. Specifically, *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). As explained above, a person of ordinary skill in the art would have understood that an SRB1 is one of three types of signaling radio bearers. Thus,

a person of ordinary skill in the art would have understood that *Zhang's micro network node* (i.e., access unit) and *macro network node* (i.e., central unit) send and receive control information with radio bearer (RB) identifiers that identify the SRB type of an RRC message.

337. *Lin1* discloses multiple ways 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. In this regard, the person of ordinary skill in the art would have understood that distinguish 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. More particularly, the person of ordinary skill in the art would have understood that an ***RRC message*** [i.e., uplink or downlink RRC message] may be carried by one of three types of signaling radio bearers (SRBs), including an SRB0, an SRB1, and an SRB2. (*see supra*, §VI. Technical Background). Thus, a person of ordinary skill in the art would have understood that identifying an SRB type of an ***RRC message*** (i.e., uplink or downlink RRC message) would distinguish the signaling radio bearer of the ***RRC message*** (i.e., uplink or downlink RRC message) *from other types of signaling radio bearers (SRBs)*. Additionally, the person of ordinary skill in the art would have known, and *Lin1* confirms, that “different processing methods are used to process [an] ***RRC message*** [i.e., uplink or downlink RRC message] according to different

SRB types of the **RRC message** [i.e., 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). Referring to multiple different RRC message processing functions, including RRC connection, RRC connection re-setup, and others, *Lin1* explains that “indication 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 and the first anchor node 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). Based on this disclosure, a person of ordinary skill in the art would have understood that processing an **RRC message** (i.e., uplink or downlink RRC message) according to a particular SRB type would include distinguishing the signaling radio bearer of the **RRC message** (i.e., uplink or downlink RRC message) *from other types of signaling radio bearers (SRBs).*

338. A person of ordinary skill in the art would have therefore concluded that either identifying an SRB type of an **RRC message** (i.e., uplink or downlink RRC message) or processing an **RRC message** (i.e., uplink or downlink RRC message) according to the identified SRB type would include distinguishing signaling radio bearers based on the indication information stored therein. As shown below, *Lin1* discloses both concepts. Specifically, *Lin1* discloses that the **serving**

node (i.e., access unit) and the *anchor node* (i.e., central unit) both identify an SRB type of an *RRC message* (i.e., uplink or downlink RRC message) and process an *RRC message* (i.e., uplink or downlink RRC message) according to the SRB type of the *RRC message* (i.e., uplink and downlink RRC message) based on *indication information* (i.e., radio bearer identification information) in the first message and the second message.

339. First, *Lin1* discloses an access unit and a central unit that identify an SRB type of an RRC message based on radio bearer identification information in a first message and a second message.

340. Specifically, *Lin1* discloses that the “*serving node* [i.e., access unit] may send *indication information* [i.e., bearer identification information] when forwarding the *RRC connection request message* [i.e., uplink RRC message] to the first *anchor node* [i.e., central unit]” to “indicate that the *RRC connection request message* [i.e., uplink RRC message] is an RRC message carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 46:1-8). *Lin1* also discloses that “the first *anchor node* [i.e., central unit] identif[ies], according to the *indication information* [i.e., bearer identification information], that the *RRC message* (i.e., uplink RRC message) is carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 43:10-13). Thus, a person of ordinary skill in the art would have understood that the *serving node* (i.e., access unit) *indicates* an SRB type of the *RRC connection request*

message (i.e., uplink RRC message) to an *anchor node* (i.e., central unit) and the *anchor node* (i.e., central unit) *identifies* the SRB type of the *RRC connection request message* (i.e., uplink RRC message) based on *indication information* (i.e., bearer identification information). As explained above, *Lin1* discloses forwarding the *RRC connection request message* (i.e., uplink RRC message) in a *control plane signaling message* (i.e., first message) carrying the *RRC connection request message* (i.e., uplink RRC message). Thus, a person of ordinary skill in the art would have understood that the *indication information* (i.e., bearer identification information) used to indicate/identify the SRB type is in the *control plane signaling message* (i.e., first message).

