

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SAMSUNG ELECTRONICS CO., LTD., and  
SAMSUNG ELECTRONICS AMERICA, INC.,

Petitioners,

v.

XIFI NETWORKS R&D, INC.,

Patent Owner.

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Case PGR2025-00068

Patent 12,169,756

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**PATENT OWNER'S SURREPLY**

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**Patent Owner Exhibit List**

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                                       |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EX2001             | Complaint, <i>XiFi Networks R&amp;D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG, Dkt. 1 (E.D. Tex. Dec. 17, 2024).                                                                          |
| EX2002             | First Amended Docket Control Order, <i>XiFi Networks R&amp;D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG, Dkt. 28 (E.D. Tex. Apr. 14, 2025).                                                |
| EX2003             | Plaintiff's First Amended Complaint, <i>XiFi Networks R&amp;D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG, Dkt. 13 (E.D. Tex. Mar. 11, 2025).                                               |
| EX2004             | Defendants' Answer and Affirmative Defenses to Plaintiff's First Amended Complaint, <i>XiFi Networks R&amp;D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG, Dkt. 31 (E.D. Tex. Jun. 9, 2025). |
| EX2005             | Defendants' P.R 3.3 and 3.4 Invalidity Contentions (Jun. 18, 2025).                                                                                                                                                                                      |
| EX2006             | Table 1 Comparing Select Sections of Almeroth Declaration to Corresponding Sections of Petition (EX1002).                                                                                                                                                |
| EX2007             | [RESERVED]                                                                                                                                                                                                                                               |
| EX2008             | Declaration of Dr. Robert Akl, D.Sc.                                                                                                                                                                                                                     |
| EX2009             | American Heritage Dictionary (5th Ed., 2012).                                                                                                                                                                                                            |
| EX2010             | Andrew S. Tanenbaum, <i>Computer Networks</i> (5th Ed., 2011).                                                                                                                                                                                           |
| EX2011             | U.S. Patent No. 8,078,208                                                                                                                                                                                                                                |
| EX2012             | U.S. Patent No. 9,560,656                                                                                                                                                                                                                                |
| EX2013             | Curriculum Vitae of Dr. Robert Akl, D.Sc.                                                                                                                                                                                                                |

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                                  |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EX2014             | Excerpts from the prosecution history of U.S. Patent No. 11,950,105                                                                                                                                                                                 |
| EX2015             | [RESERVED]                                                                                                                                                                                                                                          |
| EX2016             | Excerpts from the prosecution history of U.S. Patent No. 12,250,564                                                                                                                                                                                 |
| EX2017             | Second Declaration of Dr. Robert Akl, D.Sc.                                                                                                                                                                                                         |
| EX2018             | Further excerpts from Andrew S. Tanenbaum, <i>Computer Networks</i> (5th Ed., 2011).                                                                                                                                                                |
| EX2019             | International Organization for Standardization and the International Electrotechnical Commission, ISO/IEC 7498-1, Information technology—Open Systems Interconnection—Basic Reference Model: The Basic Model (2d. Ed. corrected and reprinted 1996) |
| EX2020             | Amended Joint Claim Construction Statement, <i>XiFi Networks R&amp;D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG, Dkt. 62 (E.D. Tex. Feb 27, 2026).                                    |
| EX2021             | Declaration of Dr. Mark Mahon in Support of Claim Construction, <i>XiFi Networks R&amp;D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG                                                   |
| EX2022             | Excerpts from the file history of U.S. Patent No. 11,818,591                                                                                                                                                                                        |
| EX2023             | Excerpts from the file history of U.S. Patent No. 11,950,105                                                                                                                                                                                        |
| EX2024             | Excerpts from the file history of U.S. Patent No. 11,849,337                                                                                                                                                                                        |
| EX2025             | Excerpts from the file history of U.S. Patent No. 11,856,414                                                                                                                                                                                        |
| EX2026             | [RESERVED]                                                                                                                                                                                                                                          |
| EX2027             | Excerpts from the file history of U.S. Patent No. 12,114,177                                                                                                                                                                                        |

| <b>Exhibit No.</b> | <b>Description</b>                                                                                                                                                                                                                                                                  |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| EX2028             | Excerpts from the file history of U.S. Patent No. 12,250,564                                                                                                                                                                                                                        |
| EX2029             | Excerpts from the file history of U.S. Patent No. 11,974,143                                                                                                                                                                                                                        |
| EX2030             | Transcript of the Deposition of Dr. Mark Mahon, <i>XiFi Networks R&amp;D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG                                                                                                   |
| EX2031             | Samsung's Proposed Claim Constructions for the Terms and Phrases Identified for Construction Per Local Patent Rule 4-2, <i>XiFi Networks R&amp;D, Inc. v. Samsung Electronics Co., Ltd. and Samsung Electronics America, Inc.</i> , No. 2:24-cv-01057-JRG (E.D. Tex. Jan. 14, 2026) |
| EX2032             | Curriculum Vitae of Dr. Robert Akl, D.Sc.                                                                                                                                                                                                                                           |
| EX2033             | Declaration of Aaron R. Fahrenkrog in Support of Motion for Pro Hac Vice Admission                                                                                                                                                                                                  |

## I. CLAIM CONSTRUCTION

In their Petition, Petitioners applied plain and ordinary meaning to all claim terms and did not request construction of any term. Pet. at 10; EX1002, ¶65. Thereafter, in the district court, Petitioners agreed to several narrowing constructions:

| Claim Term                                                                                              | Agreed Construction                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| “virtual MAC interface”                                                                                 | “a software- or logical-based interface that is separately addressable from the recited actual MAC interfaces and that obscures the recited actual MAC interfaces from higher protocol stack layers” |
| “in a manner transparent to any layer of the wireless networking device above the processing interface” | “in a manner where any protocol stack layer of the wireless networking device above the processing interface is unaware of the operation of the processing interface”                                |
| “wireless transceiver(s)”                                                                               | a physical component that wirelessly transmits and receives data”                                                                                                                                    |

EX1028 at 7-11.

