

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MICROSOFT CORPORATION AND AFFIRMED NETWORKS, INC.,
Petitioners,

v.

LEMKO CORPORATION,
Patent Owner.

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

PATENT OWNER'S PRELIMINARY RESPONSE

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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" (May 31, 2006)
2003	Wikipedia, "Mobile switching centre server"
2004	Techopedia.com, "What is a Base Station Controller?" (Oct. 19, 2011)
2005	Metin UZAR Blog Post, "Base Station Controller (BSC)" (Sept. 19, 2009)
2006	Image of Motorola BSC
2007	Electronics-notes.com, "Cellular / Mobile Backhaul"
2008	Network Functions Virtualisation - Introductory White Paper (Oct. 2012)
2009	Dyton, J. "Lemko solutions keep connectivity alive regardless of the circumstances" (July 16, 2020)
2010	Lemko.com, distributed Mobile Architecture™ (dMA™) Overview
2011	Lemko.com, Lemko's Fundamental Architecture
2012	The Wayback Machine - InterWAVE, GSM/GPRS Products
2013	InterWAVE, WAVEXpress GSM Network In-A-Box (NIB) Datasheet (June 2003)
2014	InterWAVE, WAVEXchange II Datasheet (Oct. 2002)
2015	Microsoft Computer Dictionary, Page 68 (5th ed. 2002), definition for "distributed network"
2016	Merriam-Webster Dictionary, definition for "distributed" (June 27, 2023)

I. INTRODUCTION

Lemko's Distributed Mobile Architecture ("DMA") represented a significant paradigm shift in cellular networks. Unlike conventional networks, Lemko's DMA networks include DMA systems that communicate with each other over peer-to-peer ("P2P") connections, forming a decentralized network in which individual DMA systems communicate with each other directly instead of relying on a centralized data center to manage traffic.

In 2006, when Lemko filed the '414 Patent, then-conventional cellular networks were based on circuit-switched networks with a centralized, hierarchical architecture. All calls were carried from cell towers to regional call centers over expensive backhaul connections. The regional call centers relied on stacks of custom hardware to manage and route calls for an entire region. The cell towers had no functionality for managing and routing calls since that capacity was located in the regional call centers. This approach had many disadvantages, including the need for expensive backhaul to and from regional call centers, even when the two parties to a phone call were in the same area, because the cell towers could not manage or connect calls without the regional call centers.

The Board should deny *inter partes* review because Lemko's Distributed Mobile Architecture ("DMA") bears no resemblance to the legacy communications

networks disclosed in Mauer and Waylett.¹ Waylett's "network-in-a-box" ("NIB") is not a DMA server and plays no role in anything resembling the '414 Patent's decentralized "distributed mobile architecture." While the NIB packages several components of a legacy communications network installation into a single enclosure, it connects to (and operates within) an existing legacy communications network in the same way as a typical network installation. It does not use P2P 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 network and a wireless network, does not cure Waylett's deficiencies because neither of these conventional networks resembles a DMA server or a DMA network.

Because the concept of a DMA is missing from the art of record, Petitioners struggle to identify in the cited art aspects of the claims that only make sense in the context of the DMA. For example, each of the Challenged Claims recites a destination preference register ("DPR"), which establishes a preferred path for calls being routed from the DMA network to a destination "external" to the DMA

¹ Microsoft Corporation and Affirmed Networks, LLC ("Petitioners") petitioned for *inter partes* review (IPR) of U.S. Patent No. 7,653,414 (Ex. 1001, the "'414 Patent"), challenging claims 1-8, 11-16, and 21 ("the Challenged Claims").

network. But because Waylett and Mauer do not disclose a DMA network, they do not disclose anything resembling a DPR for routing calls outside of such a network. Similarly, the references are silent with respect to the claimed “community location registers” (“CLRs”), which contain information about UEs subscribed to other DMA servers of the same DMA network.

Thus, the Petition should be denied for failure to establish a reasonable likelihood of success as to any Challenged Claim.

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

When Lemko filed the '414 Patent, conventional networks were hierarchical because each cell tower (also known as a “base transceiver station” or “BTS”) connects to a single Base Station Controller (“BSC”), which connects to a centralized mobile switching center (“MSC”) that routes calls. See '414 Patent at 1:34-47. Cell towers did not communicate directly with other cell towers, and BSCs did not communicate directly with other BSCs. Ex. 2001 (“Declaration of Todor Cooklev, Ph.D., “Cooklev Decl.”), ¶¶ 44-46.

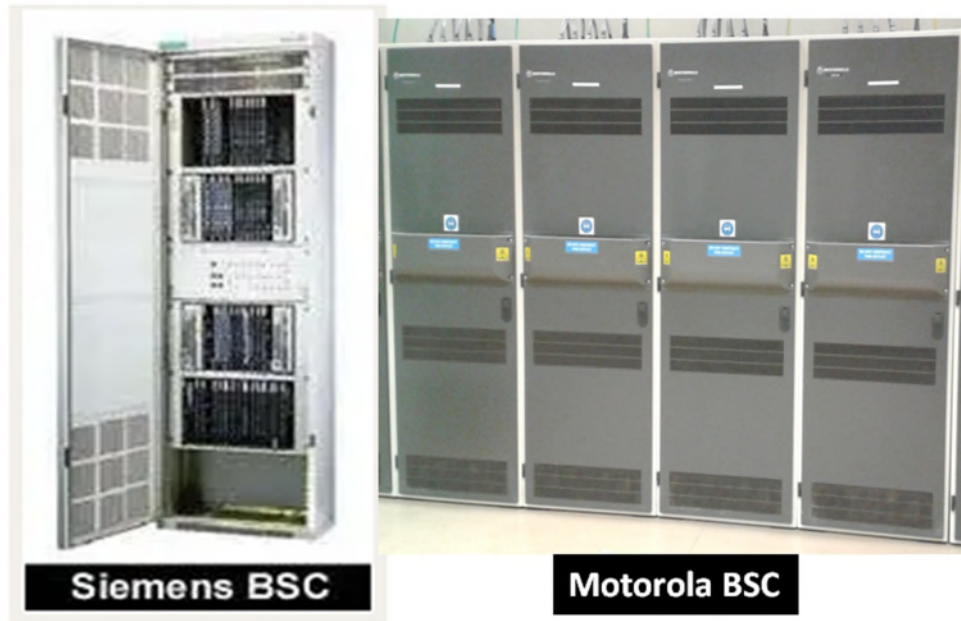
These conventional networks were also hardware-based. The MSCs were housed at large Digital Signal Processor (DSP) equipment server centers, shown in the photograph below, where the MSCs relied on stacks of DSP equipment servers

and provided the call processing functionality for the networks, including switching functions, call set-up, call termination, and routing. *See* Ex. 2002.



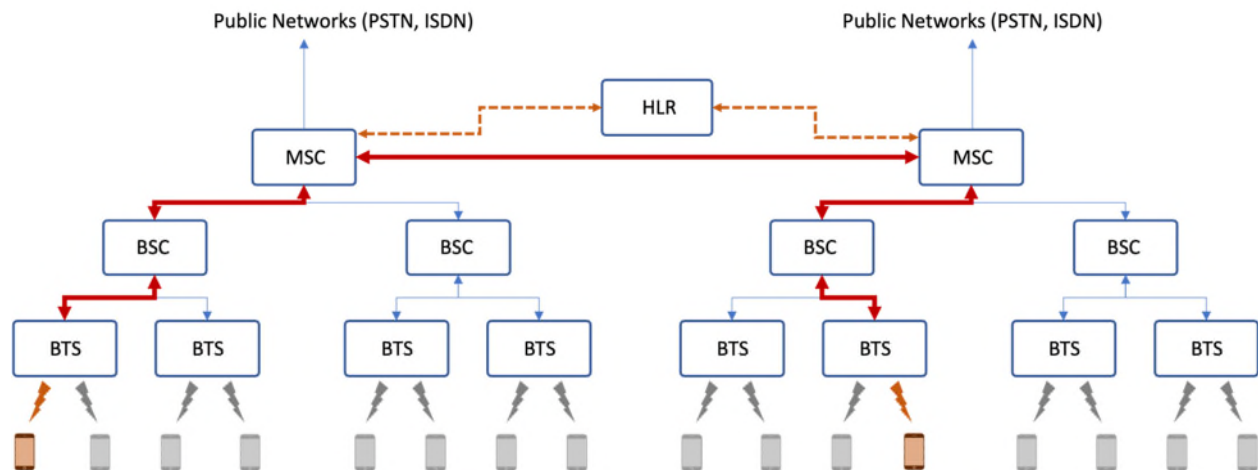
Id.; *see also* Ex. 2003.

