

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ERICSSON INC. and TELEFONAKTIEBOLAGET LM ERICSSON,
Petitioners,

v.

INTELLECTUAL VENTURES I LLC,
Patent Owner.

Case IPR2015-01873
Patent 6,640,248 B1

Before KRISTEN L. DROESCH, BRIAN J. McNAMARA, and
DAVID C. McKONE, *Administrative Patent Judges*.

DROESCH, *Administrative Patent Judge*.

DECISION

Denying Institution of *Inter Partes* Review
35 U.S.C. § 314, 37 C.F.R. § 42.108

I. INTRODUCTION

A. Background

Ericsson Inc. and Telefonaktiebolaget LM Ericsson (“Petitioner”) filed a Petition (Paper 1, “Pet.”) for *inter partes* review of claims 1–20 (“the challenged claims”) of U.S. Patent No. 6,640,248 B1 (“the ’248 Patent”). See 35 U.S.C. §§ 311–312. Intellectual Ventures I LLC (“Patent Owner”) timely filed a Preliminary Response (Paper 6, “Prelim. Resp.”). See 35 U.S.C. § 313. We have statutory authority under 35 U.S.C. § 314, which provides that *inter partes* review may not be instituted unless it is determined that “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

After considering the Petition and Preliminary Response, for the reasons provided below, we determine there is not a reasonable likelihood Petitioner would prevail in showing the challenged claims are unpatentable.

B. Related Proceedings

The ’248 Patent was the subject of an earlier petition for *inter partes* review filed by Petitioner in *Ericsson Inc. v. Intellectual Ventures I LLC*, Case IPR2014-01331, which was denied. Pet. 1; Paper 5, 2. The ’248 Patent is also the subject of ten district court proceedings. Pet. 1; Paper 5, 1.

C. The ’248 Patent (Ex. 1001)

The ’248 Patent is entitled “Application-Aware, Quality of Service (QoS) Sensitive, Media Access Control (MAC) Layer.” The ’248 Patent discloses that it is desirable to minimize or eliminate problems resulting from poor quality in wireless streaming multimedia applications. Ex. 1001, 11:46–12:39. By providing a QoS mechanism that is application-specific

rather than circuit specific, bandwidth can be conserved and dynamically allocated where needed by the QoS mechanism associated with each application type. *Id.* at 22:8–12. Media access control (MAC) layer includes an allocator that allocates bandwidth to an Internet Protocol (IP) flow associated with a software application based on the IP QoS requirements of the software application so that the IP flows of each application can be switched to appropriate destinations in a proper priority order. *Id.* at Abstract, 22:20–24. In some cases, “application-level information about the nature of the application can be used by the system to assign appropriate QoS mechanism parameters to the IP stream,” while in other cases, “information about the IP streams for use in configuring the appropriate QoS mechanism parameters can be extracted from packet headers.” *Id.* at 22:27–32. In particular, IP header fields can be used to identify IP flows and the QoS requirements of the IP flows, which are helpful for providing “application aware” resource allocation. *Id.* at 53:18–27. Application information is communicated vertically in the protocol stack model from the application layer to the MAC layer for bandwidth reservation and application switching purposes. *Id.* at 22:32–37.

D. Illustrative Claim

Claims 1 and 20 are independent, and claims 2–19 depend ultimately from claim 1. Claim 1 is illustrative:

1. An application aware, quality of service (QoS) sensitive, media access control (MAC) layer comprising:

an application-aware resource allocator at the MAC layer, wherein said resource allocator allocates bandwidth resource to an internet protocol (IP) flow associated with a software application of a user based on IP QoS requirements of said software application, wherein said resource allocator allocates said bandwidth resource in a packet centric manner

that is not circuit-centric and does not use asynchronous transfer mode (ATM).

E. Asserted Grounds of Unpatentability

Petitioner challenges claims 1–20 as unpatentable under 35 U.S.C. § 103(a) over Naghshineh¹ and Bianchi.² Petitioner also challenges claims 1–20 as unpatentable under 35 U.S.C. § 103(a) over Drake³ and Bianchi.