Further, the district court adopted narrowing constructions based on disputes raised by Petitioners:

| Claim Term                                                                                         | District Court Construction                                                                   |
|----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| “information regarding the bandwidth availabilities of the first and second wireless transceivers” | “information regarding current bandwidth availabilities of each of the wireless transceivers” |

| Claim Term                       | District Court Construction                                                          |
|----------------------------------|--------------------------------------------------------------------------------------|
| “wireless networking device”     | “device that sends and receives data over a wireless network”                        |
| Preambles                        | Limiting as to “wireless networking device” and “circuitry”; otherwise not limiting  |
| “different bands of frequencies” | “different ranges of frequencies in which the transceivers are capable of operating” |

EX1027 at 25-26. Petitioners now request that the Board apply the district court constructions. Reply at 1-3.

## **II. PETITIONERS’ NEW REPLY ARGUMENTS SHOULD BE DISREGARDED**

As described above, Petitioners no longer advocate for the application of across-the-board plain and ordinary meaning and instead advocate for application of the district court constructions. Pet. at 10; EX1002, ¶65; Reply at 1-3; EX1027 at 25-26; EX1028 at 7-11. However, since shifting claim construction positions to those Petitioner advocated for in the district court, Petitioners’ Reply positions are not supported by the Petition and therefore must be disregarded.

Petitioners are wrong that “there is no inconsistency between Petitioner’s District Court positions and the Petition.”<sup>1</sup> Reply at 1. Instead, Petitioners’

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<sup>1</sup> Indeed, Petitioners concede that they proposed narrowed constructions in the district court “to prevent PO from reading the claims overbroadly”—i.e., that

arguments and evidence applying the district court constructions were not present in their Petition, and in some cases contradict the Petition.

This is a violation of the baseline requirements for a petition—which must “identif[y], in writing and with particularity... the evidence that supports the grounds for the challenge to each claim” and which must contain statements of “[h]ow the challenged claim is to be construed,” “[h]ow the construed claim is unpatentable under the statutory grounds identified,” and “the relevance of the evidence to the challenge raised, including identifying specific portions of the evidence that support the challenge.” 35 U.S.C. § 322(a)(3); 37 C.F.R. § 42.204(b)(3)-(5); *Netflix, Inc. v. DivX, LLC*, 84 F.4th 1371, 1377 (Fed. Cir. 2023) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’” (quoting *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367 (Fed. Cir. 2016))).

The Federal Circuit has made clear that “[t]he IPR petition ... must provide an understandable explanation of the element-by-element specifics of the patentability challenges, including the identification of particular portions of prior art on which

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Petitioners’ requested constructions are narrower than would be permissible applying plain and ordinary meaning. Reply at 1.

the petitioner is relying,” and that “[g]iven these “‘strict ... requirements,’ the Board is not permitted to entertain ‘[s]hifting arguments.’” *Corephotonics, Ltd. v. Apple Inc.*, 84 F.4th 990, 1001-02 (Fed. Cir. 2023) (internal citations omitted).

This rule has an exception: a Petitioner may make new arguments in response to a post-institution claim construction proposal by Patent Owner or the Board. *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1384 (Fed. Cir. 2023); *see also Parkervision, Inc. v. Vidal*, 88 F.4th 969, 979–80 (Fed. Cir. 2023). As relevant here, Petitioners themselves agreed to or proposed the constructions (for “virtual MAC interface” and “information regarding bandwidth availability...”) that created the need for the new arguments, unsupported in the Petition. EX1027 at 25-26; EX1028 at 6-11. Therefore, the *Axonics* rule, based on APA fairness concerns, should not apply to Petitioners, and to hold otherwise would reward the gamesmanship *Axonics* sought to avoid. *Axonics*, 75 F.4th at 1384 (“We are reluctant to adopt a construction of the APA and the Board’s rules that would permit such gamesmanship.”).

Moreover, even when the law allows the opportunity to respond to a claim construction position proposed by the Board or Patent Owner, that response should “rel[y] on the same embodiments for each invalidity ground as were relied on in the petition.” *Id.*; *see also Parkervision*, 88 F.4th at 980. Here, Petitioners, in shifting claim construction positions, rely on wholesale new citations of the prior art, including previously unidentified embodiments.

For example, with regard to the “virtual MAC interface,” the Petition does not address whether Chincholi’s OMMA meets the claim construction Petitioners now puts forward: (1) “a software- or logical-based interface”; (2) “separately addressable from the recited actual MAC interfaces; and that (3) “obscures the recited actual MAC interfaces from higher protocol stack layers.” EX1028 at 7; Reply at 3. Rather, the Petition argued that the OMMA “virtualizes” through aggregation and, with reference to Chincholi’s Figures 5 and 6, identifies modules that are purportedly functional equivalents to the blocks of ’756 patent’s virtual MAC interface. *See* Pet. at 23-25; EX1002, ¶¶96, 98-100. Indeed, the words “separately addressable” and “obscures” do not appear at all in the Petition. *See, e.g.,* Pet. Instead, these arguments were delivered for the first time on Reply, after institution, and after Patent Owner’s opportunity to contest Petitioners’ arguments with evidence and expert testimony had passed.