The BSC (shown in the photograph below) connected a BTS (cell site) to the MSC through a “backhaul” connection. Ex. 2004; Cooklev Decl., ¶ 46.



See Ex. 2005 at 1; Ex.2006; Cooklev Decl., ¶ 46.

The following figure shows the hierarchical structure of these conventional networks.



Cooklev Decl., ¶ 47. In these conventional networks, the backhaul connections used T1/E1 communication lines. See Ex. 2007 at 2 (explaining that “E1/T1 systems were

widely used in telecommunications when 2G technologies including GSM were being rolled out and deployed.”).²

To place a call between two cell phones or other mobile devices (conventionally called “user equipment” or “UE”) on two different networks, call data are routed from (1) an originating UE, (2) to a BTS, (3) to a BSC, (4) to an MSC, (5) to the MSC for the second network, (6) to a BSC, (7) to a BTS, (8) to the receiving UE. This path is shown in red in the schematic diagram above. The BTS to UE connections are wireless radio connections. The other connections in this path are circuit-switched T1/E1 connections.³ Thus, for two UEs to communicate, the

² “T1/E1” refers to a telecommunications standard that is either the T1 or E1 digital transmission formats. Both T1 and E1 were developed in the 1960s and provide dedicated connections between two fixed points, with “real time” (less than 1 micro second) communications. Cooklev Decl., ¶ 47.

³ “Circuit switched” connections establish a dedicated communication path between two devices for the duration of a session. Cooklev Decl., ¶ 48. In contrast, IP networks transmit data in small packets that travel independently over a network and are dynamically routed, which can cause time delays for the message delivery, especially if the network is congested.

call data are routed to centralized MSCs (stored at centralized server locations) of the public networks using the T1/E1 communication lines. Cooklev Decl., ¶ 48.

This hierarchical, hardware paradigm had several drawbacks. Such networks were expensive to deploy because they require large amounts of space, power, and hardware resources to accommodate the stacks of servers. The rigid, hardware-based approach made it difficult to integrate and operate the dedicated hardware appliances. *See* Ex. 2008 at 5 (stating the difficulty in “integrat[ing] and operat[ing] increasingly complex hardware-based appliances.”). In addition, this centralized, hierarchical network structure required all calls to traverse expensive backhaul connections, even when both UEs were connecting to the same BTS or BTSs in close proximity. Cooklev Decl., ¶ 49.

In 2012, a broad coalition of network operators published a whitepaper detailing these problems. *See* Ex.2008. Entitled “Network Functions Virtualisation” (the “NFV Paper”), the paper proposed a network virtualization approach to address these drawbacks, mirroring the solutions Lemko invented seven years earlier. The NFV Paper’s approach is based on the 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.

See id. at 5; Cooklev Decl., ¶ 50.

As shown in the excerpt below, the 2012 NFV Paper contrasted its proposed approach against the “Classical Network Appliance Approach.” Ex. 2008 at 5. The NFV Paper noted many drawbacks of the classical approach, including that it (1) depended on “[f]ragmented non-commodity hardware,” (2) required physical installation of appliances at every site, and (3) its hardware requirements made the networks rigid and inflexible, which constrained innovation. *Id.*

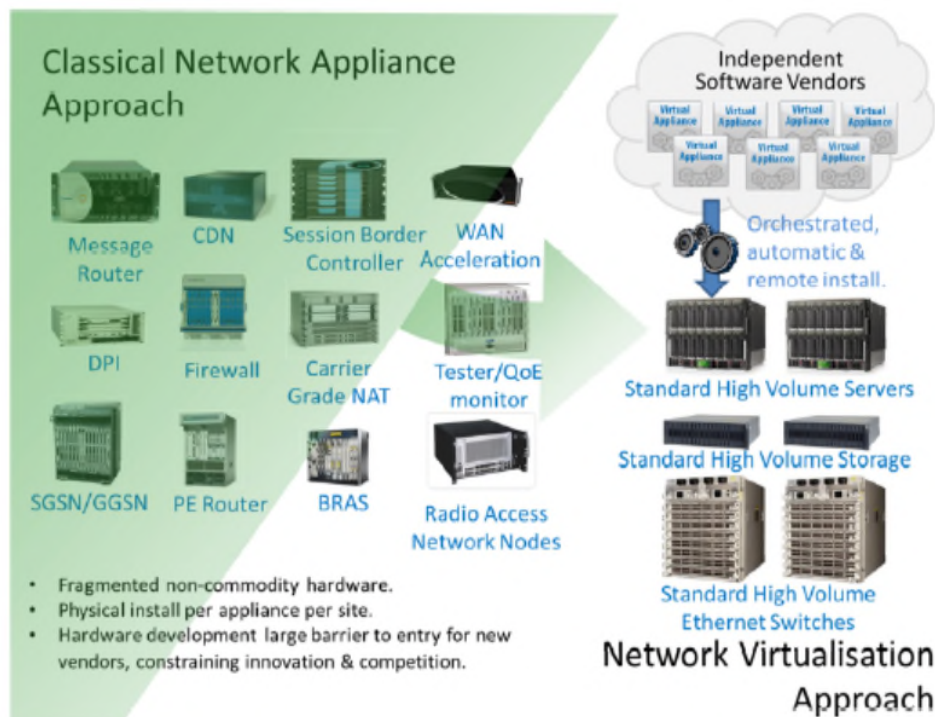


Figure 1: Vision for Network Functions Virtualisation

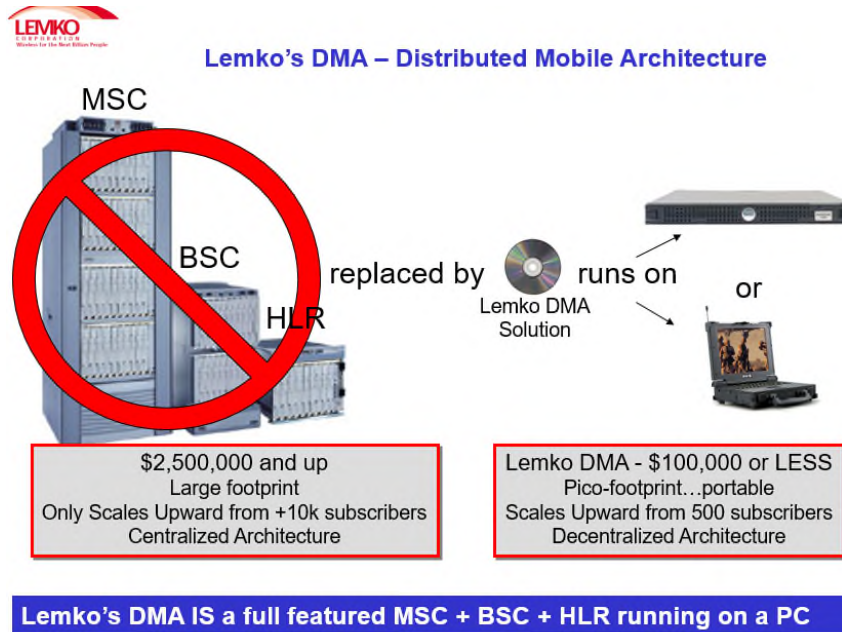
Id.; Cooklev Decl., ¶ 51.

B. Lemko's Patented DMA Technology Solved the Industry's Long-Felt Need

Lemko's approach was fundamentally different, being based on a software-implemented, decentralized, peer-to-peer network paradigm. Instead of cell towers that served only as a conduit to the backhaul leading to and from regional call centers, Lemko's claimed distributed mobile architecture ("DMA") network is based on software-based DMA servers (or DMAS), which are connected to form a peer-to-peer DMA network. Each DMAS has local cellular network management functionality that allows for calls to be connected without the centralized servers of a regional call center. Cooklev Decl., ¶ 52.

Six years before the industry proposed solutions for its long-felt needs in the NPV Paper, Lemko filed the application that led to the '414 Patent. Lemko had already solved these needs with its innovative distributed mobile architecture (DMA) infrastructure, which creates a virtualized network. Ex. 2009 at 1 ("to enable distributed networks with a database that enables a customer to create a virtualized network with multiple deployments with its Nodes."). Indeed, Lemko "developed Network Functions Virtualization (NFV) before that term was coined" because its "software enables all of core network functions, databases and gateways." *Id.*; Cooklev Decl., ¶ 53.

Specifically, Lemko's DMA implements network functionality, such as MSC, BSC, community location register ("CLR"), and home location register ("HLR") functionality, on software running on a decentralized, standard server.

