

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROSOFT CORPORATION and AFFIRMED NETWORKS, INC.,
Petitioner,

v.

LEMKO CORPORATION,
Patent Owner.

Case IPR2023-00529
U.S. Patent No. 7,653,414

PATENT OWNER RESPONSE

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TABLE OF AUTHORITIES

	Page(s)
Cases	
<i>Alloc, Inc. v. Int’l Trade Comm’n</i> , 342 F.3d 1361 (Fed. Cir. 2003)	25, 26
<i>Amgen Inc. v. Sandoz Inc.</i> , 66 F.4th 952 (Fed. Cir. 2023)	68
<i>Apple Inc. v. Samsung Electronics Co., Ltd.</i> , 839 F.3d 1034 (Fed. Cir. 2016)	68, 77
<i>Apple, Inc. v. Ameranth, Inc.</i> , 842 F.3d 1229 (Fed. Cir. 2016)	33
<i>Chicago Bd. Options Exch., Inc. v. Int’l Sec. Exch., LLC</i> , 677 F.3d 1361 (Fed. Cir. 2012)	63
<i>Cont’l Can Co. USA, Inc. v. Monsanto Co.</i> , 948 F.2d 1264 (Fed. Cir. 1991)	67
<i>CyberSource Corp. v. Retail Decisions, Inc.</i> , 654 F.3d 1366 (Fed. Cir. 2011)	62
<i>Graham v. John Deere Co.</i> , 383 U.S. 1 (1966)	68
<i>Laitram Corp. v. Rexnord, Inc.</i> , 939 F.2d 1533 (Fed. Cir. 1991)	34
<i>Medicines Co. v. Mylan, Inc.</i> , 853 F.3d 1296 (Fed. Cir. 2017)	30, 31, 32
<i>Otsuka Pharm. Co. v. Sandoz, Inc.</i> , 678 F.3d 1280 (Fed. Cir. 2012)	44
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005)	20, 31
<i>Seachange Int’l, Inc. v. C–COR, Inc.</i> , 413 F.3d 1361 (Fed. Cir. 2005)	34

<i>Tandon Corp. v. Int’l Trade Comm’n</i> , 831 F.2d 1017 (Fed. Cir. 1987)	34
<i>Toro Co. v. White Consol. Indus., Inc.</i> , 199 F.3d 1295 (Fed. Cir. 1999)	34
<i>Transocean Offshore Deepwater Drilling, Inc. v. Maersk Contractors USA, Inc.</i> , 617 F.3d 1296 (Fed. Cir. 2010)	78
<i>Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.</i> , 699 F.3d 1340 (Fed. Cir. 2012)	67
<i>Trintec Indus., Inc. v. Top-U.S.A. Corp.</i> , 295 F.3d 1292 (Fed. Cir. 2002)	67
<i>Volvo Penta of the Ams., LLC v. Brunswick Corp.</i> , 81 F.4th 1202 (Fed. Cir. 2023)	68
<i>Vulcan Eng’g Co. v. Fata Aluminium, Inc.</i> , 278 F.3d 1366 (Fed. Cir. 2002)	77
<i>WBIP, LLC v. Kohler Co.</i> , 829 F.3d 1317 (Fed. Cir. 2016)	72

PATENT OWNER’S EXHIBIT LIST

Exhibit	Description
2001	Declaration of Todor Cooklev, Ph.D. in Support of Patent Owner’s Preliminary Response
2002	Wikimedia Commons, “File: Lucent 5ESS GSM Mobile Switching Centre.jpg” (cMay 31, 2006) https://commons.wikimedia.org/wiki/File:Lucent_5ESS_GSM_Mobile_Switching_Centre.jpg (June 27, 2023)
2003	Wikipedia, “Mobile switching centre server” https://en.wikipedia.org/wiki/Mobile_switching_centre_server (June 27, 2023)
2004	Techopedia.com, “What is a Base Station Controller?” (Oct. 19, 2011) https://www.techopedia.com/definition/24191/base-station-controller-bsc
2005	Metin UZAR Blog Post, “Base Station Controller (BSC)” (Sept. 19, 2009) https://razunitem.wordpress.com/2009/09/19/base-station-controllerbsc/
2006	Image of Motorola BSC https://monsite.woopic.com/383/p/Telecommunications/img/684d91850fe954cc28a1cf8fce498804.jpg (June 28, 2023)
2007	Electronics-notes.com, “Cellular / Mobile Backhaul” https://www.electronics-notes.com/articles/connectivity/cellular-mobile-phone/mobile-communications-backhaul-link.php (June 28, 2023)
2008	Network Functions Virtualisation - Introductory White Paper (Oct. 2012) https://portal.etsi.org/NFV/NFV_White_Paper.pdf
2009	Dyton, J., “Lemko solutions keep connectivity alive regardless of the circumstances” (July 16, 2020) https://connectedremag.com/das-in-building-wireless/wireless/lemko-solutions-keep-connectivity-alive-regardless-of-the-circumstances/

Exhibit	Description
2010	Lemko.com, distributed Mobile Architecture (dMA) Overview lemko.com/htm/distributed_mesh_architecture.htm (June 28, 2023)
2011	Lemko.com, Lemko’s Fundamental Architecture https://www.lemkocorp.com/solutions/ (June 5, 2023)
2012	The Wayback Machine - InterWAVE, GSM/GPRS Products https://web.archive.org/web/20031204132701/http://iww.com/gsm_products.html#nib (captured Dec. 4, 2003)
2013	InterWAVE, WAVEXpress GSM Network In-A-Box (NIB) Datasheet (June 2003) https://mirror.unpad.ac.id/orari/library/library-ref-eng/ref-eng-2/physical/wireless/trend-gsm/microgsm/nib_may_03.pdf
2014	InterWAVE, WAVEXchange II Datasheet (Oct. 2002) https://ftp.unpad.ac.id/orari/library/library-ref-eng/ref-eng-2/physical/wireless/trend-gsm/microgsm/wxc_2_oct_02.pdf
2015	Microsoft Computer Dictionary, Page 68 (5th ed. 2002), definition for “distributed network”
2016	Merriam-Webster Dictionary, definition for “distributed” (June 27, 2023)
2017	RESERVED
2018	RESERVED
2019	RESERVED
2020	RESERVED
2021	Declaration of Todor Cooklev, Ph.D., in Support of Patent Owner’s Response
2022	“Overview of GSM, GPRS, and UMTS,” (Dec. 31, 2002) https://docstore.mik.ua/univercd/cc/td/doc/product/wireless/moblwrsls/cm x/mmg_sg/cmxcsm.htm

Exhibit	Description
2023	Declaration of Shaowei Pan in Support of Patent Owner’s Response
2024	“The Evolution of Mobile Technologies: 1G, 2G, 3G, 4G LTE,” Qualcomm, June 2014
2025	Lin, Yi-Bing, et al., “General Packet Radio Service (GPRS): architecture, interfaces, and deployment,” John Wiley & Sons, Ltd., 2001
2026	Transcript for deposition of James Proctor, <i>Microsoft Corp. and Affirmed Networks, Inc. v. Lemko Corp.</i> , No. IPR2023-00529, taken on December 6, 2023
2027	RESERVED
2028	Silicon Press, Home Location Register (HLR) Technology Brief
2029	3GPP TS 23.002 V.7.1.0 (2006-03), dated 2006
2030	Excerpts from Tanenbaum, Andrew S. et al., Computer Networks (5th ed. 2011)
2031	Wikipedia – network switching subsystem, available at https://en.wikipedia.org/wiki/Network_switching_subsystem
2032	GPRS Architecture Presentation – GSM 03.60
2033	Bryan, D., et al., Request for Comments (RFC) 7890 (June 2016)
2034	Telecommwriting.com article about GSM –Nokia Diagram, available at https://web.archive.org/web/20020607002117/http://privateline.com/PCS/GSMNokia.html
2035	Nokia GSM Architecture Training Document (Jan. 2002) https://dokumen.pub/nokia-gsm-architecture-training-document.html
2036	RADIUS – Wikipedia https://en.wikipedia.org/wiki/RADIUS

Exhibit	Description
2037	Lemko Node User’s Manuals, “Lemko DMA Provisioning Guide, Release 7.0,” dated December 17, 2012 [FILED UNDER SEAL]
2038	DPR register data [FILED UNDER SEAL]
2039	“Lemko Corporation Announces Node1 4G Core Network Solution,” Lemko Corporation, dated March 24, 2009, https://www.lemkocorp.com/lemko-corporation-announces-node1-4g-core-network-solution/
2040	Bala, P., et al., “Potential Users Profile and Existing Communication Pattern among the Rural Community of Bario: A Need Analysis for the Development of a Telecentre”
2041	Wayback Machine webpage – EAP-SIM Authentication with a RADIUS Server, archived April 2007 https://web.archive.org/web/20070430144743/https://www.interlinknetworks.com/app_notes/eap-sim.htm
2042	Brewer, Eric, et al. - The Case for technology in Developing Regions, June 1, 2005
2043	Email between Lemko and AT&T, dated September 26, 2013
2044	Email between Lemko and AT&T, dated September 13, 2013
2045	“Lemko Congratulates TelAlaska for 11 Years of Continued Operations,” Lemko Corporation, dated August 3, 2020, https://www.lemkocorp.com/lemko-congratulates-telalaska-cellular-for-11-years-of-continued-operations/
2046	“Lemko Congratulates Kuhkenah Network (K-NET) for 12 years of Continued Operations,” Lemko Corporation, dated Aug. 5, 2020, https://www.lemkocorp.com/lemko-congratulates-kuhkenah-network-k-net-for-12-years-of-continued-operations/

Exhibit	Description
2047	“Lemko Congratulates ADAK Eagle Enterprise for 10 years of Continued Cellular Operations,” Lemko Corporation, dated Aug. 5, 2020, https://www.lemkocorp.com/lemko-congratulates-adak-eagle-enterprise-for-10-years-of-continued-cellular-operations/
2048	“Lemko Congratulates Bristol Bay Cellular Partnership for 15 Years of Continued Operation,” Lemko Corporation, dated Aug. 3, 2020, https://www.lemkocorp.com/lemko-congratulates-bristol-bay-cellular-partnership-for-15-years-of-continued-operation/
2049	“TelAlaska Deploys Lemko’s Node1 System,” Lemko Corporation, dated Aug. 18, 2009, https://www.lemkocorp.com/telalaska-deploys-lemkos-node1-system
2050	“K-Net Provides Cellular Service with Lemko’s Node1,” Lemko Corporation, dated July 21, 2009, https://www.lemkocorp.com/k-net-provides-cellular-service-with-lemkos-node1/
2051	“Global Internet Limited and Tazca Connects Deploy 4G LTE-as-a-Service in Malawi’s Capitol Lilongwe,” Lemko Corporation, dated March 24, 2015, https://www.lemkocorp.com/globe-internet-limited-and-tazca-connects-deploy-4g-lte-as-a-service-in-malawis-capital-lilongwe/
2052	“Glocall Telecoms, LLC and Tazca Connects Partner to Deploy 4G LTE in Mogadishu, Somalia,” Lemko Corporation, dated March 18, 2014, https://www.lemkocorp.com/glocall-telecoms-llc-and-tazca-connects-partner-to-deploy-4g-lte-in-mogadishu-somalia/
2053	Microsoft Corp. v. Lemko Corp., No. IPR2023-00530, Decision Denying Institution, Paper 8 (P.T.A.B. Sept. 25, 2023)
2054	Default Protective Order

I. INTRODUCTION

Lemko's novel distributed mobile architecture ("DMA") introduced a new paradigm for mobile communications networks that was a clear departure from the conventional, hierarchical network architectures that dominated the industry. Conventional hierarchical networks, such as those in the Mauer (Ex. 1005) and Waylett (Ex. 1006) references, are based on a centralized hub, such as a mobile switching center (MSC) or Serving GPRS Support Node (SGSN), that routes all calls. In contrast, Lemko's claimed decentralized architecture is based on a network of DMA systems that are connected through peer-to-peer IP connections (instead of through fixed backhaul connections) and that are capable of routing calls to other DMA systems (instead of depending on a centralized MSC to route all calls). Lemko's inventive mobile architecture, with routing functionality distributed among the DMA systems, enables cellular network coverage to be expanded easily and inexpensively, even in rural communities where the cost of backhaul to an MSC is particularly burdensome.

To implement its DMA architecture, Lemko solved technical problems related to routing calls in a distributed environment, which are covered by important limitations in Lemko's U.S. Patent No. 7,653,414 (Ex. 1001, the "'414 Patent"). For example, the '414 Patent introduces the concept of a community location register (CLR), which is stored in each DMA system of a DMA network and contains

information about mobile subscribers of other peer DMA systems. That information can be used during call routing to determine, for example, whether a mobile subscriber is located within a wireless coverage area of a peer (second) DMA system. The '414 Patent also introduces the concept of a destination preference register (DPR), which solves the interoperability problem of routing a call destined outside the wireless coverage areas of the entire DMA network of DMA systems.

The Challenged Claims of the '414 Patent (Claims 1-8, 11-16, and 21) are not rendered obvious by the combination of Waylett and Mauer. Waylett's "network-in-a-box" ("NIB") is not a DMA system and plays no role in anything resembling the '414 Patent's decentralized "distributed mobile architecture." While the NIB packages several components of a then-conventional communications network installation into a single enclosure, it connects to (and operates within) an existing network in the same way as a typical network installation. It does not use direct connections to carry calls or join with other NIBs to form anything resembling a distributed mobile architecture ("DMA") network.

Mauer's dual-mode mobile phone, which can connect to a cellular wireless wide area network (WWAN) and a wireless local area network (WLAN), does not cure Waylett's deficiencies because neither of these conventional systems discloses anything resembling a DMA system or a DMA network. Additionally, because the concept of a DMA is missing from Waylett and Mauer, the asserted references

naturally fail to disclose aspects of the Challenged Claims that only make sense in the context of the DMA, such as the claimed “destination preference register” and “community location register.” These limitations enable distributed routing but are not needed, used, or known in Waylett and Mauer.

The nonobviousness of the Challenged Claims is further confirmed by secondary considerations of nonobviousness. For example, industry insiders praised Lemko’s inventions, which solved long-felt needs and obtained commercial success. Thus, the Challenged Claims should be confirmed to be patentable.

II. THE ’414 PATENT IS BASED ON LEMKO’S NEW DISTRIBUTED MOBILE ARCHITECTURE

A. Conventional Network Architectures Were Based on a Hierarchical, Specialized-Hardware Paradigm

A cellular network is a network distributed over areas of land, referred to as cells. Ex. 2029, 14. At least one transceiver, commonly referred to as a “base transceiver station,” or “BTS,” provides network coverage for user equipment (“UE”) within each cell. *Id.*, 24.

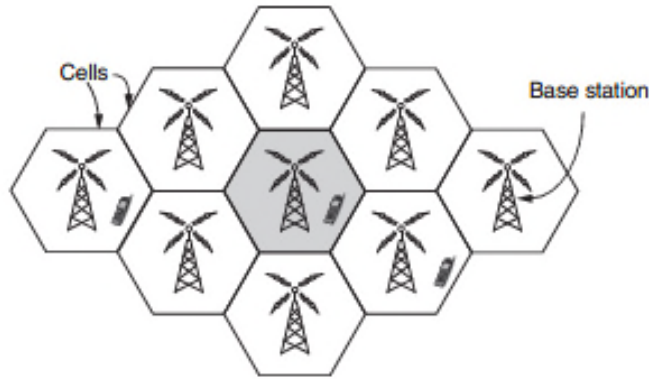


Figure 1-30. Cellular design of mobile phone networks.

Ex. 2030 (Tanenbaum 5th Ed., 66). Multiple BTSs connect to a single Base Station Controller (“BSC”), and multiple BSCs connect to a single mobile switching center (“MSC”). ’414 Patent, 1:34-47.

In order to build wireless wide area networks (WWANs) using this technology, carriers like Verizon® and AT&T® established multiple MSCs and built out the BSCs and BTSs necessary to cover a new geographic area. Ex. 2030 (Tanenbaum 5th Ed., 168). The geographic area covered by these WWANs span entire nations or continents:

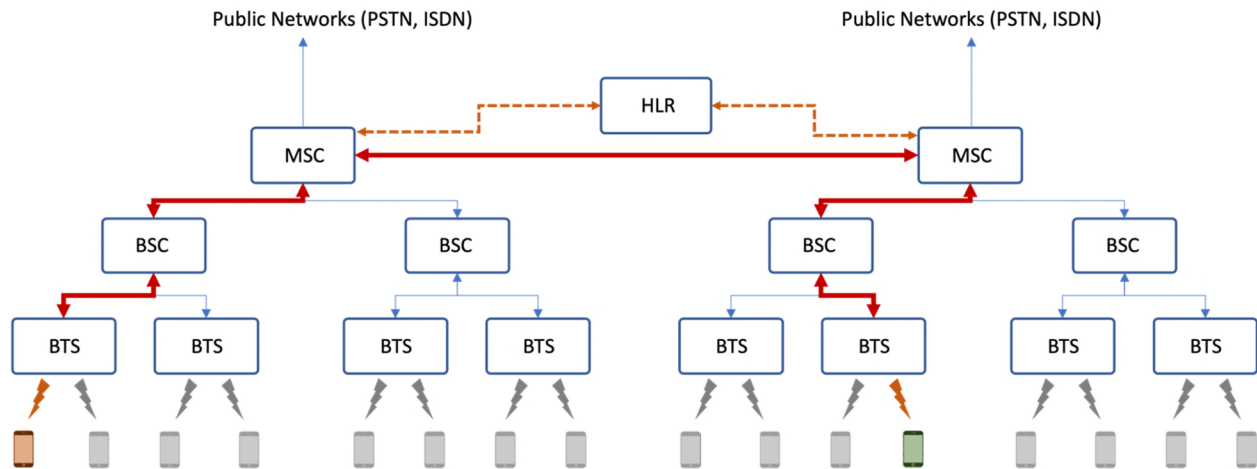
Interprocessor distance	Processors located in same	Example
1 m	Square meter	Personal area network
10 m	Room	
100 m	Building	Local area network
1 km	Campus	
10 km	City	Metropolitan area network
100 km	Country	Wide area network
1000 km	Continent	
10,000 km	Planet	The Internet

Figure 1-6. Classification of interconnected processors by scale.

Ex. 2030 (Tanenbaum 5th Ed., 18).

