UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

RPX CORP., ERICSSON INC., AND THE TELEFONAKTIEBOLAGET LM ERICSSON,
Petitioner,

v.

IRIDESCENT NETWORKS, INC.,
Patent Owner.

IPR2017-01662

Patent 8,036,119 B2

PATENT OWNER'S NOTICE OF APPEAL

Pursuant to 35 U.S.C. §§ 141(c), 142, 319 and 37 C.F.R. §§ 90.2(a) and 90.3(a), notice is hereby given that Patent Owner IRIDESCENT NETWORKS, INC. ("Patent Owner") hereby appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board, entered on December 10, 2018, in case IPR2017-01662, Paper 33 (a copy of which is attached as Exhibit A pursuant to Practice Notes to Fed. Cir. R. 15), and from all underlying findings, orders, decisions, rulings, and opinions. This notice is timely filed within 63 days of the December 10, 2018 Final Written Decision, Paper 33. 37 C.F.R. § 90.3.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner indicates that the issues on appeal may include, but are not limited to, whether the Board erred in holding that claims 1-16 of U.S. Patent No. 8,036,119 are unpatentable over the asserted art, and (ii) its findings supporting or relating to the aforementioned issues. Patent Owner also indicates that the issues on appeal include any other issues decided adversely to Patent Owner in any orders, decisions, rulings, or opinions issued in the IPR proceeding.

Pursuant to 37 C.F.R. § 90.2(a), Patent Owner is filing one (1) copy of this Notice of Appeal with the Director and also electronically filing a copy of this

Notice of Appeal with the U.S. Court of Appeals for the Federal Circuit, with the requisite filing fee, in addition to filing this Notice with the Board.

Respectfully submitted,

SHERIDAN ROSS P.C.

Date: January 8, 2019

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CERTIFICATE OF SERVICE

Per 37 C.F.R. § 90.2(a)(1), on January 8, 2019, the foregoing Notice of Appeal was filed electronically with the Board in accordance with 37 C.F.R. § 42.6(b)(1), and mailed to the Director via Priority Mail Express in accordance with 37 C.F.R. §§ 1.10 and 104.2 at the following address:

Director of the U.S. Patent and Trademark Office
c/o Office of the Solicitor
P.O. Box 1450, Mail Stop 8
Alexandria, VA 22313-1450

Per 37 C.F.R. § 90.2(a)(2), Fed. R. App. P. 15, and Fed. Cir. Rules 15, 25, and 52, on January 8, 2019 the foregoing Notice of Appeal was electronically filed with the United States Court of Appeals for the Federal Circuit via CM/ECF with appropriate fees paid through pay.gov. Per Fed. Cir. Rule 15(a)(1), one copy of this Notice of Appeal is being filed by hand with the Clerk's Office of the United States Court of Appeals for the Federal Circuit on January 8, 2019.

Per 37 C.F.R. § 42.6(e) and the parties' agreement to accept electronic service, on January 8, 2019 the foregoing Notice of Appeal was served via e-mail on the following attorneys for Petitioner:

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APPENDIX A

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Paper 33
Entered: December 10, 2018

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

RPX CORP., ERICSSON INC., AND TELEFONAKTIEBOLAGET LM ERICSSON,
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IRIDESCENT NETWORKS, INC.,
Patent Owner.

Case IPR2017-01662
Patent 8,036,119 B2

Before THOMAS L. GIANNETTI, MATTHEW R. CLEMENTS, and SCOTT B. HOWARD, *Administrative Patent Judges.*

HOWARD, *Administrative Patent Judge*.

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

I. INTRODUCTION

RPX Corp., Ericsson Inc., and Telefonaktiebolaget LM Ericsson (collectively "Petitioner") filed a Petition (Paper 1, "Pet.") to institute an *inter partes* review of claims 1–16 of U.S. Patent No. 8,036,119 B2 (Ex. 1001, "the '119 patent") pursuant to 35 U.S.C. §§ 311–19. Iridescent Networks, Inc. ("Patent Owner") filed a Patent Owner Preliminary Response. Paper 7 ("Prelim. Resp."). We instituted an *inter partes* review of claims 1–16 on all grounds of unpatentability alleged in the Petition. Paper 9 ("Institution Decision" or "Inst. Dec.").

After institution of trial, we authorized Petitioner to file supplemental information. Paper 18. Patent Owner filed a Patent Owner Response. Paper 21 ("PO Resp."). Petitioner filed a Reply. Paper 26 ("Reply"). The Board filed a transcript of the Oral Hearing held on September 24, 2018. Paper 32 ("Tr.").

Petitioner relies on Declarations by Narasimha Reddy, Ph.D. (Ex. 1025, 1040) and George Foti (Ex. 1032). Patent Owner relies on a Declaration by Dr. Jacob Sharony. Ex. 2001.

The Board has jurisdiction under 35 U.S.C. § 6(b). This Final Written Decision issues pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that challenged claims 1–16 are unpatentable.

A. Related Proceedings

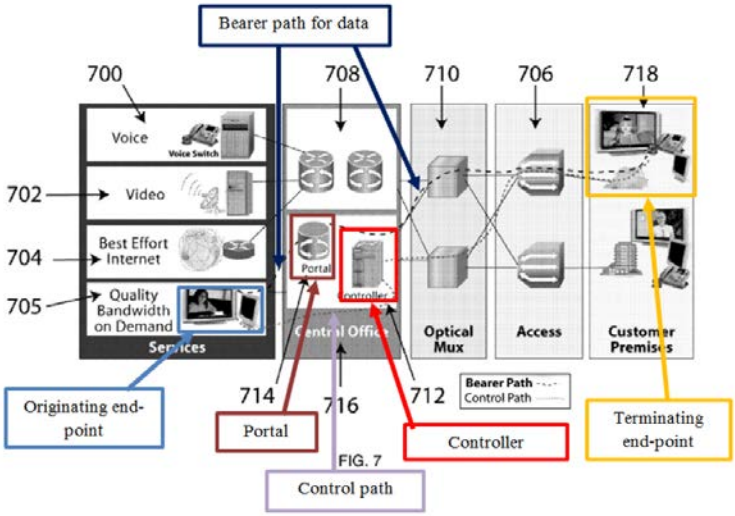
The parties indicate that the '119 patent is being asserted in the following action: *Iridescent Networks, Inc. v. AT&T Inc.*, No. 6:16-CV-01003 (E.D. Tex.). Pet. 5; Paper 5, 1. In addition, Patent Owner states that the '119 patent is also the subject of another petition for *inter partes* review:

RPX Corp. v. Iridescent Networks, Inc., Case IPR2017-01661. Paper 5, 1. Additionally, a related patent, U.S. Patent No. 7,639,612, is the subject of *inter partes* review in *RPX Corp. v. Iridescent Networks, Inc.*, Case IPR2018-00254.

B. The '119 Patent

The '119 patent relates to a method "of providing guaranteed bandwidth on demand for an end user and/or enterprise." Ex. 1001, 1:19–22. The '119 patent states that it "tak[es] a distributed approach to handling bearer packets, with a physically separated controller and managed portal platform." *Id.* at 4:64–66. "The Controller handles signaling, routing, dynamic bandwidth admission control, codec (video and/or voice) negotiation, end-to-end quality assurance, session management, subscriber data, billing, provisioning and associated operational functions" while the "Portal handles the packet bearer transport with the admission control and routing instructions given by the separate physical Controller." *Id.* at 4:66–5:6.

An example of the architecture of the '119 patent is shown in a version of Figure 7 below which has been annotated by Petitioner.



Pet. 2. The above version of Figure 7 of the '119 patent "is a diagram of a Controller and Portal Solution in the Access Network" which has been annotated by Petitioner to highlight various elements including the originating end-point, the portal, the controller, the control path, and the terminating end-point. Ex. 1001, 4:29–30; Pet. 2.

C. The Challenged Claims

Petitioner challenges claims 1–16. Claims 1 and 13 are independent. Claim 1 is illustrative of the challenged claims and is reproduced below:

> 1. A method for providing bandwidth on demand comprising:
>
> receiving, by a controller positioned in a network, a request for a high quality of service connection supporting any one of a plurality of one-way and two-way traffic types between an originating end-point and a terminating endpoint, wherein the request comes from the originating end-point and includes at least one of a requested amount of bandwidth and a codec;
>
> determining, by the controller, whether the originating end-point is authorized to use the requested amount of bandwidth or the codec and whether the terminating end-point can be reached by the controller;
>
> directing, by the controller, a portal that is positioned in the network and physically separate from the controller to allocate local port resources of the portal for the connection;
>
> negotiating, by the controller, to reserve far-end resources for the terminating end-point; and
>
> providing, by the controller to the portal, routing instructions for traffic corresponding to the connection so that the traffic is directed by the portal based only on the routing instructions provided by the controller, wherein the portal does not perform any independent routing on the traffic, and wherein the connection extending from the originating end-point to the terminating end-point is provided by a dedicated bearer path that includes a required route supported by the portal and

> dynamically provisioned by the controller, and wherein control paths for the connection are supported only between each of the originating and terminating end-points and the controller and between the portal and the controller.

Ex. 1001, 7:43–8:7.

D. Asserted Grounds of Unpatentability

We instituted trial based on the following grounds of unpatentability:

References	Basis[1]	Challenged Claim(s)
QBone,[2] Surdila,[3] and Li[4]	§ 103(a)	1-8 and 11
QBone, Surdila, Li, and Requena[5]	§ 103(a)	10 and 13–15
QBone, Surdila, Li, and Chen[6]	§ 103(a)	9 and 12
QBone, Surdila, Li, Requena, and Pillai[7]	§ 103(a)	16

Inst. Dec. 35.

[1] The Leahy-Smith America Invents Act ("AIA") included revisions to 35 U.S.C. § 100 *et seq.* effective on March 16, 2013. Because the '119 patent issued from an application filed before March 16, 2013, we apply the pre-AIA versions of the statutory bases for unpatentability.

[2] Ben Teitelbaum & Phil Chimento, QBONE BANDWIDTH BROKER ARCHITECTURE, WORK IN PROGRESS (last modified Feb. 28, 2000) (Ex. 1017, "QBone").

[3] U.S. 2002/0181462 A1 (published Dec. 5, 2002) (Ex. 1014, "Surdila").

[4] PCT Publication No. WO 2005/101730 A1 (published Oct. 27, 2005) (Ex. 1026, "Li"). Petitioner provides an English language translation of Li (Ex. 1023), along with a declaration attesting to the accuracy of the translation (Ex. 1027).

[5] U.S. 2002/0181495 A1 (published Dec. 5, 2002) (Ex. 1018, "Requena").

[6] U.S. 6,487,170 B1 (issues Nov. 26, 2002) (Ex. 1019, "Chen").

[7] U.S. 2003/0133552 A1 (published July 17, 2003) (Ex. 1011, "Pillai").

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2016);[8] *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142–46 (2016). Consistent with that 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. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). There are, however, two exceptions to that rule: "1) when a patentee sets out a definition and acts as his own lexicographer," and "2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution." *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

If an inventor acts as his or her own lexicographer, the definition must be set forth in the specification with reasonable clarity, deliberateness, and precision. *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998). "Although it is improper to read a limitation from the specification into the claims, claims must be read in view of the specification of which they are a part." *Microsoft Corp. v. Multi-Tech Sys., Inc.*, 357 F.3d

[8] Per recent regulation, the Board will apply the *Phillips* claim construction standard to petitions filed on or after November 13, 2018. *See Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board*, 83 Fed. Reg. 51340 (Oct. 11, 2018) (to be codified at 37 C.F.R. pt. 42). Because Petitioner filed its petition before November 13, 2018, we apply the BRI standard.

1340, 1347 (Fed. Cir. 2004); *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

1. "Directing, by the Controller, . . . [a Portal] . . . to Allocate Local Port Resources of the Portal"

Petitioner proposes a construction for the "directing, by the controller, . . . [a portal] . . . to allocate local port resources of the portal" step recited in claims 1 and 13. Pet. 13–14. According to Petitioner, the directing step "include[s] at least sending an allocation instruction from the controller to the portal, where the allocation instruction results in the portal allocating physical and/or logical elements of the portal." *Id.* at 14 (emphasis omitted) (citing Ex. 1025 ¶¶ 51–55). In our Institution Decision, we determined that "directing, by the controller, . . . [a portal] . . . to allocate local port resources of the portal," does not require an express construction. Inst. Dec. 7–8.

Patent Owner "accepts Petitioner's proposed constructions without prejudice, but reserves its right to present evidence and arguments as to a proper or different construction of the claim terms within the meaning of the '119 Patent should such become necessary at trial." PO Resp. 11–12.[9]

Having considered the evidence presented, we conclude that no express claim construction of this limitation is necessary to resolve the issues presented in this trial. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) ("[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.").

[9] Although Patent Owner purported to reserve its right to present evidence and argument regarding a "proper or different construction," (PO Resp. 11–12), by not doing so in the Patent Owner's Response Patent Owner waived its ability to argue an alternative claim construction (*see* Paper 10, 3).

2. "A Required Route . . . Dynamically Provisioned by the Controller"

Although neither party explicitly proposed a construction for this term, we noted in our Institution Decision that Patent Owner's argument on this limitation turned on a particular construction:

> Although Patent Owner does not request an express construction of the claim limitation "a required route supported by the portal and dynamically provisioned by the controller," as recited in claims 1 and 13, Patent Owner's arguments regarding that limitation are premised upon a construction that precludes "exclusively using pre-calculated and pre-computed paths."

Inst. Dec. 8 (citing Prelim. Resp. 29–33).

Patent Owner made similar arguments in *Iridescent Networks, Inc. v. AT&T Inc.*, No. 6:16-CV-01003 (E.D. Tex.) ("*AT&T*"). Ex. 1030, 12–13. In *AT&T*, "[t]he parties dispute whether 'dynamically provisioned by the controller' means the provisioning occurs in response to a request, or whether there can be a connection set up in advance as part of the end-to-end connection." Ex. 1030, 12. The Magistrate Judge in *AT&T* rejected Patent Owner's argument, deciding that the claim and specification does not "exclude the use of pre-existing connections, so long as such connections are provided to an end-point in response to a request" and "construe[d] the term 'dynamically provisioned by the controller' to mean 'provisioned to an end-point by the controller in response to the request.'" *Id.* at 13. Neither party objected to the Magistrate Judge's claim construction. *See* Ex. 1031.