II. ANALYSIS

A. Bar Under 35 U.S.C. § 315(a) and (b)

Patent Owner argues institution of *inter partes* review is barred because Petitioner and Petitioner’s privy were served with a complaint alleging infringement of the ’248 Patent more than one year before the filing of this Petition. Prelim. Resp. 2, 5–11; see 35 U.S.C. § 315(b). Patent Owner also argues that institution of *inter partes* review is barred because Petitioner challenged the validity of the ’248 patent by moving to intervene in a civil action challenging the validity of the ’248 Patent. Prelim. Resp. 2, 11–12; see 35 U.S.C. § 315(a). The parties filed additional briefing regarding whether Petitioner was served with a complaint alleging infringement of the ’248 Patent more than one year before the filing of this Petition. Papers 9, 11. The parties also filed as exhibits their additional briefing from *Ericsson Inc. v. Intellectual Ventures II LLC*, Case IPR2015-

¹ Ex. 1006, Mahmoud Naghshineh & Marc Willebeek-LeMair, *End-to-End QoS Provisioning in Multimedia Wireless/Mobile Networks Using an Adaptive Framework*, IEEE COMM. MAG., Nov. 1997, at 72 (“Naghshineh”).

² Ex. 1005, Giuseppe Bianchi et al., *On Utility-Fair Adaptive Services in Wireless Networks*, 1998 SIXTH INT’L WORKSHOP ON QUALITY SERV. (IWQoS ’98) 256 (“Bianchi”).

³ Ex. 1004, Drake, Jr., et al., U.S. Patent No. 5,461,611, issued Oct. 24, 1995 (“Drake”).

01872, addressing issues identical to the remaining § 315(a) and (b) issues before us. Ex. 1017; Ex. 2014. In the analysis that follows, we determine there is not a reasonable likelihood Petitioner would prevail in showing the challenged claims are unpatentable. Accordingly, we need not address Patent Owner's assertions that *inter partes* review is barred under 35 U.S.C. § 315 (a) and (b).

B. Claim Construction

Claims of an unexpired patent are interpreted using the broadest reasonable interpretation in light of the specification. *See* 37 C.F.R. § 42.100(b); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1275–79 (Fed. Cir. 2015), *cert. granted sub nom. Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 890 (2016) (mem.). Claim terms also are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

In accordance with 37 C.F.R. § 42.104(b)(3), Petitioner provides a claim chart purporting to identify corresponding structures and functions for certain means-plus-function limitations recited in claim 20. Pet. 11–12. Petitioner and Patent Owner do not provide explicit claim constructions for any remaining claim term or phrase. *See id.* at 11; Prelim. Resp. 18–21.

For the purpose of this decision, we need not construe explicitly any claim term or phrase.

C. Grounds of Unpatentability

1. Claims 1–20 over Naghshineh and Bianchi

a. Naghshineh (Ex. 1006)

Naghshineh is entitled “End-to-End QoS Provisioning in Multimedia Wireless/Mobile Networks Using an Adaptive Framework.” Naghshineh

discloses “multimedia applications [that] need to be adaptive and network-aware, and networks [that] must provide application-aware services.”

Ex. 1006, 73, cols. 1–2. The responsibility of end-to-end quality of service (QoS) provisioning “is shared between the application and the network to deliver multimedia content to a mobile/wireless terminal in the most acceptable form given the resource availability in the network at any time.”

Id. at 73, col. 2. An application presents multimedia content to a network as a multiresolution stream, thereby the multimedia streams are adaptable to satisfy different network and terminal characteristics. *Id.* at 73, col. 2–76, col. 1. The adaptive network provides a media scaling function based on the resource availability conditions in the fixed and wireless network. *Id.* at 76, col. 1. The requirements of the adaptive network include a transport service layer, routing, wireless link, and wireless medium. *Id.* at 76 § Adaptive Network. In discussing the wireless link requirement of the adaptive network, Naghshineh discloses:

The immense differences between wired and wireless links in terms of BER [(bit error rate)] and bandwidth result in access points being very critical elements of mobile and wireless networks. The interface between the wired and wireless link at an access point must ensure that the packet-level QoS of a substream is met according to its predefined priority, dictated by the application. The challenge here is to use an appropriate medium access control (MAC) protocol to maintain some availability of the shared wireless resource and to provide added protection on the transmission of packets over the wireless medium to mitigate packet loss due to fading of the medium.

Id. at 76 § Wireless Link. The transport layer in the transmitting station provides a service layer between the application and the network that allows the application to identify its substreams and its layers to the network

(intermediate switching and access points), for example, by providing packet “tagging.” *Id.* at 76 § Transport Service Layer; *see id.* at 77 § Multilayered Service Contract and Adaptive Transport (describing substream identification (SSI) tag). The required components of an adaptive mobile and wireless network include a multilayered service contract, a mobile multicast routing protocol, substream filters, substream schedulers and error control functions, and proactive resource reservation, call admission, and signaling functions. *Id.* at 76 § Adaptive Network Components to 78, col. 2. Substream scheduler (SSS) is used in mobile stations, access points or base stations to schedule the transmission of packets on the wireless medium according to their substream identification (SSI). *Id.* at 77 § Substream Scheduling and Error Control. “[T]he reason behind a ‘substream-aware’ transport is to enable elements within the network to take advantage of the fact that all data within a connection does not have the same level of QoS requirement.” *Id.* Central to the adaptive end-to-end QoS architecture is the ability of the application, transport, and network to be aware of each other’s capabilities and requirements. *Id.* at 81 § Conclusion.

