

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AT&T SERVICES INC., T-MOBILE USA, INC., CELLCO PARTNERSHIP
D/B/A VERIZON WIRELESS, ERICSSON INC., AND NOKIA OF AMERICA
CORPORATION,
Petitioners

v.

INNOVATIVE SONIC LIMITED AND CELERITY IP, LLC.
Patent Owner.

Case IPR2024-00991
U.S. Patent No. 9,736,883

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 9,736,883**

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Ex. Number	Title
1001	U.S. Patent No. 9,736,883 to Guo et al. (“the ’883 patent”)
1002	File History of U.S. Patent No. 9,736,883
1003	Declaration of Mark Mahon, Ph.D.
1004	<i>Curriculum Vitae</i> of Mark Mahon, Ph.D.
1005	U.S. Patent No. 9,479,973 (“Centonza”)
1006	U.S. Provisional Patent Application No. 61/678,722 (“Centonza Provisional”)
1007	WIPO Publication No. WO2014056130A1 (“Han”)
1008	RWS-120046, “Technologies for Rel-12 and onwards” (“The Samsung Presentation”)
1009	3GPP TS 36.331 V11.2.0 (2012-12)
1010	3GPP TS 36.413 V11.0.0 (2012-06)
1011	U.S. Patent Pub. No. 2013/0303224 (“Sambhwani”)
1012	U.S. Patent Pub. No. 2013/0183970 (“Chen”)
1013	U.S. Patent Pub. No. 2014/0010207 (“Horn”)
1014	June 21, 2022 Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings With Parallel District Court Litigation
1015	Docket Control Order
1016	Consolidation Order

Petitioners AT&T Services Inc., T-Mobile USA, Inc., Cellco Partnership d/b/a Verizon Wireless, Ericsson, Inc., and Nokia of America Corporation (collectively, “Petitioners”) request *Inter Partes* Review (“IPR”) of claims 1–11 (“the Challenged Claims”) of the ’883 patent, asserted to be owned by Innovative Sonic Ltd. and Celerity IP, LLC (collectively, “Patent Owner”). Petitioners respectfully request that the Challenged Claims be found unpatentable.

I. INTRODUCTION

During prosecution, Patent Owner accepted that the prior art disclosed the functionality of the Challenged Claims. Patent Owner instead narrowed the types of devices that performed the claimed steps (from “network nodes” to “eNBs,” which are cellular base stations) and asserted that the prior art did not teach that eNBs performed each of the claimed steps. The Examiner then allowed the claims.

It was well-known, however, to implement the claimed functionality in eNBs. This Petition involves two prior art references with those teachings—Centonza and Han—that were not before the Patent Office. Those reference anticipate or at least render obvious the Challenged Claims for the reasons below.

II. MANDATORY NOTICES

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

The real parties in interest are AT&T Enterprises, LLC,¹ AT&T Mobility LLC, AT&T Mobility II LLC, AT&T Services Inc., Cellco Partnership d/b/a Verizon Wireless, Verizon Corporate Resources Group LLC, T-Mobile USA, Inc., Ericsson Inc., Telefonaktiebolaget LM Ericsson, and Nokia of America Corporation.²

¹ AT&T Corp. is a named defendant in the below identified related cases. AT&T Corp. has undergone a corporate transaction and is now merged and converted into AT&T Enterprises, LLC. Out of an abundance of caution, Petitioners are identifying AT&T Enterprises, LLC as a real party in interest in this IPR.

² Out of an abundance of caution, Petitioners identify all current defendants in the below identified cases as potential real parties in interest only for the purpose of this proceeding and only to the extent that Patent Owner contends that these separate legal entities should be named real parties in interest in this IPR. Petitioners do so to avoid the potential expenditure of resources to resolve such a challenge. Petitioners also acknowledge that each petitioner has a number of affiliates. No unnamed entity is funding, controlling, or otherwise has an opportunity to control or direct this

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

The following are a list of related matters: *ASUS Technology Licensing Inc. et al. v. AT&T Inc. et al.*, Case No. 2-23-cv-00486-JRG-RSP (E.D. Tex. 2023) (Lead Case); *ASUS Technology Licensing Inc. et al. v. T-Mobile USA, Inc.*, Case No. 2-23-cv-00487-JRG-RSP (E.D. Tex. 2023); *ASUS Technology Licensing Inc. et al. v. Verizon Communications Inc.*, Case No. 2-23-cv-00488-JRG-RSP (E.D. Tex. 2023); *Innovative Sonic Limited et al. v. AT&T Inc., et al.*, Case No. 2-23-cv-00489-JRG-RSP (E.D. Tex. 2023); *Innovative Sonic Limited et al. v. T-Mobile USA, Inc.*, Case No. 2-23-cv-00490-JRG-RSP (E.D. Tex. 2023); *Innovative Sonic Limited et al. v. Verizon Communications, Inc. et al.*, Case No. 2-23-cv-00491-JRG-RSP (E.D. Tex. 2023).

C. Lead and Back-Up Counsel Under 37 C.F.R. § 42.8(b)(3)

Petitioners provides the following designation of counsel.

Lead Counsel	Backup Counsel
Scott W. Hejny Reg. No. 45,882 shejny@McKoolSmith.com McKool Smith, P.C.	Nicholas Mathews Reg. No. 66,067 nmathews@mckoolsmith.com McKool Smith, P.C.

Petition or Petitioners' participation in any resulting IPR. Petitioners are also not aware of any affiliate that would be barred from filing this Petition under 35 U.S.C. § 315(e).

Lead Counsel	Backup Counsel
300 Crescent Court, Suite 1500 Dallas, Texas 75201 Telephone: 214-978-4000 Fax: 214-978-4044	300 Crescent Court, Suite 1500 Dallas, Texas 75201 Telephone: 214-978-4000 Fax: 214-978-4044 Christian J. Hurt Reg. No. 63,659 churt@mckoolsmith.com McKool Smith, P.C. 300 Crescent Court, Suite 1500 Dallas, Texas 75201 Telephone: 214-978-4000 Fax: 214-978-4044

D. Service Information Under 37 C.F.R. § 42.8(b)(4)

A copy of this entire Petition, including all Exhibits and a Power of Attorney, is being served via email and FEDERAL EXPRESS, costs prepaid, to the address of the attorney or agent of record at the USPTO:

Blue Capital Law Firm, P.C.
650 Town Center Drive, Suite 1530
Costa Mesa, CA 92626

Petitioners are also serving Patent Owner's litigation counsel of record, as reflected below on the Certificate of Service.

Petitioners consent to electronic service at the addresses provided above for lead and back-up counsel and at the following email address: Celerity_IPRs@mckoolsmith.com. A Power of Attorney is filed concurrently herewith under 37 C.F.R. § 42.10(b).

III. FEES

The Office is authorized to charge a fee under 37 C.F.R. 42.15(a) to Deposit Account No. DA-505723 and any additional fees that are due.

IV. CERTIFICATION OF STANDING

Petitioners certify pursuant to 37 C.F.R. §42.104(a) that the '883 patent is available for IPR and that Petitioners are not barred or estopped from requesting an IPR of the Challenged Claims on the grounds identified herein.

V. OVERVIEW OF CHALLENGE AND RELIEF REQUESTED

A. Prior Art

This challenge is based on the following references: U.S. Patent No. 9,479,973 (“Centonza”) (Ex-1005 and Ex-1006) and U.S. Patent Publication No. WO2014056130A1 (“Han”) (Ex-1007).

B. Relief Requested

Petitioners request institution of IPR and cancellation of the Challenged Claims based on the following Grounds, supported by the Declaration of Mark Mahon, Ph.D. (Ex-1003).

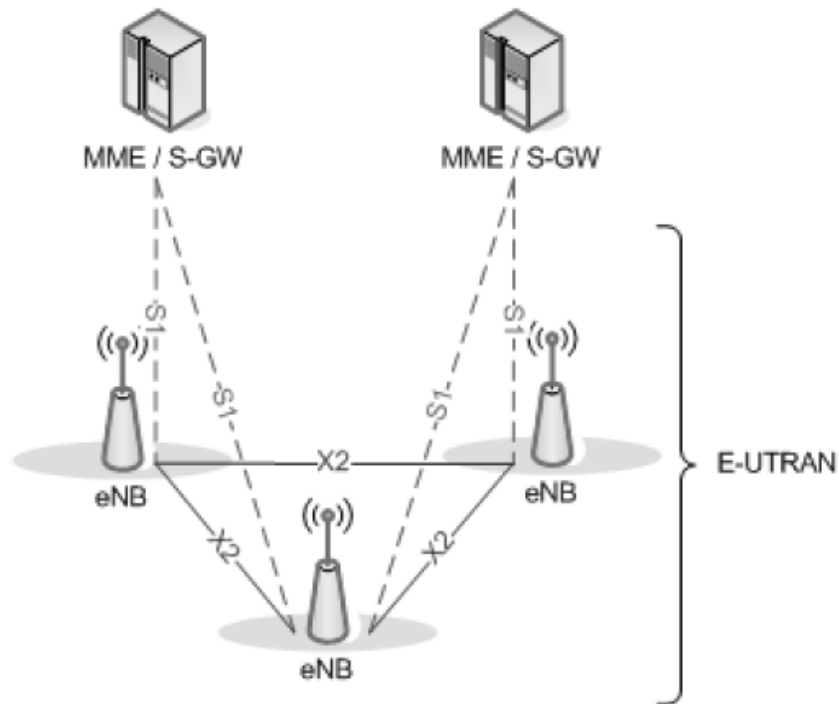
Ground	Basis	Challenged Claims	References
1	35 U.S.C. § 102 (Anticipation)	1–11	Centonza
2	35 U.S.C. § 103 (Obviousness)	1–11	Centonza
3	35 U.S.C. § 102	1–11	Han

Ground	Basis	Challenged Claims	References
	(Anticipation)		
4	35 U.S.C. § 103 (Obviousness)	1–11	Han

VI. THE '883 PATENT

A. Technical Background

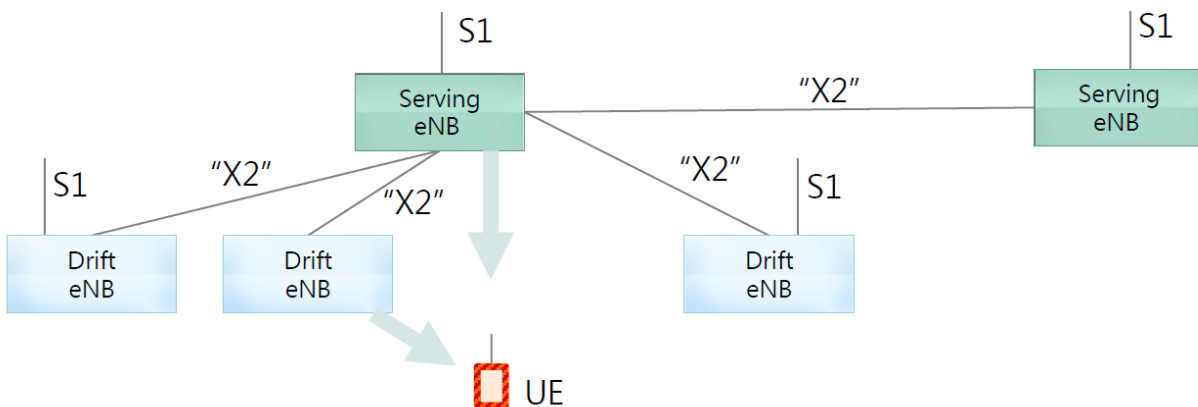
The '883 patent relates to “inter-node connectivity” in cellular networks. Ex-1003, ¶¶ 29–34; Ex-1001 at (54). These systems use a network that includes base stations (referred to as “eNBs”) and a core network that contains components such as a Mobility Management Entity (“MME”) and a Serving Gateway (“SGW”), as shown below. *Id.*, 1:33–42, 2:48–64 (describing E-UTRAN); Ex-1008, 19.



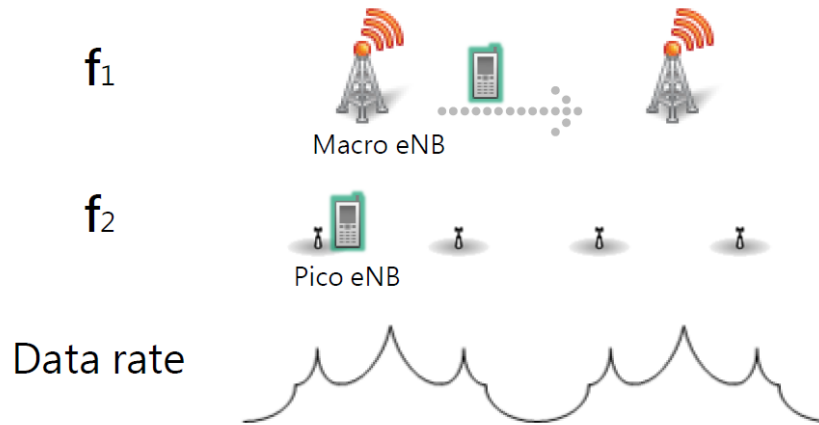
The eNBs can communicate over an “X2” interface, and each eNB can

communicate through core network devices (*e.g.*, the MME and SGW) over an “S1” interface. Ex-1003, ¶ 30. The eNBs provide cellular service to a User Equipment (“UE”), such as a smartphone. *Id.*

“Inter-node connectivity” generally refers to the ability of multiple eNBs to serve a UE. Ex-1003, ¶ 31. This functionality predates the ’883 patent. *Id.* The patent incorporates a prior art Samsung presentation that shows dual connectivity using a Serving eNB (in green) and a Drift eNB (in blue). Ex-1008, 20; Ex-1001, Fig. 5.