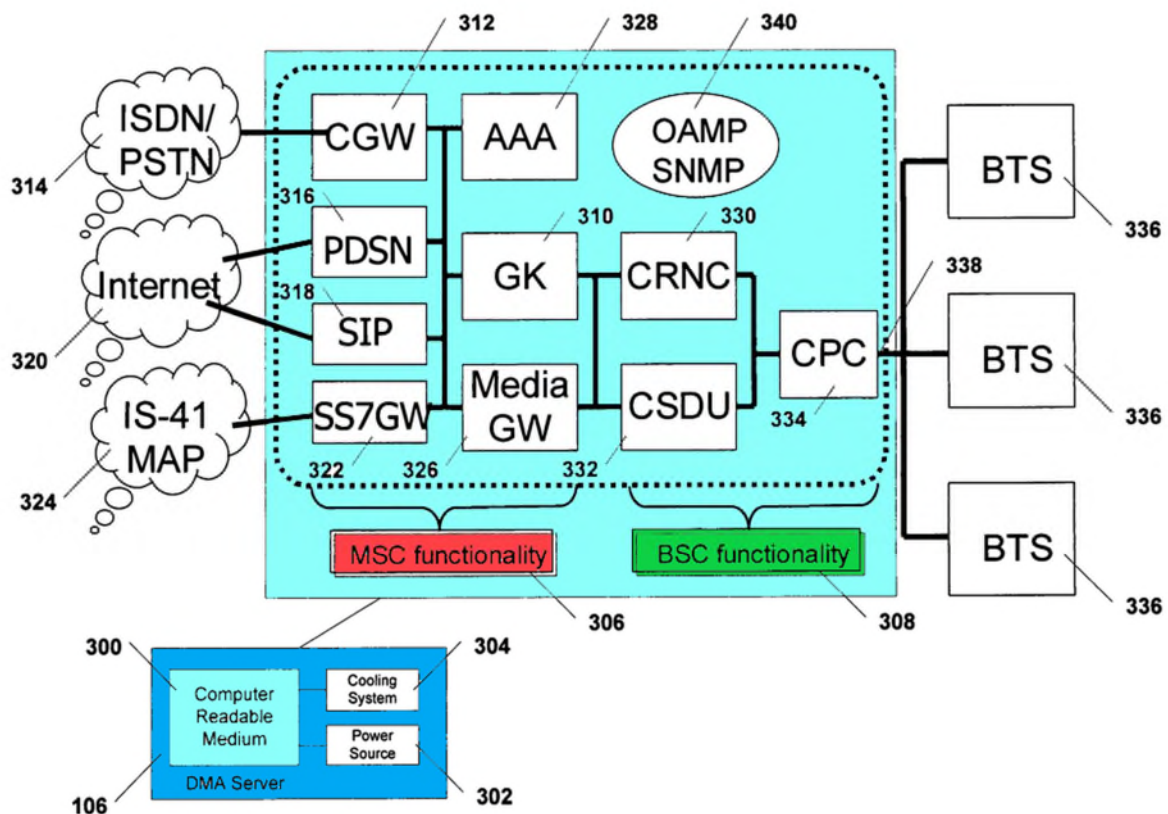


Cooklev Decl., ¶ 54-55 (citing a demonstrative excerpt from a Lemko presentation); Ex. 2010 ("[T]he heart of DMA is an all-IP software solution," including the network functionality of an MSC, BSC, radio network controller (RNC) location registers, and media and data gateways (MSG, GGSN, SGSN); *see also* '414 Patent at Figs. 1-3, 10-20 (depicting the DMA systems of the above figure).

Unlike the conventional network architecture, Lemko's DMA solution implements a virtualized core of network functionality on software running on a standard server to allow "multiple cellular nodes to be linked via IP connections" thereby reducing backhaul via T1/E1 communication lines and eliminating or

reducing the need for a centralized center or hub. Ex. 2010. Lemko developed multiple product lines based on its inventions. See Ex. 2011.

In addition to successfully developing these products, Lemko obtained the '414 Patent (and multiple other patents) to protect various aspects of its novel DMA architecture, providing for complete cellular network functionality embedded in a computer-readable medium. See '414 Patent at Abstract, 5:21-6:4, 6:5-23 7:60-8:2. Specifically, the '414 Patent specification discloses the DMA server (highlighted in light blue) having software (highlighted in blue) including both MSC (highlighted in red) and BSC (highlighted in green) network functionality:



Id. at Figs. 3 (annotated), 13, 15, and 18-20 (depicting the DMA server).

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., ¶ 56-57 (citing Ex. 2009; Ex. 2010). Figure 1 (reproduced below) illustrates that each DMA server is interconnected with other DMA servers in an Internet Protocol (IP) network via peer-to-peer connections. '414 Patent at 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., ¶ 57.

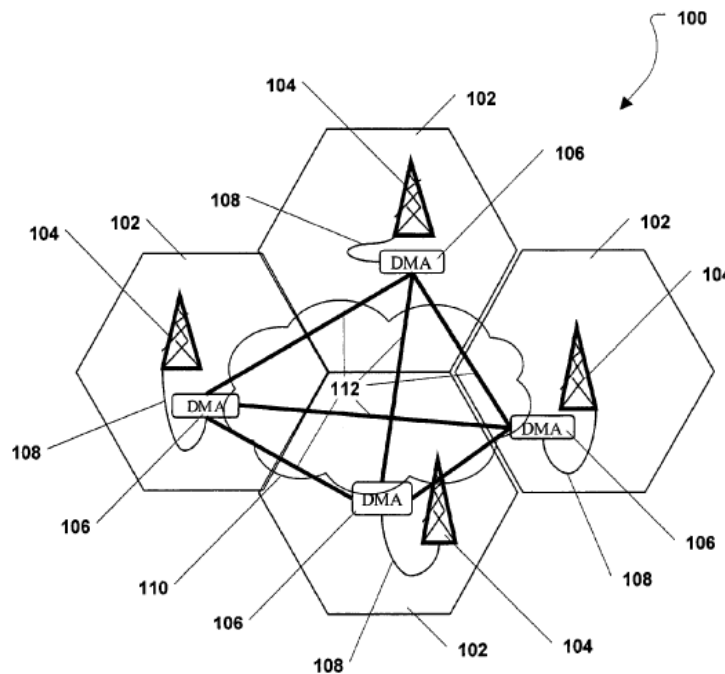
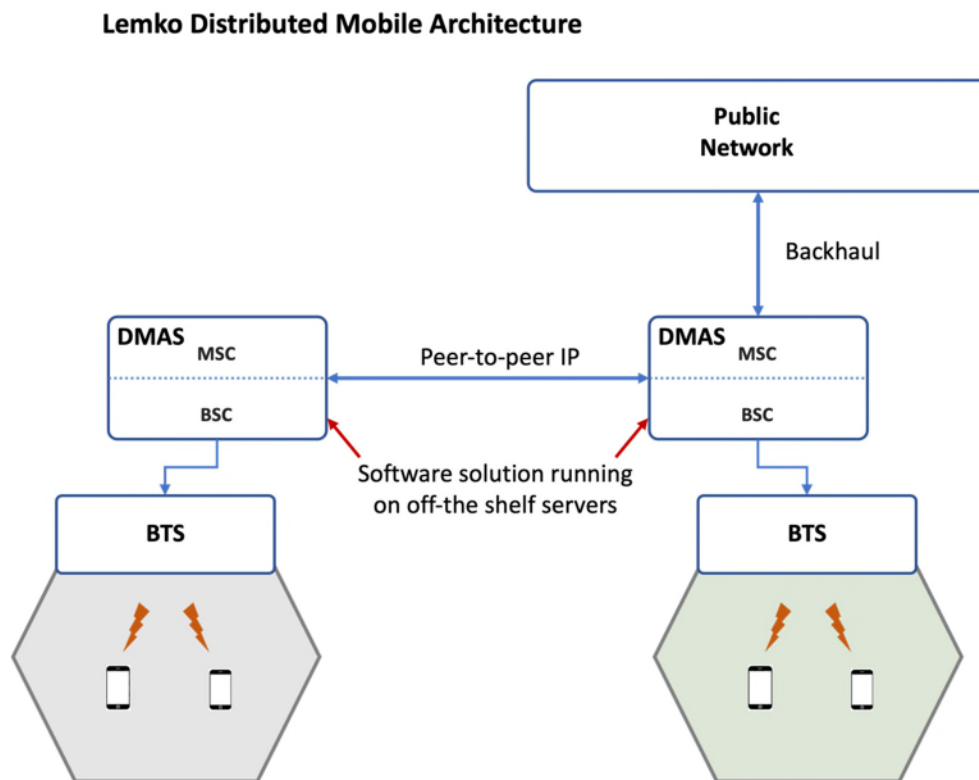


FIG. 1

'414 Patent at Fig. 1. 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, as is shown in an expanded and annotated view of Figure 1 below:



Cooklev Decl., ¶¶ 57-58. In Lemko's 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) to a BTS, (2) to a DMAS, (3) to a second DMAS (by a peer-to-peer IP connection), (4) to a BTS, (5) to the receiving UE.

