

PGR2025-00069
U.S. Patent No. 12,250,564

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

XIFI NETWORKS R&D, INC.

Patent Owner.

Post Grant Review No. 2025-00069

U.S. Patent No. 12,250,564

PETITIONER'S REPLY TO PATENT OWNER RESPONSE

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EX1002	Declaration of Kevin Almeroth, Ph.D.
EX1003	Intentionally Omitted
EX1004	File History of U.S. Patent No. 12,250,564
EX1005	WO 2013/126859 (“Chincholi”)
EX1006	Intentionally Omitted
EX1007	U.S. Patent Application 2009/0141691 (“Jain”)
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EX1017	File History of U.S. Patent No. 11,818,591
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EX1019	Intentionally Omitted

Exhibit	Description
EX1020	Patent Owner's March 26, 2025 P.R. 3-1 Infringement Contentions
EX1021	Intentionally Omitted
EX1022	Intentionally Omitted
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EX1025	Declaration of Patrick Schmidt in Support of Petitioner's Motion for Pro Hac Vice Admission
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I. CLAIM CONSTRUCTION

A. District Court Proceedings

PO wrongly claims that Petitioners have “advanced six narrowing constructions, contrary to the positions they took in the Petition.” POR 2. The parties agreed on constructions for eight terms, including “plain and ordinary” meaning for five. EX1028 7-11. For “information regarding bandwidth availabilities,” Petitioner agreed only that the information must be “current,” while disputing PO’s attempt to require feedback “directly” from actual MAC and PHY interfaces. The District Court has since rejected PO’s attempt. EX1027 11-16, 25.

Petitioner proposed constructions for only three terms, all consistent with the Petition’s application of the plain meaning. EX1028 5-6. These constructions were not offered for tactical advantage, but to prevent PO from reading the claims overbroadly. PO does *not* dispute that the Petition demonstrates these three terms are satisfied under Petitioner’s proposed constructions, or the District Court’s slightly broader constructions.

There is no inconsistency between Petitioner’s District Court positions and the Petition. Petitioner agrees the District Court constructions should apply. The evidence and analysis in the Petition demonstrate the challenged claims are unpatentable under those constructions. EX1026 ¶¶7-32.

B. The District Court Resolved The Claim-Construction Dispute

The only claim-construction dispute remaining is the “information regarding bandwidth availabilities” term. PO argued that the term requires information be obtained “*directly* from at least the recited actual PHY interface(s) and the recited actual MAC interface(s).” POR 15-24. The District Court disagreed, construing the term as “information regarding current bandwidth availabilities of each of the wireless transceivers.” EX1027 11-16, 25.¹

That construction resolves PO’s “directly” argument. It also renders untenable PO’s argument that the “processing interface” must be located at Layer 2. According to PO, the information must be obtained “directly” from actual PHY/MAC interfaces because the processing interface allegedly resides in the MAC sublayer/adjacent to the physical layer. POR 18-24. By rejecting the “directly” requirement, the District Court necessarily determined that the processing interface need not be “adjacent,” which defeats PO’s Layer-2 arguments.

¹ PO provides no reason to depart from the District Court’s claim construction, and the Board should apply the same construction here. *See* USPTO, Memorandum, *PTAB Consideration of Prior Findings of Fact and Conclusions of Law* (Sept. 16, 2025) (Board must explain if it reaches a conclusion of law different from a district court).

The Court’s construction is correct. Claim 1 requires “at least one resource monitoring interface” that “feeds information regarding the bandwidth availabilities of the first and second wireless transceivers back to the at least one virtual MAC interface.” The plain meaning of “feeds information regarding the bandwidth availabilities ... back to” encompasses both direct and indirect feedback; it does not preclude information passing through intervening layers. Nor does it require the processing interface to occupy any particular protocol-stack layer. EX1026 ¶¶19-20.

The intrinsic record is in accord. Figure 1 depicts the “process layer” as distinct from both the actual MAC layer and actual PHY layer, with the actual MAC between the process layer and actual PHY. EX1001, Fig. 1. That embodiment would be excluded under PO’s construction requiring that the information be obtained “directly” from *both* the actual PHY and actual MAC interfaces without passing through any intervening layer or interface. EX1026 ¶21.

PO’s prosecution-history arguments do not justify importing a direct-feedback or Layer-2 requirement. PO and Dr. Akl do not attempt to show that any prosecution-history statements rise to the level of a disavowal. *Schwing GmbH v. Putzmeister Aktiengesellschaft*, 305 F.3d 1318, 1324 (Fed. Cir. 2002) (disavowal required to limit scope of claim). Nor could they. EX1026 ¶¶22-32.

