

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

QUALCOMM INCORPORATED
Petitioner

v.

NETWORK SYSTEM TECHNOLOGIES, LLC
Patent Owner

Patent No. 7,594,052

Inter Partes Review No. IPR2024-00343

PATENT OWNER'S SUR-REPLY

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<i>Arctic Cat Inc. v. Bombardier Recreational Products Inc.</i> , 876 F.3d 1350 (Fed. Cir. 2017)	25
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<i>Hulu, LLC v. Sound View Innovations, LLC</i> , IPR2018-01039, Paper 29 (PTAB Dec. 20, 2019)	28, 29, 30
<i>Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.</i> , 821 F.3d 1359 (Fed. Cir. 2016)	8
<i>InTouch Techs., Inc. v. VGO Commc'ns, Inc.</i> , 751 F.3d 1327 (Fed. Cir. 2014)	24
<i>Medivis, Inc. v. Novarad Corp.</i> , IPR2023-00042, Paper 35 (PTAB Mar. 6, 2024)	27
<i>Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.</i> , 851 F.3d 1270 (Fed. Cir. 2017)	19

<i>Pers. Web Techs., LLC v. Apple, Inc.</i> , 848 F.3d 987 (Fed. Cir. 2017)	26
<i>Polaris Indus., Inc. v. Arctic Cat, Inc.</i> , 882 F.3d 1056 (Fed. Cir. 2018)	24
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LISTING OF EXHIBITS

Exhibit No.	Description
2001	WITHDRAWN
2002	<i>Curriculum vitae</i> of Dr. Erik Chmelar
2003	Neil Weste & David Harris, CMOS VLSI DESIGN: A CIRCUIT AND SYSTEMS PERSPECTIVE (4th ed. 2010)
2004	Jan Rabaey, Anantha Chandrakasan & Borivoje Nikolic, DIGITAL INTEGRATED CIRCUITS: A DESIGN PERSPECTIVE (2nd ed. 2003)
2005	William J. Dally & Brian Towles, <i>Route Packets, Not Wires: On-Chip Interconnection Networks</i> , PROC. 38TH DESIGN AUTOMATION CONF. (2001)
2006	John F. Wakerly, DIGITAL DESIGN: PRINCIPLES AND PRACTICES (4th ed. 2005)
2007	Fayez Gebali, Haytham Elmiligi & Mohamed Watheq El-Kharashi, NETWORKS-ON-CHIPS: THEORY AND PRACTICE (2009)
2008	Kurt Shuler, <i>Busses, Crossbars and NoCs: The 3 Eras of SoC Interconnect History</i> , ARTERISIP (Oct. 22, 2010), https://www.arteris.com/blog/busses-crossbars-and-nocs-the-3-eras-of-soc-interconnect-history/
2009	Kurt Shuler, <i>The SoC Interconnect Fabric: A Brief History</i> , ARTERISIP (Aug. 6, 2013), https://www.arteris.com/blog/the-soc-interconnect-fabric-a-brief-history/
2010	William Stallings, DATA & COMPUTER COMMUNICATIONS (6th ed. 1999)
2011	RESERVED
2012	United States District Courts — National Judicial Caseload Profile
2013	Frank Derfler, Jr. & Les Freed, HOW NETWORKS WORK, Chapter 22 “Repeaters, Bridges, Routers, and Switches” (4th ed. 1998)

Exhibit No.	Description
2014	IEEE 100: The Authoritative Dictionary of IEEE Standard Terms (7th ed. 2000)
2015	Douglas Downing et al., Dictionary of Computer and Internet Terms, BARRON'S (7th ed. 2000)
2016	David Patterson and John Hennessey, COMPUTER ORGANIZATION & DESIGN (2nd ed. 1998)
2017-2020	RESERVED
2021	Order Resetting Jury Trial, <i>Network System Technologies, LLC v. Texas Instruments Incorporated</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 182 (March 18, 2024)
2022	Claim Construction Order, <i>Network System Technologies, LLC v. Texas Instruments Incorporated</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 150 (Jan. 3, 2024)
2023-2026	RESERVED
2027	Complaint, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd. et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.), Dkt. 1 (Dec. 19, 2022)
2028	Docket Control Order, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd. et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.), Dkt. 59 (Jun. 16, 2023)
2029-2032	RESERVED
2033	P.R. 4-3 Claim Construction and Prehearing Statement, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd.</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 91 (Jan. 9, 2024)
2034	Plaintiff Network System Technologies, LLC's Opening Claim Construction Brief, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd.</i> , Civil Action No. 2:22-cv-00482-RWS (E.D.

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	Tex.), Dkt. 100 (Feb. 20, 2024)
2035	Defendant Samsung Electronics Co., Ltd.'s Responsive Claim Construction Brief, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd.</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 112 (March 12, 2024)
2036	Plaintiff Network System Technologies, LLC's Reply Construction Brief, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd.</i> , Civil Action No. 2:22-cv-00482-RWS (E.D. Tex.), Dkt. 116 (March 19, 2024)
2037	Complaint, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.) Dkt. 1 (Dec. 19, 2022)
2038	First Amended Complaint, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.) Dkt. 57 (Aug. 7, 2023)
2039	Second Amended Scheduling Order, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.) Dkt. 80 (Oct. 23, 2023)
2040	Defendants' Joint Opening Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 77 (Oct. 12, 2023)
2041	Plaintiff Network System Technologies, LLC's Responsive Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 81 (Nov. 16, 2023)
2042	Defendants' Joint Reply Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 83 (Nov. 30, 2023)
2043	Plaintiff Network System Technologies, LLC's Sur-Reply Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.),

Exhibit No.	Description
	Dkt. 86 (Dec. 14, 2023)
2044	Defendants' Supplemental Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 105 (Mar. 1, 2024)
2045	Plaintiff Network System Technologies, LLC's Supplemental Claim Construction Brief, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 106 (Mar. 1, 2024)
2046-2049	RESERVED
2050	Defendants' Invalidity and Ineligibility Contentions And Disclosures Pursuant to Patent Rule 3-3 Cover Pleading, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd., et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.) (July 11, 2023)
2051	Defendants' Invalidity Contention Cover Pleading, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.) (September 22, 2023)
2052	Network System Technologies, LLC's Supplemental Claim Construction Brief Regarding Claim Construction Rulings Made In Related Case, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.)(March 1, 2024)
2053-2054	RESERVED
2055	Exhibit C-1 to Defendants' Invalidity Contentions, <i>Network System Technologies, LLC v. Samsung Electronics Co., Ltd., et al.</i> , Civil Action No. 2:22-cv-00481-JRG (E.D. Tex.) (July 11, 2023)
2056	Exhibit C-1 to Defendants' Invalidity Contentions, <i>Network System Technologies, LLC v. Qualcomm Incorporated, et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.) (Sep. 22, 2023)
2057	Exhibit C-18 to Defendants' Invalidity Contentions, <i>Network System Technologies, LLC v. Qualcomm Incorporated, et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.) (Sep. 22, 2023)