After reviewing this history, we concluded in our Institution Decision that "the broadest reasonable interpretation of the claim must be broad enough to encompass the claim construction in [*AT&T*]" and construed the phrase "a required route supported by the portal and dynamically

provisioned by the controller," as recited in claims 1 and 13, to "encompass[] any route provisioned to an endpoint by the controller in response to the request and, specifically, not precluding the use of pre-defined paths made available to particular end-points in response to particular requests." Inst. Dec. 9.

Patent Owner did not address our preliminary claim construction in its post-institution filings. *See* PO Resp. 11–12. Petitioner argues that our preliminary construction was correct. Reply 13–16.

"The broadest reasonable interpretation of a claim term may be the same as or broader than the construction of a term under the *Phillips* standard." *Facebook, Inc. v. Pragmatus AV, LLC*, 582 F. App'x 864, 869 (Fed. Cir. 2014) (non-precedential). "In many cases, the claim construction will be the same under [both] standards." *In re CSB-System Int'l, Inc.*, 832 F.3d 1335, 1341 (Fed. Cir. 2016). However, the broadest reasonable construction "cannot be narrower" than the construction under the *Phillips* standard used by district courts. *Facebook*, 582 F. App'x at 869.

We have further considered our construction in light of the arguments and evidence adduced at trial. In light of the foregoing, and for the reasons stated in our Institution Decision, we maintain our determination based on the full record. *See* Inst. Dec. 8–11.

B. Legal Principles of Obviousness

An invention is not patentable "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." 35 U.S.C. § 103(a). The question of obviousness is resolved on the basis of

underlying factual determinations including the following: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and, (4) where in evidence, objective evidence of nonobviousness such as commercial success, long-felt but unsolved needs, and failure of others.[10] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). When evaluating a combination of teachings, we also must "determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). We analyze the grounds based on obviousness in accordance with the above-stated principles.

C. Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)). In a given case, "one or more factors may predominate." *Id.*

Petitioner's expert, Dr. Reddy, testifies that

> one of ordinary skill in the art would include someone who has a B.S. degree in Electrical Engineering, Computer Engineering, Computer Science, or equivalent training, as well as two to three

[10] Neither Petitioner nor Patent Owner addresses objective evidence of non-obviousness.

> years of technical experience in the field of packet-switched networking, such as Internet, local area, and wide area networks.

Ex. 1025 ¶ 4. In the Institution Decision, we adopted Petitioner's definition of the level of ordinary skill in the art. Inst. Dec. 12.

Neither Patent Owner nor Petitioner addresses the level of skill in their post-institution papers. Moreover, Patent Owner's declarant, Dr. Sharony, adopts Petitioner's proposed level of ordinary skill in the art for his testimony. *See* Ex. 2001 ¶ 18.

Based on the complete record, we see no reason to modify our preliminary determination of the level of ordinary skill in the art.

D. Whether QBone is a Printed Publication

As a preliminary matter, we must determine whether QBone is a prior art printed publication. Petitioner makes two arguments supporting its contention that QBone is a prior art printed publication: (1) QBone was published by the USPTO as part of the Surdila file history, and (2) QBone was publically accessible at the Internet2 website. Pet. 9–10; Reply 2–9. Patent Owner disputes the point. PO Resp. 12–19.

Having considered all of the evidence regarding the facts and the circumstances surrounding the public accessibility of QBone, and in view of the relevant case law, we find Petitioner has met its burden of showing that QBone was publicly accessible more than a year before May 2, 2006[11] and, therefore, are persuaded that QBone (Exhibit 1017) is a printed publication.

[11] Neither Petitioner nor Patent Owner addresses the effective filing date or date of invention of claims. For purposes of this Decision, we have used the filing date of the Provisional Application No. 60/796,660, from which the '119 patent claims priority. Ex. 1001, [60], 1:11–15.

1. Petitioner's Argument

Petitioner argues QBone is a prior art printed publication. Pet. 9–10. Petitioner argues QBone was discussed in and incorporated by reference into Surdila. Pet. 9 (citing Ex. 1014 ¶ 25). Specifically, under a heading titled "QBone Working Group Architecture" (Ex. 1014 ¶ 24), Surdila states:

> A working group known as the QBone Working Group has defined, as part of the Internet 2 initiative, an architecture for coordinating bandwidth requirements across multiple networks at the transport level. *The QBone group has published a description of the architecture in a paper entitled "QBone Bandwidth Broker Architecture" found at http://www.internet2.edu/qos/qbone/papers/sibbs/, and this paper is incorporated by reference in its entirety herein.* This paper defines the functionality of a Bandwidth Broker (BB) and contains a brief specification of a BB protocol which is to be introduced in Phase 2 of the QBone implementation program.

Ex. 1014 ¶ 25 (emphasis added). We note that the URL no longer works. *See* Ex. 2002.

Petitioner argues that on April 24, 2001, a copy of QBone was filed with the United Stated Patent & Trademark Office along with the Surdila application. Pet. 9–10 (citing Ex. 1015, 91–120; Ex. 1016). Petitioner further argues Surdila was published on December 5, 2002 and, on that date, the Surdila file history, including QBone, was publicly accessible. *Id.* at 10 (citing Ex. 1025 ¶ 68). Petitioner further argues QBone "could be located by a [person of ordinary skill in the art] in a variety of ways, including directly searching the USPTO application database as well as by using the USPTO classification system to locate the Surdila reference" which "would lead a [person of ordinary skill in the art] to the QBone reference." *Id.* (citing Ex. 1025 ¶ 69).

In further support of its publication by the PTO argument, Petitioner argues "[o]ne of the PTO's functions is 'dissemination of patent information.'" Reply 6 (quoting Ex. 1041). According to Petitioner, "[f]ile histories are an integral part of 'patent information,' and thus fall under the PTO's dissemination function." *Id*. Therefore, Petitioner argues, because QBone was a part of the Surdila file history—and incorporated by referenced into Surdila—the PTO's dissemination function applies to QBone. *Id*. at 6–7 (citing *Duodecad IT Services Luxembourg S.À.R.L. v. WAG Acquisition, LLC*, IPR2015-01036, Paper 17 (Oct. 20, 2016)).

Petitioner further argues it is irrelevant "that the URL link cited in Surdila's publication is now 'broken.'" Reply 7. According to Petitioner, "[t]he inclusion of the link in Surdila's description does not direct a [person of ordinary skill in the art] away from the [file history], but rather demonstrates that Surdila provided multiple avenues for accessing QBone." *Id*. Petitioner further argues, "Surdila states that QBone (Ex. 1017 itself) is 'incorporated by reference in its entirety'" and "an incorporated document would have been 'part of the application' and 'part of the [file history].'" *Id*. at 7–8 (citing Ex. 1014 ¶ 25; Ex. 1038, 76:2–4, 77:5–78:9).

Petitioner argues this case is just like *Bruckelmyer v. Ground Heaters, Inc.*, 445 F.3d 1374, 1376-79 (Fed. Cir. 2006), which, according to Petitioner, held that "a Canadian patent application in the [file history] was deemed publicly accessible because of the corresponding published patent." *Id*. at 8. More specifically, Petitioner argues:

> Surdila, like the patent in Bruckelmyer, is a published patent document. It is "more informative of the content" of Surdila's FH than a mere abstract. As demonstrated in the Petition, Surdila is "classified and indexed," and therefore

> provides a roadmap that would have allowed a POSITA to locate Surdila's FH.

Id. at 9 (citing Pet. 10). Additionally, Petitioner argues that Surdila's incorporation by reference provides the necessary guidance for a person of ordinary skill in the art to find Surdila and its file history. *Id.*

Following our Institution Decision, we authorized Petitioner to file as supplemental information a declaration from one of the named inventors on Surdila, George Foti, and supporting documents for that declaration. Paper 18; Exs. 1032–1035. Petitioner argues the supplemental information further establishes that QBone is a printed publication. Reply 2–5. Specifically, Petitioner argues that the testimony of Mr. Foti establishes that the QBone architecture "was well-known and publicly discussed by" people of ordinary skill in the art prior to 2006, and that papers relating to the QBone architecture were "housed on the Internet2 website[], were freely available to any interested party free of charge[,] and were easily accessible by keyword searching through a search engine, or by navigating to the relevant topic via links in the Internet2 webpage." Reply 3 (quoting Ex. 1032 ¶ 9). Mr. Foti further testifies that prior to the filing of Surdila (April 24, 2001), he accessed QBone from the Internet2 website:

> Leading up to the filing of my patent application (ERIC-1014), we accessed from Internet2's website an article titled "QBone Bandwidth Broker Architecture" by Ben Teitelbaum and Phil Chimento. I have reviewed a copy of ERIC-1017. I confirm that ERIC-1017 is a copy of the printout we provided for submission to the United States Patent and Trademark Office with the patent application (ERIC-1014).

Ex. 1032 ¶ 10. Petitioner further argues that besides being located on the Internet2 website, a person of ordinary skill in the art could have easily

accessed QBone by keyword searching with a search engine. Reply 4–5 (citing Ex. 1032 ¶¶ 5–8).

2. Patent Owner's Arguments

Patent Owner argues QBone is not a printed publication. PO Resp. 12–19. First, Patent Owner argues that the June 19, 2000 date in the footer of Exhibit 1017 (QBone) merely references the date the article was printed by Mr. Foti, not the "date the contents of the *QBone* reference were publicly available to persons of skill in the art." *Id.* at 14. Patent Owner further argues that the date on which Mr. Foti was in possession of a copy of QBone is not the question; instead, "the question is whether *QBone* is a prior art printed publication under 35 U.S.C. § 102(a)." *Id.* Patent Owner argues

> Petitioner's evidence, at best, shows only that one person was in possession of the *QBone* reference and completely fails to show *QBone* was disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, could locate the reference.

Id. at 14–15.

Second, Patent Owner argues "even if internet publication was considered, it would fail because the hyperlink to *QBone* provided in *Surdila* is currently broken and there is no evidence that it worked on December 5, 2002 (Petitioners' alleged publication date)." *Id.* at 15 (citation omitted). Patent Owner further argues the only evidence that QBone was ever available on the internet was a printout of a website obtained from the Internet Archive on January 10, 2017. *Id.* (citing Ex. 1024). Although "[t]he printout is allegedly an archived copy of how the website at the URL address: http://qbone.internet2.edu/bb/bboutline2.html appeared on April 13, 2001," Patent Owner argues there is "no direct, competent evidence from

anyone with personal knowledge of the website, Internet Archive, who can verify that the allegedly archived copy of the QBone reference is what Petitioner purports [it] to be and without that evidence, the document cannot be considered." *Id.*; *see also id.* at 15–17 (discussing cases regarding the authenticity of Internet Archive printouts). In addition to challenging the authenticity of QBone, Patent Owner also asserts it is inadmissible hearsay. *Id.* at 18–19.

3. Admissibility of QBone Articles (Exhibits 1017 and 1024)

Before addressing the substance of the printed publication argument, we address the evidentiary objections in the Patent Owner's Response. Patent Owner objects to the admissibility of QBone (Exhibit 1017) because "Petitioner has completely failed to prove Exhibit 1017 is authentic under Fed. R. Evid. 901" and that "the exhibit is impermissible hearsay for which no exception applies under Fed. R. Evid. 801 and 802." PO Resp. 19.

Patent Owner similarly objects to the Internet Archive version of QBone, Exhibit 1024: "Petitioner offers no direct, competent evidence from anyone with personal knowledge of the website, Internet Archive, who can verify that the allegedly archived copy of the QBone reference is what Petitioner purports [it] to be and without that evidence, the document cannot be considered." *Id*. at 15; *see also id*. at 15–18 (discussing cases excluding Internet Archive documents). Patent Owner also argues that Exhibit 1024 is inadmissible hearsay. *Id*. at 18–19.

The Office has prescribed rules regarding objections to exhibits and motions to exclude them:

> (b) *Other evidence*. For evidence other than deposition evidence:

> (1) *Objection*. Any objection to evidence submitted during a preliminary proceeding must be filed within ten business days of the institution of the trial. Once a trial has been instituted, any objection must be filed within five business days of service of evidence to which the objection is directed. The objection must identify the grounds for the objection with sufficient particularity to allow correction in the form of supplemental evidence.
>
> (2) *Supplemental evidence*. The party relying on evidence to which an objection is timely served may respond to the objection by serving supplemental evidence within ten business days of service of the objection.
>
> (c) *Motion to exclude*. A motion to exclude evidence must be filed to preserve any objection. The motion must identify the objections in the record in order and must explain the objections. The motion may be filed without prior authorization from the Board.

37 C.F.R. § 42.64(b), (c). Additionally, our Rules require that "[e]ach . . . motion *must* be filed as a *separate paper*." 37 C.F.R. § 42.22(a) (emphasis added).

Although Patent Owner objected to Exhibit 1017 (QBone) and Exhibit 1024 (Internet Archive version of QBone) as required by our rules (*see* Paper 12), Patent Owner did not preserve those objections by filing a motion to exclude as a separate paper. Instead, Patent Owner simply repeated its objections in the Patent Owner's Response. PO Resp. 19. Because Patent Owner did not comply with the rules regarding a motion to exclude and has not sufficiently demonstrated—or even argued—why we should waive or suspend our requirement for a separate motion to exclude (*see* 37 C.F.R. § 42.5(b)), we determine Patent Owner waived its objections to the admissibility of Exhibits 1017 and 1024.