As the UE moves out of range of a Serving eNB, the Drift eNBs boost the data throughput, as shown below with “Macro eNBs” (the Serving eNBs) and “Pico eNBs” (the Drift eNBs). Ex-1003, ¶ 32; Ex-1008, 20.



The UE is associated with “cells” that are controlled by the eNBs, *e.g.*, a primary cell and a secondary cell. Ex-1003, ¶¶ 33–34. The image above shows macro cells (f_1) controlled by the Macro eNBs and pico cells controlled by the Pico eNBs. *Id.* Through inter-node connectivity, the UE can communicate data using both a macro cell and a pico cell. *Id.*

B. Overview of the Patent

The '883 patent provides a way to handle inter-node connectivity. Ex-1003, ¶¶ 35–38. An eNB that controls a Primary Cell (“PCell”) transmits a request to an eNB to utilize a Secondary Cell (“SCell”). Ex-1001, 7:5–27. The receiving eNB then sends an acceptance and a request to switch the data path for a radio bearer of the UE (*e.g.*, to move a radio bearer from one cell to another), while at least one bearer does not switch cells. *Id.* Claim 1 recites the process as follows:

A method for handling inter-node connectivity in a wireless communication system, comprising:

receiving, by a first evolved node B (eNB), a first request from a second

eNB for aggregating a Secondary Cell (SCell) for a User Equipment (UE);

transmitting an accept message from the first eNB to the second eNB in response to the first request; and

transmitting a second request from the first eNB, which controls the SCell of the UE, to the second eNB, which controls a Primary Cell (PCell) of the UE, to change a data path for a first radio bearer of the UE, wherein the second request does not indicate to change the data path for a third radio bearer of the UE;

wherein a first path is via the first eNB and used as the data path for the first radio bearer and the third radio bearer before changing the data path for the first radio bearer.³

C. Overview of the Prosecution History

Prior to allowance, the Examiner found the claims obvious in view of three references: U.S. Patent Pub. No. 2013/0303224 (“Sambhwani”) (Ex-1011); U.S. Patent Pub. No. 2013/0183970 (“Chen”) (Ex-1012); and U.S. Patent Pub. No. 2014/0010207 (“Horn”) (Ex-1013). Ex-1003, ¶ 39; Ex-1002, 361–370. In response, Patent Owner did not assert that the prior art failed to disclose the claimed message flow. *Id.*, 407–416. It instead argued that the prior art disclosed the wrong devices:

³ Petitioners reserve the right to challenge the validity of the ’883 patent claims, including under Section 112 on the basis of written description, enablement, and definiteness, including, for example, the “third radio bearer” element and “wherein” clause of the asserted claims.

after amending the claims to replace the “network nodes” with “eNBs,” Patent Owner asserted that it would not have been obvious to combine the references—Chen and Horn disclose base stations (eNBs),⁴ while Sambhwani discloses radio network controllers.⁵ *Id.* The Examiner then allowed the claims. *Id.*, 428. The references in this Petition were not before the Patent Office.

D. Level of Ordinary Skill in the Art

As of the earliest claimed priority date, a person of ordinary skill in the art at the time of the alleged invention of the '883 patent (“POSITA”) would have had a B.S. in Electrical Engineering or a related field with at least three years of experience designing, developing, and/or testing telecommunication systems. Ex-1003, ¶ 27. A POSITA would also have familiarity with the wireless standards and well-known protocols for accessing wireless networks. *Id.* More education may supplement practical experience or *vice versa*. *Id.*

VII. CLAIM CONSTRUCTION

Petitioners submit that the Board does not need to expressly construe any terms to resolve the arguments presented herein. Petitioners submit that no terms

⁴ Ex-1012, Figs. 1–7; Ex-1013, Figs. 1–16.

⁵ Ex-1011, Fig. 1.

need to be construed because the prior art in this Petition discloses all limitations under any plausible construction. Ex-1003, ¶ 46.

VIII. OVERVIEW OF PRIOR ART

A. Centonza

Centonza, a patent assigned to Telefonaktiebolaget LM Ericsson, discloses a way to handle inter-node connectivity. Ex-1003, ¶¶ 40–42. It teaches handing over a subset bearers from one cell (*e.g.*, a “Marco cell”) to another cell (*e.g.*, a “Pico cell”) and *vice versa*. Ex-1005, Fig. 9; Ex-1006, 87 (Fig. 8).

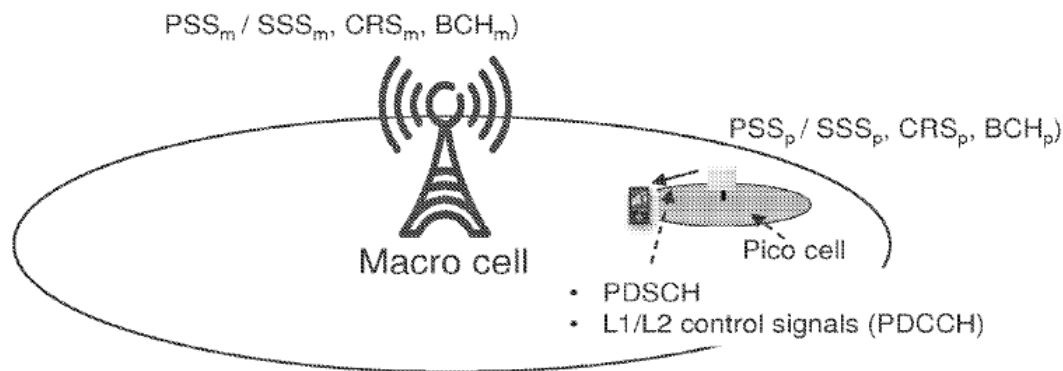


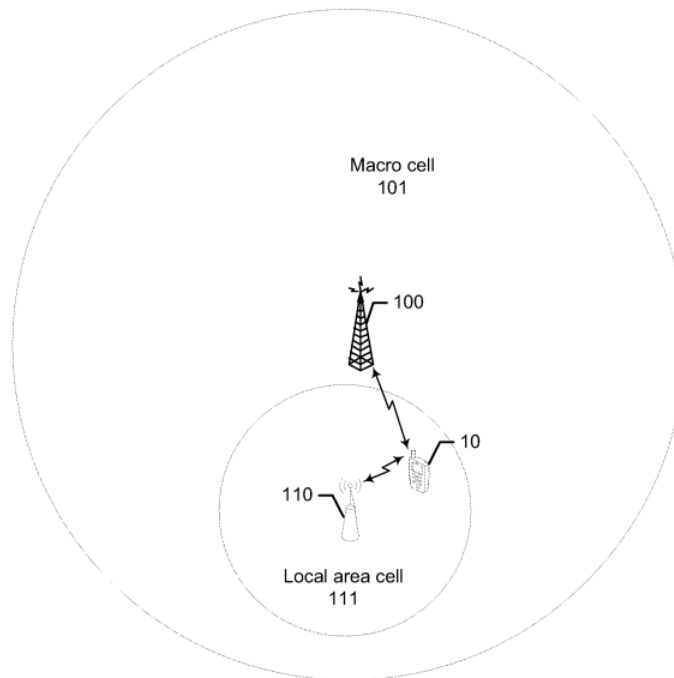
Figure 8: Heterogeneous deployment where the pico node corresponds to a cell of its own (a “pico cell”). The indices “p” and “m” indicate common signals/channels for the pico and macro cell respectively.

To handle inter-connectivity, Centonza teaches a request (*e.g.*, a Handover Request), an acceptance (*e.g.*, a Handover Request Acknowledge), and requests to change the data path. Ex-1005, Fig. 15; Ex-1006, 96 (Fig. 14).

B. Han

Han, a patent application assigned to Broadcom, also discloses a way to handle inter-node connectivity. Ex-1003, ¶¶ 43–45. “The basic idea is to let a user

equipment (UE) connect to both a macro access point and a LA [Local Area] access point simultaneously, with the macro access point controlling some connection and signaling aspects, such as mobility functions, while offloading most data transmission to the LA access point.” Ex-1007, [0003]. Han depicts the macro cell (associated with a macro access point) and a local area cell (associated with a local access point). *Id.*, Fig. 1.



Han also provides the dual-connection message sequence, including a request (*e.g.*, Dual Connection Setup Request), acceptance (*e.g.*, the Dual Connection Setup Response), and changing the data path. Ex-1007, Fig. 4.

IX. SPECIFIC GROUNDS FOR PETITION

A. Ground 1: Centonza Anticipates the Challenged Claims

Centonza anticipates the Challenged Claims for the reasons below.

1) Centonza is Prior Art

Centonza qualifies as Section 102 prior art. Ex-1003, ¶¶ 48–50. It was filed on July 15, 2013, before the '883 patent's January 29, 2014 filing date, and published on July 24, 2014. Centonza also is entitled to an August 2, 2012 priority date under Section 119(e) based on the Centonza Provisional, a date earlier than the earliest potential priority date of the '883 patent (January 30, 2013). Ex-1005, (60). The Centonza Provisional discloses the subject matter of the Challenged Claims, as shown below, and provides Section 112 support for Centonza and its claims. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1381 (Fed. Cir. 2015); MPEP § 2136(I) (9th ed. Rev. 10.2019, June 2020); MPEP § 2136.03(III). Centonza and the Centonza Provisional contain virtually an identical disclosure. Ex-1003, ¶ 49; Ex-1005, Figs. 1–19; Ex-1006, 9–34 (Figs. 1–17), 61–62 (Figs. 18–19). The chart below maps Centonza's claim 25 to corresponding support in the Centonza Provisional. Ex-1003, ¶ 50.

Centonza	Centonza Provisional
25. A method, in a target base station in a wireless communications network, for providing a handover for a sub-set of bearers associated with a wireless terminal being served by a source base station, said sub-set of bearers being less than or equal to all bearers associated with the wireless terminal, the method comprising:	The application utilizes a wireless communication network, which includes a source base station and a target base station. Ex-1006, 58–62. It discloses, in a target base station, providing a handover for a sub-set of bearers associated with a wireless terminal being served by a source base station, said sub-set of bearers being less than or equal to all bearers

Centonza	Centonza Provisional
	associated with the wireless terminal. <i>Id.</i>, 61–62 (showing handover of a “sub-set of bearers” and depicting “example operations which may be taken by the target base station ... in the providing a handover of at least a sub-set of bearers associated with a user equipment.”); <i>id.</i>, 47 (describing “a selective handover of only a subset of the UE bearers”); <i>id.</i>, 73–78 (describing embodiments where the target base station receives a selective handover request); <i>id.</i>, 73 (“41. A method, in a target base station, for providing a handover of at least a sub-set of bearers associated with a user equipment, the method comprising:”).
receiving, from the source based station, a handover request for the sub-set of bearers, wherein a least one bearer of the wireless terminal is to remain connected to the source base station	The application discloses, receiving, from the source based station, a handover request for the sub-set of bearers, wherein a least one bearer of the wireless terminal is to remain connected to the source base station. Ex-1006, 62 (showing the target base station “[r]eceive[s], from the source base station, a handover request for a sub-set of bearers”); <i>id.</i>, 73 (“receiving (50), from a source base station, a handover request for the sub-set of bearers associated with the user equipment”); <i>id.</i>, 106 (explaining that “at least one bearer (which is not associated with the identified sub-set) remains connected to the base station” as part of handover procedure); <i>id.</i>, 112 (explaining that at least one bearer

Centonza	Centonza Provisional
	“remains connected to the base station”).
analyzing an admissibility of the sub-set of bearers with respect to the handover procedure	The application discloses analyzing an admissibility of the sub-set of bearers with respect to the handover procedure. Ex-1006, 62 (showing the target base station “[a]nalyze[s] a possibility of admitting the sub-set of bearers”); <i>id.</i> , 73 (“analyzing (52) suitability of possibility of admitting the sub-set of bearers comprises in the handover request”).
sending, to the source base station, a handover acknowledgement message comprising a result of the analyzed admissibility; and	The application discloses sending, to the source base station, a handover acknowledgement message comprising a result of the analyzed admissibility. Ex-1006, 61–62 (showing the target base station “send[s], to the source base station, a handover acknowledgement message”); <i>id.</i> , 74 (“sending (64), to the source base station, a handover request acknowledgement comprising a result of analyzing”).
receiving, from the source base station, at least one subsequent handover request, wherein each subsequent handover request is treated as a handover request for only a sub-set of bearers associated with the wireless terminal.	The application discloses receiving, from the source base station, at least one subsequent handover request, wherein each subsequent handover request is treated as a handover request for only a sub-set of bearers associated with the wireless terminal. Ex-1006, 50 (“In case the target eNB receives multiple selective handover requests concerning the same UE from the same source eNB, it shouldn’t be interpreted as an error, but rather as a request to

Centonza	Centonza Provisional
	selectively hand over even more bearers of the UE towards the target.”); <i>id.</i> , 74 (same); <i>id.</i> , 62 (showing target base station “[r]eceive[s], from the source base station, a handover request for a sub-set of bearers”); <i>id.</i> , 112 (explaining that at least one bearer “remains connected to the base station”).

2) Claim 1

- a) *[Preamble]: A method for handling inter-node connectivity in a wireless communication system, comprising:*

Centonza discloses the preamble. Ex-1003, ¶¶ 51–62. It discloses handling connectivity between nodes (*e.g.*, a macro/anchor node and a pico/assisting/booster node) in a wireless communication system (*e.g.*, a cellular network). *Id.*; Ex-1005, Fig. 9, 12; Ex-1006, 16 (Fig. 8), 17 (Fig.11).

