

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ACTIVISION BLIZZARD, INC.,
ELECTRONIC ARTS INC.,
TAKE-TWO INTERACTIVE SOFTWARE, INC.,
2K SPORTS, INC., ROCKSTAR GAMES, INC., and
BUNGIE, INC.,
Petitioners,
v.
ACCELERATION BAY, LLC,
Patent Owner.

Case IPR2015-01953¹
Patent No. 6,714,966 B1

Before the Honorable SALLY C. MEDLEY, LYNNE E. PETTIGREW, and
WILLIAM M. FINK, *Administrative Patent Judges*.

**PETITIONERS ACTIVISION BLIZZARD, INC., ELECTRONIC ARTS
INC., TAKE-TWO INTERACTIVE SOFTWARE, INC., 2K SPORTS INC.,
AND ROCKSTAR GAMES, INC.'S NOTICE OF APPEAL**

¹ Bungie, Inc., who filed Petition IPR2016-00936, has been joined as a petitioner in
this proceeding.

Director of the United States Patent and Trademark Office
c/o Office of the General Counsel
United States Patent and Trademark Office
P.O. Box. 1450
Alexandria, VA 22313-1450

Pursuant to 35 U.S.C. §§ 141, 142, and 319, and 37 C.F.R. §§ 90.2-90.3, notice is hereby given that Petitioners Activision Blizzard, Inc., Electronic Arts Inc., Take-Two Interactive Software, Inc., 2K Sports Inc., and Rockstar Games, Inc. (collectively, “Petitioners”) appeal to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (“Board”) entered on March 23, 2017 (Paper 104 (sealed), which was later re-filed as Paper 107 (unsealed)) in IPR2015-01953, and from all underlying orders, decisions, rulings, and opinions regarding this *inter partes* review of U.S. Patent No. 6,714,966 (“’966 patent”). A copy of the Final Written Decision (Paper 107) is attached.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Petitioners further indicate that the issues on appeal include, but are not limited to, the following: (1) the Board’s determination that substitute claim 19 of the ’966 patent is patentable; (2) the Board’s construction of that claim; (3) the Board’s consideration of the expert testimony, prior art, and other evidence in the record; (4) the Board’s factual findings, conclusions of law or other determinations supporting or related to those

issues; as well as all (5) other issues decided adversely to Petitioners in any orders, decisions, rulings, and opinions.

Simultaneous with this submission, a copy of this Notice of Appeal is being filed with the PTAB through the E2E System. In addition, copies of the Notice of Appeal, along with the required docketing fee, are being filed with the Clerk's office for the United States Court of Appeals for the Federal Circuit.

Dated: May 25, 2017

Respectfully submitted,

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CERTIFICATE OF FILING

It is certified that, in addition to being filed electronically through the Patent Trial and Appeal Board's E2E System, a copy of PETITIONERS ACTIVISION BLIZZARD, INC., ELECTRONIC ARTS INC., TAKE-TWO INTERACTIVE SOFTWARE, INC., 2K SPORTS INC., AND ROCKSTAR GAMES, INC.'S NOTICE OF APPEAL has been filed by hand on May 25, 2017, with the Director of the United States Patent and Trademark Office, at the following address:

Director of the United States Patent and Trademark Office
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10B20, Madison Building East,
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Dated: May 25, 2017 Respectfully submitted,

/Andrew Thomases/
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*Counsel for Petitioners Activision Blizzard, Inc.,
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CERTIFICATE OF FILING

It is certified that, a copy of PETITIONERS ACTIVISION BLIZZARD, INC., ELECTRONIC ARTS INC., TAKE-TWO INTERACTIVE SOFTWARE, INC., 2K SPORTS INC., AND ROCKSTAR GAMES, INC.'S NOTICE OF APPEAL was filed electronically through the United States Court of Appeals for the Federal Circuit's CM/ECF system on May 25, 2017 and one paper copy delivered by hand on May 25, 2017, with the Clerk of the Court of the Federal Circuit, at the following address:

Clerk of the Court
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CERTIFICATE OF SERVICE

The undersigned certifies that a true and copy of the foregoing
PETITIONERS ACTIVISION BLIZZARD, INC., ELECTRONIC ARTS INC.,
TAKE-TWO INTERACTIVE SOFTWARE, INC., 2K SPORTS INC., AND
ROCKSTAR GAMES, INC.'S NOTICE OF APPEAL was served on May 25,
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Case IPR2015-01953¹
Patent 6,714,966 B1

Before SALLY C. MEDLEY, LYNNE E. PETTIGREW, and
WILLIAM M. FINK, *Administrative Patent Judges*.

FINK, *Administrative Patent Judge*.

FINAL WRITTEN DECISION²
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

¹ Bungie, Inc., who filed a Petition in IPR2016-00936, has been joined as a Petitioner in this proceeding.

² A sealed “Parties and Board Only” version of this Decision was entered on March 23, 2017. Pursuant to notice from the parties that this Decision may be made publicly available without any redactions, the Decision is reissued as a public version.

IPR2015-01953
Patent 6,714,966 B1

I. INTRODUCTION

On September 24, 2015, Activision Blizzard, Inc., Electronic Arts Inc., Take-Two Interactive Software, Inc., 2K Sports, Inc., and Rockstar Games, Inc. (collectively (and including Bungie, Inc.), “Petitioner”) filed a Petition requesting an *inter partes* review of claims 1–17 of U.S. Patent No. 6,714,966 B1 (Ex. 1101, “the ’966 patent”). Paper 2 (“Pet.”). On December 29, 2015, Acceleration Bay LLC, filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). On March 24, 2016, we instituted trial as to claims 1–11, 16, and 17 of the ’966 patent on the grounds of unpatentability, under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a). Paper 8 (“Inst. Dec.”).

After institution, Patent Owner filed a Patent Owner Response (“PO Resp.”). Paper 30, Paper 99 (redacted version). Petitioner filed a Reply to the Patent Owner Response (“Pet. Reply”). Paper 55. Patent Owner also filed a Motion to Amend. Paper 31 (“Mot.”). Petitioner filed an Opposition to Patent Owner’s Motion to Amend. Paper 54 (“Opp. Mot.”). Patent Owner filed a Reply to Petitioner’s Opposition. Paper 68 (“Reply Mot.”). Patent Owner also filed a Motion for Observation on Cross-Examination. Paper 76 (“Mot. Obsv.”). Petitioner filed a Response to Petitioner’s Motion for Observation. Paper 85 (“Resp. Obsv.”) A consolidated oral hearing for IPR2015-01951, IPR2015-01953, IPR2015-01964, IPR2015-01970, IPR2015-01972, and IPR2015-01996 was held on December 7, 2016. A transcript of the hearing has been entered into the record. Paper 98 (“Tr.”).

This Final Written Decision (“Decision”) is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we conclude Petitioner has demonstrated, by a preponderance of the evidence, that claims 1–11, 16, and 17 of the ’966 patent are unpatentable.

A. Related Matters

Petitioner identifies the following pending judicial matters as relating to the '966 patent: *Activision Blizzard, Inc. v. Acceleration Bay LLC*, Case No. 3:16-cv-03375 (N.D. Cal., filed June 16, 2016); *Electronic Arts Inc. v. Acceleration Bay LLC*, Case No. 3:16-cv-03378 (N. D. Cal., filed June 16, 2016); *Take-Two Interactive Software, Inc. v. Acceleration Bay LLC*, Case No. 3:16-cv-03377 (N.D. Cal., filed June 16, 2016); *Acceleration Bay LLC v. Activision Blizzard, Inc.*, Case No. 1:16-cv-00453 (D. Del., filed June 17, 2016); *Acceleration Bay LLC v. Electronic Arts Inc.*, Case No. 1:16-cv-00454 (D. Del., filed June 17, 2016); and *Acceleration Bay LLC v. Take-Two Interactive Software, Inc.*, Case No. 1:16-cv-00455 (D. Del., filed June 17, 2016). Paper 20, 2–3.

Petitioner and Patent Owner also identify five other petitions for *inter partes* review filed by Petitioner challenging the '966 patent and similar patents:

IPR2015-01951	U.S. Patent No. 6,714,966
IPR2015-01964 IPR2015-01996	U.S. Patent No. 6,829,634
IPR2015-01970 IPR2015-01972	U.S. Patent No. 6,701,344

Pet. 4; Paper 5, 1.

B. The '966 Patent

The '966 patent relates to a “broadcast technique in which a broadcast channel overlays a point-to-point communications network.” Ex. 1101, 4:3–5. The communication network consists of a graph of point-to-point

connections between host computers or nodes. *Id.* at 4:23–26. Figure 1 of the '966 patent is reproduced below:

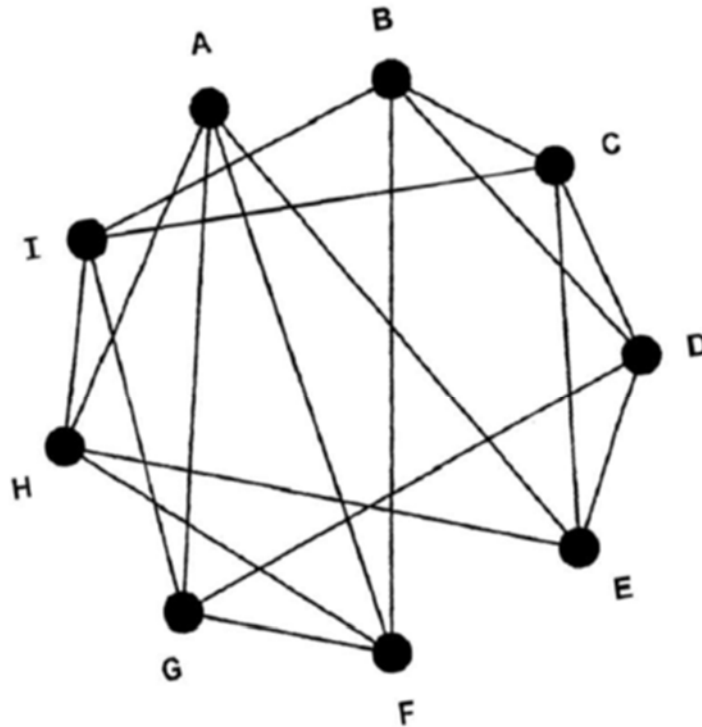


Fig. 1

Figure 1 illustrates a broadcast channel represented by a “4-regular, 4-connected” graph. *Id.* at 4:48–49. The graph of Figure 1 is “4-regular” because each node is connected to exactly four other nodes (e.g., node A is connected to nodes E, F, G, and H). *Id.* at 4:38–39, 4:49–53. A node in a 4-regular graph can only be disconnected if all four of the connections to its neighbors fail. *Id.* at 4:39–42. Moreover, the graph of Figure 1 is “4-connected” because it would take the failure of four nodes to divide the graph into two separate sub-graphs (i.e., two broadcast channels). *Id.* at 4:42–47.

To broadcast a message over the network, an originating computer sends the message to each of its four neighbors using the point-to-point connections. *Id.* at 4:30–32. Each computer that receives the message sends it to its other neighbors, such that the message is propagated to each computer in the network. *Id.* at 4:32–38. The minimum number of connections needed to traverse any two computers in the network is known as the “distance” between them, while the maximum of the distances in the network is called the “diameter” of the broadcast channel. *Id.* at 4:57–5:3. In Figure 1, the diameter is 2 because a message originating at any node (e.g., A) traverses no more than 2 connections to reach every other node. *Id.* at 5:3–6.

C. Illustrative Claim

Claims 1, 13, and 16 are independent claims. Claims 2–12 directly depend from claim 1, claims 14 and 15 directly depend from claim 13, and claim 17 directly depends from independent claim 16. Claim 1 is reproduced below.

1. A computer network for providing an information delivery service for a plurality of participants, each participant having connections to at least three neighbor participants, wherein an originating participant sends data to the other participants by sending the data through each of its connections to its neighbor participants and wherein each participant sends data that it receives from a neighbor participant to its other neighbor participants, further wherein the network is m -regular, where m is the exact number of neighbor participants of each participant and further wherein the number of participants is at least two greater than m thus resulting in a non-complete graph.

Ex. 1101, 30:2–12.

D. Pending Grounds of Unpatentability

The first pending ground of unpatentability challenges independent claims 1 and 16, and dependent claims 2–7 and 11, as anticipated under 35 U.S.C. § 102(b) by Shoubridge.³ The second pending ground of unpatentability challenges dependent claims 6–10 and 17 as directed to obvious subject matter, under 35 U.S.C. § 103(a), over the teachings of Shoubridge.

II. DISCUSSION

A. Public Availability of Shoubridge

As a preliminary matter, we address whether Shoubridge is a prior art printed publication under 35 U.S.C. § 102(b). *See* 35 U.S.C. § 311(b). It is Petitioner’s burden to prove that it is. *See* 35 U.S.C. § 316(e). The determination of whether a document is a “printed publication” under 35 U.S.C. § 102 “involves a case-by-case inquiry into the facts and circumstances surrounding the reference’s disclosure to members of the public.” *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004). “Because there are many ways in which a reference may be disseminated to the interested public, ‘public accessibility’ has been called the touchstone in determining whether a reference constitutes a ‘printed publication’ bar under

³ Peter J. Shoubridge & Arek Dadej, *Hybrid Routing in Dynamic Networks*, 3 IEEE INT’L CONF. ON COMMS. CONF. REC. 1381-86 (Montreal, 1997) (Ex. 1105) (“Shoubridge”).

35 U.S.C. § 102(b).” *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016) (citation omitted).

For purposes of the Decision to Institute, we accepted Petitioner’s unchallenged contention that Shoubridge was a paper published and presented at an IEEE conference in 1997. Inst. Dec. 5; Pet. 3, 19 (citing Ex. 1105; Ex. 1120). In its Response, Patent Owner now challenges this contention. PO Resp. 24–26. Specifically, Patent Owner argues that Dr. Shoubridge admitted in his deposition that the paper he identified in his declaration (Ex. 1120 at Exhibit B) as the paper presented at the 1997 International Conference on Communications in Montreal, on June 8–12, 1997, “was not the same paper that was presented at the conference.” *Id.* at 25 (citing Ex. 2031, 77:12–78:1, 83:4–11). Patent Owner also argues that the paper cannot be shown to have been disseminated or otherwise made available based on the publication date on the face of the paper. *Id.* at 25–26 (citing *Kyocera Wireless Corp. v. Int’l Trade Comm’n*, 545 F.3d 1340, 1350 (Fed. Cir. 2008)).

Petitioner disputes Patent Owner’s contention that Dr. Shoubridge could not identify his paper. Pet. Reply 4–5. Petitioner directs us to Dr. Shoubridge’s testimony that his paper (i.e., Shoubridge) was handed out to 500–1000 attendees as part of the proceedings and that the Exhibit “correlate[s] 100 percent with what was presented at the conference in 1997” (Ex. 2031, 78:12–79:1). Pet. Reply 4.⁴ Petitioner also contends Dr.