4. Printed Publication Analysis

"The statutory phrase 'printed publication' has been interpreted to mean that before the critical date the reference must have been sufficiently accessible to the public interested in the art; dissemination and public accessibility are the keys to the legal determination whether a prior art reference was 'published.'" *In re Cronyn*, 890 F.2d 1158, 1160 (Fed. Cir. 1989). The determination of whether a given reference qualifies as a prior art "printed publication" 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 35 U.S.C. § 102(b)." *In re Hall*, 781 F.2d 897, 898–99 (Fed. Cir. 1986); *see also SRI Int'l, Inc. v. Internet Sec. Sys.*, 511 F.3d 1186, 1194 (Fed. Cir. 2008) (quoting *Hall*). "A reference will be considered publicly accessible if it was 'disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it.'" *Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016) (quoting *Kyocera Wireless Corp. v. ITC*, 545 F.3d 1340, 1350 (Fed. Cir. 2008)). As the cases make clear, a document may be a printed publication based on either (1) actual dissemination to people of ordinary skill in the art or (2) being made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it.

Whether a publication that was not disseminated was still "accessible to the public" frequently turns on whether the reference was "cataloged or indexed in a meaningful way." *Cronyn*, 890 F.2d at 1160–61 (distinguishing between an alphabetical list of authors and titles with a "library's general practice for indexing, cataloging, and shelving"). If a publication is "neither distributed nor indexed," other factors that might be analyzed include the length of time it was "exhibited," the expertise of the audience, and "reasonable expectations that the material displayed would not be copied." *Klopfenstein*, 380 F.3d at 1350. Additionally, a document may be a printed publication if there is a road map that would direct a person of ordinary skill in the art to the document. *See Bruckelmyer*, 445 F.3d at 1379; *Blue Calypso*, 815 F.3d at 1350 ("We have previously recognized that the presence of a 'research aid' can also establish public accessibility.").

In determining whether a document is a printed publication, the Federal Circuit has recently emphasized the need for corroboration of testimony that is used to prove a document is a printed publication. *Nobel Biocare Servs. AG v. Instradent USA, Inc.*, 903 F.3d 1365, 1377–81 (Fed. Cir. 2018); *see also TypeRight Keyboard Corp. v. Microsoft Corp.*, 374 F.3d 1151, 1159 (Fed. Cir. 2004). "[C]orroboration is required of any witness whose testimony alone is asserted to invalidate a patent, regardless of his or her level of interest." *Finnigan Corp. v. Int'l Trade Comm'n*, 180 F.3d 1354, 1369 (Fed. Cir. 1999). "Corroborating evidence may include documentary or testimonial evidence." *Nobel*, 903 F.3d at 1378 (citing *TransWeb, LLC v. 3M Innovative Props. Co.*, 812 F.3d 1295, 1301 (Fed. Cir. 2016)). "Circumstantial evidence can be sufficient corroboration." *Id.* (citing *TransWeb*, 812 F.3d at 1301). The Federal Circuit has identified

several factors that may be considered in assessing the sufficiency of the corroboration in prior invention or public use cases:

> (1) the relationship between the corroborating witness and the alleged prior user,
>
> (2) the time period between the event and trial,
>
> (3) the interest of the corroborating witness in the subject matter in suit,
>
> (4) contradiction or impeachment of the witness' testimony,
>
> (5) the extent and details of the corroborating testimony,
>
> (6) the witness' familiarity with the subject matter of the patented invention and the prior use,
>
> (7) probability that a prior use could occur considering the state of the art at the time,
>
> (8) impact of the invention on the industry, and the commercial value of its practice.

Id. (citing *Woodland Tr. v. Flowertree Nursery, Inc.*, 148 F.3d 1368, 1371 (Fed. Cir. 1998)). In determining whether or not there is sufficient corroboration, we apply a "rule of reason" analysis, *Woodland*, 148 F.3d at 1371, which "involves an assessment of the totality of the circumstances including an evaluation of all pertinent evidence," *Adenta GmbH v. OrthoArm, Inc.*, 501 F.3d 1364, 1372 (Fed. Cir. 2007).

a. Publication by USPTO

In our Institution Decision, we preliminarily determined

> QBone's inclusion in the Surdila prosecution history is not, by itself, enough to establish that QBone was sufficiently publicly accessible to constitute a printed publication. Although a copy of QBone can be found in the Surdila prosecution history, Petitioner has pointed to nothing in this record that would direct a person of ordinary skill in the art to look the Surdila prosecution

> history for QBone. Instead of directing the person of ordinary skill in the art to locate QBone in the Surdila prosecution history, Surdila states "[t]he QBone group has published a description of the architecture in a paper entitled 'QBone Bandwidth Broker Architecture' found at http://www.internet2.edu/qos/qbone/papers/sibbs/."

Inst. Dec. 16–17 (quoting Ex. 1014 ¶ 25). Based on the full evidence presented during the trial, including Petitioner's Supplemental Information, we maintain our determination that QBone's inclusion in the Surdila prosecution history is not, by itself, enough to establish that QBone was sufficiently publicly accessible to constitute a printed publication. Although a copy of QBone can be found in the Surdila prosecution history, Petitioner has pointed to nothing in this record that would direct a person of ordinary skill in the art to look in the Surdila prosecution history for QBone. Instead of directing a person of ordinary skill in the art to locate QBone in the Surdila prosecution history, Surdila directs the person of ordinary skill in the art to a specific website URL: "The QBone group has published a description of the architecture in a paper entitled 'QBone Bandwidth Broker Architecture' found at http://www.internet2.edu/qos/qbone/papers/sibbs/." Ex. 1014 ¶ 25.

The Federal Circuit's decisions in *Bruckelmyer* and *Blue Calypso* are instructive. In *Bruckelmyer*, a divided panel held that, under the facts of the case, a published Canadian patent was a sufficient roadmap to the originally filed patent application, which contained figures not included in the published application, such that the application was sufficiently publicly accessible to be a printed publication. 445 F.3d at 1379 ("Because no reasonable trier of fact could have found that the '119 patent did not provide sufficient information to allow a person of ordinary skill in the art to locate

the ’119 application, including the figures contained therein, we agree with the district court and conclude that that application was ‘publicly accessible,’ and hence an invalidating § 102(b) prior art reference.”). However, *Bruckelmyer* does not address whether a published patent application can act as a roadmap to direct a person of ordinary skill in the art to the file history to find a prior art reference.

In *Blue Calypso*, the Federal Circuit held that a report (Ratsimor) located on a personal website of an author was not a printed publication. 815 F.3d at 1348–50. Specifically, the court rejected Groupon’s argument that a different “article that Dr. Ratsimor and several of the same co-authors published . . . would have [acted as a roadmap and] directed interested researchers to Ratsimor.” *Id*. at 1350.

> The published article does not provide a skilled artisan with a sufficiently definite roadmap leading to Ratsimor. An adequate roadmap need not give turn-by-turn directions, but should at least provide enough details from which we can determine that an interested party is reasonably certain to arrive at the destination: the potentially invalidating reference. The issued foreign patent in *Bruckelmyer* is such a roadmap; the existence of a patent assumes the existence of a corresponding patent application. Additionally, a published article with an express citation to the potentially invalidating reference would similarly provide the necessary guidance. *See Cornell Univ. v. Hewlett–Packard Co.*, No. 01–cv–1974, 2008 U.S. Dist. LEXIS 39343, at *20–21 (N.D.N.Y. May 14, 2008) (finding that an article in a “seminal publication in the field of electrical engineering” with an explicit citation to the allegedly invalidating reference was a research aid that made the sought-after reference publicly accessible).
>
> In this case, Groupon at no point asserts that the published article cited or mentioned Dr. Ratsimor’s personal page. Instead, Groupon asserts that the common subject matter would lead an interested party to do additional research on the UMBC

> Department's website. However, even to the extent that is true, there is no evidence that an interested party could navigate from that website to Dr. Ratsimor's personal page, whether through a direct link or a chain of links, to access the Ratsimor Reference.

Id.

Petitioner presents evidence that a person of ordinary skill in the art performing a search of the UPSTO full text database would have found Surdila. *See* Ex. 1025 ¶ 69; *see also* Pet. 10 (discussing "directly searching the USPTO application database as well as by using the USPTO classification system to locate the Surdila reference") (citing Ex. 1025 ¶ 69). However, the issue is not whether Surdila is sufficiently indexed or cataloged such that a person of ordinary skill in the art would be able to locate it, but whether QBone is "disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence, can locate it." *Blue Calypso,* 815 F.3d at 1348 (quoting *Kyocera*, 545 F.3d at 1350). Petitioner has not presented persuasive evidence to show that QBone, as opposed to Surdila, was indexed or catalogued in a meaningful way so that a person of ordinary skill in the art could have located it in the Surdila prosecution history with reasonable diligence.

Petitioner also argues that Dr. Sharony acknowledged, on cross-examination, that an incorporated document would have been "part of the application" and "part of the [file history]" (Pet. Reply 7–8), but that argument also is not persuasive. First, Dr. Sharony does not purport to be an expert in patent law or Patent Office procedure, Petitioner agrees that Dr. Sharony is not an expert in patent law of Patent Office procedure (Tr. 12), and our rules provide that "[t]estimony on United States patent law or patent

examination practice will not be admitted" (37 C.F.R. § 42.65(a)). Accordingly, we give Dr. Sharony's testimony on this subject no weight. *See, e.g., Rohm & Haas Co. v. Brotech Corp.*, 127 F.3d 1089, 1092 (Fed. Cir. 1997) (noting that a fact finder is not required to "credit the unsupported assertions of an expert witness").

Second, Dr. Sharony was not asked about QBone or what incorporation by reference generally entails; instead, he was being asked what he meant when he used it in one of his patents. *See* Ex. 1038, 76:15–77:18. Such testimony is inapposite to the issue before us.

Third, Dr. Sharony never testified that a copy of a document incorporated by reference can be found in the file history. Instead, Dr. Sharony testified that it is a part of the application and, therefore, part of the file history:

> Q. So when you were involved in preparing or reviewing this -- the patent application that issued as this patent, did you understand what "incorporated by reference" meant?
>
> A. Yeah. That the 082.11 Standard was basically part of this application.
>
> Q. Okay. So you understood, then, that that was a part of -- by stating that it was incorporated by reference, that it was considered to be part of the disclosure? . . .
>
> A. It's one of the references that – I mean, he cite the IEEE 082.11 Standard, and he includes it in the application by saying that it's incorporated here, *so it is part of the application*.
>
> Q. Okay. So it's part of the application and it's going to be part of the file history, correct?
>
> A. I believe so.

Ex. 1038, 77:13–78:9 (emphasis added) (objection omitted). As the emphasized testimony makes clear, Dr. Sharony testified the material

incorporated by reference is part of the application. *Id.*; *see also* Tr. 12 ("[PETITIONER'S COUNSEL]: I don't believe [Dr. Sharony] ever said a copy of it will be found in the file history."). Moreover, the ultimate question—"So it's part of the application and it's going to be part of the file history, correct?"—does not ask whether the document that is being incorporated by reference is going to be found in the file history or if the contents of the incorporated by reference document can be treated as part of the of the file history. *Id.* In the context of the entire testimony—in which Dr. Sharony twice stated his understanding is that the incorporated by reference material is part of the application—the most reasonable inference is that Dr. Sharony testified that the incorporated by reference material is part of the file history because it is part of the application. And, contrary to Petitioner's argument, Dr. Sharony did not testify that a copy of the document is located in the file history, a question that he was not asked. *See id.*

This is consistent with what actually happened during the prosecution of Exhibit 1036 (U.S. Patent No. 7,039,358), the patent Dr. Sharony was asked about. There is nothing on the face of the patent (the listing of cited prior art) that indicates that the IEEE standard that was incorporated by reference was ever submitted as prior art or otherwise physically included as part of the file history. *See* Tr. 56. Moreover, a review of the Public Pair record of U.S. Patent No. 7,039,358 does not indicate that the applicant submitted any documents during the prosecution of the patent.

During the Hearing, Petitioner argued that the MPEP required a non-patent document that is incorporated by reference to be included in the prosecution history. Tr. 9. However, the relevant rule states that the

Examiner "may" require a copy to be placed in the file history, not that it has to be. 37 C.F.R. § 1.57(f); MPEP 608.01(p)(I)(A)(1) ("If an application as filed incorporates material by reference, a copy of the incorporated by reference material *may* be required to be submitted to the Office even if the material is properly incorporated by reference.") (emphasis added).

Additionally, the case law cited by Petitioner does not persuade us that the inclusion of a document in a publically accessible file history is sufficiently published to be a printed publication. Although Petitioner cites *Duodecad IT Services Luxembourg S.À.R.L. v. WAG Acquisition, LLC*, Case IPR2015-01036, slip op. at 18–19, Paper 17 (PTAB Oct. 20, 2016) (Paper 17), that is a non-precedential decision by which we are not bound.

Other panels of the Board have, like us, determined that mere inclusion of a document in a publically available file history is not, without more, sufficient to make the document a printed publication. *See C & D Zodiac, Inc. v. B/E Aerospace, Inc.*, Case IPR2017-01276, slip op. at 22–26 (PTAB Oct. 2017, 2017) (Paper 12). In *C & D Zodiac*, the issue was whether page 70 of the file history, which was part of a document submitted with an Information Disclosure Statement ("The KLM Crew Rest Document"), was a printed publication. The Board determined as follows:

> The instant facts, however, are different significantly than those in *Wyer*[12] and *Bruckelmyer*. In *Wyer*, persons interested and ordinarily skilled in the relevant art could have used the published abstract as a roadmap to locate the application through no more than reasonable diligence. *Wyer*, 655 F.2d at 222, 224. Similarly, in *Bruckelmyer*, persons interested and ordinarily skilled in the relevant art could have used the published patent as a roadmap to locate the application through no more than

[12] *In re Wyer*, 655 F.2d 221 (CCPA 1981)

> reasonable diligence. *Bruckelmyer*, 445 F.3d at 79. *Here, Petitioner has provided no argument or evidence showing a potential roadmap such that no more than reasonable diligence would have been required for relevant persons to use the Moore patent to locate the diagram on page seventy of Exhibit 1009.* That diagram is not part of the invention or disclosure of the Moore patent. *It is, in our judgment, without any evidence of a roadmap, too much to expect relevant persons, in the course of exercising reasonable diligence, to search the complete file histories of issued patents for third party disclosures that might possibly be contained therein.*

C & D Zodiac, slip op., at 24–25 (emphases added).