b. Bianchi (Ex. 1005)

Bianchi is entitled “On Utility-Fair Adaptive Services in Wireless Networks. Bianchi discloses “[a] quality of service adaptive data link control model . . . that accounts for application specific adaptation dynamics that include adaptation time-scales and adaptation policies.” Ex. 1005, Abstract. “A centralized adaptation controller [at wireless network access point] employs a utility-fair allocation scheme that supports the dynamic bandwidth needs of adaptive flows over a range of operating conditions.” *Id.*; *accord id.* at 257 § 1 para. 5. “[T]he design of the utility-fair bandwidth allocation scheme and the interaction between the centralized adaptation

controller and a set of distributed adaptation handlers . . . play a key role in intelligently responding to time-varying channel capacity experienced over the air-interface.” *Id.*; *accord id.* at 257 § 1 para. 5. “Due to the fast time scale dynamics associated with wireless channels, resource allocation and adaptation techniques need to be explicitly supported not only at the transport and network layers but also at the data link controller.” *Id.* at 257 § 1 para. 5. Bianchi’s Figure 2 is reproduced below:

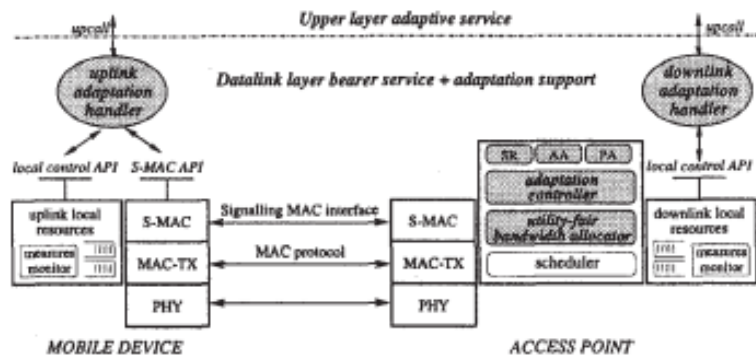


Figure 2: QOS Adaptive Datalink Model

Bianchi’s Figure 2 above depicts an adaptation controller, a utility-fair bandwidth allocator, a scheduler, and a downlink handler at the access point, and an uplink adaptation handler at the mobile device. Figure 2 further depicts an “[u]pper layer adaptive service” located above “[d]atalink layer bearer service + adaptation support.” “A signaling interface (S-MAC) provides an in-band channel between the mobile device and access point supporting various signaling features, e.g., flow setup, adaptation control, scheduler polling.” *Id.* at 258 § 2.2 para. 3. Figure 2 also depicts “MAC-TX,” “MAC protocol” and “PHY” below “S-MAC” and “Signalling MAC interface.”

c. Claims 1–20

Petitioner asserts “an application-aware resource allocator at the MAC layer,” as recited in claim 1, and an “application-aware media access control (MAC) layer . . . comprising . . . allocating means,” as recited in independent claim 20, are taught by Naghshineh’s substream scheduler (SSS). Pet. 16 (citing Ex. 1006, 76, 77; Ex. 1003 ¶ 65); *id.* at 36–37.

Specifically, Petitioner alleges:

[B]ecause available bandwidth widely fluctuates (*see* Ex. 1006, p. 72), *Naghshineh* advocates using “an appropriate medium access control (MAC) protocol to maintain some availability of the shared wireless resource and to provide added protection on the transmission of packets over the wireless medium.” (*Id.* at 76) A POSA would have known that *Naghshineh*’s SSS (i.e., resource allocator) is at the MAC layer in order “to maintain some availability of the shared wireless resource” medium and “to mitigate packet loss due to the fading of the medium.” (Ex. 1003, ¶ 66).

Pet. 16–17.

