

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.
and QUALCOMM INCORPORATED,
Petitioner,¹

v.

NETWORK SYSTEM TECHNOLOGIES, LLC,
Patent Owner.

IPR2024-00338
Patent 7,373,449 B2

Before CHARLES J. BOUDREAU, STEVEN M. AMUNDSON, and
IFTIKHAR AHMED, *Administrative Patent Judges*.

AMUNDSON, *Administrative Patent Judge*.

ORDER
Denying Patent Owner's Motion to Strike
37 C.F.R. § 42.5

¹ Qualcomm Incorporated filed a petition and a motion for joinder in IPR2024-01081 and has been joined as a petitioner in this proceeding. *See* Paper 16. After Qualcomm Incorporated was joined as a petitioner, Samsung Electronics Co., Ltd. was terminated as a petitioner. *See* Paper 17.

I. INTRODUCTION

After receiving Board authorization, Network System Technologies, LLC (“Patent Owner” or “NST”) filed a motion to strike certain “theories and evidence” submitted by Qualcomm Incorporated (“Petitioner” or “Qualcomm”). Paper 53 (“Mot.”); *see* Ex. 3007. Petitioner opposes Patent Owner’s motion. Paper 54 (“Opp.”).

For the reasons explained below, we deny Patent Owner’s motion.

II. PROCEDURAL BACKGROUND

In December 2023, Samsung Electronics Co., Ltd. (“Samsung”) initiated this proceeding by filing a Petition requesting an *inter partes* review of claims 1–6 and 9–16 in U.S. Patent No. 7,373,449 B2 (“the ’449 patent”) (Exhibit 1001) under 35 U.S.C. §§ 311–319. *See* Paper 2 (“Samsung Pet.”). Samsung’s Petition includes the following challenges to patentability:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–6, 9–16	103(a)	Goossens2002, ² Drake ³
1–6, 9–16	103(a)	Goossens2003, ⁴ Drake

Samsung Pet. 9, 15–68.

In March 2024, Patent Owner filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). Three days before filing the Preliminary Response,

² Kees Goossens et al., *Networks on Silicon: Combining Best-Effort and Guaranteed Services*, Proceedings of the 2002 Design, Automation and Test in Europe Conference and Exhibition, 1–3 (March 2002) (Exhibit 1005).

³ U.S. Patent No. 5,461,611, titled “Quality of Service Management for Source Routing Multimedia Packet Networks,” filed on June 7, 1994, and issued on October 24, 1995, to John E. Drake, Jr. et al. (Exhibit 1006).

⁴ Kees Goossens et al., *Guaranteeing the Quality of Services in Networks on Chip*, Chapter 4 in *Networks on Chip*, Kluwer Academic Publishers (Axel Jantsch & Hannu Tenhunen eds., 2003) (Exhibit 1007).

however, Patent Owner statutorily disclaimed claims 1 and 3–5.

Ex. 2062, 3; *see* Prelim. Resp. 13 n.1, 41 n.4.

In June 2024, after analyzing the arguments and evidence presented by the parties, the Board instituted an *inter partes* review of all challenged claims based on all challenges included in Samsung’s Petition. Paper 10 (“Inst. Dec.”), 87.

In June 2024, on the same day that the Board instituted an *inter partes* review in this proceeding, Petitioner filed a petition in IPR2024-01081 challenging claims 2, 6, and 9–16 in the ’449 patent on substantively identical grounds to those asserted in Samsung’s Petition. *Qualcomm Incorporated v. Network System Technologies, LLC*, IPR2024-01081, Paper 1 (“Qualcomm Pet.”). Concurrently with filing the petition in IPR2024-01081, Petitioner filed a motion for joinder, seeking joinder as a party in this proceeding under 35 U.S.C. § 315(c). *See* IPR2024-01081, Paper 3.

In July 2024, Patent Owner filed a response to Petitioner’s motion for joinder in IPR2024-01081 and urged the Board to deny the motion for various reasons. *See* IPR2024-01081, Paper 7. In July 2024, Patent Owner also filed a preliminary response in IPR2024-01081 and urged the Board to deny institution for various reasons. *See* IPR2024-01081, Paper 9.

In October 2024, the Board (1) instituted an *inter partes* review in IPR2024-01081, (2) granted Petitioner’s motion for joinder in IPR2024-01081, and (3) joined Petitioner as a party in this proceeding. Paper 16 (“Qualcomm Inst. Dec.”), 50–51; IPR2024-01081, Paper 14 at 50–51. The next day, based on a settlement between Samsung and Patent Owner, the Board granted in part a joint motion to terminate filed by Samsung and

Patent Owner and terminated Samsung as a petitioner in this proceeding.
See Paper 14 (Joint Motion); Paper 17 (Order).

In November 2024, Patent Owner filed a Response. Paper 35 (“Resp.”). To support various positions in the Response, Patent Owner filed a declaration of Dr. Nader Bagherzadeh. *See* Ex. 2070.

In January 2025, Petitioner filed a Reply to Patent Owner’s Response. Paper 43 (“Reply”). To support various positions in the Reply, Petitioner filed a declaration of Dr. Todd Mowry. *See* Ex. 1043.