Exhibit No.	Description
2058	Declaration of Peter C. Krusiewicz in Support of Motion for <i>Pro Hac Vice</i> Admission
2059	Confidential Settlement Agreement (Board Only)
2060	Confidential Collateral Agreement (Board Only)
2061	<i>Curriculum vitae</i> of Dr. Nikil Dutt
2062	2014 Design, Automation and Test in Europe Conference (“DATE”) Website Main Page
2063	H. Nejatollahi et al., “Software and Hardware Implementation of Lattice-based Cryptography Schemes,” Center for Embedded and Cyber-Physical Systems (2017)
2064	A. Rădulescu et al., “An efficient on-chip network interface offering guaranteed services, shared-memory abstraction, and flexible network configuration,” Metrics (https://ieeexplore.ieee.org/document/1268998/metric#metrics) (last accessed Sept. 20, 2024)
2065	Terms & Disclosures for Use of IEEE Websites (https://www.ieee.org/about/help/site-terms-conditions.html) (last accessed Sept. 20, 2024)
2066	<i>In re Application of Qualcomm, Inc.</i> , Case No. 1:24-mc-00437-UNA (D. Del.), Subpoena to Testify at a Deposition in a Civil Action, Gordon MacPherson
2067	Transcript of Aug. 27, 2024 Deposition of Dr. Nikil Dutt
2068	Transcript of Sept. 11, 2024 Deposition of Dr. Marwan Hassoun
2069	Transcript of Sept. 20, 2024 Deposition of Gordon MacPherson
2070	Declaration of Dr. Nader Bagherzadeh
2071	<i>Curriculum vitae</i> of Dr. Nader Bagherzadeh
2072	K. Charles Janac, “Network-on-Chip (NoC): The Technology that Enabled Multi-processor Systems-on-Chip (MPSoCs),” Multi-Processor System-on-Chip 1, WILEY 2020
2073	Gul N. Khan, “NOC: Networks on Chip SoC Interconnection Structures,” Electrical, Computer & Biomedical Engineering Toronto Metropolitan University

Exhibit No.	Description
2074	U.S. Patent No. 7,737,449
2075	Single-Hop vs. Multi-Hop Networks, CADENCE, available at https://resources.pcb.cadence.com/blog/2023-single-hop-vs-multi-hop-networks
2076	Rahul Gulati et al. "SoC interconnect architecture considerations," EDN (March. 21, 2014) available at https://www.edn.com/soc-interconnect-architecture-considerations/#:~:text=SoC%20interconnect%20architecture%20considerations%20%20High%20throughput,objectives%20Freal%20time%20objectives%203%20%20Low%20latency%20objectives
2077	Arabinda Das "Intel's Embedded DRAM: New Era of Cache Memory" EE Times (August 7, 2014)
2078	Andrei Rădulescu et al., "An Efficient On-Chip NI Offering Guaranteed Services, Shared-Memory Abstraction, and Flexible Network Configuration," IEEE Transactions On Computer-Aided Design of Integrated Circuits and Systems, Vol. 24, No. 1 (January 2005)
2079	Archived version of A. Rădulescu et al., "An efficient on-chip network interface offering guaranteed services, shared-memory abstraction, and flexible network configuration," in the IEEE Xplore Digital Library (i.e., https://ieeexplore.ieee.org/document/1268998/), captured on June 23, 2018 by the Internet Archive's Wayback Machine, available at http://web.archive.org/web/20180623162310/https://ieeexplore.ieee.org/document/1268998/
2080	Calendar of captures by the Internet Archive's Wayback Machine of https://ieeexplore.ieee.org/document/1268998/ , available at http://web.archive.org/web/20180801000000*/https://ieeexplore.ieee.org/document/1268998/
2081	Declaration of Angelo J. Christopher
2082	Affidavit of Nathaniel E. Frank-White
2083	Declaration of Dr. Marwan Hassoun, <i>Network System Technologies, LLC v. Qualcomm Incorporated et al.</i> , Civil Action No. 1:22-cv-1331-DAE (W.D. Tex.), Dkt. 77-1 (Oct. 12, 2023)
2084	Transcript of Feb. 18, 2025 Deposition of Dr. Marwan Hassoun

Exhibit No.	Description
2085	Transcript of Feb. 25, 2025 Deposition of Dr. Nikil Dutt

Petitioner has not shown that any challenged claim of the '052 Patent is unpatentable. The Reply relies on a new declaration from Petitioner's expert, Dr. Hassoun. *See* EX1030. However, his new opinions are irreconcilable with his testimony during his first deposition. For instance, Dr. Hassoun admitted during his first deposition that Weber does not disclose transmitting packets, which is dispositive for Ground 3 under the proper claim construction for "interconnect means." EX2068, 116:14-17. Nonetheless, he now asserts the opposite. EX1030, ¶76. As another example, Dr. Hassoun originally testified that a direct link between two nodes is not a "hop," but now says that it is. *Compare* EX2068, 27:8-28:1 and EX1030, ¶18. The Reply's attempts to disavow Dr. Hassoun's prior testimony underscore Petitioner's failure to meet its burden.

I. CLAIM CONSTRUCTION

A. "Interconnect Means" is a "Multi-Hop Interconnection Separated by One or More Network Nodes"

While the Board preliminary construed "interconnect means" as subject to §112, ¶6, Petitioner does not rebut Dr. Bagherzadeh's testimony that a POSITA would understand this term to be the name for structure. Paper 38 ("POR"), 16-18; Paper 48 ("Reply"), 1; EX2084, 190:16-192:8. Regardless, the Board need not decide whether "interconnect means" is a means-plus-function term because the result is the same under either of Patent Owner's proposals. POR, 16.

1. “Interconnect Means” Does not Encompass Mere Buses or Point-to-Point Wires

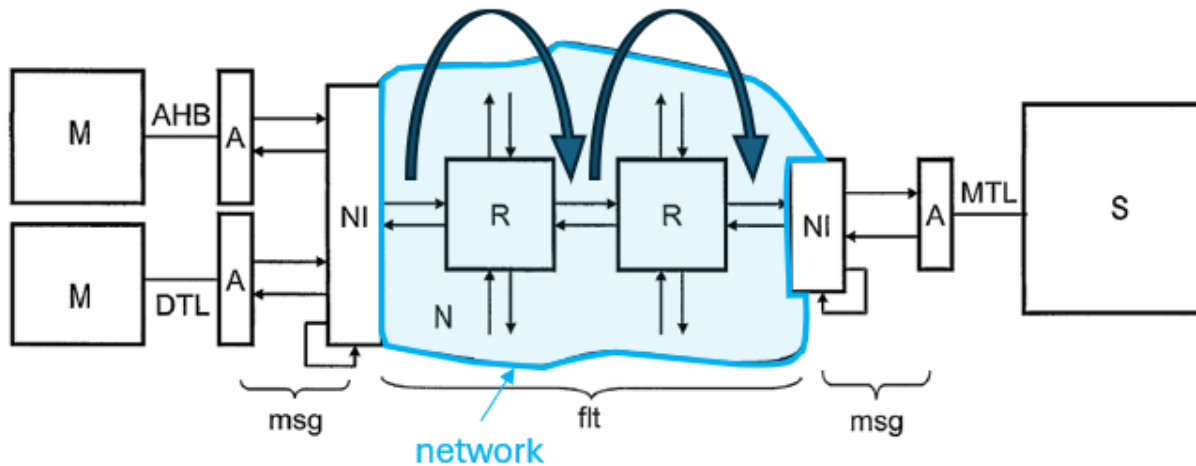
Petitioner continues to insist that “interconnect means” merely encompasses a bus, switch, or point-to-point wire. Reply, 1. But the specification discloses that “[t]he interconnect is embodied as a network on chip NOC.” EX1001, 4:46-48; EX2070, ¶109; EX1050, 10:17-24, 20:20-21:6. The fact that this network “*may include*” a bus, switch or point-to-point wire “*within* a network” does not mean that a bus, switch or point-to-point wire is by itself a network. EX1001, 4:48-50; EX2070, ¶¶126-28. Indeed, the specification distinguishes the NoC from direct interconnects such as buses and direct point-to-point wires. POR, 19; EX1001, 1:48-54, 2:31-42, 6:8-12; EX2084, 192:12-194:3, 194:12-195:10. The Reply does not address Patent Owner’s authority holding that it is improper to construe a term to read on prior art that the specification distinguishes from the invention. POR, 18.

2. The “Interconnect Means” is a Multi-Hop Interconnection

The “interconnect means” is a multi-hop interconnection between modules separated by one or more network nodes. POR, 15-23; EX2070, ¶¶103-10; EX1001, 2:33-37; EX2022, 20-24, 51. The Reply does not address any of the intrinsic evidence supporting this construction, nor does it deny that Petitioner agreed to this construction for “network” in district court. Reply, 1-2; POR, 18-20; EX1016, 13. As the Institution Decision recognized, the dispute boils down to what a “hop” entails. Paper 11, 43.