The Board should apply the District Court's construction. Under that construction, PO's direct-feedback and Layer-2 arguments fail.

II. PATENT OWNER'S TERMINATION REQUEST SHOULD BE DENIED

The Director already denied as untimely PO's request to terminate based on Petitioner's District Court claim-construction positions. Paper 19. The District Court's claim-construction order confirms that termination is unwarranted.

PO wrongly argues that Petitioner's District Court claim-construction positions were inconsistent with the Petition. POR 25-30. Petitioner stipulated to the eight agreed-upon constructions as a compromise to avoid unnecessary disputes; the parties agree those constructions are consistent with plain and ordinary meaning. For "information regarding bandwidth availabilities," PO—not Petitioner—sought to narrow by requiring information be obtained "directly" from actual MAC and PHY interfaces. Petitioner agreed only that the information must be "current." The District Court construed the term consistently with Petitioner's position. EX1027 11-16, 25.

Nor do Petitioner's proposed constructions for the preambles, "wireless networking device," and "different bands of frequencies" create inconsistency. Petitioner offered those constructions after PO indicated it intended to apply the claims overbroadly. It is undisputed that Petitioner's proposals are all in line with

the Petition. PO does *not* dispute that the Petition demonstrates that these three terms are met.

Because PO does not dispute that the Petition demonstrates a “wireless networking device,” its assertion that Dr. Almeroth’s analysis is inconsistent with Petitioner’s District Court construction is irrelevant. It is also wrong. Dr. Almeroth recognized that the claim preambles may be limiting, EX1002 ¶¶84-85, and opined that Chincholi’s “NT” (which operate as an access point) and “WTRU” (which may operate in ad-hoc mode) both qualify as a “wireless networking device.” *Id.* Those opinions are consistent with Petitioner’s proposed construction; PO fails to show otherwise.

III. ALL ’564 PATENT CLAIMS ARE OBVIOUS

A. Chincholi Discloses All Disputed Limitations

PO largely reprises the same objections raised pre-institution, including that Chincholi lacks a “virtual MAC interface” and does not disclose the feedback, transparency, bandwidth-sharing, and disassociation limitations. PO and Dr. Akl identify no new evidence undermining the Petition’s showing.

1. Chincholi discloses the “virtual MAC interface”

The Petition demonstrates that Chincholi’s OMMA layer contains a “virtual MAC interface” under the stipulated construction—*i.e.*, “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.” Pet. 25-28.

First, Chincholi’s OMMA is a “single thin software layer,” EX1005 [0120], and thus satisfies the construction’s requirement for a software- or logical-based interface. EX1002 ¶88; EX1026 ¶¶35-36.

Second, the placement of the OMMA to create a virtual interface between the actual MAC interfaces and higher layers results in MAC addresses not being visible to higher layers, thereby obscuring the actual MAC interfaces from higher layers. EX1002 ¶102; EX1026 ¶¶44-53. Chincholi’s OMMA handles data units to and from the MAC layer in the form of “MSDUs” (MAC Service Data Units), and data units to and from the IP layer in the form of IP packets, both of which lack MAC headers having actual MAC addresses. EX1005 [0138] & Table 1; EX1026 ¶¶45-48. A POSITA understands that the MAC layer receives MSDUs containing higher-layer data payloads and wraps those payloads with MAC headers, generating MPDUs (MAC Protocol Data Units). EX1026 ¶¶45-46. This confirms that Chincholi’s OMMA “obscures” actual MAC interfaces from higher protocol-stack layers. *Id.* ¶¶49-50. Chincholi’s OMMA also reorders packets before passing them to higher layers, hiding out-of-order delivery and further obscuring lower-layer multi-RAT operation. EX1005 [0128], [0172]-[0178]; EX1026 ¶74.

Third, Chincholi's OMMA Controller is separately addressable from the actual MAC addresses. WTRUs in Chincholi send signaling messages regarding their availability to the OMMA of associated NTs. EX1026 ¶¶37-43. Chincholi teaches that (i) an NT advertises its RAT capabilities, (ii) a WTRU responds with a STA_RAT_Availability message, and (iii) the OMMA Controller at the NT receives the message and uses it to update its capability database. EX1005 [0243]-[0245], Fig. 31; EX1026 ¶¶39-40. The STA_RAT_Availability message directed from WTRUs to the OMMA of NTs includes "AP_Addr," EX1005 [0244], which is the address of the NT separate from actual MAC addresses of the NT's individual RATs. EX1026 ¶¶40-43. The AP_Addr is a unique address, separate from the NT's actual MAC addresses, and is used by WTRUs to send signaling packets to the OMMA of associated NTs over the wireless medium. EX1026 ¶43. This confirms that the OMMA of each NT is "separately addressable" from the actual MAC interfaces. EX1026 ¶¶42-43.

