

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

QUALCOMM, INC.,
Petitioner,

v.

FUTURE LINK SYSTEMS, LLC,
Patent Owner.

IPR2021-01396
Patent 7,917,680 B2

Before KARL D. EASTHOM, KEVIN C. TROCK, and
JOHN A. HUDALLA, *Administrative Patent Judges*.

TROCK, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background

Qualcomm, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.” or “Petition”) to institute an *inter partes* review of claims 1–20 (“the challenged claims”) of U.S. Patent No. 7,917,680 B2 (Ex. 1001, “the ’680

patent”). Future Link Systems, LLC (“Patent Owner”) timely filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

Patent Owner’s Preliminary Response does not contest the Petition on the merits—i.e., it does not contest Petitioner’s arguments and evidence that the challenged claims would have been obvious over the applied prior art. *See generally* Prelim. Resp. The Preliminary Response does, however, seek discretionary denial of the Petition pursuant to 35 U.S.C. § 314(a). *Id.* at 4–9.

An *inter partes* review may not be instituted “unless . . . 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). Upon consideration of the Petition and the evidence of record, we determine that Petitioner has shown a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the challenged claims. Accordingly, we institute an *inter partes* review.

B. Real Party-in-Interest

Petitioner identifies itself as the only real party-in-interest. Pet. 2. Patent Owner identifies itself as the only real party-in-interest. Paper 4, 1.

C. Related Matters

Our docketing database informs us of the ’680 patent being (or having been) challenged in the following *inter partes* review proceedings of the Board: (1) *Intel Corp. v. Future Link Sys., LLC*, IPR2016-01401 (terminated by settlement after institution); (2) *Realtek Semiconductor Corp. v. Future Link Sys., LLC*, IPR2021-01182 (instituted Jan. 7, 2022); and (3) *Apple Inc. v. Future Link Sys., LLC*, IPR2022-00209 (pending institution decision).

Petitioner informs us of the ’680 patent being challenged in the above proceeding (2) and also in the following district court proceedings: (4)

Future Link Systems, LLC v. Qualcomm, Inc. et al., 6:21-cv-00265 (W.D. Tex.) (the “parallel proceeding”); (5) *Future Link Systems, LLC v. Apple Inc.*, No. 6:21-cv-00263 (W.D. Tex.); and (6) *Future Link Systems, LLC v. Broadcom Inc. et al.*, 6:21-cv-00264 (W.D. Tex.). Pet. 2–3.

Patent Owner informs us of the ’680 patent being challenged in the above proceedings (4)–(6) and also in the following district court proceedings: (7) *Future Link Systems, LLC v. Realtek Semiconductor Corporation*, No. 6:21-cv-00363-ADA (W.D. Tex.); and (8) *Future Link Systems, LLC v. Amlogic Holdings, Ltd.*, No. 1:21-cv-00634-LPS (D. Del.). Paper 4, 1.

D. The ’680 Patent (Ex. 1001)

The ’680 patent relates to packet data communications control and describes an approach to passing information between components in a computer, such as systems compliant with the Peripheral Component Interconnect (“PCI”) Express standard specification. *See* Ex. 1001, Abstract, 1:65–2:24. The ’680 patent explains that when multiple data packets are transferred simultaneously, they may merge or “bottleneck” unless there is coordination. *Id.* at 1:24–39. The ’680 patent acknowledges the prior art addressed this and other issues through use of packet-ordering rules. *Id.* at 1:18–23, 2:11–24. Packet-ordering rules order packets in accordance with a data communication protocol in order to achieve compliance with the protocol or standard and to help achieve the desired system performance. *Id.* at 2:11–24. The ’680 patent states that “[c]ompliance with these types of protocols, while achieving desirable performance,” remains challenging. *Id.* at 2:21–24.

To address this issue, the ’680 patent describes a two-step method, in which packets are (i) first ordered according to the rules of a protocol, such

as PCI Express, and (ii) then ordered using “performance-based ordering” to meet certain performance criteria. *Id.* at 2:40–49, 3:2–6.

For the first step, the ’680 patent describes first ordering the packets according to the rules of a particular protocol. *Id.* at 2:43–46. The ’680 patent explains that packet data in the data streams is ordered, relative to other packet data, for passage on a common communications link as a function of the protocols. *Id.* at 3:58–60.

For the second step, the ’680 patent explains that the packets are then ordered based on “performance-based rules.” *Id.* at 2:46–49, 3:60–63. The ’680 patent explains that the method “manages the order in which the packets are processed to meet certain performance criteria.” *Id.* at 3:1–6. The ’680 patent also explains that performance-based order is achieved “while continuing to meet the protocol requirements.” *Id.*; *see also id.* at 2:46–49 (“Performance-based ordering of the packets is carried out . . . , while meeting the protocol and other rules employed by the PCI Express (or other) system.”).

Thus, according to the ’680 patent, this two-step approach achieves desirable system performance while also continuing to meet protocol requirements. *Id.* at 3:2–5.

E. Challenged Claims

Petitioner challenges claims 1–20 of the ’680 patent. Pet. 1 *et seq.* Claims 1, 8, and 20 are independent. Claim 1 is exemplary and is set out below.

1. [a] A method for managing packet-based communications in a rules-based system, the method comprising:
[b] in a packet processor,

- [c] generating a protocol-based ordering configuration for passing packet data as a function of protocol compliance rules for the rules-based system, and
- [d] generating a performance-based communications order for passing the packet data as a function of performance-based rules and the generated protocol-based ordering configuration; and
- [e] communicating the packet data as a function of the performance-based communications order.

Ex. 1001, 9:5–16 (bracketed reference characters designated by Petitioner (*see* Pet. v)).

F. Evidence

Petitioner relies upon the following evidence:

- (1) U.S. Patent No. 6,327,636 B1, issued Dec. 4, 2001 (“Guthrie”) (Ex. 1004);
- (2) Eugin Hyun, et al., *The Effective Buffer Architecture for Data Link Layer of PCI Express*, Proceedings of the International Conference on Information Technology: Coding and Computing (ITCC ’04) (“Hyun”) (Ex. 1005);
- (3) U.S. Patent No. 7,120,714 B2, issued Oct. 10, 2006 (“O’Connor”) (Ex. 1006);
- (4) Declaration of Marwan Hassoun, Ph.D. (Ex. 1003); and
- (5) Declaration of Sylvia D. Hall-Ellis (Ex. 1011).