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 and/or legacy networks. '414 Patent at 5:37-54. If the two UEs are registered to the same DMA system, (e.g., DMA System 202), as reflected in the DMA system's Home Location Register ("HLR"), calls are routed locally via the DMA system. The HLR stores of each DMA system stores information about the mobile subscribers registered with that DMA system. *Id.* at 9:38-42; 10:21-23, 10:35-39.

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.* at 5:41-54. The CLR at each DMA system stores information about mobile subscribers registered with another DMA system within the DMA network. *Id.* at 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.* at 8:3-29.

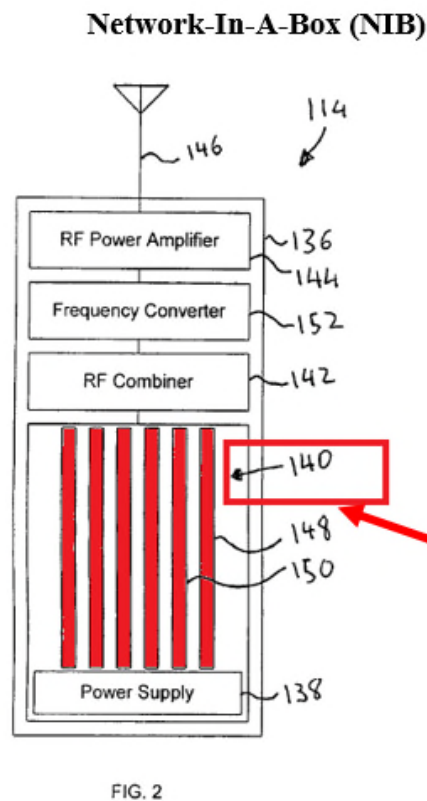
When a mobile subscriber is roaming and enters the coverage area of a new DMA system (*i.e.* a DMA system that it is not subscribed to), it temporarily registers with the DMA system. *Id.* at 5:55-59. Information about the roaming subscriber is stored in the DMA system's Visitor Location Register ("VLR").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

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.* at 8:30-36. “The destination preference register includes a preferred call path for calls to be routed outside of a distributed mobile architecture network that is accessible to the first distributed mobile architecture system.” *Id.* at 2:67-3:4. For example, the DPR may specify that that calls to UEs located outside of the DMA Network should be routed over either a Voice over Internet Protocol (“VoIP”) path, a Mobile Switching Center (“MSC”) path, or an Integrated Services Digital Network (“ISDN”) path. *Id.* at 3:5-9.

C. Waylett is Based on the Conventional Network Approach

Waylett is based on the conventional network appliance approach, which depends on a hierarchical network and hardware-based components. Specifically, Waylett is directed to a network-in-a-box (NIB), such as the WaveExpress NIB platform (reproduced below), that located certain hardware-based components in a single enclosure. Ex. 1006 at 8:7-10, *id.* at 9:36-42 (explaining that embodiments are based upon WaveExpress’s NIB platform). These hardware-based components are referenced as cards 140 (highlighted in red below):

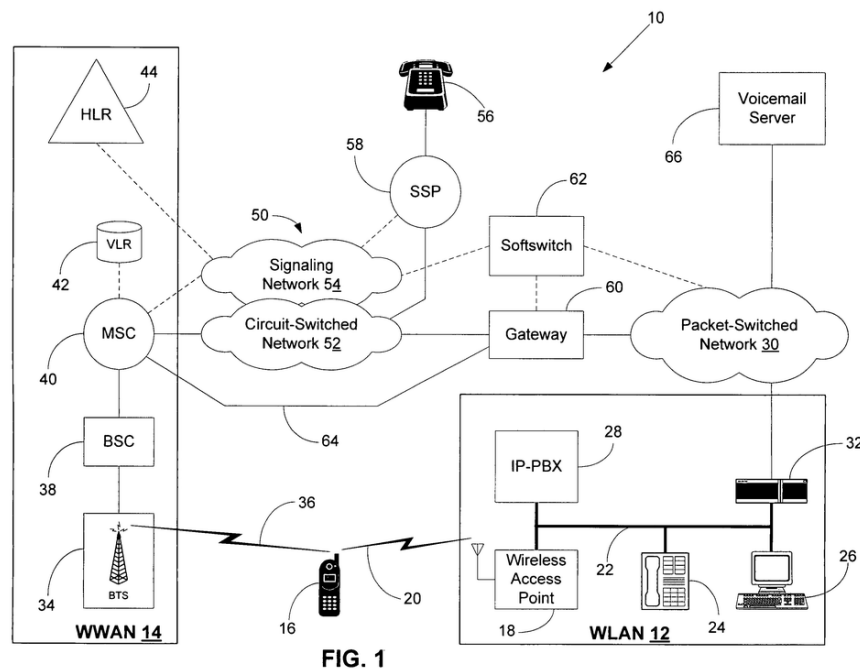


Cooklev Decl., ¶ 65 (citing Ex. 2012 at 1 (annotated)); Ex. 1006 at Fig. 2 (annotated); *see also id.* at 8:7-36 (disclosing that the NIB includes a number of cards), *id.* at 9:32-46.

As Petitioners concede, Waylett does not disclose connecting NIBs through peer-to-peer connections. Instead, Waylett's NIBs transfer call data using the standard backhaul circuit-switch T1/E1 communication lines. *See* Ex. 2013 at 1 (disclosing that the NIB communicates "over E1 or T1 timeslot or Ethernet Port."), Ex. 2014 at 1 (disclosing the NIB has up to 256 E1 ports); Ex. 1006 at 7:9-11, 8:33-36 (disclosing the E1 or T1 trunks contained in cards); Cooklev Decl., ¶ 66.

D. Mauer Also Uses Conventional Cellular and Wireless Networks

Mauer discloses a cellphone that can communicate using multiple types of wireless access technology. Ex. 1005 at 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.* at 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.* at 4:35-53; *see also* Pet. at 9-10.



Id. at Fig. 1.

None of the wireless networks in Mauer constitute DMA systems that are connected to other DMA systems as part of a DMA network, let alone using peer-to-peer connections. The WWAN 14 is a conventional, hierarchical cellular network having BTS, MSC, BSC, HLR, and VLR hardware appliances. And Mauer's WWAN and WLAN networks lack any peer-to-peer connections, and instead are interconnected via a circuit-switched network (52) and packet-switched network (30) by a gateway (60). *Id.* at 7:9-12. Mauer does not disclose or suggest establishing peer-to-peer IP connections between anything resembling DMAs within a mobile network, as recited in the Challenged Claims of the '414 Patent. Cooklev Decl., ¶¶ 67-69.

III. LEVEL OF ORDINARY SKILL IN THE ART

For the purpose of this preliminary response only, Lemko applies Petitioners' definition of a person of ordinary skill in the art ("POSITA") as one with "a bachelor's degree in electrical engineering, computer engineering, or an equivalent, as well as two years of industry experience related to telecommunications networks . . . Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education." Pet. at 3.

IV. CLAIM CONSTRUCTION

A. The Board Should Deny the Petition Because Petitioners Failed to Construe the Key “Distributed Mobile Architecture” Term

The Board should deny the Petition under 37 C.F.R. § 42.104(b)(3)-(4) because Petitioners did not construe the Challenged Claims or identify “[h]ow the construed claim is unpatentable under the statutory grounds.”

Although the phrase is used hundreds of times in the specification and recited multiple times in each Challenged Claim, Petitioners do not take a position on the meaning of the term “distributed mobile architecture.” Pet. at 7. Petitioners do not argue that the term has any plain and ordinary meaning to a POSITA or attempt to explain what that plain meaning might be. *Id.* Petitioners do not argue that the term has a particular meaning in the context of the '414 Patent. *Id.* And Petitioners do not argue that the claims require no express construction. *Id.* Yet Petitioners were obligated to take *at least* one of these paths:

6. Claim Construction: If a petitioner believes that a claim term requires an express construction, the petitioner must include a statement identifying a proposed construction of the particular term and where the intrinsic and/or extrinsic evidence supports that meaning. On the other hand, a petitioner may include a statement that the claim terms require no express construction.

Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019) (“CTPG”) at 44.

The Board should deny the Petition because of Petitioners' failure to address the construction of "distributed mobile architecture," given its importance to the Challenged Claims. *Meta Platforms, Inc. v. Almondnet, Inc.*, No. IPR2022-00929, Paper 7 at 16 (P.T.A.B. Oct. 26, 2022) (denying a Petition where Petitioner did not meet its "obligation" to construe a key term and its obviousness grounds did not align with the plain meaning of the term); *Orthopediatrics Corp. v. K2M, Inc.*, No. IPR2018-01547, Paper 9 at 10 (P.T.A.B. Feb. 22, 2019) (denying a Petition where Petitioner declined to construe a term that it "should have known . . . was likely to be at issue in th[e] proceeding").

Petitioner did not meet this basic burden, incorrectly suggesting instead that it has no obligation to construe terms that have not already been construed in district court. Pet. at 7. While the Board "will consider any prior claim construction determination in a civil action or ITC proceeding if a federal court or the ITC has previously construed a term of the involved claim using the same standard," the non-existence of such a prior construction does not relieve Petitioner of its burden to construe the claims under 37 C.F.R. § 42.104(b)(3). CTPG at 47, 44-49.

"[B]ecause the Petition does not address the scope or meaning of '[distributed mobile architecture],' the Petition does not explain why" Mauer's wireless wide area network ("WWAN") and ("WLAN") "would fall within the scope" of the claimed DMA Systems or how the two networks taken together "fall within the scope" of the

claimed DMA Network. *Samsung Elec. Co. v. Blaze Mobile, Inc.*, No. IPR2021-01571, Paper 15 at 14 (P.T.A.B. Apr. 4, 2022); 37 C.F.R § 42.104(b)(4).

As explained in detail below, they do not. There is nothing “distributed” about the conventional, hierarchical network architectures disclosed in Mauer and Waylett, and Petitioners do not even attempt to explain what it is about Mauer’s WWAN and WLAN that makes each a DMA system or why Mauer’s entire network architecture should be considered a DMA Network. Pet. at 18 (labeling disparate telecommunications systems connected via typical circuit-switched networks as “DMA systems” and the overall network as a “DMA network”). Petitioners’ tack of drawing boxes around disparate elements of these systems and calling them DMA systems or DMA networks—without ever establishing what those terms mean to a POSITA in the context of the ’414 Patent or how the art satisfies those meanings—falls far short of its dual burdens under 37 C.F.R. § 42.104(b)(3)-(4).

B. A “DMA network” is Formed by Peer-to-Peer Connections

Each of the Challenged Claims requires a distributed mobile architecture (DMA) network, where individual DMA systems (“DMAs”) are connected with peer-to-peer connections to form the DMA network. Cooklev Decl., ¶ 34-40.

The term “distributed network” is well understood in the networking arts to refer to “[a] network in which processing, storage, and other functions are handled by separate units (nodes) rather than by a single main computer.” Ex. 2015 at 168

(Microsoft Computing Dictionary, 5th Ed.); *see also* Ex. 2016 (Merriam-Webster computing definition of “distributed”) (“having at least some of the processing done by the individual workstations and having information shared by and often stored at the workstations”).

Consequently, rather than managing all calls at a single centralized MSC, like conventional systems, the '414 Patent discloses a “distributed mobile architecture” where call management is distributed among the various DMAs that make up a DMA network:

Within the **distributed** and associative communications system 100, the controlling logic can be **distributed and decentralized**. 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 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 at 4:45-60 (emphasis added). In the '414 Patent's DMA Network, the controlling logic, and the data for routing calls, are distributed among individual DMAs, which are connected to every other DMAs in the DMA Network using a peer-to-peer connection. *Id.* at 4:28-31.

Figure 1 (reproduced below) illustrates that each DMA is interconnected with other DMAs in an Internet Protocol (IP) network via peer-to-peer connections. '414 Patent at 4:28-44 ("each DMA 106 is interconnected with the other DMAs 106 via an Internet protocol network . . . As such, there exists peer-to-peer connection 112 between each DMA 106 in the system").

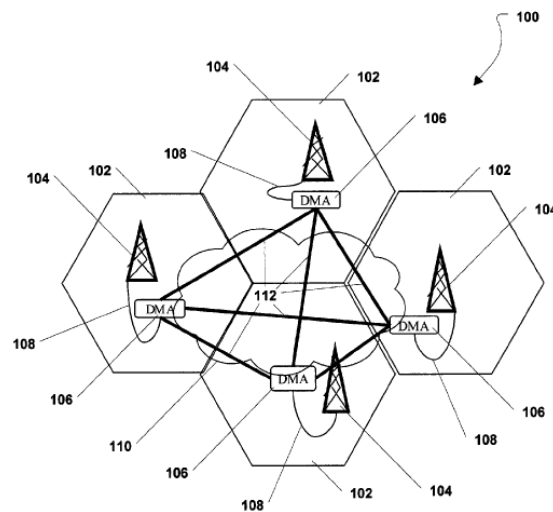
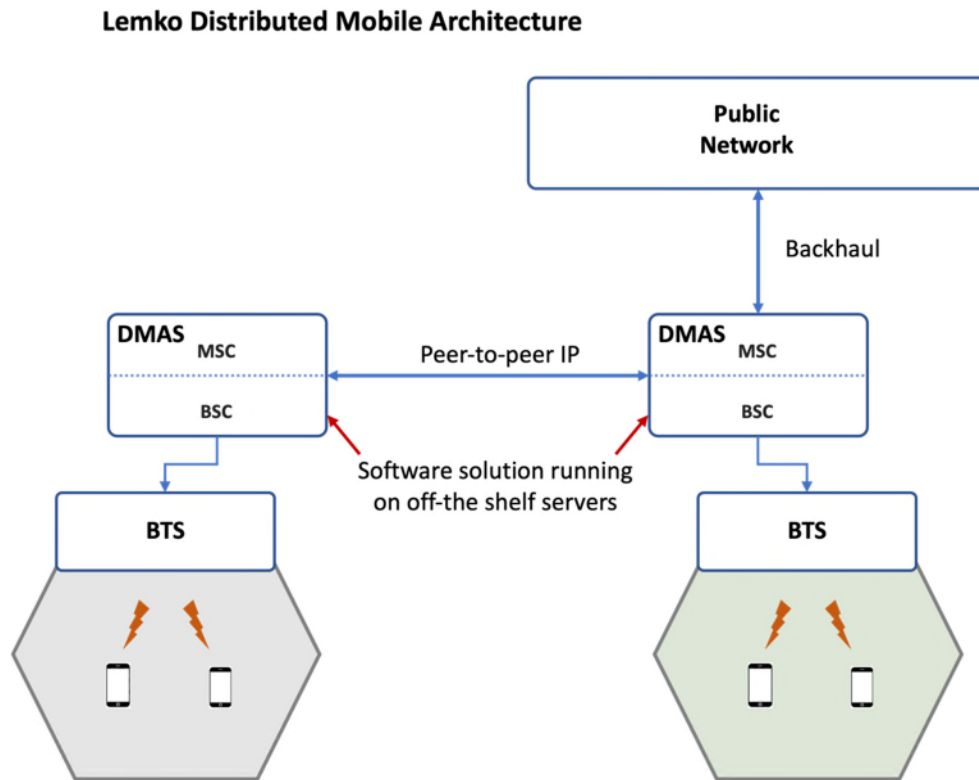


FIG. 1

Id. at Fig. 1. The use of these peer-to-peer IP network connections between DMAs in the same network 100 eliminates or reduces the need to route traffic through a

backhaul, as is shown schematically in an expanded and annotated view of Figure 1 below:



Cooklev Decl., ¶ 38. In Lemko's 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) to a BTS, (2) to a DMA, (3) to a second DMA (by a peer-to-peer IP connection), (4) to a BTS, (5) to the receiving UE.

Similarly, Figure 2 (reproduced below) also illustrates that a network system that "include[s] an Internet protocol (IP) peer-to-peer network" that includes a DMA 202 coupled to DMA 204 and to DMA 206, and the second DMA 204 is coupled to the third DMA 206.