PO's various arguments fail.

First, PO's assertion that actual MAC addresses are "apparent to the OMMA and to layers above the OMMA," POR 34, is unsupported by anything in Chincholi. Because the OMMA deals with packets lacking MAC headers, EX1026 ¶¶45-51; *see also* EX1005 [0138] (describing OMMA operating on MSDUs), PO's assertion is wrong.

Second, PO’s argument that Chincholi’s OMMA is not “virtual,” POR 34-36, ignores that the OMMA is a “single thin software layer,” EX1005 [0120], which meets the agreed-construction for “a software- or logical-based interface” EX1026 ¶¶33-36. In arguing that “a virtual MAC interface would have a programmed or non-static address,” POR 35, PO imports new limitations. PO’s argument that Chincholi does not contain the word “virtual,” POR 34-35, is irrelevant—Dr. Almeroth explained the substance of Chincholi implements a “virtual” interface. EX1002 ¶¶102-104; EX1026 ¶¶33-36.

Third, PO is incorrect that the OMMA “merely acts as a conduit.” POR 35. Chincholi’s OMMA uses feedback and scheduling to select and direct traffic among RAT/MAC/PHY paths, so higher layers exchange packets with OMMA rather than selecting underlying actual MAC interfaces. EX1005 [0143], [0213]; *see also id.* [0161], [0205]; EX1026 ¶56. Chincholi’s OMMA is not a passive conduit: it supports diversity, multiplexing, hybrid, and dynamic RAT-switching modes, uses traffic shaping and feedback-based routing to distribute packets across RATs, and includes packet-scheduling and re-ordering logic. EX1005 [0150]-[0161], [0172]-[0178], [0187]-[0188], Figs. 10-13, 25; EX1026 ¶¶57, 74.

Fourth, PO’s claim that the OMMA is “not disclosed as being a separately addressable entity,” POR 35, overlooks the functionality described above wherein WTRUs address signaling packets to the OMMA using an address separate from the

actual MAC addresses of the NT. EX1005 [0243]-[0245], Fig. 31; EX1026 ¶¶39-43.

Fifth, PO's claim that the "Petition resorts to equivalents-type arguments," POR 36, is baseless. That Chincholi's OMMA embodies all of the functionality that the '564 associates with the "virtual MAC interface" supports other evidence showing the term is met. EX1002 ¶¶100, 102-104; EX1026 ¶¶54, 58-59. PO quibbles with the Petition's mapping of Chincholi's functional blocks to those in the '564 patent. POR 36-39. But PO tellingly does not dispute that dependent claims 4, 5, and 6, which require these functionalities, are met by Chincholi. EX1001, cls. 4-6; Pet. 45-48; EX1002 ¶¶138-140.

Sixth, PO's argument that because Chincholi's two or more RATs operate "independently" of one another, they are not "directed" by the OMMA, POR 37, is a non-sequitur. Petitioner identified how Chincholi's OMMA "directs" the RATs as claimed via the "MAC Resource Reservation Module" and the "Traffic Shaping Module," which manage and direct traffic toward appropriate RAT resources. Pet. 28; EX1002 ¶¶103-104; EX1026 ¶55.

Seventh, PO's argument that Chincholi's OMMA does not disclose a "virtual MAC interface" because it is at "layer 3" of the protocol stack, POR 40-42, is inapposite. As discussed above, *supra*, Section I.B., there is no basis for requiring the "virtual MAC interface" be located at any particular layer. The parties'

stipulated construction imposes no MAC-sublayer or Layer-2 placement requirement. The District Court’s rejection of PO’s related “direct” feedback construction necessarily rejects PO’s attempt to import layer-placement restrictions.

Regardless, even if PO’s Layer-2 argument were correct as a matter of claim construction, the premise that Chincholi’s disclosures are limited to “layer 3” is wrong. Chincholi teaches, “[t]he OMMA layer may not be an independent layer, but rather the functionality of the OMMA layer may reside partially on one or more layers (e.g., the IP layer, *the MAC layer, etc.*) of the protocol stack.” EX1005 [0122]. Chincholi therefore meets the claim limitation regardless. EX1026 ¶60.

2. Chincholi discloses the “resource monitoring interface”

Contrary to PO at POR 42-44, Chincholi teaches feeding back “current” information regarding bandwidth availabilities and not mere “historical metrics and averages.” EX1026 ¶¶61-68. The OMMA Feedback Device Classifier collects “measurement metrics fed back from each RAT,” including “channel quality metrics and the number of available resources on the medium.” Pet. 28-30. Although some feedback metrics “*may* reflect the average state of the system operating on each RAT,” EX1005 [0141], that permissive disclosure does not exclude current resource-availability information. EX1026 ¶68.