Patent Owner argues Petitioner’s assertions are supported only by conclusory testimony of Petitioner’s expert Mark R. Lanning that only quotes one sentence from Naghshineh discussing the MAC protocol. Prelim. Resp. 32 (quoting Pet. 17; Ex. 1006, 76) (citing Ex. 1003 ¶ 66); *see id.* at 35. Patent Owner asserts that the quoted disclosure from Naghshineh discussing the MAC protocol does not mention substreams or scheduling substreams, and Naghshineh never discloses the SSS is part of the MAC layer. *Id.* at 32–33. Lastly, Patent Owner argues Petitioner’s assertions are contradicted by Bianchi’s characterization of Naghshineh as addressing adaptive quality of service techniques at the transport and network layers of wireless networks, which Patent Owner asserts is

consistent with Naghshineh's disclosure. *Id.* at 33–34 (citing Ex. 1005, 256; Ex. 1006, 73). Patent Owner further argues that the transport and network layers are both located above, and distinct from, the MAC layer. *Id.* (citing Ex. 1001, 42:42–44; Ex. 2011, 430).

We agree the citation to Naghshineh's discussion of MAC protocol does not mention substreams or scheduling substreams, and further agree Naghshineh does not disclose the SSS is part of the MAC layer. *See* Ex. 1006, 76 § Wireless Link, 77 § Substream Scheduling and Error Control. We also agree Naghshineh discloses adaptive quality of service techniques at the transport and network layers of wireless networks, which are distinct from a MAC layer. *See* Ex. 1005, 256 § 1 para. 2; Ex. 1006, 73, cols. 1–2, 76, col. 1 § Transport Service Layer, 77 § Substream Scheduling and Error Control; Ex. 1001, 42:42–44; Ex. 2011, 430. Lastly, Petitioner's assertion that a person of ordinary skill would have known Naghshineh's SSS is at the MAC layer is not supported by a sufficient factual basis. We give little weight to Mr. Lanning's opinion (*see* Ex. 1003 ¶ 66) because it is not supported by underlying fact. *See* 37 C.F.R. § 42.65. Mr. Lanning's testimony is only supported by selected out-of-context quotation of Naghshineh. It is not readily apparent, and Mr. Lanning does not explain, why one with ordinary skill in the art would know that Naghshineh's SSS is at the MAC layer based on the following full disclosure of Naghshineh:

The interface between the wired and wireless link at an access point must ensure that the packet-level QoS of a substream is met according to its predefined priority, dictated by the application. The challenge here is to use an appropriate medium access control (MAC) protocol to maintain some availability of the shared wireless resource and to provide added protection on the transmission of packets over the

wireless medium to mitigate packet loss due to fading of the medium.

Ex. 1006, 76 § Wireless Link; see Ex. 1003 ¶ 66.

Petitioner further asserts that an application aware resource allocator at the MAC layer would have been obvious in view of Naghshineh and Bianchi. Pet. 17, 36–37. Petitioner contends “[i]t would have been obvious to incorporate *Bianchi*’s application-aware scheduler into *Naghshineh*’s access point so that it is ‘better suited to respond to application specific adaptation needs.’” *Id.* at 18 (quoting Ex. 1005, Abstract; Ex. 1003 ¶ 70). Petitioner further contends “[a] POSA would have been motivated to do so because ‘an access point must ensure that the packet-level QoS of a substream is met [as] dictated by the application.’” *Id.* (second alteration in original) (quoting Ex. 1006, 76; Ex. 1003 ¶ 70). Petitioner asserts “*Bianchi* explains that due to the fast fading in ‘wireless channels, **resource allocation and adaptation techniques need to be explicitly supported . . . at the data link’ layer.**” *Id.* (quoting Ex. 1005, 257). Petitioner contends “[t]o address this need, a POSA would have understood to employ an access point’s scheduler (i.e., ‘resource allocator’) at the MAC protocol layer, as taught by *Bianchi* in Fig. 2.” *Id.* at 18–19 (citing Ex. 1005, 258) (reproducing Bianchi’s Figure 2 with added annotations).

Patent Owner rebuts Petitioner’s arguments by asserting that Petitioner does not explain how its reproduction of Bianchi’s Figure 2 with added annotations teaches employing the scheduler at the MAC layer. Prelim. Resp. 38–39. Patent Owner argues that Petitioner’s quotations from Bianchi merely discuss the data link layer and the S-MAC interface. *Id.* at 39. Patent Owner contends the MAC layer is a strict subset of the data link layer, such that the data link layer has components that are not employed at

the MAC layer. *Id.* (citing Ex. 1003 ¶ 56; Ex. 1001, 42:42–44; Ex. 1005, Fig. 2; Ex. 1013, 27); *see* Ex. 2011, 430, Fig. 13. Patent Owner further argues that Bianchi’s scheduler may interact with the MAC layer to transmit packets over the interface, but the scheduler is not at the MAC layer. Prelim. Resp. 40.