341. *Lin1* also discloses that “the first *anchor node* [i.e., central unit] may include the *indication information* [i.e., radio bearer identification information] in a message when sending the *RRC connection setup message* [i.e., downlink RRC message] . . . so that the first *serving node* [i.e., access unit] identifies, according to the *indication information* [i.e., radio bearer identification information], that the *RRC connection setup message* [i.e., downlink RRC message] is the RRC message carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 46:18-25). *Lin1* further discloses that the “*serving node* [i.e., access unit] identifies, according to the *indication information* [i.e., bearer identification information], that the *RRC connection setup message* [i.e., downlink RRC message] is the RRC message

carried by the SRB0 [i.e., one of three SRB types].” (Ex. 1003, 46:23-25). Thus, a person of ordinary skill in the art would have understood that the *anchor node* (i.e., central unit) *indicates* an SRB type of the *RRC connection setup message* (i.e., downlink RRC message) to a *serving node* (i.e., access unit) and the *serving node* (i.e., access unit) *identifies* the SRB type of the *RRC connection setup message* (i.e., downlink RRC message) based on *indication information* (i.e., bearer identification information). As explained above, *Lin1* discloses forwarding the *RRC connection setup message* (i.e., downlink RRC message) in a *control plane signaling message* (i.e., second message) carrying the *RRC connection setup message* (i.e., downlink RRC message). Thus, a person of ordinary skill in the art would have understood that the *indication information* (i.e., bearer identification information) used to indicate/identify the SRB type is in the *control plane signaling message* (i.e., second message).

342. Second, *Lin1* discloses an access unit and a central unit that process an RRC message according to an SRB type identified by radio bearer identification information in a first message and a second message. For example, *Lin1* discloses that “[e]ach time an *RRC message* [e.g., uplink or downlink RRC message] is sent between the first *anchor node* [i.e., central unit] and the first *serving node* [i.e., access unit], whether the RRC message is an RRC message carried by an SRB0 [i.e., a first of three SRB types], an RRC message carried by an SRB1 [i.e., a second of

three SRB types], or an RRC message carried by an SRB2 [i.e., a third of three SRB types] needs to be indicated, so that a receiver performs processing.” (Ex. 1003, 47:30-48:3). As separately explained for the *serving node* (i.e., access unit) and the *anchor node* (i.e., central unit) below, both *Lin1*’s *serving node* (i.e., access unit) and *anchor node* (i.e., central unit) perform different processing according to the SRB type indicated for an RRC message.

343. With respect to the processing performed by the *serving node* (i.e., access unit), *Lin1* discloses that a “RRC message [that] is carried by the SRB0 [i.e., a first of three SRB types] [is] process[ed] by using an RRC layer entity of the first *serving node* [i.e., access unit],” “a first RLC layer entity [is] used to process an RRC message carried by the SRB1 [i.e., a second of three SRB types], and a second RLC layer entity [is] used to process an RRC message carried by the SRB2 [i.e., 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). Based on this disclosure, the person of ordinary skill in the art would have understood that *Lin1*’s *serving node* (i.e., access unit) processes an *RRC message* (e.g., uplink or downlink RRC message) using different processing entities (i.e., RRC layer entity, first RLC layer entity, and second RLC entity) according to a specific SRB type identified by the *indication information* (i.e., radio bearer identification information) within a message.

344. With respect to the processing performed by the **anchor node** (i.e., central unit), *Lin1* discloses that the first **anchor node** (i.e., central unit) processes an RRC message carried by an SRB0 (i.e., a first of three SRB types) using an RRC layer entity, an RRC message carried by an SRB1 [i.e., a second of the three SRB types]” using a first PCDP layer, and an RRC message carried by an SRB1 [i.e., 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). Based on this disclosure, the person of ordinary skill in the art would have understood that *Lin1*’s **anchor node** (i.e., central unit) processes an **RRC message** (e.g., uplink or downlink RRC message) using different processing entities (i.e., RRC layer entity, first PCDP layer entity, and second PCDP entity) according to a specific SRB type identified by the **indication information** (i.e., radio bearer identification information) within a message.