Chincholi teaches that “[a]t *startup*, the OMMA layer may receive the available bandwidth of each of the one or more RATs,” and “[a]t the beginning of

the *ramp-up phase*, the OMMA layer may receive RSSI values as seen by the one or more RATs.” EX1005 [0167]; Pet. 24. Those then-received available-bandwidth and RSSI values disclose current bandwidth/resource availability. EX1026 ¶¶65-66. Chincholi also discloses dynamic RAT switching based on “*instantaneous* channel quality/availability of the RATs,” EX1005 [0154], which confirms the information is “current.” EX1026 ¶67.

Chincholi also identifies feedback metrics such as RSSI “level,” “number of channels,” and “channel bandwidth,” and describes the OMMA Scheduler as using these metrics for feedback-based routing. EX1005 [0215]-[0216]. A POSITA would understand these examples confirm Chincholi’s feedback is not limited to historical-only averages. EX1026 ¶68. For example, RSSI level is a signal-strength metric, and number of channels and channel bandwidth are resource-availability metrics. *Id.*

PO’s argument that the resource monitoring interface must receive bandwidth availability “directly” fails under the District Court’s construction. Chincholi also contemplates “direct” feedback to the extent the OMMA functionality may reside in the MAC. EX1005 [0122]; EX1026 ¶¶69-70.

Notably, unlike Chincholi, the ’564 specification makes no mention of a resource monitoring interface, let alone one limited to feeding back only “current” bandwidth availability received “directly” from the actual MAC/PHY interfaces. In

response to this written description deficiency, PO argued that “[a] POSITA would recognize that the RF block and virtual PHY layers can be programmed or ‘formed’” to act as a resource monitoring interface. POR 80. PO therefore cannot dispute that the claimed implementation was at least obvious.

3. Chincholi discloses “transparent” operation

PO wrongly asserts that Chincholi’s transparent mode is disclosed in only “a single sentence.” POR 48. Chincholi repeatedly distinguishes transparent and non-transparent OMMA operation and illustrates a “transparent OMMA Receiver” embodiment. EX1005 [0212], [0256], Fig. 34; EX1026 ¶¶77.

PO argues the claim requires a “particular manner of achieving transparency” with respect to various functions. POR 48-49. But the stipulated construction merely requires operation “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.” In transparent mode, the OMMA distributes, combines, and forwards packets without higher layers being aware of the OMMA’s internal routing, combining, and RAT-selection operations. EX1005 [0126], [0192]; EX1026 ¶¶72-74. That is the transparency the claim requires. *Id.*

Chincholi’s TCP discussion confirms the “transparency” limitation is met. Packets sent over different RATs may arrive out of order, causing the receiving TCP entity to trigger retransmission or congestion-control behavior. EX1005 [0171]-

[0173]. To address this, the OMMA layer may reorder packets based on OMMA sequence numbers, and may hold packets temporarily until the next expected packet arrives. EX1005 [0176]-[0178]. The OMMA of the transmitting device may also schedule packets in a manner that avoids triggering TCP congestion-control mechanisms. EX1005 [0179]. Thus, the OMMA manages multi-RAT operation “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.” EX1026 ¶74.

PO’s only other objection is that the “‘processing interface’ itself must contain the virtual MAC interface.” POR 48-49. But Chincholi discloses that too. *Supra* §III.A.1. As Dr. Almeroth explained in his original declaration, “Chincholi discloses that the OMMA (*i.e.*, the processing interface) includes the claimed ‘virtual MAC interface’ formed within it.” EX1002 ¶102. Chincholi’s software OMMA layer is positioned above actual MAC layers, presents a common interface to the IP layer, handles MSDUs rather than actual MAC-layer MPDUs and thereby obscures actual MAC interfaces from higher protocol-stack layers, and is separately addressable from the actual MAC interfaces. EX1026 ¶¶75-76.

PO’s argument that Chincholi discloses transparency only “above layer 3,” POR 49-50, relies again on its misguided claim construction. *Supra* §I.B. The stipulated construction imposes no Layer-2 or MAC-sublayer requirement, and the

District Court’s rejection of PO’s related “direct” feedback construction undercuts PO’s attempt to import layer-placement restrictions into the claims. It also overlooks Chincholi’s Layer-2 embodiment. EX1005 [0122]; EX1026 ¶¶78.