In these conventional cellular WWANs, each BTS is connected to one and only one BSC. Ex. 2021 (“Declaration of Todor Cooklev, Ph.D. in Support of Patent Owner’s Response, “Cooklev Decl.”), ¶¶31-33. BTSs do not have any ability to route calls, other than to connect to the single BSC. *Id.* Each BSC is connected to one and only one MSC. *Id.* BSCs do not have any ability to route calls beyond forwarding them to the single MSC. *Id.* Expensive backhaul connections connect BSCs to MSCs.¹

¹ Backhaul connections use T1/E1 communication lines. Ex. 2007, 2 (“E1/T1 systems were widely used in telecommunications when 2G technologies including GSM were being rolled out”).



Cooklev Decl., ¶33 (citing Ex. 2022, 4-5).

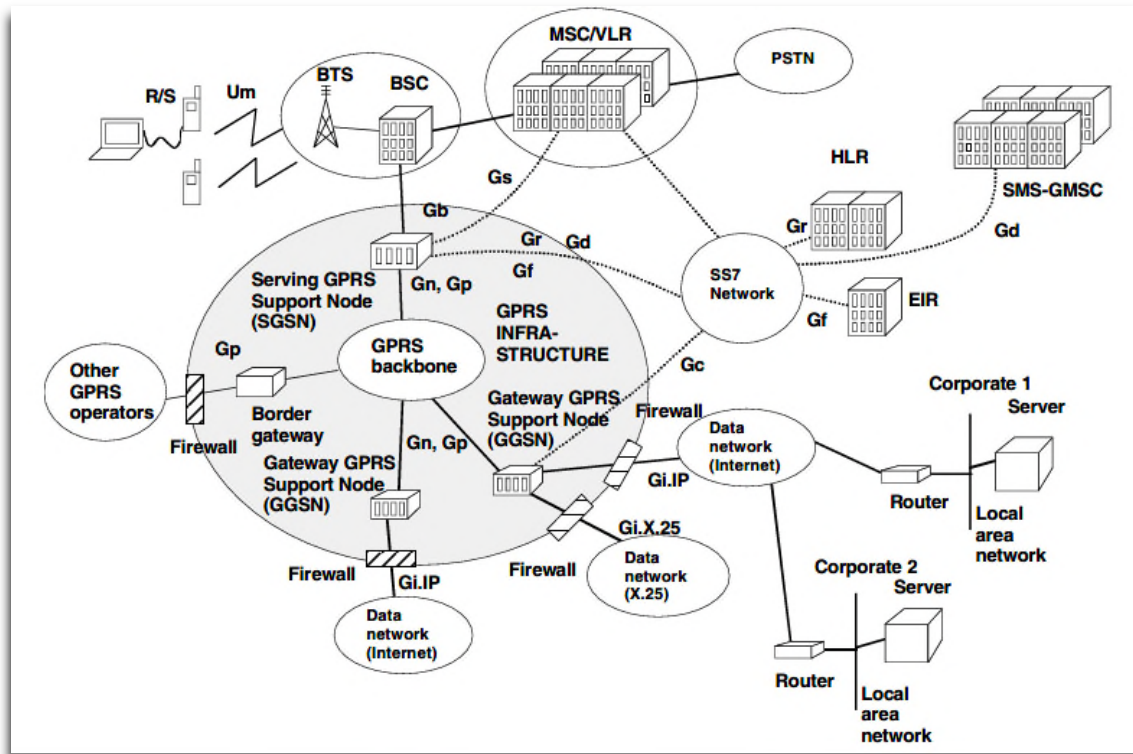
Centralized MSCs authenticate callers and route calls to other users (referred to as “UEs” by convention). Cooklev Decl., ¶34; Ex. 2031. When a user (UE shown in orange on the left in the illustration above) wishes to call another user (UE shown in green on the right), the call is routed from a BTS (left) to a BSC (left) to an MSC (left). Cooklev Decl., ¶34. The MSC polls the carrier’s home location register (HLR) and visitor location register (VLR) to determine whether the UE is registered with the MSC’s network or whether the UE is visiting (roaming). *Id.* After authenticating the UE, the MSC routes the call to another MSC (if the party being called is another mobile user) or to a public telephony network, like the PSTN. *Id.*; Ex. 2029, 20-22.

MSCs are large installations housed at server centers, and depend on network-card based hardware:



Ex. 2003; Ex. 2002, 1-3; Ex. 2032, 3 (depicting MSC).

The first generation (1G) of cellular network technologies, released between the late 1970s and early 1980s, carried only analog telephony signals. Ex. 2024, 5, 9; Ex. 2030 (Tanenbaum 5th ed., 166-170). These analog systems were soon replaced by second generation (2G) digital telecommunications networks, which introduced limited data services, like SMS text messaging via a packet-switched “general purpose radio service” (“GPRS”) by SGSN (Serving GPRS Support Node) and GGSN (Gateway GPRS Support Node). Ex. 2024, 5, 9, 13; Ex. 2030 (Tanenbaum 5th ed., 170-174). While voice phone calls were routed between MSCs over circuit-switched networks to ensure lag-free voice calls, data signals were routed via the SGSN-GGSN to packet-switched networks, like the Internet. Ex. 2029, 13; Ex. 2030, Tanenbaum 5th Ed., 67-68.



Ex. 2032, 3 (showing routing of voice and data calls).

In the GPRS, a Serving GPRS Support Node (“SGSN”) performs the role of the MSC. Ex. 2025, 6. Like the MSC, the SGSN receives data from BSCs and routes it, with the help of a Gateway GPRS Support Node (“GGSN”), to the appropriate recipient within the IP network. Ex. 2025, 1-2, 5-6, 13. The SGSN is also responsible for keeping track of which UEs are registered to which BSCs (or Node Bs). *Id.*

Expanding cellular network coverage using this hierarchal hub-and-spoke network architecture was very expensive, due in large part to the cost of installing an MSC and connecting new spokes (BTSs/Node Bs) and BSCs/RNCs to a hub (the MSC or GGSN) over backhaul connections. Cooklev Decl., ¶¶35-38.

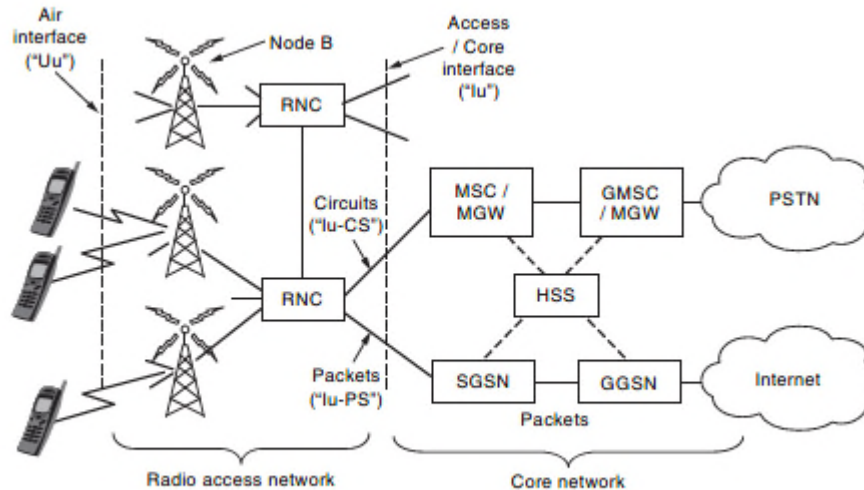


Figure 1-31. Architecture of the UMTS 3G mobile phone network.

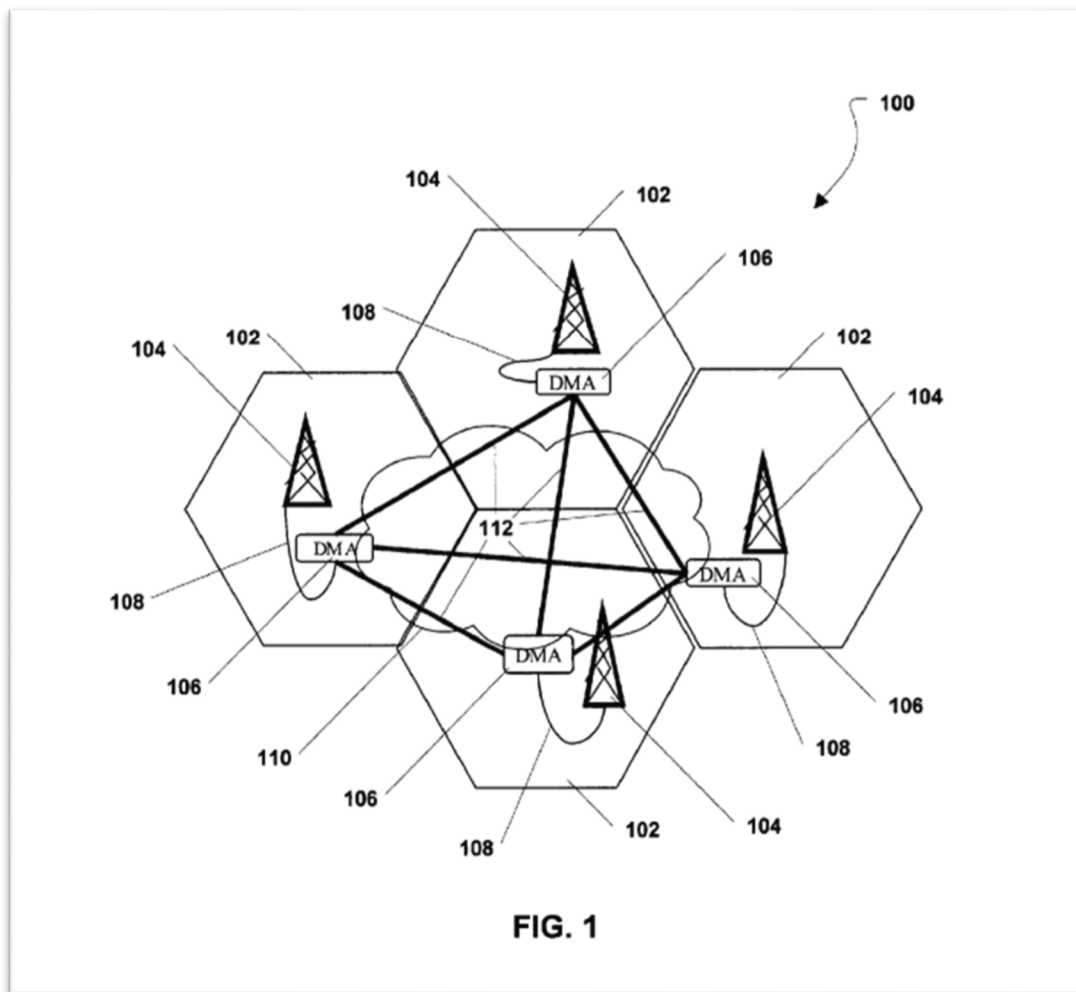
Ex. 2030 (Tanenbaum 5th ed., 67). Consequently, telecom companies were slow to expand cellular network service to rural areas, which could not muster the user base necessary to justify the expense of building new cell towers, installing BSCs, and connecting those BSCs to MSCs or SGSNs or GGSNs over expensive backhaul connections. Cooklev Decl., ¶38 (citing '414 Patent, 1:37-51).

B. Lemko's Claimed Distributed Mobile Architecture (DMA) Introduced a New Distributed Cellular Network Architecture

The '414 Patent discloses and claims a distributed mobile architecture ("DMA"). "Within the distributed and associative communications system 100, the "controlling logic can be distributed and de-centralized." '414 Patent, 4:45-47, 17:47-49. Rather than one centralized MSC controlling routing for a set of BTSs (via intermediary BSCs), the MSC and BSC controlling logic is distributed to each

node of the DMA, which are called “DMA systems” or “DMA servers” and together form a “DMA network.” *Id.*, 7:56-59.

Distributing the routing functionality to the DMA systems eliminates the need to carry every call over an expensive backhaul connection to a centralized MSC for switching and routing. Instead, when calls are made between UEs located within the same DMA network, calls are routed directly between DMA systems via peer-to-peer connections:



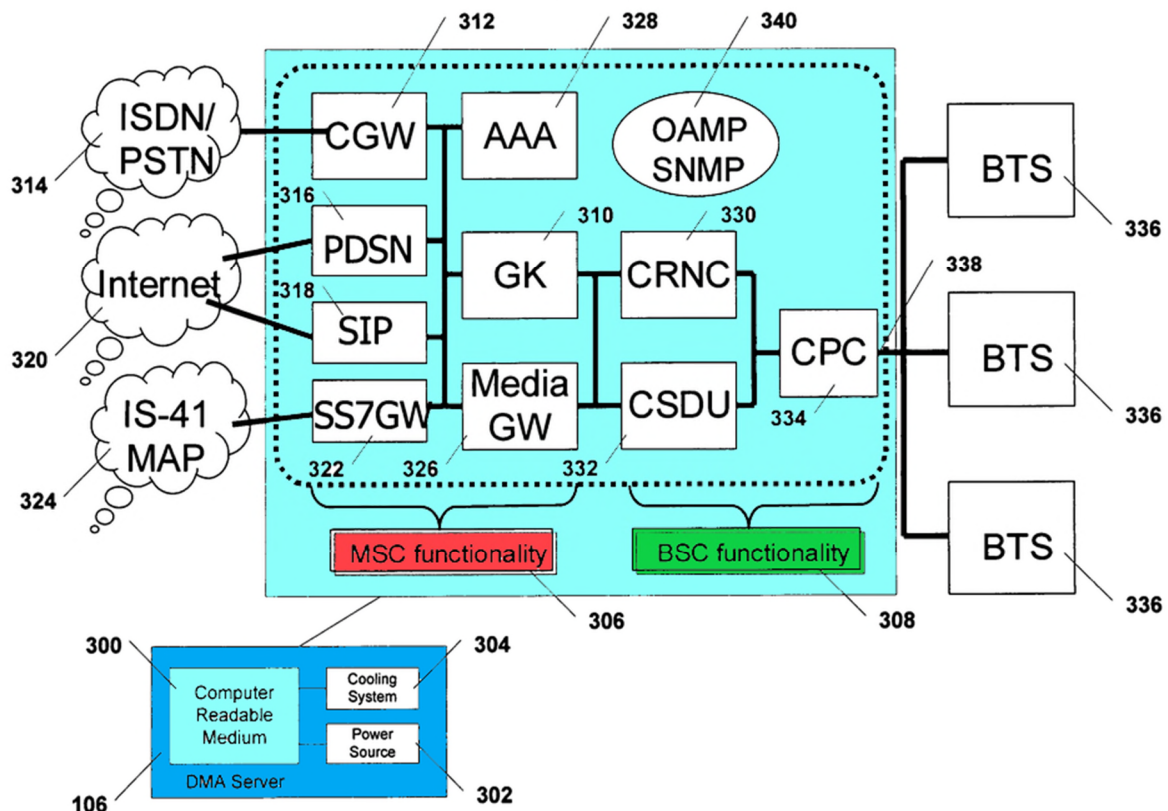
'414 Patent, Fig. 1, 4:29-44 (with reference to Figure 1 describing that “each DMA 106 is interconnected with the other DMAS 106 via an Internet protocol network 110” and therefore “there exists a peer-to-peer connection 112 between each DMA 106 in the system 100.”); Cooklev Decl., ¶¶39-40.

The use of these peer-to-peer IP network connections between DMA systems 106 in the same DMA network 100 eliminates or reduces the need to route traffic through a backhaul to a centralized device like an MSC or SGSN. Instead, in the claimed DMA network, and in contrast to the conventional network architectures discussed in the previous section, a call from a first UE to a second UE is routed (1) from the BTS that provides wireless coverage to the first UE, (2) to a DMA system, (3) to a second DMA system (by a peer-to-peer IP connection), (4) to the BTS that provides wireless coverage to the second UE, (5) to the receiving UE. Cooklev Decl., ¶41 (citing '414 Patent, 5:41-54, 12:15-31), ¶¶61-66.

Because the DMA systems route calls between each other, the distributed mobile architecture reduces the need for expensive centralized hubs and the expensive backhaul connections necessary to connect to those hubs. Ex. 2010, 1 (“The heart of DMA is an all-IP software solution that contains infrastructure for cellular service” that eliminates a “center or hub”). The DMA systems route calls amongst themselves via peer-to-peer connections within a private IP network (a virtualized DMA network 110). '414 Patent, 4:38-40, 10:44-46, 16:55-57.

Expanding the DMA network only requires connecting a new DMA system to the existing peer-to-peer IP network and connecting the new DMA system to a BTS. *Id.*, 4:15-44, 4:58-60.

To enable this decentralized architecture, the '414 Patent teaches implementing the functionality conventionally provided at the MSC and BSC in software located at the DMA systems. *Id.*, 6:20-23, 7:60-8:2; Cooklev Decl., ¶¶42, 43. The DMA servers include a computer-readable medium (blue) storing an MSC module (red) and a BSC module (green):



'414 Patent, Figs. 3 (annotated), 13, 15, and 18-20 (depicting DMA server).

The DMA systems are connected to BTSs that provide cellular service to UEs in the area. *Id.*, 4:28-35, Fig. 1. Each DMA server has its own MSC and BSC functionality, including gateways and a cellular radio network controller (CRNC), to allow for a fully functionally virtualized network. Cooklev Decl., ¶44 (citing Ex. 2009; Ex. 2010).

To enable seamless handoff of a UE between DMA systems in the same peer-to-peer DMA network, the '414 Patent teaches that the home location register ("HLR") and visitor location register ("VLR") are fully distributed among the DMA servers in the DMA network, in contrast to traditional HLRs (which serve many MSCs) and VLRs (stored locally at each MSC). '414 Patent, 4:53-56. The '414 Patent's HLR stores information about the UEs registered with that DMA network, including the identity of the DMA servers serving the device. '414 Patent, 8:45-52, Fig. 5; 8:41-9:37. The VLR stores the same information about UEs that are roaming. *Id.*; Ex. 2028.

The '414 Patent leverages this flexible and unconventional architecture in multiple ways. For example, calls between two UEs that are subscribed to the same DMA Network are routed without any need to traverse expensive backhaul connections or conventional networks. '414 Patent, 5:37-54. Each DMA system's HLR stores information about the mobile subscribers registered with that DMA system. *Id.*, 9:38-42; 10:21-23, 10:35-39. If the two UEs are registered to the same

DMA system, (e.g., DMA System 202), as reflected in the DMA system's HLR, calls are routed locally via the DMA system. *Id.*

If two UEs are registered to different DMA systems (e.g., DMA system 202 and 204) of the same DMA network, as reflected in the DMA systems' Community Location Registers ("CLRs"), calls are routed directly between the DMA systems. *Id.*, 5:41-54. The CLR at each DMA system stores information about mobile subscribers registered with another DMA system within the DMA network. *Id.*, 3:28-35. Each DMA system may include more than one CLR, each corresponding to the HLR of another DMA system in the DMA network. *Id.*, 8:3-29.