G. Asserted Grounds of Unpatentability

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 3, 7, 8, 10–12, 15–20	103	Guthrie
2, 4–6, 9	103	Guthrie, O’Connor
1, 2, 7–11, 13–16, 20	103	Hyun
3–6, 17–19	103	Hyun, Guthrie

Pet. ix.

II. ANALYSIS

A. 35 U.S.C. § 314(a)

Patent Owner asserts that we should exercise our discretion to deny institution under 35 U.S.C. § 314(a). Prelim. Resp. 4–9 (citing *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”)).

35 U.S.C. § 314(a) states:

[t]he Director may not authorize an *inter partes* review to be instituted unless the Director determines 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.

The Director has delegated the discretion to deny institution of an *inter partes* review under § 314(a) to the Board.¹ *See also Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2140 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”). Under our precedent, the Board may exercise this discretion if instituting *inter partes* review would lead to “inefficient use of Board resources.” *See NHK Spring Co., Ltd. v. Intrix-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 20 (PTAB Sept. 12, 2018) (precedential) (“*NHK*”).

In *Fintiv*, the Board discussed various factors that “relate to whether efficiency, fairness, and the merits support the exercise of authority to deny institution.” *Fintiv*, Paper 11 at 6. Pursuant to *Fintiv*, the Board assesses the following factors to determine whether to exercise its discretion to deny institution:

¹ “The Board institutes the trial on behalf of the Director.” 37 C.F.R. § 42.4(a) (2021).

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court's trial date to the Board's projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board's exercise of discretion, including the merits.

Id.

For the reasons discussed below, we do not agree with Patent Owner that the circumstances of this case warrant the exercise of discretion to deny institution under § 314(a).

1. *Whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted*

According to Patent Owner, “no stay of District Court proceedings has either been requested or granted in relation to this pending IPR Petition.” Prelim. Resp. 5. Patent Owner argues that “Petitioner cannot show any reasonable likelihood that the District Court will enter a stay if this proceeding is instituted,” and that “[t]his factor favors denial of institution.” *Id.* at 6.

Petitioner, however, argues that “this factor is neutral.” Pet. 19.

We decline to infer how a district court may rule on a motion to stay a parallel proceeding pending *inter partes* review. Given that neither party

has requested such a stay from the district court, we view this factor as neutral.

2. *Proximity of the court's trial date to the Board's projected statutory deadline for a final written decision*

According to Patent Owner, the district court has set a date for trial in the parallel proceeding for January 11, 2023. Prelim. Resp. 1, 6. Patent Owner indicates, however, that “the District Court’s scheduling order notes that this date is a placeholder.” *Id.* at 6. Nonetheless, Patent Owner argues that “the District Court’s trial date would substantially predate completion of this proceeding if instituted,” and that “[t]his factor favors denial of institution.” *Id.* at 6.

Petitioner, however, argues that “[e]ven if the trial occurs shortly before the PTAB hearing, the PTAB has held that such close proximity of a district court trial date weighs in favor of institution.” Pet. 20–21 (citing *MediaTek Inc. et al. v. Nippon Telegraph and Telephone Corp.*, IPR2020-01607, Paper 12 (PTAB April 2, 2021); *Western Digital Corp. et al. v. Martin Kuster*, IPR2020-01391, Paper 10 (PTAB February 16, 2021); *Facebook, Inc. v. USC IP Partnership, L.P.*, IPR2021-00034, Paper 13 (PTAB April 30, 2021).

Our precedent states that “[i]f the court’s trial date is earlier than the projected statutory deadline [for a final written decision], the Board generally has weighed this fact in favor of exercising authority to deny institution under *NHK*.” *Fintiv*, Paper 11 at 9.

Because the currently scheduled trial in the parallel proceeding is approximately one month before the projected statutory deadline for a final written decision in this case, if instituted, we view this factor as neutral or slightly favoring the exercise of discretionary denial.

3. *Investment in the parallel proceeding by the court and the parties*

Patent Owner argues that this factor favors denial of institution.

Patent Owner indicates that “[t]he District Court has already begun claim construction proceedings in the parallel proceeding,” and “[t]he parties have already submitted opening and responsive claim construction briefs.”

Prelim. Resp. 7. Patent Owner also indicates that “[t]he parties have also exchanged preliminary infringement and invalidity contentions.” *Id.*

Petitioner argues that this factor favors institution because “[t]he district court litigation is in its infancy,” and “[n]o discovery has taken place.” Pet. 21–22.

Based on the current record before us, it appears that only a minimal amount of work may have been done in the parallel proceeding that might be relevant to the issues raised in the Petition with respect to the ’680 Patent. Patent Owner indicates that only preliminary invalidity contentions have been exchanged, and Petitioner indicates that no fact discovery has occurred. The parties have not indicated specifically whether any of the issues to be addressed by the district court in a *Markman* hearing would have any direct bearing on the challenged claims of the ’680 Patent or the asserted grounds in this Petition.

Because the parallel proceeding is still in its early stages, no fact discovery has taken place, and any work that might be relevant to the issues raised in the Petition with respect to the ’680 Patent has not been identified specifically, we find this factor weighs against the exercise of discretionary denial.

4. *Overlap between issues raised in the petition and in the parallel proceeding*

Patent Owner argues that this factor favors denial of institution because “the overlap between the issues raised in the Petition and the parallel proceeding is essentially complete,” indicating that “all three of the challenged independent claims are asserted in the District Court litigation.” Prelim. Resp. 7–8.

Petitioner asserts that this factor favors institution because “Petitioner agrees that it will not assert invalidity grounds in the litigation that are included in this petition.” Pet. 22. Petitioner argues that its “agreement not to use the same grounds if institution is granted reduces the risk of duplicative efforts across proceedings.” *Id.* (citing *Sand Revolution II, LLC v. Continental Intermodal Grp.-Trucking LLC*, IPR2019-01393, Paper 24 at 11–12 (PTAB June 16, 2020) (informative); *Google LLC et al v. Parus Holdings, Inc.*, IPR2020-00846, Paper 9 at 22 (PTAB October 21, 2020)).

Stipulations, such as Petitioner’s affirmative stipulation here, mitigate to some degree concerns of duplicative efforts between the Board and the parallel proceeding with respect to the challenges raised in the Petition. *See Sand Revolution II, LLC v. Continental Intermodal Grp. – Trucking LLC*, IPR2019-01393, Paper 24 at 11–12 (June 16, 2020) (informative).

Therefore, given the potential overlap here, but taking into account Petitioner’s stipulation, we find that this factor weighs marginally against exercising discretionary denial.