Notably, while PO faults Chincholi’s express transparency disclosure as insufficient, PO’s written-description position relies on a thinner inference from Figure 1. POR 76-77. Chincholi’s transparent-mode OMMA disclosures at least render the limitation obvious. EX1026 ¶¶71, 79.

4. Chincholi “do[es] not prevent” other wireless networking devices from using remaining bandwidth

According to PO, this limitation requires only “that two devices or two applications could share a single MAC/PHY pair at the same time.” POR 51. PO also acknowledges that Petitioner and Dr. Almeroth identified Chincholi’s “multi-WTRU multi-IP flow cases,” including “multiple WTRUs, a single NT, and multiple IP flows from the NT to one or more of the WTRUs.” POR 52 (*citing* Pet. 42-43; EX1005 [0328]). That discloses both multiple devices and multiple applications sharing a single MAC/PHY pair. EX1026 ¶¶80-86.

PO responds that Chincholi’s packets are “queued and distributed sequentially.” POR 52-53. But the Petition also relied on Chincholi’s express disclosure of OFDMA operation, which permits simultaneous allocation of orthogonal frequency resources to different users. EX1005 [0161] & Table 2; EX1002 ¶¶134-135; EX1026 ¶¶83-86. PO’s assertion that Chincholi does not

describe OFDMA in sufficient detail, POR 54, is beside the point: OFDMA was a known and well-understood multiple-access technique, and Chincholi expressly identifies it as a mode of operation for the disclosed system. EX1026 ¶¶85, 88-89.

PO's argument that WTRUs "may contend with each other," POR 53, fares no better. The cited Chincholi passages concern WTRUs contending with one another for a *shared* frequency resource. *Id.* (citing EX1005 [0117]). This does not preclude different WTRUs from simultaneously using *different* frequency resources within the available bandwidth, as contemplated by OFDMA. EX1026 ¶87.

Again, PO's position that Chincholi is deficient cannot be squared with its written-description argument. PO contends this limitation is supported by Figure 1 of the '564 patent, which allegedly depicts App A and App D sharing a MAC/PHY pair. POR 51-52, 85-86. But, unlike Chincholi's more detailed disclosures, Figure 1 does not disclose *simultaneous* use of different portions of available bandwidth by different users, as PO claims is required of the prior art. POR 52-53. PO cannot rely an expansive reading of the '564 patent's Figure 1 while denying that Chincholi's multi-WTRU/multi-IP-flow operation and OFDMA disclosures render the limitation obvious. EX1026 ¶¶88-89, 124.

5. Chincholi discloses "without requiring disassociation"

PO contends this limitation requires only that the system "not operate based on what is known as 'break before make.'" POR 56. PO then mischaracterizes Dr.

Almeroth's analysis as a "naked, citationless sentence, phrased in negative language." POR 57. PO ignores Dr. Almeroth's explanation that when a RAT switch occurs, "the OMMA sender may duplicate packets across the RATs to avoid out-of-order packet reception at the OMMA receiver." EX1002 ¶128; EX1005 [0255]; Pet. 39-40. Duplicating packets across RATs during switching means that the prior RAT path remains available during the switch and is not broken before the new RAT path is used. EX1026 ¶¶93-94. This is further described as part of Chincholi's "soft handover process." EX1005 [0381]; EX1026 ¶93. That refutes PO's characterization that Chincholi discloses only "break before make." EX1026 ¶94.

PO's argument that Chincholi teaches "disabl[ing]" low-quality RATs, POR 56-57, does not suggest otherwise. EX1026 ¶¶90-91. Nowhere in PO's cited passages does Chincholi suggest that low-quality RATs are disabled *before* switching to better-quality RATs. EX1005 [0154]-[0155]; EX1026 ¶¶95-96. Chincholi instead teaches selecting a best RAT based on "instantaneous" channel quality/availability and, when a switch is required, duplicating packets across RATs during the switch, which demonstrates "make before break." EX1005 [0154], [0255]; EX1026 ¶¶92-94. Chincholi also does not equate disabling or not using a RAT with disassociating the recipient. EX1026 ¶¶95-98. Dr. Akl's contrary opinion

simply assumes that “disabling” a RAT requires disassociation before switching, but he identifies nothing requiring that sequence. EX1026 ¶¶95, 98-99.

PO’s arguments are irreconcilable with its written-description argument. PO contends that Figure 1’s mere depiction of two applications connected to multiple radios indicates “make before break.” POR 83-84. But the ’564 specification nowhere discusses “make before break,” “break before make,” or any equivalent concept. Nor does it disclose a recipient associated with first and second MAC/PHY pairs and then transmitting without requiring disassociation from one or both. EX1026 ¶123. PO cannot rely on pure inference from Figure 1 to supply written-description, yet dismiss the Petition’s materially more substantial prior-art showing.