⁴ We have considered Patent Owner’s contention that this portion of Petitioner’s Reply exceeds the proper scope of reply (*see* Paper 65), but we disagree. We determine that this portion of the Reply, as well as those other portions of the Reply cited herein (and any accompanying exhibits), is properly responsive to evidence and arguments raised by Patent Owner in its

Shoubridge's second declaration explains that the \$10 price tag and copyright notice (the alleged source of the discrepancy according to Patent Owner (Tr. 54:15–55:8)) was indeed on the copy distributed at the June 1997 conference. Pet. Reply 4–5 (citing Ex. 1136 ¶¶ 4–8; Ex. 1137).

We find that Petitioner has satisfied its burden of proving that Shoubridge was a printed publication that was publicly available as of June 1997. At the outset, we observe that Dr. Shoubridge is a third-party witness with no alleged interest in the outcome of these proceedings. *See* Ex. 2031, 7:9–16, 90:25–91:7. In his first declaration, he testified that the attached Exhibit B⁵ was the paper he presented at the 1997 conference. Ex. 1120 ¶¶ 6–7. Although Patent Owner is correct that the pages of Exhibit B were not the *actual* pages from the conference proceeding (as in physically obtained at the conference), but a reproduction, Patent Owner does not address Dr. Shoubridge's repeated testimony that the content of the paper was identical in every respect to what was presented and distributed in bound conference volumes. Ex. 2031, 77:24–78:7 (“So I can confirm that that [Exhibit B] paper was the paper I presented at the conference and it was put in the proceeding. That was what was published in the -- that content of that paper is what was published in the proceedings.”); 81:19–82:4 (“[P]ages 1381 to 1386 will correlate 100 percent with what was submitted as Exhibit

Response and Preliminary Response (*see also* Paper 67), and, therefore, does not raise a new issue or belatedly present evidence. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,767 (Aug. 14, 2012). In this regard, although not properly in the context of a motion to exclude (*see infra* § IV.A.1), we have also considered the arguments presented in Patent Owner's Motion to Exclude (Paper 77) as it relates to the propriety of the exhibits filed with Petitioner's Reply.

⁵ Exhibit B is identical to the Shoubridge reference, Exhibit 1105.

[B]. So it's an accurate reproduction, but it is not an actual bound – you know, it's not pages out of the bound volume.”). Patent Owner does not direct us to any authority that requires the same physical paper to be in evidence for a reference to qualify as prior art.

We have considered the fact that Dr. Shoubridge was, at first, unable to confirm that the \$10 price indicated on the first page of the paper (*see* Ex. 1105, 1) was on the version of the paper presented in the conference and contained in the bound conference proceedings. Ex. 2031, 80:15–19 (“Maybe they do, but this one doesn’t.”). However, Dr. Shoubridge addressed this perceived discrepancy in his second declaration, where he stated that he was not looking at the first page of his article when asked about the price indication. *See* Ex. 1136 ¶¶ 4–8; Pet. Reply 4–5. We find this explanation credible. With its Reply, Petitioner submitted Ex. 1137, which appears to be a scan of the bound version of Dr. Shoubridge’s article. Pages 30 to 36 of Ex. 1137 appear to be identical to the Shoubridge reference in every respect including formatting, pagination, *and the \$10.00 indication on the first page.*⁶ Consequently, Ex. 1137 confirms Dr. Shoubridge’s deposition testimony as well as his second declaration that the contents and \$10 price of the paper on Exhibit B was identical to the paper presented at the conference.

⁶ The issue of whether the bound conference proceeding contained the \$10 indication, therefore, is resolved by Exhibit 1137, which contains the \$10 indication on its first page. As Petitioner represents, and Dr. Shoubridge states in his second declaration, Dr. Shoubridge may not have been looking at the first page of the paper when being cross-examined about the price indication. Pet. Reply 4–5; Ex. 1136 ¶¶ 4–8.

In sum, Dr. Shoubridge's testimony, which we find to be credible, supports Petitioner's contention that the Shoubridge reference (Ex. 1105) was a paper that was published and disseminated at the 1997 IEEE conference.⁷ Because the 1997 date on the face of Shoubridge is supported by evidence, it is unnecessary to consider Patent Owner's argument that standing alone, the 1997 date on the face of the paper, is insufficient evidence of publication date and public availability. We determine Shoubridge to be a printed publication for purposes of 35 U.S.C. §§ 102(b) and 311(b).

B. Level of Ordinary Skill in the Art

Citing its declarant, Dr. Karger, Petitioner opines that a person of ordinary skill in the art would have a minimum of:

- (1) a bachelor's degree in computer science, computer engineering, applied mathematics, or a related field of study; and
- (2) four or more years of industry experience relating to networking protocols or network topologies. Karger ¶ 19. Additional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education. *Id.*

Pet. 15. Patent Owner's declarant, Dr. Goodrich, opines that a person of ordinary skill would be "someone with a bachelor's degree in computer science or related field, and either (1) two or more years of industry

⁷ Patent Owner does not argue that presentation and dissemination at the conference are insufficient to prove public availability. In any event, the circumstances of this IEEE conference, in which 500–1000 people attended and were given copies of the proceedings (Ex. 2031, 85:6–11, 86:1–10), are more than sufficient for Shoubridge to qualify as a printed publication. *See Mass Inst. of Tech. v. AB Fortia*, 774 F.2d 1104, 1109 (Fed. Cir. 1985).

experience and/or (2) an advanced degree in computer science or related field. Ex. 2022 ¶ 25.

We do not discern substantial differences in the parties’ proposed descriptions of the level of ordinary skill in the art. Both require at least an undergraduate degree in computer science or related technical field, and both require at least two years of industry experience (although Petitioner proposes four years), but both agree that an advanced degree could substitute for work experience. For purposes of this Decision, we adopt Petitioner’s proposed definition as more representative, but note that our analysis would be the same under either definition.

C. Claim Interpretation

In an *inter partes* review, claim terms in an unexpired patent are given their “broadest reasonable construction in light of the specification of the patent in which they appear.” 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S.Ct. 2131, 2144–46 (2016). Under the broadest reasonable construction standard, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

1. “m-regular”

Petitioner proposes the term “m-regular,” recited in at least independent claim 1, means “each node is connected to exactly m other nodes.” Pet. 13 (citing Ex. 1101, 4:38–39, 14:61-15:3). Patent Owner does not offer a construction of this term. Prelim. Resp. 12–13; PO Resp. 19–24. For purposes of the Decision to Institute, we agreed that Petitioner’s proposed construction accords with the broadest reasonable construction

consistent with the specification, which, for example, describes a graph in which each node is connected to four other nodes as a 4-regular graph.

Ex. 1101, 4:38–39. We see no need to alter that construction here.

Accordingly, we construe “*m*-regular” to mean “each node is connected to exactly *m* other nodes.”

2. “*m*-connected”

Petitioner proposes the term “*m*-connected,” recited in at least dependent claims 4 and 5, be construed as “dividing the network into two or more separate parts would require the removal of at least *m* nodes.” Pet. 14 (citing Ex. 1101, 4:42–46). Patent Owner does not offer a construction of this term. Prelim. Resp. 12–13; PO Resp. 19–24. The portion of the specification cited by Petitioner describes the 4-connected graph as having the property that it would take the failure of at least 4 nodes to divide the graph into disjoint subgraphs. Ex. 1101, 4:42–46. Because Petitioner’s construction accords with the specification description, we see no reason to alter that construction here. Accordingly, we construe “*m*-connected” to mean “dividing the network into two or more separate parts would require the removal of at least *m* nodes.”

3. “*information delivery service*”

Patent Owner contends that the term “*information delivery service*” should be construed as a “logical broadcast channel which distributes content that overlays an underlying network.” PO Resp. 20, 34. Specifically, Patent Owner contends the term is not followed by a transition phrase such as “comprising” or “consisting of,” and is, therefore, not part of a preamble. *Id.* at 32. Patent Owner further contends that, even if “[a] computer network for providing an *information delivery service* for a

plurality of participants” is considered a preamble, it provides antecedent basis for the terms “the network” and “participants,” and, therefore, it should be treated as a limitation. *Id.* at 32–33. We do not agree with Patent Owner.

“It is well settled that the recitation of a new intended use for an old product does not make a claim to that old product patentable.” *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997); *see also In re Zierden*, 411 F.2d 1325, 1328 (CCPA 1969) (“[A] mere statement of a new use for an otherwise old or obvious composition cannot render a claim to the composition patentable.”). The facts of *Schreiber* are particularly relevant to the issue here. There, the apparatus claim at issue recited: “A dispensing top *for passing only several kernels of a popped popcorn at a time from an open-ended container* filled with popped popcorn, having a generally conical shape” *Schreiber*, 128 F.3d at 1475 (emphasis added). The Federal Circuit held that, although the “[prior art] did not address the use of the disclosed structure to dispense popcorn,” the absence of such disclosure did not defeat anticipation. *Id.* at 1477. In other words, the court determined that the recitation of the popcorn dispensing use did not have patentable weight. *Id.*

It is worth noting that in *Schreiber*, similar to here, the claim lacked the transitional phrase “comprising” or “consisting of” to indicate whether the statement was part of a preamble. Indeed, there was no discussion of whether the statement of intended use in *Schreiber* (i.e., “for passing only several kernels of popped popcorn”) was a preamble statement or not. Whether the statement of intended use appears in the body of the claim or the preamble is immaterial. *See In re Anderson*, 2016 WL 5940057, *4

(Fed. Cir. Oct. 13, 2016) (holding “for use” statements in the body of the claim do not add structural limitations).

We consider whether the circumstances here compel a different result than in *Schreiber*. Patent Owner is correct that the terms “network” and “participant,” used in the body of the claims, find their antecedent basis in the opening term that includes the disputed information delivery service (i.e., “[a] *computer network* for providing an information delivery service for a plurality of *participants*”). However, although this suggests “computer network” and “plurality of participants” are essential structure within the claim, the suggestion does not extend to “information delivery service,” which, we determine, is not essential to understanding the structurally complete invention otherwise recited in the claim. *See Catalina Mktg. Int’l v. Coolsavings.com, Inc.*, 289 F.3d 801, 810 (Fed. Cir. 2002) (holding the phrase “located at predesignated sites such as consumer stores” not essential to understand limitations or terms in the claim).

In making this determination, we have also considered the specification. *See id.* at 808 (noting that the specification may underscore certain structure or steps as important). Patent Owner cites several examples of “information delivery service” discussed in the specification:

[The] “information delivery service application is implemented using the broadcast channel. The information delivery service allows participants to monitor messages as they are broadcast on the broadcast channel.” [Ex. 1101,] ‘966 Patent, 16:25-28. The specification further provides that “the information delivery service may be used to distribute a broad range of content . . .” *Id.*, 16:37-40 (emphasis added).

PO Resp. 20. However, these excerpts and others support our determination that “for providing an information delivery service” is a statement of intended use.

For example, the information delivery service is described almost entirely by its uses, e.g., it “allows participants to monitor messages” (Ex. 1101, 16:27–28), “may be used to distribute a broad range of content” (*id.* at 16:37–38), and “may provide a directory web site” (*id.* at 16:41–42). In this vein, even if Patent Owner is correct that the foregoing examples demonstrate that the information delivery service operates at the “application layer,” *see* PO Resp. 20–21 (citing Ex. 2022 ¶¶ 53–57), that contention reinforces our view that information delivery service does not add structure to claim 1, but is a term to represent various applications that might use the structure of claim 1.

To the extent the information delivery service is described in structural terms, e.g., as a “broadcast channel,” this, too, supports our conclusion that information delivery service is an intended use. For example, the specification states that the “information delivery service application is implemented using the broadcast channel.” Ex. 1101, 16:25–26. However, the specification consistently describes the broadcast channel in terms of the structural elements of claim 1. Similar to claim 1, Figure 1 is described as “a graph that is 4-regular and 4-connected *which represents a broadcast channel.*” Ex. 1101, 2:44–46 (emphasis added); *see id.* at 2:47–61 (referring to the interconnected computers in the networks of Figures 2– 5B as broadcast channels); *id.* at 4:23–26 (describing the broadcast channel as “a graph of point-to-point connections (i.e., edges) between host computers (i.e., nodes)”). In view of these descriptions, we conclude that claim 1

recites a structurally complete invention (i.e., “a broadcast channel”), which may be used to provide “an information delivery service.”

In view of the foregoing, we decline to adopt Patent Owner’s proposed construction of “information delivery service” and, instead, determine that the term is a statement of intended use not entitled to patentable weight. *See Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997) (holding that a preamble is not limiting “where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention”).

4. “participant”

Patent Owner contends that the term “participant” should be construed as “an information delivery service application program that interacts with a logical broadcast channel which overlays an underlying network.” PO Resp. 22. Patent Owner contends that the specification’s statement that the “information delivery service application is implemented using the broadcast channel,” as well as descriptions of such applications connecting to each other through the broadcast channel and the broadcast channel overlays a point-to-point network supports its construction. *Id.* (citing Ex. 1101, 16:25–28, 1:44–51, 4:3–5). Accordingly, Patent Owner contends, the term “participant is used to refer to the application programs which interact with a logical broadcast channel that overlays an underlying network rather than the physical components that communicate at the network level.” *Id.* (citing, e.g., Ex. 1101, 15:13–17, claim 9).

Petitioner contends the specification uses “participant” without imposing any such limitations. Pet. Reply 2 (citing Ex. 1101, 1:44–49, 1:40–43, 1:54–67, 2:14–20, 2:31–38). Accordingly, Petitioner contends,

under the broadest reasonable interpretation, the term “participant” should receive its plain meaning (“participant in the network”). Pet. Reply 3.

As an initial matter, we observe that Patent Owner’s proposed construction, “an information delivery service application program that interacts with a logical broadcast channel which overlays an underlying network,” builds on its proposed construction of “information delivery service” by requiring a participant to be an “information delivery service *application program*” that interacts with the logical broadcast channel. However, as set forth in detail above, the information delivery service is an intended use that *may* include application programs. *See also* Ex. 1101, 1:40–41 (“collaborative processing applications, such as . . . network meeting programs”). Thus, adding an application program requirement to “participant” is an attempt to add a further limitation (i.e., “application program”) to the intended use that, we determine, is not a claim limitation.

On the other hand, claim 9, which depends from claim 1, recites that “each *participant* is a *process executing on a computer*.” *Id.* at 30:27–28. The ’966 patent uses the term “process” in describing both application programs and parts of programs. *See, e.g., id.* at 15:25–32 (“Computer 600 includes multiple application programs 601 executing as separate processes. . . . Alternatively, the broadcaster component may execute as a separate process or thread from the application program.”); Fig. 9 (“Contact process”). Thus, as used in claim 9, participant encompasses more than *application programs*—the limitation Patent Owner seeks to impose on “participant” in claim 1. By imposing a narrower limitation on “participant,” for purposes of claim 1, than the limitation imposed by claim

9, Patent Owner’s proposed claim construction is inconsistent with the specification.⁸

Petitioner proposes that “participant” be construed to have its “plain meaning.” Pet. Reply 3 (“participant in the network”). For reasons discussed below, we agree that the plain meaning of the term “participant,” including the various constraints placed on it by the claims themselves, would be sufficiently clear to a person of ordinary skill in the art for purposes of the analysis.