When a mobile subscriber is roaming and enters the coverage area of a new DMA system (*i.e.* a DMA system that it is not subscribed to), it temporarily registers with the DMA system. *Id.*, 5:55-59. Information about the roaming subscriber is stored in the DMA system's Visitor Location Register ("VLR"). *Id.*, 3:36-40. The DMA system then provides the roaming subscriber's information to the other DMA systems within the DMA network, which store the information in those DMA systems' CLRs. *Id.*, 5:59-61. This technique enables calls to be routed to the roaming subscriber over the DMA network. *Id.*

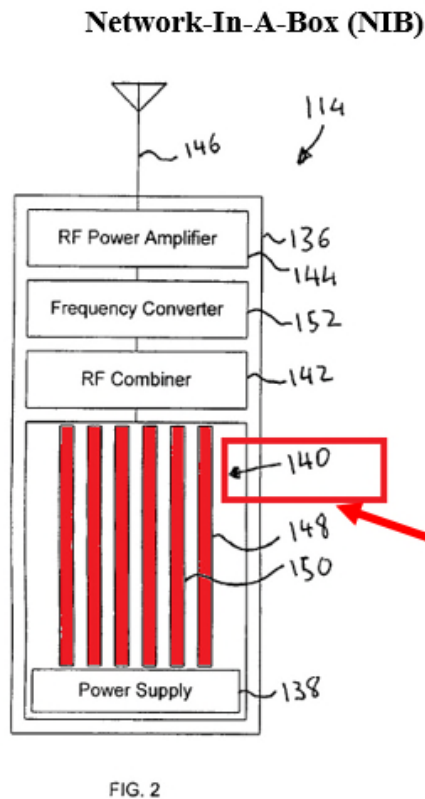
When a mobile subscriber subscribed to a DMA system of a DMA network calls a destination outside of the DMA network, the DMA system consults a Destination Preference Register ("DPR"). *Id.*, 8:30-36. Figure 2 of the '414 Patent

illustrates a DMA network having DMA systems, which each have their own separate interface to outside of the DMA network. '414 Patent, Fig. 2, 5:3-20 (describing one DMA system having an MSC interface, another DMA system having a VoIP interface, and another DMA system having an ISDN interface). When a call from a mobile subscriber is made to a destination outside of the DMA network, the peer-to-peer nature of the DMA network makes available (i.e., shares) all of these interfaces for routing the call outside. *Id.*, 5:62-6:4. Thus, the peer-to-peer aspect of the DMA network avoids the need for each DMA to have multiple interfaces to external networks (e.g., multiple MSC interfaces, multiple ISDN interfaces). The “destination preference register” (DPR) provides a preferred hierarchy of interfaces to make calls external to the DMA network. *Id.*, 5:65-67; Cooklev Decl., ¶¶45-49.

III. THE ASSERTED REFERENCES ARE BASED ON THE CONVENTIONAL NETWORK APPROACH

A. Waylett’s Network-in-a-Box is Based on the Conventional Network Appliance Approach

Waylett discloses a network-in-a-box (NIB), such as the WAVEXpress NIB platform (reproduced below), that located certain hardware-based components in a single enclosure. Ex. 1006, 8:7-17, 9:36-42 (explaining that embodiments are based on WAVEXpress’s NIB platform). Waylett relies on hardware-based network cards 140 (highlighted in red below):



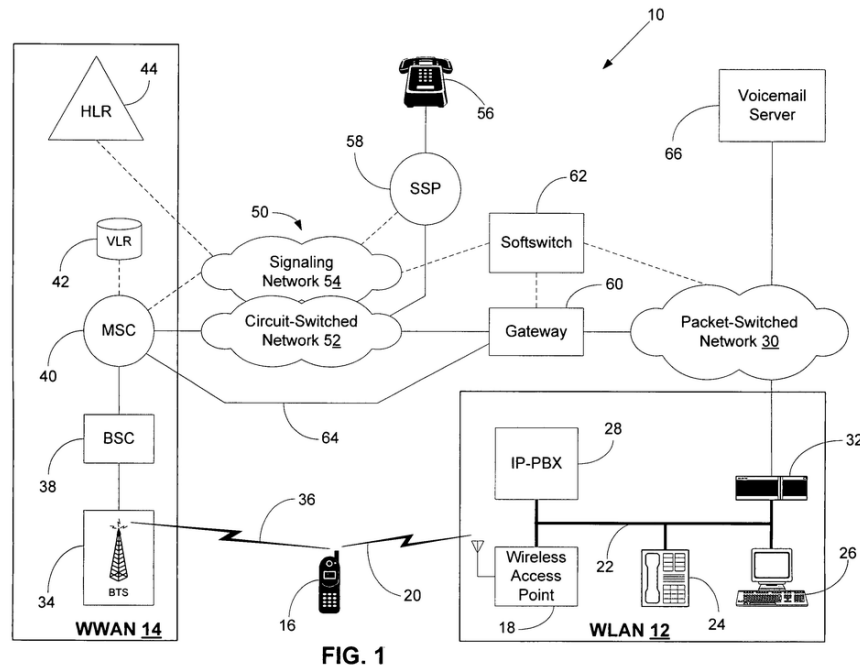
Cooklev Decl., ¶71; Ex. 1006, Fig. 2 (annotated), 8:7-36 (disclosing that NIB includes network cards), 9:32-46.

Waylett does not teach or suggest connecting NIBs through peer-to-peer connections. Instead, Waylett's NIBs transfer call data to an MSC via a BSC using the standard backhaul circuit-switch T1/E1 communication lines. Ex. 2013, 1 (disclosing that NIB communicates over E1, T1, or Ethernet), Ex. 2014, 1 (NIB has up to 256 E1 ports); Cooklev Decl., ¶72. In other words, Waylett's NIBs are installed as adjuncts to existing conventional networks and connect to those

networks using the same standard interfaces. Ex. 2026 (Proctor Tr.), 45:21-46:20, 48:1-5; Cooklev Decl., ¶¶72, 93.

B. Mauer’s WWAN and WLAN Use Conventional Cellular and Wireless Networks

Mauer discloses a cellphone that can communicate over two different types of existing wireless networks. Ex. 1005, 1:32-58. This so-called “multi-mode” cellphone “may have one interface for communication with a WWAN, using a wireless access technology such as CDMA, and another interface for communication with a WLAN, using a wireless access technology such as IEEE 802.11.” *Id.*, 1:36-40. Figure 1 of Mauer (reproduced below) illustrates the typical network environment of its multi-mode cellphone, having one type of wireless network (e.g., a cellular network, or “WWAN 14”) and a different type of wireless network (e.g., a Wi-Fi network, or “WLAN 12”). *Id.*, 4:35-53; Paper 3 (“Pet.”), 9-10.



Ex. 1005, Fig. 1.

The wireless networks in Mauer are conventional, hierarchical networks. Mauer's WWAN 14 is a conventional cellular network having BTSs, MSCs, BSCs, an HLR, and VLR hardware appliances, where all calls are routed from a BTS to a BSC to an MSC. Ex. 1005, 5:65-6:44. Mauer's WLAN 12 is a conventional wireless local area network providing wireless coverage over a limited area, like a single building, where connectivity is provided by one wireless access point 18. *Id.*, 5:11-15. These WWAN and WLAN networks lack peer-to-peer connections between each other and/or other networks, such as the PSTN. Instead, Mauer discloses interconnecting these disparate circuit-switched (52) and packet-switched networks (30) with a gateway (60). *Id.*, 7:9-12. Mauer does not disclose or suggest establishing peer-to-peer IP connections between anything resembling DMA

systems within a mobile network, as recited in the Challenged Claims of the '414 Patent. Cooklev Decl., ¶¶73-74.

IV. LEVEL OF ORDINARY SKILL IN THE ART

In the Institution Decision, the Board adopted Petitioners' definition of a person of ordinary skill in the art ("POSITA") as "a person with a degree in computer science, electrical or computer engineering, physics, or a similar discipline" and "at least two years of relevant experience, including, for example, work related to telecommunications work." DI, 11-12. Lemko applies this definition in this Response. Cooklev Decl., ¶¶18-22.

V. CLAIM CONSTRUCTION: DISTRIBUTED MOBILE ARCHITECTURE

Consistent with the intrinsic record, the term "distributed mobile architecture (DMA)" should be construed as:

a network architecture where DMA systems have distributed call-routing functionality and are connected with other DMA systems through peer-to-peer connections (i.e., without connecting through a hierarchical network hub architecture).

Cooklev Decl., ¶¶52-54. This construction is dispositive, as Mauer and Waylett do not satisfy these requirements.²

A. “Distributed Mobile Architecture (DMA)” is Distributed with Call-Routing Functionality Located on DMA Systems

The term “distributed mobile architecture (DMA)” should be construed consistent with the plain meaning of its words, which require a mobile architecture with distributed functionality, instead of centralized functionality and hierarchal organization. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005) (“The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction”) (citation omitted). Rather than routing calls from individual nodes (BTS/Node B) through centralized hubs (MSCs/SGSNs), the distributed mobile architecture distributes the task of routing calls among each node (DMA system) of the DMA network. Cooklev Decl., ¶55. The Board did not address this issue in its preliminary

² This construction is consistent with the one Lemko proposes for the same term in unrelated but co-pending IPR2023-00531, concerning Lemko’s U.S. Patent No. 7,855,988. The proposed construction in that case includes a further limitation that the DMA not be a legacy communications network, based on additional statements in that patent’s specification and claims. That additional limitation is not relevant to the grounds asserted in this IPR.

consideration of the meaning of the term distributed mobile architecture. DI, 14-15, 27-29.

Distributed systems differ from traditional computer networks in that “a collection of independent computers appears to its users as a single coherent system.” Ex. 2030 (Tanenbaum, 2). Consistent with this understanding, the ’414 Patent consistently uses the term “distributed mobile architecture” to refer to a mobile communications architecture where routing functionality and the information necessary to route calls are distributed among the multiple DMA systems of a DMA network. ’414 Patent, 4:45:47 (“Within the distributed and associative telecommunications system 400 the controlling logic can be ***distributed and decentralized.***”).³ Accordingly, DMA servers that form a DMA network appear as a “single coherent system” to any UE interacting with the network. Cooklev Decl., ¶56.

It is this distributed nature of the DMA network that allows DMA systems to seamlessly route messages among one another without having to traverse a centralized switching hub, like an MSC or SGSN:

As illustrated in FIG. 1, ***each DMA 106 is interconnected with the other DMAs 106 via an Internet protocol network 110.*** As such, there exists a peer-to-peer connection 112 between each DMA 106 in the system 100. The DMAs 106 can handle

³ All emphasis is added.

telephony traffic that is communicated at each antenna 104. For example, *the DMAs 106 can switch and route calls received via each antenna 104*. Additionally, *the DMAs 106 can hand-off calls to each other as mobile communication devices move around and between the cellular coverage sites 102*. The DMAs 106 can communicate with each other via the IP network 110 and can further transmit calls to each other via the IP network 110.

'414 Patent, 4:28-40, 17:47-49 (“control logic within the DMAs can be distributed and associated”), 10:44-46 (describing DMA systems “linked to each other via an IP network”), 16:55-57 (discussing a “peer-to-peer connection is established”), 4:58-60 (discussing how a new DMA system and its coverage can be “easily added to the system”), 6:20-23 (discussing implementing functionality including call routing in software located at the DMA systems), 7:60-8:2 (same), 4:53-56 (describing the HLR and VLR are “distributed equally and fully among all the DMAs”), 5:37-54 (discussing routing a call between two UEs between different DMA systems in the same DMA network locally without the need to traverse expensive backhaul connections), 5:62-6:4 (discussing routing calls to a mobile subscriber outside of the DMA network by making available an interface from a peer DMA system). Cooklev Decl., ¶57.

Driving home the distinction between the claimed DMA and conventional, hierarchal network topologies is that the DMA network is self-healing and

redundant, which depends on its distributed architecture that allows individual DMA systems to make routing decisions:

Moreover, the wireless coverage provided by the disclosed system 100 is self-healing and redundant. In other words, due to the interconnectivity via the IP network 110, if one or more of the DMAs 106 loses power, fails, or is otherwise inoperable, telephony traffic handled by the inoperable DMA 106 can be re-routed to one of the remaining operable DMAs 106. Additionally, user data stored in a database, e.g., a home locator resource (HLR) or a visitor locator resource (VLR), can be distributed equally and fully among all of the DMAs 106. It can also be appreciated that new cellular coverage sites can be easily added to the system 100 as the demand for users increases. Specifically, a DMA can be deployed, connected to an antenna, connected to the IP network, and activated to provide cellular coverage in a new area.

'414 Patent, 4:47-60. The distributed nature of the DMA means that there are no centralized points of vulnerability as there are in conventional hierarchal networks. Cooklev Decl., ¶58 (citing Ex. 2030, Tanenbaum, 55, '414 Patent, 17:53-55). The distributed mobile architecture, therefore, is distributed because it has no center or hub (like a centralized MSC or SGSN) and because each DMA system routes calls directly to other DMA systems in the DMA network. Cooklev Decl., ¶58 (citing '414 Patent, 4:14-47, 6:20-37; Ex. 2010; Ex. 2009), ¶¶41-42.

Petitioners' expert agreed that the use of "distributed" requires that functionality be distributed among the DMA systems. Proctor Tr., 74:3-22 (testifying that under a plain and ordinary meaning of "distributed mobile architecture" in light of the specification, "distributed" means that "there needs to be functionality distributed"), 71:22-72:4 ("Mobile architecture ... has got to be an architecture that addresses mobile devices" and "distributed means that something has got to be in multiple places"). This further confirms that "distributed mobile architecture" requires a network of DMA systems that distribute the call-routing functionality of the DMA network.

B. Each "DMA System" is Connected to Other DMA Systems Through Peer-to-Peer Connections

Because the distributed mobile architecture (DMA) is a distributed and decentralized architecture with call-routing functionality distributed to the DMA systems, each DMA system is able to connect to other DMA systems instead of transiting through a hierarchical network via a hub, such as an MSC or SGSN. Cooklev Decl., ¶¶60-70. These are peer-to-peer connections because the DMA systems connect directly, without traversing a hierarchical network. The Board declined at the institution stage to adopt a construction of "DMA network" that would require peer-to-peer connections. DI, 14-15.

**1. The Specification Provides For Peer-to-Peer Connections
Between the DMA Systems**

As discussed in Sections II.B and V.A above, a core concept of the ‘414 Patent is to provide and enable a distributed architecture to avoid costs associated with the backhaul needed to implement a centralized and hierarchical network that depends on routing all calls via a centralized hub. In order to do so, the nodes within the DMA network communicate with each other directly as peers.

The claim construction inquiry “must interpret the claims in light of the specification, yet avoid impermissibly importing limitations from the specification.” *Alloc, Inc. v. Int’l Trade Comm’n*, 342 F.3d 1361, 1370 (Fed. Cir. 2003) (collecting cases). That balance turns on how the specification characterizes the claimed invention. *Id.* When the specification read as a whole suggests that the very character of the invention requires the limitation to be a part of every embodiment, as is the case here, it is proper to construe the terms in view of the specification. *Id.*

The Federal Circuit’s analysis in *Alloc* is instructive. *Alloc* centered on patents about techniques for laying wood flooring tiles, which were joined along edges by “locking groove[s]” and “locking element[s].” *Id.*, 1365-66. The Federal Circuit affirmed the construction that the claims required “play,” *i.e.*, a space between a groove and a locking element of an adjacent panel, even though none of the asserted patent claims recited the term “play.” *Id.*, 1367-68. This is because “all the figures and embodiments disclosed in [the patents at issue] imply play, or in the

case of [a specific figure], expressly disclose play.” *Id.*, 1370. The specification criticized prior art floor systems without play; the patents did not show or suggest any systems without play. *Id.*, 1369-70. As such, the court found “the [specification] read as a whole leads to the inescapable conclusion that the claimed invention must include play in every embodiment.” *Id.*, 1370. The same reasoning applies in the present case to require the claimed invention to include a peer-to-peer connection between DMA systems.

The primary system diagrams of the ’414 Patent (Figures 1-2) and the accompanying disclosure in the specification make clear that the claimed invention’s “DMA network” includes peer-to-peer connections between its DMA systems. Figure 1 (reproduced below) depicts this peer-to-peer arrangement and its accompanying disclosure states that “each DMA 106 is **interconnected** with the other DMAs 106 via an Internet protocol network 110” and “[a]s such, **there exists a peer-to-peer connection 112** between each DMA 106 in the system 100.” ’414 Patent, 4:28-32. The use of such peer-to-peer connections is in contrast to the conventional networks where BTSs do not directly connect to each other as peers and, instead, rely on traversing a hierarchical backhaul to the BSC and MSC in order to connect to another BTS. Cooklev Decl., ¶62.