We agree with Patent Owner that the MAC layer is a distinct sublayer of the data link layer. *See* Ex. 1013, 27. We further agree that Bianchi’s disclosure of employing components at the data link layer does not provide sufficient support for Petitioner’s assertion that the scheduler is at the MAC layer. *See* Ex. 1005, Figs. 2, 10; *see also id.* at 258 § 2.2 (“We propose a number of enhancements to data link layer architecture to support QoS adaptation”), *id.* at 262 (“data link layer provides a flexible adaptation interface for service providers and application developers to program related datalink support”).

Furthermore, Petitioner’s assertions of obviousness are conclusory, and supported only by selected out-of-context quoted phrases from Bianchi and Naghshineh. “[O]bviousness . . . cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006), *quoted with approval in KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). For example, Petitioner does not provide sufficient articulated reasoning with rational underpinning for incorporating Bianchi’s scheduler into Naghshineh’s access point based on the following full disclosure of Bianchi: “In this paper we assess the state-of-the-art in quality of service adaptive wireless systems and argue for new adaptation techniques that are better

suited to respond to application specific adaptation needs.” Ex. 1005, Abstract (Petitioner’s quoted language underlined); *see* Pet. 18; Ex. 1003 ¶ 70. As a further example, Petitioner does not provide sufficient articulated reasoning with rational underpinning for the proposed modification based on the following full disclosure of Naghshineh: “The interface between the wired and wireless link at an access point must ensure that the packet-level QoS of a substream is met according to its predefined priority, dictated by the application.” Ex. 1006, 76 § Wireless Link (Petitioner’s quoted language underlined); *see* Pet. 18; Ex. 1003 ¶ 70. As a final example, Petitioner does not provide sufficient articulated reasoning with rational underpinning for the proposed modification based on the following full disclosure of Bianchi: “Due to the fast time scale dynamics associated with wireless channels, resource allocation and adaptation techniques need to be explicitly supported not only at the transport and network layers but also at the data link controller.” Ex. 1005, 257, col. 1 (Petitioner’s quoted language underlined); *see* Pet. 18.

Lastly, Petitioner contends “[i]t would have been obvious to employ *Bianchi*’s S-MAC interface in *Naghshineh*’s access point to allocate resources at the MAC layer because ‘**resource allocation and adaptation techniques need to be explicitly supported not only at the transport and network layers but also at the data link’ layer.**” Pet. 20 (quoting Ex. 1005, 257). Petitioner alleges “[b]y doing so, application ‘[f]lows can be dynamically programmed at the MAC layer.’” *Id.* (second alteration in original) (quoting Ex. 1005, 257) (citing Ex. 1003 ¶¶ 57, 70).

Patent Owner rebuts Petitioner’s arguments by asserting that *Bianchi*’s S-MAC interface does not allocate resources, is not part of the packet scheduler, adaptation handler, or adaptation controller, and is not at

the MAC layer. Prelim. Resp. 40. Patent Owner contends Bianchi discloses the S-MAC interface provides signaling between various components of Bianchi's systems. *Id.* (citing Ex. 1005, 258).

We agree Bianchi does not teach or suggest that the S-MAC interface performs resource allocation and is not part of the adaptation controller, scheduler, or adaptation handler. We further agree Bianchi discloses that the S-MAC interface provides signaling between components. *See* Ex. 1005, 258 § 2.2 paras. 3, 5, 259 § 3.1 para. 3, 262–63 § 4.3 para. 3, 263 § 4.4 para. 3, 265–66 § 5.3 para. 2.

Moreover, Petitioner's assertions of obviousness are conclusory and based on selected out-of-context quoted phrases from Bianchi. *See Kahn*, 441 F.3d at 988. For example, Petitioner does not provide sufficient articulated reasoning with rational underpinning for employing Bianchi's S-MAC interface in Naghshineh's access point based on the following full disclosures of Bianchi: (1) “Due to the fast time scale dynamics associated with wireless channels, resource allocation and adaptation techniques need to be explicitly supported not only at the transport and network layers but also at the data link controller”; and (2) “*sustained rate services (SR)* support the minimum bandwidth portion of adaptive flows while attempting to assure quality of service constraints. Flows can be dynamically programmed at the MAC layer [18] to combine different service classes.”⁴ Ex. 1005, 257 § 1 para. 5, § 2.1 para. 2 (Petitioner's quoted language underlined); *see* Pet. 20; Ex. 1003 ¶¶ 57, 70.

⁴ Bracketed numeral 18 references “G. Bianchi, A. T. Campbell, ‘A Programmable MAC’, submitted for publication.” Ex. 1005, 267.