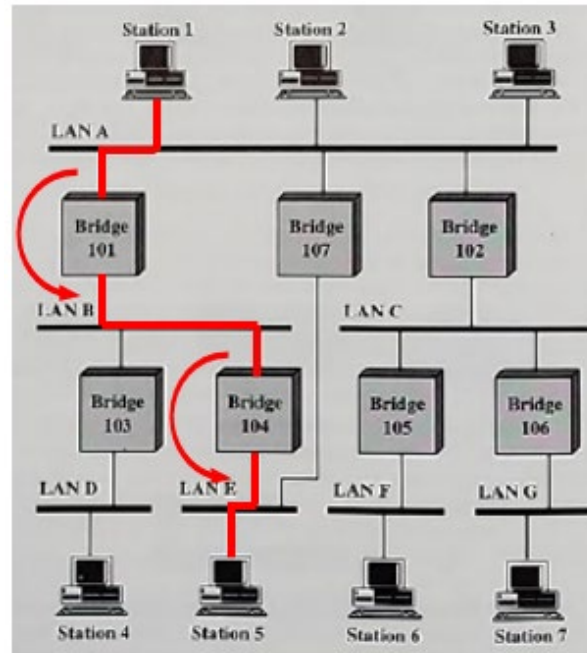
a. A “Hop” Requires Transversing a Network Node

A “hop” occurs when a packet traverses a network node. POR, 19-20; EX2070, ¶¶114-19; EX2073, 80; EX2075, 2. For example, in FIG. 1 of the ‘052 Patent, network N is a **multi-hop** interconnection at least because a packet traverses multiple network nodes between modules M and S.



EX1001, FIG. 1 (excerpted and annotated)

Likewise, in the example below, one hop occurs when a packet traverses bridge 101 and another occurs when traversing bridge 104. EX1030, ¶83; EX2010, 461 (describing multiple hops between stations 1 and 5); EX2084, 259:23-260:12.



EX2010, 460-460 (FIG. 13.16) (annotated)

Dr. Hassoun initially testified that a direct link between two nodes is not a “hop.”

Q. When a packet travels from a first network node to a second network node is that a hop?

A. If I understand your example correct, what you described is a direct connection between one network node to another network node.

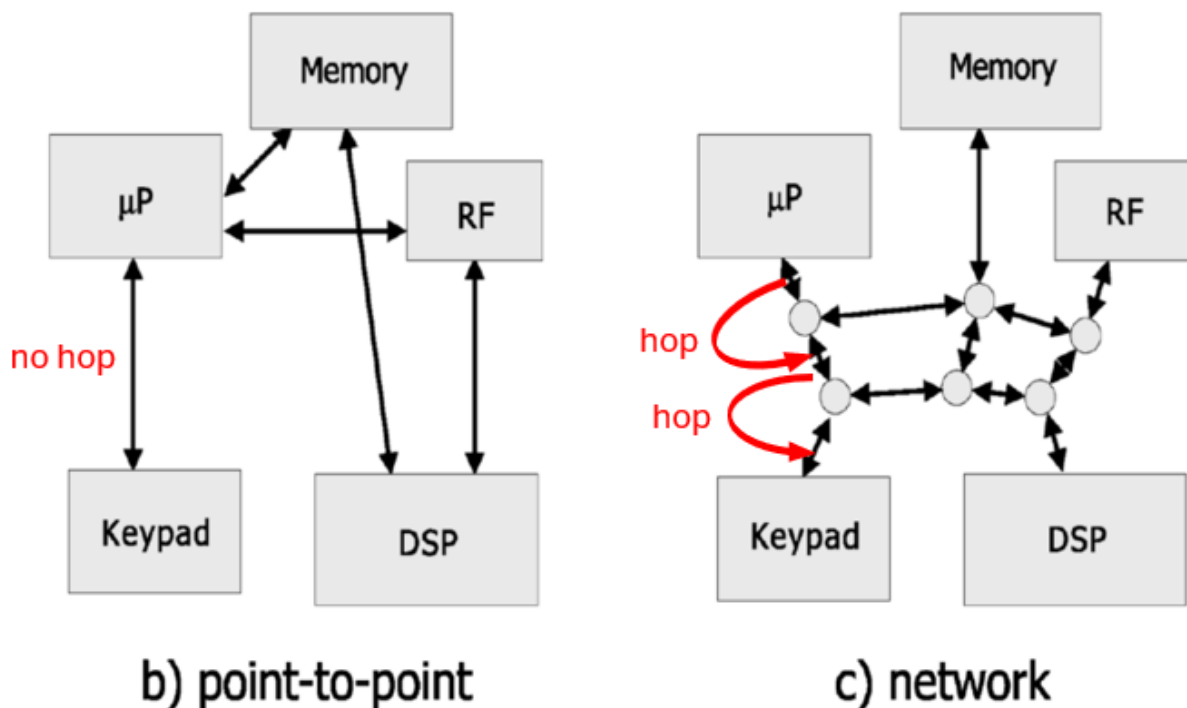
Q. So that wouldn't be a hop?

A. If it's going directly from one node to another node, then it's not a hop. That's – that's the distinction.

Q. Okay. So if the network had a router and the packet traveled from a first network node to the router and then from the router to a second network node, is that a hop?

A. Yes, the router would be a hop.

EX2068, 27:8-28:1. However, Dr. Hassoun now opines that a “hop” is merely “a communication *link* with a node on each end.” EX1030, ¶18; EX2084, 206:19-208:5. This is inconsistent with his prior testimony and, in any event, incorrect because data does not “hop” anything in a direct link between two nodes. EX2070, ¶¶114-17. The difference is illustrated below:



EX2073, 8 (excerpted and annotated)

Another problem with Dr. Hassoun's new opinion is that he defines a “hop” using a generic “node.” EX1030, ¶18. For instance, Dr. Hassoun asserts there is one “hop” between two directly linked modules. *Id.* However, a “network node” is a component (e.g., router or switch) “*in* a network,” i.e., the interconnect means. EX1030, ¶21; EX1050, 58:21-59:3; EX2084, 202:6-10 (explaining that “a node, if

it's not part of a network, then it's not a network node"). The hop must occur *within* the interconnect means. EX2070, ¶¶ 113-22; EX2068, 26:22-27:21.

b. A "Hop" Uses Packet-Based Communication

Perhaps *the* hallmark feature of an NoC compared to traditional interconnects is that it uses packet-based communication. POR, 21; EX1001, 6:30-38; EX2070, ¶¶ 120-22; EX2073, 15; EX2076, 2; EX2005, 4; EX1050, 14:23-15:20; EX1051 (defining "packet" as "the manner in which data are organized...for transmission and switching through a data network"). In other words, the thing that traverses a network node during a "hop" is a packet. Indeed, Dr. Hassoun admitted that in NoCs, "packets are transmitted over the network." EX2068, 26:22-24, 27:17-28:1.¹

Petitioner's only response is that Dr. Bagherzadeh supposedly "could not identify any definitional language in the specification." Reply, 24-25 (citing EX1050, 65:24-74:12). This mischaracterizes Dr. Bagherzadeh's deposition testimony and does not negate his explanation (which Dr. Hassoun initially agreed with) that a POSITA understands that an NoC uses packet-based communication, and that this characteristic distinguishes it from traditional direct interconnects like

¹ Petitioner's expert in a related IPR also admitted this; however, as of this Sur-Reply, the Board has not ruled on Patent Owner's Motion to Submit Supplemental Information. Paper 45.

buses and point-to-point wires. EX1001, 5:10-13, 6:61-64; EX2070, ¶¶20, 73, 86-87; EX2068, 26:22-24.

B. Undisputed Constructions

The Reply does not dispute any of the other constructions discussed in the POR. Reply, 1-2; EX1030, ¶¶9-21; POR, 15-24.