Here, as in *C & D Zodiac*, there is no persuasive evidence that a person of ordinary skill in the art would have examined the Surdila file history to find QBone. Instead, as discussed earlier, Surdila directs the person of ordinary skill in the art to a URL (Ex 1014 ¶25).

b. Publication on the Internet2 Website

We are persuaded by Mr. Foti's testimony (Ex. 1032) and the supporting exhibits that QBone is a printed publication based on its publication on the Internet2 website.

Mr. Foti testifies that in the early 2000s, a person of ordinary skill in the art would have been aware of the QBone bandwidth broker architecture. Ex. 1032 ¶ 4. Mr. Foti further testifies that, in the timeframe leading up to filing the application that published as Surdila, he "familiarized [himself] with different principles relating to the QBone bandwidth broker architecture" and that the Internet Engineering Task Force ("IETF") "provided multiple RFCs (Requests for Comment) in which the QBone bandwidth broker architecture was identified, discussed, and/or referenced to varying degrees of detail." *Id.* ¶ 5. Mr. Foti also testifies that "[t]he IETF is open to the public and does not have a membership requirement; rather,

anyone may register and attend any meeting, whether participation in a mailing list or a physical meeting." *Id.* ¶ 6.

Additionally, Mr. Foti testifies that "IETF materials such as RFCs are available on the Internet and easily retrieved utilizing common search terms relevant to the RFCs." *Id.* ¶ 6. Mr. Foti further testifies about a search he conducted that found "[o]ne such RFC example that identified and discussed aspects of the QBone Bandwidth Broker Architecture, . . . RFC 2768, titled 'Network Policy and Services: A Report of a Workshop on Middleware.'" *Id.* ¶ 7 (discussing Ex. 1035). That document was obtained using search terms "including 'RFC,' 'QBone,' and '2000' or 'RFC,' 'bandwidth broker,' and '2000.'" *Id.* Mr. Foti testifies that Exhibit 1035 "was a publication that persons of ordinary skill in the art, including myself, reasonably relied upon in the 2000-2001 time frame for both learning about technical matters relating to the Internet and contributing to the evolution and engineering of the Internet." *Id.* According to Mr. Foti, "[t]his is an example of how, in the course of familiarizing myself with the well-known topics involving QBone through the IETF materials, I was directed to the Internet2 organization for additional information specifically regarding the QBone bandwidth broker architecture." *Id.* ¶ 9.

Mr. Foti also testifies, regarding the Internet2 organization's website,

> The Internet2 organization maintained in 2000, and still today, a webpage to house materials related to the organization's research. During 2000, the papers housed on the Internet2 website were freely available to any interested party free of charge and were easily accessible by keyword searching through a search engine, or by navigating to the relevant topic via links in the Internet2 webpage.

Id. ¶ 9.

Finally, Mr. Foti testifies that prior to filing the application that published as Surdila, he "accessed from Internet2's website an article titled 'QBone Bandwidth Broker Architecture' by Ben Teitelbaum and Phil Chimento," a copy of which (Ex. 1017) was provided to the USPTO. *Id*. ¶ 10.

Patent Owner did not cross-examine Mr. Foti. Tr. 39. Nor did Patent Owner offer any rebuttal testimony challenging the facts established by Mr. Foti. Having reviewed Mr. Foti's testimony and the corroborating exhibits, including the discussion of QBone in Surdila and the inclusion of QBone in the Surdila prosecution history, we find Mr. Foti's testimony credible.

Based on the foregoing undisputed testimony, we are persuaded that a person interested and ordinarily skilled in the subject matter or art,[13] exercising reasonable diligence, could have located QBone. Ex. 1032 ¶¶ 4, 5, 7–9; *Blue Calypso*, 815 F.3d at 1348. For example, Mr. Foti testifies how his review of IETF materials directed him to QBone and the Internet2 website. *Id*. ¶¶ 5, 7–9. That testimony is consistent with the documentary evidence in this case. Specifically, Exhibit 1035 is an article that was published in February 2000 and references the Internet2 QBone working group: "To implement any type of Bandwidth Broker model, it is necessary to establish a mechanism for policy exchanges. The Internet2's Qbone working group is currently working to define a prototype inter-domain bandwidth broker signaling protocol. This work is being coordinated with

[13] We have determined that a person of ordinary skill in the art would have had a B.S. degree in Electrical Engineering, Computer Engineering, Computer Science, or equivalent training, as well as two to three years of technical experience in the field of packet-switched networking, such as Internet, local area, and wide area networks. *See* Section II.C.

IETF efforts." Ex. 1035, 20; *see also* Ex. 1032 ¶¶ 8–9. Additionally, Surdila references the QBone study group and the Internet2: "A working group known as the QBone Working Group has defined, as part of the Internet 2 initiative, an architecture for coordinating bandwidth requirements across multiple networks at the transport level." Ex. 1014 ¶ 25.

Additionally, the unchallenged testimony of Mr. Foti establishes that the Internet2 website was indexed and searchable using a keyword search and a search engine: "During 2000, the papers housed on the Internet2 website were freely available to any interested party free of charge and were easily accessible by keyword searching through a search engine, or by navigating to the relevant topic via links in the Internet2 webpage." Ex. 1032 ¶ 9. Consistent with Mr. Foti's testimony, the Internet Archive obtained a copy of a version of QBone in 2001. *See* Ex.1024. Based on the URL in Exhibit 1024,[14] a version of QBone was saved by the Internet Archive on April 13, 2001.[15]

Although indexing is often a key component of a printed publication analysis, "indexing is not 'a necessary condition for a reference to be publicly accessible'; it is but one among many factors that may bear on

[14] https://web.archive.org/web/20010413043914/http://qbone.internet2.edu/bb/bboutline2.html.

[15] We take Official Notice of how the URL of the Internet Archive provides the date the website was captured: "Pay attention to the date code embedded in the archived url. This is the list of numbers in the middle; it translates as yyyymmddhhmmss. For example in this url http://web.archive.org/web/20000229123340/http://www.yahoo.com/ the date the site was crawled was Feb 29, 2000 at 12:33 and 40 seconds." https://help.archive.org/hc/en-us/articles/360004651732-Using-The-Wayback-Machine (last accessed Dec. 7, 2018).

public accessibility." *Voter Verified, Inc. v. Premier Election Solutions, Inc.*, 698 F.3d 1374, 1380 (Fed. Cir. 2012) (quoting *In re Lister*, 583 F.3d 1307, 1312 (Fed. Cir. 2009)); s*ee also*, *e.g.*, *Nobel*, 903 F.3d 1365 (holding that a catalog distributed at a conference was a printed publication); *Suffolk Techs., LLC. v. AOL Inc.*, 752 F.3d 1358 (Fed. Cir. 2014) (holding a user group post was sufficiently disseminated when six people responded and many more people may actually have seen it); *Klopfenstein*, 380. F.3d 1345 (holding a slide presentation at a conference was a printed publication); *Mass. Inst. of Tech. v. AB Fortia*, 774 F.2d 1104 (Fed. Cir. 1985) (holding that a paper disseminated to six people of ordinary skill in the art and discussed with between 50 and 500 people skilled in the art was a printed publication). For both online and more traditional, tangible media, "the ultimate question is whether the reference was 'available to the extent that persons interested and ordinarily skilled in the subject matter or art[,] exercising reasonable diligence, can locate it.'" *Voter Verified*, 698 F.3d at 1380 (citing *SRI*, 511 F.3d at 1194). "Thus, while often relevant to public accessibility, evidence of indexing is not an absolute prerequisite to establishing online references . . . as printed publications within the prior art." *Id*.

For example, in *Voter Verified*, the district court held that an article posted on a website that was well known in the relevant community, was freely available to copy, and could have been located using a search tool:

> Starting in January 1995, however, all content published in the Risks Digest (including the Benson article) became available worldwide on the internet through the website *http://catless.ncl.ac.uk/Risks*. Furthermore, unrebutted testimony in the record indicated that (1) the Risks Digest was well known to the community interested in the risks of computer automation,

> including those concerned with electronic voting technologies, and by 1999 the Risks Digest contained more than 100 articles relating to electronic voting; (2) all submissions for publication in the Risks Digest are treated by the community as public disclosures; and users can freely and easily copy Risks Digest content. In addition, since September 1995 the Risks Digest website has included a search tool that would have retrieved the Benson article in response to search terms such as "vote," "voting," "ballot," and/ or "election."

Id. at 1380–81. Based on those facts, the Federal Circuit held that the district court did not err in finding the Benson article a printed publication:

> Given the record before us, we see no error in the district court's factual findings or its conclusion that the Benson article constituted publicly available prior art relative to the '449 patent. The Risks Digest website was undisputedly open to any internet user by the critical date. Whether or not the website itself had been indexed by 1999 (through search engines or otherwise), the uncontested evidence indicates that a person of ordinary skill interested in electronic voting would have been independently aware of the Risks Digest as a prominent forum for discussing such technologies. And upon accessing the Risks Digest website, such an interested researcher would have found the Benson article using that website's own search functions and applying reasonable diligence. In short, the Benson article was publicly available by the critical date and therefore qualifies as a prior art "printed publication" under § 102(b).

Id. at 1381.

Similar to *Voter Verified*, Mr. Foti's testimony and the other evidence of record demonstrates that the Internet2 group and its website were well known to those of ordinary skill in the art. *See* Ex. 1032 ¶¶ 4–9 (discussing the general knowledge of QBone architecture and the Interent2 website); Ex. 1014 ¶ 25 (discussing the QBone working group, the Internet2 initiative, and providing a link to an article posted on the Internet2 website); Ex. 1035, 20 (discussing the Internet2's QBone working group). The undisputed

testimony also establishes that documents on the Internet2 website were freely accessible and free to copy. *See* Ex. 1032 ¶ 9; Ex. 1024 (copy of QBone obtained by the Internet Archive). And, there is no dispute that a person of ordinary skill in the art could have located QBone using either "keyword searching through a search engine, or by navigating to the relevant topic via links in the Internet2 webpage." Ex. 1032 ¶ 9.[16] Indeed, QBone was sufficiently indexed that Mr. Foti was able to search for and obtain a copy of the article prior to April 2001, when the application that published as Surdila was filed. *See* Ex 1014, [22], ¶ 25.

Applying the rule of reason, we also find Mr. Foti's testimony to be sufficiently corroborated. Most importantly, Mr. Foti's testimony is corroborated by Surdila, an application on which he is a named inventor. *See* Ex. 1014, [76]. In Surdila, Mr. Foti identifies QBone, indicates that QBone is "published," identifies the QBone working group, and identifies the Internet2 initiative:

> A working group known as the QBone Working Group has defined, as part of the Internet 2 initiative, an architecture for coordinating bandwidth requirements across multiple networks at the transport level. *The QBone group has published a description of the architecture in a paper entitled "QBone Bandwidth Broker Architecture"* found at http://www.internet2.edu/qos/qbone/papers/sibbs/. . . .

Id. ¶ 25 (emphasis added). This evidence both corroborates his testimony that he obtained a copy of QBone from the Internet2 website and that it was published. His testimony is further corroborated by the copy of QBone

[16] Patent Owner agrees that the person of ordinary skill in the art is "a person with a pretty substantial technical background" and would be "somebody who knows their way around computers." Tr. 38.

located in the Surdila file history (Ex. 1015, 91) and a version of QBone located on the Internet Archive with a capture date of April 2001 (Ex. 1024, 1).

Other aspects of Mr. Foti's testimony are also corroborated. For example, Mr. Foti provides written documents that confirm his testimony that IETF documents were available to the public for free, that the QBone architecture was well-known to people of ordinary skill in the art, and that references to QBone were found in various IETF documents. *Compare* Ex. 1032 ¶¶ 3–8, *with* Ex. 1033; Ex. 1034; Ex. 1035.

Additionally, Mr. Foti's testimony is uncontradicted. Although Patent Owner argues the testimony is insufficient, Patent Owner has not offered any contradictory cross-examination testimony, contradictory testimonial evidence by a fact witness, or contrary documentary evidence. That lack of "contradiction or impeachment of the witness' testimony" is some evidence of corroboration. *See Nobel*, 903 F.3d at1378 (citing *Woodland.*, 148 F.3d at 1371).

The evidence as a whole demonstrates that Mr. Foti found QBone on the Internet2 website. *See* Ex. 1032 ¶ 10. There is no requirement that a document needs to be disseminated to more than one person—or even to one person—to be a printed publication. For example, in *Voter Verified*, although the district court did not making any finding regarding whether any person actually obtained a copy of the Benson article, the Federal Circuit affirmed the determination that the Benson article was a printed publication. *See* 511 F.3d at 1380–81; *cf. In re Klopfenstein*, 380 F.2d at 1350–51 (finding a slide presentation a printed publication and only discussing the ability to copy the documents, even though no copies were actually

distributed to the public). Similarly, in *Nobel Biocare*, a catalog was found to be a printed publication even though there was only evidence that a single person obtained a copy of it at a tradeshow. 903 F.3d at 1376–77.

We disagree with Patent Owner that we should focus on the availability of QBone through the link provided in Surdila on December 2, 2002—the day Surdila was published. Because we are not relying on publication via the Surdila published application or the Surdila file history, the date that those documents became publically available is not the key date. The issue is whether a person of ordinary skill in the art, exercising reasonable diligence, could have located QBone more than a year before May 2, 2006. As discussed above, the evidence sufficiently establishes that Mr. Foti not only could have, but did, locate QBone without the link provided in Surdila.

c. Conclusion of Printed Publication Analysis

For the reasons set forth above, we find that Petitioner has shown by a preponderance of the evidence that Exhibit 1017 (QBone) qualifies as a printed publication prior to the critical date. Therefore, QBone is prior art.