Accordingly, based on the record before us, there is not a reasonable likelihood Petitioner would prevail in showing that the challenged claims are unpatentable over Naghshineh and Bianchi.

2. Claims 1–20 Over Drake and Bianchi

a. Drake (Ex. 1004)

Drake discloses a quality of service (QoS) management system for routing multimedia packets in local area networks. Ex. 1004, Title, Abstract. Figure 1 of Drake is reproduced below.

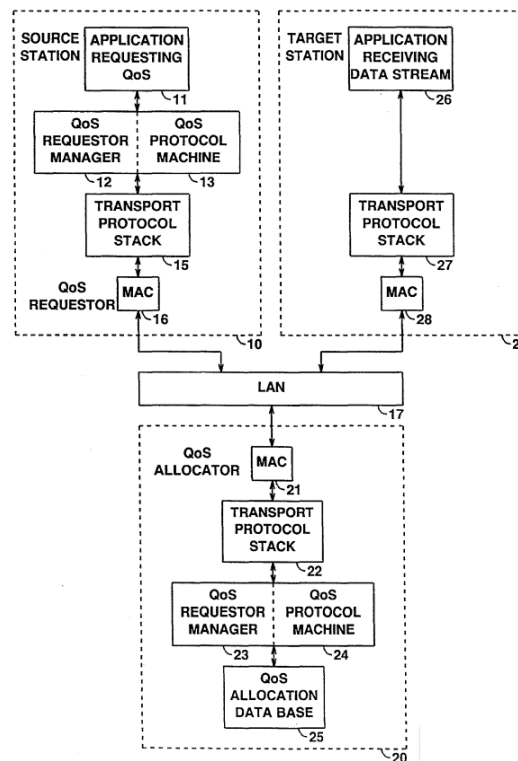


Figure 1 of Drake above depicts source station 10, target station 29, local area network (LAN) 17, and QoS allocator station 20. Ex. 1004, 4:17–25. Source station 10 includes application 11 requesting a QoS connection to target destination 29 for multimedia transmission. *Id.* at 4:26–30. QoS requestor manager 12 and QoS protocol machine 13 at source station 10 assemble a request to reserve a QoS connection for a multimedia stream on a

path through LAN 17 between source station 10 and target station 29. *Id.* at 4:31–36. A request packet is formatted using standard LAN transport protocol 15, and launched on LAN 17 through MAC entity 16. *Id.* at 4:36–39. LAN transport protocol 15 and MAC entity 16 are standard parts of all stations attached to LAN 17. *Id.* at 4:39–46. QoS allocator station 20 receives QoS request from source station 10, examines the resources of LAN 17, and determines if a path exist in LAN 17 between source station 10 and target station 29 that satisfies the requested QoS level. *Id.* at 4:49–53. QoS allocator station 20 is attached to LAN 17 and manages the QoS requests for the entire LAN 17. *Id.* at 4:66–67. QoS allocator station 20 includes MAC entity 21 and LAN transport protocol stack 22, which provide the same functions for QoS allocator station 20 as the similar entities provide for source station 10 and target station 29. *Id.* at 4:67–5:4.

b. Claims 1–20

Petitioner asserts Drake teaches “an application-aware resource allocator at the MAC layer,” as recited in claim 1, and an “application-aware media access control (MAC) layer . . . comprising . . . allocating means,” as recited in independent claim 20. Pet 40–41, 59–60. Specifically, Petitioner contends Drake “discloses a QoS resource allocator 20 comprising a MAC entity 21, which is at the MAC layer.” *Id.* at 40 (citing Ex. 1004, Fig. 1; Ex. 1003 ¶ 148). Petitioner alleges Drake’s “QoS allocator 20 is at least at the MAC layer because ‘allocator station 20 includes a Medium Access Control (MAC) entity 21’ that handles QoS requests using MAC entity 21.” *Id.* at 40–41 (emphasis omitted) (quoting Ex. 1004, 5:1–2) (citing Ex. 1004, 5:55–59; Ex. 1003 ¶ 149). Petitioner further contends “*Drake’s* allocator station 20 uses . . . Data Stream Descriptors at the MAC layer ‘to control multimedia data stream entry into a LAN, based on the quality of service

requirements for that particular data stream.”” *Id.* at 41 (quoting Ex. 1004, 2:15–17) (citing Ex. 1004, 4:30–31, 10:3–4; Ex. 1003 ¶ 150). On this basis, Petitioner concludes “[a] POSA would have understood that *Drake* discloses an application-aware allocator 20 at the MAC layer.” *Id.* (citing Ex. 1003 ¶ 150).