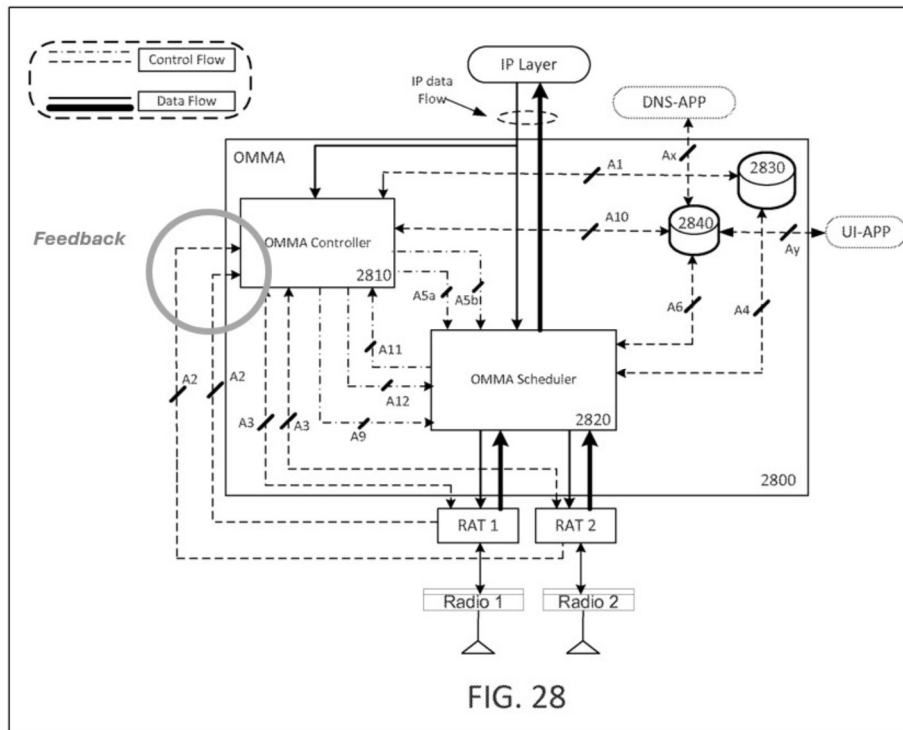
As to the “separately addressable” aspect of the virtual MAC interface construction that Petitioners negotiated in the district court, Petitioners’ Reply improperly pivots to a new embodiment from Chincholi that is not disclosed in the Petition. Reply at 6-7; EX1026, ¶¶33-60. Because Figures 5 and 6, cited in the Petition, provide generic descriptions of one “example OMMA layer” (EX1005, [0017]), they do not disclose how, if at all, Chincholi’s OMMA is “addressable,” in particular how the OMMA is “*separately* addressable.” Therefore, Petitioners’

Reply and supplemental expert declaration mine for a different embodiment to satisfy this requirement—Figure 31 and corresponding description (EX1005, [0243]-[0245]), which Petitioners argue describes “OMMA-directed signaling to the NT’s OMMA Controller.” EX1026, ¶42.

But none of this is cited in the Petition. Indeed, every portion of Chincholi cited as support for “separately addressable” in the Reply is cited for the first time—and none is contained anywhere in the Petition or initial declaration. Reply at 7 (citing for the first time EX1005, [0243]-[0245], Fig. 31); EX1026, ¶¶37-43 (citing for the first time EX1005, [0242]-[0245], Fig. 31). Petitioners thus improperly “reli[ed], in [their] Reply submissions, on previously unidentified portions of a prior-art reference to make a meaningfully distinct contention.” *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367 (Fed. Cir. 2015).

Moreover, the Figure 31 embodiment does not pertain to the embodiment in Figures 5 and 6. Chincholi contains 388 paragraphs describing 59 figures. EX1005. Chincholi does not tie Figure 31 to Figures 5 and 6. Rather, “FIG. 31 illustrates an example call flow illustrating signaling corresponding to an example of a RAT availability update procedure described herein.” EX1005, [0243]. Chincholi in fact describes four different figures as different “example call flow[s],” including Figure 31. EX1005, [0042] (describing Fig. 31), [0044] (Fig. 33), [0047] (Fig. 36), [0071] (Fig. 59).

Petitioner’s expert references his earlier testimony, attempting to connect the Reply to the Petition. EX1026, ¶37 (citing EX1002, ¶¶103-104). But that initial testimony highlights one particular signaling call path—“A2”—with regard to a different limitation (“information regarding bandwidth availability”):



EX1002, ¶103 (citing EX1005, Fig. 28 (annotations added)); *see also* Pet. at 26-27 (same). Meanwhile, the description of Figure 31 that Petitioners cite in Reply with regard to the virtual MAC interface discusses the separate “A3” signaling call path. EX1005, [0243]. Petitioners’ expert’s reference back to analysis of an element of a different embodiment related to a different limitation cannot make the Reply’s analysis of Figure 31 related to the Petition.

Similarly, as to “obscures ... from higher protocol stack layers,” Petitioners and their expert also rely heavily on totally new portions of Chincholi, including reference to “MSDUs” in Table 1—which was never previously cited with regard to the virtual MAC interface. *See* Reply at 6 (citing for the first time with regard to the virtual MAC interface EX1005, [0128], [0138], [0172]-[0178] & Table 1); EX1026, ¶¶44-50, 74 (citing for the first time with regard to the virtual MAC interface EX1005, [0138], [0171]-[0173], [0176-179] & Table 1). Consequently, Patent Owner’s expert Dr. Akl was never able to opine on Table 1 virtual MAC interface arguments.