II. PETITIONER FAILED TO MEET ITS BURDEN FOR GROUND 1

The Reply has not rebutted the Board's preliminary finding that Rădulescu2004 does not anticipate. Paper 11, 25-26.

A. Rădulescu2004 Does Not Disclose a “Communication Service Identification”

1. Petitioner New Interpretation of the Phrase “Based On” is Improper

For the claimed “communication service identification,” which includes either (i) a communication thread or (ii) an address range, the Petition argued that Rădulescu2004's “requests for communication services (read/write operations) made by the Master IP module *include* a communication service identification corresponding to ‘at least one address range... .’” Petition, 25. The Institution Decision found that any “communication service identification” in Rădulescu2004 does not “contain[] an address range.” Paper 11, 25.

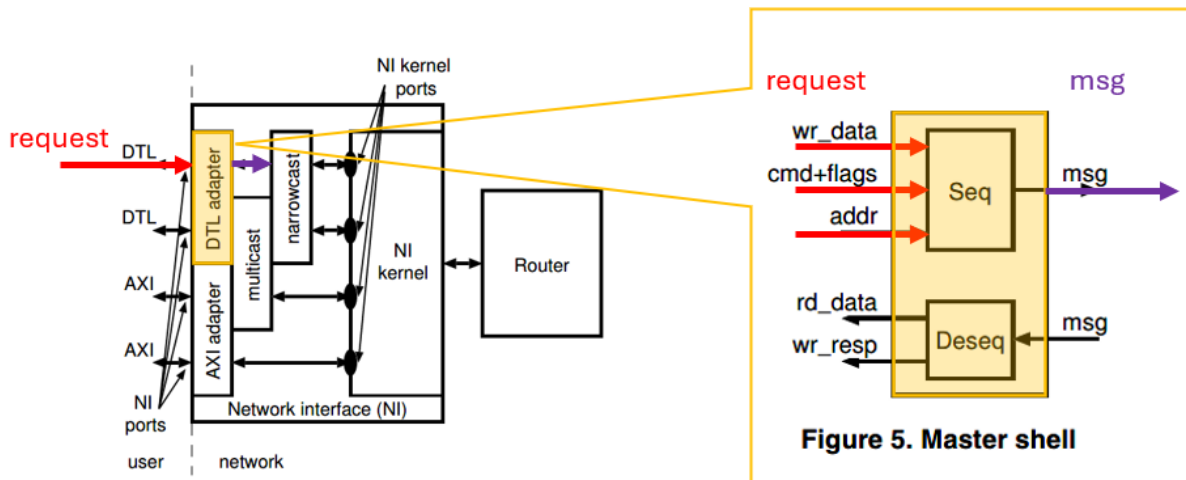
Recognizing the deficiencies in the Petition, the Reply changes course and argues that “[c]laim 6 only requires that requests be ‘*based on*’ a communication service identification that is either an address range or a thread” and that

Rădulescu2004's request need not contain an address range. Reply, 8-11. This is contrary to the Petition's argument that Rădulescu2004's "**requests** ... made by the Master IP module **include** a communication service identification," which in turn includes an address range. Petition, 25. Petitioner should be held to its initial theory, which was that Rădulescu2004's request contains a communication service identification, i.e., address range. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016). Moreover, the Reply is effectively proposing a new construction for the phrase "based on" in violation of the Board's rule that a reply "cannot raise new claim construction issues that were not previously raised." CTPG at 44-45.

2. Petitioner's New "Based On" Interpretation Fails

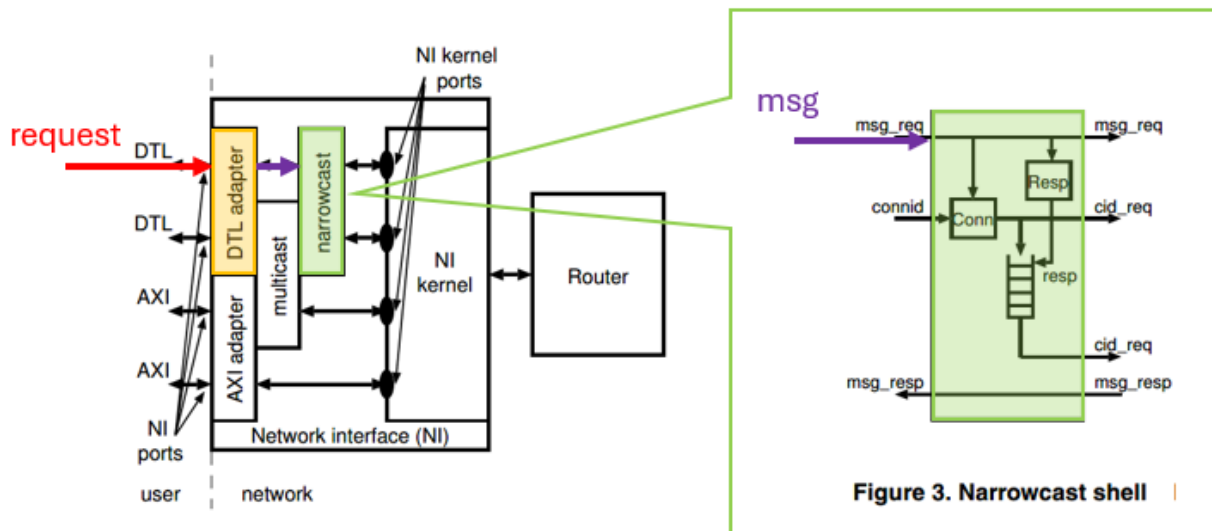
The Reply argues that "[t]he communication service requests in Rădulescu2004 are 'based on' these address ranges because the requests contain an address that, using the address ranges 'configured' in the narrowcast module, correspond to 'the slave for which the transaction is destined.'" Reply, 11 (citing EX1030, ¶127). However, when asked what "based on" means, Dr. Hassoun explained that "**it needs to consider** at least a communication thread or one address range." EX2084, 216:24-217:24. There is no evidence that Rădulescu2004's requests "consider" an address range under Petitioner's new interpretation.

Rădulescu2004's only disclosure regarding "an address range" is that "[t]he address range assigned to a slave is configurable in the narrowcast module," which is within the network interface. EX1005, 4; EX1030, ¶27; EX2070, ¶93. The address range is stored within this narrowcast module. EX1005, 4; EX1030, ¶27; EX2084, 272:19-21. In Rădulescu2004, requests are received by the master shell or adapter, which generates a "msg." EX1003, ¶ 146.



EX1005, FIGS. 1, 5 (annotated)

Then, the "msg" is sent from the adapter to the narrowcast module where the address range assigned to a slave is stored and configured. EX1050, 125:3-11; EX2068, 93:5-94:17.



EX1005, FIGS. 1, 3 (annotated)

The Reply fails to explain how the initiator IP block issues a request that “considers” the address range configured and stored downstream in the narrowcast module. Reply, 8-11.

The Reply also attempts to draw parallels between Rădulescu2004 and the ‘052 Patent specification. Reply, 8-11. But Petitioner’s reliance on the specification to meet its burden is flawed because anticipation requires comparing the claims against Rădulescu2004, not “comparing...specification figures with the prior art to determine the patentability of the invention.” *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1053 (Fed. Cir. 1988); *see also* EX2084, 220:1-7; EX2070, 114:15-115:11.

B. Rădulescu2004 Does Not Disclose “Mapping”

Petitioner argues that the Response “is nothing more than a repackaged version of the argument that was preliminarily rejected in the Institution Decision.” Reply, 12-13. This is incorrect. The Response did not argue that the claims are limited to a “fixed hardware configuration” or that connection properties must be assigned “prior to their use.” POR, 42-44. Tellingly, Petitioner does not cite to where the Response supposedly argued this.