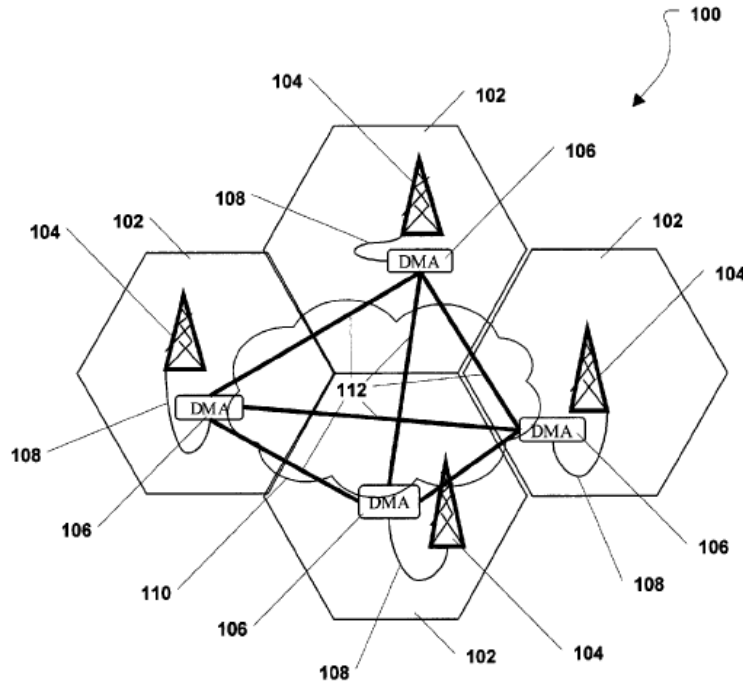
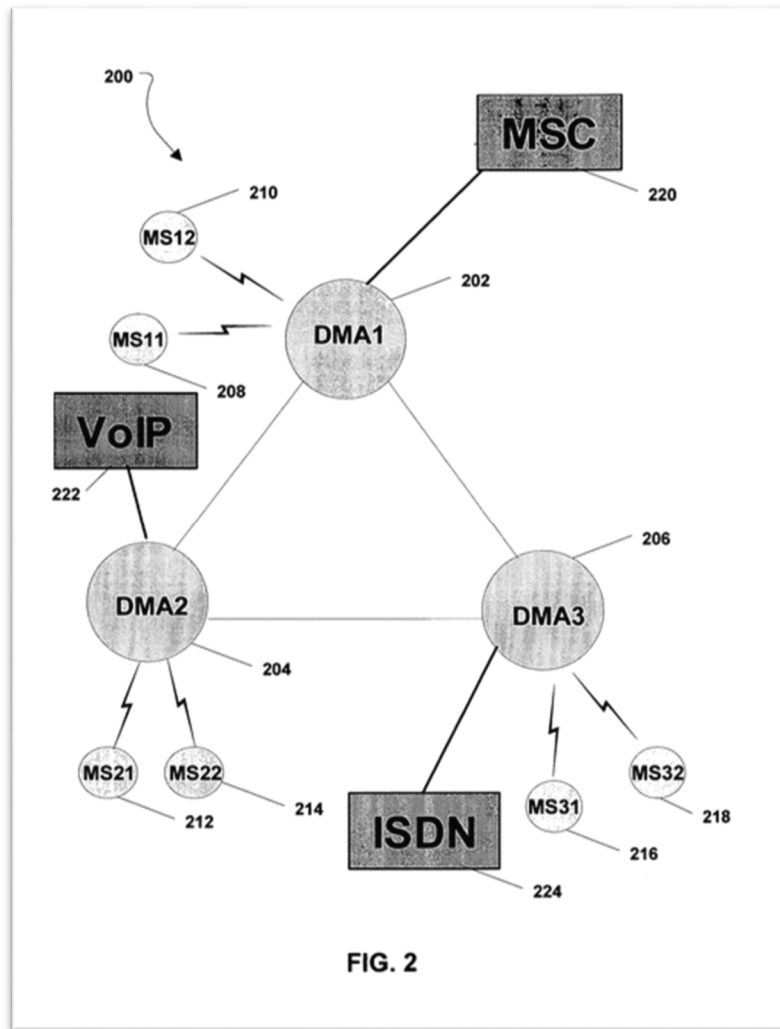


FIG. 1

'414 Patent, Fig. 1. Lemko selected the peer-to-peer connections of Figure 1 as the cover page drawing figure for the '414 Patent, highlighting the importance of this structure. '414 Patent, 1; Ex. 1002, 70 (Application Data Sheet specifying the Applicant-Suggested drawing figure as Figure "1").

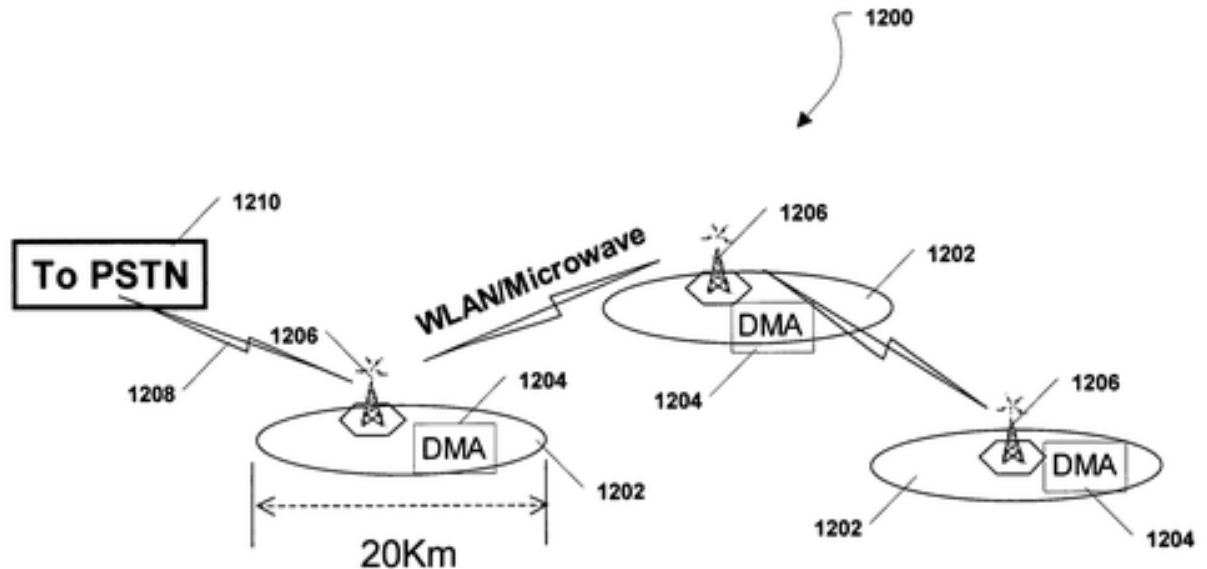
Similarly, Figure 2 depicts and the corresponding portions of the specification disclose a network system that "include[s] an Internet protocol (IP) peer-to-peer network" comprising a DMA 202 coupled to DMA 204 and to DMA 206, and the second DMA 204 is coupled to the third DMA 206. '414 Patent, 4:61-5:2.



'414 Patent, Fig. 2. As discussed above, the purpose and benefit of this distributed architecture is that the DMA systems can communicate directly as peers without first traversing an intervening hierarchical network MSC, shown as element 220 in Figure 2 as outside of the DMA network of DMA systems. Cooklev Decl., ¶63.

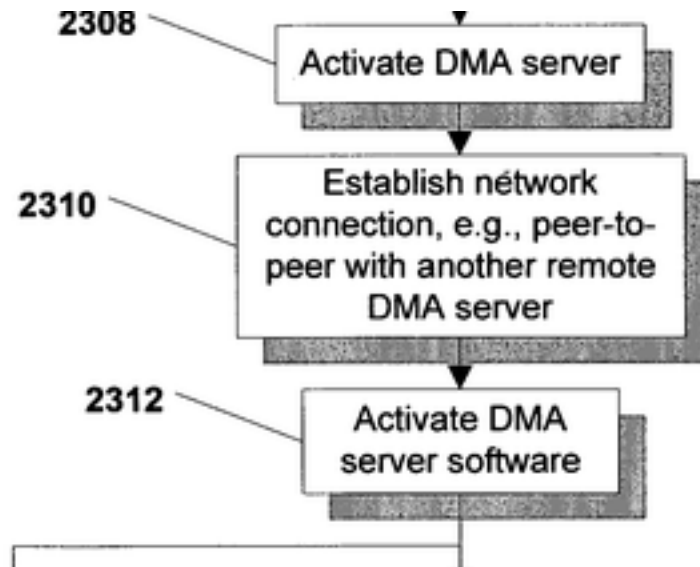
Additionally, Figure 12 of the '414 Patent depicts, and the specification describes, a system of wireless local loops (WLLs) having DMA systems (element 1204). The specification discloses that the WLLs (each having a DMA system) “can

be *interconnected* via a wireless local area network (WLAN),” and that “[s]ince *the DMAs 1204 are connected to each other* via the WLAN or microwave connections, the relatively expensive inter-site back-haul component is removed.” ’414 Patent, 12:15-31. This further shows the use of peer-to-peer connections.



’414 Patent, Fig. 12; Cooklev Decl., ¶64.

As another example, Figure 23 shows a “method of deploying a distributed management architecture server,” and describes establishing “a network connection, e.g., *peer-to-peer* with another remote DMA server.” *Id.*, Figure 23 (shown below in excerpt); 16:21-23 (“In a particular embodiment, the network connection is a *peer-to-peer connection* between the DMAs.”).



'414 Patent, Fig. 23 (excerpted). Consistent with the purpose of the '414 Patent to provide a ***distributed*** mobile architecture, every embodiment depends on the DMA systems communicating with each other as peers. Cooklev Decl., ¶65.

In the Institution Decision, the Board considered these disclosures as “non-limiting,” referencing the use of qualifiers such as “non-limiting, exemplary embodiment” in the specification’s use of peer-to-peer. DI, 15. The Federal Circuit has previously recognized that the presence of such “non-limiting” language is not dispositive and that it is appropriate to limit a claim element to a disclosed example when that example is the only relevant disclosure that informs the public of its meaning. *Medicines Co. v. Mylan, Inc.*, 853 F.3d 1296, 1309 (Fed. Cir. 2017) (construing the term “efficient mixing” according to the specific mixing conditions in a “non-limiting” example). In *Medicines*, for example, the court was required to construe a term, “efficient mixing,” which did not “carr[y] an accepted meaning to

one of ordinary skill in the art.” *Id.*, 1307. The Court then construed the term in a manner consistent with the specification, recognizing that the patent’s novelty was based on its “batch consistency,” and the specification taught “efficient mixing as a necessary and sufficient condition for achieving batch consistency.” *Id.*, 1303-05.

Like the term “efficient mixing” considered in *Medicines*, the term “distributed mobile architecture” does not carry an accepted meaning to those of ordinary skill in the art, so it is necessary to “turn to the remainder of the specification, ‘the single best guide to the meaning of a disputed term’ and ‘a concordance for the claims’ to determine the [scope of ‘distributed mobile architecture’].” *Id.*, 1307 (citing *Phillips*, 415 F.3d at 1315). The goal of the ’414 Patent is to distribute routing functionality so that, where possible, the nodes receiving calls (DMA systems) can communicate with each other as peers, instead of traversing a hierarchical and expensive backhaul infrastructure to a centralized MSC, and the only way the patent discloses to achieve this is through peer-to-peer connections between the DMA systems. ’414 Patent, 1:34-51, 4:14-17, 4:61-62. Cooklev Decl., ¶66.

Accordingly, peer-to-peer connections are the only embodiment and description of how the claimed DMA systems form a DMA network, making it “entirely appropriate to limit the term [DMA System] to the sole portion of the

specification that adequately discloses [DMA System] to the public.” *Medicines*, 853 F.3d at 1309 (citations omitted).

2. The Claims Confirm the DMA Systems Are Connected By Peer-to-Peer Connections

The peer-to-peer architecture of the claimed DMA network is confirmed by the structure of the Challenged Claims. Specifically, each of the independent claims requires that the community location registers associated with one DMA system are stored in a different DMA system. ’414 Patent, 18:25-29 (“information stored at a community location register (CLR) associated with the second DMA system, wherein the CLR associated with the second DMA system is stored at the first DMA system”), 19:15-19, 19:24-28, 20:1-5 (claim 11 reciting “stores information associated with a second HLR of a second DMA system, wherein the second HLR stores information associated with one or more mobile subscriber devices that are registered with the second DMA system”).

The claims further recite that the DMA systems use the CLRs in order to route calls to subscribers located in and out of coverage areas of the DMA systems. ’414 Patent, 18:22-29 (Claim 1: “determining whether the second mobile subscriber is located within a second wireless coverage area... based on information stored at a community location register”), 19:12-17 (same), 19:22-26 (similar but for “a third wireless coverage area”), 20:18-22 (similar). This arrangement has no purpose other than to permit the DMA systems to communicate directly without traversing a

hierarchical network through a centralized hub, i.e., as peers. Cooklev Decl., ¶¶67-68; ‘414 Patent, 5:37-54, 12:15-31.

In its Institution Decision, the Board noted that dependent claims 3 and 10 specifically recite a “peer-to-peer connection.” DI, 14. The Board found this to be evidence that the independent claims should not be construed as requiring peer-to-peer connections in view of the doctrine of claim differentiation. *Id.* However, dependent claims 3 and 10 add a limitation that the calls are connected “via ***an Internet Protocol (IP)*** peer-to-peer connection.” ‘418 Patent, Claims 3, 10.

Because these claims require a specific type of peer-to-peer connection—an Internet Protocol connection—construing the independent claims as requiring peer-to-peer connections (but not necessarily Internet Protocol peer-to-peer connections) does not render dependent claims 3 and 10 as redundant. In addition, dependent claims 3 and 10 are narrower in scope as to when the Internet Protocol based peer-to-peer connection is used (when “the second mobile subscriber is located within the second wireless coverage”). ‘414 Patent, 18:43-46 (claim 3), 19:41-49 (claim 10). Since Lemko’s claim construction does not generate redundancy, the doctrine of claim differentiation does not apply here. *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1238 (Fed. Cir. 2016) (“This court has declined to apply the doctrine of claim differentiation where the claims are not otherwise identical in scope.”).

Moreover, the doctrine of claim differentiation is not a hard and fast rule and can always be overcome where the specification dictates a contrary construction, as is the case here. *Seachange Int’l, Inc. v. C-COR, Inc.*, 413 F.3d 1361, 1369 (Fed. Cir. 2005); *accord, Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed. Cir. 1991) (“Claim differentiation is a guide, not a rigid rule.”) (citation omitted). Moreover, “the doctrine of claim differentiation does not serve to broaden claims beyond their meaning in light of the specification.” *Toro Co. v. White Consol. Indus., Inc.*, 199 F.3d 1295, 1302 (Fed. Cir. 1999); *Tandon Corp. v. Int’l Trade Comm’n*, 831 F.2d 1017, 1024 (Fed. Cir. 1987) (“Whether or not claims differ from each other, one cannot interpret a claim to be broader than what is contained in the specification and claims as filed.”) (citations omitted). Thus, claim differentiation, to the extent it is even relevant, does not trump the impact of the intrinsic record as a whole, which makes clear that the Challenged Claims are directed to a peer-to-peer network of DMA systems.

In sum, “distributed mobile architecture” should be construed as one where DMA systems are connected through peer-to-peer connections to other DMA systems. Cooklev Decl., ¶¶60-70.

VI. THE CHALLENGED CLAIMS ARE PATENTABLE OVER MAUER AND WAYLETT

The Board should uphold the validity of the Challenged Claims because the asserted references do not render obvious the Challenged Claims. Mauer and Waylett do not teach or suggest at least the following limitations:

- (1) “distributed mobile architecture;” (including distributed mobile architecture systems and distributed mobile architecture network);
- (2) a “destination preference register” (DPR); and
- (3) a “community location register” (CLR).

Each of these limitations is recited in all of the independent Challenged Claims and, therefore, provides an independent basis to uphold their validity.

A. The Proposed Combinations of Mauer and Waylett Do Not Teach a DMA Network or DMA System

All of the Challenged Claims require a distributed mobile architecture (DMA) network and at least one DMA system. As discussed in Section V, “distributed mobile architecture” should be construed as “a network architecture where DMA systems have distributed call-routing functionality and are connected with other DMA systems through peer-to-peer connections.” Mauer and Waylett do not satisfy this construction.

Neither Mauer nor Waylett teaches a distributed network, let alone one with peer-to-peer connections between the DMA systems. Petitioners do not show how

and why, absent hindsight and use of the '414 Patent as a roadmap, a POSITA would have been motivated to modify Waylett with Mauer's alleged teaching of peer-to-peer IP connections to obtain the inventions of the Challenged Claims.

1. Petitioners' Proposed Combinations of Mauer and Waylett Do Not Result in a DMA Network of DMA Systems

Petitioners allege that Mauer's WLAN (12) and WWAN (14) are a DMA network having "two separate and distinct DMA systems." Pet., 21-22. Alternatively, Petitioners contend that the WWAN could be substituted for another WLAN to satisfy a second DMA system. *Id.*, 20, 22-23. Neither scenario involves peer-to-peer connections between Mauer's WLAN(s) and WWAN(s). Cooklev Decl., ¶¶78-95.

Instead, Mauer describes how it uses conventional hierarchical or hub-style networks to connect voice calls to a UE served by either a WLAN or a WWAN. Ex. 1005, 10:65-13:67. For example, a call from a WWAN to a "multi-mode mobile station 16" is routed via a centralized MSC and out of the WWAN to a softswitch element. *Id.*, 11:8-21. The softswitch "attempts to establish the call ... via WLAN 12" by sending a SIP Invite message, which the softswitch obtains from an external database or centralized SIP registrar. *Id.*, 11:22-36. If the call attempt is unsuccessful (i.e., the mobile station is inaccessible via the WLAN), the softswitch will "try to locate multi-mode mobile station 16 in WWAN 14 by querying HLR 44," i.e., using the conventional backhaul. *Id.*, 13:4-32. As such, Mauer's process

is entirely limited to the use of conventional hierarchical networks, without using peer-to-peer connections between the alleged DMA systems (WLAN and WWAN). Cooklev Decl., ¶79.