Moreover, certain of Petitioners’ Reply arguments are contradictory to those in the Petition. The Petition argued that the “information regarding bandwidth availability” limitation “requires merely a component capable of receiving feedback statistics regarding the available resources of the wireless transceivers” and that Chincholi met the limitation via disclosure of feedback statistics. Pet. at 25-26; EX1002, ¶¶101-104. The Petition and accompanying declaration said nothing about feedback being “current.” *Id.* In Reply, Petitioners and their expert now argue for the first time that more than “mere[]” statistics are required, advocating for the district court’s construction that requires information be “current.” Reply at 10-12; EX1026, ¶¶61-70. Further, the Reply argues for the first time that Chincholi discloses such “current” bandwidth availability information. *Id.* Again, these

arguments are without merit—but made for the first time after Patent Owner’s opportunity to contest them with evidence and expert testimony had passed. *See infra*, Section III.A.2; *see also Corephotonics*, 84 F.4th at 1001-1002 (noting that “the Board is not permitted to entertain ‘[s]hifting arguments’”).

The Board should disregard these new arguments. *See Netflix*, 84 F.4th at 1377-1378 (argument based on new embodiment forfeited because not raised in petition); *Ariosa*, 805 F.3d at 1367 (“We see no error in the Board’s rejection of [petitioner’s] reliance, in its Reply submissions, on previously unidentified portions of a prior-art reference to make a meaningfully distinct contention.”); *see also Parkervision*, 88 F.4th at 980; *Axonics*, 75 F.4th at 1384; *Apple Inc. v. Omni MedSci, Inc.*, No. 2023-1034, 2024 WL 3084509, at \*6 (Fed. Cir. June 21, 2024) (allowing reply arguments because they rely on same embodiments as petition); *Dropbox, Inc. v. Datagnet, LLC*, IPR2024-00079, 2025 WL 1203665, at \*16 (P.T.A.B. Apr. 25, 2025) (“That holding in *Axonics* controls here, because the Reply Brief relies on the same embodiments ... that are cited in the Petition.”). In any event, these new arguments are meritless. *See infra*, Sections III.A.1-2.

It would be similarly inappropriate for Petitioners to continue to assert the plain and ordinary meaning arguments laid out in the Petition while operating under narrowed constructions in the district court. Pet. at 10; EX1002, ¶64; EX1027; EX1028. “It is axiomatic that claims are construed the same way for both invalidity

and infringement.” *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1330 (Fed. Cir. 2003). The Director has recently made clear that only in rare circumstances may a Petitioner take inconsistent claim construction positions before the Board and in the district court. *Revvo Techs., Inc. v. Cerebrum Sensor Techs, Inc.*, IPR2025-00632, Paper 20 at 4 (Nov. 3, 2025) (precedential). While a petitioner’s inconsistent positions may be excused based on sufficient explanation as to “why the different positions are warranted” (*id.* at 5), a petitioner “may proffer a different, broader construction before the Board when the district court *already has rejected* petitioner’s narrower construction”—not when the district court has accepted it (*Revvo Techs., Inc. v. Cerebrum Sensor Techs., Inc.*, IPR2025-00632, Paper 36 at 4 (Jan. 26, 2026) (*Revvo II*) (emphasis in original)). Therefore, under *Revvo*, were Petitioners to continue to put forward plain and ordinary meaning here, the Petition should be terminated. *Revvo II*, Paper 36 at 3 (petitioners may not “have it both ways”); *see also, e.g., Apple Inc. v. Theta IP, LLC*, IPR2024-00817, Paper 31 at 19-20 (Nov. 24, 2025) (evaluating *Revvo* in final written decision).

### **III. THE PETITION DOES NOT ESTABLISH THAT THE APPLIED REFERENCES RENDER THE CHALLENGED CLAIMS UNPATENTABLE**

#### **A. The Petition Does Not Establish that Chincholi Discloses Limitations Common to All Challenged Claims**

##### **1. “virtual MAC interface”**

Petitioners’ Reply, despite improper new arguments and evidence, confirms that Chincholi does not disclose the claimed “virtual MAC interface,” either under plain and ordinary meaning or the district court’s construction. *See* Paper 17 (POR), Section VI.A.1; *see also supra*, Section II.

First, Chincholi’s OMMA is not “separately addressable,” notwithstanding the Reply’s new argument that “WTRUs in Chincholi send signaling messages regarding their availability to the OMMA of associated NTs.” Reply at 6. “Separately addressable from the recited actual MAC interfaces” means that the virtual MAC interface has its own address that it uses for purposes of transferring data. *See* POR at 11; EX2017, ¶¶53-55; EX2010 at 17 (“An address field within each packet specifies the intended recipient.”), *id.* at 34 (discussing “addressing”). This is consistent with the way Chincholi uses the term “address”—to indicate the destination where data is sent. *See, e.g.*, EX1005, [0004] (“The first and second IP packets may be part of an Internet Protocol (IP) flow addressed to a receiving node.”); [0007] (similar); [0200] (similar); [0383] (similar).