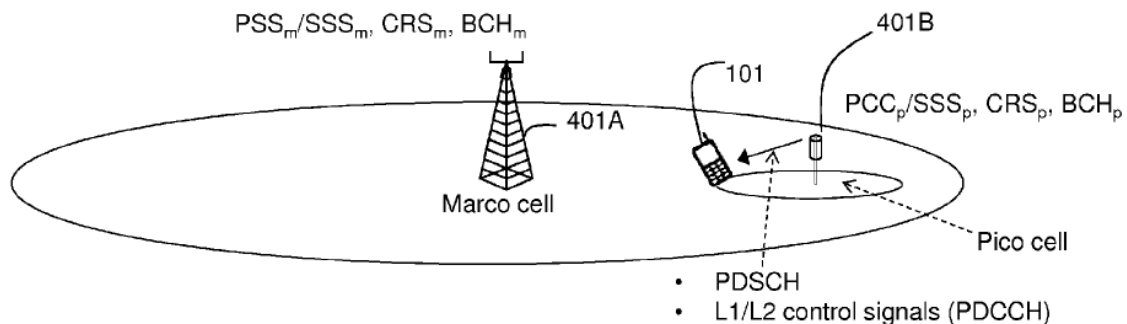


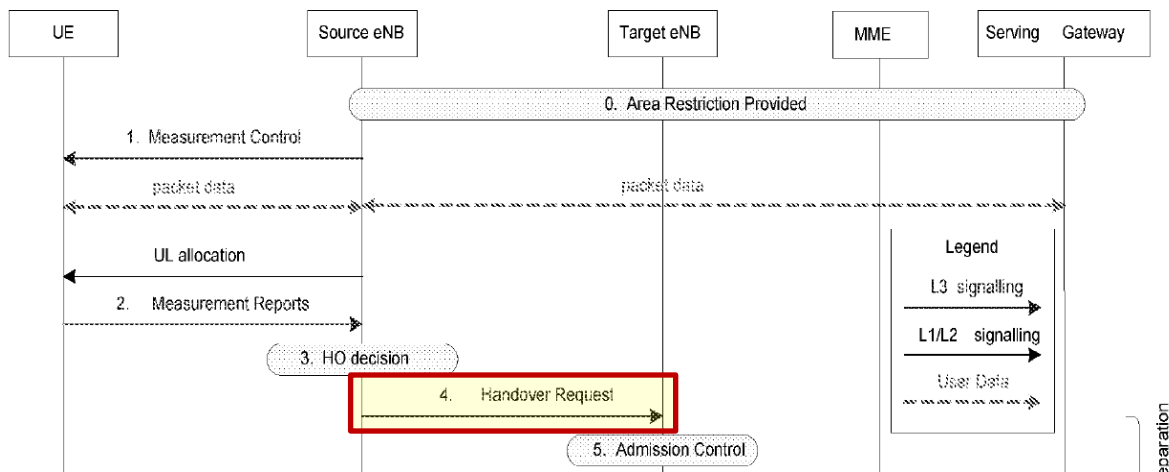
FIGURE 9

Centonza discloses that the two nodes each have a cell of their own (*e.g.*, the macro node corresponds to a macro cell and a pico node corresponds to a pico cell),

which means that the connectivity is “inter-node.” Ex-1003, ¶¶ 56–61; Ex-1005, 9:34–41, 16:57–62; Ex-1006, 15–16; *see also id.*, 26 (disclosing “dual connectivity”); Ex-1005, 10:34–40 (disclosing “dual connectivity”).

- b) [1b]: receiving, by a first evolved node B (eNB), a first request from a second eNB for aggregating a Secondary Cell (SCell) for a User Equipment (UE);

Centonza discloses this limitation. Ex-1003, ¶¶ 63–86. It discloses a Handover Request from the Source eNB to the Target eNB. Ex-1006, 46 (Fig. 14); Ex-1005, Fig. 15.



“receiving, by a first evolved node B (eNB), a first request from a second eNB...”

The Target eNB (the “first evolved node B”) receives a first request from the Source eNB (the “second eNB”). Ex-1003, ¶¶ 63–74; Ex-1006, 62 (Fig. 19); Ex-1005, 3:37–41 (“receiving, from the source base station, a handover request”); *id.*, Fig. 19 (“Receive, from the source base station, a handover request”); *id.*, 17:5–35 (X2 HANDOVER REQUEST); *id.*, 1:53–57 (describing “an anchor flow from the

macro base station (or ‘anchor eNB’) 401A and a assisting flow from a pico base station (or a ‘assisting eNB’) 401B”); *id.*, 6:20–26 (explaining that “base stations 401” are “called enhanced NodeBs (eNBs or eNodeBs)”); *id.*, 4:17; Ex-1006, 9 (similar); *id.*, 36 (defining “eNB”).

“...for aggregating a Secondary Cell (SCell) for a User Equipment (UE)”

The Handover Request includes a first request for aggregating an SCell for a UE. Ex-1003, ¶¶ 74–85. The ’883 patent explains that a PCell can be “a macro cell, and the SCell could be a small cell.” Ex-1001 at 5:66–67. Centonza discloses macro cells and pico cells (an anchor cell and a booster/assisting cell), including as a “Primary serving cell” (a PCell) and a “secondary cell” (an SCell). Ex-1005, Figs. 8–12, 12:10–27; Ex-1006, 14–18, 20, 144; Ex-1003, ¶¶ 74–85. Thus, the Source eNB controls a PCell and the Target eNB controls an SCell. *Id.*

The Handover Request includes a target cell identifier (the “Target Cell ID”) for an SCell as well as a list of the sub-set of radio bearers (called E-RABs⁶) to handover in an “E-RABs To Be Setup List.” Ex-1006, 50; Ex-1005, 17:5–18:24.

⁶ “E-RAB” is short for “E-UTRAN Radio Access Bearer,” and the E-RABs handed over include data radio bearers. Ex-1003, ¶ 84; Ex-1006, 47 (“[U]nless otherwise specified, by bearer it is meant a data radio bearer.”); *id.*, 11, 47, 49, 51; Ex-1005, 4:13, 16:36–40, 17:5–18:24, 21:56–65, 27:56–58, 30:27–30.

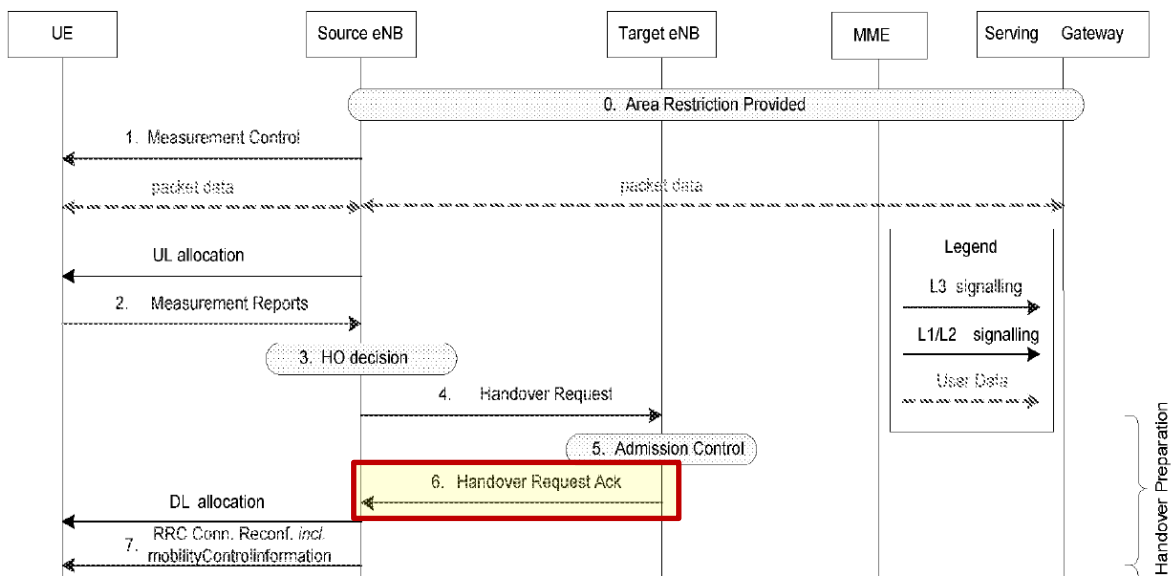
X2 HANDOVER REQUEST message	
	Presence
IE/Group Name	
Message Type	M
Old eNB UE X2AP ID	M
Cause	M
Target Cell ID	M
GUMMEI	M
UE Context Information	
>MME UE S1AP ID	M
>UE Security Capabilities	M
>AS Security Information	M
>UE Aggregate Maximum Bit Rate	M
>Subscriber Profile ID for	O
RAT/Frequency priority	
>E-RABs To Be Setup List	
>>E-RABs To Be Setup Item	
>>>E-RAB ID	M
>>>E-RAB Level QoS Parameters	M
>>>DL Forwarding	O
>>>UL GTP Tunnel Endpoint	M
>RRC Context	M
>Handover Restriction List	O
>Location Reporting Information	O
>Management Based MDT Allowed	O
UE History Information	M
Trace Activation	O
SRVCC Operation Possible	O
CSG Membership Status	O

This disclosure shows that the Handover Request includes a request for aggregating a SCell of a UE, namely by requesting to handover a subset of bearers (in the E-RABs To Be Setup List) “towards” a target cell. Ex-1003, ¶¶ 84–85; Ex-1006, 62 (Fig. 19); *id.*, 48, 66, 70 (disclosing handover “towards the pico node or

cell”); *id.*, 52–54 (teaching selective handover from Anchor Cell A to Assisting Cell B); Ex-1005, 19:25–21:54 (same); *id.*, Fig. 19.

- c) [1c]: transmitting an accept message from the first eNB to the second eNB in response to the first request; and

Centonza discloses this limitation. Ex-1003, ¶¶ 87–94. It teaches that, after determining if it can admit the handed-over bearers, the Target eNB (the first eNB) “[s]ends, to the source base station [the second eNB], a handover acknowledgement message.” Ex-1006, 45 (Fig. 14), 62 (Fig. 19); Ex-1005, Figs. 15 and 19.



The Target eNB sends this acknowledgment in response to the Handover Request, and the message includes an acceptance of the request: “[W]hen the target eNB receives a HANDOVER REQUEST message, it performs admission control and if it may admit one or more of the data radio bearers comprised in the [handover] request, it sends a HANDOVER REQUEST ACKNOWLEDGE message over X2

towards the source eNB.” Ex-1006, 54; *id.*, 54–55, 93 (describing HANDOVER REQUEST ACKNOWLEDGE); Ex-1005, 21:55–23:31 (same).

- d) [1d]: transmitting a second request from the first eNB, which controls the SCell of the UE, to the second eNB, which controls a Primary Cell (PCell) of the UE, to change a data path for a first radio bearer of the UE, wherein the second request does not indicate to change the data path for a third radio bearer of the UE;*

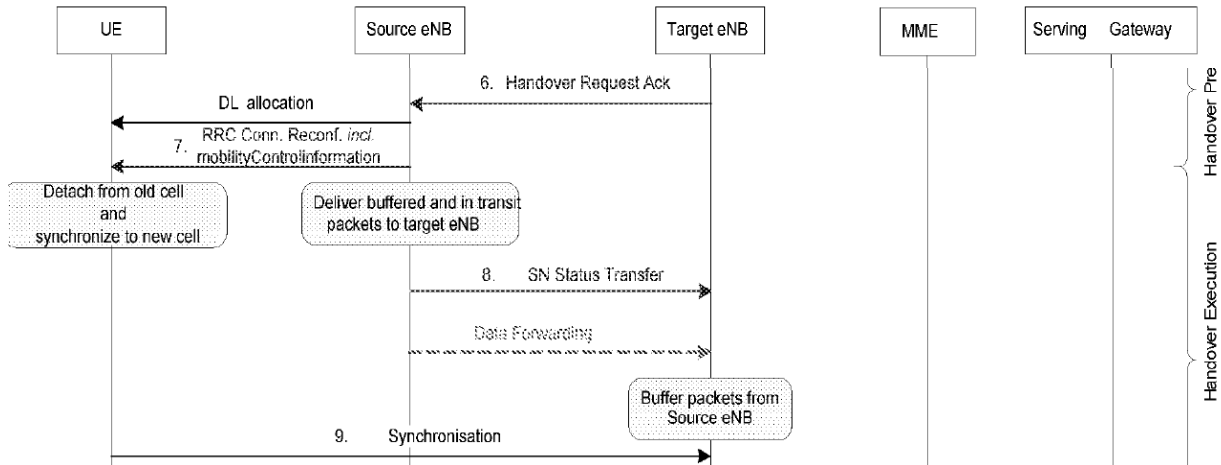
Centonza discloses this limitation. Ex-1003, ¶¶ 95–128. It discloses three messages that contain the claimed “second request,” each of which occurs after the “first request”: the Handover Request Acknowledge, the Path Switch Request to UE Context Release, and the Handover Request for subsequent selective handovers. *Id.* ***“transmitting a second request from the first eNB ... to the second eNB ... to change a data path for a first radio bearer of the UE ...”***

The Handover Request Acknowledge is transmitted from the Target eNB (“first eNB”) to the Source eNB (“second eNB”) over the X2 interface. Ex-1003, ¶¶ 101–108. The message includes an acceptance and a request to change a data path for a first radio bearer. *Id.* It contains an E-RABs Admitted List and an E-RABs Not Admitted List. Ex-1006, 55; Ex-1005, 22:1–8.