In March 2025, Patent Owner filed a Sur-reply to Petitioner’s Reply. Paper 55 (“Sur-reply”).

III. FACTUAL BACKGROUND

A. The Challenged Claims

The ’449 patent originally included eighteen claims as follows:

- independent claim 1 for an “[i]ntegrated circuit”;
- claims 2–9 that depend directly or indirectly from claim 1;
- independent claim 10 for a “[m]ethod for exchanging messages in an integrated circuit”; and
- claims 11–18 that depend directly or indirectly from claim 10.

Ex. 1001, 18:32–20:38.

As discussed above, (1) Samsung challenged claims 1–6 and 9–16; (2) Patent Owner statutorily disclaimed claims 1 and 3–5; and (3) Petitioner challenges claims 2, 6, and 9–16. *See* Samsung Pet. 9, 15–68; Prelim. Resp. 13 n.1, 41 n.4; Qualcomm Pet. 10, 16–71; Ex. 2062, 3; *supra* § II.

Claim 10 exemplifies the challenged claims and reads as follows (with formatting added for clarity and with bracketed numbers and letters added for reference purposes):⁵

10. [10.pre.1] Method for exchanging messages in an integrated circuit comprising a plurality of modules, the messages between the modules being exchanged over connections via a network,

[10.pre.2] wherein said connections comprises [sic] a set of communication channels each having a set of connection properties, any communication channel being independently configurable,

[10.pre.3] wherein said connection through the network supports transactions comprising at least one of outgoing messages from the first module to the second module and return messages from the second module to the first module

and further comprising the steps of:

[10.a] the first module issuing a request for a connection with the second module to a communication manager, wherein the request comprises desired connection properties associated with the sets of communication channels;

[10.b] the communication manager forwarding the request to a resource manager;

[10.c] the resource manager determining whether a target connection with the desired connection properties is available;

[10.d] the resource manager responding with the availability of the target connection to the communication manager; and

[10.e] the target connection between the first and second module being established based on the available properties of said communication channels of said connection.

⁵ We use the same reference numbers and letters that Petitioner uses to identify the claim language. *See* Qualcomm Pet. 45–47.

Ex. 1001, 19:21–20:6.

B. The Asserted References

As background for the discussion of the parties’ respective contentions, below we provide brief summaries of the asserted references.

1. GOOSSENS2002 (EXHIBIT 1005)

Goossens2002 is a paper titled “Networks on Silicon: Combining Best-Effort and Guaranteed Services” by Kees Goossens et al., published in Proceedings of the 2002 Design, Automation and Test in Europe Conference and Exhibition (March 2002). Ex. 1005, 1; Ex. 1025 ¶¶ 8–11.

Goossens2002 discloses (1) a system on silicon (SOS) based on the “intellectual-property block (IP) re-use model” containing “hundreds of IPs” and (2) a network on silicon (NOS) for communication between the IPs. Ex. 1005, 1. The IPs “interact in many different ways,” such as “event-driven, data streaming, message passing, shared memory, etc.” *Id.* at 2.

Goossens2002 explains that a “router network based on packet switching” alleviates various problems in a system on silicon because “wires are shared, or made programmable, by introducing switches (routers).” Ex. 1005, 1. With a “router network based on packet switching,” IPs “communicate only using the network so that their layout and timing closure are independent of other IPs,” thus decoupling “computation (IPs) and communication (NOS).” *Id.*

Goossens2002 also explains that an NOS “with guaranteed services simplifies programming individual IPs.” Ex. 1005, 2. Among other things, an NOS with guaranteed services eases integration into larger systems because “some IPs have inherent performance requirements, such as a minimum throughput (for real-time streaming data), or bounded latency (for

interrupts).” *Id.* Also, “services that are guaranteed to an IP are not affected by other IPs in the network, making reasoning about the IP in isolation possible.” *Id.* at 3.

Goossens2002 discloses an NOS supporting “both guaranteed and best-effort services.” Ex. 1005, 3. The services include “uncorrupted transmission, lossless transmission, in-order delivery, throughput, jitter (delay variation), and latency.” *Id.* at 2.

In the NOS supporting “both guaranteed and best-effort services,” the “programming of IPs is compositional because their services are independent of each other.” Ex. 1005, 3. Also, “[q]uality-of-service managers can effectively observe and steer” the NOS because “it behaves predictably in terms of performance and cost.” *Id.*

2. GOOSSENS2003 (EXHIBIT 1007)

Goossens2003 is a book chapter titled “Guaranteeing the Quality of Services in Networks on Chip” by Kees Goossens et al. in the book titled “Networks on Chip” edited by Axel Jantsch and Hannu Tenhunen (Kluwer Academic Publishers 2003). Ex. 1007, 61;⁶ Ex. 1027 ¶¶ 5–7; Ex. 1035 ¶¶ 41–49. Goossens2003 explains that systems on chip (SoCs) use networks on chip (NoCs) to “solve deep submicron problems” and “divide global problems into local, decoupled problems.” Ex. 1007, 61; *see id.* at 64, 78. An NoC integrates “heterogeneous” intellectual property blocks (IPs) in a “standard fashion” because “the NoC services largely define the platform.” *Id.* at 66. The NoC services “aid in decoupling applications and architectures.” *Id.*; *see id.* at 78.