345. 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, *Zhang* suggests yet 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. Specifically, *Zhang* discloses that the **uplink signaling or uplink data** [i.e., uplink RRC message]

and the *downlink signaling or downlink data* [i.e., downlink RRC message] are transmitted on a default logical channel corresponding to the radio bearer. (Ex. 1007, 59:6-9, 63:7-26). The person of ordinary skill in the art would have understood, and the above disclosure of *Zhang* confirms, that the radio bearer of an RRC message impacts the logical channel used by a network node to process the RRC message. Specifically, the person of ordinary skill in the art would have known that each SRB type of an RRC message is processed using a different logical channel. Therefore, a person of ordinary skill in the art would have understood that *Zhang's micro network node* [i.e., access unit] and *Zhang's macro network node* [i.e., central unit] distinguish signaling radio bearers based on the radio bearer identification information-included in the first message and the second message to process an RRC message using the correct logical channel.

Dependent Claim 2

Claim 2, Element [2.pre]: The method of claim 1

346. As set forth above, *Lin1* and *Zhang* render obvious all of the elements of claim 1. Thus, *Lin1* and *Zhang* render obvious [2.pre].

Claim 2, Element [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

347. *Lin1* discloses claim element [2.a].

348. *Lin1* discloses the access unit comprises a node configured to provide an RLC function, a MAC function, and a PHY function. Specifically, *Lin1* discloses

a **serving node** (i.e., 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). The person of ordinary skill in the art 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. Thus, the person of ordinary skill in the art would have understood that the **serving node** (i.e., access unit) comprises a node configured to provide an RLC function, a MAC function, and a PHY function.

349. *Lin1* discloses that the RLC function, the MAC function, and the PHY function are configured for transmission of user plane data. Specifically, with reference to FIG. 1, (reproduced and annotated below), *Lin1* discloses “an S1-U user plane interface [is] established between the MME 101 in a core network and the **anchor node 103** [i.e., central unit] and between the SGW 102 in the core network and the **anchor node 103** [i.e., central unit]. The **anchor node 103** [i.e., central unit] and the **serving node 104** [i.e., access unit] are connected by using a signal tunnel (backhaul) to establish an interface. The interface may be specifically an enhanced X2 interface or may be an interface of another type. A radio link connection is set up between the **UE 105** [i.e., terminal] and the **serving node 104** [i.e., access unit].” A person of ordinary skill in the art would have understood that an “S1-U user plane interface” is an interface used to transmit user plane data. (see Ex. 1010,

Abbreviations and Acronyms, p. xxvii). Thus, the person of ordinary skill in the art would have understood the RLC function, the MAC function, and the PHY function of *Lin1*'s **serving node** (i.e., access unit) are configured for transmission of user plane data.