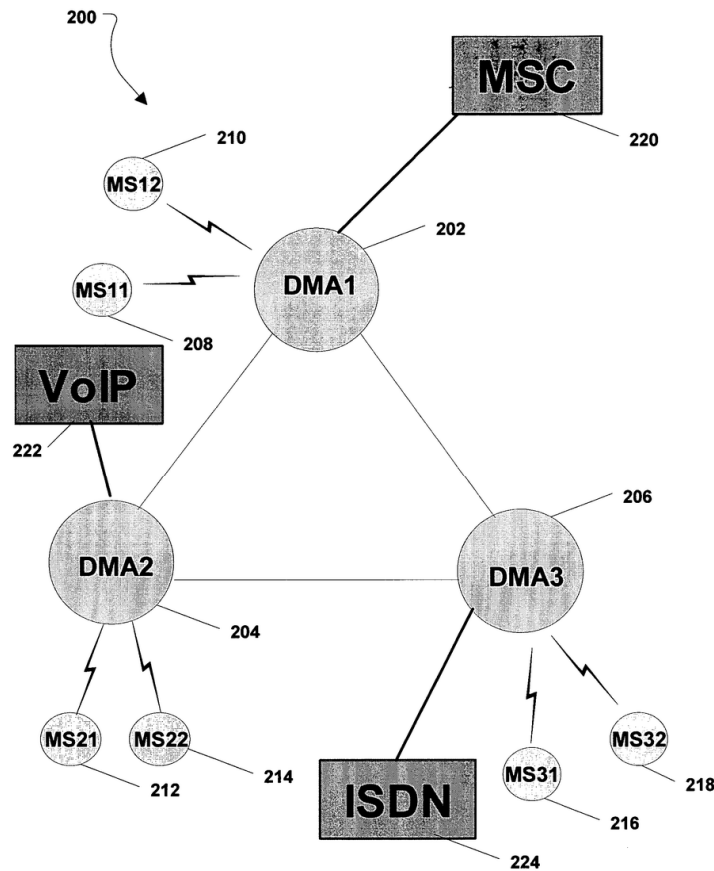


FIG. 2

'414 Patent at Fig. 2, 4:61-5:2.

Thus, “DMA network” should be construed to mean individual DMA systems connected with peer-to-peer connections to form the DMA network.

**V. PETITIONERS FAIL TO DEMONSTRATE A REASONABLE
LIKELIHOOD OF SUCCESS ON ANY CHALLENGED CLAIM**

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

- (1) a DMA network of a plurality of DMA systems;
- (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, an independent ground to deny the Petition.

A. Mauer and Waylett Do Not Teach a Distributed Mobile Architecture Network or Distributed Mobile Architecture Systems

All of the Challenged Claims require a distributed mobile architecture (DMA) network. This DMA network is “distributed” because it includes a number of nodes, *i.e.* DMA systems, that share the data storage and processing tasks for routing calls. The DMA systems can route the calls locally between themselves over peer-to-peer connections, using HLR and CLR data to route the calls via the DMA network rather than traversing a typical T1/E1 backbone connection. The DMA systems can also route calls outside of the DMA network using DPRs. Neither Mauer nor Waylett teaches a distributed network, let alone a DMA network with peer-to-peer connections between the DMAs. Nor do Petitioners 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 and have a reasonable expectation of success in doing so.

First, Mauer's WWAN and WLAN are not "DMA systems," as Petitioner asserts. Pet. at 18. The DMA systems of the '414 Patent are nodes of a DMA network, whereas Mauer's WWAN is a "Wireless Wide Area Network" (like a 2G/3G cellular network) and Mauer's WLAN is "Wireless Local Area Network" (like an IEEE 802.11 Wi-Fi network). Ex. 1005 at 1:12-31. These networks are not, and are not described as, nodes in any distributed network, and Petitioner has not attempted to explain how these networks even facially qualify as DMA systems of a DMA network. See § IV.A, *supra*.

"[B]ecause the Petition does not address the scope or meaning of '[distributed mobile architecture],' the Petition does not explain why" Mauer's wireless wide area network ("WWAN") and ("WLAN") "would fall within the scope" of the claimed DMA Systems or how the two networks taken together "fall within the scope" of the claimed DMA Network. *Samsung*, Paper 15 at 14; 37 C.F.R § 42.104(b)(4). This is ground alone to deny the Petition.

Second, at least because Mauer's disparate networks (the alleged DMA systems) are not nodes of a DMA network, they are not connected via peer-to-peer connections. See § IV.B, *supra*. Petitioners do not address peer-to-peer connections for most of the Challenged Claims.

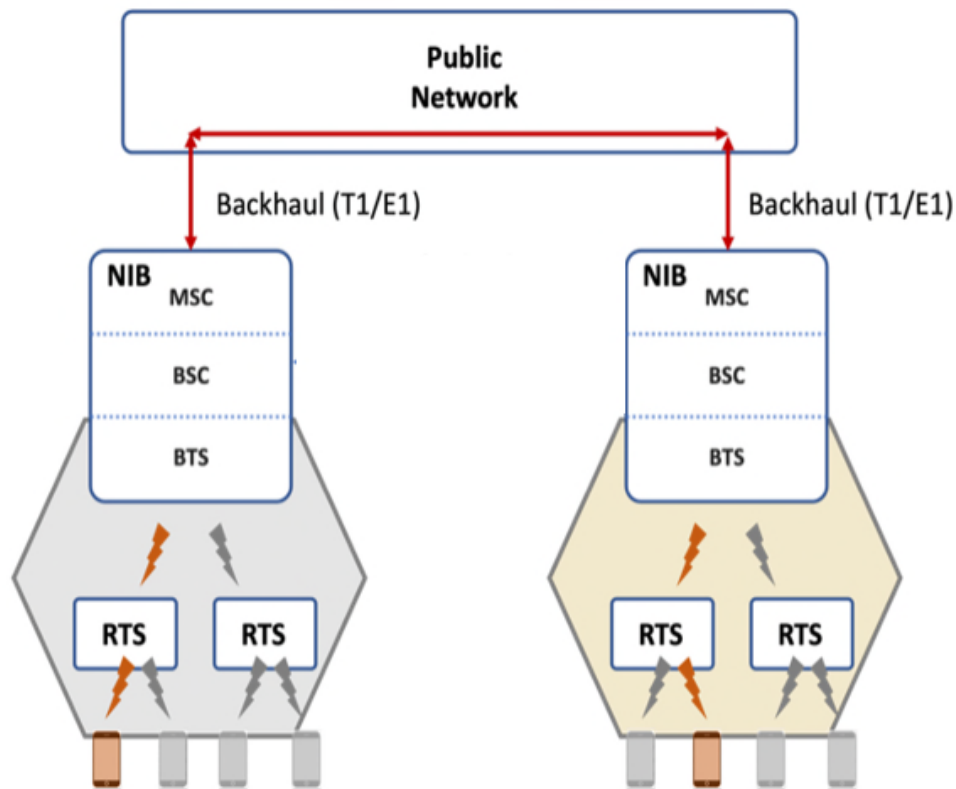
For Claim 3, which requires use of an Internet Protocol (IP) peer-to-peer connection between the first DMA system and the second DMA system, Petitioners

rely exclusively on Mauer. *See* Pet. at 43. Petitioners allege that Mauer discloses IP peer-to-peer connections between two DMA systems (allegedly the WWAN and a WLAN). Pet. at 44 (citing Ex. 1005 at 5:34-38, 3:59-61, 1:17-20, 5:56-58, 4:66-5:2). However, as Mauer explains, these SIP connections are connections made directly to UEs. *See* Ex. 1005 at 7:30-36. Thus, any alleged “peer-to-peer” connections are not made between the entities that Petitioner alleges to be the “DMA systems;” they are only made between a gateway and a UE that communicates over the WLAN. *Id.* These are not the entities that Petitioner contends are allegedly peers in a peer-to-peer network. Pet. at 44.

Further, Petitioners’ assertion that the Session Initiation Protocol (SIP) is a peer-to-peer connection is unfounded. Pet. at 44 (citing Ex. 1003 at ¶ 134). The SIP protocol is generally classified as a client-server protocol, and would not have been known to a POSITA at the time the invention was made as a peer-to-peer connection. Cooklev Decl., ¶ 74. This is consistent with Mauer’s disclosure of using its softswitch element as a centralized SIP registrar. Ex. 1005 at 7:55-58, 8:11-17. Thus, Petitioner’s expert declaration does not establish that a POSITA would understand SIP to be an IP-based P2P connection.

Waylett does not cure Mauer’s deficiencies. Waylett describes a private network formed by multiple hardware-based NIBs. The NIBs are connected with 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 at 17:10-12; *see also* Ex. 2013 (disclosing the T1/E1 ports for communication); Ex. 1006 at 7:9-11, 9:65-10:6, 17:7-17, Fig. 11. This setup is illustrated below:



Cooklev Decl., ¶ 75 (citing Ex. 1006 at Fig. 11 (annotated); Ex. 2013 at 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., ¶ 76. Other than the radio connection between the UE and the NIB, all of these connections are T1/E1. Circuit-switched, dedicated T1/E1 connections were used by industry for such connections because they provided dedicated, reliable, fixed bandwidth connections between known points (such as between an NIB and a public telephone network). Cooklev Decl., ¶ 76. Thus, there were no peer-to-peer connections between NIBs (which Petitioners contend are DMA systems in Ground 2).