⁶ For Exhibit 1007 (Goossens2003), we follow Petitioner’s practice and cite to the page numbers that appear in the publication.

Goossens2003 describes the *Æ*thereal NoC, consisting of routers and network interfaces (NIs), that provides guaranteed services for “real-time and critical functions” as well as best-effort services. Ex. 1007, 71–74. The *Æ*thereal NoC offers “differentiated services” with connections for “communication between one master and one or more slaves, with an associated service level.” *Id.* at 71.

The *Æ*thereal NoC uses “three kinds of connections” as follows:

- (1) a simple connection between a master and a single slave where the master “initiates [a] transaction which the slave executes, possibly resulting in a response (e.g. for a read)”;
- (2) a narrowcast connection between a master and one or more slaves where a request from the master is “executed by exactly one slave”; and
- (3) a multicast connection between a master and one or more slaves where a request from the master is “duplicated and each slave receives a copy.”

Ex. 1007, 72 (emphases omitted).

Goossens2003’s Figures 4.4 and 4.5 (reproduced below) depict connections used in the *Æ*thereal NoC:

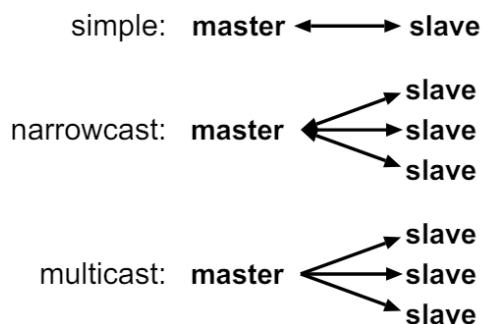


Figure 4.4. Connection types.

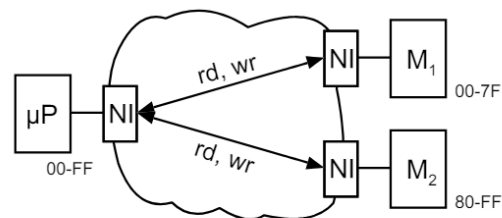


Figure 4.5. A narrowcast connection.

Above on the left, Figure 4.4 illustrates (1) a simple connection between a master and a single slave, (2) a narrowcast connection between a master and three slaves, and (3) a multicast connection between a master and three slaves. Ex. 1007, 72. Above on the right, Figure 4.5 illustrates an example narrowcast connection between a master identified as “ μ P” and two slaves identified as “M₁” and “M₂” together with a network interface (NI) associated with each module. *Id.*

3. DRAKE (EXHIBIT 1006)

Drake is a U.S. patent titled “Quality of Service Management for Source Routing Multimedia Packet Networks,” filed on June 7, 1994, and issued on October 24, 1995. Ex. 1006, codes (22), (45), (54). Drake states that the invention “relates to multimedia packet transmission systems and, more particularly, to insuring [sic] adequate quality of service (QoS) for transmission of multimedia signals in local area networks.” *Id.* at 1:8–11.

Drake explains that “[m]ultimedia information, particularly audio and full motion video, has unique properties that impose stringent requirements on the communications network.” Ex. 1006, 1:22–24. For example, “[u]nexpected network delays caused by throughput or processing delays can disrupt the presentation of the multimedia data to the end user.” *Id.* at 1:22–24. Additionally, “packet or cell based networks do not inherently guarantee the delivery of a specified quantity of data in each time interval of a specified duration.” *Id.* at 1:50–52.

According to Drake, “a method is required in those packet networks to provide equivalent levels of network service for the multimedia applications.” Ex. 1006, 1:52–55. “This function can be called bandwidth management, or more broadly, quality of service (QoS) management.” *Id.*

at 1:55–57. To improve performance in local area networks, Drake discloses a QoS management system for local area networks that “ensures selected levels of quality of service to all transmission requests submitted to the management system.” *Id.* at code (57); *see id.* at 2:26–41.

Drake’s Figure 1 (reproduced below) depicts a QoS management system:

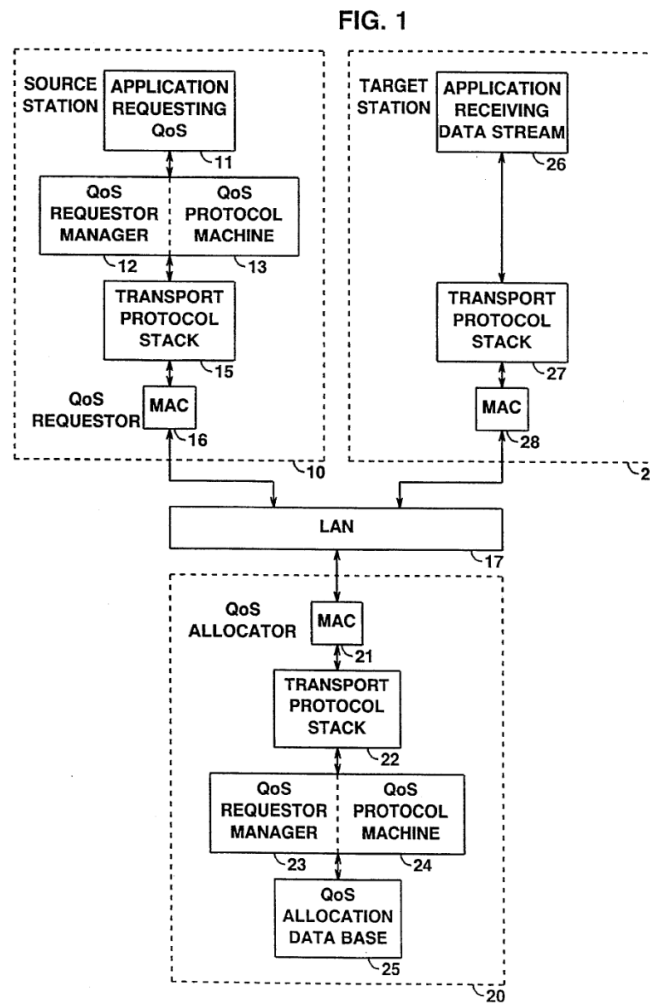


Figure 1 illustrates a QoS management system including source station 10, QoS allocator 20, and target station 29 connected to one another by local area network (LAN) 17. Ex. 1006, 3:36–40, 4:18–26, Fig. 1. QoS

allocator 20 “implements a quality of service management process for LAN 17.” *Id.* at 4:23–26; *see id.* at 4:50–57.

As shown in Figure 1, source station 10 includes application 11 that “requests a QoS connection to the destination or target station 29.” Ex. 1006, 4:27–30, Fig. 1. Source station 10 also includes QoS requestor manager 12 and QoS protocol machine 13. *Id.* at 4:32–34, Fig. 1. “Together, components 12 and 13 assemble a request to reserve a QoS connection for a multi-media data stream on [a] path through the LAN 17 between source station 10 and target station 29.” *Id.* at 4:34–37. More particularly, “QoS requestor manager 12 interacts with application 11 using internal messages as is well known in the art and utilizes QoS protocol machine 13 to format the QoS request.” *Id.* at 4:62–65.

As shown in Figure 1, source station 10 additionally includes transport protocol stack 15 for formatting a request packet and medium access control (MAC) entity 16 for launching the request packet on LAN 17. Ex. 1006, 4:37–40, Fig. 1.

IV. DISCUSSION

A. Legal Principles

The Board’s rules specify that a “reply may only respond to arguments raised in the corresponding . . . patent owner response, or decision on institution.” 37 C.F.R. § 42.23(b) (2024). But a “petitioner is entitled to respond to new arguments made in a patent owner response.” *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1380 (Fed. Cir. 2023); *see Rembrandt Diagnostics, LP v. Alere, Inc.*, 76 F.4th 1376, 1384–85 (Fed. Cir. 2023) (determining that arguments regarding motivation to combine in a petitioner reply properly addressed arguments in a patent owner response);

37 C.F.R. § 42.23(b). Moreover, a petitioner “may introduce new evidence after the petition stage if the evidence is a legitimate reply to evidence introduced by the patent owner.” *Anacor Pharm., Inc. v. Iancu*, 889 F.3d 1372, 1380–81 (Fed. Cir. 2018).

Additionally, the Board’s Consolidated Trial Practice Guide (“CTPG”)⁷ explains that “in response to issues arising from the Supreme Court’s decision” in *SAS Institute Inc. v. Iancu*, 584 U.S. 357 (2018), the Board will permit a petitioner reply to “address issues discussed in the institution decision.” CTPG 73; *see* 37 C.F.R. § 42.23(b).

B. Alleged New First-Module Theory of Unpatentability

1. PATENT OWNER’S CONTENTIONS

Patent Owner contends that the preliminary response in IPR2024-01081 “explained that the Petition failed to specify whether” the claimed “first module” corresponds to Drake’s source station 10 or application 11 in source station 10. Mot. 1 (citing IPR2024-01081, Paper 9 at 28–29).⁸ Patent Owner contends that the institution decision in IPR2024-01081 “found that ‘Petitioner consistently identifies’ the ‘first module’ as Drake’s source station 10 and not application 11.” *Id.* (quoting Qualcomm Inst. Dec. 23).

Patent Owner contends that the Reply and Dr. Mowry’s declaration (Exhibit 1043) include an improper new first-module theory of unpatentability where Petitioner and Dr. Mowry (1) rely “solely” on the

⁷ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

⁸ In its contentions, Patent Owner references the preliminary response in IPR2024-01081 (Paper 9), but Patent Owner incorrectly cites to Paper 7. Mot. 1.

Goossens references for the claimed “first module” and (2) disavow “any reliance” on Drake for the claimed “first module” but still identify “application 11 as the ‘thing’/‘component’ in Drake that ‘mak[es] the service request.’” Mot. 2 (alteration by Patent Owner) (emphasis omitted) (quoting Reply 3); *see* Sur-reply 2–4. According to Patent Owner, Petitioner’s new first-module theory “purports to identify the ‘first module’ solely as the Goossens references’ IPs,” but the Petition “never mentions” Goossens’ IPs for limitations 6.d and 10.e.⁹ Mot. 2 (citing Qualcomm Pet. 43–44, 47, 67, 70; Reply 4, 15–17, 21).

