

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC., DELL TECHNOLOGIES INC.,
AND DELL INC.

Petitioners,

v.

CORRIGENT CORPORATION,
Patent Owner.

IPR2023-00168
Patent 7,113,485 B2

Before NATHAN A. ENGELS, CHRISTOPHER L. OGDEN, and
BRENT M. DOUGAL, *Administrative Patent Judges*.

ENGELS, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Cisco Systems, Inc., Dell Technologies Inc., and Dell Inc. (collectively, “Petitioner”) filed a Petition (Paper 3, “Pet.”) requesting *inter partes* review of claims 1–20 of U.S. Patent No. 7,113,485 B2 (Ex. 1001, “the ’485 patent”). Patent Owner Corrigent Corporation filed a Preliminary Response. Paper 7. The Board issued a Decision Granting Institution. Paper 10.

After institution, Patent Owner filed a Response (Paper 19, “PO Resp.”), Petitioner filed a Reply (Paper 23), and Patent Owner filed a Sur-reply (Paper 26). Both parties presented oral arguments at a virtual hearing, and a copy of the hearing transcript is in the record. Paper 30.

Based on the complete record in this proceeding, we determine that Petitioner has proven by a preponderance of the evidence that claims 1–20 of the ’485 patent are unpatentable.

A. *Real Parties-in-Interest*

Petitioner identifies Cisco Systems, Inc., Dell Technologies Inc., and Dell Inc. as the real parties-in-interest. Pet. 76. Patent Owner identifies itself as the sole real party-in-interest. Paper 5, 2.

B. *Related Matters*

The parties indicate that the ’485 patent is involved in the following district court cases: *Corrigent Corp. v. Cisco Sys., Inc.*, No. 6-22-cv-00396 (W.D. Tex.), and *Corrigent Corp. v. Dell Techs., Inc.*, No. 1-22-cv-00496 (D. Del.). Pet. 76; Paper 5, 2.

C. *The Challenged Patent*

The ’485 patent relates to “improved methods and devices for measuring network latency, particularly in ring topologies.” Ex. 1001, 2:59–

61. Among other things, the '485 patent describes methods for measuring respective latencies of different classes of service, measuring round-trip latency between pairs of nodes, and monitoring latency variations over time. Ex. 1001, 2:62–3:3.

D. Illustrative Claim

Of the challenged claims, claims 1, 6, 9, 11, 16, and 19 are independent claims. Claim 6 is copied below with bracketed labels added as referenced in the Petition.

[6.0] A method for measuring latency in a network in which traffic is transmitted in a plurality of classes of service, the method comprising:

[6.1] generating a latency measurement packet containing an indication that the packet belongs to a selected one of the classes of service;

[6.2] transmitting the latency measurement packet from a source node in the network, so that the packet is passed through the network at a level of service accorded to the class;

[6.3] noting a time of receipt of the latency measurement packet at a destination node in the network; and

[6.4] calculating the latency for the selected one of the classes of service by taking a difference between a time of transmission of the latency measurement packet and the time of receipt thereof.

E. Alleged Grounds of Unpatentability

Petitioner asserts that claims 1–20 would have been unpatentable on the following grounds:

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
6, 7, 16, 17	103(a) ¹	Klassen ²
9, 19	103(a)	Klassen, Geiger ³
1–4, 8, 11–14, 18	103(a)	Klassen, Kao, ⁴ Poulin ⁵
10, 20	103(a)	Klassen, Kao, Geiger
5, 15	103(a)	Klassen, Kao, Poulin, Geiger

Pet. 11. Petitioner also supports its challenge with a Declaration of Henry Houh, Ph.D. (Ex. 1003) and the Supplemental Declaration of Dr. Henry Houh in Support of Petitioner’s Reply (Ex. 1052). Patent Owner supports its positions with the Declaration of George N. Rouskas, Ph.D. Ex. 2005.

II. ANALYSIS

A. Petitioner’s Burden of Proof

Petitioner bears the burden of proving unpatentability of the challenged claims, and this burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). Petitioner must prove unpatentability by a preponderance of the evidence. *See* 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

¹ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. The ’485 patent was filed prior to the effective date of the AIA. Therefore, we apply the pre-AIA version of § 103; however, our analysis would be the same under the current version of the statute.

² US 6,711,137 B1; filed Mar. 12, 1999; issued Mar. 23, 2004. Ex. 1005.

³ US 5,701,302; filed Oct. 25, 1995; issued Dec. 23, 1997. Ex. 1006.

⁴ US 7,212,490 B1; filed July 6, 2001; issued May 1, 2007. Ex. 1007.

⁵ US 6,545,979 B1; filed Nov. 27, 1998; issued Apr. 8, 2003. Ex. 1008.

B. Law of Obviousness

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter 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. *See 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 ordinary skill in the art; and (4) secondary considerations of nonobviousness, if placed at issue which has not happened here. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

C. Level of Ordinary Skill in the Art

In determining the level of skill in the art, we consider the type of problems encountered in the art, the prior art solutions to those problems, the rapidity with which innovations are made, the sophistication of the technology, and the educational level of active workers in the field. *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *Orthopedic Equip. Co. v. U.S.*, 702 F.2d 1005, 1011 (Fed. Cir. 1983).

Petitioner contends a person of ordinary skill in the art at the time of the invention would have had “a working knowledge of network communications, including ring networks and latency calculation methodologies” and “a bachelor’s degree in computer science, computer engineering, electrical engineering, or an equivalent training, and approximately two years of work experience in network communications.” Pet. 9 (citing Ex. 1003 ¶ 19). Petitioner also states that a lack of work

experience can be remedied by additional education, and vice versa. Pet. 9 (citing Ex. 1003 ¶ 19). Patent Owner states that it uses the same definition of a person of ordinary skill in the art. PO Resp. 4.

We determine Petitioner’s level of ordinary skill is supported by testimonial evidence and is consistent with the level reflected by the ’485 patent and the asserted prior art, and we apply Petitioner’s level of ordinary skill in this Decision.

D. Claim Construction

We construe claims using the principles set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc) and related cases. *See* 37 C.F.R. § 42.100(b) (2022). Under that precedent, the words of a claim are generally given their “ordinary and customary meaning,” which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *Phillips*, 415 F.3d at 1312–13.

Neither party proposes any express claim constructions (Pet. 10; PO Resp. 3), but Patent Owner notes that the district court in the parties’ co-pending litigation construed certain claim elements, such as the preamble and “latency measurement packet” (PO Resp. 3 (citing Ex. 2001, 3; Ex. 2005 ¶ 38)). We determine it is unnecessary to construe any terms. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

E. Ground 1: Alleged Obviousness of Claims 6, 7, 16, and 17 as Obvious Based on Klassen

Petitioner provides a claim-by-claim, limitation-by-limitation comparison of each of claims 6, 7, 16, and 17 to specific teachings of Klassen, with citations to testimony from Dr. Houh as additional supporting evidence. Pet. 14–28.

1. *[6.0] A method for measuring latency in a network in which traffic is transmitted in a plurality of classes of service, the method comprising:*

The parties do not specifically address whether the preamble is limiting, but Petitioner cites Klassen as teaching “a ‘**method for network measurement** and planning’ where ‘probative testing’ is used to ‘deriv[e] . . . **latency**.’” Pet. 14–15 (quoting Ex. 1005, claims 16, 40) (citing Ex. 1005, 3:66–4:3, 8:43–52; Ex. 1003 ¶¶ 45–47). Petitioner cites Klassen’s teachings regarding “probative test packets” (cited as the claimed “latency measurement packets”) that include “type of service” and “class of service” bits in the packet headers. Pet. 15 (citing Ex. 1005, 2:53–60, 7:49–55, 11:50–51, 16:17–33; Ex. 1003 ¶¶ 50–53); *see* Reply 3.

Patent Owner does not specifically rebut Petitioner’s showings for the preamble beyond the arguments addressed below with respect to limitation [6.1]. To the extent that the preamble may be limiting, we determine Petitioner has sufficiently shown that Klassen teaches the preamble.