Ex. 1003, FIG. 1

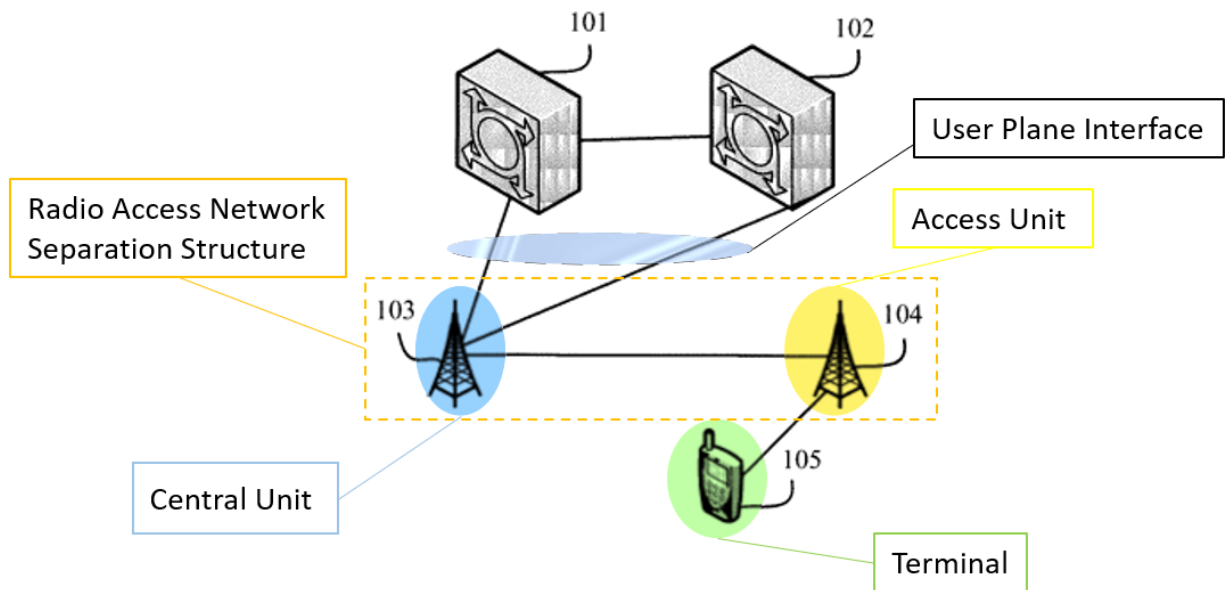


FIG. 1

350. Thus, *Lin1* discloses claim element [2.a].

Claim 2, Element [2.b]: wherein the central unit comprises a node configured to provide a PDCP function, for transmission of the user plane data.

351. *Lin1* discloses claim element [2.b].

352. *Lin1* discloses the central unit comprises a node configured to provide a PDCP function, for transmission of the user plane data. Specifically, *Lin1* discloses an ***anchor node*** (i.e., 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). The person of ordinary skill in the art would have understood that the node that includes these entities, first and second PDCP, *would* perform or otherwise provide a PDCP function. As discussed above, the ***anchor node*** (i.e., central unit) is connected to an S1-U user plane interface with an MEE and SGW through which user plane data is transmitted. Thus, the person of ordinary skill in the art would have understood that the ***anchor node*** (i.e., central unit) is a node configured to provide a PDCP function, for transmission of the user plane data.

Dependent Claim 4

Claim 4, Element [4.pre]: The method according to claim 1

353. As set forth above, *Lin1* and *Zhang* render obvious all of the claim elements of claim 1. Thus, *Lin1* and *Zhang* render obvious [4.pre].

Claim 4, Element [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.

354. *Lin1* discloses claim element [4.a].

355. First, *Lin1* discloses a second message that comprises a RRC connection setup message. (*see supra*, §IX.C, Claim 1, Element [1.b]). As such, *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.

356. Second, *Lin1* discloses a second message that comprises signaling radio bearer identification information. (*see supra*, §IX.B, Claim 1, Element [1.c]). As such, *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*.

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

RRC message] *according to* an ***RRC connection request message*** [i.e., uplink RRC message that includes a CRNTI would have suggested to the person of ordinary skill in the art that the ***RRC connection setup message*** [i.e., downlink RRC message] also includes the CRNTI.

358. Moreover, *Lin1* further discloses “sending, by the first ***serving node*** [i.e., access unit], the RRC connection setup message to the first ***UE*** [i.e., terminal].” (Ex. 1003, 46:26-27). The person of ordinary skill in the art would have understood that a CRNTI is used to identify a ***UE*** [i.e., terminal] for transmission of a downlink message. Thus, *Lin1*’s disclosure of sending the RRC connection setup message to a ***UE*** (i.e., terminal) would have motivated the person of ordinary skill in the art to include the CRNTI in the ***RRC connection setup message*** [i.e., downlink RRC message] or a ***signaling control message*** [i.e., second message] carrying the ***RRC connection setup message*** [i.e., downlink RRC message]. 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*.

Independent Claim 8

Claim 8, Element [8.pre]: An access unit for configuring a wireless connection of a terminal, comprising:

359. To the extent that element [1.pre] is found to be limiting, *Lin1* discloses claim element [8.pre]. Specifically, *Lin1* discloses a ***serving node*** that provides the

same functionality as the claimed access unit. (*see supra*, §IX.C, Claim 1, Element [1.pre]). *Lin1* also discloses ***user equipment (UE)*** that provides the same functionality as the claimed terminal. (*see supra*, §IX.C, Claim 1, Element [1.pre]). Finally, *Lin1* discloses a ***serving node*** (i.e., access unit) that configures a wireless connection of a ***UE*** (i.e., terminal). (*see supra*, §IX.C, Claim 1, Element [1.pre]).