Nothing in the Reply demonstrates that the OMMA Controller itself has an address, let alone an address to which any data is sent. *See id.*; EX1026, ¶¶37-43, 56-57. Rather, Chincholi discloses only that the NT and WTRU have addresses, and messages pass through the OMMA, which acts like an aggregator and so does not have its own address, identifier, endpoint, or interface. Chincholi's OMMA merely receives IP packets and distributes them among the RAT protocol stacks, operating as a pass-through. EX1005 [0243]-[0245]; EX2017, ¶¶78-79. In sum, the OMMA does not serve as a proxy for an actual MAC interface or multiple actual MAC interfaces, as the virtual MAC interface of the '756 patent does. EX2017, ¶54.

Moreover, for a virtual MAC interface to be “separately addressable from the recited actual MAC interfaces,” the virtual MAC interface must intervene between higher protocol layers sending data down the protocol stack and the actual MAC interfaces. *See* EX2017, ¶¶54, 80. In a new argument, the Reply points to a “message” about RAT availability to satisfy this element. Reply at 6-7. However, this is not a data transfer. Moreover, the message comes from the physical layer *below* the actual MAC interfaces, and not above. *See* EX1005, [0243]-[0245]; EX1026, ¶¶37-43.

Second, Chincholi's OMMA does not “obscure the recited actual MAC interfaces from higher protocol stack layers.” Because the actual MAC interfaces sit at the MAC sublayer of layer 2, the actual MAC interfaces must be obscured to

anything above layer 2, and the virtual MAC interface itself must be located in layer 2 in order to obscure anything above it. *See* EX2010 (Tanenbaum) at 300. While Petitioners concede that “Chincholi’s OMMA operates as a common layer immediately above the MAC layers,” it is clear that the OMMA sits at layer 3. EX1026, ¶49. This is because it can communicate directly with layer 4 (which only an adjacent layer can) and because it performs layer 3 packet routing functions. POR at 38-40; EX2017, ¶¶88-89; EX1005, [0139], [0171]-[0186], [0369]-[0370]; EX2018 (Tanenbaum) at 42-44; EX2019, § 7.5.4.2.2. Therefore, OMMA does not obscure the actual MAC interfaces from layer 3, a protocol stack layer higher than the actual MAC interfaces.

Moreover, Petitioners’ new argument that Chincholi’s reference to MSDUs means that actual MAC addresses are obscured is incorrect. Reply at 6. Petitioners’ argument that the MSDUs “lack MAC headers having actual MAC addresses” (*id.*) misses the point: a lack of header or address does not obscure the existence of the *interface itself* from higher layers. In fact, Chincholi separately makes the actual MAC interfaces and their associated addressing information available to the OMMA and, as explained by Patent Owner’s expert, does not disclose a virtual MAC interface that obscures those actual MAC interfaces from higher layers. EX2017, ¶¶80-81; EX1005, [0192]. Rather than obscuring the existence of the actual MAC interfaces as required by the construction, Chincholi merely “combines packets from

different RATs,” leaving the existence of the many RATs apparent as the OMMA forwards the packets. *Id.* The reference to MSDUs is a red herring.

Additionally, Petitioners are wrong that “Chincholi’s OMMA embodies all of the functionality that the ’756 associates with the ‘virtual MAC interface.’” Reply at 9. Patent Owner does not “quibble” with the comparison between functional blocks—Patent Owner pointed out that (1) the Petition does not explain at all why or how those blocks are equivalent; and (2) when examined, the blocks serve different functions. POR at 34-38; EX2017, ¶¶84-87. On Reply, Petitioners provide no further explanation for why Chincholi’s traffic shaping module is the functional equivalent of the ’756 patent’s ultra-streaming block or why Chincholi’s MAC resource reservation module is the equivalent of the ’756 patent’s processing block. Reply at 9. Moreover, Petitioners’ expert’s contention that Chincholi’s IP QoS Scheduler module 603 is equivalent to the ’756 patent’s decision block because it has “decision-making functionality” is incorrect. EX1026, ¶¶58-59. The decision block of the challenged claims does not perform generic decision-making functions, but rather specific ones: “determin[ing] the size and type of data stream being received, and the type of processing necessary to put the stream in a format where it is capable of being transmitted.” EX1001 at 3:34-37. Separating individual QoS streams is not equivalent to that functionality. EX1005, [0143]; EX2017, ¶85. Finally, Patent Owner indeed disputes that dependent claims 4-6 are met (*see* Reply

at 9); each requires the virtual MAC interface and other disputed claim limitations that are absent from claim 1, merely with a more specific virtual MAC interface that is also not present in Chincholi. EX1001, 12:49-60.

In all, Petitioners' new, strained, and unsupported arguments cannot demonstrate that Chincholi discloses the virtual MAC interface under the district court construction, because Chincholi's OMMA is not separately addressable from the actual MAC interfaces and does not obscure the actual MAC interfaces from higher layers, nor does it perform the functions of the claimed virtual MAC interface.

**2. “resource monitoring interface” that “provides information regarding the ... bandwidth availabilities”**

The Petition fails to show that Chincholi discloses a “resource monitoring interface” that “provides information regarding the first and second bandwidth availabilities” because Chincholi's feedback relates to channel quality, not bandwidth availability, and because it is not “current,” as required by the district court claim construction.

Petitioners and their expert previously argued that “[a] POSITA would understand that the ‘resource monitoring interface formed in the processing interface’ requires merely a component capable of receiving feedback statistics regarding the available resources of the wireless transceivers.” Pet. at 25 (citing EX1002, ¶101). Supporting that point, Petitioners pointed to portions of Chincholi

that describe the collection of feedback metrics, including “averages.” EX1005, [0161], Table 2.