2. *[6.1] generating a latency measurement packet containing an indication that the packet belongs to a selected one of the classes of service;*

Petitioner contends Klassen’s probative test packets include one-way packets and two-way packets that are generated and transmitted by an “apparent network speed analysis (ANSA) application” (cited as the claimed

“source node in the network”) to measure latency at different priority levels. Pet. 16–19 (citing Ex. 1005, 1:52–55, 1:59–63, 4:7–12, 7:56–60, 8:24–32, 8:53–59, 9:32–46, 16:17–33; Ex. 1003 ¶¶ 48–49, 55–64, 66–68). As noted above, Petitioner contends Klassen teaches that its probative test packets include “type of service” or “class of service” bits in their headers, and Petitioner contends Klassen’s packets are transmitted through the network with a priority level that is indicated by the value of those bits. Pet. 20; Reply 3. Petitioner also contends that since Klassen sends and receives the probative test packets, it would have been obvious to a person of ordinary skill for the ANSA to generate the packets. Pet. 1819; *see* PO Resp. 63–64.

Patent Owner argues the Petition maps the “level of service” and “class of service” to the same disclosures in Klassen. PO Resp. 64. According to Patent Owner, Petitioner contends the claimed “classes of service” are Klassen’s priority levels for limitations [6.0] and [6.1], but Patent Owner contends the Petition also “emphasizes Klassen’s priority levels in bold and suggests that Klassen’s [type-of-service/class-of-service] ToS/CoS bits specify a priority level.” Sur-reply 26 (citing Pet. 15, 19). Patent Owner also argues that Petitioner improperly introduces new argument in Petitioner’s Reply by arguing that it is the “values” of the ToS/CoS bits that constitute the claimed “class of service,” while Klassen’s priority level corresponding to each value constitutes the recited “level of service.” Sur-reply 26 (citing Reply 3; Ex. 1052 ¶¶ 7–9).

We are persuaded by Petitioner’s argument that Klassen teaches or reasonably suggests limitation [6.1]. Klassen states that its ANSA application sends and receives probative test packets having ToS or CoS bits “set in network packets’ headers” (Ex. 1005, 2:53–57) and that priority bits

(e.g., ToS) are used to distinguish levels of service in the network (Ex. 1005, 11:50–51). We disagree with Patent Owner that Petitioner introduced improper new argument by citing the “value” of the header bits in Petitioner’s Reply; we understand the Petition to refer to the value of the bits when referring to the bits and the fact that packets can be categorized according to the bits, with the Reply reasonably clarifying the arguments from the Petition.

3. *[6.2] transmitting the latency measurement packet from a source node in the network, so that the packet is passed through the network at a level of service accorded to the class;*

Petitioner contends Klassen’s probative test packets are transmitted into the network by the ANSA (the source node in the network). Pet. 19 (citing Ex. 1005, 7:56–60, 8:53–59). Petitioner also contends Klassen uses the ToS or CoS bits such that the packets perform network measurement at different priority levels (the level of service accorded to the class of service of the packet). Pet. 20 (citing Ex. 1005, 3:66–4:3, 6:64–7:22; Ex. 1003 ¶¶ 7273).

Patent Owner argues “for limitation [6.2], Petitioner[] fails to explain how Klassen discloses a ‘level of service’ accorded to the selected ‘class[] of service.’” PO Resp. 64; *see* Sur-reply 25.

We are persuaded by Petitioner’s arguments that Klassen teaches or reasonably suggests limitation [6.2]. Among other things, Klassen states that “[p]riority bits (e.g., TCP/IP type of service) are used to distinguish levels of service in the network.” Ex. 1005, 11:50–51; *see* Ex. 1005, 7:18–21, 7:49–55. We also disagree with Patent Owner’s arguments that Petitioner conflates the classes of service and level of service for the reasons explained above.

4. *[6.3] noting a time of receipt of the latency measurement packet at a destination node in the network; and*

Petitioner contends Klassen's ANSA sends probative test packets to a target station (the destination node in the network). Pet. 20–21 (citing Ex. 1005, 7:56–60, 9:36–44). According to Petitioner, it would have been obvious for Klassen's probative test packets to follow the established standard for Internet Control Message Protocol ("ICMP") packets that use "ping programs" to measure latency. Pet. 21 (citing Ex. 1003 ¶ 82; Ex. 1005, 1:53–63, 5:15). It follows, according to Petitioner, that ICMP explains that echo or ping packets include a "Receive Timestamp" that specifies "the time the echoer first touched [the message] on receipt." Pet. 21 (citing Ex. 1023, 16–17; Ex. 1003 ¶ 82). Petitioner further contends a person of ordinary skill would have understood that in both one-way and two-way ping scenarios, it would have been obvious that target station 24 notes a time of receipt of the packet. Pet. 21–22 (citing Ex. 1005, 1:58–63; Ex. 1003 ¶¶ 76–83).

Patent Owner does not separately address Petitioner's showings for this limitation. We find Petitioner's arguments persuasive.

5. *[6.4] calculating the latency for the selected one of the classes of service by taking a difference between a time of transmission of the latency measurement packet and the time of receipt thereof.*

Petitioner contends Klassen's ANSA records or calculates network evaluation parameters about probative test packets include a packet send time stamp, packet receipt time stamp, packet one-way trip time, and packet round trip time. Pet. 22, 7:56–60, 8:43–52, 9:32–46; Ex. 1003 ¶¶ 84–85. According to Petitioner, "[i]t was well known that one-way latency is the time that it takes a packet to arrive at a specific network node from a sending

node, and round-trip latency is the time that it takes a packet to arrive at a specific network node and then return to the sending node.” Pet. 22 (citing Ex. 1003 ¶¶ 49, 86–90). Further, among other things, Petitioner contends it was well known that packet on-way trip time is an example of latency that is calculated by taking a difference between a time of transmission of a packet and the time of receipt of the packet. Pet. 22–23 (citing, e.g., Ex. 1019, 1:65–2:7; Ex. 1042, 2:23–26; Ex. 1001, 2:1–2, 2:38–44, 2:24–49; Ex. 1033, 6, 8, 12, 15, 26; Ex. 1003 ¶¶ 86–89). Petitioner also cites Dr. Houh’s testimony and additional supporting references for the proposition that a person of ordinary skill would have understood that subtracting packet send time stamps from packet receipt time stamps “was the most common way to calculate latency from packet timestamps.” Pet. 23–24 (citing Ex. 1003 ¶¶ 86–89, 91; Ex. 1005, 7:56–60, 8:43–52; Ex. 1017; Ex. 1026; Ex. 1033; Ex. 1035; Ex. 1036; Ex. 1044; Ex. 1045; Ex. 1048).

Patent Owner does not separately address Petitioner’s showings for this limitation. We find Petitioner’s arguments persuasive.

6. *Conclusion Regarding Claim 6*

Based on the entire record, for the reasons explained above we determine Petitioner has shown by a preponderance of the evidence that claim 6 is unpatentable in view of Klassen.

7. *[7.0] A method according to claim 6, [7.1] wherein generating the latency measurement packet comprises generating a plurality of latency measurement packets, [7.2] containing respective indications that the packets belong respectively to the plurality of the classes of services, and [7.3] wherein calculating the latency*

comprises determining the latency for each of the classes of service respectively.

Building on its showings for claim 6, Petitioner contends that Klassen's ANSA transmits multiple probative test packets and that it would have been obvious to generate a plurality of probative test packets at the ANSA. Pet. 25 (citing Ex. 1005, 1:52–55, 7:56–60, 8:53–59, 9:36–44; Ex. 1003 ¶¶ 58–65, 96–100). Petitioner also contends that Klassen's probative test packets include ToS and CoS bits in the headers, as discussed above. Pet. 26. Finally, Petitioner contends Klassen's ANSA calculates latency for all levels of service in the network. Pet. 26 (citing Ex. 1005, 7:56–60, 8:43–52, 9:32–46, 16:17–33, claim 41; Ex. 1003 ¶¶ 93, 103–104, 107–109).