E. Obviousness over QBone, Surdila, and Li

As discussed below, we find that all of the claim limitations required by claims 1–8 and 11 in the specific arrangement required by the claims are found in the teachings of QBone (Ex. 1017), Surdila (Ex. 1014), and Li (Ex. 1026), and, further, it would have been obvious to a person of ordinary skill in the art to combine them in the manner suggested by Petitioner. *See* Pet. 15–54; *see also* Ex. 1025 ¶¶ 76–267. Having considered the entirety of the evidence before us, we find that Petitioner has demonstrated, by a preponderance of the evidence, that claims 1–8 and 11 of the ’119 patent

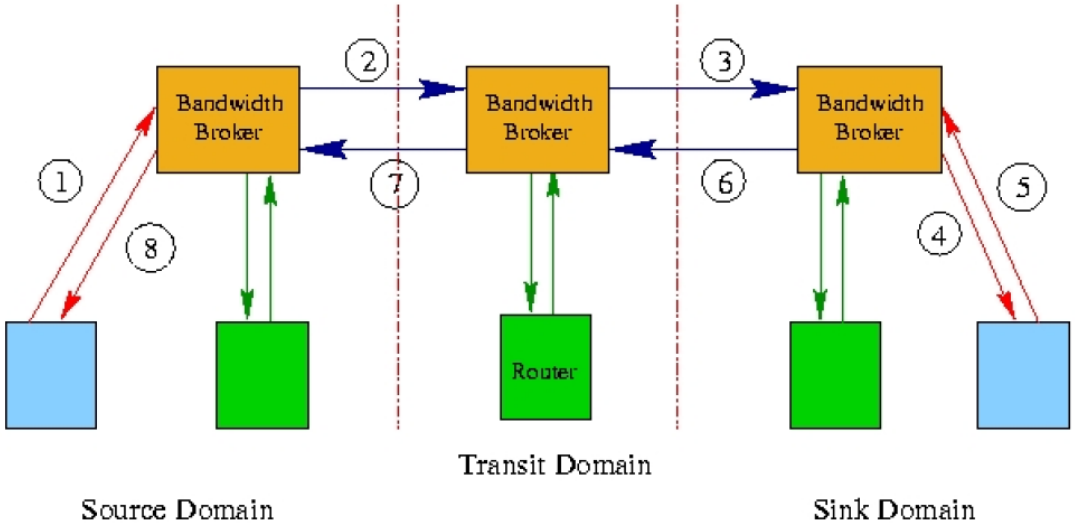
would have been obvious to a person of ordinary skill in the art based on the combined teachings of QBone, Surdila, and Li.

1. Summary of QBone

QBone is a paper entitled "QBone Bandwidth Broker Architecture, Work in Progress." Ex. 1017, 1. According to the paper, the purpose of QBone "is to establish a minimal set of requirements for network clouds wishing to participate in inter-domain QoS signaling trials across the QBone." *Id.* The goal of QBone is to "[d]efine a model of the 'bandwidth broker' resource managers to be deployed in the QB one," "[r]ecommend a deployment phasing for the QBone bandwidth broker work," and "[s]pecify a common interdomain interface for the QBone bandwidth broker." *Id.*

QBone teaches using a bandwidth broker ("BB") that receives resource allocation requests ("RAR") from an originating end system in the same domain. *Id.* at 5. In response to an RAR, the bandwidth broker "responds . . . with a confirmation of service or denial of service . . . known as a Resource Allocation Answer (RAA)." *Id.* Additionally, "[t]he request may have certain side effects also, such as altering the router configurations at the access, at the inter-domain borders, and/or internally within the domain, and possibly generating additional RAR messages requesting downstream resources." *Id.*

QBone discusses "how the protocol works end-to-end," including when "[a]n end system initiates a request for service . . . to another end system." *Id.* at 11–12. QBone provides the following figure shown below.



End system request with fully specified destination

Ex. 1024, 11.[17] The figure shows a representation of an "[e]nd system request with fully specified destination." Ex. 1017, 13. When an end system sends an RAR to the bandwidth broker, the bandwidth broker must make a number of decisions including "[w]hether the requester is authorized for this service," "[t]he route through the domain to the egress router," and "[w]hether the flow (possibly according to the policies of the domain) may be accepted for the specified service." *Id*. at 16.

Additionally, "the bandwidth broker completes any resource allocation actions within the domain, modifies PHB [(Per Hop Behavior)] and traffic conditioner parameters at the egress router for the flow and forwards the RAA to the requesting end system." *Id*. at 15. "This may include setting the marking functions for the flow in the access router

[17] According to Petitioner, this figure from Exhibit 1024 is "a cleaner copy of the same figure" as on page 13 of QBone (Exhibit 1017). Pet. 16. Because of the superior copy quality, we are using the version shown in Ex. 1024.

serving the requesting end system (indicated by the green arrows in the figure)." *Id.*

2. Summary of Surdila

Surdila "relates to telecommunication systems and, more particularly, to a system and method of providing End-to-End (E2E) Quality of Service (QoS) across multiple Internet Protocol (IP) networks." Ex. 1014 ¶ 2. According to Surdila, "[t]he support of E2E QoS is a very important issue related to the launching of [various] real-time applications." *Id.* ¶ 7. The major challenge with that issue "is to make sure that when a user requests a certain QoS, this QoS can be assured all the way to the recipient." *Id.*

Surdila identifies QBone as a "paper [which] defines the functionality of a Bandwidth Broker (BB) and contains a brief specification of a BB protocol which is to be introduced in Phase 2 of the QBone implementation program." *Id.* ¶ 25. Surdila incorporates QBone by reference. *Id.*

Surdila Figure 6 is shown below.

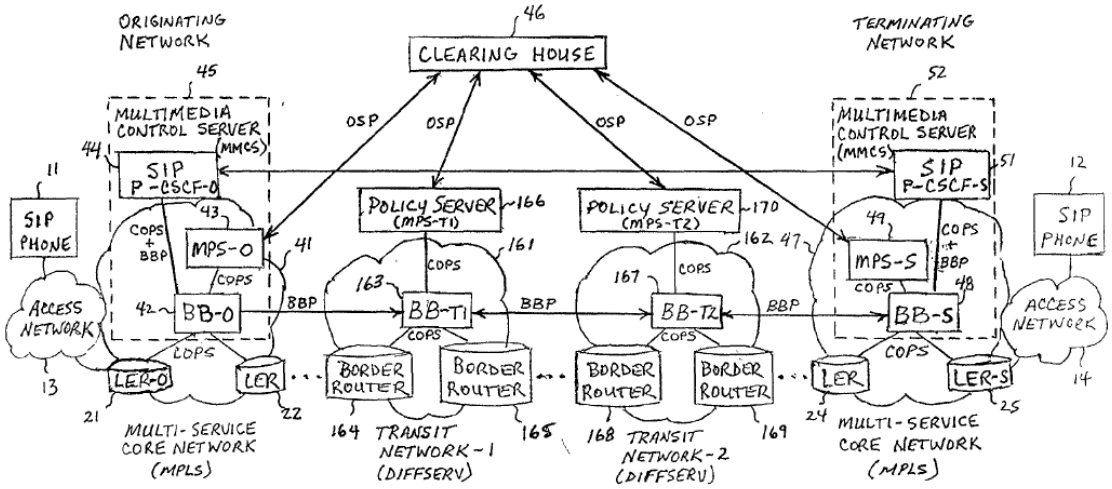


FIG. 6

Ex. 1014, Fig. 6. Figure 6 "is a simplified block diagram of the preferred embodiment of the Phase 2 BB Architecture of the present invention when

there are BBs in every transit network." *Id.* ¶ 20. As shown in Figure 6, "[t]he BB-O 42 also interfaces with an originating SIP CSCF (P-CSCF-O) 44 using a new link and a combination of the COPS protocol and the BB protocol (BBP)." *Id.* ¶ 41.[18] Additionally, "[t]he interface between the P-CSCF-O 44 and the BB-O 42 provides a link between the control plane and the transport plane, and the combination of the BB-O 42, the MPS-O 43, and the P–CSCF–O 44 form a functional entity known as a Multimedia Control Server (MMCS) 45." *Id.* When used to place a call from one originating end system to a terminating end system, "End User (UE-A) 11 sends an Invite message to the Originating P-CSCF-0 44" which is forwarded to "UE-B 12 with the Proposed SDP [(Session Description Protocol)] and includes an Authentication token." *Id.* ¶¶ 62–63.

3. Summary of Li

Li "relates to an implementation scheme of quality of service in a virtual private network, and discloses a system and a method for ensuring quality of service in a network based virtual private network, so that there is a practical solution to a QoS problem of an MPLS VPN." Ex. 1023, 1. Li states that the "bearer control network includes centralized resource controllers" which "perform[] resource calculation and route selection, send[] route indications to the routers, [and] allocate[e] resources and perform[] access control in the logical bearer network." *Id.* at 12. As part of the allocation and routing determination, a centralized resource controller

[18] Although the cited description is for Figure 3, Surdila states that Figure 3 is similar to Figure 6 "except that BBs have been implemented in Transit Network-1 161 and Transit Network-2 162." *Id.* at ¶ 76.

"distribut[es] MPLS label stacks that represent the routes to ingress PEs [provider edge routers]." *Id.* at 17.

4. Claim 1

a. Undisputed Limitations

Petitioner relies on either QBone alone or QBone in combination with Surdila for many of the limitations recited in claim 1. *See* Pet. 24–48. Specifically, Petitioner argues QBone teaches "providing bandwidth on demand" as provided in the preamble, the determining whether the terminating end point can be reached by the controller step, and the negotiating step. *Id*. at 24–25, 34–35, 39–41. Petitioner further argues that the combination of the teachings of QBone and Surdila teaches the receiving and directing steps. *Id*. at 25–33, 36–39. Petitioner also argues QBone teaches "wherein control paths for the connection are supported only between each of the originating and terminating end-points and the controller and between the portal and the controller" ("control paths limitation"). *Id*. at 46–48. Patent Owner does not challenge Petitioner's contentions regarding these limitations. *See* PO Resp. 19–34.

Based on the evidence and reasoning provided in the Petition (Pet. 24–41, 46–48), we are persuaded that QBone teaches "providing bandwidth on demand" as provided in the preamble, along with the determining whether the terminating end point can be reached by the controller step, the negotiating step, and control path limitation recited in claim 1 and that the combination of QBone and Surdila teaches the receiving and directing steps recited in claim 1.

We address the remaining steps of claim 1, which Patent Owner does contest, in turn.

b. "determining, by the controller, whether the originating end-point is authorized to use the requested amount of bandwidth or the codec"

i. Petitioner's Arguments

Specifically, Petitioner argues QBone teaches that the bandwidth broker (the controller) responds to the RAR, which includes a requested amount of bandwidth, from an originating end-point by determining whether the requestor is authorized for the service, including the requested amount of bandwidth. Pet. 34 (citing Ex. 1017, 13, 22, 24; Ex. 1025 ¶¶ 159–160). According to Petitioner, a person of ordinary skill in the art would have understood that the bandwidth broker "determines whether the end system is authorized for the service identified in the RAR, where the RAR includes a requested amount of bandwidth." *Id*. (citing Ex. 1025 ¶¶ 161–162).

Alternatively, Petitioner argues that Surdila teaches authorization of a codec and the combination of QBone and Surdila teaches this limitation. Pet. 34–35. Specifically, Petitioner argues Surdila teaches that "the originating end-point sends a SIP Invite message (an example of what may be included for a request) that 'includes . . . Proposed Session Description (SDP)(QoS Assured).'" *Id*. (quoting Ex. 1014 ¶ 62). Petitioner further argues that a person of ordinary skill in the art would have known that the SIP Invite includes one or more codecs for the session and that, after a response, the user (UE-A) is authenticated and the call is authorized with the requested codec. *Id*. at 35 (citing Ex. 1014 ¶ 63; Ex. 1025 ¶¶ 163–164).

ii. Patent Owner's Arguments

Patent Owner argues that because the Petition states that "QBone's authorization 'could be done based on a number of factors, including bandwidth,'" that argument "does not meet its burden to set forth a prima

facie case of obviousness." PO Resp. 29 (citing Pet. 34; *Rockwell Automation, Inc. v. Automation Middleware Sols., Inc.*, Case IPR2017-00023, slip op. at 16–17 (PTAB Apr. 7, 2017) (Paper 15)). Patent Owner further argues "Petitioner has not provided evidence that explains why a POSITA would perform authorization using bandwidth, as opposed to the many other authorization techniques." *Id*. (emphasis omitted).

Patent Owner further argues Surdila does not cure the deficiencies of QBone. *Id*. at 30. According to Patent Owner, "Petitioner's bandwidth/codec-based obviousness argument is simply one of 'availability,' not actual use, and must fail as a matter of law." *Id.*

iii. Our Analysis

Based on the evidence before us, we are persuaded QBone teaches "determining, by the controller, whether the originating end-point is authorized to use the requested amount of bandwidth or the codec" as recited in claim 1. QBone teaches a bandwidth broker that makes a number of decisions in response to the RAR, including "[w]hether the requestor is authorized for this service." Ex. 1017, 13; *see also* Ex. 1025 ¶ 160. QBone also teaches that the requested service, as specified in the RAR, includes a requested amount of bandwidth. Specifically, QBone states that the RAR message "includes a globally well-known service ID and an IP destination IP address, a source IP address, an authentication field, times for which the service is requested and *the other parameters of the service*." Ex. 1017, 13 (emphasis added); *see also* Ex. 1025 ¶ 161. One of the fields of the RAR message—that is, one of the other parameters of service—is the "Service Parameterization Object" or "SPO." Ex. 1017, 21–22 (setting forth the RAR message format, including the SPO); *see also* Ex. 1025 ¶ 161. QBone

further explains that the "SPO . . . may be a simple parameter (e.g. bits-per-second of bandwidth)." Ex. 1017, 24; *see also* Ex. 1025 ¶ 161. Accordingly, QBone teaches that authorization is determined based on a number of factors, including the requested amount of bandwidth.

As we noted in the Institution Decision, "the entire section, taken as a whole, refers to what a person of ordinary skill in the art would have understood." Inst. Dec. 29. The very sentence that uses the "could have" language also refers to what a person of ordinary skill in the art "would have" understood:

> QBone teaches that the requested service specified in the RAR includes a requested amount of bandwidth. *See* analysis of claim element [1.2]; ERIC-1017, pp.13,22,24. *It would have been understood* by a POSITA that authorization as in QBone could be done based on a number of factors, including bandwidth. Thus, the BB that determines whether the end system is authorized for the service identified in the RAR, where the RAR includes a requested amount of bandwidth, provides an example of determining whether the originating end-point is authorized to use the amount of bandwidth in the request. ERIC-1025, ¶¶161-162.

