

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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MICROSOFT CORPORATION AND AFFIRMED NETWORKS, INC.,  
Petitioner,

v.

LEMKO CORPORATION,  
Patent Owner.

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Case IPR2023-00531  
U.S. Patent No. 7,855,988

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**PATENT OWNER'S PRELIMINARY RESPONSE**

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**PATENT OWNER'S EXHIBIT LIST**

| <b>Exhibit</b> | <b>Description</b>                                                                                                                                                                                                                                                                                                               |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 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)<br><a href="https://commons.wikimedia.org/wiki/File:Lucent_5ESS_GSM_Mobile_Switching_Centre.jpg">https://commons.wikimedia.org/wiki/File:Lucent_5ESS_GSM_Mobile_Switching_Centre.jpg</a> (June 27, 2023)                                   |
| 2003           | Wikipedia, "Mobile switching centre server"<br><a href="https://en.wikipedia.org/wiki/Mobile_switching_centre_server">https://en.wikipedia.org/wiki/Mobile_switching_centre_server</a> (June 27, 2023)                                                                                                                           |
| 2004           | Techopedia.com, "What is a Base Station Controller?" (Oct. 19, 2011) <a href="https://www.techopedia.com/definition/24191/base-station-controller-bsc">https://www.techopedia.com/definition/24191/base-station-controller-bsc</a>                                                                                               |
| 2005           | Metin UZAR Blog Post, "Base Station Controller (BSC)" (Sept. 19, 2009)<br><a href="https://razunitem.wordpress.com/2009/09/19/base-station-controllerbsc/">https://razunitem.wordpress.com/2009/09/19/base-station-controllerbsc/</a>                                                                                            |
| 2006           | Image of Motorola BSC<br><a href="https://monsite.woopic.com/383/p/Telecommunications/img/684d91850fe954cc28a1cf8fce498804.jpg">https://monsite.woopic.com/383/p/Telecommunications/img/684d91850fe954cc28a1cf8fce498804.jpg</a> (June 28, 2023)                                                                                 |
| 2007           | Electronics-notes.com, "Cellular / Mobile Backhaul"<br><a href="https://www.electronics-notes.com/articles/connectivity/cellular-mobile-phone/mobile-communications-backhaul-link.php">https://www.electronics-notes.com/articles/connectivity/cellular-mobile-phone/mobile-communications-backhaul-link.php</a> (June 28, 2023) |
| 2008           | Network Functions Virtualisation - Introductory White Paper (Oct. 2012)<br><a href="https://portal.etsi.org/NFV/NFV_White_Paper.pdf">https://portal.etsi.org/NFV/NFV_White_Paper.pdf</a>                                                                                                                                         |

| Exhibit | Description                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2009    | Dyton, J., “Lemko solutions keep connectivity alive regardless of the circumstances” (July 16, 2020)<br><a href="https://connectedremag.com/das-in-building-wireless/wireless/lemko-solutions-keep-connectivity-alive-regardless-of-the-circumstances/">https://connectedremag.com/das-in-building-wireless/wireless/lemko-solutions-keep-connectivity-alive-regardless-of-the-circumstances/</a>                |
| 2010    | Lemko.com, distributed Mobile Architecture™ (dMA™) Overview<br><a href="http://lemko.com/htm/distributed_mesh_architecture.htm">lemko.com/htm/distributed_mesh_architecture.htm</a> (June 28, 2023)                                                                                                                                                                                                              |
| 2011    | Lemko.com, Lemko’s Fundamental Architecture<br><a href="https://www.lemkocorp.com/solutions/">https://www.lemkocorp.com/solutions/</a> (June 5, 2023)                                                                                                                                                                                                                                                            |
| 2012    | GPRS Architecture Presentation (Feb. 18, 1999)<br><a href="http://student.ing-steen.se/datacom/GPRS/architecture.pdf">http://student.ing-steen.se/datacom/GPRS/architecture.pdf</a>                                                                                                                                                                                                                              |
| 2013    | “What is the Home Location Register (HLR)?” (Feb. 5, 2023)<br><a href="https://www.cyberyodha.org/2023/02/what-is-home-location-register-hlr.html">https://www.cyberyodha.org/2023/02/what-is-home-location-register-hlr.html</a>                                                                                                                                                                                |
| 2014    | Silicon Press, Home Location Register (HLR) Technology Brief<br><a href="http://www.silicon-press.com/briefs/brief.hlr/brief.pdf">http://www.silicon-press.com/briefs/brief.hlr/brief.pdf</a>                                                                                                                                                                                                                    |
| 2015    | Melrose Labs, HLR (Home Location Register) - Glossary (2023)<br><a href="https://melroslabs.com/glossary/hlr-home-location-register/">https://melroslabs.com/glossary/hlr-home-location-register/</a>                                                                                                                                                                                                            |
| 2016    | O’Reilly Media, Inc., Packet Data Protocol (PDP) – Excerpt from The IMS: IP Multimedia Concepts and Services (2nd ed. 2006)<br><a href="https://www.oreilly.com/library/view/the-ims-ip/9780470019061/9780470019061_packet_data_protocol_open_parenthesis_pd.html">https://www.oreilly.com/library/view/the-ims-ip/9780470019061/9780470019061_packet_data_protocol_open_parenthesis_pd.html</a> (June 29, 2023) |
| 2017    | Microsoft.com, “Developing apps using multiple PDP contexts” (Dec. 14, 2021)<br><a href="https://learn.microsoft.com/en-us/windows-hardware/drivers/mobilebroadband/developing-apps-using-multiple-pdp-contexts">https://learn.microsoft.com/en-us/windows-hardware/drivers/mobilebroadband/developing-apps-using-multiple-pdp-contexts</a>                                                                      |
| 2018    | Mpiracle.com Glossary, “PDP Context”<br><a href="https://www.mpirical.com/glossary/pdp-context">https://www.mpirical.com/glossary/pdp-context</a> (June 29, 2023)                                                                                                                                                                                                                                                |

| <b>Exhibit</b> | <b>Description</b>                                                                      |
|----------------|-----------------------------------------------------------------------------------------|
| 2019           | Nandhakumar, B., "Dictionary of Computer Networking," Pages 199-200, 286 (1st ed. 2011) |
| 2020           | IBM Dictionary of Computing, Page 351 (10th ed. Aug. 1993)                              |

## I. INTRODUCTION

Lemko's inventions are based on a novel distributed mobile architecture ("DMA") infrastructure paradigm that is very different from the then-conventional networks. Lemko's DMA networks are built on DMA servers that communicate with each other over peer-to-peer ("P2P") connections, forming a decentralized network where nodes are able to communicate with each other without relying on a centralized center to manage traffic. In contrast, conventional legacy networks, such as those in the reference cited by Petitioners, rely on centralized mobile switching centers to manage traffic.<sup>1</sup>

One key feature of Lemko's inventive DMA server is that it implements core cellular communications functionality in software instead of hardware, a technique now known as "network functions virtualization (NFV)." Ex. 2009. Lemko's network functionality is encoded in software and installed on the DMA server's "computer readable medium," instead of the bulky, expensive, non-commodity hardware, used in then-conventional networks. Lemko's solution is far less

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<sup>1</sup> Legacy networks "include one of a public switched telephone network (PSTN); a wireless communications network serviced by mobile switching center; a public internet protocol (IP) network, and an American National Standards Institute 41 (ANSI-41) network." See '988 Patent at Claim 4.

expensive than the traditional hardware-based paradigm. Virtualizing the network functionality also enabled further claimed benefits, like the ability to route traffic from DMA servers of one DMA network to DMA servers of another DMA network and legacy networks via DMA gateways.

The Board should deny *inter partes* review<sup>2</sup> because Petitioners fail to show that the Flore reference anticipates Lemko's Challenged Claims. Petitioners contend that Flore's network components equate to the claimed DMA infrastructure. *See* Pet. at 9-11.<sup>3</sup> But Flore's network components are part of the then-conventional fragmented and hierarchical architecture, without the peer-to-peer connections that are the basis of Lemko's inventive network. Flore teaches nothing about moving call-management functionality to DMA servers that are connected as peers, and Flore fails to disclose multiple other claim limitations discussed below. Indeed, it was not until 2012—four years after Lemko's filing—that the telecommunication

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<sup>2</sup> Microsoft Corporation and Affirmed Networks, LLC ("Petitioners") petitioned for *inter partes* review (IPR) of U.S. Patent No. 7,855,988 (Ex. 1001, the "'988 Patent"), challenging claims 1, 3-9, and 20 ("the Challenged Claims"). Petitioners assert Flore (Ex. 1005) against all of the Challenged Claims.

<sup>3</sup> The Petition's introduction makes a passing obviousness, Ground 1, however, is specifically based on an anticipation theory. *See* Pet. at 2.

industry for the first time published a paper that recognized the need for the decentralized, software-based network of Lemko's DMA infrastructure. Thus, the Petition should be denied for failure to establish a reasonable likelihood of success as to any Challenged Claim.