5. *Whether the petitioner and the defendant in the parallel proceeding are the same party*

Here, the parties do not contest that Petitioner is a defendant in the parallel proceeding. Accordingly, this factor does not weigh against exercising discretionary denial.

6. *Other circumstances that impact the Board's exercise of discretion, including the merits*

Patent Owner argues that this factor favors denial of institution because

the District Court is already considering multiple cases involving the '680 patent that are set for trial earlier than the statutory deadline for a Final Written Decision would arise in this matter. Multiple defendants have indicated that they intend to challenge the validity of claims of the '680 patent, but have not joined in the instant Petition. Thus, the Petition constitutes little more than an attempt at serial and wasteful re-litigation before the Board of the same issues that will be addressed in the District Court litigation. Given this, it is an unnecessary use of the Board's resources to provide yet another forum for redundant challenge to the claims of the '680 patent, particularly where such a challenge would only follow a determination by the District Court.

Prelim. Resp. 8–9.

Petitioner argues that “the merits of the petition weigh strongly in favor of institution because

the only allegedly novel aspect of the '680 patent is its recitation of adding performance-based packet ordering on top of well-known protocol-based ordering. But the '680 patent's specification itself concedes all of the major claimed features were known in the prior art. Indeed, the '680 patent's specification confirms that Hyun's PCI Express ordering is the claimed protocol-based ordering, and further admits that performance considerations were “typical” in packet ordering systems. Likewise, Patent Owner expressly admitted that

Guthrie discloses protocol-based ordering “as claimed” and that performance-based ordering—the allegedly inventive feature—was a “typical” consideration “inherent” in packet transfer system design. Indeed, the prior art expressly teaches combining protocol-based ordering and performance-based ordering as claimed.

Pet. 23.

Based on the current record, we consider the merits to be particularly strong. For example, as discussed below with respect to independent claim 1, Petitioner provides persuasive evidence that the recited limitations of independent claim 1 are taught by Guthrie and Hyun and would have been obvious to one of ordinary skill in the art. Instituting *inter partes* review under these circumstances would “serve the interest of overall system efficiency and integrity because it allows the proceeding to continue in the event that the parallel proceeding settles or fails to resolve the patentability question presented.” *Fintiv*, Paper 11 at 15.

Given the particularly strong merits based on the current record, we determine this factor weighs against exercising discretionary denial.

7. Conclusion

We consider “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Fintiv*, Paper 11 at 6. In our view, the facts weighing against exercising discretion to deny institution collectively outweigh those favoring exercising discretion to deny institution. The parallel proceeding is in its early stages. Fact discovery has not yet commenced. The current trial date scheduled in the parallel proceeding is only one month before a projected final written decision in this case. Petitioner has agreed to stipulate that it will not assert invalidity grounds in the parallel proceeding that are included in this Petition.

Moreover, the merits of the Petition are particularly strong based on the present record. For these reasons, we decline to exercise our discretion under 35 U.S.C. § 314(a) to deny *inter partes* review.

B. Level of Ordinary Skill

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). “The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991).

Petitioner contends that a person of ordinary skill in the art “would have had a bachelor’s degree in computer or electrical engineering (or a comparable degree) with three or more years of experience designing SoCs [systems-on-chip] or processors (or equivalent experience). This level of skill is approximate, and more experience would compensate for less formal education, and vice versa.” Pet. 4 (citing Ex. 1003 ¶ 16). Patent Owner does not dispute this level of skill. *See generally* Prelim. Resp.

Based on the record presented, including our review of the ’680 patent and the types of problems and solutions described in the ’680 patent and cited prior art, we adopt Petitioner’s assessment of the level of ordinary skill in the art, except that an additional three years of post-degree professional design experience would be sufficient, and apply it for purposes of this Decision. To the extent the parties disagree as to the level of ordinary skill in the art, the parties may address the issue in their papers during trial and explain, for example, how a different definition would impact the obviousness analysis of the challenged claims.

C. Claim Construction

We apply the claim construction standard as set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc); 37 C.F.R. § 42.100(b) (The Board construes each claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.”) Under *Phillips*, claim terms are generally given their ordinary and customary meaning as would be understood by one with ordinary skill in the art in the context of the specification, the prosecution history, other claims, and even extrinsic evidence including expert and inventor testimony, dictionaries, and learned treatises, although extrinsic evidence is less significant than the intrinsic record. *Phillips*, 415 F.3d at 1312–17. Usually, the specification is dispositive, and it is the single best guide to the meaning of a disputed term. *Id.* at 1315.

Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Matal*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (in the context of an *inter partes* review, applying *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Petitioner asserts that “the challenged claims should be accorded their plain and ordinary meaning in this proceeding.” Pet. 7 (citing Ex. 1003 at ¶¶ 23–31). Petitioner references a prior district court claim construction for certain claim terms, but argues that “these [district court] constructions are not necessary to determine the patentability of the claims.” Pet. 8 (citing Ex. 1007, 3–4).

Patent Owner does not address claim construction in its Preliminary Response. *See generally*, Prelim. Resp.

For purposes of this Decision, we determine that no claim term requires express construction. *See Vivid Techs.*, 200 F.3d at 803 (holding that only terms that are in controversy need to be construed, and “only to the extent necessary to resolve the controversy”).

D. Patentability Challenges

1. Principles of Law

Pursuant to 35 U.S.C. § 103, a claim is unpatentable if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective indicia of nonobviousness, i.e., secondary considerations.² *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

The Supreme Court has made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming a combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. Reaching this conclusion, however, requires more than a mere showing that the prior art includes separate references covering each

² The current record does not include any evidence related to objective indicia of nonobviousness.

separate limitation in a claim under examination. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention. *Id.*

2. *Relevant Prior Art*

a) *Guthrie (Ex. 1004)*

Guthrie describes packet-based communications in a rules-based computer communication system based on an improvement to the PCI specification. Ex. 1004, 1:50–56, 6:13–16. Guthrie’s improvement involves “pipelined read transfers” (PRTs), which “are ordered in accordance with a predetermined processing priority to improve performance and avoid deadlocks.” *Id.* at Abstract. Guthrie describes using “ordering rules for the pipelined read transfers [to ensure] compatibility and system optimization.” *Id.* at 7:65–67. Guthrie explains that a system “that supports the PRT command will forward PRT requests and PRT response between its primary and secondary PCI busses.” *Id.* at 3:26–28. Guthrie explains that these PRT requests and responses are packets. *Id.* at 6:15–16.