Moreover, Petitioners fail to identify how Mauer's alleged peer-to-peer IP connection between two different networks (*e.g.*, WLAN and WWAN) was any "old element" that could be merely "rearranged and combined" with Waylett's T1/E1 connections to allow peer-to-peer telephony traffic between NIBs. *See Samsung Elecs. Co. v. Netlist, Inc.*, No. IPR2022-00063, Paper 53 at 35 (P.T.A.B. May 3, 2023) (upholding patentability because the petitioner failed to "identif[y] any 'old element'" where "each element is purportedly taught, in some manner, by one of the references, and the elements are merely rearranged and combined.") (citation omitted).

Thus, neither Mauer nor Waylett disclose DMA networks formed by DMAs interconnected with peer-to-peer connections.

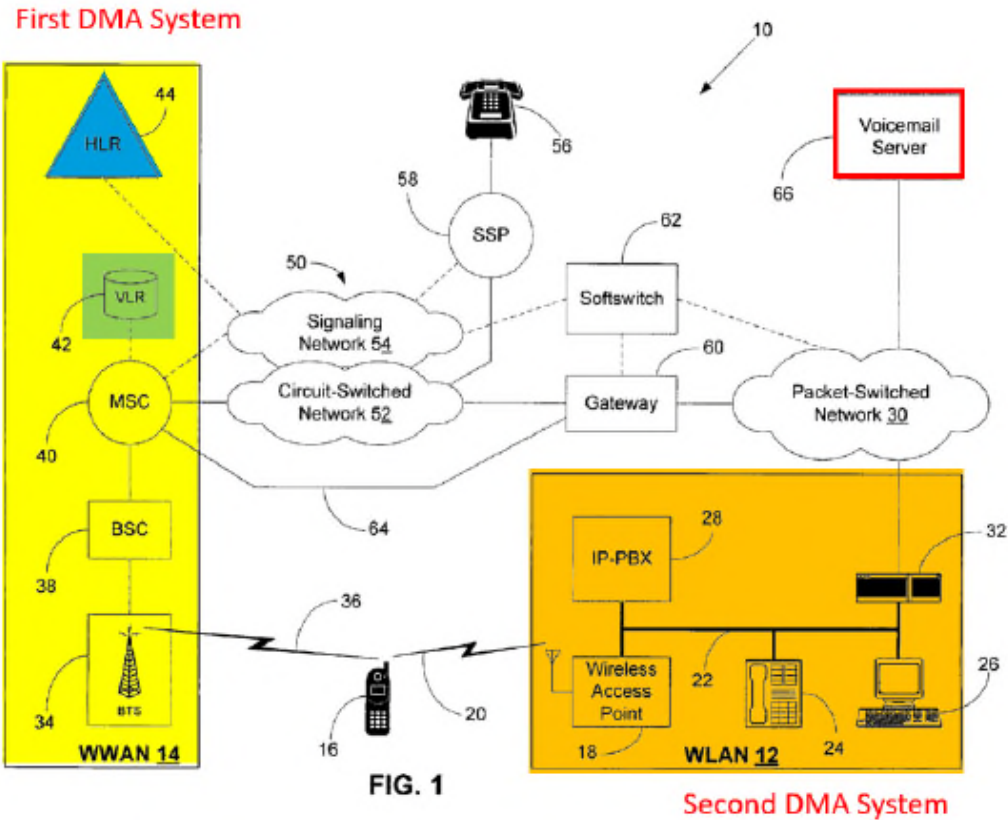
B. Mauer and Waylett Do Not Teach or Render Obvious the Destination Preference Register Limitation

Mauer and Waylett do not disclose the destination preference register limitation and, therefore, cannot render obvious any of the Challenged Claims. Cooklev Decl., ¶¶ 78-84. Claims 1 and 8 require that “determining a preferred call path to route the *call outside of the DMA network* based on information stored at a destination preference register (DPR), wherein the DPR is stored at the first DMA system.” ’414 Patent at 18:32-36, 19:32-34. Claim 11 recites a similar limitation. *Id.* at 20:6-17 (“route the call via a particular preferred call path of the one or more preferred call paths stored at the DPR when the AAA module determines that the call is directed to a destination device that is *outside of the DMA network*”). Thus, the DPR must be able to route calls through a preferred call path outside of the DMA networks. The Petition cites Mauer’s voicemail server as a “preferred call path to route the call,” but this fails to satisfy the claims for multiple reasons. Pet. at 38-42.

First, Mauer’s voicemail server is *within* the alleged DMA network and is not, therefore, an external path. Petitioner alleges that telecommunications system 10 is the claimed “DMA network.” Pet. at 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 at 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 “be otherwise **located in** network 10.” *Id.* There is nothing in Mauer that would suggest to a POSITA that the location of the voicemail server is outside of the wireless telecommunications network 10 that includes WWAN 14 or WLAN 12. *Id.* Therefore, a POSITA would conclude that Mauer's voicemail server is within network 10 and therefore is not outside the DMA system, as required by the Challenged Claims.

Petitioners do not address Mauer's disclosure regarding the location of the voicemail server. 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).



Pet. at 39 (reproducing Ex. 1005, Fig.2 (annotated in the Petition)).

But a POSITA would not consider voicemail server 66 to be outside of the second DMA system in light of the statements in the specification discussed above. Indeed, mobile station 16 (depicted as a cell phone) is also shown outside of the WLAN and WWAN boxes, but a POSITA would understand that the mobile station is within those systems because Mauer illustrates them as being within range and communicating via air interfaces 20, 36. Ex. 1005 at 4:64-5:9, 5:65-6:3, 5:11-15. The schematic layout of elements in Mauer's figure 1, therefore, is not evidence that the voicemail server is "outside of the DMA network."

Second, Mauer's "alternative communication option" (e.g., voicemail server) cannot satisfy the DPR limitation because a voicemail server is not a "preferred call path." Pet. at 38. 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 at Fig. 2, 5:3-20 (describing one DMA system having a MSC interface, another DMA system having a VoIP interface, and another DMA system having a 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.* at 5:62-6:4. Thus, the peer-to-peer aspect of the DMA network avoids each DMA system from needing to separately have its own duplicative interface (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.* at 5:65-67.

Mauer's "alternative communication option" (being a voicemail server) is not a preferred call path for routing the call to be established outside of the network, as required by the claims. Instead, it represents an end of the (communications) road. In fact, Mauer discloses that it cancels routing the call. Ex. 1005 at 13:58-61 ("cancel the SS7 signaling for routing the call to MSC 40").

Finally, 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. at 40-42. Instead, Petitioners improperly rely entirely on conclusory expert testimony and hindsight reasoning to fill in the gap. Pet. at 40 (arguing that the use of a destination preference register would happen “necessarily”).

First, Petitioners argue the act of sending a call to voicemail “necessarily require[s]” storing information. Pet. at 40. Then, Petitioners argue that a POSITA would have been motivated to store the so-called obvious information in a destination preference register. *Id.* at 40-42; *see also* Ex. 1003 at ¶¶ 122-28. But, Petitioners ignore the plain language of Mauer which provides that rather than be a stored preference, the “alternative communication option” is a user selection at the time of phone call. Ex. 1005 at 12:67-13:3 (“The caller may also be given other options instead of or in addition to leaving a voice message. For example, the caller may be given the option of sending an instant message or an SMS message to multi-mode mobile station 16.”). Therefore, a POSITA would not find that Mauer teaches or suggests the use of information stored at a DPR where the DPR is stored at the first DMA system.

**C. Mauer and Waylett Do Not Teach or 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., ¶¶ 85-94

Challenged Claims 1 and 8 require that information in a “community location register” be the basis for “determining that a mobile subscriber is located within the coverage area of a second DMA system.” ’414 Patent at 18:25-29, 19:15-19. Claims 1 and 8 also require that the CLR be stored at the first DMA system. *Id.* (Claims 1 and 8 reciting “based on 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”). These limitations enable the DMA networks to route calls among the various DMAs that make up the DMA network without having to access external legacy networks via expensive backhaul connections. *See* Section II.B, *supra*. Independent Claim 11 recites a similar CLR limitation. ’414 Patent at 20:1-5 (Claim 11 reciting a DMA system “comprising... 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”).