## **II. THE '988 PATENT IS BASED ON LEMKO'S NEW DISTRIBUTED-MOBILE-ARCHITECTURE PARADIGM**

### **A. Background: Conventional Network Architectures Were Based on a Hierarchical Hardware Paradigm**

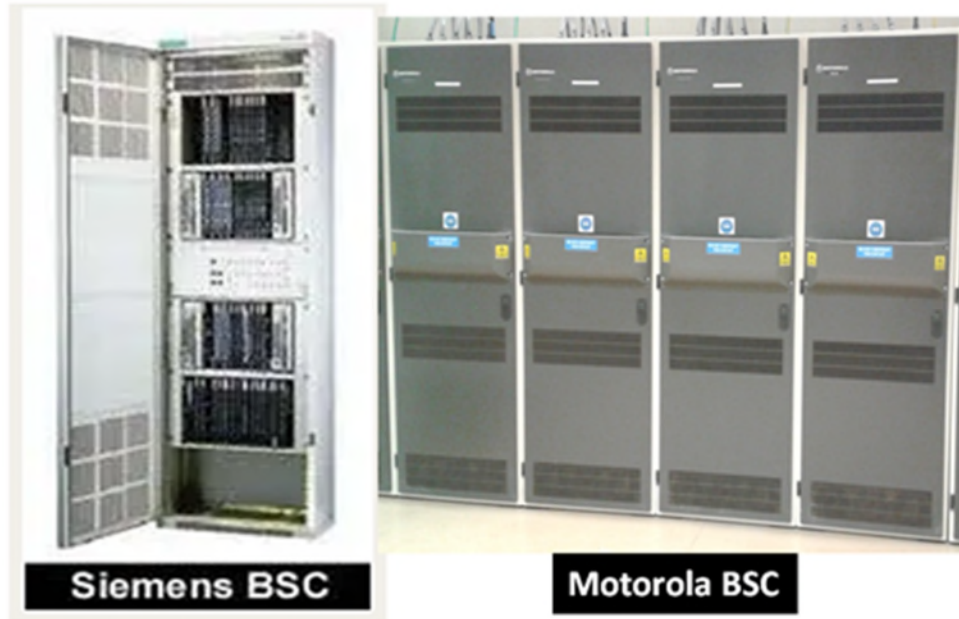
In 2008, when Lemko filed the '988 Patent, then-conventional cellular networks were based on circuit-switched networks with a centralized, hierarchical paradigm. All calls were carried from cell towers to regional call centers over expensive backhaul connections. The regional call centers relied on large stacks of servers with custom hardware to manage and route calls for an entire region. In contrast, the cell towers had no functionality for managing and routing calls, since that capacity was located in the regional call centers. There were many drawbacks to this approach, 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 had no ability to manage or connect calls independent of the regional call centers). Ex. 2001 (Declaration of Todor Cooklev, Ph.D., "Cooklev Decl."), ¶¶ 41-44.

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 '988 Patent at 1:37-51. Cell towers did not communicate directly with other cell towers, and BSCs did not communicate directly with other BSCs. Cooklev Decl., ¶ 45.

These conventional networks were also hardware-based. The MSCs were housed at large server Digital Signal Processor (DSP) 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 at 1-3.

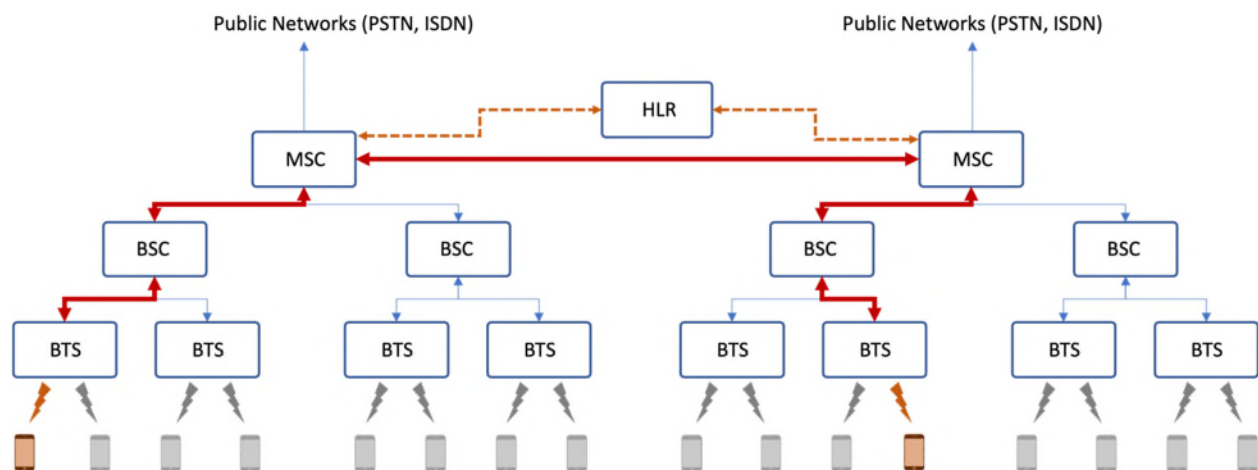


Ex. 2003. The BSC (shown in the photograph below) connected a BTS (cell site) to the MSC through a “backhaul” connection. Ex. 2004; Cooklev Decl., ¶¶ 46-47.



Ex. 2005; Ex. 2006; Cooklev Decl., ¶ 47.

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



Cooklev Decl., ¶ 48. In these conventional networks, the backhaul connections were based on 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”).<sup>4</sup>

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.<sup>5</sup> Thus, for two UEs to communicate, the

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<sup>4</sup> “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. Cooklev Decl., ¶ 48 n.1.

<sup>5</sup> “Circuit switched” connections establish a dedicated communication path between two devices for the duration of a session. Cooklev Decl., ¶ 49 n.2. In contrast, IP networks transmit data in small packets that travel independently over a network and are dynamically routed.

call data are routed to centralized MSCs (stored at centralized server locations) of the public networks using the T1/E1 communication lines. Cooklev Decl., ¶ 49.

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., ¶50.

In 2012, a broad coalition of network operators published a whitepaper detailing these problems. *See* Ex. 2008. Entitled “Network Functions Virtualization” (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.

*Id.* at 5; Cooklev Decl., ¶ 51.

As shown in the excerpt below, the 2012 NFV Paper contrasted its proposed approach against the “Classical Network Appliance Approach.” 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. *See* Ex. 2008 at 5.