Claim 8, Element [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

360. *Lin1* and *Zhang* render obvious claim element [8.a].

361. *Lin1* discloses an ***anchor node*** that provides the same functionality as the claimed central unit. (*see supra*, §IX.C, Claim 1, Element [1.a]).

362. *Lin1* discloses an access unit that includes a transmitter configured to transmit a first message to a central unit. Specifically, with reference to FIG. 5 (reproduced and annotated below), *Lin1* discloses a ***serving node*** (i.e., access unit) that includes a transmitter 501 and a receiver 502. (Ex. 1003, 40:8-22).

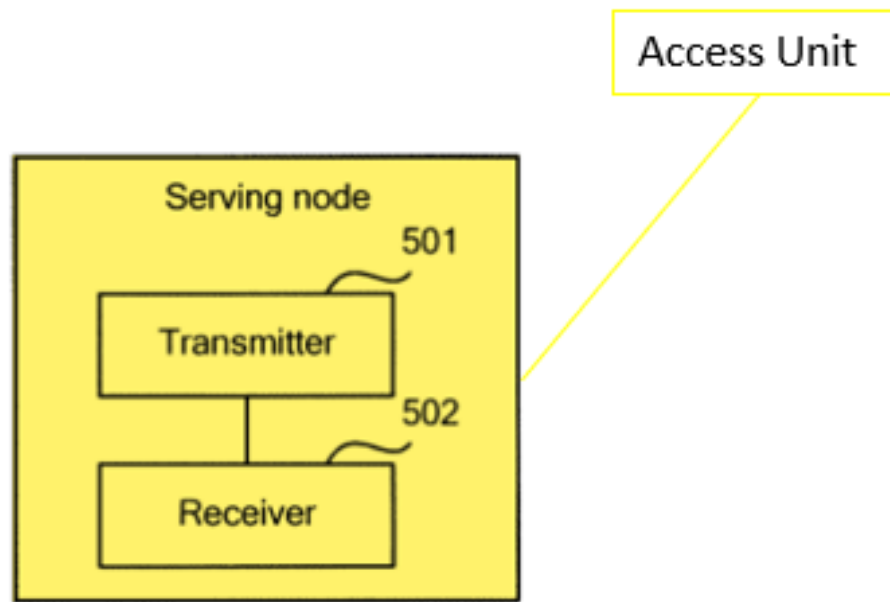


FIG. 5

363. *Lin1* discloses that “transmitter 510 is configured to: send the RRC message received by the receiver 502 to the first ***anchor node*** [i.e., the central unit]”. (Ex. 1003, 40:8-22). Thus, *Lin1* discloses a transmitter configured to transmit a first message to a central unit.

364. *Lin1* discloses an uplink RRC message received from a terminal. Specifically, *Lin1* discloses an ***RRC connection request message*** that is a defined type of uplink RRC message received from a ***UE*** (i.e., terminal). (*see supra*, §IX.B, Claim 1, Element [1.a]).

365. *Lin1* discloses several examples of a first message that includes an uplink RRC message received from a terminal. Specifically, *Lin1* discloses a SRB0RRCTransfer, an InitialRRCTransfer, and a control plane signaling message that each include an ***RRC connection request message*** (i.e., uplink RRC message) and are transmitted to an ***anchor node*** (i.e., central unit). (*see supra*, §IX.C, Claim 1, Element [1.a]).

366. To the extent it is argued that *Lin1* does not disclose a first message that includes an uplink RRC message received from a terminal, *Zhang* further discloses sending an uplink signaling or uplink data between two network node, a ***micro network node*** (i.e., access unit) and a ***macro network node*** (i.e., central unit), which suggests a first message that includes an uplink RRC message. (*see supra*, §IX.C, Claim 1, Element [1.a]).