5. “connection”

Patent Owner contends the term “connection” should be construed as “an edge between two information delivery service application programs connected to a logical broadcast channel that overlays an underlying network.” PO Resp. 23–24 (citing Ex. 1101, 4:51–53, 11:22–23, claims 1 and 16).

⁸ Patent Owner contends that its construction is “unrebutted” and that Petitioner’s declarant, Dr. Karger, testified that he had no understanding of the terms Patent Owner seeks to construe. PO Resp. 23 (citing, e.g., Ex. 2033, 100:23–101:8, 51:14–52:9). We disagree. Petitioner “interpreted [terms] for purposes of this review with their plain and ordinary meaning consistent with the specification of the ’966 patent.” Pet. 13; Pet. Reply 3. Moreover, we have reviewed portions of Dr. Karger’s testimony cited by Patent Owner (*see* PO Resp. 26–27; Paper 77 (“Motion for Observations”)), and do not agree that he had no understanding of the terms. Although Dr. Karger did not attempt to provide an explicit definition of terms Patent Owner seeks to construe (*see, e.g.*, Ex. 2032, 52:8–9 (“I haven’t tried to scope out exactly what the boundaries of that meaning are.”), Ex. 2034, 120:20–21 (same)), Dr. Karger did apply his understanding of the meaning of these terms to the art. For these reasons, we reject Patent Owner’s suggestion that his testimony be given no weight.

As discussed above, we disagree with Patent Owner’s attempt to introduce an “information delivery service application program” limitation into claim 1. When applied to “connection,” such a limitation is incorrect for an additional reason. As Petitioner points out, claim 8 recites that “connections are TCP/IP connections,” which means that connections may exist at the transport layer rather than at the application layer as Patent Owner’s construction requires.⁹ Pet. Reply 2 (citing Ex. 2022 ¶ 31). Similarly, in the specification, connections are described without reference to application programs. *See* Ex. 1101, 1:43–45 (“The point-to-point network protocols, such as UNIX pipes, TCP/IP, and UDP, allow processes on different computers to communicate via point-to-point connections.”); 6:22–25 (discussing computer connections using the TCP/IP protocol).

Petitioner proposes that “connection” be construed to have its “plain meaning.” Pet. Reply 3 (“connection between participants”). For reasons discussed below, we agree that the plain meaning of the term “connection,” including the various constraints placed on it by the claims themselves—e.g., participants have connections through which data can be sent or received—would be sufficiently clear to a person of ordinary skill in the art for purposes of the analysis.

*D. Anticipation of Claims 1–7, 11
and 16 by Shoubridge*

Petitioner contends claims 1–7, 11, and 16 are anticipated by Shoubridge. Pet. 16–58. We have reviewed the Petition, Patent Owner’s Response, Petitioner’s Reply, as well as the relevant evidence discussed in

⁹ We point out that the specification does not use the term “layer” or refer to the OSI Reference Model.

those papers and other record papers. We have reviewed Petitioner's arguments and the underlying evidence cited in support and are persuaded Petitioner sufficiently establishes that claims 1–7, 11, and 16 of the '966 patent are anticipated by Shoubridge.

1. Shoubridge (Ex. 1105)

Shoubridge describes techniques for routing messages to all the participants in a communications network. Ex. 1105, 1.¹⁰ Specifically, Shoubridge models a communication network as a graph in which “[e]ach node functions as a source of user traffic entering the network where traffic can be destined to all other nodes within the network.” *Id.* at 2. In a specific example, Shoubridge describes a “64 node network with connectivity of degree 4” modeled as a “large regular graph forming a manhattan grid network that has been wrapped around itself as a torus.” *Id.* at 3. Shoubridge describes a routing protocol called “constrained flooding, the most efficient way to flood an entire network.” *Id.* at 2. In constrained flooding, a packet received at a node is rebroadcast on all links except the link it was received on, and packets are numbered such that if a “packet[] revisit[s] a node with the same sequence number, [it is] discarded.” *Id.* at 3. Shoubridge describes simulations using both constrained flooding and minimum hop algorithms that use routing tables. *Id.* at 2–4. Ultimately, a hybrid routing model is proposed in which constrained flooding is used if routing tables are unable to provide a next node entry for forwarding user traffic, but minimum hop is used if a valid next node entry exists. *Id.* at 4–5.

¹⁰ We refer to exhibit pagination.

2. *Is Shoubridge Enabled?*

As a threshold matter, Patent Owner contends “Shoubridge is not enabled,” because it teaches a routing model simulation and “does not teach an m-regular, non-complete graph network with communications at the application layer in the real world.” PO Resp. 31 (citing Ex. 1105, 2). Patent Owner further contends that “[a] POSITA would have to perform undue experimentation to create an application layer overlay that would be m-regular and incomplete graph over an underlying network. [Ex. 2022], Goodrich Decl. ¶ 74; see § II.C, *supra* (describing the 3 year development of an m-regular, incomplete graph at the application layer).” PO Resp. 31.

Petitioner contends the claims are not limited to an application layer overlay and, in any event, a person of ordinary skill in the art would have found it straightforward to implement Shoubridge’s network as an overlay at the application layer. Pet. Reply 18 (citing Ex. 1105, 3; Ex. 1125 ¶¶ 113–117). Petitioner acknowledges that Shoubridge discloses the claimed network (i.e., using “flooding”) in a simulation, but contends that a person of ordinary skill in the art would have understood that the simulation could be implemented in a real-world network. *Id.* at 18–19 (citing Ex. 1125 ¶¶ 92–100). We agree with Petitioner.

To anticipate a claimed invention, a prior art reference must enable one of ordinary skill in the art to make the prior invention without undue experimentation. *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1354 (Fed. Cir. 2003).

Factors to be considered in determining whether a disclosure would require undue experimentation . . . include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of

working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

In re Wands, 858 F.2d 731, 737 (Fed. Cir. 1988). However, the cited prior art has a presumption of enablement and, therefore, the burden of proving non-enablement of a reference rests on Patent Owner. *See In re Antor Media Corp.*, 689 F.3d 1282, 1287–88 (Fed. Cir. 2012); *Impax Labs., Inc. v. Aventis Pharms., Inc.*, 545 F.3d 1312, 1316 (Fed. Cir. 2008).

Here, to begin with, Patent Owner’s argument based on the alleged difficulty of implementing Shoubridge at the application layer is not persuasive because we reject Patent Owner’s proposed constructions adding such a requirement. Moreover, we have considered Dr. Goodrich’s testimony that such an implementation would require undue experimentation, but this, as Petitioner points out, seems premised on the mistaken belief that “Shoubridge merely shows an adaptive routing algorithm.” Ex. 2022 ¶ 74. As set forth below in more detail, Shoubridge clearly teaches a simulation based on both routing algorithms and “constrained flooding,” the latter of which Petitioner relies on. Ex. 1105, 2–3, Figure 1; *see* Pet. 31–32 (citing Ex. 1105, 2–3); Ex. 1119 ¶ 110; Ex. 1125 ¶ 115.

Aside from its contentions, neither Patent Owner nor Dr. Goodrich provide a *Wands* factor analysis to support its assertion that undue experimentation would be required to implement Shoubridge’s network in the “real world,” except to note parenthetically that it took three years to implement an m-regular, incomplete graph. *See* PO Resp. 31. Patent Owner bases this contention on the testimony of inventors, Mr. Holt and Mr.

Bourassa. *See* PO Resp. 4–5 (citing Ex. 2024 ¶¶ 9–26; Ex. 2024 ¶¶ 8–41). However, we observe that this three year development was directed almost entirely at unclaimed features of the system.¹¹ *See, e.g.*, Ex. 2024 ¶¶ 12–14 (challenge associated with “joining a SWAN session”), ¶ 17 (challenge associated with node departures), ¶ 18 (challenge in enforcing a consistent state with no global reference). The lengthy development of unclaimed features does not support Patent Owner’s assertions of undue experimentation. *See Wands*, 858 F.2d at 737 (“breadth of the claims”).

For the foregoing reasons, we determine that Patent Owner has not demonstrated that Shoubridge is not enabled.

3. Claims 1 and 16

Claims 1 and 16 recite “[a] computer network for providing an information delivery service for a plurality of participants.” We have determined this requires a computer network and a plurality of participants, but that “information delivery service” is not limiting. Petitioner relies on Shoubridge’s disclosure of “forwarding user traffic between source and destination nodes in a communication network” as disclosing the recited network and plurality of participants. Pet. 28–29 (citing Ex. 1105, 1; Ex. 1119 ¶ 103). Petitioner also relies on Shoubridge’s description of flooding

¹¹ Indeed, an early version of the system supporting chat and drawing features was implemented by “early 1997,” which would have been only a few months after the project began in November 1996. *See* Ex. 2024 ¶ 16; Ex. 2026 ¶ 4 (“The SWAN project begin in November 1996.”). This supports Dr. Karger’s testimony that a person of ordinary skill in the art would have been able to implement Shoubridge’s disclosure without undue experimentation. Ex. 1125 ¶ 115.

algorithms broadcasting user traffic. *Id.* at 29 (citing Ex. 1105, 4; Ex. 1119 ¶ 105).

Patent Owner contends Shoubridge does not disclose the claimed network, because it does not “disclose an information delivery service” as properly construed (i.e., as “a logical broadcast channel which distributes content that overlays an underlying network”). PO Resp. 34–35. Specifically, Patent Owner contends that the disclosure of forwarding user traffic over a network does not satisfy its constructions of “information delivery service” and “participants.” *Id.* Patent Owner contends flooding means sending packets over the network layer of the OSI model, “not the application layer,” as its proposed construction requires. *Id.* at 35–36 (citing Ex. 2022 ¶ 83).

We disagree with Patent Owner, because its contentions rely on constructions of “information delivery service” and “participant” that we reject. Instead, we have determined that “information delivery service” is an intended use and “participant” does not require an application program. Although Patent Owner also argues that Shoubridge does not disclose “a computer network for providing an information delivery service for a plurality of participants” even if its proposed constructions are not adopted, we observe these arguments largely rely on its proposed constructions. PO Resp. 36–37 (“[A]n information delivery service is data specific and operates at the application layer. Shoubridge . . . is data agnostic.”); *id.* at 39. These arguments are not persuasive, because the claims do not require “specific” data or operation at the application layer.

Nonetheless, we consider whether Petitioner has shown sufficiently that the cited evidence discloses the claim limitations. As Patent Owner

concedes (PO Resp. 35), Shoubridge’s disclosure of flooding alone describes sending data at least at the network layer, which indisputably discloses the existence of a “computer network.” Moreover, aside from arguments depending on its proposed claim construction, Patent Owner does not address Shoubridge’s disclosure of forwarding user traffic between source and destination nodes. We agree that the term “participant” encompasses source and destination “nodes” receiving user traffic. Indeed, the ’966 patent contemplates computers and processes or programs executing on a computer as participants.¹² *See* Ex. 1101, 13:20–21 (“[N]eighbors of a newly connecting computer are preferably selected randomly.”); 30:29–30 (“[E]ach participant is a process executing on a computer.”); Ex. 1119 ¶ 40. Accordingly, we conclude Shoubridge discloses the recited computer network and plurality of participants.

Claim 1 also recites “each participant having connections to at least three neighbor participants.” Claim 16 recites “each participant having connections to exactly four neighbor participants.” Petitioner directs us to Shoubridge’s “64 node [manhattan] grid network with connectivity of degree 4” as disclosing connections to at least three neighbor participants and exactly four neighbor participants. Pet. 30 (citing Ex. 1105, 3); Ex. 1119 ¶¶ 89–90.

Patent Owner disputes this contention based on its proposed construction of participants (i.e., “participant would be located on the

¹² Although unnecessary in view of our determination that information delivery service is not a limitation, we agree that the plain and ordinary meaning of information delivery service encompasses “user traffic.” *See* Pet. Reply ¶ 6; Ex. 1119 ¶ 105; Ex. 1125 ¶¶ 125.

application layer” (PO Resp. 37), “simulated nodes in Shoubridge are simulations of computers at the network layer, rather than the application layer” (*id.* at 38)), which we reject for the reasons discussed above. Patent Owner also disputes this contention based on its proposed construction of connections (i.e., “an edge between two information delivery service application programs . . .” (PO Resp. 40)), which we also reject.

Patent Owner also contends that Petitioner improperly mixes unrelated disclosures in Shoubridge. *Id.* at 38. Specifically, Petitioner contends that the manhattan grid is a simulation and unrelated to Shoubridge’s “flood search routing generally.” *Id.* at 38–39. We agree that the disclosed manhattan grid network is a simulated network, but disagree that it is unrelated to the flood search routing discussion. The discussion of the manhattan grid network simulation occurs under the heading of “Simulation model” beginning on page 2 of the exhibit, in which “[f]lood search routing has been selected for its robustness in dynamic networks and is modeled as constrained flooding, the most efficient way to flood an entire network [12]. Any user packet . . . is copied and broadcast on all outgoing links.” Ex. 1105, 2. The next paragraph describes the 64 node manhattan grid network used to simulate the transmission of the user packets. *Id.* at 3. The next section describes the “Simulation results” of the “constrained flooding model.” *Id.* These descriptions of the flooding algorithm (specifically, constrained flooding), therefore, include the disclosed 64 node manhattan grid network—the simulation environment for evaluating the algorithm. *See* Pet. Reply 19. Consequently, for purposes of anticipation, we find the relied upon disclosures of Shoubridge are “arranged or combined

in the same way as in the claim.” *Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381–83 (Fed. Cir. 2015).

Dr. Karger, Petitioner’s declarant, testifies that a manhattan grid network with connectivity of degree 4 means each node is connected to exactly 4 other nodes. Ex. 1119 ¶¶ 89–90. We find this unrebutted testimony to be credible. Accordingly, we determine that Petitioner has sufficiently supported its contention that Shoubridge discloses “connections to at least three neighbor participants” (claim 1) and “connections to exactly four neighbor participants” (claim 16).

Claim 1 further recites:

wherein an originating participant sends data to the other participants by sending the data through each of its connections to its neighbor participants and wherein each participant sends data that it receives from a neighbor participant to its other neighbor participants

Claim 16 recites a similar limitation. For this “data sending” limitation, Petitioner cites Shoubridge’s description of constrained flooding in which a packet is broadcast to all other participants (i.e. nodes) on outgoing links (i.e., all links except for the one it received the packet on) as disclosing the recited limitation. Pet. 31–32 (citing Ex. 1105, 2–3); Ex. 1119 ¶ 110.