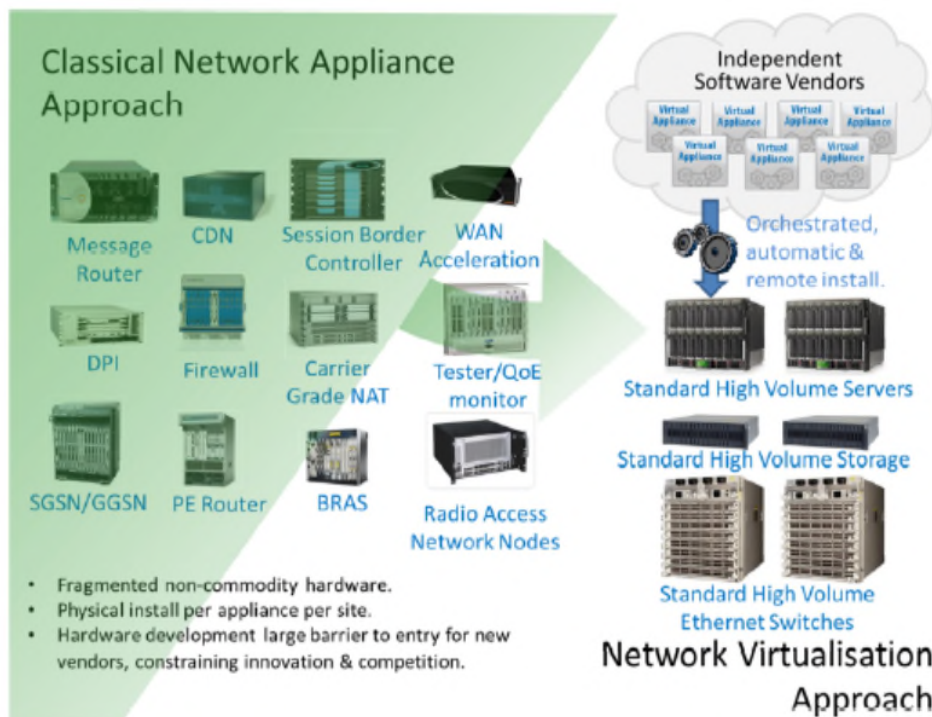


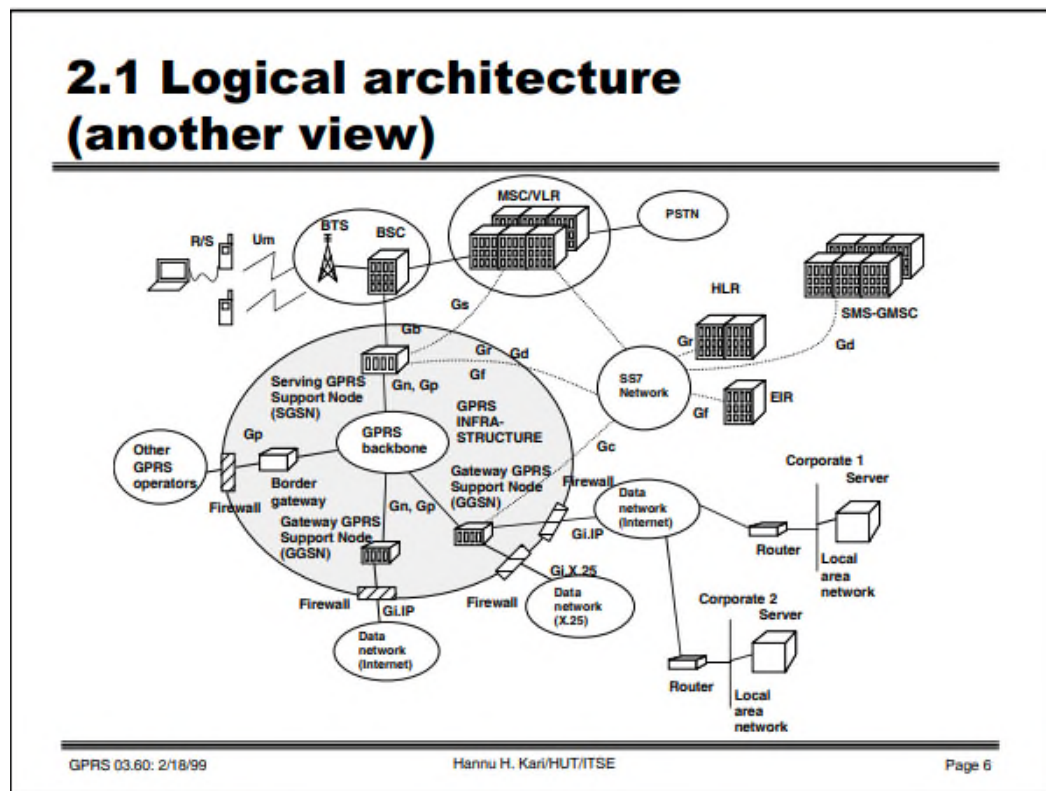
**Figure 1: Vision for Network Functions Virtualisation**

*See id.* at 5; Cooklev Decl., ¶¶ 52-53.

### B. Flore Uses the Then-Conventional, Hierarchical Network Architecture

Flore is directed to techniques for performing inter-system handovers between conventional wireless communications networks using different radio technologies, such as managing handovers between a General Packet Radio Service (GPRS) (a 2G network) core network and Evolved Packet Core network (a 4G network). Flore at Abstract, ¶¶ 3, 30; Cooklev Decl., ¶ 61.

These conventional networks include the conventional, hierarchical network architecture described above. For instance, the illustration below depicts the GPRS network architecture, serviced by a centralized MSC server location and BSC:

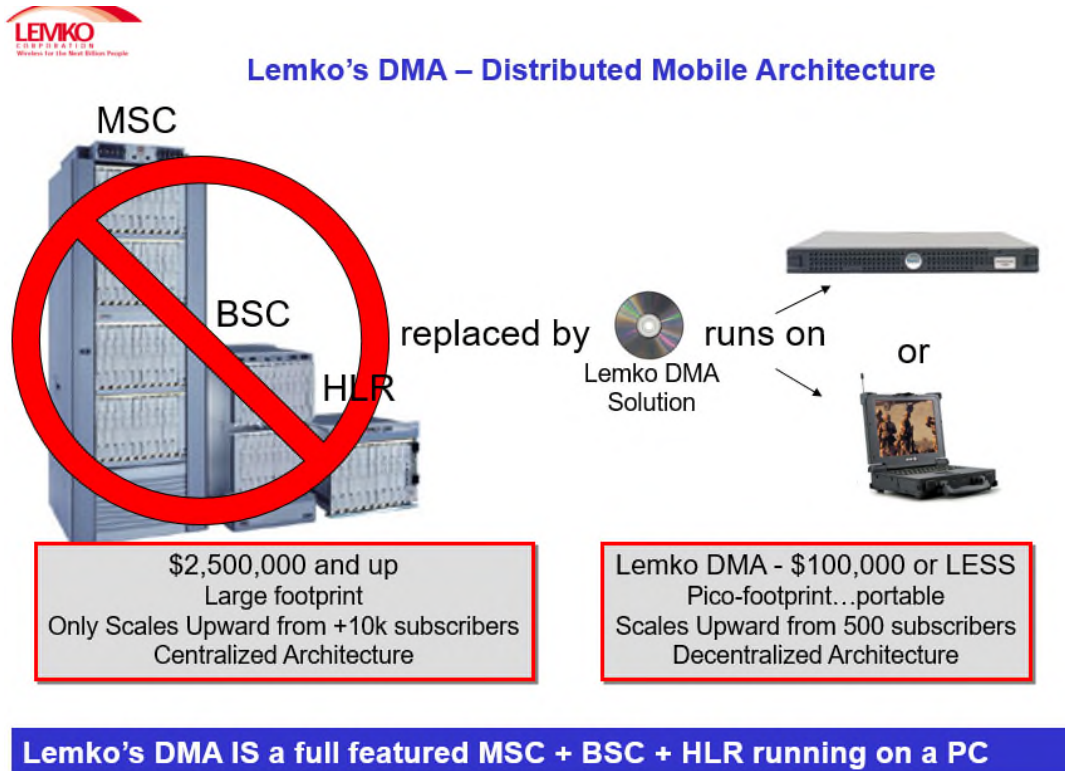


Ex. 2012 at 3; *see also* Ex. 1006 at 14, 23-25 (describing the GPRS network as disclosed in Flore with MSC and BSC hardware-based physical components); Flore at ¶ 30. In Flore's architecture, a call between two UE would be routed from (1) an originating UE, (2) to a BTS, (3) to a BSC, (4) to an MSC, (5) to the core for the first network (such as the GPRS core), (6) over Flore's Gn interface to the core for the second network (such as the GSM core), (7) to an MSC for the second network, (8) to a BSC, (9) to a BTS, and finally (10) to the receiving UE. Cooklev Decl., ¶¶ 62-63.

**C. Lemko's Patented DMA Technology Had Already Solved the Industry's Long-Felt Need**

Years before the industry proposed solutions for its long-felt needs in the NPV Paper, Lemko filed the '988 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" as its "software enables all of core network functions, databases and gateways." *Id.*; Cooklev Decl., ¶¶ 54-55.

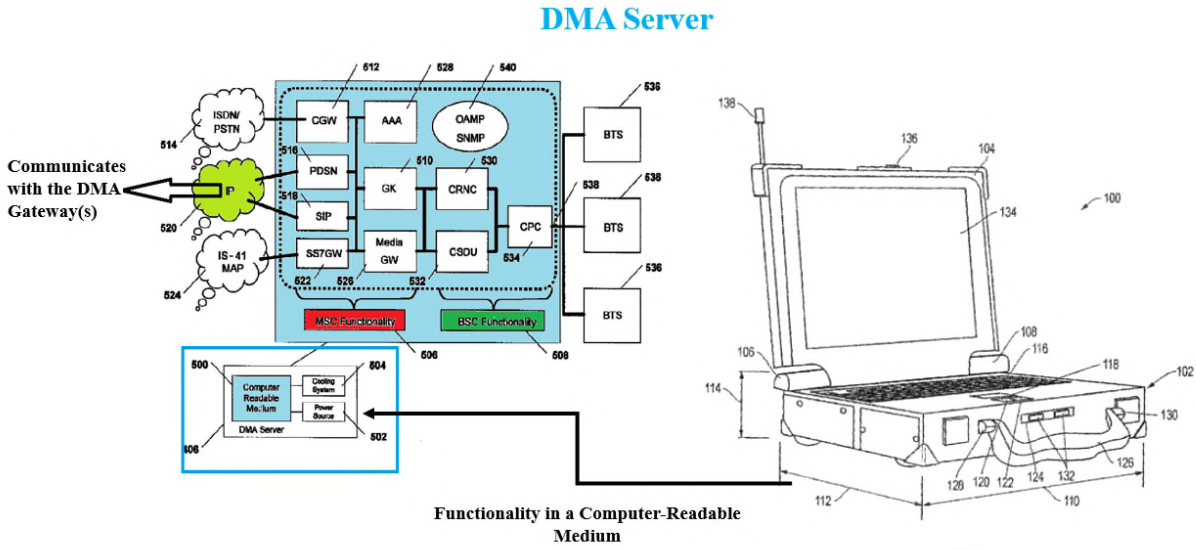
Specifically, Lemko's DMA implements network functionality, such as MSC, BSC, and home location register ("HLR") functionality,<sup>6</sup> onto a computer-readable medium running on a standard server, as the figure below depicts:



<sup>6</sup> The HLR is a database used in cellular networks to store subscriber information, such as the subscriber's mobile number, authentication information, and the services they have subscribed to. Cooklev Decl., ¶ 56 n.3 (citing Exs. 2013-2015). The HLR plays an important role in routing calls and messages within a network and in managing customer mobility and authentication. *Id.*

Cooklev Decl., ¶ 56 (citing a demonstrative excerpt from 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* ’988 Patent at Figs. 1 and 3 (depicting the DMA servers of the above figure). Accordingly, unlike the then-conventional hardware-based network architecture, Lemko’s DMA solution implements a virtualized core of network functionality on software running on standard servers to allow “multiple cellular nodes to be linked via IP connections,” as peers, thereby reducing backhaul via T1/E1 communication lines and eliminating the need for a centralized center or hub. Ex. 2010. Lemko developed multiple product lines based on its inventions. *See* Ex. 2011.