TABLE 8

X2 HANDOVER REQUEST ACKNOWLEDGE message	
	Presence
<u>IE/Group Name</u>	
Message Type	M
Old eNB UE X2AP ID	M
New eNB UE X2AP ID	M
E-RABs Admitted List	
> E-RABs Admitted Item	
>> E-RAB ID	M
>> UL GTP Tunnel Endpoint	O
>> DL GTP Tunnel Endpoint	O
E-RABs Not Admitted List	O
Target eNB To Source	M
eNB Transparent Container	
Criticality Diagnostics	O

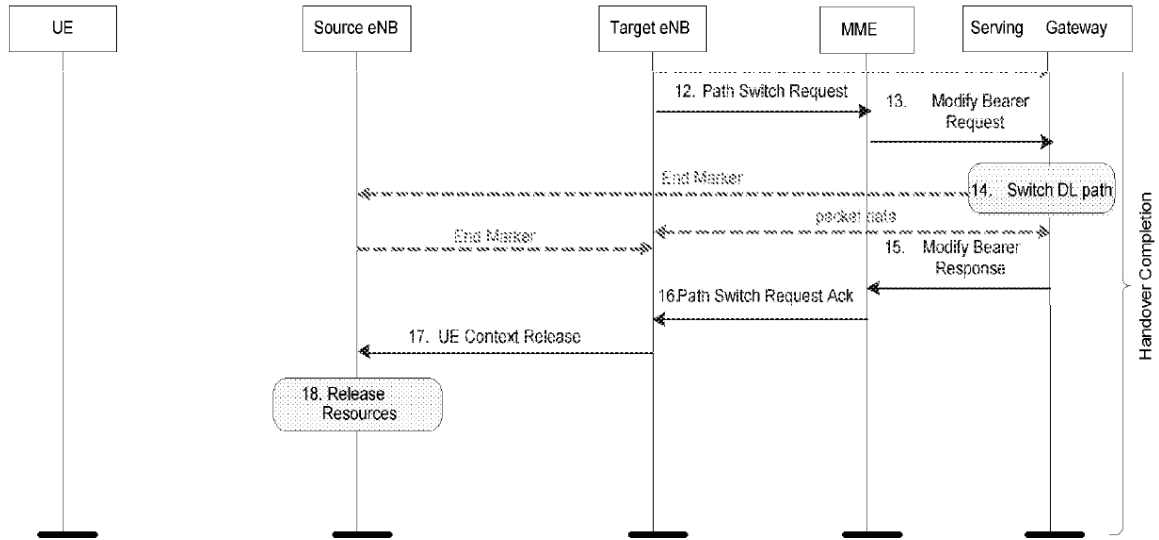
The Source eNB receives these lists and changes the data path of radio bearers based on the lists: “the source eNB decides to keep those bearers [on the Not Admitted List] with itself and hand over only the ones listed in the E-RABs Admitted List.” Ex-1006, 55; Ex-1005, 22:19–25. Centonza shows the data-path change in the steps after receipt of the Handover Request Acknowledge, namely the downlink (“DL”) allocation, detaching from the old cell and synchronizing to the new cell, and forwarding packets to the Target eNB. *Id.*; Ex-1006, 46 (Fig. 14); *id.*, 93 (teaching that “user plan data forwarding may be initiated” upon receipt of Handover Request Acknowledge); Ex-1005, Fig. 15; *id.*, 13:42–44 (“DL data arriving at the source eNB for the user equipment are then forwarded to the new target eNB.”).



This process changes the data path for the handed-over bearers and, correspondingly, the Handover Request Acknowledge requests to change the data path via the E-RABs Admitted List. Ex-1003, ¶¶ 101–108. While the Source eNB releases its resources later in the process, the Handover Request Acknowledgement requests to change the data path for the provided E-RABs (which the Source eNB then fulfills). *Id.*; Ex-1005, 30:13–18 (explaining that bearers “were successfully handed over” prior to the Path Switch Request); Ex-1006, 94 (teaching that “target eNB can begin sending data to the UE and the UE can send data to the target based on the scheduling grants it is receiving” after the Handover Request Acknowledge and the Path Switch Request “inform[s] that the UE has changed cell”).

The second message that meets the “second request” limitation is Path Switch Request to UE Context Release. Ex-1003, ¶¶ 109–119. That message originates from the Target eNB (at step 12 below), propagates through the core network (the MME and SGW), and results in the Source eNB releasing the resources (step 18).

Id.; Ex-1006, 46 (Fig. 14); Ex-1005, Fig. 15. This is a request from the Target eNB to the Source eNB that flows through the core network, which acts as a conduit to sending the message to the Source eNB over X2. Ex-1003, ¶ 119.

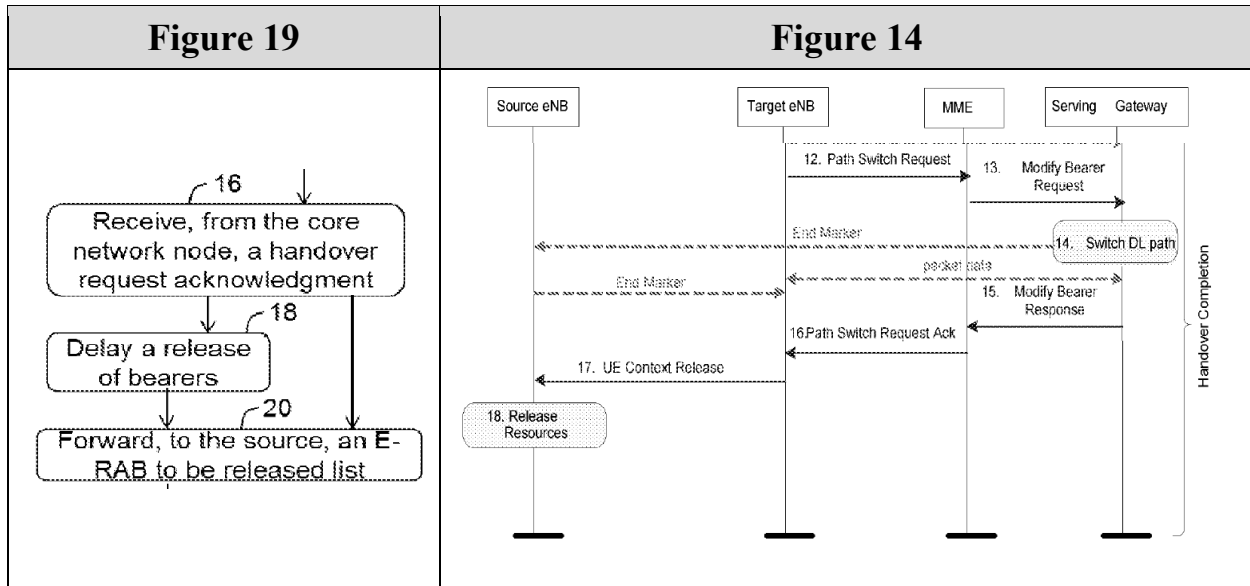


The Path Switch Request “indicat[es] switching of bearers listed in X2: HANDOVER REQUEST message.” Ex-1006, 51; Ex-1005, 18:14–19. The request also includes a list of E-RABs handed over (reflected in the highlighted “E-RAB To Be Switched in Downlink List”). *Id.*, 18:48–19:23; Ex-1006, 52.

TABLE 1a

PATH SWITCH REQUEST message					
IE/Group Name	Presence	Range	Semantics description	Criticality	Assigned Criticality
Message Type	M			YES	reject
eNB UE S1AP ID	M			YES	reject
E-RAB To Be Switched in Downlink List		1		YES	reject
>E-RABs Switched in Downlink Item IEs		1 to <maxnoof E-RABs>		EACH	reject
>>E-RAB ID	M			—	
>>Transport layer address	M			—	
>>GTP-TEID	M		To deliver DL PDUs	—	

After sending the Path Switch Request, the Target eNB sends to the Source eNB a list of bearers to release (UE Context Release), which triggers the Source eNB to release the radio and control-plane related resources (step 18 in Fig. 14). Ex-1006, 46 (Fig. 14), 34 (Fig. 19), 94, 158; Ex-1005, Fig. 15, Fig. 19, 19:64–20:8.



While the core network is involved in switching the downlink path (step 14), the Source eNB changes the data path and releases resources based on messages received from the Target eNB (Handover Request Acknowledgement and Path Switch Request to UE Context Release). Ex-1003, ¶¶ 112–118.

The third message that meets this element is the Handover Request for subsequent selective handovers (*e.g.*, requests from the assisting cell to the anchor cell). Ex-1003, ¶¶ 120–123. Centonza explains that the assisting node (the “first eNB”) sends the anchor node (the “second eNB”) a Handover Request that “recommends the selective handover of these bearers to the new assisting node. The anchor may use the recommendation and may handover the bearers to the new assisting node or decide to keep it with itself or drop them.” Ex-1005, 23:54–61; Ex-1006, 56–57. The Handover Request includes a list radio bearers to handover (the “E-RABs To Be Setup List”) shown above in [1b]. Ex-1006, 50; Ex-1005,

17:5–18:24; Ex-1003, ¶ 120–123. This message also requests a data-path change because it requests handing over the bearers in the E-RABs To Be Setup List. *Id.*

“...the first eNB, which controls the SCell of the UE... the second eNB, which controls a Primary Cell (PCell) of the UE”

The Target eNB (“first eNB”) controls the SCell of the UE and the Source eNB (“second eNB”) controls a PCell of the UE, including at the time of the second requests identified above. Ex-1003, ¶¶ 76, 97, 104, 113, 123, 126. As detailed above, the Target eNB controls an SCell of the UE (*e.g.*, an assisting or pico cell) and the Source eNB controls a PCell of the UE (*e.g.*, the anchor or macro cell) of the UE. *Id.*; Ex-1001, 6:66–67 (’883 patent explaining that “[t]he PCell could be a macro cell, and the SCell could be a small cell”).

“wherein the second request does not indicate to change the data path for a third radio bearer of the UE”

The identified “second requests” are to change a data path for a first radio bearer (*e.g.*, the data path for a bearer handed over) but do not indicate to change the data path for a third radio bearer of the UE (*e.g.*, the data path for a radio bearer that is not handed over). Ex-1003, ¶¶ 71, 98–99, 103–108, 112–118, 120–125, 127. Centonza explains that the number of bearers that are handed over is “less than or equal to a total number of bearers associated with the wireless terminal,” *i.e.*, at least one bearer is not handed over (and there is no request to change the data path for that

third radio bearer).⁷ *Id.*; Ex-1005, 3:7–8; *id.*, 29:2–5 (describing a handover request “for a sub-set of bearers, wherein at least one bearer of the wireless terminal is to remain connected to the source base station”); Ex-1006, 106 (explaining that “at least one bearer (which is not associated with the identified sub-set) remains connected to the base station” as part of handover procedure); *id.*, 112 (explaining that at least one bearer “remains connected to the base station”). The Handover

⁷ A POSITA would have understood that there were at least 11 data radio bearers for a UE in the LTE-based partial handover system that Centonza describes (and potentially up to 256). Ex-1003, ¶¶ 71, 99, 127; Ex-1005, 1:20–2:36, Figs. 4 and 5 (describing protocol stack for LTE); Ex-1006, 11–12 (Figs. 3 and 4), 27, 91 (similar); Ex-1009, 281 (reciting that the maximum number of data radio bearers is 11); Ex-1001, 2:47–64 (incorporating by reference 3GPP TS 36.331 V11.2.0); Ex-1006, 150, 152, 210, 211 (disclosing a range of “E-RABs Switched in Downlink” and “E-RAB To Be Setup” with a range of “1 to <maxnoofE-RABs>”); Ex-1005, 18:46–19:24 (similar); *id.*, (56) (listing 3GPP TS 36.413 V10.2.0 as references cited); Ex-1010, 9.1.3.1–9.1.3.7, 9.1.4.1, 9.1.4.3, 9.1.5.2, 9.1.5.4, 9.1.5.5, 9.1.5.8, 9.1.5.9, 9.1.9.1, 9.1.2.7, 9.2.1.31, 9.2.1.36 (explaining that the value maxnoofE-RABs refers to the “[m]aximum no. of E-RABs towards one UE, the maximum value is 256”).

Request Acknowledge and Path Switch Request state that there are bearers that will not be handed over, the E-RABs Not Admitted List and the Selective Handover Indicator, respectively, reinforcing that the requests do not indicate a change in data path for a third radio bearer. Ex-1003, ¶ 127; Ex-1006, 52, 55; Ex-1005, 19:1–23, 22:1–18.

- e) *[1e]: wherein a first path is via the first eNB and used as the data path for the first radio bearer and the third radio bearer before changing the data path for the first radio bearer.*

Centonza discloses this limitation. Ex-1003, ¶¶ 129–136. It teaches dual connectivity between a macro node and a pico node through the selective handover of bearers between nodes (both to and from each node). *Id.*; see, e.g., Ex-1005, 2:37–45, 13:45–54, 21:49–61; Ex-1006, 26, 28, 56–57, 101–102, 149. When this occurs, a first and third radio bearer (e.g., two of the up to 11+ E-RABs) utilize the same first data path prior to the handover of a first radio bearer (e.g., one of the E-RABs). *Id.* That includes bearers at the Target eNB (e.g., the first data path is via the pico node for two of the E-RABs, and this path exists prior to the handover of an E-RAB to the macro node or another pico node), including in the case of subsequent selective handovers. Ex-1003, ¶¶ 129–136.

3) Claim 2

- a) *[Preamble]: The method of claim 1, wherein*

Centonza anticipates claim 1 for the reasons above.