Patent Owner contends that the simulated packets sent and received in Shoubridge are at the network layer and not “through an information delivery service.” PO Resp. 40–41. Rather, citing its declarant, Dr. Goodrich, Patent Owner contends that the simulated packets are sent only to find routes in the simulation for following packets to follow. *Id.*; Ex. 2022 ¶¶ 94–95 (“Moreover, the flood search algorithm in Shoubridge only sends

control packet data to find routes in the simulation. Control packets finds a path or route for all following packets to follow.”). We disagree.

Shoubridge’s simulation is based on both “constrained flooding” in which “all nodes are visited at least once” (and which Petitioner relies on) and minimum hop “routing algorithms” in which “control messages are exchanged between neighboring nodes for the purpose of maintaining routing tables.” Ex. 1105, 2–3; *see id.* at Fig. 1 (“Flood” and “Minhop”). Dr. Goodrich’s testimony that control packets are sent to find routes does not explain which algorithm in Shoubridge it is based on, but it appears to be based on the description of the routing algorithm, not the constrained flooding on which Petitioner relies. As such, Dr. Goodrich’s testimony does not address Petitioner’s evidence that the limitation is disclosed by constrained flooding.

Shoubridge describes constrained flooding as follows:

Any user packet transmitted from a node is copied and broadcast on all outgoing links. Intermediate transit nodes do not broadcast a packet on the same link that a packet was originally received on. Constrained flooding uniquely identifies packets associated with a particular flood search by using sequence numbering. Nodes store sequence numbers of packets already flooded. If any packets revisit a node with the same sequence number, they are discarded instead of being further broadcast to neighbours. This technique ensures that all nodes are visited at least once and duplicated traffic is kept to a minimum throughout the network.

Ex. 1105, 2–3. We find this description of “user packets” being copied and broadcast on all outgoing links to intermediate nodes and resent until all nodes are visited at least once to support Dr. Karger’s testimony that Shoubridge discloses “send[ing] data” in the manner required by the claim

limitation. *See* Ex. 1119 ¶ 110. Accordingly, we find Shoubridge satisfies the data sending limitation.

Finally, claim 1 requires that the “network is m -regular, where m is the exact number of neighbor participants” and “wherein the number of participants is at least two greater than m , thus resulting in a non-complete graph.” Here again, Petitioner relies on Shoubridge’s 64 node Manhattan grid network with connectivity of degree 4 as disclosing this limitation. Pet. 33–34 (Ex. 1105, 3). Petitioner relies on this description as teaching a similar requirement for claim 16 (“stable 4-regular state” and “at least six participants to result in a non-complete graph”). *Id.* at 56–57. Petitioner also relies on Dr. Karger’s testimony that a person of ordinary skill would have understood this description to disclose a non-complete graph that is m -regular (i.e., each participant has exactly 4 neighbor participants) and in which the number of participants is at least two greater than m (i.e., 64 is at least two greater than 4). Ex. 1119 ¶¶ 89–91, 116, 120, 198. Patent Owner does not present an argument in response to these contentions.

We agree the cited network in Shoubridge satisfies the construction of “ m -regular” because each node is connected to exactly $m = 4$ neighboring nodes and that the graph is non-complete, based on Dr. Karger’s unrebutted testimony. We also agree that the number of participants (i.e., 64) is at least two greater than m (i.e., $64 > 2 * (m = 3 \text{ neighbor participants})$), as required by claim 1, and is at least 6, as required by claim 16. Accordingly, for the foregoing reasons, we determine Petitioner has satisfied its burden of proving by a preponderance of the evidence that Shoubridge anticipates claims 1 and 16.

4. Claims 2–5 and 11

Claim 2 requires that each participant of the computer network of claim 1 is “connected to 4 other participants.” Claim 3 requires that “each participant is connected to an even number of participants.” Petitioner contends these limitations are satisfied by Shoubridge’s 64 node grid network *with connectivity of degree 4*, which satisfies both claim 2’s requirement for connections to four other participants and claim 3’s requirement for connections to an even number of participants. Pet. 34–35 (citing Ex. 1105, 3; Ex. 1119 ¶¶ 123–126). Patent Owner does not address these limitations.

Claim 4 requires the network of claim 1 to be “ m -connected, where m is the number of neighbor participants of each participant.” Claim 5 requires the network to be both m -connected and m -regular. Petitioner relies again on Shoubridge’s 64 node grid network with connectivity of degree 4 as satisfying the respective limitations. Pet. 35–36 (citing Ex. 1105, 3; Ex. 1119 ¶¶ 127–131). We construed m -connected to mean “dividing the network into two or more separate parts would require the removal of at least m nodes.” Petitioner contends Shoubridge’s network is 4-connected and that it would take the failure of at least 4 nodes to divide the network into two or more separate parts. *Id.*; Ex. 1119 ¶ 90 (“It would take the failure of at least 4 nodes to divide the network.”). Petitioner contends Shoubridge’s network is 4-regular for the same reasons as discussed above with respect to claim 1 (i.e., each node is connected to exactly 4 other nodes), which also requires the network to be m -regular. Pet. 36. Patent Owner does not address these limitations.

Claim 11 recites that “each participant sends to each of its neighbors only one copy of the data.” For this limitation, Petitioner relies on Shoubridge’s statement that “[c]onstrained flooding uniquely identifies packets If any packets revisit a node with the same sequence number, they are discarded instead of being further broadcast to neighbours.” Pet. 42 (quoting Ex. 1105, 2); Ex. 1119 ¶ 153. Patent Owner does not address this limitation.

We have reviewed the foregoing contentions regarding claims 2–5 and 11, and determine that they are supported by the record. Accordingly, we determine Petitioner has satisfied its burden of proving by a preponderance of the evidence that Shoubridge anticipates claims 2–5 and 11.

5. Claims 6 and 7

Claims 6 and 7 respectively require all the participants be peers and the connections be peer-to-peer connections. Petitioner contends that these limitations are disclosed by Shoubridge’s network topology and statement that the “total load entering (and leaving) the network . . . is evenly distributed across all N nodes.” Pet. 36–38 (citing Ex. 1105, 3); *see also* Ex. 1119 ¶ 134. Because user traffic is evenly distributed, according to Petitioner, nodes are treated equally. Ex. 1119 ¶ 134; Pet. Reply 12 n.11 (citing Ex. 1119 ¶¶ 213–216 (“A POSITA would therefore have understood that the disclosed processors constitute peers connected in a peer-to-peer network by peer-to-peer connections.”))).

Patent Owner contends that “[a] POSITA would understand that peer-to-peer communications occur at the application-level, using a structured or unstructured overlay network,” and that the ’966 patent only discusses peer-

to-peer networks in an application-level context. PO Resp. 42 (citing Ex. 1101, 13:26–34; Ex. 2022 ¶ 99; Ex. 2038).

To begin with, as with the limitations of claim 1, we reject the attempt to read an “application-layer” requirement into the claims. Here, both Patent Owner and Dr. Goodrich cite page 1 of Exhibit 2038 (“Schollmeier”) as supporting this application-layer interpretation of peer-to-peer, but provide no further explanation.¹³ Although Schollmeier does give “Napster” as an application-level example of a peer-to-peer network, it then states such networks can be described in “more than just an application specific way . . . simply as the opposite of Client/Server architectures.” Ex. 2038, 1. Indeed, the paper states that “[a] distributed network architecture may be called a Peer-to-Peer . . . network, if the participants share a part of their own hardware resources . . . to provide the Service and content offered by the network.” *Id.* (“Definition 1”).

These descriptions do not indicate that peer-to-peer is limited to “communications [that] occur at the application-level, using a structured or unstructured overlay network,” – as Patent Owner asserts (PO Resp. 42) – but broadly refer to “networks” in which participants share resources without a central server. Similarly the cited portion of the ’966 patent also does not support Patent Owner’s proposed construction of peer-to-peer, but simply states all connected computers are peers as far as broadcasting is concerned. *See* Ex. 1101, 13:25–32. We, therefore, are not persuaded by

¹³ Patent Owner does not propose a construction for peer or peer-to-peer, or otherwise purport to analyze these terms under the broadest reasonable interpretation standard. *See* 37 C.F.R. § 42.104(b)(3).

Patent Owner's arguments relating to an application-layer requirement of the term peer-to-peer.¹⁴

Patent Owner also contends "Shoubridge discloses a route searching algorithm, which is unrelated to peer-to-peer communications," and that its "simulation is designed to evenly distribute packets so that each node can act as a source node." PO Resp. 43. Patent Owner further contends that "[w]hen asked how the even distribution simulation relates to peer-to-peer technology, Dr. Karger could not provide an answer." *Id.* (citing Ex. 2034, 137:6–138:6). We disagree.

As explained above in detail with respect to the enablement issue and claim 1, Shoubridge's simulation uses constrained flooding in one embodiment and route searching in another embodiment. *See* Ex. 1105, 2–3, Fig. 1 ("Flood" and "Minhop"). Therefore, Patent Owner's reliance on Shoubridge's discussion of route searching algorithms does not address Petitioner's evidence based on constrained flooding. Moreover, we have reviewed the cited portions of Dr. Karger's testimony and find that it does not support Patent Owner's contention that he admitted his reliance on distribution simulation does not relate to peer-to-peer connections. *See* Ex. 2034, 137:6–138:6.

We find the evidence supports Dr. Karger's declaration. Among other things, "[e]ach node functions as a source of user traffic entering the network, where traffic can be destined to all other nodes within the network," and "[t]he total load entering (and leaving) the network . . . is

¹⁴ We also reject Patent Owner's contention that, unlike Shoubridge, peer-to-peer are "continuously evolving systems, with peers leaving and joining," as unsupported by the record. *See* PO Resp. 43–44.

distributed evenly across all N nodes.” Ex. 1105, 2–3. In addition, in the constrained flooding algorithm, each node behaves the same, whereby each “user packet transmitted from a node is copied and broadcast on all outgoing links.” *Id.* at 3. We find this evidence supports Dr. Karger’s opinion that all nodes are peers (claim 6) because “*each node has a substantially identical function, and there is no hierarchy or privileged participant in the disclosed graph of 64 nodes.*” Ex. 1119 ¶ 134 (emphasis added); *see* Ex. 1125 ¶ 149 (“no node has a special role to play”). Similarly, with respect to claim 7, the above-cited evidence, specifically the fact that each node communicates with its neighboring nodes, supports Dr. Karger’s opinion that the disclosed network topology is peer-to-peer. *See* Ex. 1119 ¶¶ 134, 214. Because it is consistent with the evidence, we credit Dr. Karger’s testimony.

For the foregoing reasons, we determine Petitioner has satisfied its burden of proving by a preponderance of the evidence that Shoubridge anticipates claims 6 and 7.

*E. Obviousness of Claims 6–10
and 17 over Shoubridge*

Petitioner contends claims 6–10 and 17 are unpatentable as obvious over Shoubridge. Pet. 16–58. We have reviewed the Petition, Patent Owner’s Response, Petitioner’s Reply, as well as the relevant evidence discussed in those papers and other record papers. We have reviewed Petitioner’s arguments and the underlying evidence cited in support and are persuaded Petitioner sufficiently establishes that claims 6–10 and 17 of the ’966 patent are unpatentable as obvious over Shoubridge.

1. Claims 6 and 7

Relying on its anticipation analysis (Pet. 36–38), Petitioner contends that claims 6 and 7 also would have been obvious in view of Shoubridge. Pet. 58 (citing Ex. 1119 ¶¶ 213–216). Dr. Karger opines that a person of ordinary skill in the art would have been motivated to implement the disclosed nodes as peers and the disclosed connections as peer-to-peer to obtain “improved reliability.”¹⁵ Ex. 1119 ¶ 215. Patent Owner disputes Petitioner’s obviousness analysis, contending that Dr. Karger never explains his rationale based on improved reliability and, thus, fails to explain why a person of ordinary skill in the art would have modified Shoubridge. PO Resp. 44–45.

We have considered Patent Owner’s argument; however, in view of our determination above that Shoubridge discloses that its participants are peers and that its connections are peer-to-peer, we also find the same disclosures in Shoubridge *teach or suggest* the limitations of claims 6 and 7 for purposes of obviousness.

¹⁵ We disagree that Dr. Karger’s opening obviousness analysis (Exhibit Ex. 1119) is deficient for failure to consider secondary considerations, as Patent Owner alleges. *See* PO Resp. 29–30. Patent Owner directs us to no authority for the proposition that Dr. Karger’s opening declaration, submitted at the time of the Petition, was required to anticipate and address secondary considerations that had not yet been articulated by Patent Owner and submitted for the record. We have considered *Intri-Plex Technologies, Inc. v. Saint-Gobain Performance Plastics Rencol, Ltd.*, IPR2014-00309 (Paper 83) (PTAB Mar. 23, 2014), cited by Patent Owner, but that case simply states that secondary considerations, *if in evidence*, must be considered. *See* slip op. at 35. Here, once Patent Owner presented its evidence and arguments, in the Response, Dr. Karger submitted a rebuttal declaration addressing Patent Owner’s evidence. *See* Ex. 1125 ¶¶ 184–221.

2. Claim 8

Claim 8 requires the connections of claim 1 to be “TCP/IP connections.” Petitioner contends it would have been obvious to implement the “communication network” disclosed in Shoubridge with TCP/IP connections as required by claim 8, because TCP/IP is a well-known network protocol and, therefore, an obvious design choice. Pet. 58; Ex. 1119 ¶¶ 217–221.

Patent Owner contends “[a] POSITA would understand that the ‘966 Patent is generally geared towards an overlay network operating on top of a reliable underlying network like the TCP/IP communication protocol.” PO Resp. 45–46 (citing Ex. 2022 ¶ 107); *id.* at 46 (“[A]t least because Shoubridge fails to teach an overlay network, the incorporation of TCP/IP with Shoubridge would not work.”). We disagree because this argument again relies on proposed claim constructions that we reject, namely, that the claims require the presence of an overlay network in Shoubridge. In addition, Patent Owner fails to explain why a limitation directed at the implementation of a transport-layer protocol (i.e., TCP/IP) (*see, e.g.*, Ex. 2022 ¶ 31) would require an “overlay network” to work.

Patent Owner also contends that the use of flooding, as disclosed in Shoubridge, “would cause problems in a large network utilizing TCP/IP.” PO Resp. 46–47 (citing Ex. 2037, Ex. 2046). However, the claims are not directed to a “large network,” but ones with as few as 6 participants (i.e., “at least two greater than m ” (claim 1) or “at least six participants” (claim 16)). Moreover, we have reviewed the cited evidence but we observe that the discussions of flooding do not appear to discourage the use of TCP/IP for connections. The issue is not whether flooding itself is impractical, but

whether it would have been obvious to implement flooding, as disclosed in Shoubridge (as well as in Exhibits 2037 and 2046), using TCP/IP for the connections.