Lemko’s innovative DMA technology is described and claimed in the ’988 Patent through its novel DMA infrastructure. *See* ’988 Patent at Abstract, 4:1-19, 9:36-11:27. Specifically, the specification discloses that a DMA server (or DMAS) has a computer-readable medium (highlighted in light blue) including MSC (highlighted in red) and BSC (highlighted in green) network functionality:



*Id.* at Figs. 1, 5 (annotated); *see id.* at 7:19-21. Accordingly, each DMA server has its own MSC and BSC functionality, including gateways and a cellular radio network controller (CRNC), to allow for a virtualized network. Ex. 2009; Ex. 2010; Cooklev Decl., ¶ 57.

The DMA server may be interconnected with other DMA servers via an IP network (DMA network), allowing for peer-to-peer communication between each DMA server in the network. '988 Patent at 6:46-49, Fig. 4. DMA servers and the devices they serve can also communicate with other DMA servers and devices located on separate networks and legacy networks, such as conventional telephone or cellular networks using MSCs as in Flore, via DMA gateways. *See id.* at 10:53-66, Claim 5; Flore at ¶ 30 (describing the conventional legacy networks with centralized MSCs); Ex. 2012 at 3. DMA gateways bridge the separate networks and

communications via a DMA gateway communications network that the DMA gateways are part of. *See id.* In this manner, the DMA gateways facilitate communications between devices serviced by DMA servers on separate networks and legacy communication networks. Cooklev Decl., ¶ 58.

By leveraging the DMA servers, DMA gateways, and DMA gateway communications networks, the claimed inventions route communications between devices serviced by different networks, *e.g.*, between DMA networks or between a DMA network and a legacy communication network. '988 Patent at 9:36-11:27. For instance, Figure 6 exemplifies (reproduced below) communication between wireless devices on separate private IP networks. *Id.* at Fig. 6. To enable communication across these separate networks, a first DMA gateway utilizes communications information (not shown) to identify the devices of home networks serviced by DMA gateways. *Id.* at 11:11-27, *id.* at Fig. 6. In this example, DMA gateway 602 uses the communications information to identify a target UE (wireless device 652) of the private IP network 640 serviced by the second DMA gateway 604. *Id.* at 11:11-27, *id.* at Fig. 6. The communication is then routed via DMA gateway communications network 606 to private IP network 640 that is accessible by DMA gateway 604. *See id.* at Abstract, 9:37-40, 15:24-36, Fig. 6. This use of DMA gateways applies equally to connecting calls to a telephone 612 on

conventional public-switched telephone network 610 (a legacy communications network).

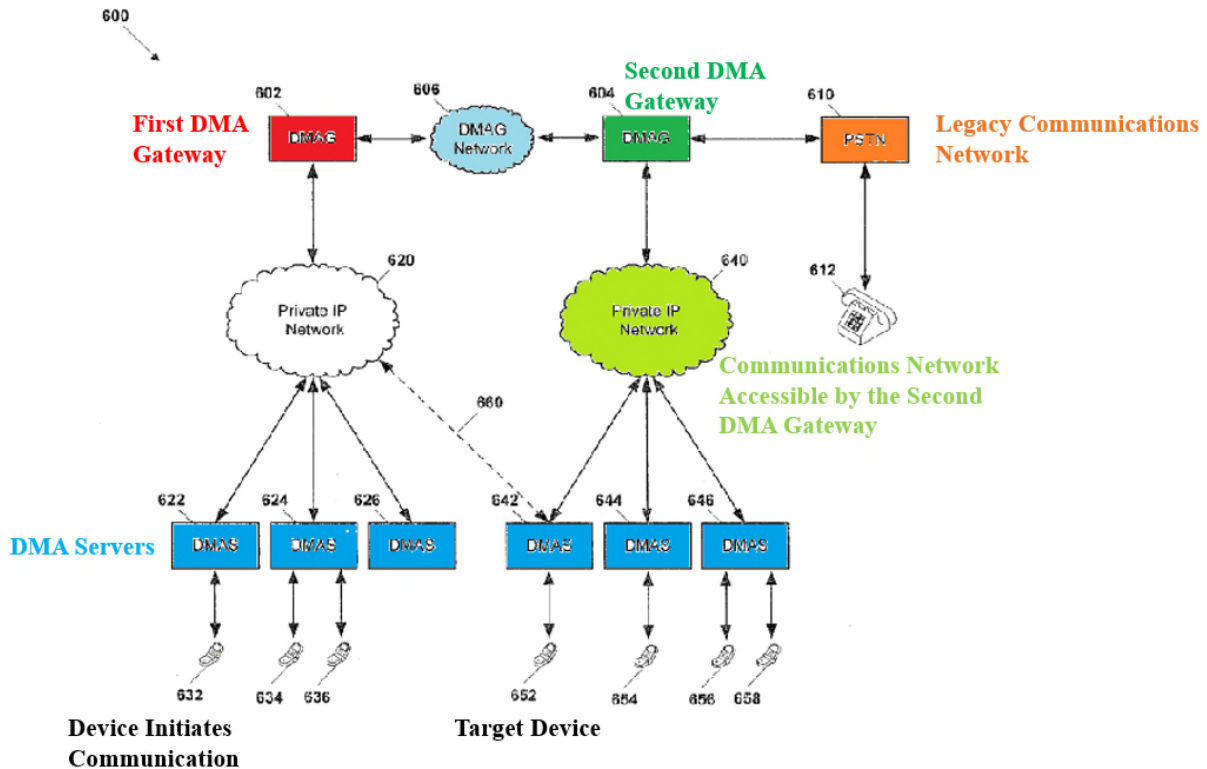


FIG. 6

*Id.* at Fig. 6 (annotated) (showing the use of a DMA gateway network to connect first and second DMA gateways, allowing for communications from UE associated with a first private network to reach UE associated with a second private network or the public-switched telephone network); Cooklev Decl., ¶¶ 59-60.

### 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 of a POSA could substitute for professional experience, or significant experience in the field could substitute for formal education.” Pet. at 3; Cooklev Decl., ¶¶ 18-23.

#### 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 well over a hundred 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 8. 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 ’988 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 8. 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” Flore’s conventional, hierarchical network architecture components “would fall within the scope” of the claimed DMA infrastructure. *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 networks disclosed in Flore, and Petitioners do not even attempt to explain what it is about the components of these networks that make them part of a DMA network. Pet. at 10-11 (labeling disparate components of GPRS and Evolved Packet Core Networks disclosed in Flore as part of a DMA infrastructure). Petitioners’ tack of drawing boxes around disparate elements of these networks and calling them part of a DMA infrastructure—without ever establishing what DMA means to a POSITA in the context of the ’988 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. “DMA servers” Are Connected by Peer-to-Peer Connections**

Each of the Challenged Claims requires a distributed mobile architecture (DMA), where individual DMA servers are connected with peer-to-peer connections. Cooklev Decl., ¶ 26.

According to the '988 Patent, each DMA server has its own MSC and BSC functionality, including gateways and a cellular radio network controller (CRNC), to allow for a fully functional virtualized network. '988 Patent at Figs. 1-3, 5; *see id.* at 7:19-21; Cooklev Decl., ¶¶ 27-28 (citing Lemko's demonstrative depicting the DMA server and fully functional virtualized network)). Consequently, rather than managing all calls at a single centralized MSC, like conventional systems, the '988 Patent discloses a "distributed mobile architecture" where call management is distributed among the various DMA servers that make up a DMA network:

Within the **distributed** and associative communications system 400, the controlling logic can be **distributed and decentralized**. Moreover, the wireless coverage provided by the disclosed system 400 is self-healing and redundant. In other words, due to the interconnectivity via the IP network 410, if one or more of the DMAs 406 loses power, fails, or is otherwise inoperable, telephony **traffic handled by the inoperable DMA 406 can re-routed to one of the remaining operable DMAs 406**. 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 406**. It can also be appreciated that new cellular coverage sites can be easily added to the system 400 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.