Now operating under the district court claim construction proposed by Petitioners that requires “current” bandwidth availability information, Petitioners no longer argue that “merely” statistics would qualify. Though Petitioners concede that Chincholi discloses feedback metrics that “reflect the average state of the system,” they now argue Chincholi “does not exclude current resource-availability information.” Reply at 10. But the examples cited by Petitioners are inapposite.

Petitioners point to Chincholi’s disclosure that, “[a]t startup, the OMMA layer may receive the available bandwidth of each of the one or more RATs.” Reply at 10-11 (citing EX1005 [0167]). But “[a]t startup,” no bandwidth is yet being used. Rather, the OMMA layer receives “the total channel bandwidths supported by” individual RATs. EX1005, [0163]. Understanding total channel bandwidth availability does not indicate real-time or current bandwidth usage, or what bandwidth remains available.

Petitioner also argues that Chincholi discloses the “information” limitation because it “discloses dynamic RAT switching based on ‘instantaneous channel quality/availability of the RATs.’” Reply at 11 (quoting EX1005 [0154]). But this disclosure refers to channel quality, based on criteria such as “low throughput, low RSSI, transmission control protocol (TCP) re-ordering trigger, high medium access

delay, and high end-to-end delay.” EX1005, [0155]. These types of channel characteristics do not relate to bandwidth availability, but rather to quality of service. There is no disclosure of “current” bandwidth availability information based on these types of feedback.

In all, Petitioners have pivoted from their original argument under the plain and ordinary meaning, meant to capture the disclosure of their primary reference. Now that they must operate under their chosen, narrower district court claim construction, proposed in the forum where Petitioners argue for non-infringement, their new arguments contradict their old ones—and fail to show that Chincholi discloses “information regarding the bandwidth availabilities” of the transceivers. *See also supra*, Section II.

**B. The Petition Does Not Establish that Chincholi in View of Secondary Reference Clegg Renders Any Challenged Claim Unpatentable**

Petitioners’ Reply talks past the points made by Patent Owner regarding a POSITA’s lack of motivation to combine Chincholi with Clegg. Reply at 14-15. Patent Owner did not assert that Petitioners advocate for Clegg’s ultra-wide band tuner itself to be incorporated into Chincholi, but rather explained that a POSITA would not be motivated to incorporate aspects of Clegg into Chincholi’s disparate system, nor to undertake the extensive technical reworking required to do so. EX2017, ¶115. This is true even as to modifying “Chincholi’s monitoring and

response techniques” with “Clegg’s teachings for addressing carrier-specific interference within bandwidth channels.” Reply at 14-15. Moreover, a POSITA would not have been motivated to combine Chincholi with Clegg because the two references solve different technical problems at different layers of the IEEE 802.11 protocol stack using entirely different mechanisms. EX2017, ¶115; EX1009 at 3:11-56 (describing Clegg functionality taking place within PHY layer). A POSITA would understand that substituting Clegg’s PHY-layer carrier-selection techniques into OMMA would not improve OMMA’s RAT-selection functionality because the two mechanisms operate at different protocol layers and make different types of decisions. *See* EX2017, ¶¶114-118; *Medtronic, Inc. v. Teleflex Innovations S.à.r.l.*, 69 F.4th 1341, 1351 (Fed. Cir. 2023) (where combination does not “achieve the same end[]” as the claimed invention, Board correct to find no motivation to combine, and a contrary finding would be “a recipe . . . ripe for hindsight abuse”).

#### **IV. THE PETITION DOES NOT ESTABLISH THAT THE CLAIMS OF THE ’756 PATENT ARE INVALID UNDER SECTIONS 101 OR 112**

##### **A. The Petition Fails to Demonstrate that the ’756 Patent Is Directed to Ineligible Subject Matter**

##### **1. The ’756 Patent Meets Step 1**

Petitioners largely ignore the substance of Patent Owner’s Step 1 improvement, which contains two parts: first, “the fact that it is the claimed virtual MAC interface that performs ... bandwidth allocation decision-making” and,

second, “that it does so while sitting at the MAC sublayer of layer 2 of the protocol stack.” POR at 54. Petitioners make no attempt to rebut that the ’756 patent discloses the specific improvement of a virtual MAC interface that performs bandwidth allocation decision-making, an essential inventive improvement of the ’756 patent.

In fact, the ’756 patent discloses specific improvements to the functioning of wireless networking devices and the “insatiable demand for more bandwidth” by introducing an architecture that (1) determines wireless bandwidth demand from one or more applications, (2) defines virtual MAC and virtual PHY layers that determine available resources in the actual MAC and PHY layers, and (3) allocates available resources to satisfy the bandwidth demands of the one or more applications. *See* EX1001 at 1:56-58, 3:51-4:3, 4:64-5:16, 12:24-30. In particular, the ’756 patent introduces a processing layer into the MAC sublayer to “manage signals” between the upper layers, such as the application layer, and the actual MAC and PHY layers, allowing for more efficient bandwidth allocation decisions with greater granularity than prior wireless networking devices. *Id.* at 2:58-67, 4:49-52, 4:64-5:16, 6:6-10, Fig. 4.