Rădulescu2004 does not disclose “mapping...according to the communication service identification” as recited in the challenged claims because, as discussed above, Rădulescu2004 does not disclose a communication service identification. POR, 43; *supra*, §II.A. But even if Rădulescu2004 discloses a communication service identification (an address range), it does not disclose performing mapping “according to” the address range. POR, 42-44. Rădulescu2004 discloses that “[a] port can have multiple connections to allow differentiated traffic classes, in which case there are also *connid signals to select on which connection* a message is supplied or consumed.” EX1005, 3. To the extent Rădulescu2004 performs any “mapping” to a connection, it is performed “according to” the connid signal rather than a communication service identification. EX2084, 101:7-9; EX1003, ¶122; EX1030, ¶30.

Moreover, Rădulescu2004 does not expressly disclose “mapping ... to a connection based on a set of connection properties.” POR, 43-44. To this point, the Reply merely argues that “each connection has connection properties,” but fails to establish that any “mapping” in Rădulescu2004 is “*based on* a set of connection properties.” Reply, 12. While Rădulescu2004 selects a connection using the connid signals, it does not say that the connection is selected “based on” a particular set of connection properties. EX1005, 3; EX2070, ¶¶164-170.

Finally, the Reply's attempt to draw parallels between Rădulescu2004 and examples in the '052 Patent's specification is unavailing. Reply, 13-14; *Uniroyal*, 837 F.2d at 1053.

III. PETITIONER FAILED TO MEET ITS BURDEN FOR GROUND 2

A. Petitioner Failed to Show Why a POSITA Would Modify Rădulescu2004 to Use Optional OCP Signals

The Reply argues that a POSITA would use OCP's MAddrSpace (address range) and MThreadID (communication thread) signals in Rădulescu2004's NoC to “achieve backwards compatibility.” Reply, 14-17. Specifically, Dr. Hassoun opines that “[a] POSA would know that in order to provide backward compatibility with IP modules that use the combination of MAddr and MAddrSpace, the adapter units in the network interfaces of Radulescu2004's system would need to work with both MAddr and MAddrSpace.” EX1030, ¶39. This argument, however, is flawed because it wrongly presupposes that Rădulescu2004's IP modules use the MAddr

and MAddrSpace signals when neither is disclosed Rădulescu2004 or required when using OCP. *Supra*, §II.

OCP teaches that the MAddrSpace and MThreadID signals are “optional” and not used in every OCP architecture. POR, 45-47; EX1006, 15, 23, 26, 27; EX2070, ¶¶176, 182; EX2084, 285:9-286:7, 288:1-14. Indeed, Dr. Hassoun concedes that only “**some** architectures take advantage of the MAddrSpace signals to identify the ‘address region of a transfer.’” EX1030, ¶39. Rather than explain **why** Rădulescu2004’s NoC is an architecture that uses MAddrSpace or MThreadID, he continues to assert that “a system that implements these [optional OCP] extensions would need to have them.” EX2068, 77:1-11; EX1030, ¶43; Reply, 14-17. This circular logic is unavailing. POR, 46-47; EX1050, 173:22-174:18.

Petitioner and Dr. Hassoun’s impermissible use of hindsight is highlighted by Dr. Hassoun’s assertion that Rădulescu2004 should be backwards compatible with “every possible OCP architecture.” EX2084, 287:13-17. The fact that Rădulescu2004’s IP **could** use optional OCP signals, standing alone, does not mean that it would have been obvious to modify Rădulescu2004 to arrive at the claimed invention. *Adidas AG v. Nike, Inc.*, 963 F.3d 1355, 1359 (Fed. Cir. 2020) (“The obviousness inquiry does not merely ask whether a skilled artisan could combine the references, but instead asks whether they would have been motivated to do so”).

B. OCP Does Not Cure the Deficiencies of Rădulescu2004

Rădulescu2004 does not disclose “mapping” because (i) it does not disclose any communication service identification and (ii) any “mapping” to a connection would be performed using the connid signal. *Supra*, §II.B. And even if, *arguendo*, Rădulescu2004 were modified to use the optional MAddrSpace and MThreadID signals from OCP, Petitioner failed to demonstrate why a POSITA would perform the claimed mapping step “according” to these optional OCP signals. POR, 49-51.

Additionally, explained in the POR, the “connections” in Rădulescu2004 are very different than the “connections” in OCP. POR, 52-53; EX2070, ¶¶187-191. Petitioner does not dispute this. Reply, 17-18; EX1030, ¶47; EX2084, 288:15-289:15. Brushing this difference aside, Petitioner argues on the one hand that “Ground 2 does not call for use of OCP’s connections in Radulescu2004’s system.” Reply, 17. Yet on the other hand, Petitioner argues that a POSITA would look at OCP’s disclosure of mapping the MThreadID signal to an OCP connection as motivation to map OCP’s MThreadID to Rădulescu2004’s connection. *Id.*, 18. Petitioner fails to explain how mapping OCP’s signals to OCP’s **bus-based** connections discloses mapping to Rădulescu2004’s **packet-based** connections. *Id.*, 18-19.

Dr. Hassoun also testified that the proposed “combination ***does not call for the incorporation of OCP’s interfaces*** in Radulescu2004’s network,” making clear

that the combination relies on Rădulescu2004's network interfaces. EX1030, ¶47. However, Rădulescu2004 does not disclose using the MThreadID signal, let alone mapping the MThreadID signal. *See* EX1005; EX2070, ¶146. Dr. Hassoun on one hand opines that a POSITA would be motivated to incorporate OCP's teaching that OCP interfaces map the MThreadID signal to a MConnID but on the other hand states that the interfaces that teach this mapping would *not* be included in the combination. EX1030, ¶47; EX1006, 38-39, 46-47. Petitioner provides no evidence how Rădulescu2004's interface would map OCP's MThreadID signal, or why a POSITA would be motivated to perform mapping using that signal in Rădulescu2004's interface.

IV. PETITIONER FAILED TO MEET ITS BURDEN FOR GROUND 3

The Reply has not rebutted the Board's preliminary finding that Weber does not anticipate. Paper 11, 37-43.

A. Weber Does Not Disclose the Claimed "Mapping Means" (Claims 1-5 and 7)

The Reply does not dispute that the Petition (1) proposed construing the term "mapping means" in claims 1-5 and 7 such that the corresponding structure under §112, ¶6 includes sequentializing *and* desequentializing units and (2) failed to argue or provide any evidence that Weber discloses a desequentializing unit. Reply, 25; POR, 23-24, 57-59; Pet., 24-25; EX2068, 62:16-23. The Board should hold Petitioner to its proposed construction and disregard Dr. Hassoun's new opinions

that Weber discloses a desequentializing unit as an improper new theory. Reply, 25 (citing EX1030, ¶¶61-64); *Colas Sols., Inc. v. Blacklidge Emulsions, Inc.*, 759 F. App'x 986, 990 (Fed. Cir. 2019) (pointing out flaws in the petition does not allow petitioner to fill the gaps via its reply).

B. Weber Does Not Disclose a Multi-Hop Interconnection on a Single Integrated Circuit (Claims 1-7)

Weber does not disclose a multi-hop interconnect for the simple reason that it does not disclose packets. POR, 60; *supra*, §I.A.2.b. Dr. Hassoun admitted this during his first deposition:

Q. Weber does not disclose transmitting packets over a shared bus, correct?

A. No, it does not.

EX2068, 116:14-17; *see also id.*, 117:4-5 (testifying "...Weber is silent regarding whether packets can or cannot be sent..."), 121:11-13 ("Q. And earlier we discussed Weber does not disclose packets, correct? A. Yes"). After a 39-minute recess in which Dr. Hassoun admits rehearsing his redirect testimony with counsel, he offered a new opinion that Weber "suggests the use of packets." EX2068, 144:1-9, 144:18-145:3, 145:16-146:13; EX2084, 256:2-8; *FLIR Sys., Inc. v. Leak Surveys, Inc.*, IPR2014-00411, Paper No. 45 at 7 (PTAB Feb. 10, 2015) ("[W]hen recess conversations occur ... the Board may find that there was witness coaching and may

exclude or give little, or no, weight to the testimony of a coached witness”). When recrossed, Dr. Hassoun reaffirmed that Weber does not disclose packets:

Q. Okay. So with respect to whether Weber discloses packets, you would still agree, wouldn't you, that Weber does not expressly disclose packets, correct?