Patent Owner asserts that the Board should strike Petitioner’s new first-module theory and Dr. Mowry’s related testimony. Mot. 5.

2. PETITIONER’S CONTENTIONS

Petitioner contends that the alleged new first-module theory fails for two reasons. Opp. 1. First, Petitioner asserts that the Petition “identified the Goossens publications (the primary references) as disclosing the claimed ‘first module’ in each of the combinations.” *Id.* (citing Qualcomm Pet. 21–22, 40, 45–47, 55–56, 65, 68–69).

Second, Petitioner asserts that “the discussion of Drake’s application 11 as also being a first module” in the Reply is “entirely proper” and responds to the following:

- (1) the Board’s preliminary determination in the institution decision in IPR2024-01081 that “the Petition identified

⁹ Limitation 6.d recites “wherein a connection between the first and second module is established based on the available properties of said communication channels of said connection.” Ex. 1001, 19:2–5. Limitation 10.e similarly recites “the target connection between the first and second module being established based on the available properties of said communication channels of said connection.” *Id.* at 20:4–6.

source station 10 as a first module, while also noting that the Petition identified Drake's application 11 as the component 'involved in issuing a request'; and

- (2) Patent Owner's claim-construction argument in the Response that the claimed "first module" and the claimed "communication manager" should be construed as "separate and distinct claim elements."

Opp. 2–3 (emphasis omitted) (quoting Resp. 13) (citing Qualcomm Inst. Dec. 22–24).

Petitioner contends that the Reply properly "points out that in the Petition's combinations, the first module and communication manager are separate and distinct." Opp. 3. Petitioner contends that the Reply properly "explains that even in Drake alone, application 11 is what issues a QoS request." *Id.* And Petitioner contends that the Reply properly "addresses the Drake 'first module' issue discussed in the joinder institution decision" in IPR2024-01081. *Id.*

Regarding Patent Owner's assertion that the Petition "never mentions" Goossens' IPs for limitations 6.d and 10.e, Petitioner contends that Patent Owner ignores the Petition because:

- (1) the Petition "already addressed" how the Goossens references disclose the claimed "first module" and the claimed "second module" in connection with limitations 6.a and 10.a; and
- (2) limitations 6.d and 10.e "refer back to 'the' first and second modules" recited earlier in the respective claims.

Opp. 1 (emphasis omitted) (citing Qualcomm Pet. 43, 47, 67, 70). Petitioner also contends that the Goossens2003-Drake challenge "expressly references Goossens2003's IPs 'request for a connection.'" *Id.* at 1–2 (citing Qualcomm Pet. 67).

3. ANALYSIS

For the reasons explained below, we disagree with Patent Owner that the Reply and Dr. Mowry's declaration (Exhibit 1043) include an improper new first-module theory of unpatentability. *See* Mot. 1–3.

For the Goossens2002-Drake challenge, the Petition relies on Goossens2002 for disclosing not only the claimed “first module” but also the claimed “second module,” i.e., Goossens2002's IPs that “perform computations.” *See, e.g.,* Qualcomm Pet. 21–22, 27, 40, 45. As an example, claim 6 recites a “first module” and at least one “second module.” Ex. 1001, 18:60–63. For claim 6, the Petition contends that “Goossens2002 describes that its IPs (i.e., processing modules) ‘can set up and remove connections.’” Qualcomm Pet. 40 (emphasis omitted) (quoting Ex. 1005, 3).

As another example, claim 10 recites a “plurality of modules” including a “first module” and a “second module.” Ex. 1001, 19:21–30. For claim 10, the Petition contends that “Goossens2002 describes a system on silicon (i.e., integrated circuit) in which multiple intellectual property blocks (i.e., modules) communicate with one another over connections via a ‘network on silicon.’” Qualcomm Pet. 41 (emphases omitted) (quoting Ex. 1005, 1).

For the Goossens2002-Drake challenge, the Petition also references Drake for the “first module” and the “second module” by asserting that:

- (1) “Drake likewise describes ‘connections’ between source and target stations (i.e., first and second processing modules)”;
- (2) “Drake likewise describes communications in the ‘forward direction’ (i.e., outgoing messages) and in the ‘backward direction’ (i.e., return messages) between

source and target stations (i.e., first and second modules)”;

- (3) “Drake describes that an application in a source station (i.e., first module) ‘requests a QoS connection to the destination or target station’ (i.e., second module)”;
- (4) “Drake further describes that the application in the source station (i.e., first module) communicates this request to a QoS requestor manager (i.e., communication manager) for subsequent transmission to a QoS allocator”; and
- (5) “Drake describes that, having received a request for a connection from an application in the source station (i.e., first module), the QoS requestor manager (i.e., communication manager) ‘assemble[s] a request to reserve a QoS connection.’”

Qualcomm Pet. 27, 32, 40–41 (alteration by Petitioner) (emphases omitted) (quoting Ex. 1006, 4:35).