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. at 30 (“Mauer, however, does not expressly disclose using ‘information stored at a community location register...’”); *id.* at 33 (same). Petitioners exclusively rely on Waylett, but it also fails to disclose or render obvious the CLR limitations, as set forth below.

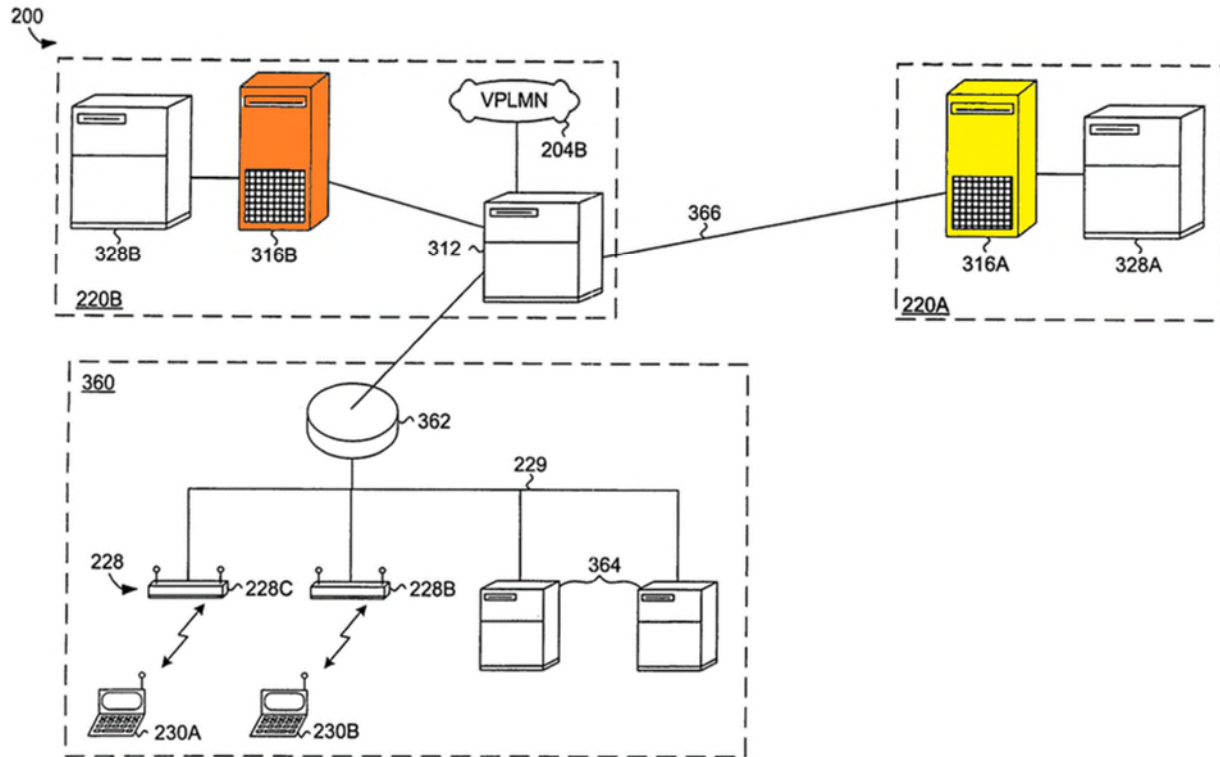
1. Waylett’s Distributed HLR is Not a CLR Stored at a First DMA System

Waylett does not teach or suggest determining whether a mobile subscriber is in a certain coverage area “based on information stored at a community location register (CLR) associated with [a] second DMA system, wherein the CLR associated with the second DMA system is stored at [a] first DMA system,” as required by the Challenged Claims. Instead, Waylett’s NIB uses the conventional approach of using home location registers and visitor location registers for determining subscriber information. Notably, the ’414 Patent *also* discloses and relies on HLRs and VLRs, which are admittedly well-known in the art. The CLR, on the other hand, was not known in the art and only makes sense in the context of the ’414 Patent’s DMA because it is used to route calls between UEs subscribed to different DMAs in a DMA network.

Though Waylett describes the use of a “distributed public HLR/VLR . . . and/or a distributed private HLR,” this distributed HLR is not a peer-to-peer system

as described by the '414 Patent. Waylett describes that the information used to determine subscriber information for a UE is stored elsewhere (to the particular segment of the distributed HLR/VLR responsible for that wireless network and subscriber), and requests must be routed there. Ex. 1006 at 14:61-66 (“rout[ing] . . . to the appropriate public or private HLR”), 21:12-28 (“routing . . . to the appropriate HLR” by using a “configuration table” to contact the “controlling HLR”). Thus, Waylett does not disclose locating the CLR information at the WWAN 12, which Petitioners assert is the first DMA system.

To the contrary, Waylett confirms that the HLR for determining a particular subscriber information is located at a private home network, which is within the alleged **second** DMA system, and not the alleged first DMA system. Waylett states that where “a visiting private UE 230A to an area served by the corporate LAN [360] is able to communicate with another UE 2130B [sic] home private network 220A and terminals or servers 364 in the corporate LAN 360 and with terminals in the public network 202 through the local or visited public cellular network 204B and the corporate LAN.” Ex. 1006 at 17:23-28. This location of the HLR at the alleged **second** DMA system (highlighted in yellow) is shown in Waylett's Figure 12, reproduced below.



Ex. 1006 at Fig. 12 (annotated).

Specifically, to authenticate the UE 230A, Waylett explains that a “RADIUS server 312 determines subscriber information for the visiting UE 230A *is not stored* in private HLR [316B] but in a private HLR 316A in the home private network 220A.” Ex. 1006 at 17:33-36 (emphasis added)⁴. Therefore, Waylett teaches away from the express limitation of the claims which require that a community location

⁴ Waylett’s use of reference numeral “216B” instead of “316B” appears to be a typographical error as there is no such element “216B” in Fig. 12 or in the other Figures of Waylett. Ex. 1006 at 17:35, Fig. 12.

register associated with a second DMA system is actually stored at a first DMA system. *See* Claims 1, 8 (reciting “the CLR associated with the second DMA system is stored at the first DMA system”); Claim 11 (reciting a “distributed mobile architecture (DMA) system, comprising... a community location register (CLR) that stores information associated with a second HLR of a second DMA system”). Waylett’s distributed HLR/VLR is exclusively located within the alleged second DMA system and, therefore, fails to satisfy or render obvious the community location register limitations of the Challenged Claims.

2. Waylett’s Configuration Table is Not the Basis for Determining a Mobile Subscriber is in a Coverage Area Associated with a Second DMA System

Each of the Challenged Claims requires that the CLR is used to determine whether “the second mobile subscriber is located within a second wireless coverage area of the DMA network that is associated with the second DMA system.” The Petition incorrectly asserts that Waylett’s configuration table satisfies this requirement. Pet. at 34-35.

Waylett’s configuration table is an ancillary data structure and 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). As discussed above, Waylett’s procedure routes a query to the controlling segment of the HLR/VLR for that mobile phone, and it is that controlling part of the HLR/VLR—not the configuration table—that is

used to locate/authenticate the mobile user. Ex. 1006 at 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 and is instead based on the part of the HLR/VLR responsible for that mobile phone that is stored elsewhere (as described above).

Waylett's configuration table does not teach or suggest a modification to Mauer that would yield “determining whether the second mobile subscriber is located within a second wireless coverage area of the DMA network that is associated with the second DMA system ***based on information stored at a community location register (CLR) associated with the second DMA system,***” as required by Challenged Claims 1 and 8.

Additionally, the Petition is incorrect in asserting that Waylett's configuration tables “store these subscriber identities along with their appropriate HLR.” Pet. at 34. At most, Waylett's configuration table uses “IMSI ranges,” rather than specific IMSI or subscriber identities. Ex. 1006 at 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., ¶ 94. For that reason, 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.

VI. CONCLUSION

For all of these reasons, Patent Owner requests that the Board deny institution of *inter partes* review of the Challenged Claims of the '414 Patent.

Respectfully submitted,

Dated: June 28, 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'S PRELIMINARY RESPONSE specified in 37 C.F.R. §
42.24 has 7,350 words in compliance with the 14,000 word limit set forth in 37
C.F.R. § 42.24(b)(1). This word count was prepared using the Microsoft Word
word-processing system used to prepare this paper.

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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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<i>Manner of service</i>	Electronic Filing (mhopkins@winston.com; bshelton@winston.com; mrueckheim@winston.com; Winston-MSFT-Lemko-IPR@winston.com)
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