Guthrie’s rules-based system for ordering PRT requests and responses is based on PCI protocol compliance rules. *Id.* at 1:50–54. Guthrie implements “[o]rdering rules for PCI data transfer transaction requests . . . set forth in the . . . PCI specification. In general, [these] ordering rules define priorities for the return of data requested within a PCI system.” *Id.* at 6:66–7:2. Guthrie describes that these rules include PRTs, which generate a protocol-based ordering of packets as a function of the PCI protocol rules. *Id.* at Abstract.

Guthrie also describes a system “to adjust the PRT command flow to maximize performance based on the characteristics of the PRT PCI devices, i.e., data buffering depth and sensitivity to latency.” *Id.* at 4:49–62. Guthrie describes a set of “new ordering rules for the pipelined read transfers [to ensure] compatibility and system optimization with the pipelined read transfers within PCI systems.” *Id.* at 7:65–67. Guthrie’s “new ordering rules” (performance-based rules) for PRTs are used in addition to PCI ordering rules (protocol-based rules) to determine the order in which the packet data of Guthrie’s system is communicated. *Id.* at 7:65–67.

Guthrie describes that the system communicates the PRT packets based on a received destination address. *Id.* at 6:23–26. Guthrie describes an ordering table (Fig. 9) with additional ordering rules to include “new ordering requirements” including “for performance reasons” to communicate the packets transmitted by the system. *Id.* at 8:32–41.

b) Hyun (Ex. 1005)

Hyun is a publication titled, The Effective Buffer Architecture for Data Link Layer of PCI Express. Ex. 1005, 1.³ Hyun describes a “buffer management scheme to increase performance of the PCI Express architecture.” *Id.* Hyun generalizes the architecture as follows: “PCI Express . . . consists of Root Complex, Switch, and Endpoint. A Root Complex denotes the root of an I/O [input/output] hierarchy that connects the CPU/memory subsystem to the I/O. A Switch provides fan-out

³ Citing testimony from Dr. Hall-Ellis, Petitioner asserts that “Hyun is prior art to the ’680 patent as it was published before the earliest priority date of the ’680 patent.” Pet. 12 (citing Ex. 1011). Patent Owner does not challenge the status of Hyun as prior art. *See generally*, Prelim. Resp. On this preliminary record, we are persuaded that Hyun qualifies as prior art to the ’680 patent. *See, e.g.*, Ex. 1011 ¶ 41.

capability and enables a series of connectors[.] An Endpoint is an I/O device connected to the PCI Express, such as graphic controller[.]” *Id.*

Hyun describes PCI Express as using the following layers and protocols:

The PCI Express specifies the architecture in terms of three discrete logical layers: the Transaction Layer, the Data Link Layer, and the Physical Layer. The PCI Express uses packets to communicate information between a transmitter and a receiver. In the transmitter, packets are formed in the Transaction and the Data Link Layers to carry the information from the transmitter to the receiver. The Physical Layer converts the information received from the Data Link Layer into an appropriate serialized format and transmits it to receiver. In the receiver, the received serial information is de-serialized into parallel packet by Physical Layer, and the packet is transmitted to the Data Link Layer and the Transaction Layer.

Id. at 2.

Hyun also describes PCI Express as using the following “traffic class” and “virtual channel” control of the “transactions” (i.e., packets):

The Traffic Class (TC) allows differentiation of transactions into eight traffic classes. Together with the PCI Express Virtual Channel (VC) support, the TC mechanism is a fundamental element for enabling differentiated traffic service. Every PCI Express Transaction Layer Packet (TLP) uses TC information as an invariant label that is carried end to end within the PCI Express fabric. As the packet traverses across the fabric, this information is used to make decisions with regards to proper servicing of the traffic.

Id. Hyun further states: “Conceptually, traffic that flows through VCs is multiplexed . . . on the transmitter and de-multiplexed . . . on the receiver. Traffic is associated with VCs by mapping packets with particular TC labels to their corresponding VCs.” *Id.*

Figure 2 of Hyun is shown below.

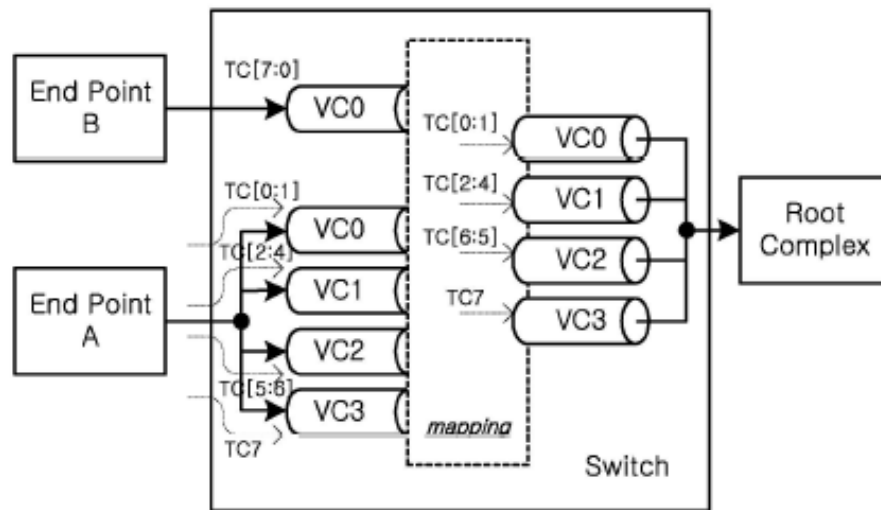


Fig. 2. An example of VC/TC mapping

Hyun’s Figure 2, above, shows an example of VC/TC mapping. Hyun discloses:

Endpoint A supports four VCs. Here, . . . VC3 has the highest priority and the VC0 has the lowest priority. If Endpoint A wants to transfer TLP with the highest priority through VC3 to Switch, it labels the TLP with TC7. Switch transfers the TLP through VC3, which has the highest priority, to Root Complex. Thus, TLP with TC7 label requested by Endpoint A is transferred to Root Complex more quickly than TLPs with other TC labels.

Id.

Hyun further describes PCI Express as using a “transaction type” control of the transactions. *Id.* Hyun states “[t]he transaction types can be classified as Posted Request, Non-Posted Request, and Completion [Request]” and “the order of the priority is Posted Request, Completion Request, and Non-Posted Request.” *Id.* Hyun further states “the ordering rules are applied within a single Traffic Class and there is no ordering requirement among requests with different TC labels[; t]hat is, the ordering is independent among transactions with different TC labels.” *Id.* at 3.