For the Goossens2003-Drake challenge, the Petition relies on Goossens2003 for disclosing not only the claimed “first module” but also the claimed “second module,” i.e., multiple “intellectual property blocks” (IPs) that Goossens2003 describes as “masters” and “slaves.” *See, e.g.*, Qualcomm Pet. 55, 58–59, 65, 67–68. As an example, claim 6 recites a “first module” and at least one “second module.” Ex. 1001, 18:60–63. For claim 6, the Petition contends that (1) “Goossens2003’s master IPs (i.e., first module) issue requests for connections to the network interfaces (i.e., communication managers)” and (2) “the requested connections are between a ‘master’ (i.e., first module) and ‘one or more slaves’ (i.e., second modules).” Qualcomm Pet. 65 (emphases omitted) (quoting Ex. 1007, 71).

As another example, claim 9 recites “at least one network interface means (NI), associated to each of said modules.” Ex. 1001, 19:17–20. For

claim 9, the Petition contends that (1) “Goossens2003 explains that, in its SOC, ‘network interfaces’ translate between the ‘transport layer’ utilized by the IPs to request services and the ‘network layer’ utilized by the routers of the NOC to transport data” and (2) the “IPs negotiate with network interfaces to obtain connections with certain properties” and reserve network resources. Qualcomm Pet. 67 (quoting Ex. 1007, 74, 77).

As yet another example, claim 10 recites a “plurality of modules” including a “first module” and a “second module.” Ex. 1001, 19:21–30. For claim 10, the Petition contends that “Goossens2003 describes an SoC (i.e., integrated circuit) in which multiple IP blocks (i.e., modules) communicate with one another over connections via a ‘network on chip.’” Qualcomm Pet. 68 (emphases omitted).

For the Goossens2003-Drake challenge, the Petition also references Drake for the “first module” and the “second module” by asserting that:

- (1) “Drake likewise describes ‘connections’ between an application in a source station (i.e., first module) and a target station (i.e., second module)”; and
- (2) “Drake similarly describes that an application in a source station (i.e., first module) ‘requests a QoS connection’ and that it directs these requests to a ‘QoS requestor manager’ (i.e., communication manager).”

Qualcomm Pet. 59, 65–66 (emphases omitted).

Hence, for both challenges, the Petition relies on the Goossens references for disclosing the claimed “first module” and also discusses Drake. *See, e.g.*, Qualcomm Pet. 21–22, 27, 32, 40–41, 45, 55, 58–59, 65–68.

Regarding Patent Owner’s assertion that the Petition “never mentions” Goossens’ IPs for limitations 6.d and 10.e, we agree with Petitioner that the

Petition “already addressed” how the Goossens references disclose the claimed “first module” and the claimed “second module” in connection with limitations 6.a and 10.a. *See* Qualcomm Pet. 40–41, 43–44, 46–47, 65, 67, 69–70; Mot. 2; Opp. 1.

In the Response, Patent Owner asserts that the Petition fails to satisfy the Board’s rule that requires a petition to “specify where each element of the claim is found in the prior art.” *See* Resp. 17–20; 37 C.F.R.

§ 42.104(b)(4). In particular, Patent Owner contends that the Petition takes “inconsistent positions” and does not “clearly specify” where the claimed “first module” is found in Drake. Resp. 17, 19.

In the Reply, Petitioner addresses that Response argument by explaining that:

- (1) the Petition relies on the Goossens references for disclosing the claimed “first module”; and
- (2) the Petition relies on application 11 in Drake’s source station 10 as the “thing” in Drake that initially requests a QoS connection.

Reply 3–4, 16–17, 21; *see* Opp. 3.

Dr. Mowry’s deposition testimony supports Petitioner’s explanation. *See, e.g.*, Ex. 2078, 172:4–176:3. According to Petitioner, Dr. Mowry “confirmed at his deposition that he was focusing on” application 11 in source station 10 as the “thing” in Drake that initially requests a QoS connection because “that is the component Drake teaches makes the service request.” Reply 3–4 (citing Ex. 1006, 4:27–29; Ex. 2078, 171:21–176:3). According to Patent Owner, Dr. Mowry “initially testified that Drake’s source station 10 corresponds to the claimed ‘first module’” but “later clarified that only the application 11 within source station 10 corresponds

to the claimed ‘first module.’” Resp. 18–19 (emphasis omitted) (citing Ex. 2078, 173:8–13, 174:10–19, 174:23–175:19, 175:21–176:2).

In the Petition and the Reply, Petitioner relies on the same disclosures from the same references to support the same legal grounds: obviousness over the Goossens references and Drake. *See, e.g.*, Qualcomm Pet. 21–22, 27, 32, 40–41, 45, 55, 58–59, 65–66, 68; Reply 3–4, 16–17, 21. In the Reply, Petitioner properly addresses a Response argument with an explanation how the cited disclosures in the references demonstrate unpatentability. Petitioner’s explanation does not amount to a new theory of unpatentability. *See, e.g., Apple Inc. v. Andrea Elecs. Corp.*, 949 F.3d 697, 706 (Fed. Cir. 2020) (determining that a petitioner reply did not change the petitioner’s legal ground); *Ericsson Inc. v. Intell. Ventures I LLC*, 901 F.3d 1374, 1379–81 (Fed. Cir. 2018) (determining that the Board parsed reply arguments “with too fine of a filter”).