Claim 8, Element [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,

367. *Lin1* and *Zhang* render obvious claim element [8.b1].

368. *Lin1* discloses an access unit that includes a receiver. Specifically, with reference to FIG. 5 (reproduced and annotated below), *Lin1* discloses a ***serving node*** (i.e., access unit) that includes a transmitter 501 and a receiver 502. (Ex. 1003, 40:8-22).

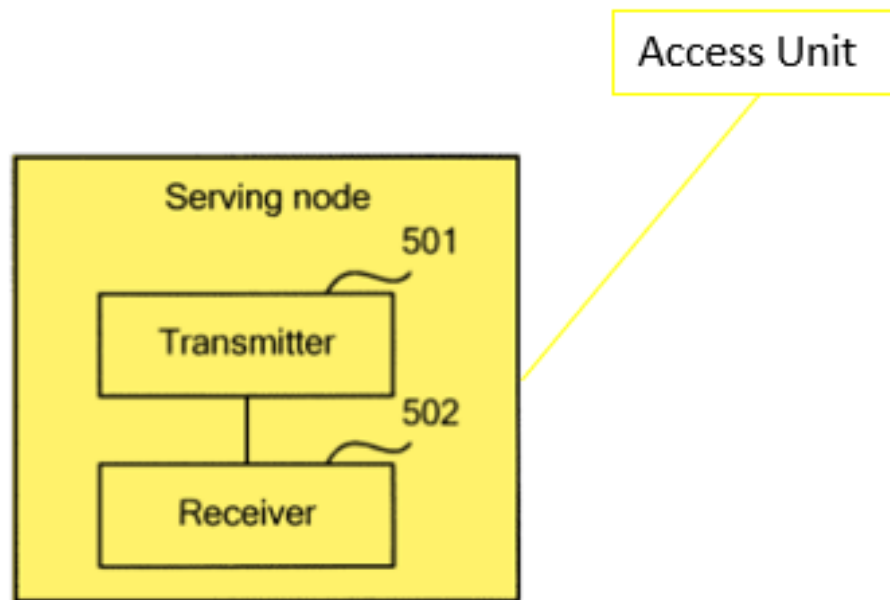


FIG. 5

369. *Lin1* discloses multiple different examples of receiving a second message from the central unit that includes a downlink RRC message in response to the uplink RRC message from the terminal. Specifically, *Lin1* discloses ***RRC connection setup message*** that is a defined type of downlink RRC message. (*see supra*, §IX.C, Claim 1, Element [1.b]). *Lin1* discloses receiving a control plane signaling message and a PDCP PDU that each include an ***RRC connection setup message*** (i.e., downlink RRC message) and are in response to an ***RRC connection request message*** (i.e., uplink RRC message). (*see supra*, §IX.C, Claim 1, Element [1.b]).

370. 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 in response to the uplink RRC message from the terminal, *Zhang* discloses that the “**macro network node** [i.e., central unit] sends **downlink signaling or downlink data** [i.e., downlink RRC message] to the **micro network node** [i.e., access unit]”. (*see supra*, §IX.C, Claim 1, Element [1.b]).

Claim 8, Element [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.

371. *Lin1* and *Zhang* render obvious claim element [8.b2].

372. As described above, *Lin1* discloses a **serving node** (i.e., access unit) that includes a transmitter. (Ex. 1003, 40:8-22).

373. *Lin1* discloses multiple different examples of the **serving node** (i.e., access unit) transmitting a downlink RRC message to a terminal. Specifically, *Lin1* discloses sending an **RRC connection setup message** (i.e., downlink RRC message) to a **UE** (e.g., terminal). (*see supra*, §IX.C, Claim 1, Element [1.c]). *Lin1* also discloses sending a processed PDCP PDU to the **UE** [i.e., terminal]. (*see supra*, §IX.C, Claim 1, Element [1.c]).

374. To the extent it is argued that *Lin1* does not disclose transmitting a downlink RRC message to a terminal, *Zhang* discloses that “the **micro network node**

[i.e., access unit] forwards, to the *user equipment* [i.e., terminal], the *downlink signaling or downlink data* [i.e., downlink RRC message] sent by the *macro network node* [i.e., central unit].” (*see supra*, §IX.C, Claim 1, Element [1.c]).