Figure 3 of Hyun is shown below.

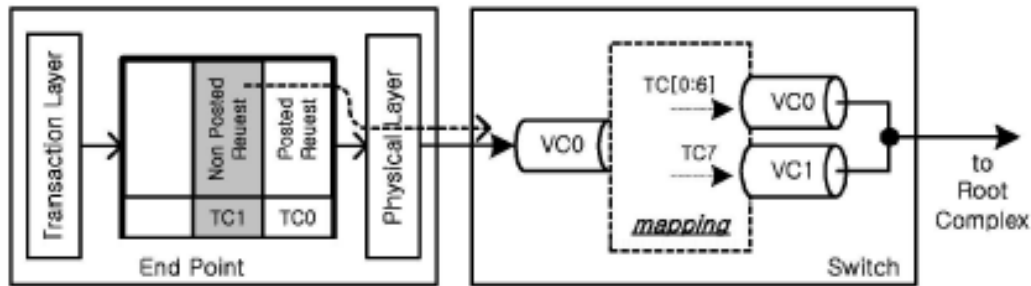


Fig. 3. Independent ordering requirement among requests with different TC labels.

Hyun’s Figure 3, above, schematically illustrates communication of requests from an End Point and through VCs connected by a Switch. According to Hyun, “figure 3 shows [the] independent ordering requirement between TCs in a general Endpoint implemented [by] one TC.” *Id.* Hyun “assume[s] that the []Posted Request with TC0 label is not processed due to [a problem] of the corresponding receiver. But, because of independent ordering requirement among TLPs with differential TC labels, the [Non] Posted Request with TC1 label can pass [the] Posted Request[.]” *Id.*⁴

Hyun’s proposed “buffer management scheme” (*id.* at 1) addresses a problem of a prior scheme for supporting the above controls of transactions (supporting the prioritizations of TCs, VCs, and transaction types). *Id.* at 3–4.

⁴ We use the bracketed portions of the quoted “[]Posted Request with TC0 label” and “[Non] Posted Request with TC1 label” to correct clear typographical errors in Hyun.

Hyun's Figure 4, is shown below.

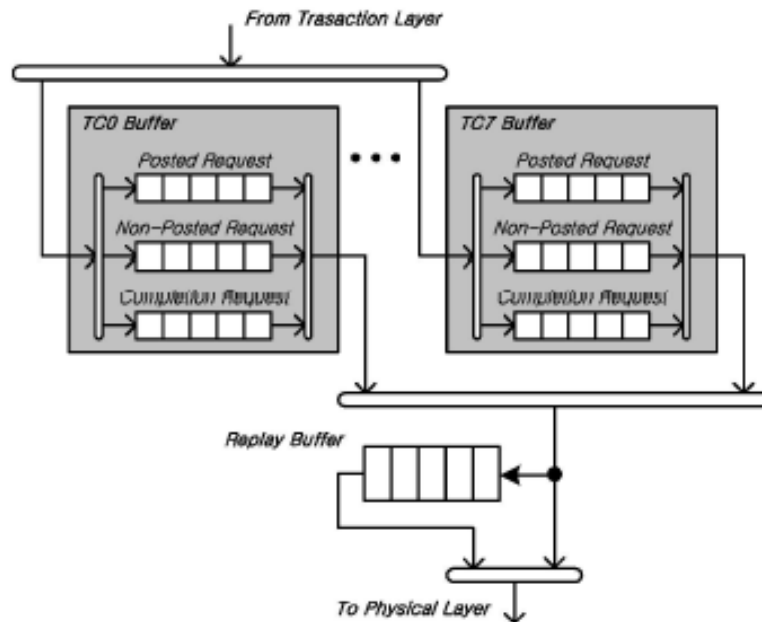


Fig. 4. The conceptual buffer architecture to support requirements for PCI Express in the typical Endpoint.

Hyun's Figure 4, above, schematically illustrates a buffer architecture connecting an Endpoint's transaction layer and physical layer. According to Hyun, this "Endpoint device with a single VC and multiple TCs [has] multiple TC buffers to support independent ordering requirement among TLPs with differential TC labels[,] . . . sub buffers in each TC buffer to support the ordering rules among three request types with same TC[,] and [a] replay buffer to support replay mechanism." *Id.* at 3. The replay mechanism temporarily stores already-transmitted transactions (i.e., holds copies) because: "[I]f the received TLP has error, then the receiver sends the negative acknowledgement . . . [and] the transmitter should send this TLP again[.] Also, if the transmitter doesn't receive any acknowledgement for long time, it must send all TLPs are not acknowledged again." *Id.*

Hyun describes the prior scheme of buffers as having a drawback with respect to the TC buffers. Hyun “assume[s] that TLPs with some TC labels are issued more frequently than TLPs with other TC labels by transmitter's Transaction layer. In this case, the efficiency of the whole buffers may be reduced. It will be occurred also when TLP with one request among three request types are issued more frequently.” *Id.* Hyun also describes the prior scheme as having a drawback with respect to the replay buffer. Hyun “assume[s] that the replay buffer is full, because TLPs in replay buffer are [not] acknowledged ye[t]. So transmitter cannot transfer more requests although TC buffer has requests to transfer.” *Id.* at 3–4.

Hyun’s proposed scheme addresses the above drawbacks by “merg[ing] all buffers for TCs and replay of one VC into only one buffer and dynamically adjust[ing] the size[.]” *Id.* at 4. Generally speaking, each transaction is stored to a physical address of the buffer and assigned (mapped to) a respective logical address that prioritizes the transaction according to the above controls of transactions (via the prioritizations of TCs, VCs, and transaction types). *Id.* Hyun states “the proposed scheme efficiently supports not only the ordering rules among the requests with the same TC label but also independent ordering requirement among requests with different TC labels.” *Id.* Hyun further states “[t]he proposed scheme assigns dynamically . . . TC buffer [space] and replay buffer space using only one buffer.” *Id.*

c) O’Connor (Ex. 1006)

O’Connor is directed to a high-speed, starvation-free arbiter system having a plurality of arbiters for use in computing or processing systems including computer systems, server systems, and wireless communication devices and systems. Ex. 1006, Abstract, 1:60–62. Such wireless devices

may include, for example, a “personal digital assistant (PDA), a laptop or portable computer with wireless communication capability, a web tablet, a wireless telephone, a wireless headset, a pager, an instant messaging device, an MP3 player, a digital camera, an access point, or other device that may receive and/or transmit information wirelessly.” *Id.* at 2:31–36.