Additionally, in the preliminary response in IPR2024-01081, Patent Owner argued that Petitioner “failed to identify with specificity which disclosure in Drake” corresponds to the claimed “first module.” IPR2024-01081, Paper 9 at 29. In the institution decision in IPR2024-01081, the Board disagreed with that argument and preliminarily determined that Petitioner “consistently identifies Drake’s source station 10 as the claimed ‘first module.’” Qualcomm Inst. Dec. 23 (citing Qualcomm Pet. 27, 32, 40–41, 59). Petitioner’s explanation in the Reply that application 11 in Drake’s source station 10 is the “thing” in Drake that initially requests a QoS connection properly addresses that preliminary determination. *See* Reply 3–4; 37 C.F.R. § 42.23(b); CTPG 73.

In the preliminary response in IPR2024-01081, Patent Owner did not dispute that Petitioner relies on the Goossens references for disclosing the claimed “first module” and the claimed “second module.” *See, e.g.*, IPR2024-01081, Paper 9 at 24–36, 45–46. Hence, in the institution decision in IPR2024-01081, the Board did not discuss Petitioner’s reliance on the Goossens references for disclosing the claimed “first module” and the claimed “second module.”

C. Alleged New Network-Interface Theory of Unpatentability

1. PATENT OWNER’S CONTENTIONS

Patent Owner contends that the Petition relies on Drake’s QoS requestor manager 12 as the claimed “communication manager” but fails to explain “why or how” QoS requestor manager 12 would have been implemented in the Goossens references, “including where it would be located and how it would work with the existing service requests.” Mot. 3 (citing Resp. 24–37, 46–47, 49–60).

Patent Owner contends that the Reply and Dr. Mowry’s declaration (Exhibit 1043) include an improper new network-interface theory of unpatentability as follows:

- (1) Drake’s QoS requestor manager 12 is a network-interface component;
- (2) an ordinarily skilled artisan would have implemented Drake’s QoS requestor manager 12 in a network interface in Goossens’ systems; and
- (3) a skilled artisan would have been motivated to do so based on an alleged “need for interfacing components” in both off-chip and on-chip networks.

Mot. 3–4 (citing Reply 9–15; Ex. 1043)); *see* Sur-reply 5–6 (citing Reply 9–15).

Additionally, Patent Owner contends that the Petition “never mentions ‘interface’ in relation to Drake.” Mot. 4. Patent Owner contends that the Petition only mentions “interface” as follows: in both challenges for claim 9 reciting “network interface means” based on the Goossens references “with no reference to Drake”; and in the Goossens2003-Drake challenge for claim 2 and limitation 6.a based on Goossens2003’s network interface but not Drake’s QoS requestor manager 12. *Id.* (citing Pet. 44–45, 62–63, 65–68; Reply 9 n.4, 16). According to Patent Owner, the Petition relies on Goossens2003’s network interface and Drake’s QoS requestor manager 12 “as alternatives, not in combination.” *Id.*

Patent Owner asserts that the Board should strike Petitioner’s new network-interface theory and Dr. Mowry’s related testimony “because they purport to provide an entirely new theory and rationale as to where and why” Drake’s QoS requestor manager 12 would have been implemented in the Goossens references. Mot. 4; *see id.* at 5. According to Patent Owner, Petitioner’s new network-interface theory and Dr. Mowry’s related testimony provide the “only alleged motivation to combine specific to” Drake’s QoS requestor manager 12 and “thus were necessary for prima facie obviousness.” *Id.* at 4 (emphasis omitted); *see id.* at 1.

Further, Patent Owner asserts that the Response’s “showing that the Petition lacked any explanation” as to (1) where Drake’s QoS requestor manager 12 would have been implemented in the proposed combinations and (2) why an ordinarily skilled artisan would have incorporated Drake’s QoS requestor manager 12 into the Goossens references did not open the door for new theories. Mot. 4–5.

2. PETITIONER’S CONTENTIONS

Petitioner contends that the Reply arguments and Dr. Mowry’s related testimony regarding an ordinarily skilled artisan’s “understanding of interfacing are not ‘new obviousness theories,’ nor are they the ‘only alleged motivation to combine.’” Opp. 3 (quoting Mot. 4). According to Petitioner, the Reply “maintains the same theory as the Petition (which already provides the necessary motivations), while properly responding” to Patent Owner’s Response arguments. *Id.* (emphasis omitted) (citing Qualcomm Pet. 16–20, 51–54; Reply 6–15).

Additionally, Petitioner contends that:

- (1) the Response asserts that an ordinarily skilled artisan would not have been motivated to include Drake’s QoS requestor manager 12 in Goossens’ systems because it would have been “redundant,” and the Reply properly responds that it would not have been “redundant” because an ordinarily skilled artisan would have known that Drake’s QoS requestor manager 12 was “part of the network interfacing componentry, which was known to be needed”;
- (2) the Response asserts that Drake teaches away from including Drake’s QoS requestor manager 12 in Goossens’ IPs, and the Reply properly responds that “it was understood in the art that the equivalent on-chip place for interfacing components,” such as Drake’s QoS requestor manager 12, is outside of Goossens’ IPs, e.g., in a network interface of the NoC; and
- (3) the Response asserts that implementing Drake’s QoS requestor manager 12 in Goossens’ systems would have been “complex,” and the Reply properly responds that “one ‘natural’ place to implement QoS-12 would have been in the network interface, where Goossens2003 already teaches putting communication management functionality.”