B. Motivation to Combine

PO and Dr. Akl attack strawman combinations. They argue combining Chincholi with Clegg would require bodily incorporating Clegg’s “ultra-wideband tuner” and “necessitate extensive technical reworking”; that Clegg and Choi do not teach “without requiring disassociation”; and that Choi does not teach “do not prevent.” POR 60-65; EX1026 ¶¶100-101, 111, 113. None of those arguments addresses the combination the Petition presented. Pet. 13-16, 39-41; EX1002 ¶¶78-83, 120-122, 125-130; EX1026 ¶100.

First, the Petition did not propose incorporating Clegg’s ultra-wideband tuner into Chincholi. *See Allied Erecting & Dismantling Co. v. Genesis Attachments*,

LLC, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference.”). The Petition explained that a POSITA would have understood that Chincholi’s monitoring and response techniques could be enhanced by Clegg’s teachings for addressing carrier-specific interference within bandwidth channels. Pet. 14-15; EX1026 ¶¶102-110. PO admits that Clegg’s techniques apply to IEEE 802.11, POR 60, which Chincholi implements, EX1005 [0121]; EX1002 ¶137. Chincholi already teaches dynamic allocation of contiguous and non-contiguous channels (EX1005 [0118]); Clegg adds “additional detail on how to mitigate carrier-specific interference within channels.” Pet. 15. Petitioner’s combination does not require replacing Chincholi’s transceivers with Clegg’s ultra-wideband tuner. EX1026 ¶¶102, 107-110.

Second, PO’s “break before make” arguments are misdirected. The Petition did not rely on Clegg or Choi to supply the “without requiring disassociation” limitation. Rather, the Petition relied on Chincholi’s RAT-switching disclosure. Pet. 14-15, 39-40; EX1026 ¶¶111-113. The Petition relies on Clegg and Choi for their respective teachings regarding carrier-specific interference mitigation and channel-quality-based selection—not to replace Chincholi’s OMMA architecture. *Id.* 14-15, 38-39. The manner in which Clegg and Choi handle associations and de-associations would not undermine a POSITA’s motivation to pursue the specific

proposed combination. Clegg and Choi are compatible with Chincholi because they provide additional inputs and criteria for Chincholi's existing feedback-based architecture, without replacing Chincholi's association-management or OMMA architecture. EX1026 ¶¶111-113.

Third, Choi is not relied on for the “do[es] not prevent” limitation. EX1026 ¶111. The Petition relies on Choi's disclosure of selecting among candidate channels based on channel-quality information, including RSSI and CCA-related measurements. Pet. 35-39; EX1026 ¶¶111-112. PO's assertion that Choi does not itself disclose OFDMA sharing does not undermine the reason to combine, because this feature is already in Chincholi. EX1026 ¶¶82-89, 111-112.

Finally, the Petition cited Wang as background evidence to show that avoiding disassociation was known and desirable, further supporting the motivation to combine Chincholi with Clegg/Choi while preserving Chincholi's no-disassociation RAT-switching functionality. Pet. 40-41; EX1026 ¶114. PO's objection regarding Wang does not negate its use as background of POSITA knowledge. EX1026 ¶114.

The Petition articulated non-hindsight reasons to combine: Clegg's carrier-specific interference mitigation and Choi's channel-quality-selection teachings would predictably improve Chincholi's feedback-based multi-RAT system. Pet. 13-16, 33-41; EX1026 ¶115.

IV. ALL '564 PATENT CLAIMS ARE UNPATENTABLE UNDER SECTION 101

A. Step 1

PO's only Step 1 argument is that the claims improve conventional systems by inserting a "virtual MAC interface and resource monitoring interface into the MAC sublayer of layer 2" of a protocol stack. POR 69, see also POR 68-73. This argument fails because it depends on an architectural feature absent from the construed claims. *Supra* §I.B; EX1027 11-16, 25; EX1026 ¶116.

The claims do not require PO's asserted Layer-2 architecture. They instead recite nothing more than functionally connected components, such as a "processing interface," "virtual MAC interface," and "resource monitoring interface." EX1002 ¶¶201-202; EX1026 ¶116.

Ericsson Inc. v. TCL Communication Tech. Holdings, Ltd., is directly on point. There the Federal Circuit rejected the patentee's argument that the invention was directed to a specific layered architecture because "[n]either claim recites any particular architecture at all." 955 F.3d 1317, 1328 (Fed. Cir. 2020). *Two-Way Media Ltd. v. Comcast Cable Communications, LLC*, likewise rejected reliance on an unclaimed software architecture. 874 F.3d 1329, 1338-39 (Fed. Cir. 2017). The same flaw is present here. PO relies on placement of the processing interface in the MAC sublayer of Layer 2. But the claims impose no such protocol-stack placement requirement. EX1026 ¶116.