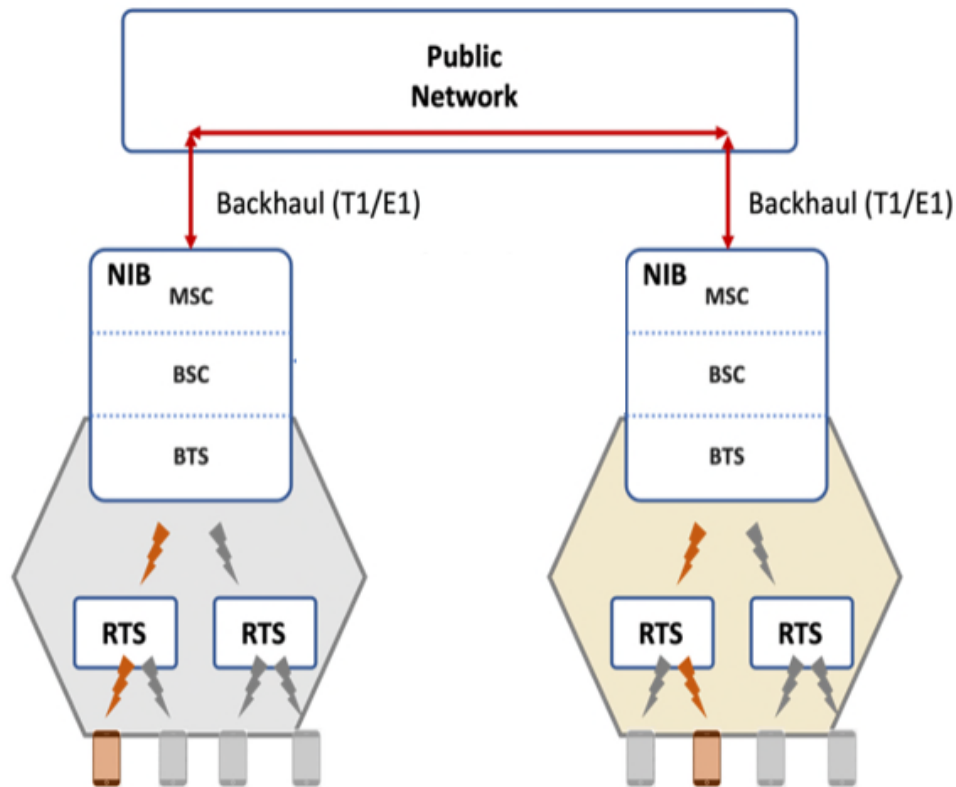
Petitioners only address peer-to-peer connections with respect to dependent Claim 3. Pet., 43-45. Claim 3 requires use of an Internet Protocol (IP) peer-to-peer connection between the first and second DMA systems. Petitioners rely on Mauer, alleging that the use of a Session Initiation Protocol (SIP) satisfies the requirement of an IP peer-to-peer connection between two DMA systems. Pet., 43-44 (citing Ex. 1003, ¶134; Ex. 1005, 5:34-38, 3:59-61, 5:56-58, 4:66-5:2; Ex. 1015, Abstract, 1:17-20). But the SIP protocol is a client-server protocol, and would not have been known to a POSITA at the time the invention to be a peer-to-peer connection. Cooklev Decl., ¶80.⁴

Moreover, even if SIP connections could be considered peer-to-peer connections, they are not peer-to-peer connections between **DMA systems**. Instead, the alleged “peers” in these connections are the mobile devices that communicate over the WLAN. Cooklev Decl., ¶81; Ex. 1005, 7:30-36 (“various endpoints, e.g.,

⁴ An extension to support peer-to-peer connections was added to the SIP protocol in 2016, over a decade after the priority date of the ’414 Patent. Cooklev Decl., ¶ 80; Ex. 2033 (describing addition of P2P extension).

multi-mode mobile station 16”). Thus, Petitioners’ alleged “peer-to-peer” connections are not peer-to-peer connections between DMA systems, as the Challenged Claims require. In fact, Petitioners’ expert repeatedly confirmed that the mobile phones ***are excluded from*** and ***not part of a DMA system***. Proctor Tr., 67:9-21 (“That is pretty obvious that a phone is not part of the DMA network”), 68:8-16 (“[T]he telephones would not be part of that [DMA] network.”). As such, Mauer’s use of SIP to connect mobile devices fails to disclose peer-to-peer connections between ***DMA systems***.

Waylett does not cure Mauer’s deficiencies. Waylett describes a network in box (NIBs) that connects to existing WWAN networks using then-conventional T1/E1 communication links for backhaul to provide voice and data communication and a private wide area network (PWAN) for “distributing HLR registration and authentication loads.” Ex. 1006, 17:10-12; Ex. 2013 (disclosing T1/E1 ports for communication); Ex. 1006, 7:9-11, 9:65-10:6, 17:7-17, Fig. 11. This setup is illustrated below:



Cooklev Decl., ¶¶82-83 (citing Ex. 1006, Fig. 11); Ex. 2013, 1 (disclosing that the NIB has “all E1 or all T1” ports for voice and data communication).

As shown above, the call path from one UE to another UE goes from the NIB, over T1/E1 backhaul, to a public network, over T1/E1 backhaul to a second NIB, to the recipient UE. Cooklev Decl., ¶84. Thus, there were no peer-to-peer connections between NIBs (which Petitioners contend are DMA systems in Ground 2) and, in particular, no Internet-Protocol-based peer-to-peer connections, as Claim 3 requires.

Thus, Mauer and Waylett, alone or in combination, do not disclose DMA networks formed by DMAs interconnected with peer-to-peer connections.

2. Petitioners Do Not Explain How Mauer and Waylett Disclose DMA Systems and a DMA Network

Even if the Board does not adopt Lemko’s proposed claim construction for distributed mobile architecture, it should reject Petitioners’ grounds due to their failure to articulate a coherent theory of how Mauer’s WWAN and WLAN are “DMA systems.” Pet., 18. Petitioners contend that Mauer’s WWAN is a “Wireless Wide Area Network” (like a 2G/3G cellular network) and Mauer’s WLAN is a “Wireless Local Area Network” (like an IEEE 802.11 Wi-Fi network). Ex. 1005, 1:12-31. Petitioners have not attempted to explain how these networks are *distributed* networks, such that they could comprise DMA systems of a DMA network.

Petitioners and their expert have failed to give any weight to the terms “DMA” or “distributed mobile architecture,” essentially treating them as nonce words. Pet., 18-23, 49-51. “DMA” and “distributed mobile architecture” are central concepts in the ’414 Patent, appearing over 550 times in the specification and claims. For Ground 1, Petitioners assert that the presence of “separate” or “distinct” systems, WLAN and WWAN, are sufficient to satisfy the distributed mobile architecture systems limitations. Pet., 17-22; Ex. 1003, ¶¶82-91. Petitioners, in effect, simply

contend that these are networks, without demonstrating that they are ***distributed mobile architecture*** networks.

For Ground 2, Petitioners contend that Waylett’s NIBs are DMA systems because its “description mirrors how the ’414 patent describes a DMA system.” Pet., 59; Ex. 1003, ¶168 (citing Fig. 3, 6:5-25). Petitioners again do not explain how the NIBs are nodes in a distributed mobile architecture network. Thus, Petitioners have failed to make a *prima facie* showing that Mauer and Waylett alone or in combination disclose DMA systems and a DMA network.

3. Petitioners’ Proposed Combination of Mauer and Waylett Lacks Any Rational Motivation to Combine

Petitioners assert that it would have been obvious to a POSITA “to implement Waylett’s NIB solution into Mauer’s system architecture” and “[t]he combination would involve using Waylett’s Network-in-a-Box 224 in each of Mauer’s WWAN 14 and WLAN 12, resulting in, least two DMA systems.” Pet., 13, 68. Petitioners further assert a POSITA would have been motivated to combine Mauer and Waylett for three reasons: (1) the references each provide reasoning to make such a combination, (2) the “resulting combination would improve Mauer’s distributed wireless network system by consolidating it into a single box, making it compact in design allowing for faster deployment,” and (3) “Waylett’s NIB would help mitigate the shared concern of Mauer—that is, reaching a mobile station as it roams or moves outside of the service or coverage area.” Pet., 15-16. All of these arguments fail

because they reflect a superficial understanding of Mauer's network architecture and Waylett's NIB and they ignore how a POSITA would have understood the respective teachings. Cooklev Decl., ¶¶89-95.

Petitioners' proposed combination—"using Waylett's Network-in-a-Box 224 in each of Mauer's WWAN 14 and WLAN 12, resulting in at least two DMA systems"—ignores that Waylett expressly discloses its NIB already provides a WLAN and the type of cellular network technology provided by Mauer's WWAN. Pet., 13; Ex. 1006, 8:7-10 (describing a base transceiver station, CBTS 114 is a Network-In-a-Box), *id.*, Fig. 5, 2:38-48 (describing the CBTS as having both a GSM/GPRS transceiver, i.e., WWAN, and "a WLAN transceiver"), 9:13-46 (describing the system coupled to a WLAN and a public GSM/3G network). Accordingly, a single NIB would be used to provide the two communication modes, cellular (via network 222) and WLAN (via network 228) disclosed in Mauer:

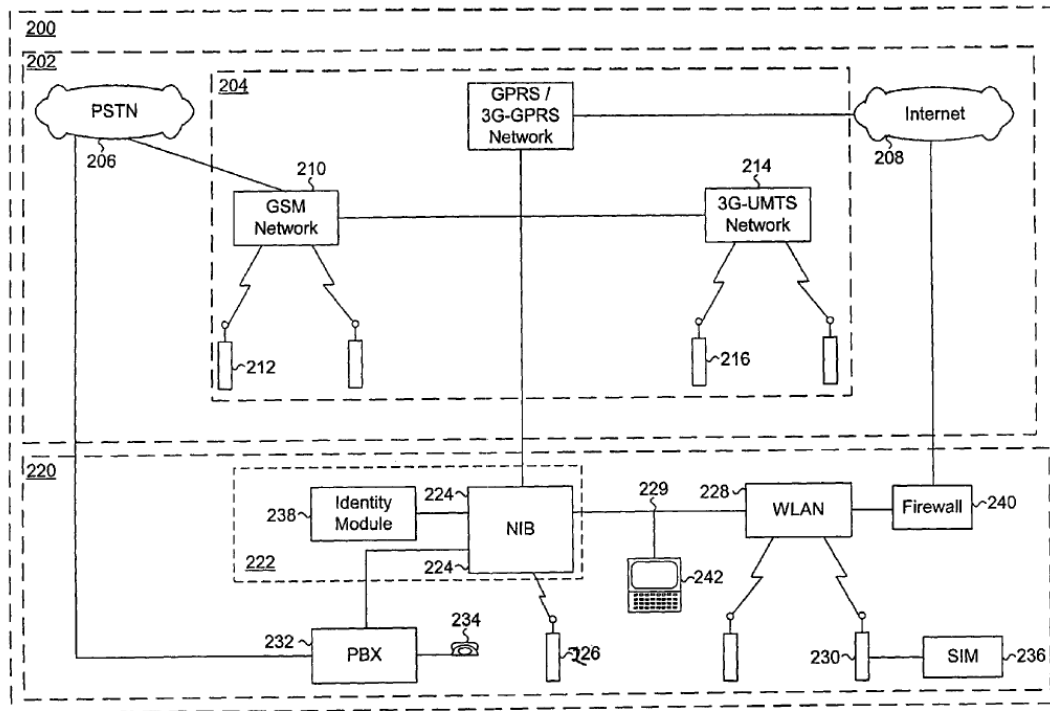


FIG. 5

Ex. 1006, Fig. 5. A POSITA would, therefore, not be motivated to use a NIB “in each of” Mauer’s WWAN 14 and WLAN 12 because a single instance of Waylett’s NIB already provides access to both types of networks (cellular and WLAN).

Indeed, adding an extraneous NIB would run contrary to Waylett’s express teachings of reducing costs and expenses. *Id.*, 2:3-13; Pet., 15; Ex. 1003, ¶78. Cooklev Decl., ¶91. Without NIBs on either side of Mauer’s architecture, Petitioners’ obviousness combination does not facially read on the claims because there are no longer two DMA Systems that form a DMA network; there is just a single NIB that provides both cellular and WLAN access. Cooklev Decl., ¶91. There is no rationale for implementing Mauer’s network architecture with Waylett’s

NIBs absent using the '414 Patent as a roadmap via prohibited hindsight reasoning. *Otsuka Pharm. Co. v. Sandoz, Inc.*, 678 F.3d 1280, 1296 (Fed. Cir. 2012) (“The inventor’s own path itself never leads to a conclusion of obviousness; that is hindsight. What matters is the path that the person of ordinary skill in the art would have followed, ***as evidenced by the pertinent prior art.***”).

Petitioners’ argument that a POSITA would implement Mauer’s WWAN with a NIB is also nonsensical because a single NIB is not a replacement for an existing WWAN. Pet., 13-15; Proctor Tr., 37:7-42-21 (arguing that one would implement Mauer’s WWAN using Waylett’s NIB). A WAN is a network that covers a large geographical footprint, like a country or continent. Ex. 2030 (Tanenbaum, 18). However, as Dr. Cooklev explains (and Mr. Proctor agrees), a single NIB provides coverage over, at most, a single building and could not serve as a replacement for a WAN. Cooklev Decl., ¶92 (citing Ex. 1006, 8:7-10, Ex. 2012, 1, Ex. 2013).

During cross-examination, Mr. Proctor expanded his argument, suggesting that a POSITA would have built an entire WWAN using Waylett’s NIBs, purportedly because it would have been less expensive. Proctor Tr., 54:19-56:3. However, Waylett’s cost savings are realized by using Waylett’s NIB as disclosed in Waylett—as an adjunct to existing infrastructure. Ex. 1006, 9:57-63; Proctor Tr., 59:9-60:13 (Mr. Proctor confirming the same). Accordingly, rather than disclosing arranging NIBs into a WWAN, Waylett discloses that its NIB can be used to provide

a “private IP network” that operates as an adjunct to existing networks, like Mauer’s WWAN.

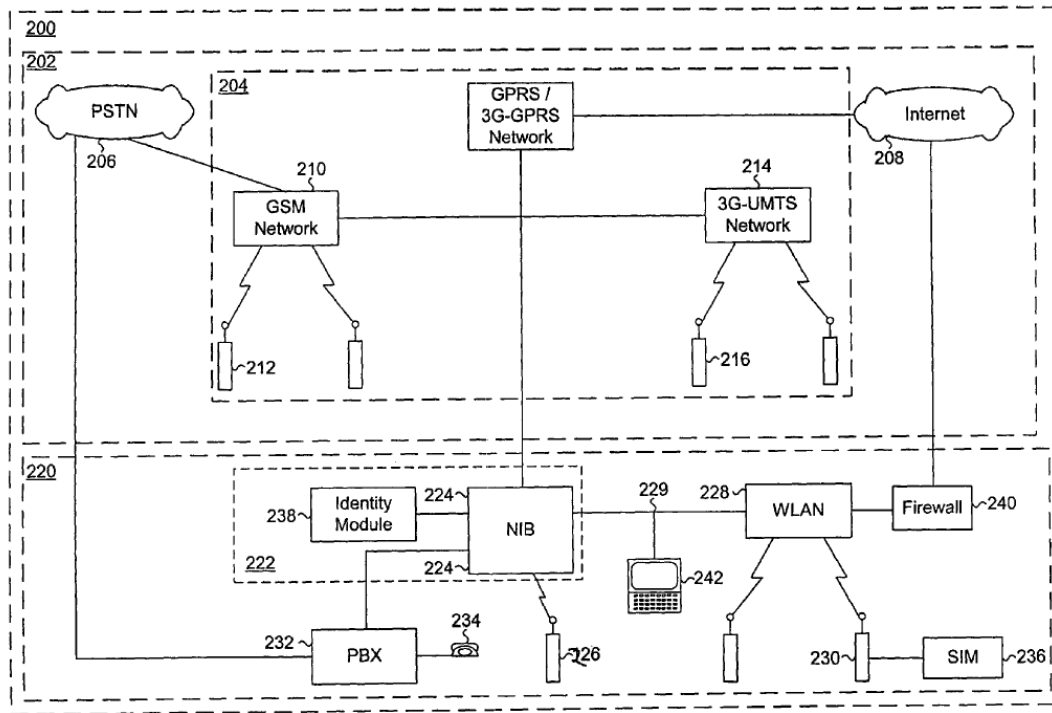


FIG. 5

Ex. 1006, Fig. 5 (illustrating a NIB connected to public 2G and 3G networks 204);
Cooklev Decl., ¶¶93.

Accordingly, a POSITA considering the teachings of Waylett, at most would have used the NIB as an adjunct to Mauer’s existing WWAN, not as a replacement. Cooklev Decl., ¶¶94. Indeed, Mr. Proctor acknowledged during cross-examination that it would not be cost-effective to replace an existing WWAN with a new WAN implemented with Waylett’s NIBs and that he had not calculated whether it would

have been more cost-effective to build an entire WWAN out of NIBs from scratch. Proctor Tr., 66:2-67:8.

Hence, there is no motivation to combine Mauer and Waylett in any manner that would yield the Challenged Claims.

B. Mauer and Waylett Do Not Render Obvious a Destination Preference Register

Mauer and Waylett do not disclose the destination preference register limitation and, therefore, cannot render obvious any of the Challenged Claims. Cooklev Decl., ¶¶96-120.

As discussed above, the '414 Patent describes how a peer-to-peer DMA network of DMA systems enables each DMA system to have its own separate interface to networks outside of the DMA network. '414 Patent, Fig. 2, 5:3-20 (describing one DMA system having an MSC interface, another DMA system having a VoIP interface, and another DMA system having an ISDN interface). Normally, when a call is made between mobile subscribers within the same DMA network, that call can be handled entirely and directly between the DMA systems without the need to traverse a backhaul. '414 Patent, 5:37-54. But, when a call from a mobile subscriber is made to a destination outside of the DMA network, the peer-to-peer nature of the DMA network makes available all of these interfaces for routing the call outside of the DMA network. *Id.*, 5:62-6:4. Thus, the peer-to-peer aspect of the DMA network enables each DMA system to share its interfaces and reduce

the need to separately have its own (duplicative) interface (e.g., multiple MSC interfaces, multiple ISDN interfaces). *Id.*, 9:59-10:4 (describing the use of a third DMA’s ISDN interface to route a call outside the DMA network).

The DPR provides interface preferences to make calls external to the DMA network. *Id.*, 5:65-67. The ’414 Patent explains how these preferences are a flexible feature that enables mobile subscribers to customize their use of the DMA network and utilize the full potential and capabilities of the DMA network. For example, “if a user wishes to save money, the user can choose to make calls outside of the DMA network via a VoIP interface” and “if a user wishes to have a higher call quality, the user can choose to make calls outside of the DMA network via an ISDN interface.” *Id.*, 9:32-37; Cooklev Decl., ¶¶97-98.

Thus, the DPR must be able to route calls through a preferred call path outside of the DMA networks to second user equipment. The Petition cites Mauer’s voicemail server as a “preferred call path to route the call,” but it fails to satisfy the claims for multiple reasons. Pet., 38-42.