- b) *[2b]: the data path for the first radio bearer is changed to a second path, wherein the second path is via the second eNB and used as a data path for a second radio bearer of the UE.*

Centonza discloses this claim limitation. Ex-1003, ¶¶ 137–139. It provides for selective handover of a subset of bearers, which changes the data path for the bearers selectively handed over (e.g., in the E-RAB list). *Id.* It teaches that, when the data path of one radio bearer is changed from the Target eNB to the Source eNB, the handed over bearer uses the same data path as a bearer already utilizing a path through the Source eNB. *Id.*; Ex-1005, 13:45–54 (discussing switching of the downlink path); Ex-1006, 22, 46; *see also* Section IX(A)(2)(e) (describing handovers between eNBs).

4) **Claim 3**

- a) *[Preamble]: The method of claim 1, wherein*

Centonza anticipates claim 1 for the reasons above.

- b) *[3b]: the second request includes a cause for data path changing.*

Centonza discloses this claim limitation. Ex-1003, ¶¶ 140–141. It explains that a triggering event may cause the eNB to “choose certain bearers (e.g. non GBR bearers) for the selective handover.” Ex-1006, 48; Ex-1005, 15:42–55. This cause for changing the data path is reflected in the second request, e.g., in the “Cause” information element in the Handover Request, the Selective Handover Indicator in the Path Switch Request, and/or the Admitted/Not Admitted Lists in the Handover

Request Acknowledge and Criticality Diagnostics. Ex-1003, ¶¶ 140–141; Ex-1005, 17:5–35, 19:1–25, 22: 1–17; Ex-1006, 50, 52, 55.

5) Claim 4

a) [Preamble]: The method of claim 1, wherein

Centonza anticipates claim 1 for the reasons above.

b) [4b]: the UE has multiple paths via different eNBs after the data path for the first radio bearer change.

Centonza discloses this claim limitation. Ex-1003, ¶¶ 142–147. It discloses that after the selective handover of a first radio bearer (*e.g.*, an E-RAB), the UE has multiple data paths via different eNBs, such as the data path via the anchor eNB and the assisting eNB. *Id.*; Ex-1005, 2:55–60 (explaining that system can “maintain control plane at one eNB, while sharing the data load at several eNBs”); *id.*, 15, 13:45–54 (discussing switching of the downlink path); Ex-1006, 22 (same), 46 (Fig. 14), 58 (discussing “sharing the data load at several eNBs”).

6) Claim 5

a) [Preamble]: The method of claim 1, further comprising:

Centonza anticipates claim 1 for the reasons above.

b) [5b]: receiving, by the first eNB, a confirmation message from the second eNB for changing the data path for the first radio bearer.

Centonza discloses this claim limitation. Ex-1003, ¶¶ 148–149. Centonza discloses that the Target eNB receives a Handover Confirm message “once the target

eNB and the user equipment are synchronized,” and, “[a]fter a proper setup of the connection with the target eNB is performed (which comprises the switching of the DL path in the serving gateway), the old connection is released and any remaining data in the source eNB that is destined for the user equipment is forwarded to the target eNB.” Ex-1005, 13:45–55; Ex-1006, 22.

7) Claim 6

a) [Preamble]: The method of claim 1, wherein

Centonza anticipates claim 1 for the reasons above.

b) [6b]: the second request comprises information about loading status of a cell controlled by the first eNB.

Centonza discloses this claim limitation. Ex-1003, ¶¶ 150–151. It explains that the selective handover may be based upon the load status of the Target eNB. *Id.*; Ex-1006, 48, 67, 71; Ex-1005, 16:1–8.⁸ Information about the load status may

⁸ See also Ex-1005, 26:10–17 (“A need for a selective handover procedure may be determined based on the target base station load status. The radio circuitry 410A may be configured to receive, from the target base station 410B, the target base station load status.”); *id.*, 27:28–37 (“According to some of the example embodiments, the selecting 12 further comprises selecting 24 the sub-set of bearers based on any one or more of a threshold, triggering event, a radio signal level, a

be reflected in the second request, such as in the “Cause” information element in the Handover Request, the Selective Handover Indicator in the Path Switch Request, and/or the Admitted/Not Admitted Lists in the Handover Request Acknowledge. Ex-1003, ¶ 151; Ex-1005, 17:5–35, 19:1–25, 22: 1–17; Ex-1006, 50, 52, 55.

8) Claim 7

Claim 7 is similar to claim 1, but from the perspective of the second eNB (the Source eNB). Petitioners incorporate their analysis from claim 1 here. Ex-1003, ¶ 152.

- a) [Preamble]: A method for handling inter-node connectivity in a wireless communication system, comprising:*

This preamble is the same as claim 1 and, for the same reasons, is met by Centonza. Section IX(A)(2)(a); Ex-1003, ¶ 153.

- b) [7b]: transmitting a first request from a second evolved Node B (eNB) to a first evolved Node B (eNB) for aggregating a Secondary Cell (SCell) for a User Equipment (UE);*

Centonza discloses this limitation, which mirrors [1b]’s “receiving” step. Section IX(A)(2)(b); Ex-1003, ¶¶ 154–155. Centonza teaches that the Source eNB

buffer level of a bearer, and/or a load situation at the source and/or target base station.”).

(the “second eNB”) sends a Handover Request to the Target eNB (the “first eNB”). The Handover Request contains a request for aggregating an SCell, such as a pico cell, for a UE. For the same reasons as [1b], Centonza teaches this element.

- c) [7c]: receiving, by the second eNB, an accept message from the first eNB in response to the first request;*

Centonza discloses this limitation, which mirrors [1c]’s “transmitting” step. Section IX(A)(2)(c); Ex-1003, ¶¶ 156–157. Centonza teaches that Source eNB (the “second eNB”) receives from the Target eNB (the “first eNB”) a Handover Acknowledgement, which contains an accept message. *Id.* For the same reasons as [1c], Centonza teaches this element.

- d) [7d]: receiving, by the second eNB which controls a Primary Cell (PCell) of the UE, a second request from the first eNB which controls the SCell of the UE; and changing a data path for a first radio bearer of the UE and not changing a data path for a third radio bearer of the UE based on the second request;*

Centonza discloses this limitation, which mirrors the “transmitting ... a second request” step in [1d]. Section IX(A)(2)(d); Ex-1003, ¶¶ 158–162. As detailed for [1d], three messages meet claim 1’s “second request” limitation. These messages meet [7d] for the same reasons. *Id.* Centonza teaches that these “second requests” are to change a data path for a first radio bearer (*e.g.*, a bearer contained in the E-RAB elements for handed-over bearers) and not change the data path for a third radio bearer (*e.g.*, a bearer not contained in the in the E-RAB elements above or a bearer

in the E-RABs Not Admitted List). *Id.* The data path for a first radio bearer (*e.g.*, a bearer that is handed over) is changed based on each of the “second requests” above; likewise, the data path for a third radio bearer (*e.g.*, a bearer that is not handed over) is not changed based on each “second request.” *Id.* Each of the “second requests” from [1d] are received by the second eNB (the Source eNB). *Id.* The Target eNB controls an SCell, and the Source eNB controls a PCell. *Id.*

- e) [7e]: wherein a first path is via the first eNB and used as the data path for the first radio bearer and the third radio bearer before changing the data path for the first radio bearer.*

This element is the same as [1e] and, for the same reasons, is met by Centonza.

Section IX(A)(2)(e); Ex-1003, ¶ 163.

9) Claim 8

- a) [Preamble]: The method of claim 7, wherein*

Centonza anticipates claim 7 for the reasons above.

- b) [8b]: the data path for the first radio bearer is changed to a second path, wherein the second path is via the second eNB and used as a data path for a second radio bearer of the UE.*

This element is the same as [2b] and, for the same reasons, is met by Centonza.

Section IX(A)(3); Ex-1003, ¶¶ 164–165.

10) Claim 9

- a) [Preamble]: The method of claim 7, further comprising:*

Centonza anticipates claim 7 for the reasons outlined above.

- b) *[9b]: transmitting a confirmation message from the second eNB to the first eNB for changing the data path for the first radio bearer.*

This claim element is the same as [5b] but recites “transmitting a confirmation message” instead of “receiving a confirmation message.” Centonza teaches this limitation for the same reasons as [5b]. Section IX(A)(6); Ex-1003, ¶¶ 166–168. The Target eNB receives a confirmation message from the Source eNB for changing the data path of the first radio bearer (Handover Confirm). *Id.* The Source eNB (the “second eNB”) transmits that message to the Target eNB (the “first eNB”). *Id.*

11) Claim 10

- a) *[Preamble]: The method of claim 7, wherein*

Centonza anticipates claim 7 for the reasons above.

- b) *[10b]: the UE has multiple paths via different eNBs after the data path for the first radio bearer change.*

This element is the same as [4b] and, for the same reasons, is met by Centonza. Section IX(A)(5); Ex-1003, ¶¶ 169–170.

12) Claim 11

- a) *[Preamble]: The method of claim 7, wherein*

Centonza anticipates claim 7 for the reasons above.

- b) *[11b]: the second request comprises information about loading status of a cell controlled by the first eNB.*

This element is the same as [6b] and, for the same reasons, is met by Centonza. Section IX(A)(7); Ex-1003, ¶¶ 171–172.

B. Ground 2: Centonza Renders Obvious the Challenged Claims

Centonza anticipates the Challenged Claims. To the extent Centonza does not anticipate the claims, it renders the claims obvious for the reasons below.

1) Motivation to Modify Centonza

a) Path Switch Request to UE Context Release

To the extent the Path Switch Request to UE Context Release the Target eNB provided initially over the S1 interface (through the core network) is not considered “from the first eNB ... to the second eNB” ([1e] and [7e] (similar)), a POSITA would have been motivated to exclusively use X2 for this message. Ex-1003, ¶¶ 173–175.

Before the ’883 patent, it was known to exchange requests over X2 (including in Centonza). Ex-1005, Fig. 15; Ex-1006, 46 (Fig. 14); Ex-1003, ¶¶ 173–175. Exclusively using X2 would reduce the network components needed to forward messages to an eNB. *Id.* This would reduce the network’s processing load and the potential for error. *Id.* Using X2 would also speed up the network, *e.g.*, the message would not need to pass through the core network. *Id.* And it would allow the network to scale without potentially overloading the core network or expanding the amount of core network components. *Id.*

A POSITA would have further found that using X2 instead of S1 would have a reasonable expectation of success. Ex-1003, ¶¶ 173–175. Centonza and the ’883 patent describe the two options as interchangeable. Ex-1005, 13:24–26 (“Handover is performed via the X2 connection, whenever available, and if not, using S1 (i.e.,

involving the Core Network (CN)).’); Ex-1006, 208; Ex-1001 at 7:18–25 (“[T]he second eNB could send a request to the first eNB or a core network node (such as a MME (Mobility Management Entity) or a S-GW (Serving Gateway)), to switch a data path’); *id.*, 7:47–51 (“...eNB1 could send a Data Path Switch Request either to eNB2 or to a MWE or a S-GW to change the first data path’). Centonza also teaches that, when a bearer is handed over, the eNBs and UE handle the detaching from the old cell, synchronizing to the new cell, forwarding data, and releasing resources without the core network’s involvement. Ex-1005, Fig. 15 (steps 6–11); Ex-1006, Fig. 14 (same). A POSITA would thus expect communicating exclusively through X2 would work. Ex-1003, ¶ 175. And none of the references, or the ’883 patent, express difficulty that would result from exclusively using X2. *Id.*

b) Handover Request Acknowledge and Handover Requests

To the extent the Handover Request Acknowledge and Handover Request are not “request[s] . . . to change a data path” ([1d], [7e] (similar)), a POSITA would have been motivated to modify these messages to request to change the data path (and then change the data path based on these messages). Ex-1003, ¶ 177. The two messages already include a list of E-RABs to handover, like the Path Switch Request. *Id.* In that scenario, the Source eNB, in addition to changing the DL allocation at the UE and forwarding packets to the Target eNB, could also release its resources for those E-RABs (rather than wait for the UE Context Release or the

end marker from the core network). *Id.* A POSITA would be motivated to make this change to simplify the system and reduce the number of messages exchanged between the eNBs and the core network for the same reasons as above. *Id.* A POSITA would also have recognized that this change would not have impacted the selective handover system because cells and downlink data path would have already changed at the UE. *Id.* A POSITA would thus have a reasonable expectation of success for the same reasons as above. *Id.*

c) Cause For Data Path Changing and Loading Status

To the extent the “second requests” above ([1d] and [7d]) do not include “a cause for data path changing” ([3b]) or “information about loading status of a cell controlled by the first eNB” ([6b] and [11b]), a POSITA would have been motivated to modify Centonza to include that information. Ex-1003, ¶¶ 178–179. Centonza discloses that the eNBs track both sets of data. *Id.*; Ex-1006, 48; Ex-1005, 15:42–55, 16:1–8. Including that data in the second request would make the system more efficient by informing the Source eNB (and the core network) of the network conditions in connection with the data-path change. Ex-1003, ¶ 178. This would assist the system with subsequent handovers based on network conditions. *Id.* In addition, this approach would reduce the number of messages transmitted through the network, which increases speed and reduces the potential for error. *Id.*

A POSITA would have had a reasonable expectation of success. Ex-1003, ¶ 179. The “second requests” already include the information elements to carry this data (*e.g.*, Cause, the Selective Handover Indicator, the Admitted/Not Admitted Lists, and Criticality Diagnostics. *Id.*; Ex-1005, 17:5–35, 19:1–25, 22: 1–17; Ex-1006, 50, 52, 55. A POSITA would thus have understood that the modification would simply require taking data Centonza already tracks and including it in an existing message field. Ex-1003, ¶ 179. This is a small, trivial change (if any). *Id.*

2) Independent Claims

Centonza renders obvious claims 1 and 7. Ex-1003, ¶ 180. Centonza discloses each element of these claims. To the extent Centonza does not disclose [1d] and [7d], it would have been obvious to modify the system for the reasons above to meet those limitations. *Id.* First, it would have been obvious to have the Target eNB send the Path Switch Request to UE Context Release to the Source eNB exclusively over X2 and not over S1. *Id.* Second, it would have been obvious to modify the Handover Request Acknowledge and subsequent Handover Requests to include the same elements as the Path Switch Request. *Id.* Any of these modifications would have met [1d] and [7d]. *Id.*

3) Dependent Claims

Centonza also renders obvious claims 2–6 and 8–11. Ex-1003, ¶ 181. Centonza discloses each element of these claims. To the extent Centonza does not

disclose [3b], it would have been obvious to a POSITA to modify Centonza to meet that element (*e.g.*, include the handover cause in a “second request”) based on the motivations above. To the extent Centonza does not disclose [6b] and [11b], it would have been obvious to a POSITA to modify the system to meet that element (*e.g.*, include loading status information in a “second request”) based on the motivations above.