That the invention is directed to a mere abstraction is reinforced by PO's own claim construction positions. PO originally sought to tie the "virtual MAC interface" to Layer-2 of a protocol stack, but ultimately accepted a broader, functional construction. *Supra* §I.B. PO then pressed a related Layer-2 theory through its "directly" construction for the bandwidth-availability term, but the Court rejected it. EX1027 11-16, 25. PO cannot now rely upon a Layer-2 placement requirement to avoid § 101. *Ericsson*, 955 F.3d at 1329.

Without the unclaimed architectural overlay, the claims are directed to the abstract idea of evaluating available communication resources and selecting among them for transmitting data. EX1002 ¶¶201-202; EX1026 ¶116. The claims fail to specify any concrete implementation for *how* the processing interface performs its recited functions. EX1002 ¶202. Such overly functional claiming of software and network components, untethered to a concrete implementation, is abstract claiming.

PO's cited cases are distinguishable. The *Enfish* claims were limited to a specific self-referential table that improved computer functionality. *Packet Intelligence*, *SRI*, *Uniloc*, and *Data Engine* likewise involved claimed mechanisms and structures absent here.

B. Step 2

The claims also fail Step Two because they recite no inventive concept. EX1002 ¶¶203-204; EX1026 ¶116. PO again asserts that the inventive concept lies

in placing the virtual MAC interface “in MAC sublayer of Layer 2 of a network stack” to provide “transparent bandwidth allocation decision making.” POR 73.

That argument fares no better at Step 2 than it did at Step 1. A Layer-2 architecture is not claimed, as confirmed by the District Court’s construction. *Supra* §I.B; EX1027 11-16, 25. Also, an inventive concept cannot be supplied by features appearing only in the specification. *Ericsson*, 955 F.3d at 1328-29.

Nor do the claims recite anything more than conventional components performing conventional functions. EX1002 ¶¶201, 203-204; EX1026 ¶116. They recite a “processing interface,” “application interface,” “actual MAC [and PHY] interfaces,” “wireless transceivers,” “virtual MAC interface,” and “resource monitoring interface,” connected in functional terms. The claims define the processing interface by mere conventional functions. EX1002 ¶¶202-204. That is not enough.

The same is true of the asserted “transparency” improvement. The claims do not recite any mechanism for achieving transparency; they simply state the desired outcome. EX1002 ¶¶202-204; EX1026 ¶116. Result-oriented language cannot supply an inventive concept.

V. ALL '564 PATENT CLAIMS ARE UNPATENTABLE UNDER SECTION 112

A. Multiple Limitations Lack Written Description Support

PO's response rests on the same basic error throughout: It relies on what a POSITA might infer or find obvious from the specification, rather than on what the specification discloses. POR 76-86; EX1026 ¶117. Neither the '564 specification nor the provisional supplies support for the challenged limitations. EX1026 ¶117. PO's resort to the provisional—and its own self-serving characterizations of it in the '591 prosecution history—underscores the thinness of the written description.

1. “in a manner transparent to any layer . . . above the processing interface”

Conceding its written description does not mention “transparent” operation, PO argues that a POSITA would infer a “single point of access” from Figure 1. POR 76-77. But operating as a “single point of access” between the MAC/PHY layers and the application layers says nothing about whether the processing interface operates transparently. EX1026 ¶118. A single interface does not imply transparency; higher layers may use a single interface while still being aware of that interface's operation. *Id.* Nothing in the '564 specification discloses that upper layers are unaware of operation of the processing layer. *Id.*

2. “evaluate the data transfer characteristics”/ “better than”

PO argues a POSITA would have understood “data transfer characteristics” to reference known quality-of-service parameters, and that the disclosure

“suggest[s]” such evaluation through references to bandwidth, environmental conditions, and range. POR 78. But the specification’s passing references to data cycles, transfer rates, capability, efficiency, and optimization focus on bandwidth availability, not evaluating data transfer characteristics to decide whether one identified bandwidth portion is “better” than another. EX1026 ¶119. PO’s argument depends on what a POSITA might find obvious, not on what the inventor described. *Id.*

3. “resource monitoring interface”

PO argues that “[a] POSITA would recognize that the RF block and virtual PHY layers *can be programmed or ‘formed’* to perform desired tasks and not others.” POR 80. But the inventor disclosed only the RF block and virtual PHY arrangement. PO cannot now broaden that disclosure into a generic “resource monitoring interface” untethered to the narrower components described. EX1026 ¶120.