375. *Lin1* discloses radio bearer identification information included in the first message and the second message. Specifically, *Lin1* discloses *indication information* that is included in *control plane signaling messages* (i.e., first and second messages) and that a person of ordinary skill in the art would consider radio bearer identification information. (*see supra*, §IX.C, Claim 1, Element [1.c]).

376. To the extent it is argued that *Lin1* does not disclose radio bearer identification information included in the first message and the second message, *Zhang* discloses control information transmitted between network nodes that “includes an identifier of a radio bearer (RB), and values of the identifier of the radio bearer (RB) are “SRB 1” and “DRB 2” that suggest radio bearer identification information included in the first message and a second message. (*see supra*, §IX.C, Claim 1, Element [1.c]).

377. *Lin1* also discloses multiple ways 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. Specifically, *Lin1* discloses that the *serving node* (i.e., access unit) and the *anchor node* (i.e., central unit) distinguish signaling radio bearers by either identifying an

SRB type of an **RRC message** (i.e., uplink and downlink RRC message) or processing an **RRC message** (i.e., uplink and downlink RRC message) according to the SRB type of the **RRC message** (i.e., uplink and downlink RRC message) based on **indication information** (i.e., radio bearer identification information) in the first message and the second message. (*see supra*, §IX.B, Claim 1, Element [1.c]).

378. 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, *Zhang* discloses that the **uplink signaling or uplink data** [i.e., uplink RRC message] and the **downlink signaling or downlink data** [i.e., downlink RRC message] are transmitted on a default logical channel corresponding to the radio bearer, which would have suggested to a person of ordinary skill in the art that *Zhang's micro network node* (i.e., access unit) and **macro network node** (i.e., central unit) distinguish signaling radio bearers based on the radio bearer identification information-included in the first message and the second message to process an RRC message using the correct logical channel. (*see supra*, §IX.C, Claim 1, Element [1.c]).

Dependent Claim 9

Claim 9, Element [9.pre]: The access unit according to claim 8,

379. As set forth above, *Lin1* and *Zhang* discloses all of the claim elements of claim 8. Thus, *Lin1* and *Zhang* render obvious [9.pre].

Claim 9, Element [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

380. *Lin1* discloses an 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. Specifically, *Lin1* discloses a ***serving node*** (i.e., access unit) that provides an RLC function, a MAC function, and a PHY function that are configured for transmission of user plane data. (*see supra*, §IX.C, Claim 1, Element [2.a]).

Claim 9, Element [9.b]: wherein the central unit comprises a node configured to provide a PDCP function, for transmission of the user plane data.

381. *Lin1* discloses a central unit that comprises a node configured to provide a PDCP function, for transmission of the user plane data. Specifically, *Lin1* discloses an ***anchor node*** (i.e., central unit) that performs or otherwise provides a PDCP function, for transmission of user plane data. (*see supra*, §IX.C, Claim 1, Element [2.b]).

Dependent Claim 11

Claim 11, Element [11.pre]: The access unit according to claim 8,

382. As set forth above, *Lin1* and *Zhang* discloses all of the claim elements of claim 8. Thus, *Lin1* and *Zhang* render obvious [11.pre].

Claim 11, Element [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.

383. *Lin1* and *Zhang* discloses claim element [11.a].

384. First, *Lin1* discloses a second message that comprises a RRC connection setup message. (*see supra*, §IX.C, Claim 1, Element [1.b]). As such, *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.

385. Second, *Lin1* discloses a second message that comprises signaling radio bearer identification information. (*see supra*, §IX.B, Claim 1, Element [1.c]). As such, *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*.

386. Third, *Lin1* would have motivated the person of ordinary skill in the art to include a CRNTI in a second message. (*see supra*, §IX.B, Claim 1, Element [4.a]). As such, 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*.

X. CONCLUSION

I declare that all statements made herein of my own knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: October 15, 2024



Michael Kotzin, Ph.D.