'988 Patent at 6:63-7:12 (emphasis added). In the '988 Patent's DMA network, the controlling logic, and the data for routing calls, are distributed among individual DMA servers, which are connected to every other DMA server in the DMA network using a peer-to-peer connection. *Id.* at 7:2-7.

Figure 4 (reproduced below) illustrates that each DMA server is interconnected with other DMA servers in an Internet Protocol (IP) network via peer-to-peer connections. '988 Patent at 6:46-37 ("each DMA server 106 is interconnected with the other DMA servers 106 via an Internet protocol network . . . . As such, there exists peer-to-peer connection 412 between each DMA server 406 in the system").

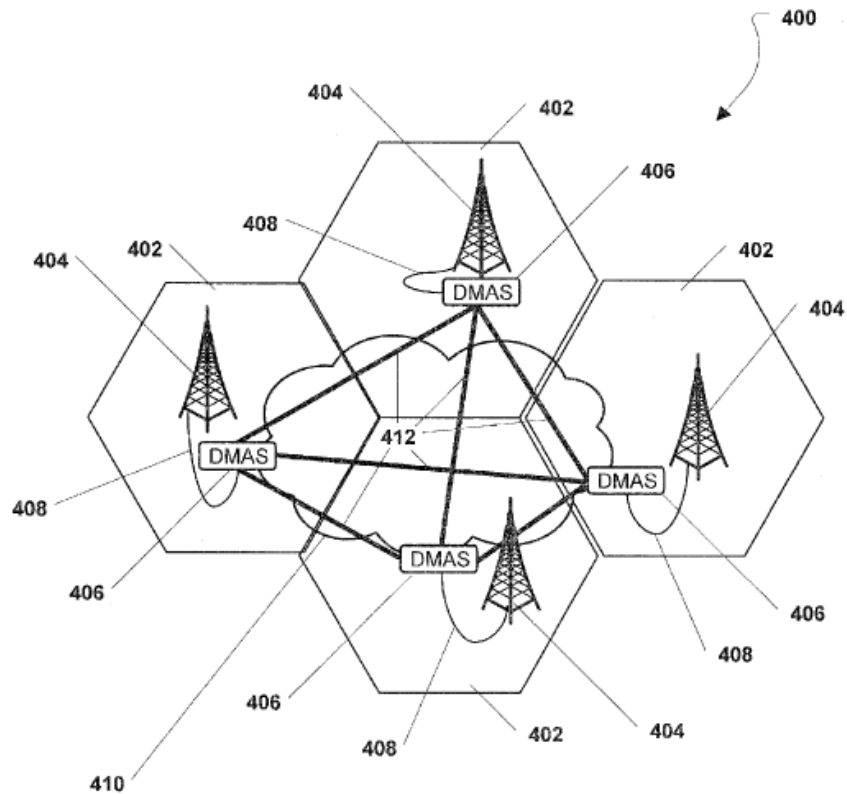
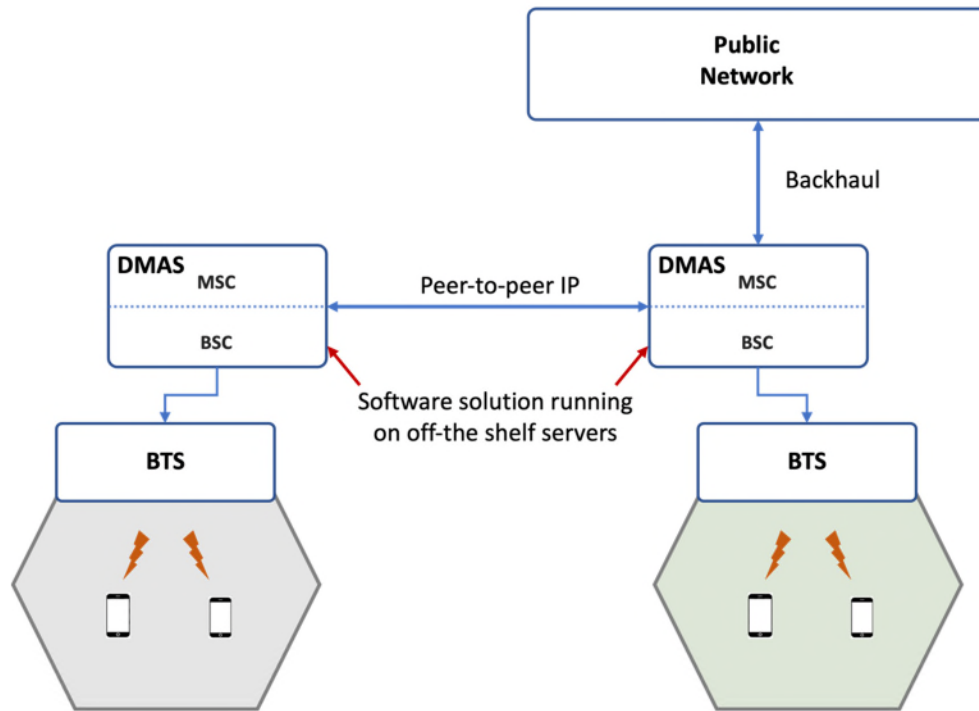


FIG. 4

*Id.* at Fig. 4. The use of these peer-to-peer IP network connections between DMA servers in the same network 400 eliminates or reduces the need to route traffic through a backhaul, as is shown schematically in an expanded and annotated view of Figure 4 below:

**Lemko Distributed Mobile Architecture**



Cooklev Decl., ¶ 29. 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. *Id.* at ¶ 30.

Thus, DMA server should be construed to be connected to other DMA servers through peer-to-peer connections. *Id.* at ¶ 31.

**C. “Communications Information” Must Include Information Identifying the Home Network for a Target Device**

The claimed “communications information” must include “information identifying devices serviced by a home network.” ’988 Patent at Claim 1; Cooklev Decl., ¶ 32.

The Challenged Claims expressly state that the claimed “communications information:” (i) “indicat[es] one or more devices accessible by a DMA server and a legacy communications network,” (ii) is stored “in a home DMA register,” and (iii) is “to be served by the second DMA gateway” to indicate a target device. ’988 Patent at Claim 1. In accordance with these requirements, the “communications information” must include information that identifies the target devices serviced by a home network. *Id.* at 11:10-25, 14:5-14; Cooklev Decl., ¶ 33.

Specifically, to facilitate communication between devices serviced by different networks, the DMA gateways maintain communications information that identifies devices on the home networks that each DMA gateway services, and which is provided to other DMA gateways through the exchange of register data:

DMA gateways provide information to one another regarding the communications networks they service by exchanging register data describing the networks they service. The register data describes devices for which the networks they service are the home network . . . .

’988 Patent at 11:20-25. The register data identifying “devices for which the networks they service are the home network” (*id.* at 11: 23-24) is known as home location register (HLR) information that is stored in a “home DMA register.” *Id.* at Claim 1, 15:14-23, 16:63-17:12. By locating this functionality at the DMA gateway, the DMA gateway is able to identify the specific DMA gateway it needs to contact

in order to connect a call to a UE located in a different home network. Cooklev Decl., ¶ 34.

The HLR information includes subscriber location and user profile data, such as the user's phone number, which is used to determine the routing of the communication to the home network servicing the target device. Ex. 2015 (explaining that “[i]n order for communication to take place with the mobile device of a subscriber, the location of the device must be known in order to route those communications to the part of the mobile network serving their mobile device.”); Ex. 2013 at 1 (explaining that the HLR information is “used to determine the correct routing for incoming and outgoing calls and messages.”); Ex. 1006 at 13 (disclosing the HLR as a register “to which a mobile subscriber is assigned for record purpose such as subscriber information.”). Accordingly, a DMA gateway accesses the HLR information stored in the home DMA register to identify the target UE serviced by a home network and routes the communication to the network serviced by the DMA gateway. See Cooklev Decl., ¶ 35 (citing '988 Patent at 13:58-14:14). Therefore, for at least these reasons, “communications information” must include information identifying devices serviced by a home network. Cooklev Decl., ¶ 35.

While Petitioners do not propose an explicit construction for communications information, their anticipation theory depends on an incorrect implicit construction of communications information. Specifically, Petitioners contend that Flore's

Packet Data Protocol (PDP) context is communications information. *See* Pet. at 13 (“[T]he PDP context included in the message contains information identifying the UE 110”). A PDP context, however, is not part of the claimed communications information. Cooklev Decl., ¶ 36. As discussed in more detail in Section V.D *infra*, a PDP context is only used to create a cellular communication connection over which UE can subsequently exchange IP packets; it does not identify devices for which networks serviced are the home networks. *Compare* Ex. 2016 at 1 (explaining that a “Packet Data Protocol (PDP) context offers a packet data connection over which the UE and the network can exchange IP packets.”) *with* ’988 Patent at 11:20-25. Moreover, as discussed in more detail in Section V.E *infra*, the PDP context is stored in a GGSN register, not in a home DMA register as the Challenged Claims require. ’988 Patent at Claim 1 (“storing the communications information in a home DMA register”); Cooklev Decl., ¶ 37.