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

PO asserts a POSITA would have understood that conventional Wi-Fi radios could emit on different bands. POR 81. But Figure 1 shows no radios at all, and a POSITA would understand that multiple MAC/PHY pairs could exist with a single radio. EX1026 ¶121. PO’s argument is also undermined by its complaint, which alleges that the inventor was frustrated by prior Wi-Fi’s ability to use “*only one*

channel or band (then, either 2.4 or 5 GHz) at a time” and “set to work on inventing a solution” allowing use of “more than one channel or band at a time.” EX2018 ¶18. PO cannot now claim that a multi-transceiver system adapted to operate on different bands can be inferred from the scant disclosure in Figure 1.

5. “request or create . . . a first [and second] association between a recipient and the first [and second] actual MAC and PHY interfaces”

PO contends a POSITA would have understood that “association” merely indicates “two components are in radio range of each other and connect with each other.” POR 82. That is undermined by PO’s complaint, which asserts that conventional Wi-Fi systems did *not* permit a receiver to maintain associations on multiple bands at the same time. EX2018 ¶34.

Nor does Figure 1 disclose first and second associations between a recipient and first and second actual MAC/PHY interfaces. EX1026 ¶122. At most, Figure 1 depicts application traffic associated with MAC/PHY resources; it says nothing about whether there are multiple associations with different recipients, as opposed to a single recipient merely receiving data from multiple applications. *Id.*

6. “without requiring disassociation”

PO argues that Figure 1’s depiction of two applications connected to multiple radios/transceivers “indicates to a POSITA that ‘make before break’ is being employed” and therefore the system does not require disassociation. POR 83-84.

But, as discussed above, neither the provisional nor the '564 specification even disclose a recipient having first/second associations. They certainly do not disclose “make before break,” “break before make,” or any equivalent concept. EX1026 ¶123. A static figure depicting applications connected to MAC/PHY resources does not disclose any association-management process, much less one forming a new association before breaking another. *Id.* They therefore do not disclose transmitting without requiring disassociation from such associations. *Id.*

7. “do not prevent”

For written description PO asserts that a POSITA would understand this limitation “to express the ability for resource sharing of the various actual PHY interfaces or the transceivers depicted in Figure 1—including as being shared by two applications.” POR 85. But, for prior art, PO also wrongly criticizes Chincholi for not showing “a single transceiver’s resources are shared *simultaneously*.” POR 53. Unlike Chincholi, Figure 1 does not depict multiple devices simultaneously utilizing remaining bandwidth. EX1026 ¶124. PO does not even contend that it does. Indeed, Figure 1 provides no description of how the MAC/PHY pairs of Figure 1 relate to available bandwidth or how different devices share that bandwidth. *Id.*

B. Multiple Limitations Are Indefinite

PO’s responses do not cure the indefiniteness problems. For “partially simultaneously” and “substantially simultaneously,” PO argues that a POSITA

would understand the phrases in the context of parallel transmissions during a TXOP. POR 87-88. But neither term appears in the priority applications or the '564 specification, and the patent says nothing about TXOPs or any benchmark for distinguishing the two. EX1026 ¶125. The problem is not the use of temporal qualifiers in the abstract; it is that the patent provides no objective way to determine where “partial” simultaneity ends and “substantial” simultaneity begins. *See In re Taasera Licensing LLC Patent Litig.*, No. 22-MD-03042, 2023 WL 8628323, at *20 (E.D. Tex. Dec. 13, 2023). As the Petition explained, this indefiniteness argument is consistent with Ground 1. Pet. 98 n.3.

The same is true of “better than.” PO argues that a POSITA would understand “better than” to mean the bandwidth portion whose characteristics will achieve transmission more effectively, and that relevant metrics would “almost always” point in the same direction. POR 88-89. But the priority applications and '564 specification identify no controlling metric, weighting, hierarchy, or rule for resolving conflicts when throughput, bandwidth, signal strength, delay, jitter, loss, or other characteristics point in different directions. EX1026 ¶126. PO’s “almost always” response underscores the problem: sometimes the metrics will not align, yet PO identifies no rule in the patent for those cases. *Id.* As the Petition explained, this indefiniteness argument is consistent with Ground 1. Pet. 101 n.4.

VI. CONCLUSION

The Board should cancel all claims of the '564 patent.

DATED: June 30, 2026

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

This Reply complies with the type-volume limitation of 5,600 words, comprising 5,593 words, as counted using the Microsoft Word software that was used to prepare this paper, excluding the parts exempted by 37 C.F.R. § 42.24(c).

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CERTIFICATE OF SERVICE

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