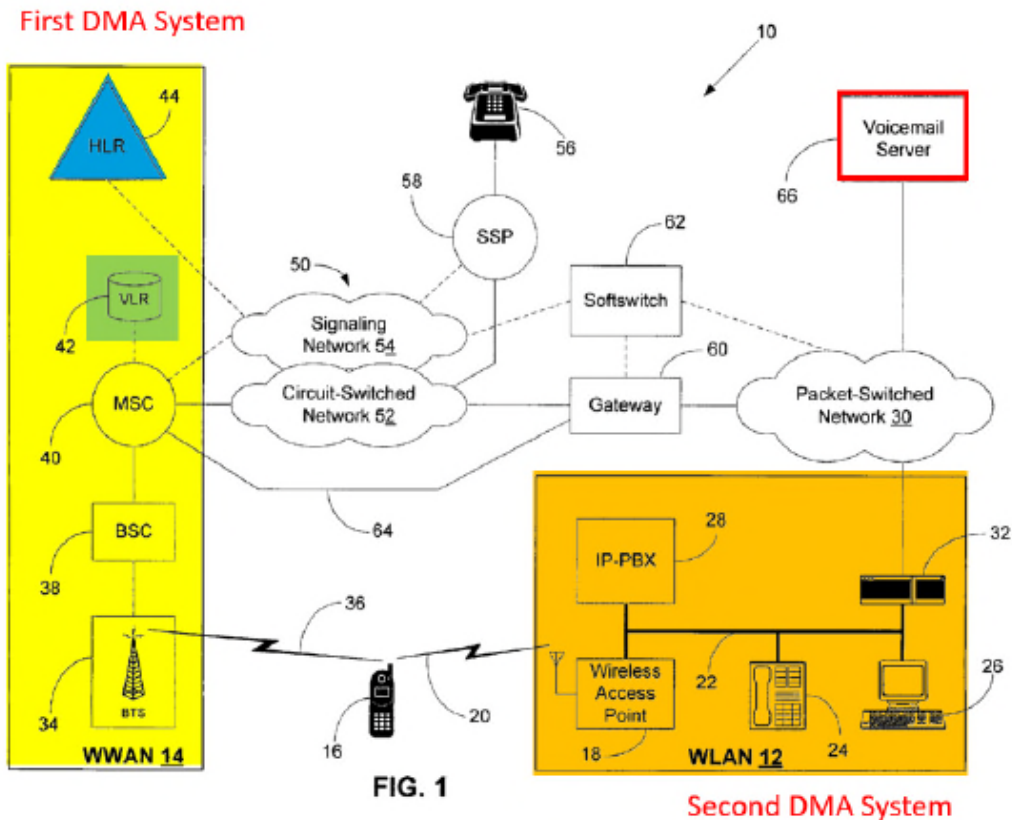
1. Mauer’s Voicemail Server is Located Within the Alleged DMA Network

Mauer’s voicemail server is *within* the alleged DMA network and is not, therefore, an external path. Petitioners allege that telecommunications system 10 is the claimed “DMA network.” Pet., 21 (“Both WWAN 14 and WLAN 12 belong to the same system 10 (‘DMA network’).”). However, Mauer expressly discloses that

the voicemail server is **within** the communications network that includes the WLAN and WWAN. Ex. 1005, 8:25-34 (“Wireless telecommunications network 10 may also **include** a voicemail server 66....”). Thus, the optional voicemail server is within the alleged network, not external to it.

Mauer also discusses that voicemail server 66 is positioned or coupled to other network elements (e.g., “to PSTN 50,” “to MSC 40”) and may “be otherwise **located in** network 10.” *Id.* There is nothing in Mauer that would suggest to a POSITA that the voicemail server is outside of the wireless telecommunications network 10 that includes WWAN 14 or WLAN 12, as required by the Challenged Claims. *Id.*

Petitioners’ argument that the voicemail server is not part of the network appears to rely exclusively on the schematic diagram in Fig. 2 of Mauer, which does not depict the voicemail server 66 in the box that Petitioners annotated orange and contend is the second DMA system (see excerpt below). But, the schematic layout of elements in Mauer’s Figure 1 is not evidence that the voicemail server is “outside of the DMA network.”



Pet., 39 (reproducing Ex. 1005, Fig. 1 (annotated in the Petition)).

In its Institution Decision, the Board gave Petitioners the benefit of the doubt and interpreted their argument as not suggesting that every component of Mauer's telecommunications system 10 corresponds to Claim 1's DMA network. DI, 36-37. Perhaps taking this cue, Petitioners' expert clarified his opinion during cross-examination on what elements in Mauer's network 10 were considered "inside" and "outside" of the network. Proctor Tr., 67:9-70:18 (arguing mobile phones are outside of the network, but declining to confirm whether "signaling network 54, circuit-switched network 52, softswitch[] 62, gateway 60 packet-switched network

30” were part of a DMA network). This exercise in arbitrary line drawing is pure hindsight reasoning that would only be done in hindsight of the Challenged Claims.

A POSITA would not consider voicemail server 66 to be outside of what Petitioners’ contend to be the DMA network. Cooklev Decl., ¶¶100-104. A POSITA would understand that voice-mail servers (“VMS”) are typically provided by cellular service providers, are considered part of a mobile architecture, and are even often co-hosted in the same data centers as the MSC. Cooklev Decl. ¶104. This understanding is reflected in this Nokia diagram illustrating a classic “GMS network architecture,” where the “Voice Mail System” is depicted as being part of the “Exchange System” tier and connected to the MSC.

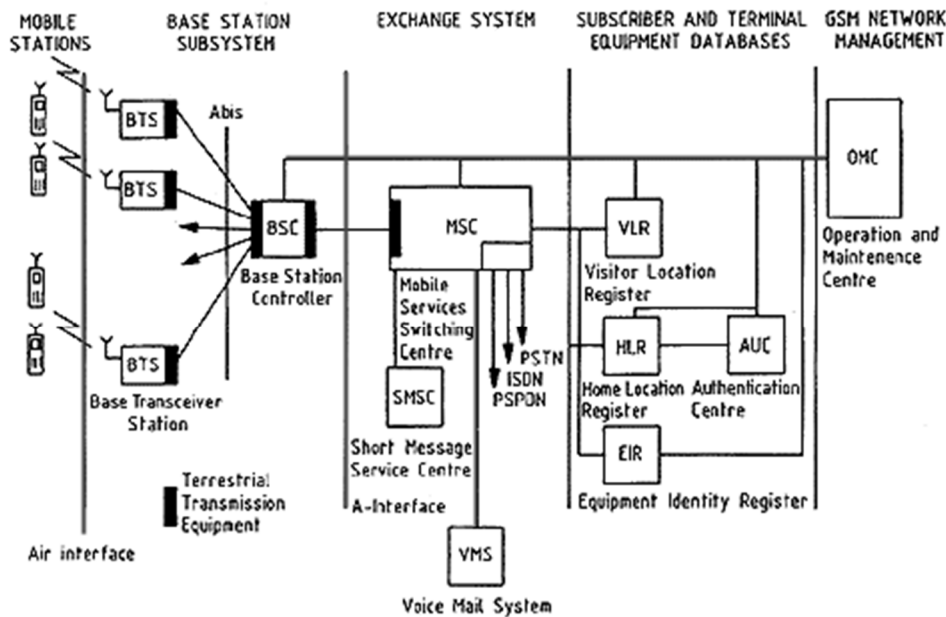
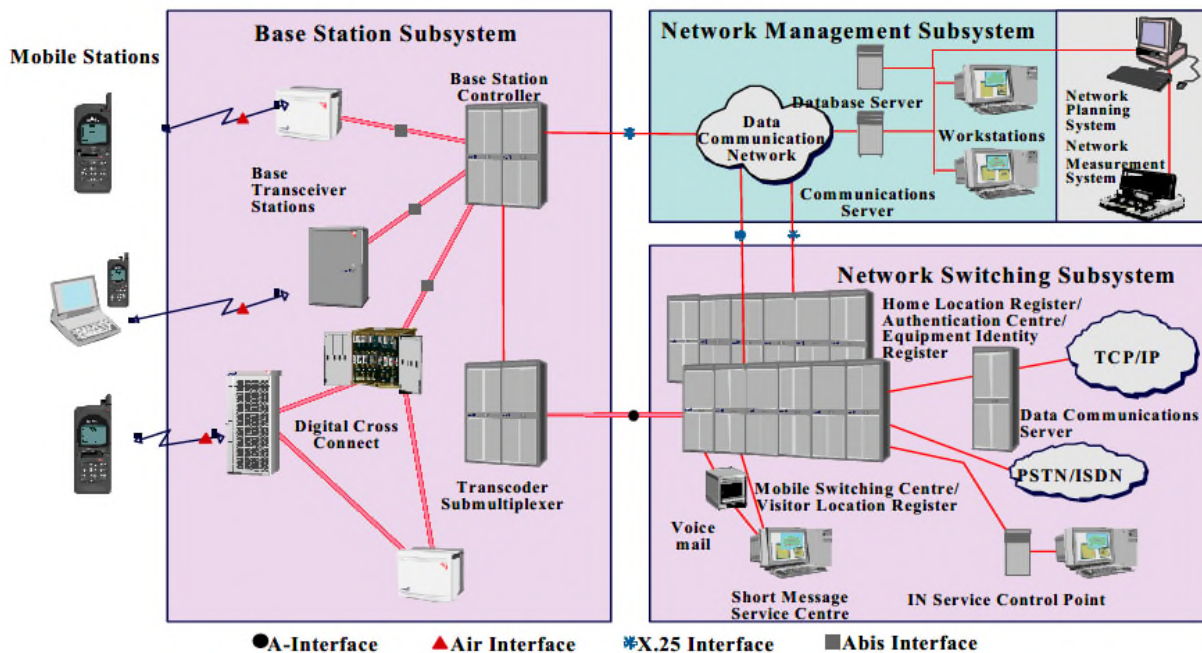


Fig. 1. GSM network architecture

Ex. 2034 (showing “VMS” or “Voice Mail System” as part of the “Exchange System” layer), Cooklev Decl., ¶104.



See also, Ex. 2035, 20 (showing “Voice mail” as part of the “network switching subsystem”)

Petitioners’ own evidence (Pet., 40-41) further demonstrates that the voice-mail system is part of Mauer’s network architecture. Cooklev Decl., ¶105; Ex. 1016, 4:56-57 (“MSC 22 may be coupled by a voice trunk with a voice-mail server”), 5:39-42 (“enterprise voice mail server 60 may be integrated as a function of the IP PBX server 50 or, as shown, may exist as a separate component”), 7:64-67 (“**Sitting as nodes on network 90**, in addition to the MGW 78 . . . are . . . **and voice mail server(s) 86**”).

Thus, Mauer does not disclose determining a preferred call path to route a call outside of the DMA network based on information stored at a destination preferred register.

2. Mauer's Voicemail Server is Not the Second Mobile Subscriber

Petitioners' argument also fails because Mauer's voicemail server is not a second mobile subscriber. Each of the independent claims requires receiving "a call from a first mobile subscriber to a second mobile subscriber" and a DPR for "determining a preferred call path to route *the call* outside of the DMA network." '414 Patent, Claims 1, 8, and 11. Antecedent basis therefore requires that "the call" outside the DMA network must be a call from the first mobile subscriber to the second, and Mauer's voicemail server is not the second mobile subscriber. In fact, Mauer discloses it *cancels* routing the call to connect to the intended second mobile subscriber when sending the call to voicemail. Ex. 1005, 13:58-62 ("cancel the SS7 signaling for routing the call to MSC 40").

The Board found at institution that Mauer does not teach cancelling call routing completely, and that it "establish[es] the call to voicemail" by "rout[ing] the call to voicemail server 66." DI, 38. But, the claims require "rout[ing] *the call*," whose antecedent basis refers to "a call from a first mobile subscriber *to a second mobile subscriber*." '414 Patent, 18:8-10, 18:66-67.

Under this plain reading, establishing a call to a voicemail system is not the same “call” from one mobile subscriber’s UE to a second subscriber’s UE. The underlying switching technology of Mauer cancels the SS7 signaling for routing the original call to the MSC signaling, as discussed above. Cooklev Decl., ¶¶107-109. In fact, Mr. Proctor admitted that establishing a connection to the voicemail server requires addressing a message to its IP address instead of the second mobile subscriber. Proctor Tr., 115:12-22, 116:10-117:1 (acknowledging Mauer’s call gets routed to the voicemail system’s address). This stands in contrast to the claimed invention whose purpose is to connect the first mobile subscriber to the second when the second mobile subscriber is only accessible via a network outside the DMA network. ’414 Patent, 9:59-63 (“the DMA establishes the call to the MDN outside of the DMA network via a DMA server that routes the call over the preferred call path”).

Petitioners’ expert argued, for the first time on cross-examination, that “one of ordinary skill in the art would understand” that “the call” is a “request to set up a call to the ... second mobile subscriber” or “a request to initiate the call.” *Id.*, 119:3-8, 119:11-13, 117:14-121:15. But even this interpretation requires a request to set up a call to still be “to the second mobile subscriber” when it is routed outside the DMA network, and not to a voicemail server. Thus, routing a call to voicemail is

not routing a call to the second mobile subscriber's UE, as the Challenged Claims require.

3. Mauer's "Alternative Communication Option" is Not Triggered When "The Call Is Directed to a Destination Device That is Outside of the DMA Network"

Mauer does not teach or suggest how the destination preference register is used in the claims, namely, when the call is being routed to a destination mobile subscriber *outside of the DMA network*. Specifically, Claim 11 requires that the preferred call paths stored at the DPR are used to route calls when it is "determine[d] that the call is directed to a destination device that is outside of the DMA network." '414 Patent, 20:15-17. Challenged claims 1 and 8 recite a similar limitation where the preferred call path based on "information stored at a destination preference register" is determined "when the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area." *Id.*, 18:30-32, 19:20-22, 19:28-31 (similar).

Petitioners argue that Mauer discloses "an alternate communication option" that is activated when the call receiver is "inaccessible." Pet., 70-72; Ex. 1005, Fig. 2, 9:39-10:5. This occurs at the end of multiple attempts after the system exhausts its options, at which point (step 120 below) the multi-mode mobile station is assigned "inaccessible" status. Cooklev Decl., ¶¶111-112; Ex. 1005, 9:39-10:5.

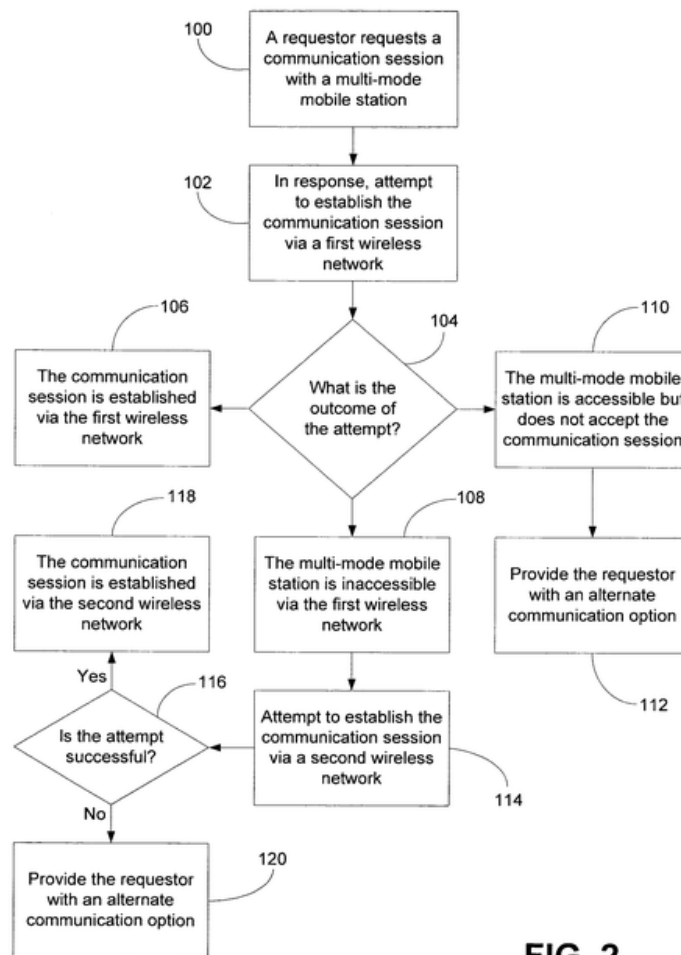


FIG. 2

Ex. 1005, Fig. 2. But “inaccessible” is a broad term, and does not imply a specific determination that the UE is outside of the coverage area of the DMA network. *Id.*, 9:42-43 (“The multi-mode mobile station may be inaccessible via the first wireless network for various reasons.”), *id.*, 10:54-59 (“because the multi-mode mobile station is inaccessible via the second wireless network or ***is accessible but does not accept the communication session***”); Cooklev Decl., ¶113. Thus, the assignment of “inaccessible” status fails to satisfy the Challenged Claims’ requirement that the

DPR is used “when” it is “determine[d] that the call is directed to a destination device that is outside of the DMA network” (Claim 11) or “**when** the second mobile subscriber is not located within the first wireless coverage area and is not located within the second wireless coverage area” (Claims 1 and 8). Mauer does not teach such a determination.

4. Mauer Does Not Disclose Information Stored at a DPR at a DMA System

Petitioners concede that Mauer does not disclose “information stored at a destination preference register (DPR), wherein the DPR is **stored at the first DMA system.**” Pet., 40-42. Relying on conclusory expert testimony and hindsight reasoning, Petitioners fail to fill this and establish why “[a] POSITA would have been motivated to store information pertaining to Mauer’s voicemail server 66 in a ‘destination preference register (DPR)’ in the ‘first DMA server.’” *Id.* (emphasis omitted).

First, Petitioners provide no evidence supporting their assertion that “information about the voicemail server” would be the type of information needed to be shared across multiple DMA systems in case any DMA failed. Pet., 41; Ex. 1003, ¶125 (expert parroting the Petition). Instead, if POSITA found it necessary to store the information for sending a call to voicemail, as Petitioners assert, the POSITA would have understood that information to have been stored in the softswitch element 62. Cooklev Decl., ¶115. This is because Mauer teaches that it

is the softswitch that handles the calls to voicemail server 66. Ex. 1005, 8:32-34 (“softswitch 62 may establish a call to voicemail server 66 when the multi-mode mobile station intended to receive the call does not answer it”). Mauer’s softswitch is not part of either WLAN 12 or WWAN 14 (i.e., the alleged first and second DMA systems), and Petitioners do not explain why a POSITA would modify softswitch 62 to yield the claimed DPR limitation by moving the DPR to multiple DMA systems. Pet., 18.

Second, Petitioners mischaracterize their evidence relating to GSM standard. The textbook cited by Petitioners states that the “IMSI detach” procedure occurs “because of powerdown or because the SIM is removed.” Ex. 1013, 3. There is no indication in the GSM standard that IMSI detach occurs “when the second mobile subscriber is not located within the first” or “second wireless coverage area,” as the claims require. Cooklev Decl., ¶116.