Patent Owner does not separately address claim 7. We agree with Petitioner's arguments that Klassen teaches or reasonably suggests each additional limitation of claim 7, and we determine Petitioner has shown by a preponderance of the evidence that claim 7 is unpatentable in view of Klassen.

8. *Claim 16*

Claim 16 is an apparatus claim with elements [16.1]–[16.4] that are substantively identical to elements [6.1]–[6.4]. Pet. 27. Petitioner identifies Klassen's ANSA as the claimed apparatus for measuring latency of claim 16 and relies on substantively the same arguments addressed above for claim 6 for limitations [16.1]–[16.4]. Pet. 28.

Patent Owner does not separately address claim 16. We agree with Petitioner's arguments that Klassen teaches or reasonably suggests each additional limitation of claim 16 for the same reasons discussed above regarding claim 6, and we determine Petitioner has shown by a

preponderance of the evidence that claim 16 is unpatentable in view of Klassen.

9. *Claim 17*

Claim 17 depends from claim 16 and is the apparatus equivalent of claim 7. Petitioner contends claim 17 is unpatentable for the same reasons discussed above for claim 7. Pet. 28.

Patent Owner does not separately address claim 17. We agree with Petitioner's arguments that Klassen teaches or reasonably suggests each additional limitation of claim 17 for the same reasons discussed above regarding claim 7, and we determine Petitioner has shown by a preponderance of the evidence that claim 17 is unpatentable in view of Klassen.

F. Ground 2: Alleged Obviousness of Claims 9 and 19 as Obvious Based on Klassen and Geiger

Petitioner contends claims 9 and 19 are unpatentable in view of the combined teachings of Klassen and Geiger. Pet. 28–40. As a threshold matter, Patent Owner contends Geiger is not analogous art. PO Resp. 7–11.

1. *Geiger is Analogous Art*

“Two separate tests define the scope of analogous prior art: (1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.” *In re Bigio*, 381 F.3d. 1320, 1325 (Fed. Cir. 2004). “We determine the field of endeavor ‘by reference to explanations of the invention’s subject matter in the patent application, including the embodiments, function, and structure of the claimed

invention.” *Netflix, Inc. v. DivX, LLC*, 80 F.4th 1352, 1359 (Fed. Cir. 2023) (quoting *Bigio*, 381 F.3d at 1325).

Petitioner contends the ’485 patent’s field of endeavor is “packet-switched network communications.” Pet. 11–12; Reply 17. Patent Owner contends the ’485 patent “is in the field of latency evaluations in packet-switched networks, and its objective is measuring latency in such networks.” PO Resp. 8.

Contrary to Patent Owner’s focus on latency evaluations, “[t]he field of endeavor of a patent is not limited to the specific point of novelty, the narrowest possible conception of the field, or the particular focus within a given field.” *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1001 (Fed. Cir. 2016). “Unlike the reasonable-pertinence test, the field-of-endeavor test does not look to the problem that the patent purports to address.” *Netflix*, 80 F.4th at 1359. As noted by Petitioner, Geiger and the ’485 patent “both operate with ‘packet-switched network communications.’” Reply 17. In fact, Patent Owner acknowledges that the ’485 patent relates to packet-switched networks in describing the field as “latency evaluations *in packet-switched networks*.” PO Resp. 8. Likewise, the ’485 patent describes its field of invention broadly with latency measurements being the particular focus within the field, stating “[t]he present invention relates generally to network communication systems and protocols, and specifically to methods of latency measurements in packet-switched networks, and particularly in ring networks.” Ex. 1001, 1:6–9. And Geiger, describing its field of invention, states “[t]he present invention relates generally to data communication systems and, in particular, to a method and apparatus for adaptively compressing and expanding data packets in a data communication

system.” Ex. 1006, 1:7–10. Further supporting Petitioner’s relatively broad recitation of the field of endeavor, each expert states that a person of ordinary skill would have had “approximately two years of work experience in network communications.” Ex. 2005 ¶ 24; *see also* Ex. 2005 ¶ 6 (Dr. Rouskas stating he is an expert “in network communication systems and especially packet-switched network communication systems and the various fields therein, including fields related to latency”).

Weighing the evidence of record, we agree with Petitioner that the relevant field of endeavor of the ’485 patent is packet-switched network communications, and we further agree that Geiger is from the same field. Because we determine Geiger satisfies the field-of-endavor test for analogous art, we do not reach the reasonably-pertinent test.

2. Petitioner Establishes Reasons to Combine Klassen and Geiger

Petitioner cites Geiger primarily for its teachings that it is desirable to ignore out-of-order packets, arguing that in the combination of Klassen and Geiger, Klassen’s ANSA would ignore any probative test packets that are received out of sequence, per Geiger. Pet. 28–29, 38–39. Petitioner contends a person of ordinary skill “would have combined Klassen and Geiger because both are related to network packet transmission.” Pet. 29. According to Petitioner, “Klassen describes various methods—such as measuring latency—that involve sending packets. Geiger teaches how packets are transmitted and acknowledged within a network.” Pet. 29 (citing Ex. 1005, 4:7–12, claim 40; Ex. 1003 ¶¶ 126–129).

Further, among other things, Petitioner contends a person of ordinary skill would have been motivated to combine the references and doing so would have been within the person of ordinary skill’s skillset. Pet. 29.

Petitioner states “[t]he combination would have been obvious because it represents merely the use of a known technique (Geiger’s treatment of packets received at a destination node in a different order than they were sent) to improve a similar process (Klassen’s transmission of probative test packets to analyze the network) in the same way to yield predictable results.” Pet. 29–30 (citing Ex. 1003 ¶ 130). According to Petitioner, “Klassen provides extensive disclosure about network analysis methods and provides only some details on probative test packet processing by the receiver. Geiger discloses the very details that Klassen expects a [person of ordinary skill in the art] to know, i.e., how a destination node receiving packets responds to packets received out of order.” Pet. 30 (citing Ex. 1006, 3:30–47, 7:66–8:19; Ex. 1003 ¶¶ 129–130).

Patent Owner argues that Geiger is not relevant to or compatible with Klassen and that Klassen teaches away from the alleged combination. PO Resp. 7. Patent Owner argues Geiger is wholly unrelated to latency and is instead directed to adaptively companding packets, which is a field of data compression. PO Resp. 12. According to Patent Owner, “there are no indications or assertions that the specific relied-upon portion of Geiger relates to evaluating latency or performance measurement more broadly.” PO Resp. 12 (citing Ex. 1006, 7:66–8:19). Further, Patent Owner argues Geiger’s relied-upon teachings are irrelevant to, and incompatible with, Klassen’s disclosures regarding latency. PO Resp. 12. Patent Owner argues Geiger’s teachings are specifically tied to Geiger’s adaptive companding methods and that Geiger describes only ignoring certain “selected” packets that are received out of order. PO Resp. 12–13. As such, Patent Owner contends a person of ordinary skill looking to modify Klassen using Geiger

would not know whether or to what extent the packets should be ignored and modifying Klassen to include Geiger's "selected" and "unselected" packets would render Klassen inoperable for its intended purpose. PO Resp. 13–15 (citing Ex. 2005 ¶¶ 58–62; Ex. 2006, 38:5–25, 41:22–43:14, 43:23–44:1, 47:6–12, 48:5–13, 48:20–24, 50:5–8, 50:23–51:1).