O’Connor describes several different arbitration methods. These include, priority-based arbitration, which refers to a method of distributing resources in which some requesters are given preferential treatment according to their assigned priority, and unfair arbitration, which refers to an arbitration method that may not give all requesters an equal opportunity to obtain the resource. Other described arbitration methods include fairer arbitration, which is an arbitration scheme that comes closer to being fair (that is, to treating all requesters about the same) than some other scheme, fixed-priority arbitration, which is an arbitration scheme in which a priority assigned to each requestor may be fixed and generally does not change over time, and least-recently-granted arbitration, which is an arbitration scheme that grants a resource to the requester that has not been granted the resource for the longest period of time. *Id.* at 2:50–67.

According to O’Connor, pipelined systems generally have a need for fast arbitration schemes to allocate a shared resource among several requesters. *Id.* at 1:12–14. O’Connor teaches that applying, e.g., two-stage arbitration improves access in a pipelined system. *See, e.g., id.* at 3:38–4:28 (teaching that two arbiters may be used to apply two-stage arbitration, improving access of lower-priority requesters in a pipelined system), 4:30–35 (describing three arbiters used for three-stage arbitration).

E. Obviousness over Guthrie (Ground 1)

Petitioner asserts that claims 1, 3, 7, 8, 10–12, and 15–20 would have been obvious over Guthrie. Pet. ix, 26–57. Patent Owner does not respond substantively to Petitioner’s evidence and arguments with respect to these claims. *See generally*, Prelim. Resp.

Claims 1, 8, and 20 are independent. Independent claim 1 is exemplary. We consider Petitioner’s evidence and arguments with respect to claim 1 in detail below.

1. Independent Claim 1

a) 1[a] A method for managing packet-based communications in a rule-based system

For the preamble, Petitioner asserts that, in Patent Owner’s papers from IPR2016-01401, “Patent Owner admitted that Guthrie discloses managing packet-based communications in a rules based system, i.e., protocol-based ordering according to PCI.” Pet. 26 (citing Ex. 1008, 17). Petitioner also argues that

Guthrie teaches a transfer method called Pipeline Read Transfer (“PRT”). In the PRT system, data packets are first ordered in compliance with Peripheral Component Interconnect (“PCI”) ordering protocols. Ex. 1004 at 1:66-67 (“A method and apparatus is provided in which Pipelined Read Transfers (PRT) are implemented.”), 8:11-13 (“The pipelined read transfer information **packet** includes the source address SA, the target or destination address DA and the total byte count of the **transfer**.”); 8:32-35 (“In FIG. 9, columns 7 and 8, together with rows 6 and 7 have been **added to the PCI specification ordering rules** to reflect the new ordering requirements added for PRT transactions.”).

Pet. 26–27 (citing Ex. 1003 ¶ 39).

As previously noted above, Patent Owner does not respond substantively to Petitioner's evidence and arguments with respect to this limitation.

Based on the record before us, we are persuaded that Petitioner has shown sufficiently for purposes of institution that Guthrie's description of a Pipelined Read Transfer method amounts to *a method for managing packet-based communications in a rule-based system*, as recited in the preamble of independent claim 1.⁵

b) 1[b] in a packet processor

For this limitation, Petitioner argues that "Guthrie teaches that its PRT response master processes packets by first ordering them according to PCI rules, and further ordering them according to additional PRT rules." Pet. 27. Petitioner also argues that "Guthrie's PRT response master is a packet processor according to the plain and ordinary meaning of that term, *i.e.*, a processor that processes packets." *Id.* (citing Ex. 1003 ¶ 40). Petitioner's declarant, Dr. Hassoun, testifies that "Guthrie teaches that its PRT response master processes packets by first ordering them according to PCI rules, and further ordering them according to additional PRT rules." Ex. 1003 ¶ 40.

Patent Owner does not respond substantively to Petitioner's evidence and arguments with respect to this limitation.

Based on this preliminary record, Petitioner has demonstrated sufficiently that Guthrie's PRT response master amounts to the recited "*packet processor*" of limitation 1[b].

⁵ The issue of whether the preamble is limiting need not be resolved at this stage of the proceeding because Petitioner shows sufficiently for purposes of institution that the recitation in the preamble is satisfied by the prior art.

- c) *1[c] generating a protocol-based ordering configuration for passing packet data as a function of protocol compliance rules for the rules-based system*

For this limitation, Petitioner asserts that “Guthrie teaches that all packets are processed first according to PCI ordering rules—a protocol-based ordering configuration—to maintain PCI compatibility.” Pet. 28–29 (citing Ex. 1004 at 7:65–67, 8:1–4, 8:32–35; Ex. 1003 ¶ 44). In support, Petitioner provides Guthrie’s Figure 9 (annotated), shown below. Pet. 29.

		PREVIOUS TRANSACTION							
SUBSEQUENT TRANSACTION		2 PMW	3 DRR	4 DWR	5 DRC	6 DWC	7 PRTR	8 PRTC	
PMW	1	N	Y	Y	Y	Y	Y	Y	"protocol-based ordering" rules
DRR	2	N	Y/N	Y/N	Y/N	Y/N	(Y)/N	(Y)/N	
DWR	3	N	Y/N	Y/N	Y/N	Y/N	(Y)/N	(Y)/N	
DRC	4	N	Y/N	Y/N	Y/N	Y/N	Y	Y	
DWC	5	N	Y/N	Y/N	Y/N	Y/N	Y	Y	
PRTR	6	N	Y/N	Y/N	Y/N	Y/N	Y/N	(Y)/N	"performance-based ordering" rules
PRTC	7	Y	(Y)/N	(Y)/N	(Y)/N	(Y)/N	Y/N	Y/N	

FIG. 9

Guthrie’s annotated Figure 9, above, is a chart illustrating the ordering priorities for pipelined read transfers. According to Guthrie, Figure 9 represents the ordering rules when a bridge in the system is capable of allowing multiple transactions to proceed in each direction at the same time. Ex. 1004, 8:4–7. Each column of the table represents an access that was accepted by the bridge earlier, while each row represents a transaction just accepted. The contents of the box indicate what ordering relationship the second transaction must have to the first. Ex. 1004, 8:7–11. According to

Petitioner, Figure 9 illustrates “the PCI ordering rules (yellow) that are first applied to packets.” Pet. 29.

Patent Owner does not respond substantively to Petitioner’s evidence and arguments with respect to this limitation.