**V. THE PETITION SHOULD BE DENIED BECAUSE PETITIONERS FAIL TO DEMONSTRATE A REASONABLE LIKELIHOOD OF SUCCESS ON ANY CHALLENGED CLAIM**

For at least the reasons set forth herein, Petitioners fail to show that Flore anticipates the Challenged Claims. Flore does not disclose at least the following limitations of the Challenged Claims:

- 1) a “DMA server;”

- 2) a “communications network [that is] accessible by a second DMA gateway” where one or more devices [are] accessible by one of a DMA server and a legacy communications network;”
- 3) a “DMA gateway communications network;”
- 4) “Communications information” that indicates a target device and is “served by the second DMA gateway;” and
- 5) a “home DMA register of the first DMA gateway.”

Each of these failures is an independent basis to find that the Challenged Claims are not anticipated by Flore. Thus, the Board should deny institution.

**A. Flore Does Not Disclose a “DMA server”**

Each of the Challenged Claims requires a DMA server. As discussed in Section IV.B *supra*, a DMA server is connected to other DMA servers by peer-to-peer connections, a critical component of Lemko's claimed distributed mobile architecture network. Flore does not disclose any node that corresponds to a DMA server, as it is based on a conventional, hierarchical network architecture that lacks peer-to-peer connections. *See* § II.B, *supra* (describing the conventional networks disclosed in Flore); Cooklev Decl., ¶ 65.

Petitioners initially contend that the radio network controller (RNC) and the access gateway (AGW) are DMA servers. *See* Pet. at 9-10 (“Thus the RNC and AGW in Flore serve as the ‘**distributed mobile architecture (DMA) servers**’ of the asserted claims.”). These nodes cannot be DMA servers, *inter alia*, because they are part of the conventional network architectures. *See, e.g.*, Ex. 1006 at 14, 23-25

(describing the conventional GPRS network serviced by centralized MSCs disclosed in Flore as including an RNC and gateways). Moreover, they are not connected by peer-to-peer connections to corresponding homogeneous devices as required by the '988 Patent. See '988 Patent at 6:46-49, Fig. 4 (depicting a *DMA server* connected by peer-to-peer connection to another *DMA server*). Instead, the RNC connects to SGSN 142 and the AGW connects to Inter-AS Anchor 152. Flore at Fig. 1 (depicting RNC 124 connecting to SGSN 142 and AGW 134 connecting to Inter-AS Anchor 152); Cooklev Decl., ¶¶ 66-67.

Moreover, in addressing the specific claim limitation reciting the “one or more devices accessible by one of a DMA server,” Petitioners contend that the DMA server is instead “one or more Node Bs.” Pet. at 13 (alleging that “the UE 110 is accessible by one or more Node Bs.”). Node Bs also cannot be DMA servers because there are no connections (peer-to-peer or otherwise) between Node Bs as required by the Challenged Claims. See Flore at Fig. 1; § IV.B, *supra* (establishing that DMA servers are connected with peer-to-peer connections); Cooklev Decl., ¶ 68.

Finally, because Petitioners inconsistently rely on the RNC, AGW, and Node Bs as the DMA servers in different portions of the Petition, Petitioners' allegations are uncertain and unclear, which is a further ground to reject the Petition. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378-79 (Fed. Cir. 2015)

(“[I]f the fact trier of the issue is left uncertain, the party with the burden loses.”)  
(citation omitted).

**B. Flore Does Not Disclose a “Communications Network” That is  
“Accessible by a Second DMA Gateway”**

Flore does not disclose the “communications network [that is] accessible by a second DMA gateway,” as recited in Independent Claim 1. ’988 Patent at Claim 1.

Figure 6 of the ’988 Patent (reproduced below) shows the “communications network” which is “accessible by a second DMA gateway” as a private IP network with devices accessible by DMA servers that are part of a DMA network:

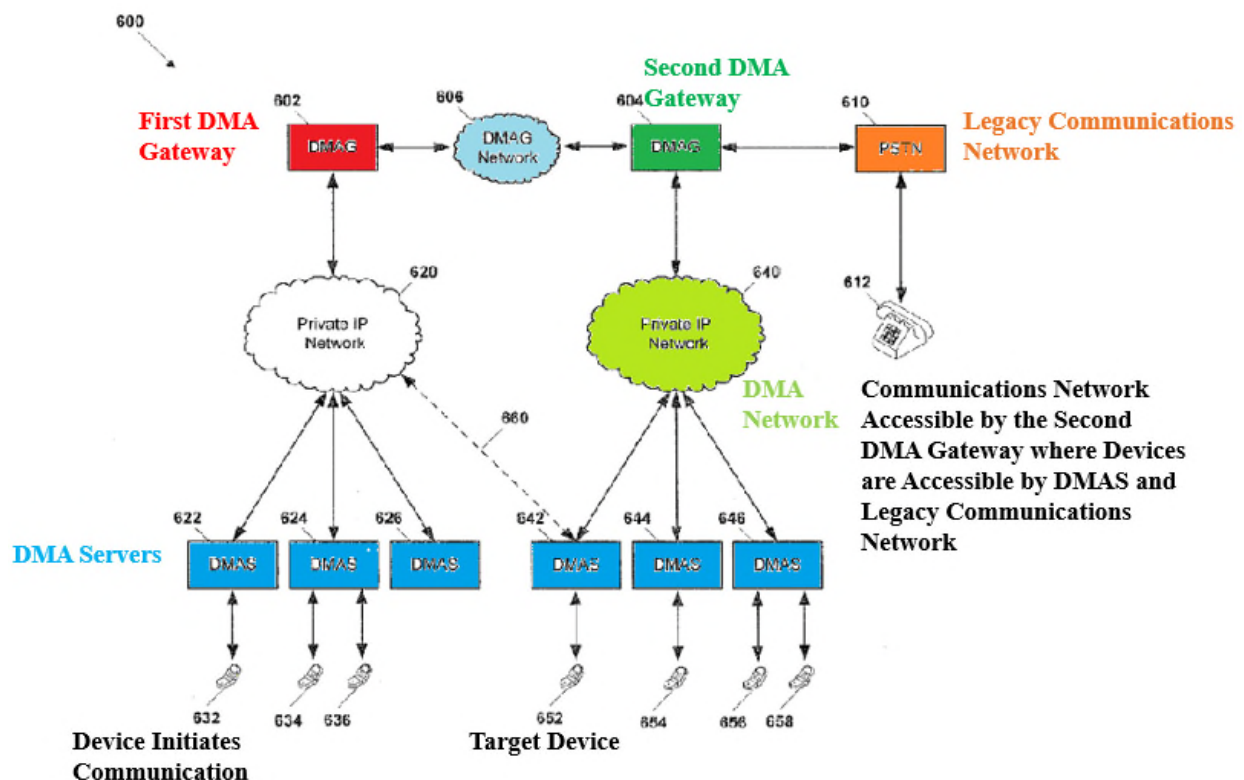
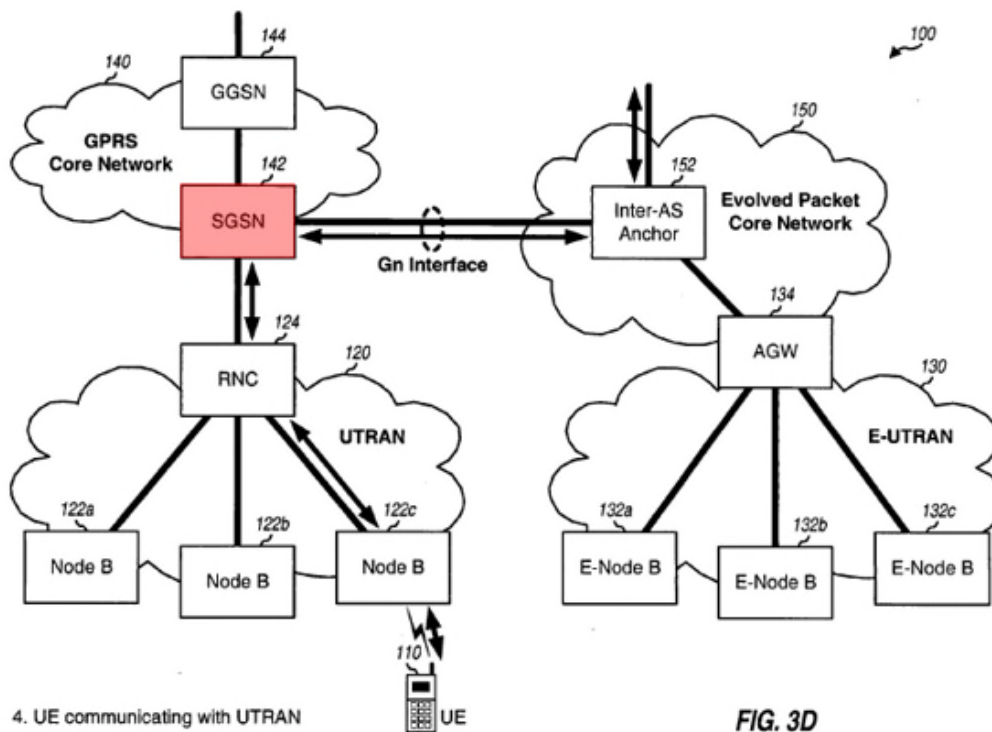


FIG. 6

*Id.* at Fig. 6 (annotated); *see also id.* at 10:57-59 (“The second private IP network 640 communicates with the second DMA gateway 604.”). Within the communications network, the DMA servers are connected by a peer-to-peer DMA network. *See id.* 6:46-49; *see also* § IV.B, *supra*; Cooklev Decl., ¶¶ 69-70.