Pet. 34 (emphasis added). Moreover, the referenced testimony in the above paragraph refers specifically to what factors the authorization "would be based on," not could be based on. Ex. 1025 ¶ 162. Thus, Petitioner has established persuasively that a person of ordinary skill in the art would have understood that QBone permits several options, one of which is bandwidth.

Even if QBone could use factors other than the requested amount of bandwidth, it nevertheless teaches that bandwidth is one of the factors that can be considered and that is sufficient. A method is obvious even if it is only performed in some circumstances, but not others. *See Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1002 (Fed. Cir. 2016) ("It does not matter

that the use of alphabetical order for locations would not always result in farther-over-nearer ordering. It is enough that the combination would sometimes perform all the method steps, including farther-over-nearer ordering.") (citing *Hewlett-Packard Co. v. Mustek Sys., Inc.*, 340 F.3d 1314, 1326 (Fed. Cir. 2003)).

Because we find QBone teaches this limitation with regard to authorizing the amount of bandwidth, Petitioner's and Patent Owner's arguments directed to the combination of QBone and Surdila are moot. Claim 1 recites determining authorization to use "the requested amount of bandwidth *or* the codec." Ex. 1001, 7:52–55 (emphasis added). When a claim is written in the alternative, the prior art need only teach one of the embodiments for the claim to be unpatentable. *See Brown v. 3M*, 265 F.3d 1349, 1351 (Fed. Cir. 2001) (holding that when the claim covers alternatives, the claim may be unpatentable if any of the alternatives within the scope of the claim are taught by the prior art.).

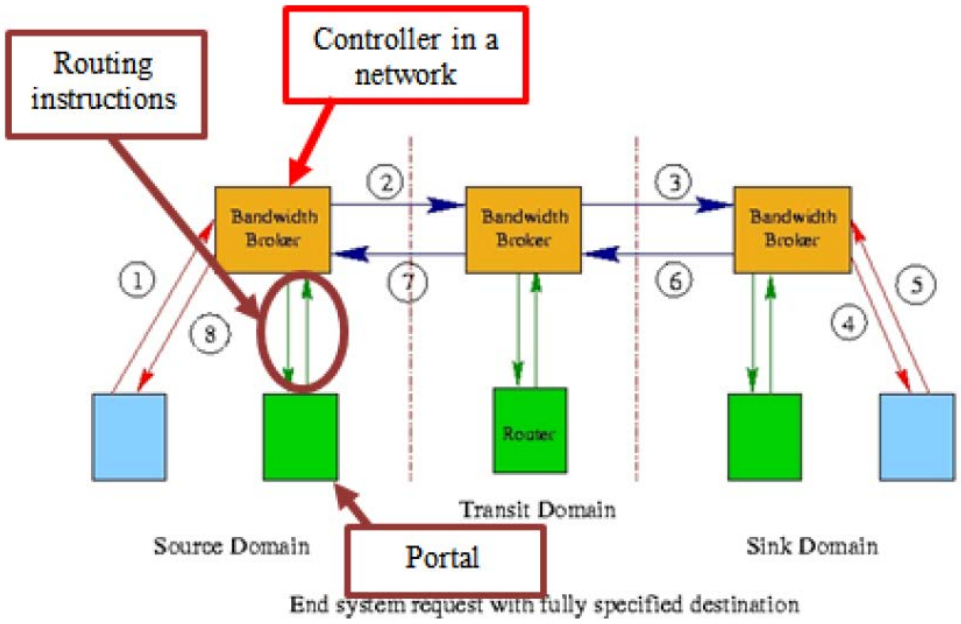
Accordingly, based on the entirety of the record, we find QBone teaches "determining, by the controller, whether the originating end-point is authorized to use the requested amount of bandwidth or the codec" as recited in claim 1.

c. *"providing, by the controller to the portal, routing instructions for traffic corresponding to the connection so that the traffic is directed by the portal based only on the routing instructions provided by the controller, wherein the portal does not perform any independent routing on the traffic"*

i. Petitioner's Arguments

Petitioner argues the combination of QBone, Surdila, and Li teaches "providing, by the controller to the portal, routing instructions for traffic corresponding to the connection so that the traffic is directed by the portal based only the routing instructions provided by the controller, wherein the portal does not perform any independent routing on the traffic" step recited in claim 1. Pet. 41–44.

First, Petitioner argues "QBone teaches that the [broadband broker ("BB")] provides instructions to the access router in the originating domain by setting the marking functions, based on the BB deciding '[t]he route through the domain to the egress router,' which route would include the access router." *Id*. at 41 (citing Ex. 1017, 13, 15). In support of its argument, Petitioner directs us to an annotated version of a figure from QBone, reproduced below.



Id. at 41 (citing Ex. 1017, 13). The figure reproduced above is an overview of the communication involved when an end system initiates a request for service to a different end system. Ex. 1017, 12. The figure has been annotated by Petitioner to identify what Petitioner argues is the "Controller in a network," the "Routing instructions," and the "Portal." Pet. 41. Petitioner further argues that "[t]he 'setting the marking functions' from the BB in the originating domain shows the provision of instructions for traffic corresponding to the requested connection." *Id.* at 41–42 (citing Ex. 1025 ¶ 188).

Second, Petitioner argues to the extent that the marking functions are not routing instructions, "Surdila expressly teaches an implementation of MPLS labels as 'routing instructions' in a router (which Surdila refers to as a 'Label Edge Router' (or LER))." *Id*. at 42. Specifically, Petitioner argues the LERs insert a specific label in the data packers and the routing of the packers is based on that label, not the IP address. *Id.* (citing Ex. 1014 ¶ 34;

Ex. 1025 ¶¶ 189–190). Petitioner further argues that "[a] premise of MPLS labels is to allow a router to route traffic based on the label-switched routing instructions instead of the information in its regular routing table." *Id*. (citing Ex. 1014 ¶ 34; Ex. 1025 ¶ 190); *see also* Reply 20 ("MPLS labels provide all the information the MPLS routers (which includes the LER) need to forward packets (using the labels instead of a traditional IP lookup).") (citing Ex. 1040 ¶¶ 20–21); Ex. 1038, 51:6–20 (Dr. Sharony testifying that "if it's an MPLS switch, it relies on the label" and that the LSP is "a path that is defined by labels that the switches along the path would basically know how to forward the packet and stay on that same path.").

Third, Petitioner argues to the extent QBone and Surdila do not teach the limitation, Li does. Pet. 42–43. Petitioner argues "Li teaches a centralized resource controller that determines resource allocation and routing between sites, including 'distributing MPLS label stacks that represent the routes to ingress PEs [provider edge routers, i.e., LERs in Surdila].'" *Id*. at 43 (quoting Ex. 1023, 17). Petitioner further argues "Li's MPLS label stacks correspond to Surdila's 'labels' and hence the 'routing instructions'" that tell the provider edge routers the forwarding route. *Id*. (citing Ex. 1023, 19, 22; Ex. 1025 ¶ 192).

ii. Patent Owner's Arguments

Patent Owner argues that "[t]he system described in QBone does not include a controller that dynamically and exclusively provisions end-to-end packet routing instructions to a portal." PO Resp. 20–21. According to Patent Owner, "[t]he nodes (which Petitioner suggests corresponds to the 'portal') in QBone operate with information other than routing instructions

provided by Petitioner suggests is a controller and do perform independent routing." *Id*. at 21.

Patent Owner further argues that "[t]he nodes in QBone perform their own analysis of each packet and independently determine their own routing behavior based on this analysis." *Id.* at 22. Therefore, according to Patent Owner, "*QBone's* described system supports situations where the BB is not controlling routing decisions, allowing other elements, e.g., nodes or switches, to make independent routing decisions. Thus, *QBone* does not disclose the claimed system." *Id*. at 23.

Patent Owner also argues Surdila and Li do not cure the deficiencies in QBone. *Id*. at 28–29. Patent Owner argues Surdila teaches MPLS, which the'119 patent acknowledges was well-known at the time it was filed. *Id*. at 28 (citing Ex. 1001, 2:6–47). Therefore, Patent Owner argues that "*Surdila's* disclosure of MPLS does not meaningfully affect the validity of the '119 Patent and does not overcome the deficiencies of *QBone*." *Id.* (citing Ex. 2001 ¶ 45). Similarly, Patent Owner argues Li is also cited for its teaching of MPLS and is therefore merely "cumulative of the teachings of the '119 Patent and *Surdila*." *Id*.

Additionally, during the Hearing, Patent Owner argued for the first time that Li teaches that MPLS switches still perform a look-up function and therefore the switches perform independent routing of the traffic. Tr. 44–53.

iii. Our Analysis

Based on the evidence before us, we are persuaded that the combination of QBone, Surdila, and Li teaches "providing, by the controller to the portal, routing instructions for traffic corresponding to the connection so that the traffic is directed by the portal based only on the routing

instructions provided by the controller, wherein the portal does not perform any independent routing on the traffic," as recited in claim 1. QBone teaches that the bandwidth broker provides instructions to the originating domain by setting the marking function to indicate the route the traffic should take. Ex. 1017, 13, 15. Surdila teaches MPLS switches that use MPLS labels instead of traditional IP address routing tables to direct traffic. Accordingly, the combination of QBone and Surdila teach the bandwidth broker (the controller) providing the MPLS label information which is used to direct the traffic at the MPLS switches. *See* Ex. 1025 ¶ 190.

Moreover, the evidence sufficiently shows that when MPLS switches are used, the MPLS switches do not independently route the traffic. For example, Surdila teaches that "[t]he LER[]s function as edge routers that also insert a specific label in the data packets *to identify a specific media flow* at the entry of the network , and remove the label upon exiting the network. Ex. 1014 ¶ 34. The MPLS switch "then routes packets based on the bales inserted by the LERs rather than the IP addresses." *Id*. Thus, Surdila teaches that the packets are routed by labels added at the originating endpoint that direct the route of the packet, and that the switches do not perform any independent routing function.

Similarly, Li also teaches MPLS switches use label information for determining routes. Li teaches a controller which is responsible for "distributing MPLS label stacks that represent the routes to ingress [Provider Edge Routers ('PEs')]." Ex. 1023, 11. A provider edge router that receives the MPLS label stack "encapsulates the packet/frame with the label stack indicated by [the controller]" and "performs . . . forwarding along the route determined in the label stack." *Id*. at 16. In other words, the controller

provides a MPLS stack label with routing information and that routing information is used to route the data packet at the MPLS switches.

Moreover, both experts testified that MPLS switches direct the data packets based on the label information and not by using a traditional IP lookup. Dr. Reddy testified that a person of ordinary skill in the art would understand that MPLS switches replace the IP lookup function with using the MPLS label information:

> As I explained in my prior declaration, "MPLS labels allow a router to route traffic based on the label-switched routing instructions instead of the information in its regular routing table." Ex. 1025, ¶ 190. This was further demonstrated by the express teaching of Surdila, namely that "[t]he Multi-Protocol Label Switching (MPLS) protocol then ***routes packets based on the labels inserted by the LERs rather than the IP addresses***." Ex. 1014, ¶ [0034] (emphasis added).
>
> As this demonstrates, when using MPLS "no independent routing" is performed, per the claim language, because the IP lookup is replaced by the MPLS lookup. As a POSITA would have understood from the teaching of Surdila, the MPLS labels provide all the information the LER (label edge router) needs to forward using the labels instead of a traditional IP lookup. Thus, QBone's router modified with the MPLS teachings of Surdila would replace the IP lookup with the label routing.

Ex. 1040 ¶¶ 20–21 (numbering omitted); *see also* Ex. 1025 ¶ 190. On cross-examination, Dr. Sharony provided similarly testimony:

> Q. Okay. So an MPLS, then, the switch at the router is going to use the label instead of an IP address to forward the packet, right?
>
> A. Yes.
>
> Q. And it has to use that label, right? If a packet is an MPLS packet, then the router has to use that label to forward the packet?

> A. Yes. So MPLS switch will use the label. Some switches can support IP and MPLS, but if it's an MPLS switch, it relies on the label.
>
> Q. Okay. What's a label-switched path?
>
> A. So a label-switched path is basically a path that is defined by labels that the switches along the path would basically know how to forward the packet and stay on that same path.

Ex. 1038, 51:6–20.

Patent Owner focuses its arguments on QBone alone, not the combination of QBone, Surdila, and Li relied on by Petitioner. *See* PO Resp. 20–23. However, nonobviousness cannot be established by addressing the references individually when the obviousness contention is predicated upon a combination of prior art disclosures. *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). The test for obviousness is not whether the claimed invention is expressly suggested in any one or all of the references, but whether the claimed subject matter would have been obvious to those of ordinary skill in the art in light of the combined teachings of those references. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

To the extent Patent Owner addresses Surdila and Li, Patent Owner merely argues that the references teach MPLS switches and MPLS switches are disclosed in the '119 patent and therefore the references do not meaningfully affect the validity of the '119 patent:

> However, the '119 Patent acknowledges that MPLS was well-known at the time it was filed. [Ex. 1001,] 2:6-47. Thus, Surdila's disclosure of MPLS does not meaningfully affect the validity of the '119 Patent and does not overcome the deficiencies of QBone. EX. 2001 at ¶ 45. Petitioner relies on Li primarily also for its teachings regarding MPLS - particularly that a Centralized Resource Controller can send MPLS label

> stacks to routers. Petition at 22-23. Again, though, Li is cumulative of the teachings of the '119 Patent and Surdila.

PO Resp. 28 (emphasis omitted). However, Patent Owner cites no authority for that proposition that applicant admitted prior art cannot be used in finding claims unpatentable. *But see Riverwood Int'l Corp. v. R.A. Jones & Co.*, 324 F.3d 1346, 1354 (Fed. Cir. 2003) ("This court and its predecessor have held that a statement by an applicant during prosecution identifying certain matter not the work of the inventor as 'prior art' is an admission that the matter is prior art."); *Constant v. Advanced Micro-Devices Inc.*, 848 F.2d 1560, 1570, (Fed. Cir. 1988) ("A statement in a patent that something is in the prior art is binding on the applicant and patentee for determinations of anticipation and obviousness.").