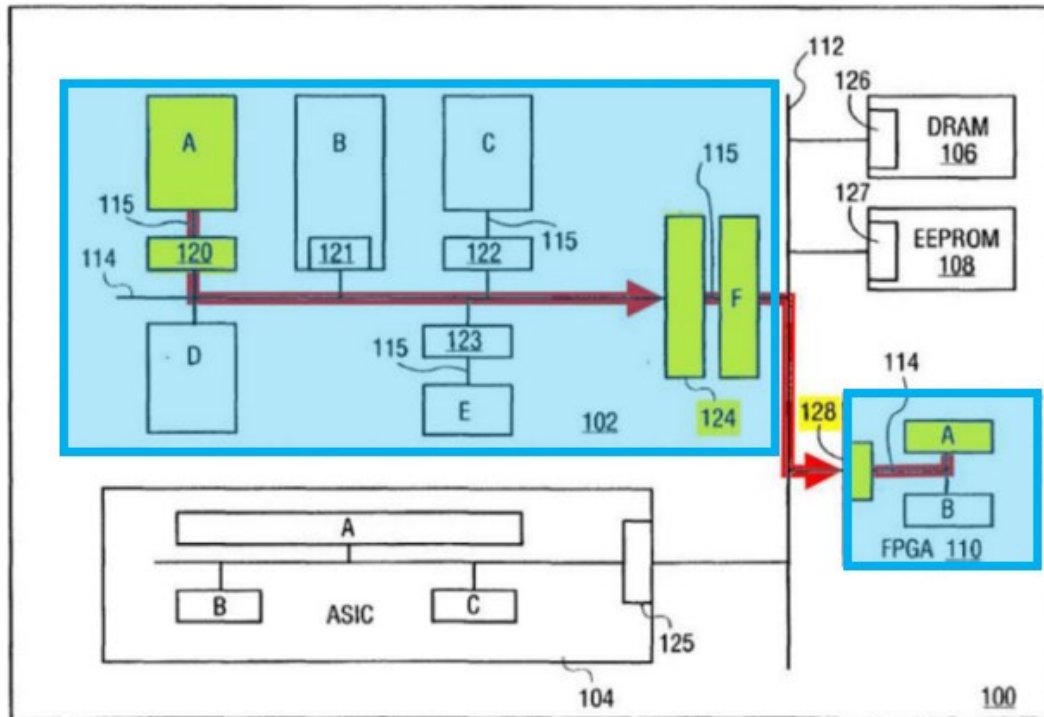
A. Yes, it doesn't use the word 'packet' in there.

EX2068, 145:8-12.

Nevertheless, Dr. Hassoun executed a second declaration testifying that “Weber discloses packets.” EX1030, ¶76; EX2084, 251:3-10. The Board should give this testimony no weight. *Homeland Housewares, LLC v. Whirlpool Corp.*, 865 F.3d 1372, 1378 (Fed. Cir. 2017) (“we must disregard the testimony of an expert that is plainly inconsistent with the record”). And even if, *arguendo*, the Board were to find that a “hop” does not require a packet traverse a network node or that Weber discloses packets, each of Petitioner's theories still fail.

1. Petition Theory 1: Weber FIG. 1

The claims require that each recited element is on the same integrated circuit (“IC”). POR, 24-25. Petitioner's reliance on shared buses 112 and 114 as the “interconnect means” fails because subsystem 102 and FPGA 110 are on different ICs. POR, 54-57.



EX1007, FIG. 1 (annotated)

The Reply continues to point to Weber's statement that system 100 "may consist of one or more integrated circuits or chips" to argue Weber discloses all the subsystems on one IC. Reply, 19 (citing EX1007, ¶[0038]). But the Reply does not dispute that Weber (i) does not show this in FIG. 1 and (ii) discloses elsewhere that system 100 may include only one subsystem. POR, 55-56; EX2070, ¶217; EX1007, ¶[0037]. Indeed, Dr. Hassoun admitted that Weber does not teach how to implement all the components of system 100 on a single IC. EX2084, 236:9-16; *Raytheon Technologies Corp. v. General Electric Co.*, 993 F.3d 1374, 1381 (Fed. Cir. 2021) (explaining that the prior art "must enable the portions of its disclosure being relied upon"). The sentence Petitioner relies on merely recognizes that system 100 can

include any combination of subsystems 102-110, including only one. *Id.* These disclosures are not “redundant” – they are consistent. Reply, 19.

Contrary to Petitioner's suggestion, a POSITA would not “at once envisage” subsystems 102-110 on a single IC because that would have been impractical and unusual at the time of the invention. POR, 54-57; EX2070, ¶¶217-29. Petitioner does not address or dispute the technical reasoning Dr. Bagherzadeh provided for why this is the case; instead, it merely argues that it was possible to integrate everything on one IC. Reply, 19-20; EX1030, ¶55.² Even if true, that does not mean a POSITA would “at once envisage” that possibility, especially where Weber does not expressly show such a configuration. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd*, 851 F.3d 1270, 1274 (Fed. Cir. 2017) (explaining that “*Kennametal* does not stand for the proposition that a reference missing a limitation can anticipate a claim if a skilled artisan viewing the reference would ‘at once envisage’ the missing limitation”); *see also Wonderland Nurserygoods Co. v. Baby Trend, Inc.*, 727 F. App'x 1017, 1020 (Fed. Cir. 2018).

² EX1053–EX1058 support Dr. Bagherzadeh's testimony because they either confirm that it was difficult and unusual to implement a CPU and DRAM on one IC or do not mention DRAM at all. EX2084, 232:12-241:12.

Additionally, Weber is not multi-hop because it is, at best, a conventional bus architecture that lacks network nodes. POR, 59-62. Petitioner's argument to the contrary is based on its incorrect definition of "hop." *Supra*, §I.A.2. In an attempt to distinguish Weber from conventional buses (which are not multi-hop), Petitioner argues that Weber's "interfaces" 120-128 transform it into a network. Reply, 23-25. Specifically, according to Dr. Hassoun, interfaces 120-128 are network interfaces and define multiple hops. EX1030, ¶¶72, 85-88. However, in district court, Dr. Hassoun testified that network interfaces are "*exclude[d]*" from being "the structures" of the network because "network interface" is recited separately in the claim. EX2083, ¶86; EX2084, 187:22-189:6. The fact that Weber uses "interfaces" does not make its bus architecture multi-hop. EX2070, ¶¶259-264.

2. Petition Theory 2: Weber FIG. 14

Petitioner's reliance on FIG. 14 in Weber for the "interconnect means" also fails. POR, 62-63. FIG. 14 is directed to a different embodiment than FIG. 1. POR, 62; Reply, 23-24. The Reply adds nothing to the Petitioner's conclusory assertion that a POSITA "would 'at once envisage'" an embodiment combining FIGs. 1 and 14 in Weber. POR, 62-63; Reply, 23-25. Moreover, there is no evidence that FIG. 14 is on a single IC.

In any event, FIG. 14 is not multi-hop. Dr. Hassoun opines that "there is a hop from the initiator function[al] block 1410 across the first communications subsystem

1435 and a hop across the second communication sub-system 1440 to the target functional block 1430.” EX1030, ¶72. However, Dr. Hassoun previously explained that the subsystems 1435/1440 correspond to buses 112/114. EX1003, ¶204. Subsystems 1435/1440 are not network nodes. EX2070, ¶¶269, 274.