This architecture addresses the inefficient use of channels and bands used by previous conventional wireless network architectures and allows the system of the ’756 patent to make allocation decisions at a much more granular level and with reduced latency by evaluating bandwidth requirements and available transceiver

resources together, rather than treating each resource in isolation. *See id.* at 1:56-62, 2:58-3:5; *see also id.* at 4:27-43, 6:6-10. Portions of multiple transceiver bandwidths may be grouped or allocated to satisfy an application's bandwidth requirement via the processing interface including a virtual MAC interface and resource monitoring interface. *See id.* at 4:33-43; 12:8-11, 24-30 (claim 1); *see also id.* at 2:48-3:5, 3:54-60, 4:27-43, 6:6-10, Fig. 1. These virtual interfaces operate between the network layer and the physical layer to manage signals from applications before those signals are sent to the actual MAC and actual PHY layers, monitoring current bandwidth availability of the multiple transceivers in the resource monitoring interface and making dynamic allocation decisions transparently to meet bandwidth needs at the virtual MAC interface. *Id.* at 4:49-52, 12:24-34 (claim 1). This integration of virtual MAC logic, transparency, resource monitoring interface logic, and current bandwidth availability information in every challenged claim allows the system to efficiently allocate transceiver resources to satisfy bandwidth requirements of different applications running on wireless networking devices. *See id.* 3:54-60; *see also id.* at 2:67-3:5, 6:6-10. At the time of the inventions, conventional network architecture could not share transceiver resources in this way. *See id.* at 1:56-62. This novel architecture, including the use of the virtual MAC interface and resource

monitoring interface for bandwidth allocation, represents a concrete improvement for wireless networking devices.<sup>2</sup>

Rather than addressing the substance of this concrete improvement, Petitioners' Reply arguments regarding Step 1 of the Section 101 test depend entirely on the incorrect premise that the claims do not require a layer 2 location for the processing layer—including the virtual MAC interface and the resource monitoring interface. Reply at 15-17. But as explained above, the agreed construction for “virtual MAC interface” mandates a layer 2 location for the processing interface. *See* EX1028 at 7; EX1001, 12:24-26 (“wherein the processing interface comprises:

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<sup>2</sup> That the claims recite this specific and novel architecture distinguishes the '756 patent from that in Petitioners' cited cases. Reply at 16. In those cases, the Federal Circuit held that ineligibility was based on a lack of recited “particular architecture” or “any particular assertedly inventive technology for performing [claimed] functions.” *Ericsson Inc. v. TCL Commc'n Tech. Holdings, Ltd.*, 955 F.3d 1317, 1328 (Fed. Cir. 2020); *Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC*, 874 F.3d 1329, 1337-38 (Fed. Cir. 2017). That is not the case here.

at least one virtual MAC interface [and] at least one resource monitoring interface...”); *see supra* Section III.A.1.<sup>3</sup>

## 2. The ’756 Patent Meets Step 2

Petitioner makes two incorrect arguments with regard to Step 2: (1) that the processing layer is not located in layer 2; and (2) that the processing layer, including the virtual MAC interface and the resource monitoring interface, constitute only “conventional components performing conventional functions.”

First, as explained above, pursuant to both the construction of virtual MAC interface and the understanding of a POSITA, the processing layer is located in layer 2. *Supra* Section IV.A.1; *see also* Section III.A.1. This choice to form the

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<sup>3</sup> Nor was the district court’s construction, which declined to adopt Patent Owner’s construction stating that bandwidth information is obtainable “directly” from the actual PHY, a rejection of a layer 2 location of the processing interface. EX1027 at 16. Rather, the district court merely stated that the particular term was not the place to locate that interpretation, stating “[t]he disputed language states nothing about the *source* of the information,” and that “[r]ather, it limits the information’s *content*.” *Id.* But a POSITA viewing the claim as a whole would view the processing interface as having a layer 2 location. *See* EX2017, ¶70; *see also id.*, ¶¶63-69.

virtual MAC and resource monitoring interfaces departed from conventional Wi-Fi architectures, and the formation of virtualized interfaces in Layer 2 that operate transparent to upper layers allows for making efficient bandwidth allocation decisions with greater granularity. EX1001 at 2:58-3:5, 4:49-52, 4:64-5:18, 6:6-10, Fig. 4.

Second, the processing layer of the '756 patent does not contain merely conventional components, nor do they perform conventional functions. Rather, the challenged claims are directed to novel methods and architecture for a virtual MAC interface (with “transparent” decision-making) and resource monitoring interface (feeding back current bandwidth availabilities) that, together, provide for: (1) the simultaneous maintenance and dynamic allocation of multiple Wi-Fi transceivers having different bandwidth availabilities and frequency bands; and (2) the identification and exclusion of unavailable bandwidth portions in order to allocate available, non-contiguous bandwidth portions to satisfy bandwidth requirements. *See supra*, Section IV.A.1; *see also* EX1001, 12:31-44 (claim 1) (“the virtual MAC interface being configured to ... use the information provided to it by the resource monitoring interface to make allocation decisions with respect to first and second bandwidth availabilities to at least partially satisfy the bandwidth requirement of the data stream.”).

**B. The Petition Fails to Demonstrate that the '756 Patent's Claims Lack Adequate Written Description**

**1. “transparent”**

On Reply, Petitioners again require too much for written description. They have agreed that a POSITA would view “transparent” as meaning “unaware of the operation of the processing interface,” and have no trouble applying it. Reply at 3, 12-14; EX1028 at 8. Further, Patent Owner’s expert explained how the specification suggests the claimed transparency to a POSITA. EX2017, ¶¶96-98, 129-130. There is no evidence to negate that a POSITA would not view the inventor as “in possession of the invention.” *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306 (Fed. Cir. 2008).