C. Ground 3: Han Anticipates the Challenged Claims

1) Han is Prior Art

Han was filed on October 8, 2012, which predates the ’883 patent’s earliest priority date (January 30, 2013) and is thus Section 102 prior art. Ex-1003, ¶ 182.

2) Claim 1

- a) [Preamble]: A method for handling inter-node connectivity in a wireless communication system, comprising:*

Han discloses the preamble. Ex-1003, ¶¶ 184–191; Ex-1007, [0003] (describing the “basic idea” of dual connection is to “let a user equipment (UE) connect to both a macro access point and a LA [local areas] access point simultaneously ... while offloading most data transmission to the LA access point”); *id.*, [0017] (“[D]uring dual connection a user equipment (UE), such as UE 10, may be in communication with, *e.g.*, connected to, both a macro access point (MAP) 100, which serves a macro cell 101, and a local access point (LAAP) 110, which supports a local area cell 111.”). The access points may be “a base station, an access node,

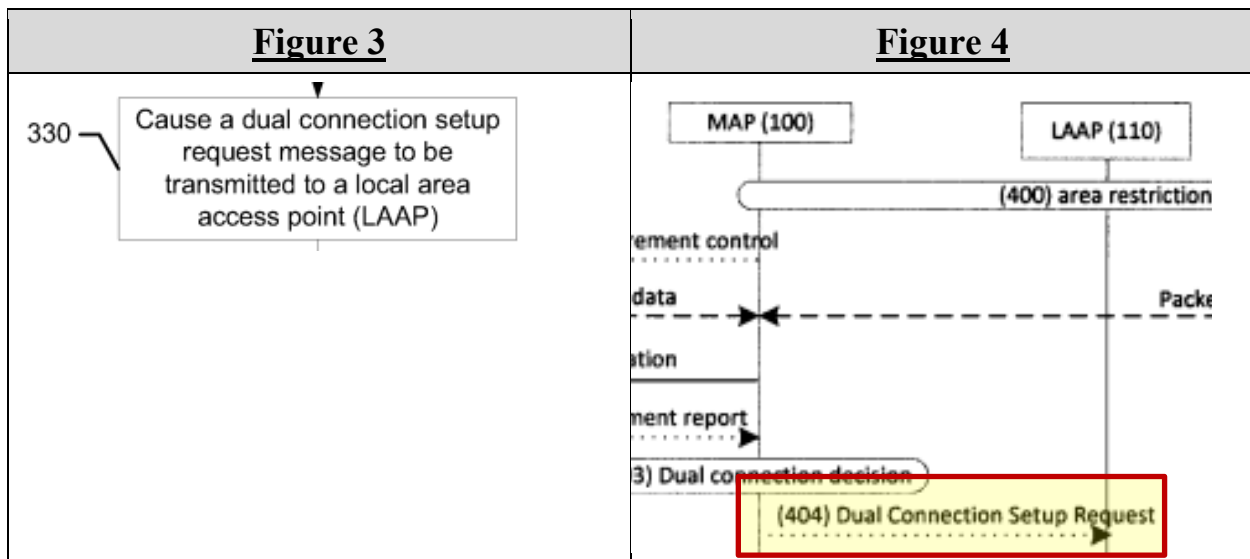
or any equivalent, such as a Node B, an evolved Node B (eNB),” among others. *Id.*, [0018]. Han discloses handling inter-node connectivity, particularly dual connectivity between nodes. *Id.*, Fig. 1, Fig. 3, [0017]–[0018], [0029].

- b) [1b]: receiving, by a first evolved node B (eNB), a first request from a second eNB for aggregating a Secondary Cell (SCell) for a User Equipment (UE);

Han discloses this limitation. Ex-1003, ¶¶ 192–195. Han discloses receiving, by a first eNB (the Local Area Access Point or “LAAP”), a first request from a second eNB (the Macro Access Point or “MAP”) for aggregating a SCell for a UE (the local cell for the UE). *Id.*

“receiving, by a first evolved node B (eNB), a first request from a second eNB...”

Han teaches that the MAP transmits a “dual connection setup” message to the LAAP, which, in turn, receives that message. Ex-1007, Figs. 3 and 4, [0034], [0040].



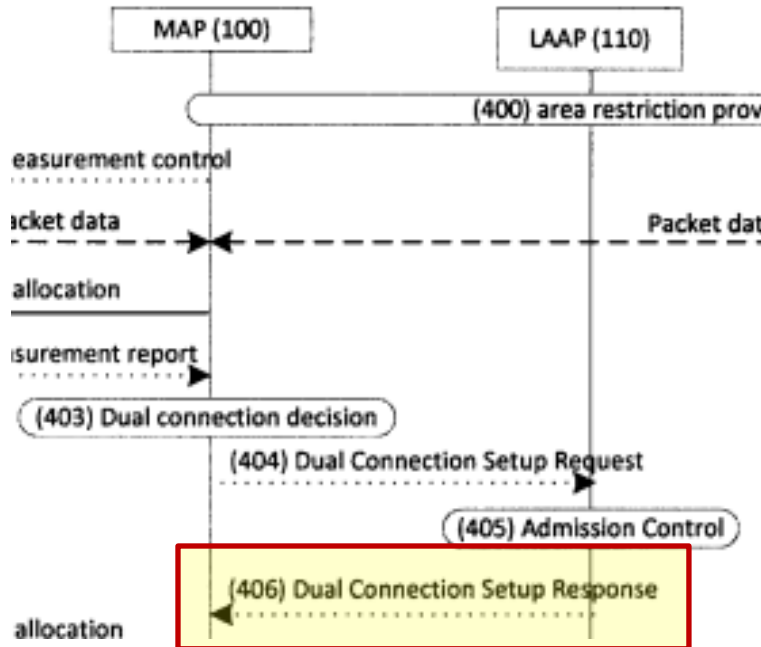
The LAAP and MAP can be eNBs and thus meet the “first eNB” and “second eNB” elements. Ex-1003, ¶ 194; Ex-1007, [0018].

“...for aggregating a Secondary Cell (SCell) for a User Equipment (UE)”

The Dual Connection Setup Request is a request for aggregating an SCell for a UE, specifically aggregating bearers at the LAAP’s local cell. Ex-1003, ¶ 195. The message contain information to set up the dual connection and “may include bearer split information.” Ex-1007, [0040]. The bearer split information can include “one or more radio bearer ids,” and, “by providing this bearer split information to the LAAP, the LAAP may setup appropriate data bearers for the UE so that, for example, data transmission may be offloaded from the MAP to the LAP.” *Id.* The message also includes the destination cell ID, further reflecting that the request is to aggregate an SCell for the UE. *Id.*, [0040], [0044]–[0047]; Ex-1003, ¶ 195.

- c) [1c]: transmitting an accept message from the first eNB to the second eNB in response to the first request; and*

Han discloses this limitation. Ex-1003, ¶¶ 196–199. It discloses an accept message (Dual Connection Setup Response) from the first eNB (LAAP) to the second eNB (MAP) in response to the first request (Dual Connection Setup Request). *Id.*; Ex-1007, Fig. 4, [0034] (describing response as including an acknowledgement), [0042] (describing message).

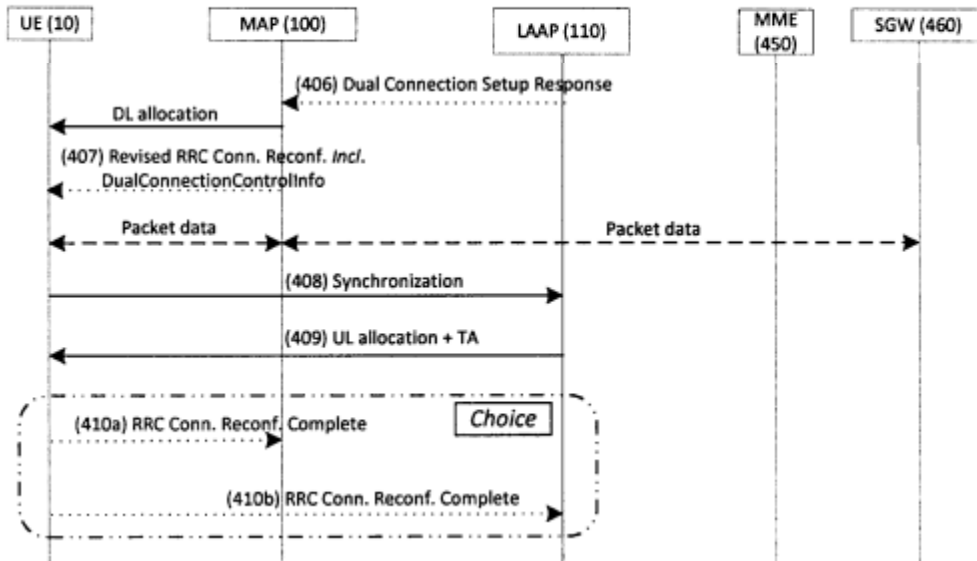


- d) [1d]: transmitting a second request from the first eNB, which controls the SCell of the UE, to the second eNB, which controls a Primary Cell (PCell) of the UE, to change a data path for a first radio bearer of the UE, wherein the second request does not indicate to change the data path for a third radio bearer of the UE;

Han discloses this limitation. Ex-1003, ¶¶ 200–218. It discloses three messages that contain the claimed “second request”: Dual Connection Setup Response, Path Switch and Suspend Request For Split Bearers to Dual Connection Establish Complete, and Dual Connection Setup Request. *Id.*

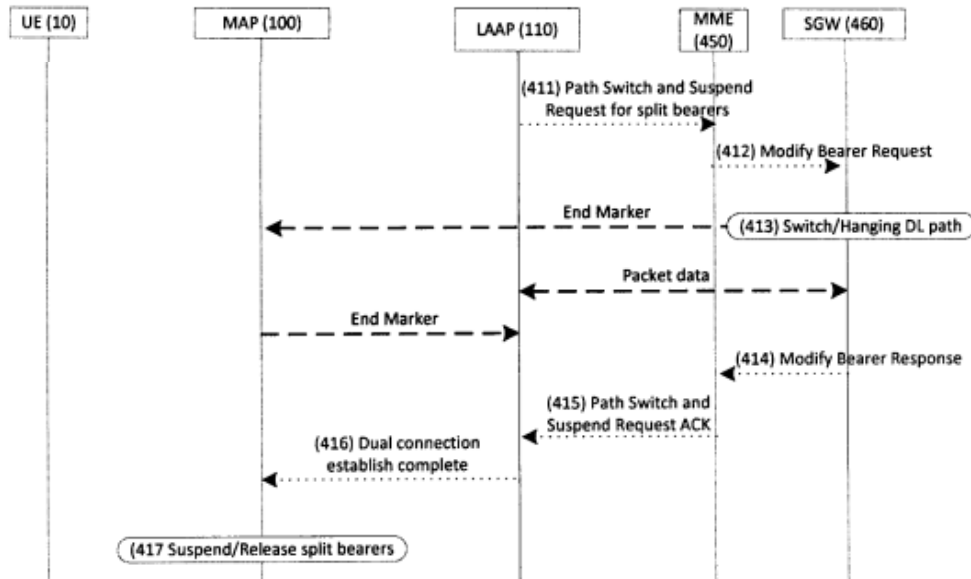
“transmitting a second request from the first eNB ... to the second eNB ... to change a data path for a first radio bearer of the UE ...”

The Dual Connection Setup Response (step 406) is sent from the LAAP to the MAP. Ex-1007, Fig. 4.



This is a request to change a data path for UE's radio bearer. Ex-1003, ¶ 202. The message includes “a transparent container to be sent to the UE ... to perform the dual connection setup.” Ex-1007, [0042]. The MAP then changes the data path based on this message, as shown in the “DL allocation” message and subsequent transmissions that result in (step 410b) “confirm[ing] the dual connection establishment procedure is completed” and allowing the LAAP to “begin sending data to the UE 10 for split bearers.” *Id.*, Fig. 4, [0043]–[0047]; Ex-1003, ¶ 202.

The Path Switch and Suspend Request For Split Bearers through the Dual Connection Establish Complete (steps 411–417) is a request from the LAAP to the MAP that flows through the core network (over S1) and to the MAP (over X2). Ex-1003, ¶¶ 203–212; Ex-1007, Fig. 4. The core network devices, such as the MME and SGW, act as a conduit for the message. Ex-1003, ¶ 206.