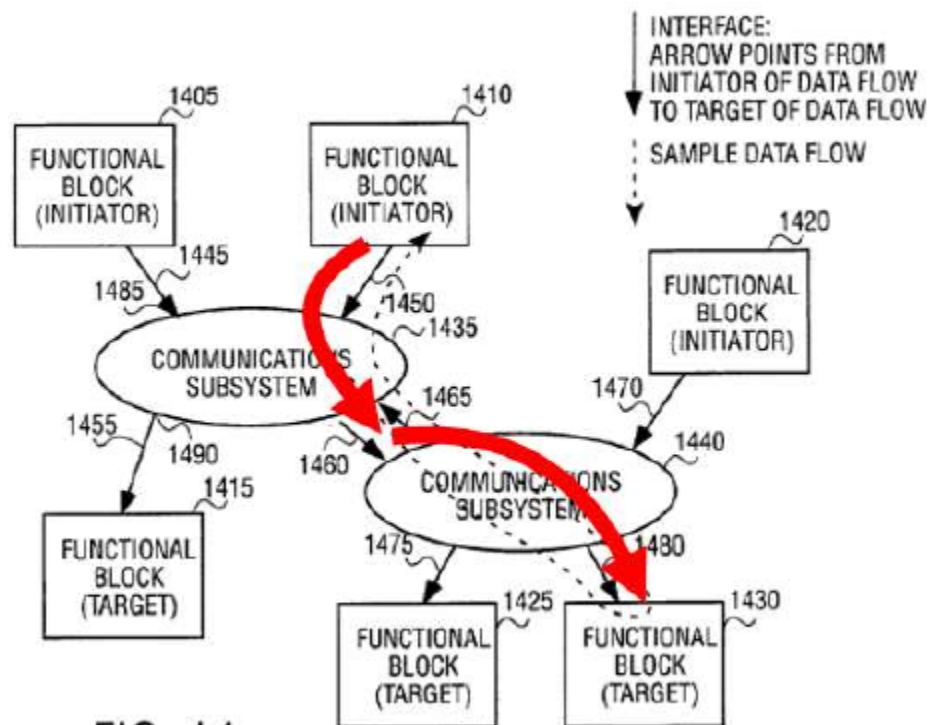


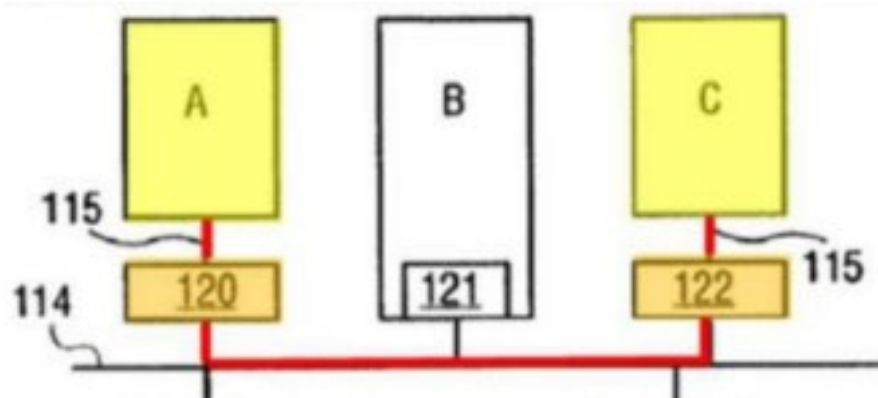
FIG. 14

EX1007, FIG. 14 (annotated); Petition, 58

Additionally, Dr. Hassoun's opinion depends on alleged hops originating *outside* of the alleged network (subsystems 1435/1440), e.g., from functional block 1410 (a first module) to subsystem 1435. EX2070, ¶¶269, 274.

3. New Reply Theory: Subsystem 102 in FIG. 1 Alone

The Reply also argues that shared bus 114 in subsystem 102 is a multi-hop interconnection on a single IC. Reply, 23.



This is improper because the Petition never relied on sub-system 102 alone for the “interconnect means.” Petition, 54-58 (identifying Weber’s (i) shared buses 112 *and* 114 in FIG. 1 or (ii) FIG. 14 for the “interconnect means”); EX1003, ¶¶199-205; *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367 (Fed. Cir. 2015) (rejecting new meaningfully distinct contention in reply). Nor did the Petition identify functional block C as the second processing module. Petition, 49-54. Regardless, shared bus 114 is not multi-hop because it directly links interfaces 120 and 122. *Supra*, §I.A.2; EX2084, 243:25-244:4 (admitting that, under Petitioner’s interpretation, there is only one hop between 120 and 122).

Petitioner also appears to argue that links 115 between modules A and C and interfaces 120 and 122 are part of the interconnect means, even though the Petition never mentions link 115. *See* Petition, 47-67. Element 115 directly links between

each module (A and C) and its corresponding interface (120 and 122), which in turn allow the modules to interface with bus 114. EX1007, ¶[0039]. Even if bus 114 is a network (which it is not), links 115 are *outside* the network and cannot form part of a “hop.” *Supra*, §I.A.2.a. Link 115 is analogous to the links between modules M and S and NIs in FIG. 1 of the ‘052 Patent, which are not part of the network N. EX1001, FIG. 1.

What is more, the only way there are multiple hops under Petitioner’s definition is if interfaces 120 and 122 are network nodes (i.e., inside the network). *Supra*, §I.A.2.a. But Dr. Hassoun explained that interfaces 120 and 122 are network interfaces and previously testified that the “interconnect means” structure “exclude[es]” a network interface. EX2083, ¶86; *supra*, §IV.B.1.

V. PETITIONER FAILED TO MEET ITS BURDEN FOR GROUND 4

A. The Reply Improperly Asserts a New Obviousness Theory For the “Integrated Circuit” Limitation

Given that Weber does not expressly disclose all the subsystems 102-110 in FIG. 1 on a single IC, the Reply argues that it would have been obvious to implement Weber this way when combined with Rădulescu2004. Reply, 26. However, the Petition never argued obviousness for the integrated circuit limitation. POR, 64-65 (citing Petition, 68-76). The Board should disregard this new obviousness theory. *Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1367 (Fed. Cir. 2023) (new obviousness

theory in reply was improper); *Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc.*, 853 F.3d 1272, 1286 (Fed. Cir. 2017) (same).

B. Petitioner's Alleged Motivation for Combining Weber and Rădulescu2004 is Flawed

The Reply does not cure the Petitioner's failure to explain *why* a POSITA would have been motivated to combine Weber and Rădulescu2004. Petition, 68-71; POR, 65-69. While the Petition pointed to alleged improvements in scalability and performance, there are two problems: (1) Weber already discloses that its bus-architecture performs better and is more scalable than traditional buses and (2) any improvements associated with Rădulescu2004 were relative to traditional buses, not Weber. POR, 65-67; EX2068, 20:11-17 (admitting that whether there are advantages “depends on the architecture of the bus you’re talking about and the architecture of the NoC you’re talking about”).

In reply, Petitioner first argues that the combination “would have been ‘routine’ and well within the skill of a POSA.” Reply, 27. These conclusory assertions, even if true, do not establish *why* one would allegedly combine Weber and Rădulescu2004. *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1068-69 (Fed. Cir. 2018) (holding that it is error to focus “on what a skilled artisan would have been able to do, rather than what a skilled artisan would have been motivated to do”); *see also InTouch Techs., Inc. v. VGO Commc'ns, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014).

The Reply next argues that “[t]he fact that Weber provides ... benefits over traditional buses...does not mean a POSA would be unmotivated to make further improvements to scalability or performance.” Reply, 27. This is yet another improper new argument that was not in the Petition. *See* Petition, 68-71; *Intelligent Bio-Sys.*, 821 F.3d at 1370 (a reply cannot introduce “an entirely new rationale” for motivation to combine). Regardless, this conclusory argument is devoid of any explanation as to **how** modifying Weber with Rădulescu2004 improves scalability and/or performance. Reply, 27. Dr. Hassoun fares no better – he merely repeats the same conclusory assertion. EX1030, ¶¶90; *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15-17 (PTAB Aug. 24, 2022) (precedential); *TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1359 (Fed. Cir. 2019) (conclusory expert testimony is insufficient).