Finally, Petitioners fail to establish that it would have been obvious to store the DPR at the claimed DMA system. Petitioners’ modifying is not applying a “known technique” or rearranging a “known element” because Petitioners concede that the DPR was not, in fact, a known element or technique. Pet., 40 (conceding Mauer does not disclose a DPR).

With regards to Independent Claim 11, Petitioners also concede that Waylett “does not expressly disclose the AAA module includes ‘a destination preference

register,’” as that claim requires. Pet., 68. For at least the reasons provided above with respect to Claims 1 and 8, Petitioners fail to establish that the missing limitation of Claim 11 would have been obvious.

In addition, Petitioners fail to show that it would have been obvious to a POSITA to use Waylett’s configuration table to achieve the DPR. Pet., 68 (referring to Pet. 30-36). Petitioners cross reference their argument about Waylett’s configuration tables, but that argument was limited to the CLR limitation, and does not address the DPR limitation. *Id.* Petitioners do not explain how it would have been obvious to have an AAA module that included a DPR as part of the claimed DMA system, as required by Claim 11. *Id.*; Cooklev Decl., ¶¶118-119.

Thus, Mauer and Waylett do not render obvious the use of information stored at a DPR where the DPR is stored at the first DMA system (claims 1 and 8) or where the DMA system includes an AAA module that includes the DPR (claim 11) for routing the call.

C. Mauer and Waylett Do Not Render Obvious the Community Location Register Limitation

Mauer and Waylett do not render obvious any of the Challenged Claims because they fail to disclose the Community Location Register (CLR) limitations. Cooklev Decl., ¶¶121-128. These “community location register” limitations are non-obvious in view of the asserted references Mauer and Waylett. Petitioners admit that Mauer does not teach a CLR. Pet., 30 (“Mauer, however, does not expressly

disclose using ‘information stored at a community location register...’) (emphasis omitted). Petitioners exclusively rely on Waylett, but it fails to disclose or render obvious the CLR limitations, as set forth below.

In its Institution Decision, the Board summarized Petitioners’ and Patent Owner’s arguments related to this limitation. DI, 32. The Board viewed Petitioners’ evidence and arguments as supporting the view that a POSITA “may have understood from this that Waylett uses the configuration register to determine whether the subscriber is in a particular coverage area.” *Id.* But, a POSITA would have understood that Waylett uses other means for coverage-area determinations. Cooklev Decl., ¶124.

The Petition incorrectly asserts that Waylett’s configuration table satisfies this requirement. Pet., 34-35. Waylett’s configuration table is not used to determine if a mobile subscriber is in a wireless coverage area (e.g., a coverage area associated with a second DMA system). Waylett discloses routing a query for this information to the appropriate HLR/VLR. Ex. 1006, 14:61-66, 21:10-28. Thus, the requisite determination of where the second subscriber is located is not made “based on” the cited configuration table (the alleged CLR) and is instead based on the part of the HLR/VLR responsible for that mobile phone that is stored elsewhere (as described above). Petitioners are, therefore, incorrect to assert that Waylett’s configuration tables “store these subscriber identities along with their appropriate HLR.” Pet., 67.

Instead Waylett's configuration table uses "IMSI ranges," rather than specific IMSI or subscriber identities, which help identify the appropriate HLR. Ex. 1006, 15:6-8, 21:25-28. IMSI ranges do not identify subscriber identities because the IMSI ranges represent a multitude of subscribers that fall between a starting address to an end address. Cooklev Decl., ¶125.

Waylett describes using a RADIUS server, which is "a networking protocol that provides centralized authentication, authorization, and accounting (AAA) management for users who connect and use a network service." Ex. 2036, 1; Ex. 2041; Ex. 1006, 14:3-11. A POSITA would understand that a RADIUS server performs authentication procedures to perform "accounting" features such as "billing" using "call detail records," or to confirm a user can access the services at the WWAN/WWLAN. Ex. 1006, 14:16-22. Waylett's configuration table does not describe the use of the RADIUS server to determine coverage areas. Cooklev Decl., ¶126.

In contrast to Waylett's configuration table, the CLR includes the location information necessary to route calls among the DMA systems so that each DMA system can determine how to route calls itself, without the need for the conventional backhaul infrastructure. '414 Patent, 5:37-40 ("the first mobile subscriber 210 of the first DMA 202 can be connected locally to the second mobile subscriber 210 of

the first DMA 202 after locating the second mobile subscriber 210 within [] a home location register (HLR) within the first DMA 202”), 5:21-61, 10:35-11:41.

Waylett fails to render obvious “a community location register (CLR) that stores information associated with a second HLR of a second DMA system, wherein the second HLR *stores information associated with one or more mobile subscriber devices that are registered with the second DMA system,*” as required by Challenged Claim 11.

D. Waylett and Mauer Fail to Teach the Claimed Computer Readable Storage Medium Within the Housing (Ground 2, Claim 21)

1. Claim 21 Requires Software-Based MSC, BSC, and CDR Functionality

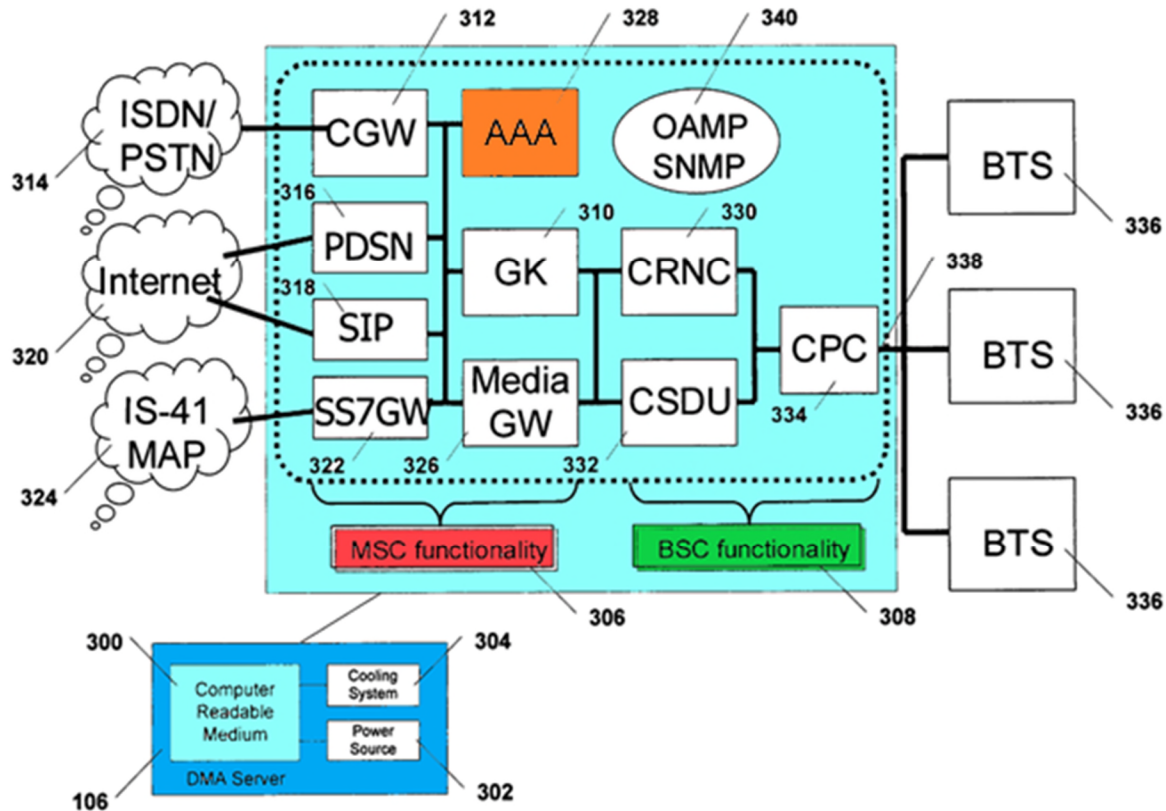
Dependent Claim 21, which depends from independent Claim 11, requires that the DMA system includes computer readable storage medium having MSC, BSC, and call detail record (“CDR”) generation functionality embedded in the computer readable storage medium. Waylett does not disclose such computer readable storage media.⁵ Instead, Waylett is based on the conventional, hardware-implemented paradigm. Cooklev Decl., ¶¶129-136, 71-72.

⁵ In another proceeding between these same parties before this same panel, this Board denied institution of inter partes review challenging U.S. Patent No. 7,548,763 (“the ’763 Patent”) in view of Waylett and another reference. Ex. 2053, 2, 7. This

The “computer readable storage medium” limitation requires a storage device that contains software-based functionality, unlike hardware-based implementations. The Federal Circuit instructs that computer readable medium claims refer to “a disk, hard drive, or other data storage device” that “contain[s] program instructions for a computer to perform a particular process.” *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011). Accordingly, the Challenged Claims require that the DMA system’s computer readable storage medium store software modules that implement its MSC, BSC, and CDR generation functionalities. Cooklev Decl., ¶131.

The specification confirms the claimed computer readable medium stores software modules because the MSC (red) and BSC (green) are embedded within the computer readable medium (light blue) of DMA server (dark blue):

Board considered a computer readable medium limitation in the ’763 Patent, similar to that recited in the ’414 Patent’s Claim 21, and rejected Petitioners’ contention that Waylett “necessarily” teaches a computer readable storage medium as “not sufficiently supported by the evidence.” Ex. 2053, 14-15; Ex. 2053, 14-24.



'414 Patent, Figs. 3 (annotated with color), 13, 15, and 18-20, 4:14-17; Cooklev Decl., ¶¶132, 43.

Lemko explicitly distinguished its software-based implementation from conventional hardware-based MSC, BSC, and CDR components, such as network cards located in centralized MSCs. '414 Patent, Cover, 1:35-48 (noting high cost of providing centralized MSCs); *Chicago Bd. Options Exch., Inc. v. Int'l Sec. Exch., LLC*, 677 F.3d 1361, 1372 (Fed. Cir. 2012) (where a patent repeatedly notes the “inadequacies” and “deficiencies” of conventional technology and proposes a remedy for the deficiencies, it “reasonably may be viewed as a disavowal of that subject matter.”) (citation omitted). Thus, the Challenged Claim requires MSC,

BSC, and CDR functionality implemented as software, not through hardware, such as network cards. Cooklev Decl., ¶¶133, 43.

2. Waylett’s Hardware-Based NIB Does Not Include the Claimed Computer Readable Storage Medium and Embedded Functionality

Waylett’s NIB does not include a computer readable storage medium with embedded MSC, BSC, and CDR functionality, as recited in Claim 21. Petitioners contend that a POSITA would have understood that Waylett’s NIBs 224 “includes these modules on its computer readable storage medium,” but provides no evidence supporting this position, and Petitioners’ expert testimony is not helpful because it simply parrots what the Petition says. Pet., 78; Ex. 1003, ¶223.

Instead, the record evidence demonstrates that Waylett’s NIB operates based on the classic, hardware-based network-appliance approach, with the various network functions being implemented using network cards 140 (shown in red below), not software. Ex. 1006, 8:7-32, 9:32-46, Fig. 2; Ex. 2013, 1; Cooklev Decl., ¶¶134-135.

Waylett's NIB

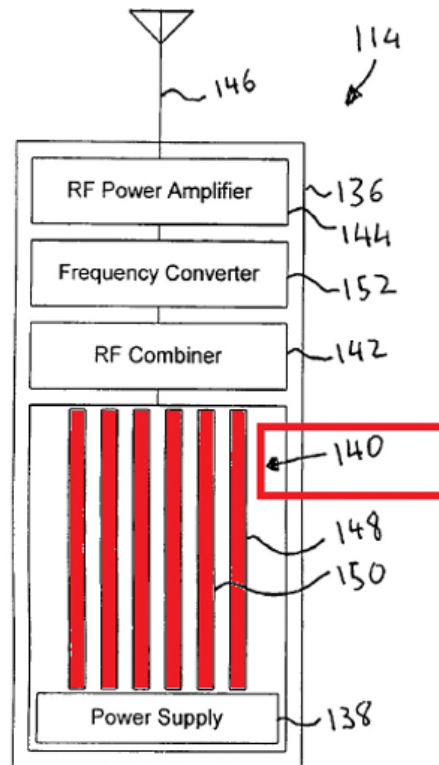


FIG. 2

Cooklev Decl., ¶135 (Ex. 1006, Fig 2 (annotated) (disclosing that the NIB depends on network cards)). Waylett's NIB platform with network cards is depicted below:



Ex. 2012. Accordingly, Waylett does not disclose embedding MSC, BSC, or CDR functionalities into a computer readable medium, as required by Claim 21, because, like traditional networks systems, those functions are implemented in network-card hardware. Cooklev Decl., ¶¶135, 71.

Waylett also does not inherently disclose the claimed computer readable storage medium. Petitioners contends that Waylett's NIB includes multiple processors and a POSITA would have understood that "processors necessarily include 'computer readable storage medium' to store the instructions operable on the processors." Pet., 61 (citing Ex. 1006, 8:10-27, Ex. 1003, ¶177). "Inherency,

however, may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient.” *Cont’l Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991); *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed. Cir. 2002) (“Inheren[cy] . . . requires that the missing descriptive material is ‘necessarily present,’ not merely probably or possibly present, in the prior art.”). Here, Petitioners fail to show that software for implementing MSC, BSC, and CDR functionality is necessarily embedded in computer-readable medium in the NIB.

To the contrary, consistent with the then-conventional hardware-based paradigm, Waylett’s MSC and BSC are implemented in hardware network cards, not in software. Ex. 1006, 8:7-36, Fig. 2; Ex. 2013. Cooklev Decl., ¶¶129-136, 43, 71. Therefore, Waylett does not inherently disclose software-based MSC, BSC, or CDR functionality embedded in a computer readable medium.

VII. SECONDARY CONSIDERATIONS DEMONSTRATE THE CLAIMS ARE NOT OBVIOUS

The objective indicia evidence demonstrates that the Challenged Claims are not obvious in view of Mauer and Waylett. Objective evidence “must always when present be considered,” because such evidence “may often be the most probative and cogent evidence in the record.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012) (internal quotations

and citation omitted). Objective indicia “guard against slipping into use of hindsight.” *Graham v. John Deere Co.*, 383 U.S. 1, 36 (1966) (citation omitted).

Objective indicia can include, for example, commercial success, industry praise, long felt but unsolved needs, failure of others and unexpected results. *Apple Inc. v. Samsung Electronics Co., Ltd.*, 839 F.3d 1034, 1052 (Fed. Cir. 2016) (citing *Graham*, 383 U.S. at 86). “[A] court need not find that all factors are present to determine that the objective considerations support a finding of nonobviousness.” *Amgen Inc. v. Sandoz Inc.*, 66 F.4th 952, 963 (Fed. Cir. 2023) (citations omitted). Here, the objective indicia include the long-felt but unresolved need for low-cost distributed architecture and industry praise for Lemko’s commercial Node1 resolving such need.

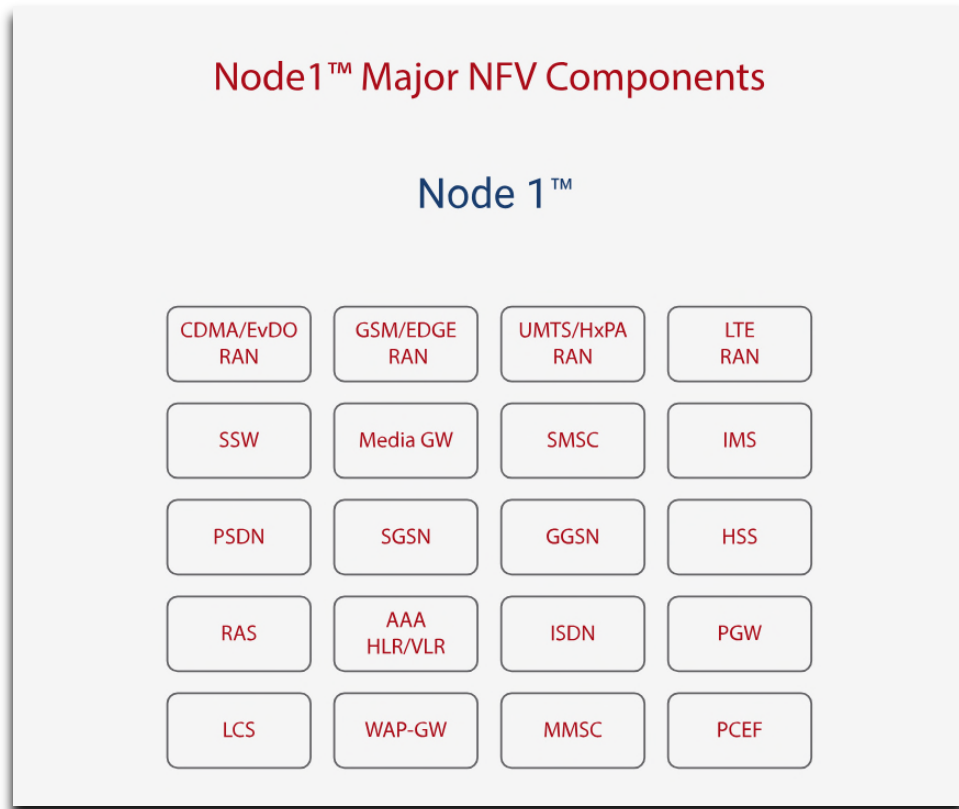
A. Lemko’s Commercial Node1 Product Practices the Challenged Claims, Establishing Nexus

In order “[f]or objective evidence of secondary considerations to be relevant, there must be a nexus between the merits of the claimed invention and the objective evidence.” *Volvo Penta of the Ams., LLC v. Brunswick Corp.*, 81 F.4th 1202, 1210 (Fed. Cir. 2023) (citation omitted). Where that “evidence is a direct result of the unique characteristics of the claimed invention” a nexus exists. *Id.* This is the case here.

As discussed in Section II.B, above, the Challenged Claims are based on distributed mobile architecture systems that allow for communications to be routed

locally as opposed to a centralized hub. '414 Patent, 4:28-60, Claim 1, 7:56-59 (each DMA system includes a DMA server). Particularly, each DMA system includes its own MSC, BSC, HLR, VLR, and CLR controlling logic to route calls in a distributed fashion amongst one another. *See* § II.B, *supra*; '414 Patent, Fig. 3 (depicting controlling-logic functionality implemented on DMA system's computer readable medium).