Patent Owner rebuts Petitioner’s contentions by pointing out that *Drake* discloses: “Like other stations, allocator station 20 includes a Medium Access Control (MAC) entity 21 and a LAN transport protocol stack 22 which provide the **same function for allocator station 20 as the similar entities provide for stations 10 and 29.**” Prelim. Resp. 49–50 (quoting Ex. 1004, 4:67–5:4). Patent Owner further points out *Drake* discloses that MAC entity 21 of allocator 20 is identical to MAC entities 16 and 28 (of stations 10 and 29), and “describes MAC 16 as a ‘standard part[] of all stations attached to a LAN’ and expressly states that ‘the details of which . . . will not be further described here except to note that standard MAC functions are defined in IEEE standards 802.5 for token ring networks.’” *Id.* at 50 (alteration in original) (quoting Ex. 1004, 4:40–45) (citing Ex. 1004, 4:67–5:4). Patent Owner contends “MAC entity 21 plays no role in QoS allocation beyond its conventional role as an interface to the LAN, just as it does with any other station.” *Id.*; *accord id.* at 51.

We agree *Drake* discloses the MAC entity 21 at QoS allocator station 20 provides standard MAC functions, and does not teach or suggest that the QoS allocator station 20 is at the MAC layer. *See* Ex. 1004, Fig. 1, 4:39–46, 4:66–5:4. Petitioner’s assertion that a person of ordinary skill would have understood that *Drake* discloses that an application-aware allocator at the MAC layer is not supported by a sufficient factual basis. We give little weight to Mr. Lanning’s opinion (*see* Ex. 1003 ¶ 150) because it is not

supported by underlying evidence. *See* 37 C.F.R. § 42.65. The supporting citations to Drake are silent regarding QoS allocator station 20 using Data Stream Descriptors at the MAC layer. *See* Ex. 1004, 2:15–17, 4:30–31, 5:5–8, 10:3–4. At best, Drake discloses an allocation request message that includes fields for the source and destination MAC addresses (hardware addresses), and a field for Data Stream Descriptors. *See id.* at 9:64–10:4, Fig. 3. Mr. Lanning’s testimony is supported only by a selected out-of-context quotation from Drake. It is not readily apparent, and Mr. Lanning does not explain, why one with ordinary skill in the art would have understood that Drake discloses an application-aware allocator at the MAC layer based on the following full disclosure of Drake: “It is extremely desirable to provide apparatus and a method to control multimedia data stream entry into a LAN, based on the quality of service requirements for that particular data stream and the quality of service available in the LAN” (*id.* at 2:14–18).

Petitioner also asserts that an application aware resource allocator at the MAC layer would have been obvious in view of Drake and Bianchi. Pet. 41–45, 59–60. Petitioner contends “[a] POSA would have incorporated an application-aware packet scheduler as taught by *Bianchi* into *Drake*’s QoS allocator 20 so that it is ‘better suited to respond to application specific adaptation needs’” and “may better accommodate applications such as dynamically ‘increasing the bandwidth for an already existing transmission path allocation, for example, if the transmission changes [or] where the request for a bandwidth increase is received at the allocator station 20.’” *Id.* at 43 (second alteration in original) (first quoting Ex. 1005, Abstract; and then quoting Ex. 1004, 12:36–42) (citing Ex. 1003 ¶ 153). Petitioner asserts “implementing *Drake*’s QoS allocator 20 at the MAC layer would be

obvious because ‘resource allocation and adaptation techniques need to be explicitly supported . . . at the data link’ layer.” *Id.* at 43–44 (quoting Ex. 1005, 257). Petitioner contends “a POSA would have understood to implement an access point comprising a scheduler (i.e., ‘resource allocator’) at the MAC layer as taught by *Bianchi*.” *Id.* at 44 (citing Ex. 1005, 258) (reproducing *Bianchi*’s Figure 2 with added annotations). Petitioner further contends “[a] POSA would have been motivated to incorporate *Bianchi*’s S-MAC interface into Drake’s QoS allocator 20 so that application ‘[f]lows can be dynamically programmed at the MAC layer.’” *Id.* at 45 (second alteration in original) (quoting Ex. 1005, 257) (citing Ex. 1003 ¶ 155).

Patent Owner rebuts Petitioner’s arguments by incorporating its previous arguments addressing the combination of Naghshineh and *Bianchi*, specifically asserting that Petitioner incorrectly argues that the functions of *Bianchi*’s packet scheduler take place at the MAC layer. Prelim. Resp. 51–52 (citing Pet. 44). As explained above in addressing the parties’ contentions regarding the combination of Naghshineh and *Bianchi*, we agree the MAC layer is a distinct sublayer of the data link layer, and *Bianchi*’s disclosure of employing components at the data link layer does not support sufficiently Petitioner’s assertion that the scheduler is at the MAC layer. *See* Ex. 1005, Figs. 2, 10, 258 § 2.1, 262; Ex. 1013, 27.