Petitioner also failed to consider the disadvantages associated with modifying Weber with Rădulescu2004. POR, 67-69. Petitioner does not rebut Dr. Bagherzadeh’s testimony explaining why it would be **dis**advantageous to replace Weber’s bus-architecture with Rădulescu2004’s NoC, which would have dissuaded a POSITA from combining them. *Id.*; EX2070, ¶¶301-04; EX1021, 8; Reply, 27-28; EX2084, 173:25-173:3. Under Federal Circuit precedent, “the benefits, both lost and gained, should be weighed against one another” in an obviousness analysis. *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000); *see also*

Arctic Cat Inc. v. Bombardier Recreational Products Inc., 876 F.3d 1350, 1360 (Fed. Cir. 2017) (“Evidence suggesting reasons to combine cannot be viewed in a vacuum apart from evidence suggesting reasons not to combine”). Petitioner’s obviousness theory never considered these drawbacks. While Dr. Hassoun claims to have done so in his first declaration, none of the paragraphs he cites mentions NoC drawbacks. EX1030, ¶91 (citing EX1003, ¶¶301-04).

C. The Petition Did Not Explain How Weber and Rădulescu2004 Would be Combined

The Reply suffers from the same flaw as the Petition because it fails to explain with specificity *how* Weber and Rădulescu2004 would be combined. POR, 69-72; Reply, 26-27; *Pers. Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 994 (Fed. Cir. 2017) (finding claims non-obvious where petition “nowhere clearly explained, or cited evidence showing, *how* the combination of the two references was supposed to work”) (emphasis in original); *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012) (finding claims non-obvious because “expert failed to explain...which combination(s) of elements in specific references would yield a predictable result, or how any specific combination would operate”).

Given the Petition’s lack of clarity, Patent Owner addressed two potential combinations—one that uses Weber’s interfaces and another that uses Rădulescu2004’s network interfaces—and explained why a POSITA would not make either. POR, 70-72. In the first potential combination (using Weber’s

interfaces instead of Rădulescu2004's network interfaces), Weber's interfaces cannot communicate with Rădulescu2004 packet-based network. POR, 70-71. Petitioner's reply that "Weber does transmit 'packets'" is not credible in view of Dr. Hassoun's prior admissions. Reply, 28; *supra*, §IV.B; EX2068, 116:14-17, 117:4-5, 121:11-13. Petitioner's alternative argument that it would be "routine" to modify Weber's interfaces to work with Rădulescu2004's network is conclusory and should be afforded no weight. Reply, 28; EX1030, ¶94 (repeating Petitioner's argument without more).

The Weber-Rădulescu2004 combination also fails because Rădulescu2004 does not disclose a communication service identification in the form of an address range or the claimed mapping. *Supra*, §II.A; Reply, 28. Petitioner's conclusory assertion that "Rădulescu2004's NoC is compatible with threads" is not supported by any evidence. Reply, 28 (citing EX1030, ¶98). Dr. Hassoun's declaration fares no better as he merely states that "a POSA would have been motivated to use Thread IDs in Rădulescu2004." EX1030, ¶98; *Xerox*, Paper 9 at 15-17.

VI. THE PETITION FAILED TO SHOW RADULESCU2004 AND OCP QUALIFY AS PRINTED PUBLICATION PRIOR ART

The Petition's contentions regarding the alleged public accessibility of Rădulescu2004 and OCP were improperly incorporated by reference via blanket citations to multiple exhibits. POR, 26-27; *Medivis, Inc. v. Novarad Corp.*, IPR2023-00042, Paper 35 at 28-30 (PTAB Mar. 6, 2024) (declining to consider incorporated-

by-reference declarations regarding publication). In contrast to the mere 2 sentences in the Petition, the Reply now devotes nearly 8 pages to this issue. *Compare* Petition, 2-3 *with* Reply, 1-8. Because the Petition did not articulate any theories regarding public accessibility, the Board should not allow Petitioner to “completely reopen the record” through its Reply. *Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-01039, Paper 29 at 15 (PTAB Dec. 20, 2019) (precedential).

A. OCP

Petitioner points to EX1006's copyright date and Internet Archive printouts as evidence of accessibility but ignores authority holding that this is insufficient. Reply, 7-8; POR, 36-38. The fact that OCP, in general, was known does not establish that this particular OCP specification was accessible. Petitioner's reliance on Dr. Bagherzadeh's testimony is flawed because it was not specifically tied to EX1006. Reply, 8 (citing EX1050, 35:25-36:4, 37:6-16 (testifying “I have not reviewed...where they could find the documentation”)).

Dr. Dutt's new testimony regarding OCP—which Petitioner could have included with the Petition but chose not to (EX2085, 34:15-24)—is conclusory and should be afforded no weight. EX1038, ¶¶18-20; *Xerox*, Paper 9 at 15-17. In fact, Dr. Dutt could not verify whether the URLs he referenced would lead to EX1006. EX2085, 50:14-51:10 (admitting he did not check hyperlink in EX1019), 51:15-

52:8, 54:14-16, 55:5-10 (admitting URL in EX1013 was provided by counsel and he did not access it), 58:5-59:11 (admitting EX1039 does not link to EX1006).

B. Rădulescu2004

The Reply does not dispute that Rădulescu2004's authors worked on multiple papers with the same title with different revision dates. POR, 26; EX2078. The Petition's reliance on the DATE04 Conference was flawed, among other reasons, because it presented no evidence POSITAs attended. POR, 31-32. Patent Owner asked whether Petitioner's witness, Dr. Dutt, was a POSITA, but he refused to answer. EX2068, 80:25-84:20. The Board should disregard Dr. Dutt's new testimony regarding POSITAs as improper new theories. EX1038, ¶¶3-5; EX2085, 19:15-17, 22:4-20, 40:23-43:1, 23:3-12; *Hulu*, Paper 29 at 15. Petitioner also accuses Patent Owner of being "misleading" with respect to restrictions on conference materials (Reply, 6), but Dr. Dutt testified attendees "were not allowed to distribute the papers...without permission" (EX2067, 39:25-40:7).

For IEEE Xplore, the Reply ignores evidence that IEEE does not and cannot warrant the accuracy of the information. POR, 33-34. The Reply also ignores that Mr. MacPherson was unfamiliar with certain IEEE practices in 2004, including whether IEEE performed spot checks to verify information (EX2069, 16:1-20) and whether it tracked article views (*compare id.*, 17:11-21 (testifying that IEEE tracked

full-text views starting March 8, 2004) and Reply, 4 (arguing that “IEEE may not have begun tracking full text views until 2011”)).

The Reply also argues that “PO has not rebutted the presumption” that IEEE is an “established publisher” (Reply, 3), but there was nothing to rebut because the Petition never argued this. The Petition only argued availability of Rădulescu2004 at DATE04, and never mentioned the March 2004 date associated with IEEE Xplore. Petition, 2-3 (citing EX1012 and EX1018 regarding “availability by February 20, 2004”); *see also* EX2085, 33:5-34:13 (admitting Xplore-related testimony could have been included in his first declaration), 60:1-62:3, 63:4-12 (admitting testimony was not based on personal knowledge). This is yet another improper new theory. *Hulu*, Paper 29 at 15.

VII. CONCLUSION

For the foregoing reasons, Petitioner failed to establish that any challenged claim is unpatentable.

U.S. Patent No. 7,594,052
IPR2024-00343

Patent Owner's Sur-Reply

Respectfully submitted,

Dated: March 4, 2025

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CERTIFICATION OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the foregoing Patent Owner's Sur-Reply is produced using a 14-point Times New Roman font and contains approximately 5,591 words, which is less than the 5,600 total words permitted by the U.S. Patent Trial and Appeal Board rules. Counsel relies on the word count of the computer program used to prepare the Sur-Reply on March 4, 2025.

Dated: March 4, 2025

By: /s/ Angelo J. Christopher
Counsel for Patent Owner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing **Patent Owner's Sur-Reply** was served on March 4, 2025, via email:

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