Patent Owner also contends Klassen teaches away from the alleged combination. PO Resp. 7, 15–17. Patent Owner states that Klassen teaches that its ANSA describes handling packets that time out and that a person of ordinary skill would have understood that packets are received after expiration of a timeout counter are "received out of the sequence" as recited in limitation [9.6]. PO Resp. 15 (citing Ex. 1005, 9:60–63; Ex. 2005 ¶ 63; Ex. 2006, 58:22–59:7, 62:20–23). Specifically, Patent Owner states that "Klassen teaches that such delayed, and thus out-of-sequence, packets are not ignored or disregarded, as Petitioner[] allege[s] that Geiger teaches, but are instead included in Klassen's calculations and treated as having a 'user specified ping timeout value.'" PO Resp. 16 (citing Ex. 1005, 9:60–63; Ex. 2005 ¶ 63). "Thus," according to Patent Owner, "Klassen already accounts for packet delay and out-of-sequence packets using another mechanism, and the [person of ordinary skill in the art] would have been discouraged from using Geiger's teachings for out-of-sequence packets in the context of Klassen for that additional reason" PO Resp. 16 (citing Ex. 2005 ¶ 63). Patent Owner additionally argues that Klassen teaches away from the combination because Geiger discloses "that its ignoring process is done by the receiving device, which equates to Klassen's *target station*," while "Klassen teaches that its *ANSA* (i.e., the *source node*) is responsible for all monitoring and calculations." PO Resp. 16–17 (citing Ex. 1005,

7:56–60, 7:66–8:1, 9:32–59, Fig. 1; Ex. 2005 ¶ 64; Ex. 2006, 30:8–31:18; Ex. 1003 ¶ 59).

First, we note in addition to Geiger, the record includes multiple references and testimony evidencing that handling packets received out of order was a known problem in the field of packet-switched network communications and that discarding out-of-order packets was one known solution to that problem. Pet. 31–32 (citing Ex. 1003 ¶¶ 132–134; Ex. 1020, 278; Ex. 1021, 19:16–20, 20:23; Ex. 1024, 78; Ex. 1025, 3), 39; *see KSR*, 550 U.S. at 420 (“any need or problem known in the field of endeavor at the time of the invention and addressed by the patent can provide a reason for combining the elements in the manner claimed”). The Court of Appeals for the Federal Circuit, applying *KSR*, has held that “if there’s a known technique to address a known problem using ‘prior art elements according to their established functions,’ then there is a motivation to combine.” *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1380 (Fed. Cir. 2023). Similarly, the Federal Circuit has held that a reason to combine or modify the prior art may be found explicitly or implicitly in market forces; design incentives; the “interrelated teachings of multiple patents”; “any need or problem known in the field of endeavor at the time of invention and addressed by the patent”; and the background knowledge, creativity, and common sense of the person of ordinary skill. *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1328–29 (Fed. Cir. 2009) (quoting *KSR*, 550 U.S. at 418–21 (2007)).

The evidence of record establishes that disregarding packets received out of order was a known solution in the field of network communications. **STRING CITE**; Ex. 1051, 49:1–5 (Dr. Rouskas agreeing that a person of

ordinary skill would understand the process for dropping out-of-order packets). Further, we credit Dr. Houh’s testimony that a person of ordinary skill would have understood the value in testing a network in view of the network’s ordinary packet handling such that “[t]reating out-of-order probative test packets just like common protocols treat out-of-order packets transmitted on the network would offer further insight into normal network operations.” Ex. 1003 ¶ 134. Contrary to Patent Owner’s arguments (PO Resp. 16–17), combining the relied-upon teachings of Geiger with Klassen would not have required considering out-of-order packets to be timed out, nor would the combination render Klassen’s teachings in operable; Patent Owner’s expert Dr. Rouskas agreed that a person of ordinary skill would understand the process for dropping out-of-order packets. Ex. 1051, 49:1–5. Weighing the evidence of record, we agree with Petitioner that a person of ordinary skill that understands the process for dropping out-of-order packets would have understood how to implement such a process in Klassen’s system with predictable success. *See* Pet. 29–30.

Further, Klassen’s teachings regarding handling of timed-out packets do not rise to the level of teaching away from the proposed combination because nothing in Klassen criticizes, discredits, or otherwise discourages the known process of discarding out-of-order packets. *In re Fulton*, 391 F.3d 1195, 1201 (Fed.Cir.2004). Further, “a reference does not teach away if a skilled artisan, upon reading the reference, would *not* be ‘discouraged from following the path set out in the reference,’ and would *not* be ‘led in a direction divergent from the path that was taken by the applicant.’” *Adapt Pharma Operations Ltd. v. Teva Pharms. USA, Inc.*, 25 F.4th 1354, 1370 (Fed. Cir. 2022) (quoting *DePuy Spine, Inc. v. Medtronic Sofamor Danek*,

Inc., 567 F.3d 1314, 1327 (Fed. Cir. 2009)). Indeed, Klassen does not specifically address out-of-order packets, much less direct a person of ordinary skill to handle out-of-order packets in ways divergent from the known process of dropping such packets as described in Geiger. *See* Ex. 1005, 9:60–63; Ex. 1051, 70:20–71:5; Reply 20–21.

Accordingly, weighing all of the evidence of record, we determine Petitioner has established that a person of ordinary skill would have had reason to combine the cited teachings of Geiger with the teachings of Klassen.

3. *[9.0] A method for measuring latency in a network, comprising:
[9.1] transmitting a sequence of latency measurement packets at given intervals from a source node in the network, while recording in the packets respective times of transmission thereof;
[9.2] noting respective times of receipt of the packets at a destination node in the network;*

According to Petitioner, Klassen measures latency in a network using its ANSA to transmit probative test packets at given intervals, with the packets including sequence numbers and time stamps, among other things. Pet. 33–35 (citing Ex. 1003 ¶¶ 138–145; Ex. 1005, 7:1–3, 7:24–26, 9:36–46). Petitioner contends Klassen’s target station receives the probative test packets and notes the respective times of receipt by either returning a receipt timestamp to the ANSA for each packet or returning each packet with the receipt timestamp to the ANSA, similar to the reasoning above regarding limitation [6.3]. Pet. 35 (citing Ex. 1005, 1:58–63; Ex. 1003 ¶¶ 146–149, 82; analysis for limitation [6.3]).

Patent Owner does not specifically rebut Petitioner’s showings for limitations [9.0], [9.1], or [9.2]. We determine Petitioner has sufficiently shown that Klassen teaches these limitations.

4. *[9.3] determining respective latencies for the packets in the sequence by calculating differences between the respective times of transmission recorded in the packets and the respective times of receipt; and*

Petitioner contends Klassen satisfies limitation [9.3] for the same reasons addressed above regarding limitation [6.4]. Pet. 35–36. Among other things, Petitioner contends Klassen teaches sending a sequence of probative test packets into the network and it would have been obvious to perform the latency calculation for each of the test packets, thus determining respective latencies for the packets in the sequence. Pet. 36 (citing Ex. 1003 ¶¶ 151–152).

Patent Owner does not specifically rebut Petitioner’s showings for limitation [9.3]; to the extent Patent Owner’s arguments address this limitation, we address those arguments below with respect to limitation [9.6]. We determine Petitioner has sufficiently shown that Klassen teaches this limitation.

5. *[9.4] monitoring a variation in the latencies over the sequence based on the calculated differences,*

Petitioner contends Klassen’s ANSA transmits a sequence of probative test packets into the network and monitors network performance by calculating apparent jitter, which is a measurement of change in packet latency. Pet. 36–37 (citing Ex. 1003 ¶¶ 153–157; Ex. 1005, 1:10–12, 7:56–60, 9:47–59, 13:45–46; Ex. 1010, 2:10–19; Ex. 1012, 385).

Patent Owner does not specifically rebut Petitioner’s showings for limitation [9.4]; to the extent Patent Owner’s arguments address this limitation, we address those arguments below with respect to limitation [9.6]. We determine Petitioner has sufficiently shown that Klassen teaches this limitation.

6. *[9.5] wherein transmitting the sequence of the latency measurement packets comprises recording respective serial numbers [sic] in the packets in the sequence, and*

Petitioner contends Klassen teaches limitation [9.5] for the same reasons address above regarding limitation [9.1]. Pet. 37–38. Patent Owner does not specifically rebut Petitioner’s showings for limitation [9.5]. We determine Petitioner has sufficiently shown that Klassen teaches this limitation.