Lemko's commercial Node1 product, which is the subject of the secondary considerations discussed below, embodies the claimed DMA system of the '414 Patent, and includes MSC, BSC, HLR, VLR, CLR controlling logic that enable the distributed mobile architecture (referred to as network function virtualization or "NFV"):



Compare Ex. 2011, 2 (listing modules within the Node1 product) with '414 Patent, Fig. 3 (listing the same functional components running on the DMA system; Cooklev Decl., ¶¶140-141.

Through the NFV functionality, Lemko's commercial Node1 "delivers a cost efficient mobile solution for rural and remote low population areas," which "replaces the switch (MSC) and base station controller / radio network controller (BSC/RNC) with an IP-interconnected software control system.":

Lemko delivers a cost efficient mobile solution for rural and remote low population areas by utilizing DMA. The system replaces the switch (MSC) and base station controller/radio network controller (BSC/RNC) with an IP-interconnected software controlled system. The DMA can

be used in a variety of applications. These include standard cellular coverage in areas where no coverage exists, wireless local loop in rural locations, and campus wide communication.

Ex. 2037, § 1.2, § 3.7-3.9 (describing Node1's CLR and VLR functionality); Ex. 2038 (depicting Node1's DPR functionality); Pan Decl., ¶19; Cooklev Decl., ¶142. In this way, "Node1 provides a complete cellular network at every cell cite," by "performing all switching, control, authentication and even billing record creation at each cell cite." Ex. 2039, 1; Pan Decl., ¶25; Cooklev Decl., ¶142.

In so doing, Lemko's NFV functionality creates distributed networks with HLR, VLR, CLR databases that "enables a customer to create a virtualized network with multiple deployments with its Nodes." Ex. 2009, 1. "A big part of [Lemko's] secret sauce is the way [it] handles the database," particularly by connecting the Nodes as a mesh to distribute the database information. *Id.*, 2. This corresponds to the distribution of the routing functionality and the CLR and DPR in order to enable routing calls locally and outside the DMA network, as required by the Challenged Claims. Pan Decl., ¶20; Cooklev Decl., ¶¶143, 55-59; '414 Patent, 4:53-56 (describing the HLR and VLR are "distributed equally and fully among all the DMAs), 6:20-23 (discussing implementing functionality including call routing in software located at the DMA systems), 7:60-8:2 (same), 5:37-54 (discussing routing a call between two UEs between different DMA systems in the same DMA network locally without the need to traverse expensive backhaul connections), Claim 1. In

particular, the Node1s within a DMA network communicate with each other using IP-based peer-to-peer connections. Ex. 2037, § 5.7.2 (showing list of peers for connection over IP network); Cooklev Decl., ¶¶143, 60-70. Thus, the Node1 embodies and has a nexus to the inventions of the Challenged Claims.

B. Lemko’s Claimed DMA Solution Resolved a Long-Felt Need For Low Cost Distributed Architecture

Lemko’s claimed DMA solution, as embodied in the Node1, solved the long-felt problem of providing a low-cost distributed architecture, capable of providing mobile networks in environments where the cost of conventional network architectures and backhaul was prohibitive. Such “[e]vidence of a long felt but unresolved need tends to show non-obviousness because it is reasonable to infer that the need would have not persisted had the solution been obvious.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1332 (Fed. Cir. 2016).

By at least 2000, there was a recognized need for a low-cost distributed network architecture that reduces the deployment cost associated with centralized, hierarchical architectures. This was especially a problem for rural and low population density environments as the hardware implementation of centralized MSCs, BSCs, and HLR/VLR cost over \$2.0 million. ’414 Patent, 1:35-39; Ex. 2040, 2 (noting that in the late 1990s, there was a need for telecommunication services in rural areas); Ex. 2042, 25 (noting that in 2000, there was a need for extending network coverage to rural areas), 25 (a main technology need is for “low cost

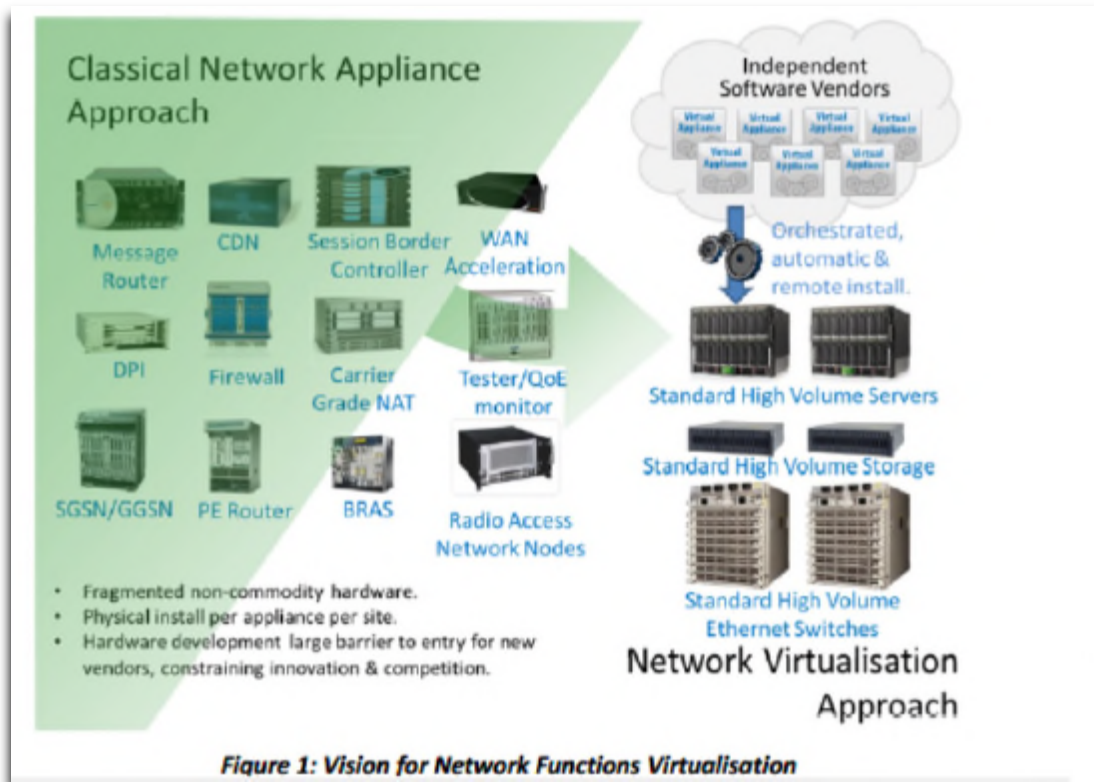
devices”), 29 (“There is a strong motivator for work in developing lost-cost intermittent networking devices”), 32 (“[T]he need for network infrastructure” for developing countries and rural areas); Pan Decl., ¶21; Cooklev Decl., ¶¶144-145.

In the centralized, hierarchical architecture, routing required expensive backhaul T1/E1 connections to centralized MSCs, even when the callers on both sides of the call were being serviced by the same tower (BTS) or by nearby BTSs. While Waylett recognized this industry need, it offered a hardware-based approach that did not resolve the problem. Ex. 1006, 1:34-2:13; Cooklev Decl., ¶¶146, 71-72; Pan Decl., ¶22. Specifically, as discussed in Section III(A), Waylett is directed to a network-in-a-box (NIB), such as the WAVEXpress NIB platform, that located certain hardware-based components in a single enclosure. Ex. 1006, 8:7-17, 9:36-42 (explaining that embodiments are based upon WAVEXpress’s NIB platform). Waylett depended on a network-card hardware-based solution. Section III(A); Cooklev Decl., ¶¶146, 71-72 (citing Ex. 2012, 1); Ex. 1006, Fig. 2, 8:7-36 (disclosing that NIB uses network cards), Ex. 1006, 9:32-46. Waylett’s NIBs transfer call data using the standard, expensive backhaul circuit-switch T1/E1 communication lines. Ex. 2013, 1 (NIB communicates “over E1 or T1 timeslot or Ethernet”); Ex. 2014, 1 (NIB has up to 256 E1 ports); Ex. 1006, 7:9-11, 8:33-36 (E1/T1 trunks contained in cards).

Waylett's hardware-based approach did not provide a solution to the industry's need. In 2012, the industry published a whitepaper entitled "Network Functions Virtualisation" (the "NFV Paper"), reemphasizing the need to transform from a classical hardware-based approach (exemplified by Waylett) to a network functions virtualization (NFV) approach given the drawbacks associated with the classical approach. Ex. 2008, 3, 5 (listing cost, network service deployment, and integration and operation difficulty). The NFV Paper was co-authored by representatives from major telecommunications organizations, including AT&T, BT, CenturyLink, China Mobile, Deutsche Teleko, NTT, Verizon, and others. Ex. 2008, 1. Specifically, the NFV approach called for a consolidation of hardware network components onto software:

It involves the implementation of network functions in software that can run on a range of industry standard server hardware, and that can be moved to, or instantiated in, various locations in the network as required, without the need for installation of new equipment.

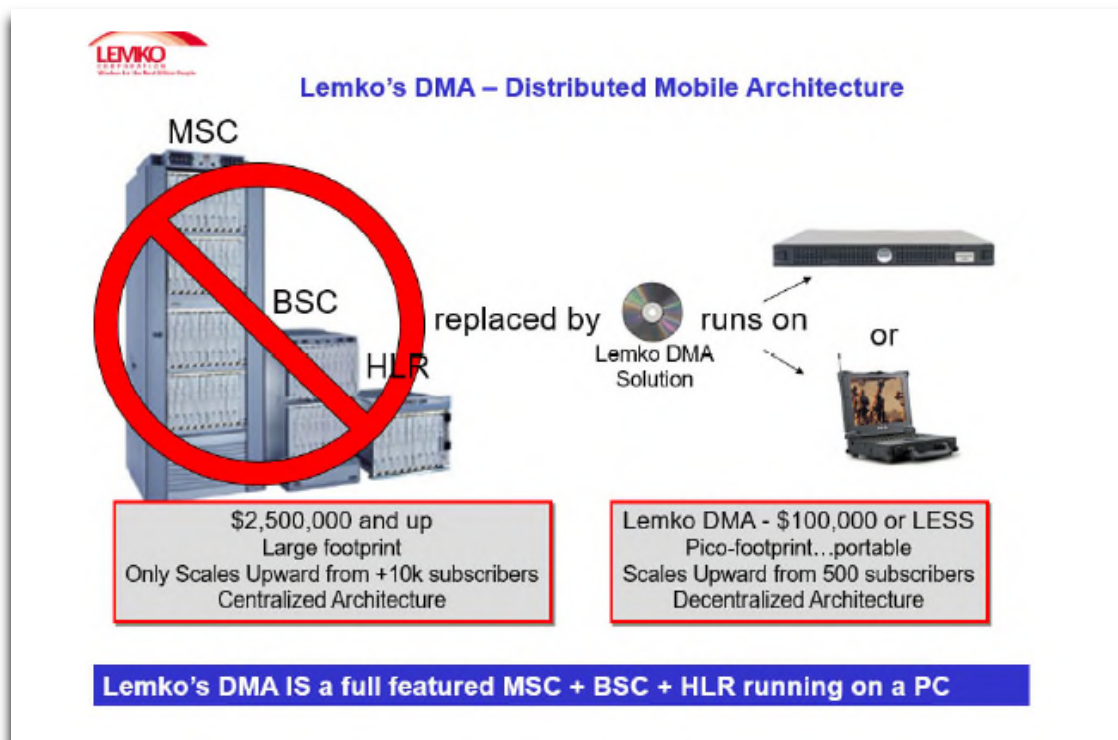
Ex. 2008, 5. This implementation is demonstrated in the figure below:



Ex. 2008, 5; Pan Decl., ¶¶23-24.

As discussed above, Lemko's claimed DMA system, as embodied by Lemko's commercial Node1, presents such an NFV approach. In fact, Lemko "developed Network Functions Virtualization (NFV) before that term was coined," as its DMA systems/Node1 products included "software [that] enables all of [the] core network functions, databases and gateways." Ex. 2009, 1; Cooklev Decl., ¶¶147-148, 43. Lemko's Node1 thus provided a far more cost-effective approach that scaled economically for deploying in rural areas. Pan Decl., ¶¶25-26; Ex. 2039, 1 (2009 press release: "Lemko Corporation is pleased to announce the first commercially available 4G Core Network Solution, Node1™. Node1 delivers the all

IP, packet-switched solution defined by the industry for next generation mobile networks. The software definable network solution eliminates backhaul, meaning that Node1 provides a complete cellular network at every cell site. Lemko's Node1 eliminates backhaul by performing all switching, control, authentication and even billing record creation at each cell site.”).



Ex. 2001, ¶¶54-55 (showing that Lemko's Node1 solution provided a decentralize architecture that cost \$100,000 or less and economically scaled with as few as 500 customers). The ability of Lemko's Node1 to solve this long-felt need was directly tied to its distributed mobile architecture and ability to route calls locally within the DMA network by distributing CLR, HLR, and DPR data at the Node1, directly corresponding to the Challenged Claims. Cooklev Decl., ¶148.

Accordingly, Lemko's claimed DMA systems/commercial Node1 products resolved the industry need for a low-cost distributed architecture.

C. The Industry Praised Lemko's Commercial Node1 Products, Which Achieved Commercial Success

The industry and Lemko's customers praised Lemko's claimed DMA solution and commercial Node1 products. Such appreciation from competitors as well as contemporaries skilled in the field of the invention provides significant evidence of nonobviousness. *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1053 (Fed. Cir. 2016) (praise from any "[i]ndustry participant[]" "weighs against an assertion that the same claimed invention would have been obvious" because they "are not likely to praise an obvious advance over the known art."); *Vulcan Eng'g Co. v. Fata Aluminium, Inc.*, 278 F.3d 1366, 1373 (Fed. Cir. 2002) ("Appreciation by contemporaries skilled in the field of the invention is a useful indicator of whether the invention would have been obvious to such persons at the time it was made.") (citation omitted).

AT&T, one of the leading telecommunications providers, praised Lemko's Node1 product and its claimed DMA solution. In 2013, AT&T and Lemko had a series of meetings during which AT&T investigated Lemko's technology (with other 70 participants from AT&T), including AT&T's Assistant Vice President and co-author of the 2012 NFV Paper, Margaret Chiosi. Pan Decl., ¶¶28-30. After observing a demonstration of Lemko's Node1 product, Ms. Chiosi stated that Lemko

had solved the problems addressed in her 2012 NFV Paper and provided a copy of the paper to Lemko. In an email to Lemko, Ms. Chiosi described Lemko's Node1/DMA solution as "a radical design" that AT&T "should look at." Ex. 2008, 1; Ex. 2043, 1. Lemko's email correspondence with AT&T shows that AT&T was focused on the "unique differentiators of Lemko's distributed mobile wireless network solution," include "peer-to-peer communications," "independent nodes that all act like one network," and software based network functionality. Ex. 2044, 1-2; Pan Decl., ¶30.

In *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Contractors USA, Inc.*, 617 F.3d 1296 (Fed. Cir. 2010), the Federal Circuit held that a statement that an invention was "a 'radical departure' from conventional systems" presented "significant objective evidence of nonobviousness." *Id.*, 1304. Thus, Ms. Chiosi's similar contemporaneous characterization of Lemko's Node1 as "a radical design," should be entitled to significant weight. Ex. 2043, 1.

Lemko's customers praised Lemko's Node1 products as providing the only and best solution for their needs, further confirming the non-obviousness of Lemko's Challenged Claims. For instance, TelAlaska sought a solution for providing cellular services to its customers in remote regions of Alaska, where it was too costly to do so using conventional network technologies. Pan Decl., ¶¶31-35. Lemko's Node1 solution met this need as it can be deployed in remote areas given its IP software

solution that “distributes the core functions of a cellular system,” and did not require extensive use of backhaul to connect calls within the same area. Ex. 2045, 2; Ex. 2049, 1. TelAlaska successfully deployed Lemko’s technology in 2009, where it has continued to operate for nearly 15 years, and praised Lemko as having “***the only solution that met our business needs and challenges***” and continued their “***tradition of innovation and excellence in communication.***” Pan Decl., ¶33; Ex. 2045, 2 (David Goggins, President of TelAlaska: “Lemko’s Solution has helped us to provide a dependable and affordable cellular service to our customers in the state of Alaska including many remote towns. The reliability of the Lemko solution is critical as many of our sites are in remote areas where travel is expensive and weather dependent”).

Lemko’s customer Kuhkenah Network (K-Net) provided similar praise. Like TelAlaska, K-Net needed to provide cellular services to remote areas in Ontario, Canada. Pan Decl., ¶¶36-37. K-Net has successfully utilized Lemko’s Node1 solution for over 14 years, praising it as “bringing our community the **best wireless network technology choice in 2009.**” Ex. 2050, 1. K-Net specifically praised Lemko’s distributed architecture. Ex. 2046, 2 (“Lemko’s distributed architecture enabled us to upgrade the network from 2G to 3G with zero disruption to the service to the customers”). Other Lemko customers, including Bristol Bay Cellular, the island of Niue, ADAK Eagle (operating in a remote island in Alaska), Globe Internet

(in Malawi), Glocall Telecoms (in Mogadishu), Dryden Municipal Telephone System (Ontario), and the Republic of Kiribati have successfully deployed and praised Lemko's technology. Exs. 2045-2052; Pan Decl., ¶38. This commercial success and praise from industry and customers further demonstrates the value and non-obviousness of the Challenged Claims. Cooklev Decl., ¶¶150-153

VIII. CONCLUSION

For all of these reasons, Petitioners have not shown by a preponderance of evidence that the Challenged Claims of the '414 Patent are unpatentable and the patentability of claims 1-8, 11-16, and 21 should be confirmed.

Respectfully submitted,

Dated: December 21, 2023

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CERTIFICATE OF COMPLIANCE WITH 37 C.F.R. § 42.24

The undersigned hereby certifies that the portions of the foregoing
PATENT OWNER RESPONSE specified in 37 C.F.R. § 42.24 has 13,989 words
in compliance with the 14,000-word limit set forth in 37 C.F.R. § 42.24(b)(2). This
word count was prepared using the Microsoft Word word-processing system used
to prepare this paper.

Dated: December 21, 2023

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CERTIFICATE OF SERVICE

The undersigned certifies, in accordance with 37 C.F.R. § 42.6(e), and pursuant to agreement by the parties that filing with the Board through the Patent Trial and Appeal Case Tracking System (P-TACTS) constitutes electronic service, that service was made on the Petitioners as detailed below.

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