Patent Owner contends Shoubridge is a simulation and intended for military applications, which do not use TCP/IP. PO Resp. 47-48 (citing Ex. 1105, 1, 3; Ex. 1106 (“Shoubridge Thesis”), 67). Thus, according to Patent Owner, a person of ordinary skill would have understood the flooding algorithms in Shoubridge to apply to a narrow set of uses, particularly the military, and not have sought to modify Shoubridge to use TCP/IP. *Id.*

We do not find these arguments persuasive. Shoubridge does not specifically mention military applications and, although acknowledging high network utilization, it teaches the use of flooding generally for robustness in dynamic networks outside of the simulation context. *See* Ex. 1105, 2, 3 (“It is reasonable to conclude that a large network similar to the one modelled, would require a flooding procedure if the network is to operate in a very dynamic, or potentially very dynamic environment.”). Moreover, we agree with Petitioner and Dr. Karger that a person of ordinary skill in the art would have understood the tradeoffs between reliability and network resource usage when deciding whether to use constrained flooding in connection with the TCP/IP protocol (*see* Pet Reply 15; Ex. 1125 ¶¶ 159–162), because Shoubridge explains these tradeoffs (*see* Ex. 1105, 2–3).

We have considered Patent Owner’s argument that TCP/IP is a routing protocol and therefore not “compatib[le]” with Shoubridge’s own “hybrid routing algorithm” (PO Resp. 48 (citing Ex. 2022 ¶ 112)), but we do not find this position credible. As we have noted throughout here and the Decision to Institute, Petitioner relies on Shoubridge’s constrained flooding

technique, not its hybrid routing algorithm. *See* Pet. 42; Inst. Dec. 14. Patent Owner and Dr. Goodrich offer no credible technical reason why TCP/IP would not work with constrained flooding.¹⁶ The fact that the '966 patent itself uses TCP/IP in such a network, without pointing out any of the alleged disadvantages Patent Owner relies on for its contentions, belies the argument that TCP/IP is not suitable for the disclosed techniques. *See* Ex. 1101, 6:23–24 (“[T]he broadcast technique establishes the computer connection using TCP/IP communications protocol, which is a point-to-point protocol, as the underlying protocol.”).

Dr. Karger provides unrebutted testimony that TCP/IP is the dominant protocol of the most obvious example of a communications network (i.e., the “Internet itself”). *See* Ex. 1119 ¶ 219. We find this testimony credible because it is consistent with the '966 patent. Indeed, the specification describes TCP/IP as one of several background prior art point-to-point protocols allowing computers to communicate. Ex. 1101, 1:44–49. Thus, we agree that TCP/IP as the point-to-point protocol for constrained flooding, as disclosed in Shoubridge, would have been one of a “finite number of identified, predictable solutions.” Pet. Reply 14 (citing *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007)). We also find Petitioner’s

¹⁶ For example, we do not find the argument that “flooding at the network layer can be considered a denial of service attack, which is illegal” (Ex. 2022 ¶ 12), to be credible. Because a person of ordinary skill in the art would have understood the costs and benefits of applying Shoubridge’s constrained flooding technique to the nodes of an m-regular network, such a result as flooding the Internet would not be a realistic result (*see* Ex. 1125 ¶ 162). *See also KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007) (“A person of ordinary skill is also a person of ordinary creativity, *not an automaton.*” (emphasis added)).

additional rationale for combining TCP/IP with constrained flooding, based on reliability, to be supported by the record. *See* Pet. Reply 14–15; Ex. 1125 ¶ 159 (“[A] POSITA would have selected between TCP if seeking robust transport mechanism . . . or UDP if seeking a simpler protocol . . . with fewer guarantees.”); ¶ 163 (describing use of TCP in ARPANET). Accordingly, we agree with and adopt Petitioner’s rationale and motivation in support of its argument for obviousness of claim 8.¹⁷

3. Claim 9

Claim 9 requires that “each participant is a process executing on a computer.” Petitioner contends that, in view of Shoubridge’s discussion of constrained flooding as the most efficient way to flood an entire network (Ex. 1105, 3), it would have been obvious that the processors disclosed in Shoubridge are computers and the disclosed flooding protocol would comprise a process on a computer. Pet. 59; Ex. 1119 ¶¶ 222–226; *see also* Ex. 1105, 1.

Patent Owner contends that “[a] POSITA reading the specification would understand that a participant is at the application layer.” PO Resp. 50. Patent Owner further contends “[t]his element is not rendered obvious because Shoubridge only discloses an underlying network layer. Shoubridge never discusses the application layer where processes interact.” *Id.*

We do not find these arguments persuasive because, to begin with, they depend on Patent Owner’s proposed claim constructions that we reject. Moreover, Patent Owner does not address why Shoubridge’s teachings

¹⁷ However, before reaching our determination as to whether the challenged claims are obvious in view of Shoubridge, we address Patent Owner’s evidence of non-obviousness below (*see* PO Resp. 53–62).

(whether simulation or otherwise) would not be implemented as “a process on a computer,” when the above cited evidence suggests a computer is what is contemplated. Ex. 1105, 1 (discussing computing processing power and memory within network nodes). We determine this evidence supports Dr. Karger’s opinion that a person of ordinary skill would have found it routine to implement Shoubridge’s nodes as a process on the disclosed computer (i.e., processor and memory). See Ex. 1119 ¶ 225. Accordingly, we agree with and adopt Petitioner’s rationale and motivation in support of its argument for obviousness of claim 9.

4. Claims 10 and 17

Claim 10 recites that “a computer hosts more than one participant.” Claim 17 recites the same. Petitioner, relying on Dr. Karger, contends that the simulation of the 64 node (i.e., 64 participant) network in Shoubridge satisfies this limitation. See Pet. 41–42 (citing Ex. 1119 ¶¶ 149, 150). Dr. Karger states that a person of ordinary skill in the art would have understood this simulation to “typically run on a single computer, or at a minimum, simulated more than one participant using a single computer.” Ex. 1119 ¶ 150.

Patent Owner contends that “[a] POSITA would understand that this claim element means that a computer hosts multiple participants by running different applications or multiple instances of the same applications that interact with each other.” PO Resp. 51–52 (citing Ex. 1101, 15:10–17; Ex. 2022 ¶¶ 123–126; Ex. 2044, 176 (defining “host” as “a server that performs centralized functions . . .”)). We do not find this argument persuasive. As an initial matter, we reject the attempt to add an “application” requirement to the claims for the reasons discussed above. Other than Patent Owner’s

argument, we find no evidence in the specification that the term “host more than one participant” means different applications or instances of the same application. The cited portion of the ’966 patent does not mention a host at all and only mentions application programs as an *example* of a *process*. See Ex. 1101, 15:17–18 (“e.g., application programs”). Neither Patent Owner nor Dr. Goodrich (whose testimony substantially tracks Patent Owner’s in this regard) explains how the dictionary definition of “host” (relating to a “server that performs centralized functions”) is applicable in the context of the ’966 patent.

Aside from its proposed construction of “hosts” and “participants,” Patent Owner’s contentions do not meaningfully address Dr. Karger’s evidence, which is that a single computer would typically host the disclosed simulation of multiple participants.¹⁸ For example, Patent Owner does not explain why such an assertion is “nonsensical,” or why it is “irrelevant to the language of the claims.” PO Resp. 52. Because this rebuttal is unsupported it does not undermine Dr. Karger’s testimony that a single computer would typically run the simulation disclosed in Shoubridge. We, therefore, credit this testimony. Accordingly, we find Petitioner’s contention that a person of ordinary skill in the art would have recognized that the simulation of participants in Shoubridge would have typically been implemented on a computer (i.e., “as hosting more than one participant”) to be supported by the record and, therefore, adopt it as our own.

¹⁸ As explained with respect to claim 1, the simulation is of a 64 node network, which we agree discloses 64 participants in the network.

5. Petitioner's Alleged Failure to Provide a Motivation

Patent Owner presents additional arguments against all of Petitioner's obviousness challenges. To begin with, Patent Owner's generalized contention that Petitioner "failed to explain why a POSITA would want to modify Shoubridge" (PO Resp. 53), is not persuasive because, as explained above, we determine that Petitioner has supported its contentions with respect to each of the challenged claims. We also do not find persuasive Patent Owner's contention that "designing systems at the application layer is completely different than designing systems at the networking layer" (*id.* at 53–54), because it relies on proposed claim constructions (i.e., "application layer" and "overlay network") that we reject.

Patent Owner also argues that "it was impracticable to implement flooding at the application layer or the network layer in a large system due to the massive bandwidth usage. It was well known at that time that flooding had limited uses and would ultimately cause[] bandwidth issues in a large enough network." *Id.* at 54. As discussed above, the claims do not require a "large system," but a system with as few as 6 participants. It is also unclear how "caus[ing] bandwidth issues in a large enough network" is probative of non-obviousness, when the prior art (including Patent Owner's exhibits) acknowledges the limitations of flooding and constrained flooding techniques, yet teaches the use of such techniques even for a "large network." *See* Ex. 1105, 2 ("[Constrained flooding [is] the most efficient way to flood an entire network."), 4 ("It is reasonable to conclude that a *large network similar to the one modelled*, would require a flooding procedure if the network is to operate in a very dynamic, or potentially very

dynamic environment.” (emphasis added)); Ex. 2037, 623 (“constrained flood routing is most noted for its robustness”); Ex. 2046, 351.

To this end, Dr. Goodrich’s simulation of Shoubridge’s network is also not persuasive (*see* PO Resp. 54; Ex. 2002 ¶¶ 132–141), because it allegedly shows why Shoubridge’s technique is not practical, when its advantages and disadvantages are already well documented in the prior art. The issue is whether, given Shoubridge’s disclosure of constrained flooding (which we determine anticipates independent claims 1 and 16), a person of ordinary skill in the art would have modified Shoubridge in the ways contemplated by the challenged dependent claims (i.e., 6–10 and 17).

Regardless, we have considered Dr. Goodrich’s simulation but we do not give it substantial weight. Among other things, Dr. Goodrich fails to sufficiently explain why he simulated a network within a network. According to Dr. Goodrich, his simulation is of “an 8-times-8 Manhattan grid network (with torus wrap-around) as an overlay on top of an 8-times-8 Manhattan grid network with torus wrap-around, which amounts to operating the topology of Shoubridge as an overlay on the Shoubridge network itself.” Ex. 2022 ¶ 132. However, by using two networks, an overlay and an underlay, we agree with Petitioner that this simulation amounts to “flooding within flooding.” Pet. Reply 21–22 & n.15. That is, it appears that “each time one node passed a message to a neighboring node, [Dr.] Goodrich also flooded the underlay network” (resulting in over 2 million messages for 2 original messages/node),¹⁹ without explaining why

¹⁹ For example, Dr. Goodrich does not explain how 2 million messages were generated. Therefore, we accept Dr. Karger’s computation that Dr.

this would be necessary. *See id.*; Ex. 1125 ¶¶ 104–105. Therefore, we do not find this simulation to be representative of Shoubridge.

For the foregoing reasons, we do not find Patent Owner’s contentions regarding the alleged failure of motivation to modify Shoubridge to be persuasive.

6. Objective Indicia of Non-Obviousness

Factual inquiries for an obviousness determination include secondary considerations based on evaluation and crediting of objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). The totality of the evidence submitted, including objective evidence of nonobviousness, may lead to a conclusion that the challenged claims would not have been obvious to one of ordinary skill in the art. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984).

Secondary considerations may include any of the following: long-felt but unsolved needs, failure of others, unexpected results, commercial success, copying, licensing, and praise. *See Graham*, 383 U.S. at 17; *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007). However, to be given substantial weight, the proponent must demonstrate a nexus between the merits of the claimed invention and the evidence of secondary considerations. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995). “Nexus” is a legally and factually sufficient connection between the objective evidence and the claimed invention, such that the objective evidence should be considered in determining nonobviousness.

Goodrich was flooding both networks as the explanation for this number of messages. *See id.*

Demaco Corp. v. F. Von Langsdorff Licensing Ltd., 851 F.2d 1387, 1392 (Fed. Cir. 1988).

In its Response, Patent Owner presents evidence and arguments as to long-felt need, unexpected results, licensing and commercial success, industry praise, and copying. PO Resp. 55–63. Patent Owner also relies on the declaration of Dr. Bims in support of its contentions. *See* Ex. 2023.

a. Long-felt need and failure of others

Patent Owner contends the “invention solved the central bottleneck problem that occurred in client/server networks and was able to address problems of management complexity through a broadcast channel that overlays a point-to-point network where each node is connected to some, but not all, neighboring network nodes.” PO Resp. 56 (citing Ex. 2023 ¶¶ 26–28, 31). Patent Owner also contends the inventors (Fred Holt and Virgil Bourassa) began trying to solve the problem at the request of Boeing management to allow a peer-to-peer communication platform with more than two users to communicate reliably and with low delay. *Id.* at 57 (citing Ex. 2024 ¶¶ 5, 8; Ex. 2025 ¶¶ 4, 7). According to Dr. Bims, Patent Owner contends, this “problem existed for years” prior to the ’966 patent. *Id.* (citing Ex. 2023 ¶¶ 26–28, 31).

We do not find this evidence persuasive. To begin with, the proffered evidence must show a long-felt need *recognized by those of ordinary skill in the art*. *In re Gershon*, 372 F.2d 535, 538 (CCPA 1967). Here, Patent Owner relies on the inventors’ recognition of the problem, which does not indicate it was a significant one. *See id.* (“[O]ne may question whether in fact such a ‘problem’ objectively existed, as distinguished from its acknowledged subjective existence in the minds of the inventors and their

patent counsel.”). Although Patent Owner also cites its declarant Dr. Bims’s testimony that the problem existed for years, this, too, is based solely on his review of the inventors’ declaration and does not independently corroborate the existence of the long-felt need or failure of others. *See* Ex. 2023 ¶¶ 26–28 (“Based on these declarations, it is my opinion that they were solving a long felt need as the systems at the time did not support the collaboration of many participants in a reliable manner.”).

Additionally, we agree Patent Owner provides little evidence of nexus to the claimed invention. *See* Pet. Reply 23–25. “[O]bjective evidence of non-obviousness must be commensurate with the scope of the claims.”

Allergen, Inc. v. Apotex Inc., 754 F.3d 952, 965 (Fed. Cir. 2014).

According to Patent Owner, the problems relating to the alleged long-felt need and failure of others are:

point-to-point network protocols did not scale as the number of participants increased; client/server middleware systems faced bottleneck performance issues as participants stored information in order to be shared and risked the failure of communications between the clients due to a server failure; multicasting networks were limited to single local-area networks; and peer-to-peer middleware communications systems relied on a user to assemble a point-to-point graph of the connections used for sharing the information and thus were not suitable for the needs of large-scale collaboration. *See* Ex. 2028 (Invention Disclosure Form); Holt Decl. at ¶¶ 6, 7; Bourassa Decl. at ¶¶ 5, 6.

PO Resp. 57. Even accepting these contentions, Patent Owner does not explain which of these problems relate to claim limitations at issue. For example, there are no claim limitations directed to scaling, large-scale collaboration, or graph assembly by a non-user.