7. *[9.6] wherein monitoring the variation in the latencies comprises disregarding the respective latencies of any of the [packets] that are received out of the sequence, as indicated by the serial numbers.*

Petitioner contends the combined teachings of Klassen and Geiger teach limitation [9.6]. Pet. 38–39. As noted above, Petitioner cites Geiger for its teachings that it is desirable to disregard packets that are received out of order as indicated by their serial numbers, and Petitioner contends a person of ordinary skill would have been motivated to account for packet loss or delay when implementing Klassen’s methods to derive accurate network measurements. Pet. 38–39. According to Petitioner, “[i]n the combination, Klassen’s ANSA would calculate ‘packet one-way trip time,’ a type of *latency*, for Klassen’s probative test packets (*latency measurement packets*). The ANSA would also calculate the apparent jitter to determine the amount of variation in the calculated latencies of the packets.” Pet. 39 (citing Ex. 1005, claim 41; Ex. 1003 ¶ 166). Further, Petitioner states “[t]he apparent jitter calculation would ‘ignore’ any probative test packets . . . that are received out of sequence, per Geiger.” Pet. 39 (citing Ex. 1003 ¶¶ 166–167).

As addressed above, we disagree with Patent Owner's arguments that Petitioner failed to establish a reason to combine Klassen and Geiger. Patent Owner additionally argues "[t]he Petition's section titled 'Reasons to Combine Klassen and Geiger' fails to specifically explain why or how the references would be combined and work together to meet limitation [9.6]." PO Resp. 19 (citing Pet. 29–33; Ex. 2005 ¶ 68). Specifically, Patent Owner argues "while Petitioner's rely on Klassen's jitter calculation for limitation [9.6.], there is no mention of Klassen's jitter in this section of the Petition, much less any explanation as to why or how a [person of ordinary skill in the art] would be motivated to modify Klassen's jitter calculation to include Geiger's teaching to ignore certain 'selected' packets." PO Resp. 19 (citing Ex. 2005 ¶ 68). Patent Owner further reiterates that Geiger's technique of ignoring certain "selected" packets was not known to be compatible with Klassen's jitter calculation such that it would yield predictable results and a person of ordinary skill "would not look to Geiger's particular process of ignoring certain 'selected' packets." PO Resp. 19–20 (citing Ex. 2005 ¶¶ 70–71). Further, Patent Owner contends a person of ordinary skill would have understood that handling out-of-order packets for latency-related jitter calculations would have depended on numerous parameters and would have required a significant amount of experimentation. PO Resp. 21 (citing Ex. 2005 ¶ 72), 23–26. Patent Owner also argues "Petitioner's assertion merely describes knowledge of an alleged problem and generic motivation to solve it, not a motivation to combine the particular asserted references, let alone explanation as to how the two completely-unrelated references would work together." PO Resp. 22.

Patent Owner also argues Petitioner failed to establish a reasonable expectation of success for modifying Klassen's performance measurement calculations with Geiger's compression-related process. PO Resp. 26. According to Patent Owner, "there is no plausible rationale as to why it would have been accurate or even workable for Klassen's performance measurement calculations, including jitter, to use Geiger's process for disregarding certain out-of-sequence "selected" packets." PO Resp. 27 (citing Ex. 2005 ¶ 81). And Patent Owner again reiterates that "the relied-upon process of Geiger is predicated on the existence of "selected" and "unselected" packets, which do not exist in Klassen, and thus Geiger's process is incompatible with Klassen." PO Resp. 27 (citing Ex. 1006, 7:66–8:19; Ex. 2005 ¶ 81).

As explained above, Petitioner's proposed combination of Klassen and Geiger does not require blind incorporation of Geiger's treatment of "selected" packets into Klassen's system. *KSR*, 550 U.S. at 421 ("A person of ordinary skill is also a person of ordinary creativity, not an automaton."). Rather, Petitioner cites Geiger for what the record establishes as a known solution to the problem of packets received out of order; the combination of Klassen and Geiger does not require bodily incorporation of Geiger's treatment of "selected" packets into Klassen. Among other evidence, Dr. Rouskas confirmed that a person of ordinary skill would have understood the process for dropping out-of-order packets. Ex. 1051, 49:1–5. Weighing the entire record, we agree with Petitioner that a person of ordinary skill would have had reason to modify Klassen's methods to incorporate the known process for dropping out-of-order packets, as evidenced by Geiger and the additional evidence of record. *See KSR*, 550

U.S. at 420 (“any need or problem known in the field of endeavor at the time of the invention and addressed by the patent can provide a reason for combining the elements in the manner claimed”); *Intel*, 61 F.4th at 1380 (“if there’s a known technique to address a known problem using ‘prior art elements according to their established functions,’ then there is a motivation to combine”). Further, we are persuaded that Petitioner has adequately shown that the combined teachings of Klassen and Geiger satisfy limitation [9.6].

8. *Conclusion Regarding Claim 9*

Based on the entire record, for the reasons explained above we determine Petitioner has shown by a preponderance of the evidence that claim 9 is unpatentable in view of Klassen and Geiger.

9. *Claim 19*

Claim 19 is an apparatus claim with elements that are substantively equivalent to elements [9.0]–[9.6]. Pet. 40. Petitioner contends claim 19 would have been obvious for the same reasons addressed above regarding claim 9. Pet. 40.

Patent Owner does not separately address claim 19. PO Resp. 67. We agree with Petitioner’s arguments that the combination of Klassen and Geiger teaches or reasonably suggests each limitation of claim 19 for the same reasons discussed above regarding claim 9, and we determine Petitioner has shown by a preponderance of the evidence that claim 19 is unpatentable in view of the combined teachings of Klassen and Geiger.

G. *Ground 3: Alleged Obviousness of Claims 1–4, 8, 11–14, and 18 as Obvious Based on Klassen, Kao, and Poulin*

Petitioner contends claims 1–4, 8, 11–14, and 18 are unpatentable in view of the combined teachings of Klassen, Kao, and Poulin. Pet. 40–65.

For a number of reasons, Patent Owner argues a person of ordinary skill would not have combined Klassen and Poulin to meet the claim limitations [1.2] and [1.4]–[1.7]. PO Resp. 29–47.

1. *Petitioner Establishes Reasons to Combine Klassen, Kao, and Poulin*

Petitioner contends a person of ordinary skill would have had reason to combine Klassen and Kao because, according to Petitioner, the references describe complimentary techniques for network analysis, with Kao specifically describing determining latency in a ring network topology. Pet. 41–42. Among other things, Petitioner argues a person of ordinary skill would have recognized that Klassen’s teachings apply to all network topologies and a person of ordinary skill would have had a reasonable expectation of success implementing Klassen’s teachings in a ring network topology as described in Kao. Pet. 42–44.

Petitioner also contends a person of ordinary skill would have had reason to combine Poulin with Klassen and Kao because the references all describe complimentary teachings for network analysis. Pet. 44. In addition to the teachings of Klassen and Kao addressed above, Petitioner cites Poulin for its teachings regarding recording timestamps by nodes in a network and using that information to calculate round-trip latency. Pet. 44 (citing Ex. 1008, 1:38–40, 1:66–2:10, 2:24–30, 2:43–57; Ex. 1012, 62; Ex. 1003 ¶ 188). Among other things, Petitioner contends combining the references would have amounted to using known techniques to improve similar processes in the same way to yield predictable results. Pet. 44 (citing Ex. 1003 ¶ 189). In particular, Petitioner contends Poulin provides details regarding when and where to add timestamps to packets and using those

timestamps for additional latency calculations for which Klassen provides limited details. Pet. 45 (citing Ex. 1008, 2:3–10; Ex. 1003 ¶ 189).