**2. “evaluating data transfer characteristics”**

Petitioners again ignore that written description is evaluated from the point of view of a POSITA, and discount that a POSITA would understand this claim limitation from the specification’s references. EX2017, ¶¶132-133 (citing EX2010 at 405; EX1001, 5:4-11, 7:1-49, 9:13-38, Figs. 7 & 11). “*Ipsis verbis*” disclosure is not required. *Fujikawa v. Wattanasin*, 93 F.3d 1559, 1570 (Fed. Cir. 1996); *Purdue Pharma L.P. v. Faulding Inc.*, 230 F.3d 1320, 1323 (Fed. Cir. 2000).

**3. “resource monitoring interface”**

Petitioners assert both here and in the district court that a POSITA would understand the “resource monitoring interface” to have its plain and ordinary

meaning and have no trouble applying that plain and ordinary meaning with regard to their Section 103 grounds. *See* Reply at 3, 10-12; EX1026, ¶¶7, 61-70; EX1028 at 9; *see also* Pet. at 25-28; EX1002, ¶101. Nor is there any indication that a POSITA, in possession of the claim language, would not understand that the RF block and feedback capabilities described in the specification to demonstrate that the inventor was in possession of the invention. EX2017, ¶¶134-137; EX1001, 3:50-55, 4:64-5:3, 8:39-42; *PowerOasis*, 522 F.3d at 1306.

#### **4. “adapted to ... emit radio waves in ... different bands of frequencies”**

The Reply erroneously states that “Figure 1 shows no radios at all.” Reply at 20. Indeed, Figure 1 depicts “transceiver resources 118,” which are defined as being “various radios and receivers.” EX1001 at 3:64-67; Fig. 1. Nor does Petitioners’ argument regarding the district court complaint contradict that a POSITA would understand this limitation. *See* EX2017, ¶¶138-140.

#### **5. “creating associations”**

Petitioners are incorrect that Figure 1 does not disclose creating associations with multiple recipients. Reply at 21. A POSITA would understand that APP A and APP D in Figure 1, each sharing the MAC/PHY pairs, could represent multiple recipients. EX2017, ¶¶100, 141-143, 145; EX1001, Fig. 1. Further, there is no inconsistency between the concept of association generally and the complaint describing multiple associations as an innovation of the ’756 patent. EX1018, ¶34.

**C. The Petition Fails to Demonstrate that the '756 Patent's Claims are Indefinite**

**1. “partially simultaneous”**

Petitioners ignore that “partially” is a readily understandable term. EX2017, ¶152. Moreover, a POSITA would be familiar with TXOPs without needing any disclosure in the specification, and a POSITA would therefore be informed of the scope of the claim. *Id.*; EX2010 at 309; *Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 789 F.3d 1335, 1341-1341 (Fed. Cir. 2015).

**2. “partially satisfy”**

A POSITA would understand that “partially” means “in part”—and does not need the specification to spell out “partial satisfaction” in addition to “satisfaction.” EX2017, ¶¶160-161. Petitioners’ contrary arguments ignore the understanding of a POSITA. *Id.*; *S3 Inc. v. NVIDIA Corp*, 259 F.3d 1364, 1371 (Fed. Cir. 2001) (“patents are written for skilled artisans”).

**V. CONCLUSION**

The Petition does not establish that any of the challenged claims are unpatentable. Patent Owner’s claims should be confirmed.

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Respectfully Submitted,

/s/Cyrus M. Morton  
Cyrus A. Morton  
(Reg. No. 44,954)  
CMorton@RobinsKaplan.com

*Lead Counsel*

Jessica L. Gutierrez  
(Reg. No. 75,094)

*Back-Up Counsel*

Aaron R. Fahrenkrog  
(*Pro hac vice*)

*Back-Up Counsel*

Robins Kaplan LLP  
800 LaSalle Avenue, Suite 2800  
Minneapolis, MN 55402  
Phone: 612-349-8500  
Fax: 612-339-4181

Attorneys for Patent Owner

**WORD-COUNT CERTIFICATE**

The undersigned certifies that the foregoing Patent Owner Response complies with the type-volume limitation of 37 C.F.R. § 42.24(c)(4) and contains 5,434 words in 14-point Times New Roman font as calculated by the word count feature of Microsoft Office. This word count is inclusive of all text and footnotes but does not include the table of contents, table of authorities, certificates or service or word count, or appendix of exhibits or claim listing.

Dated: August 25, 2026

/s/Cyrus M. Morton

Cyrus A. Morton  
(Registration No. 44,954)  
CMorton@RobinsKaplan.com  
Robins Kaplan LLP  
800 LaSalle Avenue, Suite 2800  
Minneapolis, MN 55402  
Phone: 612-349-8500  
Fax: 612-339-4181

Attorney for Patent Owner

**CERTIFICATE OF SERVICE**

The undersigned certifies that the foregoing Patent Owner Response was served on August 25, 2026, by electronic mail to Petitioners' counsel at the following addresses indicated in Petitioners' Mandatory Notices:

James M. Glass  
jimglass@quinnemanuel.com

Patrick T. Schmidt  
patrickschmidt@quinnemanuel.com

Benjamin Kleinman  
benjaminkleinman@quinnemanuel.com

Quincy Lu  
quincylu@quinnemanuel.com

Dated: August 25, 2026

/s/Cyrus M. Morton

Cyrus A. Morton  
(Registration No. 44,954)  
CMorton@RobinsKaplan.com  
Robins Kaplan LLP  
800 LaSalle Avenue, Suite 2800  
Minneapolis, MN 55402  
Phone: 612-349-8500  
Fax: 612-339-4181

Attorney for Patent Owner