Accordingly, we also find that insufficient nexus has been established between the alleged “long-felt need” and “failure of others” and the claimed invention. Consequently, we accord little weight to Patent Owner’s contentions relating to long-felt need and failure by others.

b. Unexpected results

Patent Owner relies on the three years it allegedly took inventors to “identify a solution” as unexpected results. *See* PO Resp. 58 (citing Ex. 2024 ¶¶ 9–26; Ex. 2025 ¶¶ 8–41). According to Patent Owner, “[t]his three-year period consisted of twenty-eight different epiphanies that were not readily apparent based on what was known in the art at that time.” *Id.* (citing Ex. 2025 ¶¶ 5–8; Ex. 2023 ¶¶ 29–31).

To begin with, we agree with Petitioner (Pet. Reply 25) that Patent Owner’s evidence of the difficulties in identifying a solution is not itself evidence of unexpected results. *See Procter & Gamble Co. v. Teva Pharms. USA, Inc.*, 566 F.3d 989, 994 (Fed. Cir. 2009) (noting that unexpected results requires a showing of some *superior property or advantage* that a person of ordinary skill would have found *surprising or unexpected*).

Nevertheless, we have considered this testimony. We observe (as discussed above with respect to enablement of the prior art) that most if not all of the inventors’ three-year development and 28 “epiphanies” relate to developing unclaimed features of the system. *See, e.g.*, Ex. 2024 ¶¶ 12–14 (challenge associated with “joining a SWAN session”), ¶ 17 (challenge associated with node departures), ¶ 18 (challenge in enforcing a consistent state with no global reference); *see also* Ex. 2023 ¶¶ 29–31 (discussing inventor testimony). As such, this evidence does not support a conclusion of non-obviousness. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554,

1562 (Fed. Cir. 1997) (noting evidence of lengthy development was related to unclaimed features). There is no evidence, for example, of any development issues relating to any of the claim limitations that Patent Owner contends would not have been obvious. We conclude, therefore, that insufficient nexus exists between the alleged “unexpected results” and the claimed invention. For the foregoing reasons, we give little weight to Patent Owner’s contentions relating to unexpected results.

c. Licensing and commercial success

Patent Owner contends that “the patented invention described in the ‘966 Patent gained commercial success through its successful licensing of the claimed invention to Sony.” PO Resp. 59 (citing Ex. 2023 ¶ 10, Ex. 2029). Patent Owner further contends that Sony’s PlayStation is a commercial embodiment of the claimed invention of the ‘966 patent and that it has obtained increased sales as a result of products that practice the recitations of the challenged claims. *Id.* (citing Ex. 2023 ¶¶ 11–13; Ex. 2070 (chart mapping Sony product to licensed patents)).

We have considered Exhibit 2029, which purports to be a license agreement between Boeing Management Company and Sony Computer Entertainment for the ‘966 patent and related patents. *See* Ex. 2029, 1, 11 (“Attachment A”). We have also considered Dr. Bims’s opinion that at least Sony PlayStation is a commercial embodiment of the ‘966 patent, as evidenced by his claim chart purportedly mapping claim 1 of the ‘966 patent to PlayStation 3 and PlayStation 4. *See* Ex. 2070. In addition, we have considered Dr. Karger’s rebuttal testimony that Dr. Bims’s claim chart fails to show that the PlayStation products meet all of the limitations of claim 1. *See* Ex. 1125 ¶¶ 187–211.

We recognize that there is a presumption of nexus when the asserted objective evidence is tied to a specific product that is an embodiment of the claimed invention. *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1329–31 (Fed. Cir. 2016). Secondary considerations evidence, however, must relate to the merits of the invention and not extrinsic factors, or features already known in the art. *In re Kao*, 639 F.3d 1057, 1070 (Fed. Cir. 2011); *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1323 (Fed. Cir. 2006). Thus, “[a] nexus may not exist where, for example, the merits of the claimed invention were readily available in the prior art.” *ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1220 (Fed. Cir. 2016) (internal quotation marks and citation omitted). Nonetheless, while a nexus may be lacking if the objective evidence “exclusively relates to a feature that was ‘known in the prior art,’ the obviousness inquiry centers on whether ‘the claimed invention as a whole’ would have been obvious.” *WBIP*, 829 F.3d at 1330 (quoting *Rambus, Inc. v. Rea*, 731 F.3d 1248, 1257 (Fed. Cir. 2013)).

Here, Patent Owner relies solely on a chart mapping the limitations of claim 1 to the Sony PlayStation. However, even if the Sony PlayStation products satisfy all the limitations of claim 1, which Petitioner disputes, we are not persuaded a nexus exists between the claimed invention and the license agreement. As explained above, the claimed invention as whole, as recited in claim 1 and other claims, is disclosed in the prior art *as a whole*, i.e., in Shoubridge. In other words, “the merits of the claimed invention were readily available in the prior art.” *ClassCo*, 838 F.3d at 1220. Patent Owner does not direct us to any testimony or other evidence that suggests any limitations of claims 6–10 and 17, the focus of the obviousness inquiry, were embodied by the licensed product or that these features were important

to the license. Thus, this case is distinguishable from *WBIP*, in which the Federal Circuit concluded a jury's presumed factual findings relating to nexus were supported by substantial evidence when the merits of the invention involved a combination of prior elements that were known individually in the prior art. *WBIP*, 829 F.3d at 1331–32.

Patent Owner's commercial success evidence suffers from the same deficiency because it also relates to the PlayStation products. *See Ex. 2023 ¶¶ 11–12*. Consequently, there is no nexus between the alleged success and the merits of the invention.

For these reasons alone, we do not accord substantial weight to Patent Owner's license and commercial success evidence.

Although we find Patent Owner's evidence of nexus to be insufficient, we also have considered its "commercial success" based on Sony's game division allegedly experiencing an increase of about 267 billion yen for the fiscal year ending March 31, 2008, and an increase in sales of PlayStation 3 from 5.63 million units to 9.24 million units over the same period. PO Resp. 59–60 (citing Ex. 2023 ¶ 14; Ex. 2060). Even assuming these numbers are accurate, a necessary component of the commercial success inquiry is determining market share associated with the alleged product, relative to competing products. *In re Applied Materials, Inc.*, 692 F.3d 1289, 1300 (Fed. Cir. 2012). Here, without market share, or a sense of the total market, we cannot evaluate the significance of the increased sales amounts. *See id.* at 1300 ("[T]he number of units sold without evidence of the market share is only weak evidence of commercial success."). For example, we do not know whether PlayStation 3's improvement in raw sales (an increase of 5.63

million units to a total of 9.24 million units) amounted to an increase in market share or whether the total market also increased proportionately.

Dr. Bims states that “[i]t is my opinion that the increase in sales were due in part because of Sony’s license to the ‘966 Patent. These sales are indicative of the commercial success of the inventions disclosed in the ’966 Patent because Sony has utilized the invention in products that have been commercially successful.” Ex. 2023 ¶ 14. However, in the absence of further evidence, we find this reasoning to be conclusory as well as circular.²⁰ Thus, we give little weight to Patent Owner’s commercial success arguments for these additional reasons.

d. Industry praise

Patent Owner contends that there was industry praise for the ’966 patent as evidenced by Boeing’s initiative to identify internal technologies that had commercial potential, which selected SWAN (an alleged embodiment of the ’966 patent) as a leader in the portfolio of possible spin-out companies. PO Resp. 60 (citing, e.g., Ex. 2024 ¶ 27). Petitioner contends that Boeing’s own “self-referential commendation” of the technology does not demonstrate industry praise. Pet. Reply 26 (quoting *Bayer Healthcare Pharms. v. Watson Pharms.*, 713 F.3d 1369, 1377 (Fed. Cir. 2013)).

We agree with Petitioner. While “praise in the industry for a patented invention, and specifically praise from a competitor, tends to indicate that the invention was not obvious, *self-serving statements from researchers*

²⁰ We also observe that Dr. Bims does not have any obvious qualifications as an economics expert (*see* Ex. 2023 ¶¶ 2–4 (describing graduate education in electrical engineering), Appendix A).

about their own work do not have the same reliability.” In re Cree, 818 F.3d 694, 702 (Fed. Cir. 2016) (agreeing that the Board was correct to discount self-recognition of inventor’s own work). Consequently, we do not consider Boeing’s effort to promote the work of its inventors as objective evidence of industry praise.

We have also considered Patent Owner’s contention that cites to the ’966 patent in “*almost 50 other patent applications*” by well-known companies also represents praise. PO Resp. 60 (citing Ex. 2023 ¶¶ 20–22; Ex. 2074). Patent Owner’s declarant adds that “it is my opinion that the ’966 Patent describes what the industry now calls ‘peer-to-peer relay’ technology” and “citation of the ’966 Patent by companies in the gaming industry demonstrates that the gaming industry appreciates the significance of the invention described in the ’966 Patent.” Ex. 2023 ¶¶ 20–21.

We do not find this evidence persuasive of praise. First, Patent Owner’s reliance on “bare . . . citations” to the ’966 patent by other patents are not suggestive of true praise. *See Bayer Healthcare*, 713 F.3d at 1377 (finding that brief discussions of Patent Owner’s product in journal articles “fall well short of demonstrating true industry praise”). Second, Dr. Bims’s statements that the ’966 patent describes what is now termed “peer-to-peer relay” and “the gaming industry appreciates the significance of the invention” rely solely on the same list of bare citations. *See* Ex. 2023 ¶¶ 20–21. As such, they are unsupported and conclusory. Accordingly, we give little weight to Patent Owner’s contentions relating to industry praise.

e. Copying

According to Patent Owner, “Petitioner’s products are embodiments of the patented invention described in the [’966] Patent.” PO Resp. 61. In

support, Patent Owner cites Dr. Bims’s declaration and Exhibits 2071, 2072, and 2073, which Dr. Bims represents as “infringement contentions filed in the parallel district court proceedings.” Ex. 2023 ¶¶ 15–18. We find this evidence to be insufficient to establish copying.

“[Federal Circuit] case law holds that *copying requires evidence of efforts to replicate a specific product*, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype, photographing its features, and using the photograph as a blueprint to build a replica, *or access to the patented product combined with substantial similarity to the patented product.*” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010) (emphasis added). On the other hand, reliance solely on infringement contentions is insufficient to demonstrate copying because “otherwise, every infringement suit would automatically confirm the nonobviousness of the patent.” *Id.* (internal quotations and citations omitted). Here, in his declaration, Dr. Bims cites the entirety of Patent Owner’s lengthy infringement contentions as evidence of copying and provides the same undifferentiated statement for each of the accused products that “these games have certain modes that allow players in different locations across the world.” *See* Ex. 2023 ¶¶ 16–18. Dr. Bims does not cite specific evidence, for example, of similarities between the accused product and Patent Owner’s product that would tend to show copying. Accordingly, we give little weight to Patent Owner’s contentions relating to copying.

7. Legal Conclusion of Obviousness

We have considered Patent Owner’s evidence of non-obviousness against Petitioner’s showing above regarding the subject matter of claims 6–10 and 17 in view of Shoubridge. We find the evidence supports giving the

proposed objective indicia of non-obviousness little weight overall. Considering the evidence as a whole, including Petitioner's rationales in support of its contentions that the limitations of claims 6–10 and 17 are unpatentable, either because a person of ordinary skill in the art would have recognized that Shoubridge teaches or suggests the relevant limitations or because the relevant limitations would have been obvious modifications for such an artisan, we are persuaded that Petitioner has established by a preponderance of the evidence that claims 6–10 and 17 would have been obvious in view of Shoubridge.

III. MOTION TO AMEND

Patent Owner requests, should independent claim 1 and dependent claims 7 and 8 be determined to be unpatentable, that substitute claims 18, 19, and 20, respectively, be entered. Mot. 2; Reply Mot. 1. Petitioner opposes the request. Opp. Mot. 1. For the reasons that follow, we determine that substitute claims 18 and 20 are unpatentable, but that claim 19 is patentable over the prior art of record.

A. Substitute Claims

Patent Owner's proposed substitute claims are set forth below "with: (1) underlining indicating inserted text, (2) italics indicating claim language previously incorporated by reference via a dependency clause and now explicitly recited, and (3) strikethrough indicating deleted text." Mot. 4.

18. (Proposed Substitute for Claim 1) A dynamic, overlay computer network ~~for providing that overlays an underlying network and provides~~ an information delivery service for a plurality of participants, each participant having connections to at least three neighbor participants, each participant connected to

a broadcast channel, the broadcast channel being associated with a channel type and a channel instance,

wherein an originating participant sends data to the other participants connected to the broadcast channel by sending the data through each of its connections to its neighbor participants and wherein each participant sends data that it receives from a neighbor participant to its other neighbor participants,

further wherein the dynamic, overlay network is m-regular, where m is the exact number of neighbor participants of each participant, ~~and~~

further wherein the number of participants is at least two greater than m thus resulting in a non-complete graph, and

further wherein the data includes sports data.

19. (Proposed Substitute for Claim 7) ~~The computer network of claim 1~~ *A computer network for providing an information delivery service for a plurality of participants, each participant having connections to at least three neighbor participants,*

wherein an originating participant sends data to the other participants by sending the data through each of its connections to its neighbor participants and wherein each participant sends data that it receives from a neighbor participant to its other neighbor participants,

further wherein the network is m-regular, where m is the exact number of neighbor participants of each participant, ~~and~~

further wherein the number of participants is at least two greater than m thus resulting in a non-complete graph,

further wherein the connections are peer-to-peer connections,

further wherein the network is formed through a broadcast channel that overlays an underlying network,

further wherein the information delivery service is provided by at least one information delivery service application program executing on each computer of the computer network that interacts with the broadcast channel,

and further wherein participants can join and leave the network using the broadcast channel.

20. (Proposed Substitute for claim 8) ~~The computer network of claim 1~~ A dynamic, overlay computer network for providing an information delivery service for a plurality of participants, each participant being an information delivery service application, each participant having connections through the dynamic, overlay computer network to at least three neighbor participants,

wherein an originating participant sends data to the other participants by sending the data through each of its connections to its neighbor participants and wherein each participant sends data that it receives from a neighbor participant to its other neighbor participants,

further wherein the network is m -regular, where m is the exact number of neighbor participants of each participant, ~~and~~

further wherein the number of participants is at least two greater than m thus resulting in a non-complete graph,

further wherein the information delivery service is provided by at least one information delivery service application program executing on each computer of the dynamic, overlay computer network that interacts with a broadcast channel,

further wherein the dynamic, overlay network overlays an underlying network which contains underlying network connections, and

further wherein the underlying network connections are TCP/IP connections.

Mot. 28–30.

B. Claim Interpretation

Patent Owner proposes constructions for several terms that it reasonably anticipates as being subject to dispute. Mot. 5. Specifically, Patent Owner proposes construing “sports data,” “overlay computer network that overlays an underlying network,” “information delivery service,”

“broadcast channel,” “connection,” and “dynamic, overlay computer network.” *Id.* at 5–9.