Based on this preliminary record, Petitioner has demonstrated sufficiently that Guthrie’s ordering priorities for pipelined read transfers meets the recited “*generating a protocol based ordering configuration for passing packet data as a function of protocol compliance rules for the rules based system*” of limitation 1[c].

d) *1[d] generating a performance-based communications order for passing the packet data as a function of performance-based rules and the generated protocol-based ordering configuration*

For this limitation, Petitioner argues that “Guthrie teaches the claimed performance-based ordering by its disclosure of additional PRT packet ordering rules.” Pet. 30 (citing Ex. 1003 ¶ 46). Petitioner argues, “Guthrie teaches that in addition to adhering to PCI’s protocol-based ordering configuration, its PRT method adds ‘new ordering rules for the pipelined read transfers to insure [sic] compatibility and system optimization with the pipelined read transfers within the PCI system.’” Pet. 30–31 (citing Ex. 1004, 7:65-67 (emphasis omitted)).

Referring to Guthrie’s Figure 9 (annotated by Petitioner, shown above in Section II.E.1.c), Petitioner argues that “Guthrie’s system adheres to the protocol-based ordering set forth in the PCI specification (yellow), and adds ‘**new ordering rules** for the pipelined read transfers’ (red).” Pet. 31 (citing Ex. 1004, 7:65–67 (emphasis added by Petitioner); Ex. 1003 ¶ 47).

Petitioner further argues that “Guthrie teaches: ‘**Pipelined read transfers are ordered** in accordance with predetermined processing priority *to improve*

performance and avoid deadlocks.” Pet. 31–32 (citing Ex. 1004, 2:8–10 (emphasis added by Petitioner), *see also id.* at 7:65–67).

Patent Owner does not respond substantively to Petitioner’s evidence and arguments with respect to this limitation.

Based on this preliminary record, Petitioner has demonstrated sufficiently that Guthrie’s pipelined read transfers ordered in accordance with predetermined processing priority to improve performance teaches the recited “*generating a performance based communications order for passing the packet data as a function of performance based rules and the generated protocol based ordering configuration*” of limitation 1[d].

e) *1[e] communicating the packet data as a function of the performance-based communications order*

For this limitation, Petitioner argues that

Guthrie teaches communicating packet data as a function of its performance-based ordering, i.e., as a function of PRT ordering requirements. *See* claim 1d. Guthrie teaches that its PRT response master communicates packets to the request target once they are ordered according to its additional PRT performance-based rules. Ex. 1004 at 8:1-43 (describing ordering the packets according to PRT performance-based ordering rules before transfer), 5:16-29 (describing, e.g., burst data transfers), 6:23-26 (“The PRT request target will use the destination address received in the PRT request packet as the initial destination address in the PRT response packet [when the] PRT request ***data is delivered***[.]”) (emphasis added); 6:66-7:19 (describing that packet ordering rules determine transfer ordering), 1:12-14 (teaching “an ***improved information transfer methodology*** in a computer related environment.”) [(emphasis added)]; Ex. 1003 at ¶ 50.

Pet. 34.

Patent Owner does not respond substantively to Petitioner’s evidence and arguments with respect to this limitation.

Based on this preliminary record, Petitioner has demonstrated sufficiently that Guthrie's PRT response master communicating packets to request targets teaches the recited "*communicating the packet data as a function of the performance based communications order*" of limitation 1[e].

2. *Dependent Claims 3, 7, 10–12, and 15–19*

Petitioner argues that Guthrie teaches the limitations of dependent claims 3, 7, 10–12, and 15–19. *See* Pet. 34–42, 46–64.

Patent Owner does not respond substantively to Petitioner's evidence and arguments with respect to these dependent claims. *See generally*, Prelim. Resp.

We have considered the evidence and arguments presented in the Petition, as well as the testimony of Petitioner's declarant, Dr. Hassoun. *See* Pet. 34–42, 46–57; Ex. 1003 ¶¶ 51–69, 76–98. Based on the current record before us, we are persuaded that Petitioner has demonstrated sufficiently for purposes of institution that Guthrie teaches the limitations of dependent claims 3, 7, 10–12, and 15–19.

3. *Conclusion on Ground 1*

Based on the current record, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge under 35 U.S.C. § 103(a) to claims 1, 3, 7, 8, 10–12, and 15–20 as obvious over Guthrie.

F. *Obviousness over Guthrie and O'Connor (Ground 2)*

Petitioner asserts that dependent claims 2, 4–6, and 9 would have been obvious over Guthrie and O'Connor. Pet. ix, 58–64. Patent Owner does not respond substantively to Petitioner's evidence and arguments with respect to these claims. *See generally*, Prelim. Resp.

1. Dependent claims 2, 4–6, and 9

Petitioner argues that Guthrie and O'Connor teach the limitations of dependent claims 2, 4–6, and 9. *See* Pet. 58–64.

Patent Owner does not respond substantively to Petitioner's evidence and arguments with respect to these dependent claims. *See generally*, Prelim. Resp.

We have considered the evidence and arguments presented in the Petition, as well as the testimony of Petitioner's declarant, Dr. Hassoun. *See* Pet. 58–64; Ex. 1003 ¶¶ 104–122. Based on the current record before us, we are persuaded that Petitioner has demonstrated sufficiently for purposes of institution that Guthrie and O'Connor teach the limitations of dependent claims 2, 4–6, and 9.

We are also persuaded that Petitioner has demonstrated that a person of ordinary skill in the art would have had reasons to combine the teachings of Guthrie and O'Connor in the manner described in the Petition. For example, claim 2 depends from independent claim 1, and adds a first arbiter to generate the protocol-based ordering configuration, and a second separate arbiter to generate the performance-based communications order. *See* Ex. 1001, 9:17–26. Petitioner argues that a person of ordinary skill in the art would have looked to O'Connor's teaching of applying two-stage arbitration to improve access of lowered priority requesters in a pipelined system to carry out the different arbitration functions in Guthrie to improve efficiency. Pet. 60–61 (citing Ex. 1006, 3:38–4:28; Ex. 1003 ¶ 112). Petitioner argues that both Guthrie and O'Connor are in the same field of endeavor as the '680 Patent, namely, data packet processing, and that all three patents use similar techniques to solve the same problem. Pet. 61. Petitioner also argues that a person of ordinary skill in the art would have had a reasonable expectation

of success, as “Guthrie uses the same techniques to improve data packet transmission as the ’680 patent,” and “O’Connor also uses a two-step arbitration scheme to improve packet data flow.” *Id.*

2. Conclusion on Ground 2

Based on the current record, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge under 35 U.S.C. § 103(a) to claims 2, 4–6, and 9 as obvious over Guthrie and O’Connor.