Petitioners rely on Flore’s SGSN 142 (shown in red below) for allegedly satisfying the “second DMA gateway” limitation. Pet. at 13. However, Petitioners do not point to or identify any understandable explanation of a “communications network” accessible by SGSN 142, let alone one providing peer-to-peer connections as the claimed “communications network” does for DMA servers. *See id.* at 11, 12-13; Cooklev Decl., ¶ 71.



Flore at Fig. 3D (annotated).

Petitioners' failure to clearly identify the claimed communications network is fatal to their Petition, which "must specify where each element of the claim is found in the prior art patents or printed publications relied upon," as is required by § 42.104(b)(3). Petitioners were obligated to and failed to "provide an understandable explanation of the element-by-element specifics of its unpatentability contentions, identifying supporting disclosures from the asserted prior art." *Nichia Corp. v. Document Sec. Sys., Inc.*, No. 2020-2261, 2022 WL 1218036, at \*4 (Fed. Cir. Apr. 26, 2022) (citing 35 U.S.C. § 312(a)(3)). "[T]he burden of persuasion is on the petitioner[s] to prove 'unpatentability by a preponderance of the evidence,' 35 U.S.C. § 316(e), and that burden never shifts to the patentee." *Dynamic Drinkware*, 800 F.3d at 1378. Thus, Petitioners' failure to articulate an understandable explanation of their contention for this limitation dictates denial of the Petition. *Id.*

While the Petition is unclear as to the identity of the alleged DMA network, to the extent Petitioners intended to rely on UTRAN 120, it cannot be a DMA network. The claimed communications network is one where one more devices are accessible by DMA servers (of a DMA server network) **and** a legacy communications network, allowing communication across these different networks. See '988 Patent at Claim 1 (reciting "a communications network accessible by a second DMA gateway" where "one or more devices are accessible by one of a DMA

server **and** a legacy communications network”) (emphasis added). UTRAN 120 cannot be the DMA server network, because Petitioners also assert that UTRAN 120 is the claimed “legacy communications network” which includes Nodes B.<sup>7</sup> Pet. at 13 (legacy networks 120 and 140), *id.* at 20 (“In Flore the ‘legacy network’ is the UTRAN 120 and GPRS core network 140.”). That is, because Petitioners also assert that UTRAN 120 is the claimed “legacy communications network” (which is highlighted in orange in Figure 6 above), it cannot also be the claimed “DMA network.” Pet. at 13 (legacy networks 120 and 140), *id.* at 20 (“In Flore the ‘legacy network’ is the UTRAN 120 and GPRS core network 140.”); Cooklev Decl., ¶¶ 72-73.

There are two reasons the “legacy communications network” cannot also be the “DMA network” with DMA servers. *First*, a major point of the ’988 Patent is to provide a distributed, peer-to-peer network that is different and better than legacy network, such as the conventional GPRS network with centralized MSC locations.

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<sup>7</sup> Petitioners allegation that Nodes B are DMA servers fails for the additional reason that Node Bs are included in the UTRAN legacy network, not a DMA network as DMA servers are part of and connected by peer-to-peer connections. Pet. at 13; §§ IV.B, V.A, *supra*. And, as established below, legacy networks are distinguished from a DMA network with DMA servers.

'988 Patent at Claim 5 (reciting that the “legacy communications network” is “a wireless communications network services by a mobile switching center” as Flore’s conventional networks); *see* § II.A-B, *supra*. *Second*, because the DMA server (part of the DMA network) and legacy communications network are listed “separately, the clear implication of the claim language is that those elements are distinct component[s] of the patented invention.” *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (internal quotations and citations omitted); *Cisco Sys., Inc. v. Egenera, Inc.*, No. IPR2017-01341, Paper 10 at 14-15 (P.T.A.B. Nov. 13, 2017) (denying institution because the petitioner relied on one component from the prior art for two different claim elements). In this regard, the DMA network with the DMA servers and the legacy communications network are distinct from one another. *See* § IV.B.

Thus, Flore does not disclose a “communications network” that is “accessible by a second DMA gateway.” Cooklev Decl., ¶ 74.

**C. Flore Does Not Disclose a “DMA Gateway Communications Network”**

Flore does not disclose a DMA gateway communications network. At a minimum, the DMA gateway communication network is a network that connect at least two DMA gateways and is used by the DMA gateways to discuss communications information (discussed in Sections IV.C and V.C). Cooklev Decl.,

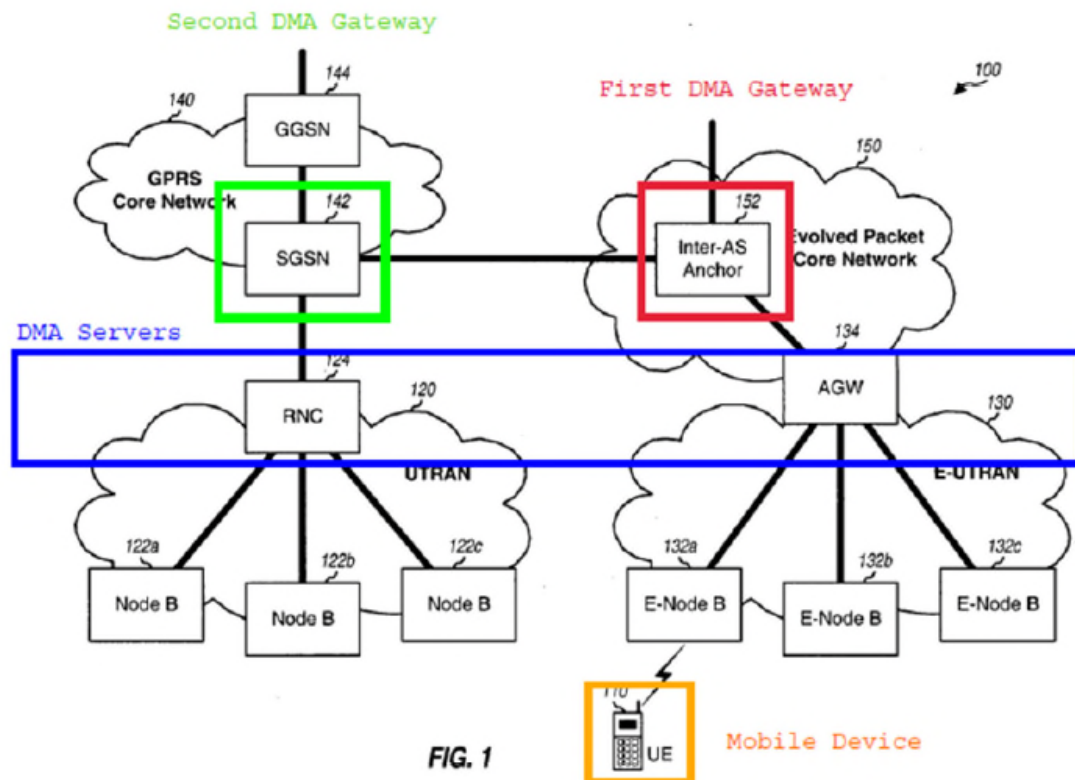
¶ 75. There are multiple flaws in Petitioners' contention that Flore's Gn interface is a "DMA gateway communications network." Pet. at 14.

**First**, the Gn interface is, as its name suggests, an interface, which is "[t]he point at which a connection is made between two hardware devices." Ex. 2019 at 199; *see also* Ex. 2020 at 351. A network is "[a] group of computers and associated peripheral devices connected by a communications channel . . .," which is different from the Gn interface. Ex. 2019 at 286; Ex. 2020 at 454. Flore describes the legacy GN interface as being within a GPRS network and connecting the SGSNs and GGSNs. *See* Flore at ¶ 29 ("Gn-interface, which is a legacy interface between SGSNs and GGSNs within a GPRS core network."), *id.* (explaining that the legacy GN interface "allows SGSN 142 to communicate with Inter-AS Anchor 152 in the same manner as another SGSN."). Accordingly, the Gn interface is "[t]he point at which a connection is made between [the SGSN and GGSNs]" of a network containing "[a] group of computers and associated peripheral devices . . . ." Ex. 2019 at 199, 286. Thus, Flore's conventional Gn interface is not itself a network, let alone a DMA gateway communications network. Cooklev Decl., ¶ 76.