As a general matter, Petitioner contends Patent Owner is seeking to use claim construction to add claim requirements, such as “application-layer,” “application program,” or “logical broadcast channel that overlays an underlying network,” that are not reasonably supported by the written description of the ’966 patent. Opp. Mot. 1–2. As an example, Petitioner contends the “’966 [patent] gives no indication the disclosed overlay network is at the application layer (*cf.* Mot.7)—nor would POSITA perceive one (Ex1124 ¶ 236). [The] ’966 lacks any discussion of network layers, OSI layer constructs, operation at the ‘application layer.’ Ex1124 ¶236.” Opp. Mot. 2. We agree with Petitioner.

To begin with, it bears pointing out that Patent Owner could have proposed substitute claims that explicitly recited the requirements it now seeks to add through claim construction. In any event, for reasons substantially similar to those discussed above (*see supra* § II.C), we agree with Petitioner that the proposed constructions are inconsistent with the specification of the ’966 patent. For emphasis, we refer specifically to the above claim construction discussion of the terms “participants” and “connection,” in which we determined that adding an “application program” or “application-layer” requirement was not consistent with the broadest reasonable interpretation of these terms given their usage in the specification. *See supra* § II.C.4–5. Moreover, in view of our findings

below regarding the teachings of the prior art, we determine that it is unnecessary to further construe the terms proposed by Patent Owner.²¹

C. Whether Substitute Claims Are Patentable

1. Claims 18 and 20

In its proposed substitute claim 18, as shown above, Patent Owner adds limitations to original claim 1, requiring the computer network to be a “dynamic, overlay computer network that overlays an underlying network and provides an information delivery service.” Claim 18 also requires that each participant is “connected to a broadcast channel, the broadcast channel being associated with a channel type and a channel instance.” Finally, claim 18 requires that the recited data “includes sports data.”

According to Patent Owner, the prior art of record (including Lin, DirectPlay,²² and Shoubridge) does not teach these additional limitations.²³

²¹ We reject Petitioner’s argument that Patent Owner’s attempt to add new matter, through claim construction, amounts to a failure to provide written description support for its proposed substitute claims in contravention to 37 C.F.R. § 42.121(b)(1). *See* Opp. Mot. 1. Rather, as required by our precedents (*see, e.g., MasterImage 3D, Inc. v. RealD Inc.*, Case IPR2015-00040 (PTAB July 15, 2015) (Paper 42) (precedential)), we find Patent Owner has sufficiently set forth the written description support it relies upon for its substitute claims. *See* Mot. 10–15.

²² Lin and DirectPlay are cited in, e.g., IPR2015-01970, Paper 2. However, in the Final Written Decision in that proceeding, we have determined that Lin was not shown to be a publicly accessible printed publication under 35 U.S.C. § 102(a).

²³ As a procedural matter, in discussing Lin, DirectPlay, and Shoubridge, as well as other references of record, we find that Patent Owner has sufficiently addressed material prior art of record known to Patent Owner as it relates to each added limitation as required by *MasterImage*. *See* Mot. 15–23 (addressing prior art raised in the proceedings as well as prior art identified during prosecution).

Mot. 17–23. For example, Patent Owner contends Shoubridge does not teach “an overlay network [as an] m-regular incomplete graph at the application layer,” but only discloses a simulation operating at the network layer, as admitted by Dr. Karger. *Id.* at 20 (citing, e.g., Ex. 2032, 102:22–103:4). Moreover, Patent Owner argues that a person of ordinary skill would not have used Shoubridge for information delivery service applications because it places robustness and reliability over latency, “which is detrimental to such applications.” *See id.* at 19–20 (citing, e.g., Ex. 2112 ¶¶ 35, 109, 130).

Petitioner argues that the additional limitations are rendered obvious by at least Shoubridge (Ground 4) or Shoubridge and Gautier²⁴ (Ground 5). Opp. Mot. 7. Specifically, regarding claim 18’s requirement for a “dynamic, overlay computer network” that “overlays an underlying network,” Petitioner contends that a person of ordinary skill in the art would have found it obvious to implement Shoubridge’s grid network as a dynamic overlay over an underlying communication network such as the Internet, which would form the links in the overlay network. *Id.* at 13 & n.12; *see* Ex. 1125 ¶¶ 133–134.

We find Petitioner’s contentions persuasive. Irrespective of whether Shoubridge fails to explicitly disclose an overlay network (*see* Mot. 20;

²⁴ Laurent Gautier and Christophe Diot, *Design and Evaluation of MiMaze, a Multi-Player Game on the Internet*, IEEE INT’L CONF. ON MULTIMEDIA COMPUTING & SYS. (1998) (Ex. 1149) (“Gautier”). Although citing Ex. 1130 in its Opposition, Petitioner filed two versions of Gautier, authenticated by separate witnesses (*see* Ex. 1130 and Ex. 1149 (authenticated in Ex. 1132)); however, because the contents of these two references are substantially the same in relevant part, we focus on Exhibit 1149, herein.

Reply Mot. 7), it does not follow that “[b]y failing to show that Shoubridge applies to the application layer, Petitioner has failed to show that Shoubridge would render . . . obvious the substitute claims.” Reply Mot. 7. Instead, the question is whether it would have been obvious to use Shoubridge’s network as an overlay based on Shoubridge’s teachings alone or in combination with other references. *See In re Keller*, 642 F.2d 413, 426 (CCPA 1981). We determine that it would be.

Dr. Karger testifies that a person of ordinary skill in the art would have implemented the communications network of Shoubridge as an overlay without having to make changes to the underlying network infrastructure, with the Internet being an obvious choice as the underlying network, and that such an implementation would work as expected. Ex. 1125 ¶ 133. By way of example, Dr. Karger contends that application-level overlays were routinely used for a “wide array of applications on the Internet.” *Id.* ¶ 20 (describing Ex. 1144²⁵); *id.* ¶¶ 134–135 (citing Ex. 1144). We find this testimony credible. McCanne describes applications such as video, audio conferencing, and whiteboard conferencing implemented using the Internet as an underlying network. Ex. 1144, 33. McCanne relies on a multicast backbone as the “overlay network” (*see id.* (“virtual multicast ‘overlay’ network”)) using internet protocols as the underlying network (*see id.* at 39 (“RTP session” as “underlying transport channels”). McCanne also discloses that group membership can be dynamic allowing participants to join and leave. *See id.* at 34, Fig. 1. Thus, Dr. Karger’s testimony that

²⁵ Steven McCanne, *Scalable Multimedia Communication: Using IP Multicast and Lightweight Sessions*, IEEE INTERNET COMPUTING, Vol. 3, Issue 2, 33–45 (1999) (Ex. 1144) (“McCanne”).

dynamic, application-level overlays were routinely used is supported by evidence of record.

We have considered Dr. Goodrich's response to this testimony (*see* Ex. 2102 ¶ 27), but do not give it substantial weight. For example, Dr. Goodrich testifies that "Shoubridge [and others] describe systems that are not at the application layer and are instead at the lower network layer, in terms of the OSI layering hierarchy. Petitioner does not describe how to modify Lin or Shoubridge, nor McCanne or Gautier, so as to create a functional system." *Id.* We disagree. As discussed above, Dr. Karger's testimony is that a person of ordinary skill would have recognized that at least Shoubridge's network could operate as an application layer overlay for the purpose of a wide-array of applications (as discussed in McCanne²⁶) using the Internet as an underlying network. Although Dr. Goodrich states that Dr. Karger did not explain how such a modification would function, we disagree. According to Dr. Karger, by "forwarding user traffic," the network of participants in Shoubridge creates an environment for sharing information (i.e., information delivery service). Ex. 1125 ¶ 136. Thus, Dr. Karger's testimony that Shoubridge would have worked as expected as an overlay for an information sharing application (e.g., such as McCanne's whiteboard or the '277 patent's database) is supported. *See KSR*, 550 U.S. at 421 ("When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill

²⁶ Another example provided by Dr. Karger is U.S. Patent No. 6,122,277, which, according to Dr. Karger, discloses a distributed database application using a communication fabric such as a 4-regular torus network. *See* Ex. 1125 ¶ 272 (citing Ex. 1116, 13:57-67).

has good reason to pursue the known options within his or her technical grasp.”).

Dr. Goodrich further testifies that “a POSITA would be at loss as to how to replicate with Lin or Shoubridge the many protocols that are referenced by McCanne as occurring at higher levels in the OSI hierarchy, including IGMP, PIM, DVMRP, CBT, LWS, RTP, and RTCP” and “since the Mbone described in Gautier is not an m-regular network, technologies such as Scalable Pruning Mechanism are incompatible with m-regular networks.” Ex. 2102 ¶ 27. We do not give Dr. Goodrich’s testimony substantial weight because his testimony is based on an assumption that obviousness is based on whether Shoubridge bodily incorporates McCanne’s (or Gautier’s) system in its entirety as opposed to what a person of ordinary skill in the art would have understood Shoubridge to teach in view of McCanne. *See Keller*, 642 F.2d at 425. Accordingly, having credited Dr. Karger’s testimony in support of Petitioner’s contentions, we agree Shoubridge, at least in view of McCanne, teaches a “dynamic, overlay computer network that overlays an underlying network and provides an information delivery service,” and similar limitations of claim 20.

Claim 18 also recites “each participant connected to a broadcast channel, the broadcast channel being associated with a channel type and a channel instance.” Claim 20 recites that “each computer of the dynamic, overlay computer network that interacts with a broadcast channel.” Petitioner contends the grid network of Shoubridge is “a broadcast channel.” Opp. Mot. 13, 16 (“Shoubridge . . . teaches ‘nodes’ that interact with a logical broadcast channel.”), 22 n.20. We agree. As discussed above (*see supra* § II.C.3), the ’966 patent uses a network graph to represent a

broadcast channel. *See* Ex. 1101, 4:5–15 (“The broadcasting of a message over the broadcast channel is effectively a multicast to those computers of the network that are currently connected to the broadcast channel.”); 4:48–53; 5:6–7. Consequently, we find that Shoubridge’s grid network, which consists of nodes forwarding user traffic (e.g., application data as disclosed in McCanne) to the other nodes, discloses “each participant connected to a broadcast channel” (claim 18) and “each computer of the dynamic, overlay computer network that interacts with a broadcast channel” (claim 20).

Claim 18 further requires that the broadcast channel is represented by a channel type and a channel instance. Petitioner contends that a person of ordinary skill in the art would have found it routine and advantageous to use channel types and instances to differentiate among multiple communication graphs allowing applications to disseminate information in parallel across separate broadcast channels, improving versatility.” *Opp. Mot.* 21 n. 19 (citing Ex. 1125 § 264). As an example, Petitioner cites Gautier’s description of a “session group address” as identifying a game type and instance (e.g., who else is playing). *Id.* at 22 & n. 21 (citing Ex. 1125 § 268; Ex. 1130); *see* Ex. 1149, 233–34.

Patent Owner contends that Petitioner conflates the “channel type” and “channel instance” and, therefore, improperly renders the terms meaningless. *Reply Mot.* 11; Ex. 2102 ¶ 53. We disagree with this contention. As Dr. Karger explains, the channel type would be used to indicate the application type and the channel instance would be used to indicate which communication graph is used for that instance to allow multiple graphs to disseminate information in parallel. *See* Ex. 1125 § 264; *see also id.* at § 268 (“[A] POSITA would have been motivated and found it

routine and advantageous to partition session group addresses to help players identify both the game type (e.g., ‘MiMaze’) and instance (e.g., who else is playing) before or upon joining.”). In other words, the claim terms are mapped to two different things, which application and which graph.

Because Dr. Karger’s explanation is supported by evidence of record, we give it substantial weight. Accordingly, we agree that a person of ordinary skill in the art would have modified Shoubridge to associate the broadcast channel with a channel type and a channel instance, as required by claim 18.

Claim 18 also requires that the “data includes sports data.” Claim 20 has no corresponding limitation. Petitioner contends it would have been obvious to use Shoubridge’s protocol to broadcast sports data over its generic grid network. Opp. Mot. 24. As an example, Petitioner analogizes Gautier’s use of a maze game to other multiplayer games (e.g., sports games) such that each player’s game broadcasts updates in the form of sports data. *Id.* (citing Ex. 1125 ¶ 272). Patent Owner argues that none of the references, including Shoubridge and Gautier, specifically discuss the transmission of sports data despite Petitioner’s attempt to conflate gaming data with sports data. Reply Mot. 12. This argument is not persuasive. As Patent Owner and Dr. Goodrich have stated, “Shoubridge is data agnostic and has no understanding of the data within the packets that is routed through the network.” Ex. 2022 ¶¶ 84, 88 (same); PO Resp. 12. Given our findings that it would have been obvious to use Shoubridge as an overlay network to broadcast application data, such as in Gautier or McCanne, Dr. Karger’s position that it would have been obvious to use such an overlay network to broadcast sports data (by analogizing to Gautier’s competitive multiplayer game application) is credible even if none of the references

explicitly disclose sports data. Accordingly, we find that a person of ordinary skill in the art would have modified Shoubridge to transmit or broadcast sports data.

Claim 20 recites that “the underlying network connections are TCP/IP connections.” Similar to its arguments for claim 8, Petitioner contends a person of ordinary skill in the art would have used TCP as one of a finite number of predictable solutions. Opp. Mot. 25 (citing *KSR*, 550 U.S. at 421; Ex. 1125 ¶ 274). Patent Owner argues that “Gautier teaches away from using the TCP/IP protocol because it is ‘unrealistic to use [the DIS standard] protocol over the Internet.’ Gautier at 4. While Petitioner does not even argue that Gautier teaches this element, it does not address the teaching away from Gautier.” Reply Mot. 12.

Patent Owner’s argument is not persuasive because Petitioner does not bodily incorporate Gautier into Shoubridge but instead, as discussed above, relies on Gautier as exemplifying the use of Shoubridge’s network for its exemplary teachings regarding channel instances and multiplayer gaming applications. Moreover, as also noted above, a person of ordinary skill in the art would have understood the tradeoffs between TCP and RTP/UDP depending on the application. *See* Ex. 1125 ¶ 159 (“[A] POSITA would have selected between TCP if seeking robust transport mechanism . . . or UDP if seeking a simpler protocol . . . with fewer guarantees.”). Accordingly, we find that a person of ordinary skill in the art would have used TCP as the transport protocol for the underlying network as required by Claim 20.

We have considered Patent Owner’s evidence of non-obviousness as set forth above (*see supra* § III.E.6) in light of the substitute claims 18 and

20 that Patent Owner proposes here. Specifically, we determine that our analysis regarding the sufficiency of the proffered evidence of secondary considerations above applies to claims 18 and 20. In addition, Patent Owner has not presented argument or evidence showing a nexus between the alleged secondary considerations and the invention of claims 18 and 20. Consequently, Patent Owner's additional evidence of non-obviousness is entitled to little weight. Considering the evidence as a whole, we are persuaded that claims 18 and 20 are unpatentable as obvious in view of Shoubridge and additional references as explained above.