G. Obviousness over Hyun (Ground 3)

Petitioner asserts that claims 1, 2, 7–11, 13–16, and 20 would have been obvious over Hyun. Pet. ix, 64–81. Patent Owner does not respond substantively to Petitioner’s evidence and arguments with respect to these claims. *See generally*, Prelim. Resp.

As noted above, claims 1, 8, and 20 are independent. Independent claim 1 is exemplary, and we consider Petitioner’s evidence and arguments with respect to this claim below.

1. Independent Claim 1

As discussed above, claim 1 recites a method for managing packet-based communications in a rules-based system, generating a protocol-based ordering configuration and a performance-based communications order for passing packet data as a function of performance-based rules and the protocol-based ordering configuration, and communicating the packet data as a function of the performance-based communications order. Ex. 1001, 9:5–16.

Petitioner argues that Hyun teaches “an improved buffer architecture for the data link layer of PCI express” that “uses packets to communicate information between a transmitter and a receiver.” Pet. 64–65 (citing

Ex. 1005, 1–2; Ex. 1003 ¶¶ 123–124). Petitioner argues that “PCI Express is a protocol-based ordering configuration,” because Hyun states that “[o]ne of the arbitration functions (112) orders the packet data in accordance with protocol standards (*e.g., to meet PCI Express standards* when implemented with a PCI Express system).” Pet. 66 (quoting Ex. 1001, Abstr.) (alteration and emphasis added by Petitioner).

Petitioner also argues that “Hyun teaches additional ordering through its ‘efficient buffer management scheme.’” Pet. 66 (quoting Ex. 1005, 1). Petitioner argues that “Hyun proposes a buffer management scheme that supports ‘not only the ordering rules among the requests with the same TC label [*i.e., the PCI Express ordering rules*] but also independent ordering requirement[s] among requests with different TC labels.’” Pet. 66 (quoting Ex. 1005, 4) (alterations by Petitioner). “These rules,” Petitioner argues, “are aimed at ‘increas[ing] *performance* and efficiency of the buffer.’” Pet. 66 (quoting Ex. 1005, 4–5) (alteration and emphasis added by Petitioner). Petitioner asserts that “Hyun’s performance-based ordering requirements are added on top of (and do not replace or modify) its PCI Express protocol-based ordering rules.” Pet. 67 (quoting Ex. 1005, 5 (“The proposed scheme...*keeps the ordering requirements of PCI Express.*”)) (emphasis added by Petitioner)). According to Petitioner, “Hyun then transmits the packets according to this additional ordering.” Pet. 68 (citing Ex. 1005, 5 (describing rates of “transfer” of packets); Ex. 1003 ¶ 128).

Dr. Hassoun’s testimony is consistent with, and supports Petitioner’s arguments. *See* Ex. 1003 ¶¶ 123–128.

Based on this preliminary record, Petitioner has demonstrated sufficiently that Hyun teaches the recited limitations of independent claim 1.

2. Dependent Claims 2, 7, 9–11, and 13–16

Petitioner argues that Hyun teaches the limitations of dependent claims 2, 7, 9–11, and 13–16. *See* Pet. 68–72, 74–81.

Patent Owner does not respond substantively to Petitioner’s evidence and arguments with respect to these dependent claims.

We have considered the evidence and arguments presented in the Petition, as well as the testimony of Petitioner’s declarant, Dr. Hassoun. *See* Pet. 68–72, 74–81; Ex. 1003 ¶¶ 129–135, 140–149. Based on the current record before us, we are persuaded that Petitioner has demonstrated sufficiently for purposes of institution that Hyun teaches the limitations of dependent claims 2, 7, 9–11, and 13–16.

3. Conclusion on Ground 3

Based on the current record, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge under 35 U.S.C. § 103(a) to claims 1, 2, 7–11, 13–16, and 20 as obvious over Hyun.

H. Obviousness over Hyun and Guthrie (Ground 4)

Petitioner asserts that dependent claims 3–6 and 17–19 would have been obvious over Hyun and Guthrie. Pet. ix, 82–87. Patent Owner does not respond substantively to Petitioner’s evidence and arguments with respect to these claims. *See generally*, Prelim. Resp.

1. Dependent claims 3–6 and 17–19

Petitioner argues that Hyun and Guthrie teach the limitations of dependent claims 3–6 and 17–19. *See* Pet. 82–87.

Patent Owner does not respond substantively to Petitioner’s evidence and arguments with respect to these dependent claims. *See generally*, Prelim. Resp.

We have considered the evidence and arguments presented in the Petition, as well as the testimony of Petitioner's declarant, Dr. Hassoun. *See* Pet. 82–87; Ex. 1003 ¶¶ 155–171. Based on the current record before us, we are persuaded that Petitioner has demonstrated sufficiently for purposes of institution that Hyun and Guthrie teach the limitations of dependent claims 3–6 and 17–19.

We are also persuaded that Petitioner has demonstrated that a person of ordinary skill in the art would have had reason to combine the teachings of Hyun and Guthrie in the manner described in the Petition. For example, claim 3 depends from independent claim 1, and specifies that the packet ordering and passing of claim 1 occurs on the *receiving* side of the transaction, i.e., that ordering be applied to packets at the requesting device. *See* Ex. 1001, 9:27–38; Ex. 1003 ¶ 155. Petitioner argues that a person of ordinary skill in the art would have been motivated by Guthrie's teaching of enhanced ordering at each node of a packet transfer system, to include the same double-ordering functionality at Hyun's receiving nodes. *See* Pet. 82–84; Ex. 1003 ¶¶ 155–160.

2. *Conclusion on Ground 4*

Based on the current record, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge under 35 U.S.C. § 103(a) to claims 3–6 and 17–19 as obvious over Hyun and Guthrie.

III. CONCLUSION

For the foregoing reasons, we are persuaded that the Petition demonstrates a reasonable likelihood of prevailing in showing the unpatentability of at least one of the challenged claims of the '680 patent. Because Petitioner has satisfied the threshold for institution as to at least one

claim, we institute *inter partes* review on all claims and all grounds raised in the Petition. *See SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018) (holding that a decision to institute under 35 U.S.C. § 314 may not institute on fewer than all claims challenged in the petition).

IV. ORDER

Accordingly, it is

ORDERED that an *inter partes* review is instituted as to all challenged claims on the grounds raised in the Petition; and

FURTHER ORDERED that *inter partes* review is instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

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