Patent Owner argues a person of ordinary skill would not have had reason to combine Klassen and Poulin for multiple reasons. PO Resp. 29. First, Patent Owner argues “fundamental differences” between Klassen and Poulin mean that combining their teachings “would ‘require alteration of the principles of operation’ of Klassen or render Klassen ‘inoperable.’” PO Resp. 29 (quoting *Adidas AG v. Nike, Inc.*, 963 F.3d 1355, 1358–1360 (Fed. Cir. 2020)). Patent Owner also argues Klassen teaches away from the alleged combination. PO Resp. 29. And Patent Owner argues there is no need for Poulin’s teachings in Klassen, including because of redundancy. PO Resp. 3031.

More specifically, Patent Owner argues “Klassen refers to ‘round trip time’ or ‘ping’ time in the common traditional sense, which does not exclude processing time at the target station.” PO Resp. 30 (citing Ex. 1005, 1:52–63, 8:49–50, 9:36–46, Fig. 3; Pet. 15, 22–24). Patent Owner also argues that Petitioner’s rely on Klassen’s standard traditional pings for the “latency measurement packet” of claim 1, but according to Patent Owner, “Poulin is directed to a unique re-defined type of round-trip delay and thus requires a specific type of packet or cell” and excludes a “processing interval” of the amount of time spent processing a packet or cell at the termination node. PO Resp. 31 (citing Ex. 1008, 3:47–59, 4:24–29, 5:44–50; Ex. 2006, 95:16–96:15; Ex. 2005 ¶ 94). Patent Owner argues that Poulin therefore requires a specific type of packet, a designated loopback cell capable of storing the processing interval. PO Resp. 32 (citing Ex. 1008, 1:49–53, 3:47–50, 3:59–4:3, 4:13–37, 5:32–50, 6:2–4, 6:64–66, 7:16–18, 7:31–32, 8:22–24, code

(57), Fig. 4; Ex. 2005 ¶ 95). Patent Owner contends Poulin's process would not work with the relied-upon traditional pings in Klassen because those pings cannot store Poulin's processing interval (delta value). PO Resp. 33.

First, we note the parties agree that a person of ordinary skill would have had knowledge of network communications and "latency calculation methodologies." Pet. 9; PO Resp. 4; Ex. 1003 ¶ 19; Ex. 2005 ¶ 24. In fact, the '485 patent states that "[m]ethods of network latency measurement are known in the art," citing a prior-art patent that "describes a ring latency timer for purposes of latency measurement in token rings." Ex. 1001, 2:1–4. The '485 patent also states that "[m]ost methods known in the art for measuring such round-trip latency are based on measuring the time required for a packet to be sent from a source node to a destination node and then back again." Ex. 1001, 2:1–4, 2:38–41. But the '485 patent states that "[t]hese methods suffer from the drawback that the measured latency includes the time taken by the destination node to process the packet that it receives from the source node and to generate the response packet to send back to the source node." Ex. 1001, 2:41–45. Poulin similarly recognizes that problem and accounts for the time taken by the destination node to process packets. Ex. 1008, 2:55–57.

As discussed above, Klassen describes using information in packet headers, including timestamps, as part of its methods for measuring latency. Ex. 1005, 1:59–63, 7:24–26, 8:24–37. Petitioner's proposed combination of Poulin's teachings of recording timestamps and subtracting a node's processing time (delta) would not have required alterations of Klassen's principles of operation; for a person of ordinary skill, the proposed combination changes the math, not the principles of operation. Ex. 1051,

48:18–49:5; Ex. 1003 ¶ 189. Again, combining the references as proposed by Petitioner does not require blindly incorporating all of the differing details of each reference; a person of ordinary skill is a person of ordinary creativity, not an automaton. *KSR*, 550 U.S. at 421.

Accordingly, weighing the evidence of record, we determine Petitioner has shown that a person of ordinary skill would have had reason to combine the cited teachings of Poulin with the teachings of Klassen and Kao, at least because such a combination amounts to using known techniques to improve similar processes with predictable success.

2. *[1.0] A method for measuring latency in a ring network in which traffic flows in first and second, mutually-opposite directions, the method comprising:*

Petitioner contends Klassen teaches measuring latency in a network and Kao teaches a ring network having an inner ring and an outer ring with data transmitted in opposite directions. Pet. 48–49. Patent Owner does not specifically dispute Petitioner’s showings for this claim element, and we find them persuasive.

3. *[1.1] transmitting a latency measurement packet from an originating node to a peer node in the first direction in the network; [1.2] noting a time of receipt of the packet at the peer node;*

Petitioner contends Klassen discloses transmitting probative test packets from the ANSA to a target station in the network. Pet. 50. Petitioner also contends it would have been obvious that the target station would record the time when the packet is received, further citing Poulin’s explicit descriptions of recording time stamps. Pet. 51. Among other things, Petitioner states that in combining the references’ teachings, Klassen’s probative test packet would be transmitted from the ANSA to a target station

and the target station would then record the time that it receives the packet from the ANSA. Pet. 51. To the extent Patent Owner's arguments address these limitations, we address those arguments below with limitation [1.7].

4. *[1.3] transmitting the packet from the peer node back to the originating node in the second direction, [1.4] while recording in the packet an indication of a peer node difference between a time of transmission of the packet from the peer node to the originating node and the time of receipt of the packet at the peer node;*

Petitioner states that Klassen describes calculating a packet round trip time, and in the combination of the references' teachings, Klassen's probative test packet would be transmitted from the ANSA to the target station on the outer ring of the ring network and returned to the ANSA from the target station on the inner ring of the ring network. Pet. 54 (citing Ex. 1007, Fig. 1; Ex. 1003 ¶¶ 214–216). Among other things, Petitioner contends Poulin teaches recording a first timestamp when a packet is transmitted from its origin, a second timestamp when a node receives the packet, and a third timestamp when the node returns the packet. Pet. 54–55 (citing Ex. 1008, 2:47–51, Ex. 1003 ¶ 220). Further, Petitioner states that Poulin teaches calculating a delta by subtracting the second timestamp from the third timestamp, which Petitioner contends is the claimed peer node difference. Pet. 55 (citing Ex. 1008, 2:51–53; Ex. 1003 ¶ 220).

Petitioner contends in combining the references' teachings, a person of ordinary skill "would have been motivated to implement Klassen's methods with Poulin's process of adding timestamps to packets and using those timestamps for various calculations. Pet. 55 (citing Ex. 1003 ¶ 222). According to Petitioner:

In the combination, Klassen's probative test packets (*latency measurement packets*) would be transmitted from the ANSA to

target station 24. Target station 24 would, per Poulin, note the time that it receives the packets from the ANSA, note the time that it returns the packets to the ANSA, and use the noted times to calculate the delta (*an indication*) of a *peer node difference between a time of transmission of the packet from the peer node to the originating node and the time of receipt of the packet at the peer node*. The delta (*an indication*) would be recorded in the packet.

Pet. 55–56 (citing Ex. 1003 ¶¶ 222–223).

Among other things, Patent Owner contends these arguments are not consistent with Petitioner’s arguments regarding limitation [1.7]. We address Patent Owner’s arguments for these limitations together with limitation [1.7], below.

5. *[1.5] noting a time of return of the packet to the originating node, [1.6] so as to determine an originating node difference between a time of transmission of the packet from the originating node to the peer node and the time of return of the packet to the originating node; and*

Petitioner contends Klassen’s ANSA records or calculates various network evaluation parameters for Klassen’s probative test packets, and a person of ordinary skill would have understood that when calculating “packet round trip time,” Klassen’s “packet receipt time stamp” refers to when the packet returns to ANSA. Pet. 56 (Ex. 1005 7:56–60, 8:43–52, 9:32–46; Ex. 1003 ¶¶ 224–225; Ex. 1011, 10:43–49, 13:34–41). Petitioner also states that Poulin teaches a fourth timestamp upon receipt of a packet by the source node. Pet. 56 (citing Ex. 1008, 2:45–55; Ex. 1003 ¶ 225). Petitioner also contends that Poulin teaches calculating a network “round trip delay” by subtracting the first timestamp from the fourth time stamp, which Petitioner contends is the claimed originating node difference. Pet. 57 (citing Ex. 1008, 2:55–57; Ex. 1003 ¶¶ 228, 230).