2. Claim 19

Claim 19 recites similar limitations to those discussed above (e.g. information delivery service and broadcast channel). Claim 19 also recites that “participants can join and leave the network using the broadcast channel.” Petitioner contends a person of ordinary skill in the art would have recognized that “using Gautier’s ‘IP multicast model’ players can join and leave the network through the broadcast model.” Opp. Mot. 14 n.14 (citing Ex. 1124 ¶ 256). Petitioner also relies on disclosures of Lin, DirectPlay, and Shoubridge as teaching this limitation. *Id.* at 18 (citing Ex. 1124 ¶ 265; Ex. 1125 ¶ 253); *see also id.* at 12–13 (discussion of the limitation “formed through a broadcast channel”).

We have considered Petitioner’s charts purporting to map the disclosures of Lin, DirectPlay, Shoubridge, and Gautier to the recited limitation, and agree with Patent Owner that none of the references teach or

suggest the ability to join or leave *using the broadcast channel*.²⁷ Reply Mot. 10 (citing Ex. 2102 ¶¶ 44–50). Regarding Gautier, we observe that Petitioner’s argument that it discloses this limitation is based on page 2’s description that “[p]articipants can join or leave the session dynamically” (*see* Opp. Mot. 18), but Petitioner does not address the statement on page 2 that “*a server is only used when a new entity joins a session, e.g., to learn the session group address and to download the maze*” (Ex. 1149, 233 (emphasis added)). However, this aspect of Gautier’s network (i.e., that includes the server) is not a peer-to-peer network as claim 19 also requires of its broadcast channel (i.e., the “connections are peer-to-peer connections”). *See* Ex. 1149, Fig. 2 (“MiMaze architecture”). In other words, new participants do not join “using the broadcast channel.”²⁸ Petitioner does not account for the incompatibility between this aspect of Gautier’s teachings and the proposed claims.

For similar reasons, we find that Petitioner’s reliance on DirectPlay is also misplaced. For example, Petitioner cites DirectPlay’s statement that “you also need to consider the more mundane work of managing a session in progress. For instance, how will players join and leave game sessions?” Ex. 1103, 122. This statement only suggests the problem of accommodating participants who join and leave the session, and avoids addressing how this

²⁷ Although we determine that Petitioner has not shown Lin is available as prior art to the ’966 patent, *see* IPR2015-01951 (Final Written Decision), we consider Petitioner’s arguments regarding Lin for completeness.

²⁸ Nor can the joining participant use the broadcast channel, because, in Gautier’s system, the new participant must obtain the session group address (i.e., the recited channel instance according to Petitioner) from the server. Ex. 1130, Fig. 2.

is accomplished. Moreover, other sections of DirectPlay explain that “DirectPlay can be a little bit of both [peer-to-peer and client/server], as shown in Figure 18–3.” *Id.* at 22. In the peer-to-peer discussion on the next page, DirectPlay explains that a new participant must contact the session host (e.g., Player #1) to obtain “the session’s name and other information.” *Id.* at 23. Once that participant connects to the host, it receives a list of other DirectPlay objects (i.e., other participants) whereupon it no longer routes messages through the message host. *Id.* In other words, like Gautier, the suggestion is at least that peer-to-peer connections forming the broadcast channel are not used until after a new participant joins the overlay network. Accordingly, like Gautier, we find DirectPlay to be incompatible with claim 19.

We have also considered Dr. Karger’s opinion as to how the foregoing references teach or suggest the recited limitation. *See, e.g.*, Ex. 1125 ¶ 250 (“[I]t would have been [an] obvious implementation choice for a participant to advantageously inform other participants in the network of its arrival or departure using the broadcast channel.”). However, in both Gautier and DirectPlay, new participants seeking to join must contact either a server or a session host to obtain information sufficient to join the broadcast channel. As such, the only teachings in Gautier and DirectPlay describe a centralized mechanism for joining that involves a connection outside of the broadcast channel before joining. In view of these alternative teachings of both DirectPlay and Gautier, which neither Petitioner nor Dr. Karger address, we determine Dr. Karger’s opinion that it would have been an obvious implementation choice to use the broadcast channel to join or leave the network is conclusory and entitled to little weight.

Finally, we have considered the cited portions of Shoubridge and Lin, but while we agree each teaches a dynamic network, we find both references to be silent on how new participants join or leave the network. *See* Opp. Mot. 11–14, 18. For example, regarding Lin, Dr. Karger relies on the statement that “one can use reliable broadcast based on the old set of processors to disseminate the new set of processors” (Ex. 1004, 24) as teaching or suggesting joining or leaving the network using the broadcast channel. *See* Ex. 1124 ¶ 267. This statement, however, does not address a processor joining the network, just that, once joined, the broadcast protocol is used. Nor does it address leaving the network at all. Consequently, we find Dr. Karger’s testimony on this point to be conclusory.

For at least these reasons, we determine that Petitioner has not rebutted Patent Owner’s showing that its proposed substitute claim 19 is patentable over the prior art.

IV. MOTIONS TO EXCLUDE

A. Patent Owner’s Motion to Exclude

Patent Owner filed a Motion to Exclude. Paper 77 (“PO Mot. Exc.”). Petitioner filed an Opposition (Paper 84, “Pet. Opp. Mot. Exc.”) and Patent Owner filed a Reply (Paper 94, “PO Reply Mot. Exc.”). For the reasons that follow, we deny the motion in part and dismiss the motion in part as moot.

1. Scope of Reply Objections

Patent Owner contends Exhibits 1125–1126, 1128, 1130, 1136–1138, 1131, 1144, and 1145 should be excluded as exceeding the proper scope of reply. PO Mot. Exc. 1–5. A motion to exclude ordinarily is not the proper mechanism for raising the issue of whether a reply or reply evidence is beyond the proper scope permitted under the rules, as a motion to exclude is

for challenging the “admissibility of evidence” under the Federal Rules of Evidence. 37 C.F.R. §§ 42.62, 42.64; Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,758, 48,767 (Aug. 14, 2012). However, as indicated above, we have considered whether the foregoing exhibits (to the extent they are relied upon) exceed the proper scope of a reply, and we conclude they do not.

2. Objections to Dr. Karger’s Declarations

Patent Owner contends Exhibits 1119, 1125, and 1145 (i.e., Dr. Karger’s Declarations) should be excluded under FRE 702, because his opinions are conclusory, do not disclose underlying facts or data in support of his opinions, and are unreliable. PO Mot. Exc. 5–7. In particular, Patent Owner contends Dr. Karger did not have an understanding of the scope of the claims and did not consider secondary considerations in forming his preliminary obviousness analysis. *Id.* As to Exhibit 1145, we dismiss the motion as moot because we did not rely on it. As to Exhibits 1119 and 1125, we deny the motion because, as noted above, we do not agree that Dr. Karger did not have an understanding of the scope of the claims, nor do we require an expert declarant to consider secondary considerations in performing his initial analysis (i.e., before Patent Owner presents evidence of secondary considerations).

3. Objections to Dr. Shoubridge’s Declarations

Patent Owner contends Exhibits 1120 and 1136 (i.e., Dr. Shoubridge’s Declarations) should be excluded under FRE 401–402 because they are “conclusory and unreliable.” PO Mot. Exc. 7–8. However, we addressed the credibility of Dr. Shoubridge’s Declarations and gave them appropriate

weight (*see supra* § II.A). Accordingly, they are not inadmissible under FRE 401–402, and we, therefore, deny the motion.

4. Mr. Grenier's Declarations

Patent Owner contends Exhibit 1141, 1144, and 1132 (Mr. Grenier's Declarations regarding Shoubridge, McCanne, and Gautier, respectively) should be excluded because he failed to authenticate the respective references (FRE 901) and had no personal knowledge of the facts stated in his declarations (FRE 602). PO Mot. Exc. 9. Patent Owner also states that “Mr. Grenier testified that IEEE was not available until the mid-2000's, which is after the relevant time frame at issue here.” *Id.* (citing Ex. 2110, 14:15–20).

As to Exhibit 1141, we dismiss the motion as moot because we did not rely on Mr. Grenier's testimony in support of the availability of Shoubridge. Regarding Exhibits 1132 and 1144, we have reviewed these declarations and we disagree that he failed to authenticate the references, which are attached as exhibits to the respective declarations. Rather, as a custodian of records for IEEE, we find that Mr. Grenier provided testimony sufficient to show that the publications (i.e., Gautier and McCanne, respectively) are what they purport to be, IEEE publications.²⁹ *See* FRE 901(a). We also find that Mr. Grenier's testimony sufficiently demonstrates

²⁹ Patent Owner does not provide support for its contention that Gautier is not an IEEE article (PO Mot. Exc. 9). Mr. Grenier provided credible, un rebutted testimony that the article attached to his declaration (Exhibit 1132, Exhibit A), which is the same as Exhibit 1149, was a proceeding presented at the 1998 IEEE International Conference on Multimedia Computing and Systems, July 1, 1998. *Id.* ¶ 8.

his personal knowledge of the business practices of IEEE for him to testify regarding these practices. *See* FRE 602.

Finally, regarding Patent Owner’s contention that “IEEE was not available until the mid-2000’s,” we find this is a mischaracterization of the testimony. First, the actual testimony is that the “IEEE *Digital Library*” was first made available in “June of 2000,” which is not the same as *IEEE* was not available until the *mid-2000’s*.³⁰ Ex. 2110, 14:15–20. Second, it is not necessary to rely on the *online* availability of the reference, because Mr. Grenier’s testimony is that the references were available well before the relevant time frame, either on the last day of the conference in the case of Gautier (*see* Ex. 1132 ¶ 11 (conference date: July 1, 1998)) or no later than the last day of the second stated publication month in the case of McCanne (*see* Ex. 1144 ¶ 11 (publication month: March-April, 1999)). Accordingly, for the foregoing reasons, we deny the motion to exclude as to Exhibits 1132 and 1144.

5. Shoubridge

Patent Owner contends Exhibit 1105 (Shoubridge) should be excluded as unauthenticated, hearsay, and irrelevant. PO Mot. Exc. 10–13 (citing FRE 901, 801–803, 401–403). However, we observe that Patent Owner’s contentions are substantially the same as those raised above regarding Shoubridge’s status as a publicly available reference (*see supra* §§ II.A, IV.A.3). Because we determined above that Shoubridge was authenticated by a credible witness (i.e., Dr. Shoubridge) with personal knowledge of the

³⁰ June of 2000 is before, not “after the relevant time frame at issue here” (PO Mot. Exc. 9). *See* Ex. 1101 at [22] (“Filed: July 31, 2000”).

time and circumstances of its public availability (*see id.*), Patent Owner's motion is denied as to Exhibit 1105.

6. Exhibits 1149–1151

Patent Owner contends Exhibits 1149 (library version of Gautier), 1150 (a website page), and 1151 (FTP directory) are not relevant because these exhibits are relied upon to establish the availability of Exhibit 1130—a different version of Gautier. PO Mot. Exc. 14–15. However, as noted above, we rely on Exhibit 1149 (authenticated by Mr. Grenier in Exhibit 1132) in lieu of Exhibit 1130 and, therefore, Exhibit 1149 is relevant. We, therefore, deny the motion as to Exhibit 1149 and dismiss the motion as to Exhibits 1150 and 1151, which we do not rely on, as moot.

7. Objections to Other Exhibits

Patent Owner contends Exhibit 1126 (Dr. Bennett's Declaration), Exhibit 1104 (Mr. Little's Declaration), Exhibit 1130 (version of Gautier), and Exhibit 1131 (Ms. Stansbury's Affidavit) should be excluded. However, because we have not relied on Exhibits 1126, 1104, 1130, and 1131, we dismiss the motion as moot as it relates to these exhibits.

8. Uncited Exhibits

Patent Owner contends Exhibits 1102–1104, 1106, 1108–1118, 1121, 1123, 1124, 1126–1129, 1131–1133, 1135–1143, 1145, and 1149–1151 should be excluded because Petitioner does not rely on them in either its Opposition or Reply and, therefore, they are irrelevant or inadmissible under FRE 401–402 and highly prejudicial under FRE 403. PO Mot. Excl. 15. However, because we have not relied on at least Exhibits 1102–1104, 1108–1115, 1117, 1118, 1121, 1123, 1126–1129, 1131, 1133, 1135, 1138–1143,

1145, 1150–1151, we dismiss the motion to exclude as moot as to these exhibits.

As to the remaining exhibits, there is no requirement that Petitioner must cite evidence in its Reply or Opposition to be relevant. *See* 37 C.F.R. § 42.64(b)(2) (permitting supplemental evidence to be filed in response to an evidentiary objection). In any event, the remaining exhibits are cited in Patent Owner’s Response (citing Ex. 1106), Dr. Karger’s Declaration (citing Ex. 1116), Petitioner’s Opposition (citing Ex. 1124), Petitioner’s Reply (citing Exs. 1132, 1136–1137). Accordingly, we deny the motion as to Exhibits 1106, 1116, 1132, and 1136–1137.

9. Conclusion

For the foregoing reasons, we deny the Motion to Exclude as to Exhibits 1105, 1106, 1116, 1119, 1120, 1125, 1132, 1136, 1137, 1144, and 1149, and we dismiss the Motion to Exclude as moot as to Exhibits 1102–1104, 1108–1115, 1117, 1118, 1121, 1123, 1126–1129, 1131, 1133, 1135, 1138–1143, 1145, 1150, and 1151.

B. Petitioner’s Motion to Exclude

Petitioner also filed a Motion to Exclude. Paper 73 (“Pet. Mot. Exc.”). Specifically, Petitioner seeks to exclude certain paragraphs of Exhibit 2026. Pet. Mot. Exc. 4–6. Because we do not rely on the cited evidence in this Final Written Decision, we dismiss Petitioner’s Motion to Exclude as moot.

V. CONCLUSION

For the foregoing reasons, Petitioner has demonstrated by a preponderance of the evidence that claims 1–7, 11, and 16 of the ’966 patent are anticipated by Shoubridge and that claims 6–10 and 17 are unpatentable

as directed to obvious subject matter over Shoubridge. Patent Owner has shown that its proposed substitute claim 19 is patentable over the prior art, but we determine that Petitioner has shown that proposed substitute claims 18 and 20 are unpatentable.

IV. ORDER

In consideration of the foregoing, it is
ORDERED that claims 1–11 and 16 of the '966 patent have been shown to be *unpatentable*;

FURTHER ORDERED that Patent Owner's Contingent Motion to Amend is *denied* with respect to substitute claims 18 and 20 and *granted* with respect to substitute claim 19;

FURTHER ORDERED that Petitioner's Motion to Exclude is *dismissed* as moot;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *dismissed* as moot as to Exhibits 1102–1104, 1108–1115, 1117, 1118, 1121, 1123, 1126–1129, 1131, 1133, 1135, 1138–1143, 1145, 1150, and 1151 and *denied* as to Exhibits 1105, 1106, 1116, 1119, 1120, 1125, 1132, 1136, 1137, 1144; and

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

FOR PETITIONER:

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