This message is a request to change the data path, ultimately causing the MAP to “release or suspend/hang radio and C-plane [control plane] related resources associated with the one or more split bearers for the UE 10” (step 417). Ex-1007, [0056]; Ex-1003, ¶¶ 203–212. The message includes “split bearer information, such as information indicating one or more bearers of the UE 10 that have moved to the LAAP 110.” Ex-1007, [0050]. This message propagates through the core network (the MME and SGW), resulting in the Dual Connection Establish Complete (step 416). *Id.*, Fig. 4. As part of this process, the SGW “may then switch the DL data path for split bearers to the LA cell 110 side,” send an end-marker to the MAAP, and then “release or suspend, e.g., hang, any U-plane/TNL resources of split bearers towards the MAP.” *Id.*, [0052]. The MAP “may ... suspend/hang the one or more split bearers upon receiving the end marker from the SGW.” *Id.*

The third message is the Dual Connection Setup Request (step 404). Ex-1003, ¶¶ 213–215; Ex-1007, Fig. 4, [0040] (describing Dual Connection Setup Request). That request may “include split bearer information,” which may “indicate which bearer(s) are to be moved and/or created by the LAAP 110.” *Id.*, [0040]; *see also id.* (explaining that the request may also contain “information such as one or more Evolved Packet System (EPS) bearer ids, one or more radio bearer ids, etc.”). By providing this bearer split information, “the LAAP may setup appropriate data bearers for the UE so that, for example, data transmission may be offloaded from the MAP to the LAP.” *Id.*, [0040]. This offloading occurs in connection with changing the data path, reflecting that the Dual Connection Setup Request includes a request to change the data path. Ex-1003, ¶ 213–215. While the request may be sent from the MAP to the LAAP, it may also be sent the other way (from the LAAP to the MAP): when the sending apparatus is “embodied by or otherwise associated with a LAAP, the dual connection setup message may be transmitted to the MAP 100.” *Id.*; Ex-1007, [0034]; *id.*, [0031] (explaining that each LAP and MAAP can have analogous functionality).

“...the first eNB, which controls the SCell of the UE... the second eNB, which controls a Primary Cell (PCell) of the UE”

The LAAP controls the SCell of the UE and the MAP controls a PCell of the UE. Ex-1003, ¶¶ 201. As detailed above, the LAAP controls a Local Area (or “LA”)

cell of the UE, which is a SCell of the UE. *Id.* The MAP controls the macro cell of the UE, which is a PCell of the UE. *Id.* This is the same disclosure as the '883 Patent, which explains that the “[t]he PCell could be a macro cell, and the SCell could be a small cell.” Ex-1001 at 6:66–67.

“wherein the second request does not indicate to change the data path for a third radio bearer of the UE”

The “second requests” above are to change a data path for a first radio bearer (*e.g.*, the data path for bearer that is split) but do not indicate to change the data path for a third radio bearer of the UE (*e.g.*, the data path for a radio bearer that is not split). Ex-1003, ¶¶ 202–203, 206–207, 212, 214–218. Han relates to LTE networks,⁹ which (per above) supported at least 11, and up to 256, radio bearers. Thus, a person of ordinary skill in the art would have understood that requesting to split bearers (and change the data path for those bearers) would not indicate a change

⁹ *See, e.g.*, Ex-1007, [0003] (explaining that the incorporation of local area networks “into the broader network infrastructure may be the next frontier in the evolution of cellular networks, such as Long Term Evolution (LTE) networks”); *id.*, [0017] (explaining that the system described in the reference may support “a Long Term Evolution (LTE) network” or “an LTE-Advanced (LTE-A) network”); *id.*, [0040] (disclosing that the Dual Connection Setup Request can include an E-RAB context).

in the data path for a third radio bearer (*e.g.*, one of the other bearers for the UE).

Id. None of these “second requests” indicate to change the data path for a third radio bearer of the UE. *Id.* Each message contains a list of the bearers to be moved over, such as bearer identification information and data for a downlink path change. *Id.*

- e)* [1e]: wherein a first path is via the first eNB and used as the data path for the first radio bearer and the third radio bearer before changing the data path for the first radio bearer.

Han discloses this limitation. Ex-1003, ¶¶ 219–226. Han teaches a dual connection between a MAP and a LAAP that allows for splitting bearers between the nodes (both to and from each node). *Id.*; Ex-1007, [0005]–[0008]. When this occurs, the first and third radio bearer (*e.g.*, two of the 11+ potential bearers) utilize the same first data path prior to the handover of the first radio bearer (*e.g.*, one of the bearers), including bearers at the LAAP. Ex-1003, ¶¶ 219–226. Han also discloses that the LAAP can send a Dual Connection Setup Request to the MAP and that the split-bearer functionality is interchangeable between the devices, meaning that the first data path is via the LAAP (first eNB) for a first and third radio bearer. *Id.*; Ex-1007, [0031], [0034]. This path exists prior to moving over the first radio bearer. Ex-1003, ¶ 219–226.

3) Claim 2

- a)* [Preamble]: The method of claim 1, wherein

Han anticipates claim 1 for the reasons above.

- b) *[2b]: the data path for the first radio bearer is changed to a second path, wherein the second path is via the second eNB and used as a data path for a second radio bearer of the UE.*

Han discloses this claim limitation. Ex-1003, ¶¶ 227–232. It discloses that the data path for the first radio bearer (e.g., the data path for a bearer at the LAAP) is changed to a second path via the second eNB (e.g., the data path for a bearer at the MAP after splitting the bearers) and is used as a data path for a second radio bearer of the UE (e.g., a bearer at the MAP prior to the offloading that remains at the MAP). *Id.*; Ex-1007, Fig. 3, Fig. 4, [0005]–[0008], [0033], [0034], [0038]. [0040], [0048]. Han provides for dual connectivity that offloads or moves a subset of bearers, which changes the data path for the bearers selectively moved over (e.g., in split bearer information) but does not change the data path for the bearers that are not moved over. *Id.*; see also Section IX(C)(2)(e) (describing splitting bearers between nodes).

4) Claim 3

- a) *[Preamble]: The method of claim 1, wherein*

Han anticipates claim 1 for the reasons above.

- b) *[3b]: the second request includes a cause for data path changing.*

Han discloses this claim limitation. Ex-1003, ¶¶ 233–235. It explains that the access points “receive one or more further measurement reports and similarly determine, based on those measurement reports, whether a dual connection should

then be established.” *Id.*; Ex-1007, [0033]; *id.*, [0040] (disclosing Quality of Service profiles).

5) Claim 4

a) [Preamble]: The method of claim 1, wherein

Han anticipates claim 1 for the reasons above.

b) [4b]: the UE has multiple paths via different eNBs after the data path for the first radio bearer change.

Han discloses this claim limitation. Ex-1003, ¶¶ 236–240. It discloses that after moving a bearer from one access point to another as part of dual connectivity, the UE has multiple data paths via different eNBs, such as the data path via the MAP and the LAAP. *Id.*; Ex-1007, Fig. 1, Fig. 3, [0003] (explaining that the dual connection “let[s] a user equipment (UE) connect to both a macro access point and a LA access point simultaneously, ... while offloading most data transmission to the LA access point”); *id.*, [0017] (“[D]uring dual connection a user equipment (UE), such as UE 10, may be in communication with, e.g., connected to, both a macro access point (MAP) 100, which serves a macro cell 101, and a local access point (LAAP) 110, which supports a local area cell 111.”).

6) Claim 5

a) [Preamble]: The method of claim 1, further comprising:

Han anticipates claim 1 for the reasons above.

- b) *[5b]: receiving, by the first eNB, a confirmation message from the second eNB for changing the data path for the first radio bearer.*

Han discloses this claim limitation. Ex-1003, ¶¶ 241–245. It discloses that the MAP receives an “end-marker” message and then “can release or suspend, e.g., hang, any U-plane/TNL resources of split bearers towards the MAP” and then “may further send the end marker to the LAAP 110.” *Id.*; Ex-1007, [0052]. In addition, the LAAP may send (and the MAP may receive) the Dual Connection Establish Complete (another form of the claimed confirmation message), which informs the receiving device “of the successful dual connection establishment.” Ex-1003, ¶¶ 241–245; Ex-1007, Fig. 4, [0006], [0007], [0008], [0031], [0034], [0055].

7) Claim 6

- a) *[Preamble]: The method of claim 1, wherein*

Han anticipates claim 1 for the reasons above.

- b) *[6b]: the second request comprises information about loading status of a cell controlled by the first eNB.*

Han discloses this claim limitation. Ex-1003, ¶¶ 246–250. It explains that load information may determine if a dual connection should be established, including disclosing that messages (like the “second requests” identified above) may include a measurements and buffer status reports. *Id.*; Ex-1007, [0033] (“Other factors which the determination may be based on may include, for example, macro cell load and/or traffic types.... [T]he apparatus may, for example, receive one or

more further measurement reports and similarly determine, based on those measurement reports, whether a dual connection should then be established.”); *id.*, [0046] (“At operation 410a, ... the UE may transmit the RRCConnectionReconfigurationComplete message, e.g., including C-RNTI, to confirm the dual connection establishment, along with an uplink Buffer Status Report, whenever possible, to the LAAP 1 10 to indicate that the dual connection establishment procedure is completed for the UE 10. The LAAP 1 10 may then verify the C-RNTI transmitted in the RRCConnectionReconfigurationComplete message. The LAAP 110 may then begin sending data to the UE 10 for split bearers.”).

8) Claim 7

Claim 7 is similar to claim 1, but from the perspective of the second eNB (the MAP). Petitioners incorporate their analysis from claim 1 here. Ex-1003, ¶ 251.

- a) [Preamble]: A method for handling inter-node connectivity in a wireless communication system, comprising:*

This preamble is the same as claim 1 and, for the same reasons, is met by Han. Section IX(B)(2)(a); Ex-1003, ¶ 252.

- b) [7b]: transmitting a first request from a second evolved Node B (eNB) to a first evolved Node B (eNB) for aggregating a Secondary Cell (SCell) for a User Equipment (UE);*

Han discloses this limitation, which mirrors [1b]’s “receiving” step. Section IX(B)(2)(b); Ex-1003, ¶¶ 253–254. Han teaches that the MAP (second eNB) sends

a Dual Connection Setup Request to the LAAP (first eNB). The Handover Request contains a request for aggregating an SCell), such as a LA cell, for a UE. Thus, for the same reasons as [1b], Han teaches this element.

- c) [7c]: receiving, by the second eNB, an accept message from the first eNB in response to the first request;*

Han discloses this limitation, which mirrors [1c]’s “transmitting” step. Section IX(B)(2)(c); Ex-1003, ¶¶ 255–256. Han teaches that the LAAP (first eNB) sends a Dual Connection Setup Response to the MAP (second eNB), which contains an accept message. Thus, for the same reasons as [1c], Han teaches this element.

- d) [7d]: receiving, by the second eNB which controls a Primary Cell (PCell) of the UE, a second request from the first eNB which controls the SCell of the UE; and changing a data path for a first radio bearer of the UE and not changing a data path for a third radio bearer of the UE based on the second request;*

Han discloses this limitation, which mirrors [1d]’s “transmitting ... a second request” step. Section IX(B)(2)(d); Ex-1003, ¶¶ 257–261. As detailed for [1d], three messages meet claim 1’s “second request” limitation. These messages meet [7d] for the same reasons. *Id.* Han teaches that these “second requests” are to change a data path for a first radio bearer (e.g., a bearer contained in split bearer information for bearers that are moved over) and not change the data path for a third radio bearer (e.g., a bearer not contained in the in the split-bearer elements). *Id.* In addition, the data path for a first radio bearer (e.g., a bearer that is moved over) is changed based

on each of the “second request” messages above; likewise, the data path for a third radio bearer (*e.g.*, a bearer that is not moved over) is not changed based on each of the “second requests.” Each of the “second requests” in [1d] are received by the second eNB (the MAP). Ex-1003, ¶ 261.

- e) *[7e]: wherein a first path is via the first eNB and used as the data path for the first radio bearer and the third radio bearer before changing the data path for the first radio bearer.*

This element is the same as [1e] and, for the same reasons, is met by Han.
Section IX(B)(2)(e); Ex-1003, ¶ 262.

9) Claim 8

- a) *[Preamble]: The method of claim 7, wherein*

Han anticipates claim 7 for the reasons above.

- b) *[8b]: the data path for the first radio bearer is changed to a second path, wherein the second path is via the second eNB and used as a data path for a second radio bearer of the UE.*

This element is the same as [2b] and, for the same reasons, is met by Han.
Section IX(B)(3); Ex-1003, ¶ 263–264.

10) Claim 9

- a) *[Preamble]: The method of claim 7, further comprising:*

Han anticipates claim 7 for the reasons above.

- b) *[9b]: transmitting a confirmation message from the second eNB to the first eNB for changing the data path for the first radio bearer.*

This claim element is the same as [5b] but recites “transmitting a confirmation message” instead of “receiving a confirmation message. Han teaches this limitation for the same reasons as [5b] above. The LAP receives a confirmation message from the MAP for changing the data path of the first radio bearer. Section IX(B)(6); Ex-1003, ¶¶ 265–267.

11) Claim 10

- a) *[Preamble]: The method of claim 7, wherein*

Han anticipates claim 7 for the reasons above.

- b) *[10b]: the UE has multiple paths via different eNBs after the data path for the first radio bearer change.*

This element is the same as 4[b] and, for the same reasons, is met by Han. Section IX(B)(5); Ex-1003, ¶¶ 268–269.

12) Claim 11

- a) *[Preamble]: The method of claim 7, wherein*

Han anticipates claim 7 for the reasons above.