6. [1.7] *calculating the latency by taking a difference between the originating node difference and the peer node difference,*

Petitioner contends Klassen’s ANSA records or calculates “various network evaluation parameters” and that Poulin teaches “how to calculate round-trip delay by subtracting the time the packets were sent to the termination node from the time the packets were received by the source node, which is the claimed *originating node difference*.” Pet. 58 (citing analysis at [1.6]; Ex. 1003 ¶¶ 235, 228–232). Petitioner further states that “Poulin also discloses calculating the delta—the difference between the time of receipt of the packet by the termination node and the time the packet is returned by the termination node—which is the claimed *peer node difference*.” Pet. 58 (citing analysis at [1.4], Ex. 1003 ¶¶ 235, 217–223). “Poulin further discloses that the round-trip delay calculation involves ‘subtracting the first time stamp from the fourth time stamp,’ thereby obtaining the *originating node difference*, and further ‘subtracting delta [(*peer node difference*)] from the result,’ which corresponds to *taking a difference between the originating node difference and the peer node difference*.” Pet. 58 (citing Ex. 1008, 2:55–57; Ex. 1003 ¶ 235).

Petitioner also states that a person of ordinary skill in the art “would have been motivated to implement Klassen’s methods with Poulin’s disclosure of where and when to add timestamps to packets, and how to use those timestamps for various calculations.” Pet. 59 (citing Ex. 1003 ¶ 236). Petitioner further argues:

In the combination, Klassen’s probative test packets (*latency measurement packets*) would be transmitted from the ANSA to target station 24. Target station 24 would then return the packets to the ANSA. Klassen’s methods would then calculate the round-trip delay excluding processing delays, per Poulin, by

first subtracting the time the packets were sent by the ANSA to target station 24 from the time the packets were received by the ANSA. The methods would then calculate the delta by taking the difference between the time of receipt of the packet by the termination node and the time the packet is returned by the transmission node to the source node. Klassen would ultimately calculate the round-trip time excluding processing delays, that is, a *latency value* as claimed, by subtracting the processing delay from the total transmission time.

Pet. 59 (citing Ex. 1003 ¶¶ 236–237).

In addition to its arguments against the combination of references, addressed above, Patent Owner argues the Petition is inconsistent in its contentions regarding limitations [1.4] and [1.7]. According to Patent Owner, Petitioner asserts for limitation [1.4] that Poulin’s delta would be calculated by Klassen’s target station but for limitation [1.7] and for the discussion of the references’ combination, Patent Owner states that Petitioner contends Poulin’s delta would instead be calculated by Klassen’s ANSA. PO Resp. 34; Sur-reply 16–21.

In its Reply, Petitioner states “the Petition explains that Klassen’s target station would calculate the delta (per Poulin) and record it in the packet” and “it would have been obvious to modify Klassen’s ANSA to ‘incorporate Poulin’s calculation’ of the delta, i.e., use the delta.” Reply 8–9 (citing Pet. 47, 55–56, 59). Further, Petitioner states “Klassen’s ANSA would receive the delta from target station, per Poulin, and use it to gain ‘more information to perform even more granular network analysis examining specific device delays, rather than all device delays as a whole.’” Reply 9 (citing Pet. 47). Patent Owner contends Petitioner’s Reply “re-characteriz[es] the Petition’s positions” with an improper new argument in

an attempt to cure the discrepancy in the Petition. Sur-reply 20 (citing Pet. 47, 59; Reply 7–8).

As noted above, we agree with Petitioner that combining the teachings of Klassen, Kao, and Poulin would have been within the skillset of a person of ordinary skill and would have combined known techniques with predictable results, allowing for more detailed latency analysis. Patent Owner’s focus on differences between Klassen and Poulin does not directly address what a person of ordinary skill would have understood from the combined teachings of the references.

As cited by Petitioner (Pet. 54–55), Poulin describes recording a first timestamp when a packet is sent from the source node, a second timestamp with the target node receives the packet, a third timestamp when the packet is sent from the target node, and a fourth timestamp when the source node receives the packet, and Poulin describes calculating “delta” by subtracting the second time stamp from the third time stamp. Ex. 1008, 2:43–55. Poulin further teaches determining round trip delay by subtracting the first timestamp from the fourth timestamp and subtracting delta from that result. Ex. 1008, 2:55–57. Contrary to Patent Owner’s arguments, these concepts are not extraordinary or uniquely tailored to Poulin’s system and methods; as noted above, the record evidences that calculating latency by taking the difference between timestamps was well known in the art. *See, e.g.*, Ex. 1003 ¶ 87.

Klassen similarly describes using timestamps for latency calculations. Klassen does not describe subtracting the time a target node spends processing a packet as part of its latency calculations; Petitioner cites Poulin as teaching that concept. Pet. 58–59. We credit Dr. Houh’s testimony that a

person of ordinary skill would have recognized Poulin's teachings of accounting for node processing times as a known technique for improving Klassen's latency calculations with predictable results, yielding more detailed latency calculations. Ex. 1003 ¶ 189

We also determine that Petitioner's Reply does not present an improper new argument. Although the Petition could have been clearer (*e.g.*, Pet. 59), Petitioner's Reply reasonably responds to arguments in Patent Owner's Response to clarify Petitioner's position that, as the Petition argues for limitation [1.4], it is the target node that would calculate the delta and provide the delta to Klassen's ANSA for use in its latency calculations (Reply 8–9).

Weighing the evidence of record, we determine Petitioner has shown that this limitation would have been obvious to a person of ordinary skill in the art in view of the teachings of Klassen, Kao, and Poulin.

7. *[1.8] wherein transmitting the latency measurement packet comprises recording in the packet an indicaton [sic] of a class of service on the network, and [1.9] transmitting the packet at a level of service accorded to the class, and [1.10] wherein calculating the latency comprises determining the latency specific to the class of service.*

For these claim elements, Petitioner refers to its analysis of elements [6.1], [6.2], and [6.4]. Pet. 59–60 (additionally citing Ex. 1003 ¶¶ 238–248). Patent Owner does not separately address these claim elements.

8. *Conclusion Regarding Claim 1*

Based on the entire record, for the reasons explained above we determine Petitioner has shown by a preponderance of the evidence that claim 1 is unpatentable in view of the combined teachings of Klassen, Kao, and Poulin.

9. *Claim 2: [2.0] A method according to claim 1, wherein recording the indication of the peer node difference comprises recording in the packet the time of transmission of the packet from the peer node to the originating node and the time of receipt of the packet at the peer node, [2.1] both measured with respect to a peer clock maintained at the peer node.*

Petitioner contends Poulin teaches calculating round-trip latency in a network using four recorded timestamps and a person of ordinary skill “would have understood that the timestamps are recorded in the packet because that would make it more straightforward for the ANSA to extract the information and use it to calculate latency.” Pet. 60–61 (citing analysis at [1.0]–[1.10]; Ex. 1003 ¶¶ 193–253. Petitioner further contends that Klassen and Poulin both explain that clock synchronization is a shortcoming of existing network assessment methods and a person of ordinary skill would have recognized that the references suggest using a clock maintained by each node to record relevant timestamps. Pet. 61–62 (citing Ex. 1005, 1:20–43; Ex. 1008, 1:64–65; Ex. 1003 ¶¶ 254–255). Further, Petitioner contends it would have been obvious to a person of ordinary skill that “both the time of receipt of a packet at a node and the time of transmission of the packet from the node would both be *measured with respect to a peer clock maintained at that node.*” Pet. 62 (citing Ex. 1003 ¶ 255).

Patent Owner does not specifically address Petitioner’s showings for claim 2, and we find them persuasive.

10. *Claim 3: [3.0] A method according to claim 2, and comprising recording in the packet the time of transmission of the packet from the originating node to the peer node measured with respect to an originating clock maintained at the originating node, and [3.1]*

wherein noting the time of return of the packet comprises recording the time of return with respect to the originating clock.