**Second**, the '988 Patent explains that the DMA gateway communications network includes a group of DMA gateways including the claimed first and second DMA gateways. '988 Patent at 9:36-43, Claim at 1 (reciting "a first distributed mobile architecture (DMA) gateway" and "a second DMA gateway."). Flore's

legacy Gn interface is not a point of connection between two or more DMA gateways. Cooklev Decl., ¶ 77.

Petitioners concede that the GPRS core network 140 corresponds to a “legacy communications network.” See Pet. at 13 (alleging “‘legacy networks 120 and 140’” correspond to the claimed “legacy communications network”) (quoting Flore at ¶ 29), *id.* at 20 (arguing that “[i]n Flore the ‘legacy network’ is the UTRAN 120 and GPRS core network 140.”). As discussed in Section V.B *supra*, the Challenged Claims distinguish a “legacy communications network” from that of a DMA server network. Flore’s legacy GPRS network includes SGSN 142 (that Petitioners allege is the second DMA gateway) as the below illustration shows:



See Pet. at 11 (citing Flore at Fig. 1 (annotated)), 13; *see also* Flore at Fig. 3D (depicting the GN interface connecting SGSN 142 of GPRS core network 140 (e.g., 2G network) to Inter-AS Anchor of Evolved Packet core network 150 (e.g., 4G network)), ¶ 29. Accordingly, under Petitioner’s flawed theory, the conventional GN interface *connects legacy networks*, it does not connect a first DMA gateway for a DMA server network to a second DMA gateway. Cooklev Decl., ¶¶ 77-78.

For at least the foregoing reasons, Flore does not disclose the claimed “DMA gateway communications network. Cooklev Decl., ¶ 79.

**D. Flore Does Not Disclose Communications Information Indicating a Target Device That is Served by the Second DMA Gateway**

The network of the Challenged Claims of the '988 Patent depends on DMA gateway's "communication information" indicating a target device of a home network that is served by the second DMA gateway under the correct construction. *See* '988 Patent at Claim 1 ("communications information to be served by the second DMA gateway"); *see* § IV.C. *supra*. Locating this functionality at the DMA gateway, instead of in an MSC or network core, is part of Lemko's novel architecture to allow DMA gateways to identify devices on a home network they service. Cooklev Decl., ¶ 80 (citing '988 Patent at 11:20-27) ("DMA gateways provide information to one another . . . by exchanging register data. The register data describes *devices for which the networks they service are the home network* as well as for what devices are visiting on their networks.") (emphasis added).

Focusing on just a portion of the claim limitation,<sup>8</sup> Petitioners identify only Flore's Inter-AS Anchor (the alleged first DMA gateway) and how it supposedly receives packets (the alleged communications). Pet. at 17 ("Flore thus discloses receiving packets (*i.e.*, 'a communication')" and "updates its PDP context").

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<sup>8</sup> The full claim limitation recites "receiving a communication at the first DMA gateway for a target device indicated by the communications information to be served by the second DMA gateway." '988 Patent at Claim 1.

Petitioners do not address or even reference the term “communications information to be served by the second DMA gateway.” *Id.* As such, nowhere do Petitioners point to or identify in Flore an alleged second DMA gateway serving communications information. Because Petitioners ignore this claim term, the Petition should be denied for at least this failure. *See Nichia*, 2022 WL 1218036, at \*4.

Moreover, to the extent Petitioners are relying on Packet Data Protocol (PDP) context field (which is unclear), a PDP context field is not the claimed “communications information.” *See* § IV.C, *supra* (“communications information” must include “information identifying devices serviced by a home network”). A PDP context field is used to ***offer a cellular communication connection*** over which the UE can subsequently exchange IP packets with the network rather than identify devices served by a home network. Ex. 2016 at 1 (explaining that a “Packet Data Protocol (PDP) context offers a packet data connection over which the UE and the network can exchange IP packets.”); Ex. 2017 at 1 (same); Cooklev Decl., ¶¶ 81-82.

The PDP context is not generated until ***after*** the system has already determined the network serving each of the UEs. Put another way, the PDP context is only related to the newly created connection between a device and network to exchange packets. This is consistent with Flore’s use of a PDP context used for establishing a connection between the user equipment (UE) and the network. *See*

Flore at ¶ 46 (“Inter-AS Anchor 152 updates its PDP context fields for UE 110 so that future packets for the UE are forwarded to SGSN 142 instead of AGW 134.”). The PDP context field does not itself contain any information identifying devices serviced by a home network and is not stored in a DMA home register as required by the Challenged Claims (discussed in Section V.E *infra*). See Cooklev Decl., ¶ 83.

Accordingly, the PDP context does not and cannot be used to identify devices for which the networks serviced by the DMA gateway is the home network. See ’988 Patent at 11:20-25. This is an important distinction from the claimed communications information, which is used to enable the DMA gateways to perform the call routing functions conventionally performed at an MSC. Cooklev Decl., ¶ 84.

**E. Flore Does Not Disclose “a Home DMA Register of the First DMA Gateway”**

Flore does not disclose a “home DMA register of the first DMA gateway.” See ’988 Patent at Claim 1 (“storing the communications information in a home DMA register of the first DMA gateway”). According to the ’988 Patent the “home DMA register” stores “communication information,” which includes information identifying devices serviced by a home network. See § IV.C, *supra*. This corresponds to the functionality provided by a home location register (HLR) in a conventional network, as the ’988 Patent explains, although, in the network of the ’988 Patent, the information is stored at a DMA server or DMA gateway (unlike in conventional networks). *Id.* at 15:14-17; Cooklev Decl., ¶¶ 85-86.

Petitioners incorrectly contend that Flore's GGSN location register is a "home DMA register." Pet. at 15-16. The GGSN location register is different from the home DMA/HLR, as recognized in Petitioners' Exhibit 1006 at 13-14 (explaining that "the location register is handled by four different entities" which includes the HLR and the separate GGSN register). Specifically, the home DMA/HLR entity "is the location register to which a mobile subscriber is assigned for record purposes." *Id.* at 13. Whereas the GGSN register entity is the "the location register function . . . [that] stores subscription information and routeing [sic] information (needed to tunnel packet data traffic destined for a GPRS MS to the SGSN) . . . for each subscriber for which the GGSN has at least one PDP context active." *Id.* at 13-14. Given that the GGSN register and the home DMA/HLR are two separate and distinct entities, a POSITA would understand that the GGSN location register function does not equate to the "home DMA register." Cooklev Decl., ¶ 87 (citing Ex. 1006 at 13-14).

Petitioners also assert that a POSITA would understand that a PDP context field is a "home DMA register" because it "necessarily has a list of entries for the UEs it serves, such as UE 110." Pet. at 16-17. Petitioners do not identify any support for this contention. To the extent Petitioners are making an inherency argument (which they have not expressly asserted), there is no reason that the PDP context field, including information for a data connection between a UE and network, is

itself a home DMA register. *See, e.g.*, Ex. 2018 at 1 (The PDP context “defines aspects such as Routing, QoS (Quality of Service), Security, Billing, etc.” for a connection between a UE and network). Inherency cannot be established by probabilities or possibilities. *See Cont’l Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991) (“Inherency . . . 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.”) (citation omitted). On the contrary, “PDP context fields” are stored in the GGSN location register which, as described above, is separate and distinct from a home DMA/HLR entity. Ex. 1006 at 13-14 (disclosing that the “GGSN has at least one PDP context active.”). This is a further reason a POSITA would not find the reference to PDP context fields to disclose a “home DMA register.” Cooklev Decl., ¶ 88.

Thus, Petitioners fail to show that Flore discloses, expressly or inherently, a “home DMA register of the first DMA gateway.” Cooklev Decl., ¶ 89.

## **VI. CONCLUSION**

For all of these reasons, Patent Owner accordingly requests that the Board deny institution of *inter partes* review of the Challenged Claims of the '988 Patent.

Respectfully submitted,

Dated: June 30, 2023

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

The undersigned hereby certifies that the portions of the above-captioned **PATENT OWNER'S PRELIMINARY RESPONSE** specified in 37 C.F.R. § 42.24 has 7,311 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.

Dated: June 30, 2023

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Lemko Corporation

**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.

|                          |                                                                                                                                    |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------|
| <i>Date of service</i>   | June 30, 2023                                                                                                                      |
| <i>Manner of service</i> | Electronic Filing<br>(rkang@winston.com<br>bshelton@winston.com;<br>mrueckheim@winston.com;<br>Winston-MSFT-Lemko-IPR@winston.com) |
| <i>Documents served</i>  | PATENT OWNER'S PRELIMINARY RESPONSE                                                                                                |
| <i>Persons Served</i>    | WINSTON & STRAWN LLP<br>Robert N. Kang<br>Barry K. Shelton<br>Michael Rueckheim                                                    |

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