Also, we do not consider the argument regarding Li raised by Patent Owner for the first time during the Hearing in reaching our decision. New arguments may not be raised during the Hearing because Petitioner has no effective opportunity to review these arguments and respond. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,768 (Aug. 14, 2012) ("*No new evidence and arguments.* A party may rely upon evidence that has been previously submitted in the proceeding and may only present arguments relied upon in the papers previously submitted."); *see also Dell Inc. v. Acceleron, LLC*, 884 F.3d 1364, 1369 (Fed. Cir. 2018) (holding that the Board was not obligated to consider an "untimely argument . . . raised for the first time during oral argument").

Patent Owner asserted that the new argument was proper because it was responsive to a new argument made in paragraph 21 of Dr. Reddy's supplemental declaration submitted with Petitioner's Reply:

> [THE BOARD]: Right. But the argument is new, and that's the question. Is this a new argument?
>
> [PATENT OWNER'S COUNSEL]: I don't believe it is because we're clarifying what the experts said in their declarations and Mr. Reddy's supplemental declarations regarding the functionality of MPLS.
>
> [THE BOARD]: Is there any reason that you couldn't have raised this in the response? Is it responsive only to something that was raised in the reply, even new testimony, because it sounded from the beginning of your argument that this is something that relates to what you contend anyway is a fundamental flaw in the petition?
>
> [PATENT OWNER'S COUNSEL]: It came out of Dr. Reddy's supplemental declaration and necessitated the bringing up of a clarification of how MPLS functions and is understood by a POSITA.
>
> [THE BOARD]: In what specific part of his declaration is it that raised something new?
>
> [PATENT OWNER'S COUNSEL]: So in his supplemental declaration, Exhibit 1040 on page 10, Dr. Reddy states when using MPLS no independent routing is performed per the claim language because the IP lookup is replaced by the MPLS lookup.
>
> [THE BOARD]: Okay. So that's paragraph 21 of the supplemental declaration?
>
> [PATENT OWNER'S COUNSEL]: Correct.

Tr. 51–52.

Contrary to Patent Owner's assertion, however, the testimony was not new. Instead, it was substantially the same as testimony and argument originally presented in the Petition. Specifically, in his Supplemental Declaration, Dr. Reddy testified that there is no independent routing in an MPLS switch because the IP look-up is replaced with label routing:

> As I explained in my prior declaration, "MPLS labels allow a router to route traffic based on the label-switched routing instructions instead of the information in its regular routing table." Ex. 1025, ¶ 190. This was further demonstrated by the express teaching of Surdila, namely that "[t]he Multi-Protocol Label Switching (MPLS) protocol then ***routes packets based on the labels inserted by the LERs rather than the IP addresses***." Ex. 1014, ¶ [0034] (emphasis added).
>
> 21. As this demonstrates, when using MPLS "no independent routing" is performed, per the claim language, because the IP lookup is replaced by the MPLS lookup. As a POSITA would have understood from the teaching of Surdila, the MPLS labels provide all the information the LER (label edge router) needs to forward using the labels instead of a traditional IP lookup. Thus, QBone's router modified with the MPLS teachings of Surdila would replace the IP lookup with the label routing.

Ex. 1040 ¶¶ 20– 21. That testimony is substantially the same as Dr. Reddy's original testimony submitted along with the Petition:

> These "labels" are "routing instructions" because, as Surdila teaches, "[t]he Multi-Protocol Label Switching (MPLS) protocol then ***routes packets based on the labels inserted by the LERs rather than the IP addresses***." [Ex. 1014 ¶ 34] (emphasis added). As would have been recognized by a person having ordinary skill in the art, the routing of packets based on the labels inserted by the LERs begins with the LERs themselves. This is an example of the access router in QBone, modified with the teachings of Surdila regarding MPLS labels, directing traffic for the requested connection (corresponding to the labels) based only on those labels instead of IP addresses, because MPLS labels allow a router to route traffic based on the label-switched routing instructions instead of the information in its regular routing table.

Ex. 1025 ¶ 190. Petitioner explicitly relied on this testimony in arguing Surdila teaches using label routing instead of an IP lookup. Pet. 42 (citing Ex. 1025 ¶ 190). By not addressing Petitioner's argument and Dr. Reddy's

original testimony in the Patent Owner's Response, Patent Owner waived the right to present that argument. *See* Paper 10, 3 ("The patent owner is cautioned that any arguments for patentability not raised in the response will be deemed waived."); *see also Dell*, 884 F.3d at 1369 (holding that the Board was not obligated to consider an "untimely argument . . . raised for the first time during oral argument").

Accordingly, based on the entirety of the record, we find QBone teaches "providing, by the controller to the portal, routing instructions for traffic corresponding to the connection so that the traffic is directed by the portal based only on the routing instructions provided by the controller, wherein the portal does not perform any independent routing on the traffic," as recited in claim 1.

d. "*wherein the connection extending from the originating endpoint to the terminating end-point is provided by a dedicated bearer path that includes a required route supported by the portal and dynamically provisioned by the controller*"

i. Petitioner's Arguments

Petitioner argues QBone teaches "wherein the connection extending from the originating endpoint to the terminating end-point is provided by a dedicated bearer path that includes a required route supported by the portal and dynamically provisioned by the controller" as recited in claim 1. Pet. 44–46; Reply 17–19.

According to Petitioner, QBone teaches the controller dynamically provisions the route. Pet. 45–46. Petitioner argues QBone teaches that the bandwidth broker determines the routes in each of the originating domain, transit domain, and destination domain in response to receiving the RAR from the originating end-point and that these routes, together, constitute a

dedicated bearer path and an end-to-end connection. *Id.* at 45 (citing Ex. 1017, 4, 11, 13, 14); *see also* Ex. 1025 ¶¶ 200–202. Petitioner also argues that the required route is "determined by the [bandwidth broker] through the originating domain" and "is supported by the access router ('portal'), since the access router is set for the requested connection such that the route traverses the access router." Pet. at 45–46 (citing Ex. 1017, 13, 15); *see also* Ex. 1025 ¶¶ 203–204. Petitioner further argues "QBone teaches that the end-to-end connection and/or route is dynamically provisioned by the [bandwidth broker] since the [bandwidth broker] completes resource allocation in response to the RAR and RAA (and the connection and/or route is taken down in response to a reservation release)." Pet. 46 (citing Ex. 1017, 15, 20); *see also* Ex. 1025 ¶ 205.

ii. Patent Owner's Arguments

Patent Owner argues QBone teaches that the "route is pre-determined using static SLSs and fixed routing tables," which is "very different from how the claimed controller 'dynamically provisions[s]' the 'required route' after receiving the 'request.'" PO Resp. 23–24 (citing Ex. 2001 ¶ 43). Patent Owner further argues QBone states "that these SLSs are based on pre-negotiated SLAs, which are 'not dynamic,'" "that the SLS are 'statically configured,' 'statically negotiated,' and 'statically defined,'" and "that the SLSs are 'already established.'" *Id*. at 31 (emphasis omitted) (quoting Ex. 1017, 5, 8, 10, 11) (citing Ex. 2001 ¶ 57).

iii. Our Analysis

Based on the evidence before us, we are persuaded QBone teaches "wherein the connection extending from the originating endpoint to the terminating end-point is provided by a dedicated bearer path that includes a

required route supported by the portal . . . by the controller" as recited in claim 1. Specifically, QBone teaches that it is only after the bandwidth broker receives a request and authenticates it that the resource allocation is performed:

> When the bandwidth broker of the originating domain receives the RAA (7) and authenticates it, the bandwidth broker completes any resource allocation actions within the domain, modifies PHB and traffic conditioner parameters at the egress router for the flow and forwards the RAA to the requesting end system (8). This may include setting the marking functions for the flow in the access router serving the requesting end system (indicated by the green arrows in the figure).

Ex. 1017, 15. QBone further teaches that the reservations are released, that is, not maintained statically for all time:

> Either of the endpoints of a QBone reservation may release the reservation, or the BBs in the endpoint domains (if they are not holders of the endpoint of the reservation) may do so. It is assumed that intermediate bandwidth brokers who are aware of a reservation (i.e. one representing a tunnel, not made within a tunnel) also know their peer bandwidth brokers both upstream and downstream with respect to the reservation. . . .
>
> *Takedown is accomplished via the RAR/RAA pair*. A node wishing to release the reservation sends an RAR indicating a release of the reservation (or part of it). A complete release should result in a 0 reservation. A negative adjustment that is not a complete release may only be sent by the initiator of the reservation (or its bandwidth broker).

Id. at 20. Because the reservations are created in response to a request and then taken down, we find that the reservations are "dynamically provisioned" as that claim has been construed. *See* Section II.A.2 (construing "dynamically provisioned").

Patent Owner's arguments are based on a claim construction of "dynamically provisioned" that precludes exclusively using pre-calculated and pre-computed paths. Those arguments are not persuasive because the broadest reasonable construction of that term "encompass[es] any route provisioned to an endpoint by the controller in response to the request and, specifically, not precluding the use of pre-defined paths made available to particular end-points in response to particular requests." Section II.A.2.

Accordingly, based on the entirety of the record, we are persuaded that the combination of QBone (dynamically provisioned reservations) with Surdila (MPLS label routing) teaches "wherein the connection extending from the originating endpoint to the terminating end-point is provided by a dedicated bearer path that includes a required route supported by the portal and dynamically provisioned by the controller" as recited in claim 1.

e. Enablement of QBone

In addition to arguing QBone does not teach various limitations recited in claim 1, Patent Owner also argues that QBone is not enabling. PO Resp. 20–21, 24–25. Specifically, Patent Owner asserts QBone only establishes a 'minimal set of requirements" and does not specify a "complete and definitive analysis of the requirements for the bandwidth broker." *Id.* (citing Ex. 1017, 1, 2). Patent Owner further argues QBone states that "policy control, policy-based admission control, accounting, authorization and authentication functions, network management functions and both inter- and intradomain routing . . . are beyond the scope of this document." *Id.* at 25 (quoting Ex. 1017, 2).

Petitioner argues "QBone does not have 'enablement problems "on its face'" simply because QBone invites QBone participants to experiment."

Reply 16 (citing *In re Morsa*, 713 F.3d 104, 110 (Fed. Cir. 2013); *In re Antor Media Corp.*, 689 F.3d 1282 (Fed. Cir. 2012)). According to Petitioner, QBone is not like the short press release that was found not to be enabling in *Morsa*, "but rather a 30-page document that the inventors in Surdila were able to build upon without undue experimentation." *Id*. at 16–17 (citing Ex. 1025 ¶¶ 104–109).

"Under § 103 . . . a reference need not be enabled; it qualifies as a prior art [reference], regardless, for whatever is disclosed therein . . . enablement of the prior art is not a requirement to prove invalidity under § 103." *Amgen Inc. v. Hoechst Marion Roussel, Inc.*, 314 F.3d 1313, 1357 (Fed. Cir. 2003); *see also Beckman Instruments, Inc. v. LKB Produkter AB*, 892 F.2d 1547, 1551 (Fed. Cir. 1989) ("Even if a reference discloses an inoperative device, it is prior art for all that it teaches."). As discussed above, Petitioner has shown that QBone alone, or QBone in combination with Surdila and/or Li, teaches various limitations recited in claim 1. Patent Owner has not specifically argued that QBone is not enabled with regard to the specific features Petitioner is relying on. Accordingly, even if QBone is not fully enabled, Patent Owner's argument is not persuasive because it does not address the specific elements of QBone that Petitioner is relying on.

f. Reasons to Combine QBone, Surdila, and Li

Petitioner argues that a person of ordinary skill in the art would have combined the teachings of QBone and Surdila. *See* Pet. 20–22; Reply 10–13. According to Petitioner, Surdila incorporates QBone in its entirety by reference and a person of ordinary skill in the art "would have been expressly motivated, upon reading Surdila, to turn to QBone to further understand the architecture and teachings incorporated by reference."

Pet. 20 (citing Ex. 1014 ¶ 25; Ex. 1025 ¶¶ 98–100). Petitioner further argues a person of ordinary skill in the art would have been motivated by QBone's acknowledgement of the need for further testing and development to improve the system with Surdila's teaching of improving system performance. Pet. 20–22 (citing Ex. 1025 ¶¶ 101–109; Ex. 1017, 7, 15; Ex. 1014 ¶¶ 34, 37–39, 76). Petitioner also argues that the implementation of the combination would have been within the skill of a person of ordinary skill in the art. *Id*. at 22; Ex. 1025 ¶ 108.

Petitioner further argues that a person of ordinary skill in the art would have combined the teachings of Li with the combined teachings of QBone and Surdila. *See id*. at 23–24; Reply 10–13. According to Petitioner, "Surdila teaches the use of MPLS edge routers that route based on labels." Pet. 23 (citing Ex. 1014 ¶ 34). Petitioner further argues to the extent Surdila does not teach the creation or distribution of MPLS labels by a central controller, a person of ordinary skill in the art would have turned to "other MPLS systems for specific implementation details to achieve the benefits of labels," such as Li. *Id*. (citing Ex. 1025 ¶¶ 114–119; Ex. 1023, 12, 13). Petitioner also argues that "[i]t would have been within the skill of a person having ordinary skill in the art to implement Li's centralized controller label generation and provision to edge routers teachings within QBone's architecture and Surdila's LER teachings" and that "[t]he predictable result would be the centralized determination taught by QBone and Li, with the routing at the edge routers per the teachings of Surdila and Li." *Id*. at 24 (citing Ex. 1025 ¶ 120).

Patent Owner argues that Petitioner has not sufficiently set forth why a person of ordinary skill in the art would have combined the reference or how the teachings of the references would be combined. PO Resp. 31–34.