Opp. 3–4; *see id.* at 5 (referencing Dr. Mowry’s testimony that a network interface would be a “natural place” to implement Drake’s QoS requestor manager 12).

Further, Petitioner asserts that the Reply does not attempt to “map a new aspect of the prior art to a claim element.” Opp. 5.

3. ANALYSIS

For the reasons explained below, we disagree with Patent Owner that the Reply and Dr. Mowry’s declaration (Exhibit 1043) include an improper new network-interface theory of unpatentability. *See* Mot. 3–5.

In the Petition, Petitioner contends that an ordinarily skilled artisan would have been motivated to combine Drake’s teachings with each of the Goossens references to:

- (1) “obtain the benefits of Drake’s known solution to ensuring the availability of network resources for guaranteed services” using QoS requestor manager 12 and QoS allocator 20; and
- (2) “create an SoC with improved performance and efficiency.”

Qualcomm Pet. 16–19, 23–24, 37–38, 51–53, 57–58, 63 (citing Ex. 1003 ¶¶ 71–82, 156–166, 187). The “desire to enhance commercial opportunities by improving a product or process is universal.” *DyStar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1368 (Fed. Cir. 2006).

Hence, contrary to Patent Owner’s contentions, the Petition provides a reason with rational underpinning as to why an ordinarily skilled artisan would have been motivated to combine Drake’s teachings with each of the Goossens references. Inst. Dec. 60–66, 82–85; *see* Qualcomm Pet. 16–19,

23–24, 37–38, 51–53, 57–58, 63; Resp. 24–26, 32, 46–47, 55; Mot. 3 (citing Resp. 24–37, 46–47, 49–60).

The challenged claims do not specify a location for the claimed “communication manager” or the claimed “resource manager” other than “disposed on a chip.” Ex. 1001, 18:32–19:5, 19:17–20:26. So the Petition did not need to specify a location in the proposed combinations for Drake’s QoS requestor manager 12 (mapped to the claimed “communication manager”) or Drake’s QoS allocator 20 (mapped to the claimed “resource manager”) to show that the proposed combinations would have yielded the claimed inventions.

In the Response, Patent Owner contends that the Petition “argues that certain components and functions of Drake’s QoS management system” would have been implemented in Goossens’ systems “but fails to explain specifically why and how” Drake’s QoS requestor manager 12 and Drake’s QoS allocator 20 “would purportedly be incorporated into and work with” Goossens’ systems. *See* Resp. 24–26, 32, 46–47, 55 (emphases omitted); Mot. 3.

In the Reply, Petitioner responds to the alleged inadequacies in the Petition concerning implementation details for the proposed combinations by explaining that an ordinarily skilled artisan would have implemented:

- (1) Drake’s QoS requestor manager 12 in a network interface in Goossens’ systems because the skilled artisan “would have known that in the on-chip context” disclosed in the Goossens references, “the equivalent place for QoS interfacing components like [Drake’s QoS requestor manager 12] is outside of the IP modules,” e.g., in a network interface of the NoC; and

- (2) Drake's QoS allocator 20 as "a centralized unit anywhere on the chip connected to the network" in Goossens' systems such that QoS allocator 20 would receive a service request from an IP ("the unit making the request") through QoS requestor manager 12.

Reply 11–12, 14 (emphasis omitted); *see* Qualcomm Pet. 38, 58 (explaining that an ordinarily skilled artisan would have implemented Drake's QoS allocator 20 as "a circuit on the same integrated circuit chip" as the IPs and networks in Goossens' systems).

In the Reply, Petitioner also explains that Goossens2003 "already teaches" providing "communication management functionality" in a network interface of the NoC and that Drake's QoS requestor manager 12 is a "specific example" of a component providing "communication management functionality." Reply 9; *see id.* at 10, 12–13.

Petitioner's explanations in the Reply properly respond to Patent Owner's contentions in the Response about alleged inadequacies in the Petition concerning implementation details for the proposed combinations. *See* Resp. 24–26, 32, 46–47, 55; Reply 9, 11–12, 14. Because the challenged claims do not specify a location for the claimed "communication manager" or the claimed "resource manager" other than "disposed on a chip," those implementation details were not "necessary for prima facie obviousness," contrary to Patent Owner's contention. *See* Mot. 1, 4; Ex. 1001, 18:32–19:5, 19:17–20:26.

Additionally, as Petitioner contends, the explanation in the Reply that "one 'natural' place to implement [Drake's QoS requestor manager 12] would have been in the network interface, where Goossens2003 already teaches putting communication management functionality," properly

responds to the assertion in the Response about the “complexity” of implementing QoS requestor manager 12 in an NoC. *See* Resp. 30, 32, 52, 54; Reply 10–13, 13 n.5; Opp. 4.

D. Summary

For the reasons discussed above, the Reply and Dr. Mowry’s declaration (Exhibit 1043) do not include improper new theories of unpatentability. *See supra* §§ IV.B.3, IV.C.3.

V. ORDER

Accordingly, it is

ORDERED that Patent Owner’s motion to strike (Paper 53) is denied.

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Patent 7,373,449 B2

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