- b) *[11b]: the second request comprises information about loading status of a cell controlled by the first eNB.*

This element is the same as 6[b] and, for the same reasons, is met by Han. Section IX(B)(7); Ex-1003, ¶¶ 270–271.

D. Ground 4: Han Renders Obvious the Challenged Claims

Han anticipates the Challenged Claims. To the extent Han does not anticipate the claims, it renders the claims obvious for the reasons below.

1) Motivation to Modify Han

a) Path Switch and Suspend Request For Split Bearers to Dual Connection Establish Complete

To the extent Path Switch and Suspend Request to Dual Connection Establish Complete the LAAP provided initially through the core network is not considered “from the first eNB ... to the second eNB” ([1e] and [7e] (similar)), a POSITA would have been motivated to exclusively use X2 for this message. Ex-1003, ¶¶ 272–275.

Before the ’883 patent, it was known to exchange requests over X2 (including in Han). Ex-1007, [0029], [0034], [0040]; Ex-1003, ¶ 273. Exclusively using X2 would reduce the network components needed to forward messages to an eNB. *Id.* This would reduce the network’s processing load and the potential for error. *Id.* Using X2 would also speed up the network, *e.g.*, the message would not need to pass through the core network. *Id.* And it would allow the network to scale without potentially overloading the core network or expanding the amount of core network components. *Id.*

A POSITA would have further found that using X2 instead of S1 would have a reasonable expectation of success. Ex-1003, ¶¶ 274–275. The ’883 patent describes the two options as interchangeable. Ex-1001 at 7:18–25. Han also teaches,

when setting up the dual connection, the eNBs and UE handle the cell reconfiguration, forwarding data, and synchronization without the core network's involvement. *Id.*, ¶¶ 274–275; Ex-1007, Fig. 4 (steps 406–410). A POSITA would thus expect communicating exclusively through X2 would work. Ex-1003, ¶¶ 274–275. And none of the references, or the '883 patent, express difficultly that would result from exclusively using X2. *Id.*

b) Dual Connection Setup Response and Dual Connection Setup Request

To the extent the Dual Connection Setup Response and Dual Connection Setup Request are not “request[s] . . . to change a data path” ([1d], [7e] (similar)), a POSITA would have been motivated to modify these messages to request to change the data path (and then change the data path based on these messages). Ex-1003, ¶ 276. The messages include the bearers whose data paths change. *Id.* In that scenario, the MAP, in addition to changing the DL allocation at the UE, could also release its resources for bearers (rather than wait for the Dual Connection Establishment Complete or the end marker from the core network). *Id.* A POSITA would be motivated to make this change to simplify the system and reduce the number of messages exchanged between the eNBs and the core network for the same reasons as above. *Id.* A POSITA would also have recognized that this change would not have impacted the selective handover system because cells and downlink data

path would have already changed at the UE. *Id.* A POSITA would thus have a reasonable expectation of success for the same reasons as above. *Id.*

c) Cause For Data Path Changing and Loading Status

To the extent the “second requests” above ([1d] and [7d]) do not include “a cause for data path changing” ([3b]) or “information about loading status of a cell controlled by the first eNB” ([6b] and [11b]), a POSITA would have been motivated to modify Han to include that information. Ex-1003, ¶¶ 277–278. Han discloses that the eNBs track both sets of data. *Id.*; Ex-1007, [0033]. Including that data in the second request would make the system more efficient by informing the MAP (and the core network) of the network conditions in connection with the data-path change. Ex-1003, ¶¶ 277–278. This would assist the system with subsequent handovers based on network conditions. *Id.* In addition, this approach would reduce the number of messages transmitted through the network, which increases speed and reduces the potential for error. *Id.*

A POSITA would have had a reasonable expectation of success. Ex-1003, ¶ 278. The “second requests” already include the information elements to carry this data (*e.g.*, Quality of Service profiles). *Id.*; Ex-1007, [0040]. A POSITA would thus understand that the modification would simply require taking data Han already tracks and including it in an existing message field. Ex-1003, ¶ 278. This is a small, trivial change. *Id.*

2) Independent Claims

Han renders obvious claims 1 and 7. Ex-1003, ¶ 279. Han discloses each element of these claims. To the extent Han does not disclose [1d] and [7d], it would have been obvious to modify the system for the reasons above to meet those limitations. *Id.* First, it would have been obvious to have the LAAP send the Path Switch and Suspend Request message to the MAAP over X2 instead of through the core network (over S1). *Id.* Second, it would have been obvious to modify the Dual Connection Setup Response and subsequent Dual Connection Setup Requests to include the same elements as the Path Switch and Suspect Request. *Id.* Any of these modifications would have met [1d] and [7d]. *Id.*

3) Dependent Claims

Han also renders obvious claims 2–6 and 8–11. Ex-1003, ¶ 280. Han discloses each element of these claims. To the extent Han does not disclose [3b], it would have been obvious to a POSITA to modify Han to meet that element (*e.g.*, include the dual-connection cause in a “second request”) based on the motivations above. To the extent Han does not disclose element [6b] and [11b], it would have been obvious to a POSITA to modify the system to meet that element (*e.g.*, include loading status information in a “second request” based on the motivations above.

X. SECONDARY CONSIDERATIONS

Petitioners are unaware of any evidence of secondary considerations that would support a finding of non-obviousness. *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311–12 (Fed. Cir. 2006). The asserted prior art cited herein demonstrates there is no evidence of failure by others and that the features recited in the Challenged Claims were readily available in the prior art. Ex-1003, ¶ 281. Even if secondary considerations did exist, they could not overcome the strong prima facie case of obviousness shown in this Petition. *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010). Should Patent Owner attempt to meet its burden to show secondary considerations, Petitioners reserve the right to respond.

XI. INSTITUTION IS PROPER UNDER SECTIONS 314 AND 325

Petitioners have shown that there is a reasonable likelihood of prevailing with respect to at least one Challenged Claim. Petitioners have not filed a civil action challenging the validity of the '883 patent that could bar review under Section 325. This is also the first and only petition challenging any of the '883 patent's claims, which weighs in favor of institution under *General Plastic Industrial Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 (P.T.A.B. Sept. 6, 2017). And the prior art relied upon here—Centonza and Han—were not before the Patent Office during prosecution, which further weighs in favor of institution. *Advanced Bioinc, LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469 (Paper No. 6)

(P.T.A.B. Feb. 13, 2020) (precedential) (looking to “whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office”).

The factors set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (P.T.A.B. Mar. 20, 2020) (“*Fintiv*”) (precedential) also favor institution.

The **first factor** (stay) is neutral, because Petitioners have not yet moved for a stay. *See Hulu LLC v. SITO Mobile R&D IP, LLC et al.*, IPR2021-00298, Paper 11 at 10-11 (P.T.A.B. May 19, 2021).

The **second factor** (proximity) is neutral. As the Director’s Interim Guidance explains, “[t]he PTAB will weigh this factor against exercising discretion to deny institution under *Fintiv* if the median time-to trial is around the same time or after the projected statutory deadline for the PTAB’s final written decision.” Ex-1014, 9. The Interim Guidance further explains that “[w]here the parties rely on time-to-trial statistics, the PTAB will also consider additional supporting factors such as the number of cases before the judge in the parallel litigation” *Id.*

Jury selection is scheduled to begin on July 21, 2025. Ex-1015, 1. With this Petition filed in May 2024, a final written decision may be expected by November 2025, not long after the trial date (and likely before any appealable post-trial decision). The Board has granted institution in cases where the final written decision issued a few months after the scheduled trial date when other factors favor

institution. *See Hulu*, IPR2021-00298, Paper 11 at 11-18; *see also NetNut Ltd. v. Bright Data Ltd.*, IPR2021-01492, Paper 12 at 9-16 (P.T.A.B. Mar. 21, 2022) (instituting review with trial date six months before final written decision). Those same factors are present here. In the litigation, moreover, there are multiple defendants, and there will be separate trials. The cases are only consolidated for pretrial. Ex-1016. It is reasonable to expect that all trials will not be complete or through post-trial orders before the final written decision. In these circumstances, the Board treats this factor as neutral. *See CrowdStrike, Inc. v. Open Text Inc.*, IPR2023-00556, Paper 9 at 8 (P.T.A.B. Sept. 12, 2023).

The **third factor** (investment) weighs against denial. The district court litigation is in its early stages. Fact discovery is in its infancy, and the parties have not engaged in expert discovery. Ex-1015, 3–5. The parties have not identified terms for claim construction. *Id.* Nor have there been any substantive orders in the case. The district court’s investment is, therefore, minimal. *See PEAG LLC v. Varta Microbattery GmbH*, IPR2020-01214, Paper 8 at 17 (P.T.A.B. Jan. 6, 2021).

Petitioners diligently filed this Petition after they received Patent Owner’s infringement contentions that confirmed Petitioners’ technology is at the center of the district court litigation. The Board has recognized that “it is often reasonable for a petitioner to wait to file its petition until it learns which claims are being asserted against it in the parallel proceeding.” *Fintiv*, IPR2020-00019, Paper 11 at 11. The

Board has further found a petitioner acted diligently when filing its petition approximately four months after receiving the infringement contentions, which is the approximate timeframe here (Ex-1015, 6). *See Corning Optical Communications LLC v. Dali Wireless, Inc.*, IPR2021-00762, Paper 8 at 9-10 (P.T.A.B. Oct. 31, 2021); *see also Hulu*, IPR2021-00298, Paper 11 at 13-14; *Ericsson Inc. v. Koninklijke KPN N.V.*, IPR2022-00079, Paper 9, 10-11 (P.T.A.B. May 25, 2022) (finding petitioner “very diligent” in filing two months after receiving infringement contentions); *Ericsson Inc. v. Koninklijke KPN N.V.*, IPR2022-00069, Paper 9, 11-12 (P.T.A.B. May 25, 2022) (same).

Petitioners’ diligence in filing and the district court’s minimal investment tips this factor in favor of institution. *PEAG*, IPR2020-01214, Paper 8 at 17-18.

The **fourth factor** (overlap) also weighs against denial. Petitioners hereby stipulate that, if trial is instituted, Petitioners will not pursue this IPR’s Grounds in the district court litigation. This stipulation eliminates any risk of overlapping effort and results. The Board has confirmed that such a stipulation “mitigates any concerns of duplicative efforts between the district court and the Board, as well as concerns of potentially conflicting decisions.” *See VMWare, Inc. v. Intellectual Ventures I LLC*, IPR2020-00470, Paper 13 at 20 (P.T.A.B. Aug. 18, 2020) (“Thus, we find that this factor weighs in favor of not exercising discretion to deny institution under 35 U.S.C. § 314(a).”). “Instituting trial here serves overall system efficiency and

integrity goals by not duplicating efforts and by resolving materially different patentability issues.” *Apple, Inc. v. SEVEN Networks, LLC*, IPR2020-00156, Paper 10 at 19 (P.T.A.B. June 15, 2020); *see also Sand Revolution II, LLC v. Continental Intermodal Group-Trucking LLC*, IPR2019-01393, Paper 24 at 12 (P.T.A.B. June 16, 2020). This factor, therefore, weighs against discretionary denial.

The **fifth factor** (parties) favors institution. Petitioners are either parties to the district court litigations or have sought to intervene. And if Petitioners Ericsson and Nokia’s motions to intervene are granted, a “holistic view” of the factors likewise favors institution. *See Verizon Business Network Services, Inc. v. Huawei Techs. Co.*, IPR2020-01141, Paper 12, 17 (P.T.A.B. Jan. 14, 2021); *Samsung Elecs. Co Ltd., v Dynamics Inc.*, IPR2020-00505, Paper 11, 15 (P.T.A.B. Aug. 12, 2020).

Even if the Board determines that the aforementioned factors favor denial, the Board should not discretionarily deny institution, because this Petition presents compelling merits (the **sixth factor**). *See CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 4-5 (P.T.A.B. Feb. 27, 2023) (precedential). Patent Owner acceded during prosecution that the prior art taught the message flow of the Challenged Claims—it only argued that the prior art had the wrong network components (a mix of network controllers and base stations), not eNBs. Ex.1002, 407–416. Both Centonza and Han—which were not before Patent Office—teach or suggest the claimed message functionality using eNBs. This Petition thus presents

compelling merits that plainly lead to the conclusion that at least one claim is unpatentable, and the Board should grant institution. *See CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 24, 75 (P.T.A.B. Mar. 17, 2023).

Due to Petitioners' diligence, it would be premature at the time of this Petition to argue regarding the timing of respective milestones in the proceeding versus the litigation. Thus, if Patent Owner raises § 314(a) arguments in a Preliminary Response, Petitioners respectfully request the opportunity to reply before institution, to address, e.g., the expected schedules of the co-pending cases.

XII. CONCLUSION

Petitioners request institution of IPR and cancellation of the Challenged Claims.

Date: May 31, 2024

Respectfully submitted,

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CERTIFICATION OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned **PETITION FOR INTER PARTES REVIEW** specified in 37 C.F.R. § 42.24 have 12,953 words, in compliance with the 14,000 word limit set forth in 37 C.F.R. § 42.24(b)(1). This word count was prepared using Microsoft Word 2010.

Respectfully submitted,

Date: May 31, 2024

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CERTIFICATION OF SERVICE

The undersigned hereby certifies that the above-captioned **PETITION FOR INTER PARTES REVIEW** is being served on counsel for patent owner via electronic mail and FEDERAL EXPRESS, costs prepaid, to the address of the attorney or agent of record at the USPTO: on May 31, 2024, in its entirety on the following counsel of record for Patent Owner:

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