Furthermore, Petitioner’s assertions of obviousness are conclusory, and supported only by selected out-of-context quoted phrases from *Bianchi* and Drake. *See Kahn*, 441 F.3d at 988. For example, Petitioner does not provide sufficient articulated reasoning with rational underpinning for implementing Drake’s QoS allocator at the MAC layer based on the following full disclosures of *Bianchi*: (1) “Due to the fast time scale dynamics associated with wireless channels, resource allocation and

adaptation techniques need to be explicitly supported not only at the transport and network layers but also at the data link controller"; and (2) "*sustained rate services (SR)* support the minimum bandwidth portion of adaptive flows while attempting to assure quality of service constraints. Flows can be dynamically programmed at the MAC layer [18] to combine different service classes."⁵ Ex. 1005, 257 § 1 para. 5, § 2.1 para. 2 (Petitioner's quoted language underlined); see Pet. 44–45. As an another example, Petitioner does not provide sufficient articulated reasoning with rational underpinning for incorporating Bianchi's scheduler into Drake's QoS allocator based on the following full disclosure of Bianchi: "In this paper we assess the state-of-the-art in quality of service adaptive wireless systems and argue for new adaptation techniques that are better suited to respond to application specific adaptation needs." Ex. 1005, Abstract (Petitioner's quoted language underlined); see Pet. 43. As a final example, Petitioner does not provide sufficient articulated reasoning with rational underpinning for the proposed modification based on the following full disclosure of Drake:

In FIG. 7 there is shown a flow chart of the process for increasing the bandwidth for an already existing transmission path allocation, for example, if the transmission changes from a one-way Client/Server transmission to a two-way Client/Client interactive transmission. Starting in start box 130 of FIG. 7, box 131 is entered where the request for a bandwidth increase is received at the allocator station 20 of FIG. 1.

Ex. 1004, 12:35–42 (Petitioner's quoted language underlined); see Pet. 43.

⁵ Bracketed numeral 18 references "G. Bianchi, A. T. Campbell, 'A Programmable MAC', submitted for publication." Ex. 1005, 267.

Lastly, Petitioner contends “[i]t would have been obvious to employ *Bianchi*’s S-MAC interface into *Drake*’s QoS allocator 20 to allocate resources at the MAC layer because ‘resource allocation and adaptation techniques need to be explicitly supported not only at the transport and network layers but also at the data link’ layer.” Pet. 44–45 (quoting Ex. 1005, 257). Petitioner further asserts “[a] POSA would have been motivated to incorporate *Bianchi*’s S-MAC interface into *Drake*’s QoS allocator 20 so that application ‘[f]lows can be dynamically programmed at the MAC layer.’” *Id.* at 45 (second alteration in original) (quoting Ex. 1005, 257) (citing Ex. 1003 ¶ 155).

Petitioner’s obviousness conclusions for employing *Bianchi*’s S-MAC interface in *Drake*’s QoS allocator are identical substantially to the obviousness conclusions for employing *Bianchi*’s S-MAC interface in *Naghshineh*’s access point. *Compare* Pet. 44–45, *with id.* at 19–20. Patent Owner rebuts Petitioner’s assertions by arguing that Petitioner mischaracterizes *Bianchi*’s S-MAC interface as a MAC layer resource allocator when it is neither a resource allocator nor at the MAC layer. Prelim. Resp. 52. For the same reasons as those explained above addressing the combination of *Bianchi*’s S-MAC interface with *Naghshineh*’s access point, we agree *Bianchi* does not teach or suggest that the S-MAC interface is a resource allocator, but discloses that the S-MAC interface provides signalling between components. Also for the same reasons explained above, Petitioner does not provide sufficient articulated reasoning with rational underpinning for employing *Bianchi*’s S-MAC interface in *Drake*’s QoS allocator station 20.

Therefore, based on the record before us, there is not a reasonable likelihood Petitioner would prevail in showing the challenged claims are unpatentable over Drake and Bianchi.

III. CONCLUSION

For the foregoing reasons, based on this record, there is not a reasonable likelihood Petitioner would prevail in showing claims 1–20 of the '248 Patent are unpatentable.

IV. ORDER

Accordingly, it is ORDERED that *inter partes* review of U.S. Patent No. 6,640,248 is not instituted based on this Petition.

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Patent 6,640,248 B1

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