Petitioner contends a person of ordinary skill would have recognized Klassen's and Poulin's disclosures as suggestions to use a clock maintained by each node to record relevant timestamps. Pet. 62–63 (citing analysis at [2.0]–[2.1]; Ex. 1005, 1:20–34; Ex. 1008, 1:64–65; Ex. 1003 ¶¶ 257, 249–256). Further, Petitioner states it would have been obvious to a person of ordinary skill that the time of transmission of a packet from a node would be recorded with respect to an originating clock maintained at that node and that the time of receipt of a packet back at a node would be recorded with respect to the originating clock maintained at that node. Pet. 63.

Patent Owner does not specifically address Petitioner's showings for claim 3, and we find them persuasive.

11. *Claim 8: [8.0] A method according to claim 6, [8.1] wherein the network comprises a ring network, and wherein transmitting the latency measurement packet comprises transmitting the packet around the ring network so that the destination node of the latency measurement packet is the source node, and [8.2] wherein calculating the latency comprises determining the latency for the selected one of the classes of service for a full circuit of the ring network.*

Petitioner contends a person of ordinary skill would have been motivated to apply Klassen's methods to measure latency in Kao's ring network to measure the full circuit latency of the network. Pet. 63–65 (citing analysis at [6.0]–[6.4], [1.0]; Ex. 1003 ¶¶ 45–94, 193–199, 264–268). Expanding on its contentions for limitation [6.4], Petitioner further contends that a person of ordinary skill would have known that latency for a full circuit of the ring network is calculated just like latency between two nodes in the network. Pet. 65 (citing analysis at [6.4]; Ex. 1003 ¶¶ 84–94, 271),

Patent Owner does not separately address Petitioner’s showings for claim 12, and we find them persuasive.

12. Claims 4, 11–14, and 18

Petitioner contends claim 4 combines claim elements [9.1], [9.3], and [9.4] and that claims 11–14 and 18 recast claims 1–4 and 8 as apparatus claims, combining claim elements [1.1]–[1.10], [2.0]–[3.1], [4.0]–[4.2], [8.0]–[8.2], and [16.0]. Further, Petitioner contends claims 4, 11–14, and 18 are obvious for the same reasons. Pet. 65 (citing Ex. 1003 ¶¶ 259–263, 272–297).

Patent Owner argues Petitioner fails to address all of the limitations of claim 11, which “includes several limitations regarding ‘respective first and second clocks’ that are not included in claim 1.” PO Resp. 47. In its Reply, Petitioner argues the “second clock” of claim 11 is addressed in the Petition’s analysis of claim element [2.1] and the “first clock” is addressed in the Petition’s analysis of claim element [3.1], which are cited in the Petition’s analysis of claim 11. Reply 11–12 (citing Pet. 65; Ex. 1052 ¶¶ 18–21). In its Sur-reply, Patent Owner contends Petitioner’s Reply and Dr. Houh’s Supplemental Declaration present new arguments to address the “clock” limitations that Petitioner failed to address in the Petition and in Dr. Houh’s original Declaration. Sur-reply 24–25.

Claim 11 is an apparatus claim with limitations substantially equivalent to claims 1–3, additionally reciting “clock” limitations, e.g., the first and second nodes comprising first and second clocks. We agree with Petitioner that its analyses of claims 1–3 sufficiently identify the claimed first and second clocks by arguing that each of the peer node and originating node maintains its own clock. Pet. 60–63; Reply 11–12. Although the

Petition refers to its analyses of claims 1–3 instead of repeating its analysis for apparatus claim 11, in view of the nature and relatedness of the claims and claim elements, there can be no mistake regarding what Petitioner alleges it is that satisfies the “clock” limitations. We are persuaded that Petitioner has adequately presented its arguments for claim 11 as unpatentable for the same reasons as presented for claims 1–3, and we determine Petitioner’s Reply does not present an improper new argument in that regard.

Patent Owner does not separately address Petitioner’s showings for claims 4, 12–14, and 18, and we find them persuasive.

13. Conclusion Regarding Claims 2–4, 8, 11–14, and 18

Based on the entire record, for the reasons explained above we determine Petitioner has shown by a preponderance of the evidence that claims 2–4, 8, 11–14, and 18 are unpatentable in view of Klassen, Kao, and Poulin.

H. Ground 4: Alleged Obviousness of Claims 10 and 20 Based on Klassen, Kao, and Geiger

1. Claims 10 and 20

Claim 10 depends from claim 9, and claim 20 depends from claim 19. Petitioner contends claim 10 is obvious for the same reasons addressed above regarding claim 9 and claim 20 is obvious for the same reasons addressed above for claim 19. Pet. 67. Petitioner also presents reasons to combine Klassen, Kao, and Geiger similar to those addressed above. Pet. 66–67. Patent Owner does not separately address Petitioner’s showings for claims 10 and 20.

For the same reasons addressed above, we determine Petitioner has shown by a preponderance of the evidence that claims 10 and 20 are

unpatentable in view of the combined teachings of Klassen, Kao, and Geiger. We additionally determine that Petitioner has shown adequate reasons to combine the references' teachings for the reasons addressed above, including Petitioner's showings that combining the references would have amounted to use of known techniques to improve similar processes with predictable results and success. Pet. 66–67.

I. Ground 5: Alleged Obviousness of Claims 5 and 15 Based on Klassen, Kao, Poulin, and Geiger

Claim 5 depends from claim 4, which depends from claim 1, and claim 15 depends from claim 14, which depends from claim 11. Petitioner contends claim 5 is obvious for the same reasons addressed above regarding claim 4 and claim 15 is obvious for the same reasons addressed above for claim 14. Pet. 69. Petitioner also presents reasons to combine Klassen, Kao, Poulin, and Geiger similar to those addressed above. Pet. 68–69. Patent Owner does not separately address Petitioner's showings for claims 5 and 15.

For the same reasons addressed above, we determine Petitioner has shown by a preponderance of the evidence that claims 5 and 15 are unpatentable in view of the combined teachings of Klassen, Kao, Poulin, and Geiger. We additionally determine that Petitioner has shown adequate reasons to combine the references' teachings for the reasons addressed above, including Petitioner's showings that combining the references would have amounted to use of known techniques to improve similar processes with predictable results and success. Pet. 68–69.

III. CONCLUSION

After reviewing the entire record and weighing evidence offered by both parties, for the reasons set forth above, we determine that Petitioner has

demonstrated by a preponderance of the evidence that claims 1–20 of the '485 patent are unpatentable in view of the cited prior art, as summarized in the following table:⁶

Claims	35 U.S.C. §	Reference(s)/Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
6,7, 16, 17	103(a)	Klassen	6,7, 16, 17	
9, 19	103(a)	Klassen, Geiger	9, 19	
1–4, 8, 11–14, 18	103(a)	Klassen, Kao, Poulin	1–4, 8, 11–14, 18	
10, 20	103(a)	Klassen, Kao, Geiger	10, 20	
5, 15	103(a)	Klassen, Kao, Poulin, Geiger	5, 15	
Overall Outcome			1–20	

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–20 of the '485 patent have been proven by a preponderance of the evidence to be unpatentable; and

⁶ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

FURTHER ORDERED that, because this is a final written decision, parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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Patent 7,113,485 B2

FOR PETITIONER:

Theodore M. Foster
David L. McCombs
Eugene Goryunov
Adam C. Fowles
Matthew Beck
HAYNES AND BOONE, LLP
ipr.theo.foster@haynesboone.com
david.mccombs.ipr@haynesboone.com
eugene.goryunov.ipr@haynesboone.com
adam.fowles.ipr@haynesboone.com
matthew.beck.ipr@haynesboone.com

FOR PATENT OWNER:

James R. Nuttall
Katherine D. Cappaert
Thomas Yebernetsky
Christopher A. Suarez
STEPTOE & JOHNSON LLP
jnuttall@steptoe.com
kcappaert@steptoe.com
tyeburnetsky@steptoe.com
csuarez@steptoe.com