First, Patent Owner argues "incorporation by reference can be done for many reasons" and "[s]imply incorporating a document by reference into a trade article has absolutely no bearing on whether the author is suggesting the teachings be combined, absent an explicit statement that the teachings are to be combined." *Id*. at 31. However, the incorporation by reference in Surdila was not merely a passing reference to the prior art. Instead, Surdila contains a detailed discussion of the QBone architecture. *See* Ex. 1014 ¶¶ 24–37. Surdila begins the description of the embodiments of the invention with a detailed discussion of the QBone architecture. *See* Ex. 1014 ¶¶ 24–37. As part of that discussion, Surdila expressly incorporates QBone by reference in its entirety. *Id*. ¶ 25. That express incorporation in the discussion of the embodiments of the invention provides an express teaching to combine the teachings of the two references. Ex. 1025 ¶¶ 99–100. As an express teaching, the incorporation by reference provides a sufficient reason for a person of ordinary skill in the art to combine the teachings of the references. *See Apple Inc. v. Immersion Corp.*, Case IPR2016-01381, slip op. at 22 (PTAB Jan. 11, 2017) (Paper 7) ("We are persuaded that Rosenberg 737's incorporation by reference of Rosenberg 281 would have led a person of ordinary skill in the art to consider Rosenberg 281 for everything it teaches by way of technology.").

Second, Patent Owner argues "Petitioner has provided no explanation as to 'how' the teachings of Surdila would be combined with QBone." *Id*. at 32 (emphasis omitted). According to Patent Owner, "Petitioner's arguments

are nothing more than conclusory statements based on hindsight and unsupported by the teachings of the references themselves as previously discussed" and fails "to show 'how' the relied upon references are to be combined – an alleged motivation is not a description of 'how' the references would be combined." *Id*. at 33. Patent Owner argues "[n]ot providing evidence of explicitly '*how*' a [person having ordinary skill in the art] would combine the references" is a clear indication that the Petition fails to establish a reasonable likelihood of success with respect to the claims. *Id*. at 31 (citing *Google, Inc. v. EveryMD.com LLC*, IPR2014-00347, slip op. at 23–27 (PTAB May 22, 2014) (Paper 9)).

This argument is not persuasive, however, because there is not a requirement for Petitioner to provide detail on exactly how the features of the secondary references—Surdila and Li—would be incorporated into QBone. "It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements." *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012). Similarly, the skilled artisan is "[a] person of ordinary creativity, not an automaton" and "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR*, 550 U.S.at 416, 421; *see also id.* at 417 ("If a person of ordinary skill in the art can implement a predictable variation, § 103 likely bars its patentability."). Moreover, there is no evidence in the record that it would have been "uniquely challenging or difficult for one of ordinary skill in the art" to combine the teachings of the references. *See Leapfrog Enters., Inc. v. Fisher-Price, Inc*., 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 418).

Patent Owner's reliance on *Google*, a non-precedential PTAB decision, does not persuade us otherwise. In *Google*, the invalidity arguments consisted of claim charts that contained summaries and quotations from two prior art references. *Google*, slip op. at 21–24. However, the arguments

> [did] not address which elements of Shah's system and Belanger's system are to be combined. Rather, Petitioners' statement covers all of the elements of Shah's system, and all of the elements of Belanger's system—essentially a grab bag of communication methods. Absent a meaningful explanation of the elements of Belanger's system that are to be combined with the elements of Shah's system, we are not persuaded that one with ordinary skill in the art would have combined the teachings of the references to arrive at the claimed subject matter based on Petitioners' asserted "common sense application of known systems in a known manner with an expected outcome."

Id. at 26. Accordingly, in that case, this Board found,

> Petitioners do not articulate sufficiently a reasoning with rational underpinning to explain why one with ordinary skill in the art at the time of the invention would have combined the teachings of Shah and Belanger to arrive at a system that would notify the first user of the input data by sending a message to the first user's telephone number.

Id. at 27.

Thus, the issue in *Google* was not whether the petition set forth how the references could be combined, but the failure of the Petition to identify what elements of each reference would be combined. *Cf. RPX Corp. v. Iridescent Networks, Inc.*, Case IPR2017-01661 (PTAB Oct. 24, 2018), Paper Tr. 28, 22 (Transcript) (Patent Owner agreeing that *Google* is "very different from what we have in this case"). Here, unlike in *Google*, Petitioner provides a detailed explanation as to which elements of QBone are

to be combined with which elements of Surdila and Li. *See* Pet. 20–24; Reply 10–13; *see also* Sections II.E.4.a–d. Accordingly, Petitioner provides "specific reasoning, based on evidence of record, to support the legal conclusion of obviousness." *See In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (citing *KSR*, 550 U.S. at 418).

We also do not find Petitioner's arguments and evidence to be conclusory. *See* PO Resp. 31–34. Instead, Petitioner provided several pages of detailed explanation citing to both the references and testimony of Dr. Reddy. *See* Pet. 20–24. That is, immediately preceding the "conclusory" concluding sentences quoted by Patent Owner, Petitioner provides the very evidence Patent Owner says is lacking. *See id*.

Based on the entirety of the record, we find Petitioner has shown sufficiently articulated reasoning with rational underpinning to support the legal conclusion of obviousness. Petitioner provides detailed analysis of the prior art, including what was missing from the primary reference QBone, and explains why, based on the teachings of the references, a person of ordinary skill in the art would have combined the references. *See* Pet. 20–22 (discussing QBone and Sudila), 23–24 (discussing QBone, Surdila, and Li); *see also* Reply 10–13 (reiterating factual basis for the combination of references).

Specifically, we are persuaded that a person of ordinary skill in the art would have combined the teachings of QBone and Surdila. Although the Supreme Court rejected the rigid application of the teaching, suggestion, or motivation test in favor of a more expansive and flexible approach to the determination of obviousness, *KSR*, 550 U.S. at 415, in this case there is an express teaching to combine the references.

Additionally, to the extent that QBone and Surdila are silent as to how the label edge routers obtain the MPLS labels, a person of ordinary skill in the art would have looked to prior art discussing the label edge routers and how they receive MPLS labels. Ex. 1025 ¶¶ 116–117. One such reference is Li, which "provides details on how to generate MPLS labels with a centralized controller and provide those MPLS labels to network elements including routers." *Id.* ¶ 119. Specifically, Li teaches "a centralized resource controller determines/generates MPLS label stacks and distributes those MPLS label stacks for determined routes to edge routers" which "encapsulate the packets with the label stack it received from the centralized resource controller and forwards the packet according to the labels, 'rather than the IP addresses.'" *Id*. (emphasis omitted) (citing Ex. 1023 12, 17, 19, 22; Ex. 1014 ¶ 34). Moreover, a person of ordinary skill in the art would have been able to "implement Li's teachings of centralized controller label generation and provision to edge routers within the architecture of QBone and with Surdila's [label edge routers]." *Id*. ¶ 120.

g. Conclusion

We have considered the entirety of the evidence submitted by the parties, and determine that Petitioner has shown, by a preponderance of the evidence, that claim 1 of the '119 patent would have been obvious over the combined teachings of QBone, Surdila, and Li.

5. Claims 2–8 and 11

As discussed below, Petitioner accounts for all of the claim limitations required by claims 2–8 and 11 in the specific arrangement required by the claim. Pet. 48–54; Ex. 1025. Having considered the entirety of the evidence before us, we find that Petitioner has demonstrated, by a preponderance of

the evidence, that claims 2–8 and 11 of the '119 patent would have been obvious to a person of ordinary skill in the art based on the combined teachings of QBone, Surdila, and Li.

Claim 2 depends from claim 1 and recites "wherein the controller is associated with a single class of service and wherein a service type of the request identifies the request as being of the single class of service and the request is routed to the controller based on the service type." Ex. 1001, 8:8–12. Petitioner argues QBone in combination with Surdila teaches the additional limitations recited in claim 2. *See* Pet. 48–49 (citing Ex. 1017, 3–4, 13; Ex. 1014 ¶ 62; Ex. 1025 ¶¶ 214–222).

Patent Owner argues "Petitioner has provided no information on 'how' QBone and Surdila would be combined to provide the claimed functionality." PO Resp. 34–35. However, we find that Petitioner has provided a sufficient explanation of which elements of QBone are to be combined with which elements of Surdila (*See* Section II.E.5.f). Patent Owner also argues that the references do not teach the limitations recited in claim 1 (PO Resp. 35), but that argument is not persuasive for the reasons discussed above. Thus, for the reasons set forth in the Petition and discussed above, we find that the combination of QBone and Surdila teach the additional limitation recited in claim 2 and claim 2 would have been obvious over the combined teachings of QBone, Surdila, and Li.

Claim 3 depends from claim 1 and recites "wherein the request is received by the controller based on signaling from a user to the controller." Ex. 1001, 8:13–14. Petitioner argues QBone teaches the limitation recited in claim 3 (*see* Pet. 49 (citing Ex. 1017, 9; Ex. 1025 ¶¶ 229–232)) and Patent Owner does not separately argue the patentability of claim 3 (*see* PO Resp.

35). We are persuaded by Petitioner's analysis and find Petitioner has shown that claim 3 would have been obvious over the combined teachings of QBone, Surdila, and Li.

Claim 4 depends from claim 3 and further recites "wherein the request is received from the user via one of a directory request, an Internet Protocol address, and a web page." Ex. 1001, 8:15–17. Petitioner argues QBone teaches the limitation recited in claim 4 (*see* Pet. 49 (citing Ex. 1017, 9; Ex. 1025 ¶¶ 229–232)) and Patent Owner does not separately argue the patentability of claim 4 (*see* PO Resp. 35–36). We are persuaded by Petitioner's analysis and find Petitioner has shown that claim 4 would have been obvious over the combined teachings of QBone, Surdila, and Li.

Claim 5 depends from claim 1 and further recites the steps of "identifying, by the controller, billing information of a user corresponding to the request for a high quality of service connection[] and charging the user for the connection." Ex. 1001, 8:18–22. Petitioner asserts the combination of QBone and Surdila teaches the limitations recited in claim 5. *See* Pet. 49–51 (citing Ex. 1017, 8, 27; Ex. 1014 ¶¶ 40, 78; Ex. 1025 ¶¶ 237–245).

Patent Owner argues the references do not teach the limitations recited in claim 1 and that "Petitioner has provided no information on 'how' QBone and Surdila would be combined to provide the claimed functionality." PO Resp. 36–37. These arguments are not persuasive for the reasons discussed above.

Based on the totality of the record, we are persuaded by Petitioner's analysis that the combination of QBone and Surdila teach the additional limitation recited in claim 5 and claim 5 would have been obvious over the combined teachings of QBone, Surdila, and Li.

Claim 6 depends from claim 5 and recites "wherein the charging may be based on at least one of a service type, an elapsed period of time, a codec type, and an amount of bandwidth used." Ex. 1001, 8:23–25. Petitioner argues QBone in combination with Surdila teaches the limitation recited in claim 6. *See* Pet. 51–52 (citing Ex. 1017, 24; Ex. 1014 ¶ 78; Ex. 1025 ¶¶ 246–250).

Patent Owner argues the references do not teach the limitations recited in claim 1 and that "Petitioner has provided no information on 'how' QBone and Surdila would be combined to provide the claimed functionality." PO Resp. 37–38. These arguments are not persuasive for the reasons discussed above.

Based on the totality of the record, we are persuaded by Petitioner's analysis that the combination of QBone and Surdila teach the additional limitation recited in claim 6 and claim 6 would have been obvious over the combined teachings of QBone, Surdila, and Li.

Claim 7 depends from claim 1 and recites "wherein determining whether the originating end-point is authorized is based on information in a subscriber database." Ex. 1001, 8:26–28. Petitioner argues QBone teaches the limitation recited in claim 7 (*see* Pet. 52 (citing Ex. 1017, 10, 13; Ex. 1025 ¶¶ 251–255)) and Patent Owner does not separately argue the patentability of claim 7 (*see* PO Resp. 37–38). We are persuaded by Petitioner's analysis and find Petitioner has shown that claim 7 would have been obvious over the combined teachings of QBone, Surdila, and Li.

Claim 8 depends from claim 1 and recites "wherein the negotiating, by the controller, to reserve far-end resources on the terminating end-point includes negotiating with another controller associated with the terminating

end-point." Ex. 1001, 8:29–32. Petitioner argues QBone teaches the limitation recited in claim 8 (*see* Pet. 52–53 (citing Ex. 1017, 13, 14; Ex. 1025 ¶¶ 259–261)) and Patent Owner does not separately argue the patentability of claim 8 (*see* PO Resp. 38). We are persuaded by Petitioner's analysis and find Petitioner has shown that claim 8 would have been obvious over the combined teachings of QBone, Surdila, and Li.

Claim 11 depends from claim 1 and recites "wherein the connection is a point-to-point connection between only the originating and terminating end-points." Ex. 1001, 8:42–45. Petitioner argues QBone teaches the limitation recited in claim 11 (*see* Pet. 53–54 (citing Ex. 1017, 13–15; Ex. 1025 ¶¶ 262–267)) and Patent Owner does not separately argue the patentability of claim 11 (*see* PO Resp. 38). We are persuaded by Petitioner's analysis and find Petitioner has shown that claim 11 would have been obvious over the combined teachings of QBone, Surdila, and Li.

We have considered the entirety of the evidence submitted by the parties, and determine that Petitioner has shown, by a preponderance of the evidence, that claims 2–8 and 11 of the '119 patent would have been obvious over the combined teachings of QBone, Surdila, and Li.

F. Obviousness over QBone, Surdila, Li, and Requena

As discussed below, we find that all of the claim limitations required by claims 10 and 13–15, in the specific arrangement required by the claims, are found in the teachings of QBone, Surdila, Li, and Requena (Ex. 1018), and further, it would have been obvious to a person of ordinary skill to combine them in the manner suggested by Petitioner. *See* Pet. 54–65; *see also* Ex. 1025 ¶¶ 268–346. Having considered the entirety of the evidence before us, we find that Petitioner has demonstrated, by a preponderance of

the evidence, that claims 10 and 13–15 of the '119 patent would have been obvious to a person of ordinary skill in the art based on the combined teachings of QBone, Surdila, Li, and Requena.

1. Summary of Requena

Requena "relates to communicating codec related information between a first communication device and a second communication device via a network." Ex. 1018 ¶ 1. Requena states "when the [first end-point] initiates a session with the [second end-point], the codec to be used for the session is to be determined (negotiated)." *Id.* ¶ 7. An SIP INVITE is sent with a message body "generated according to the SDP (Session Description Protocol) protocol" and "is called an SDP body." *Id.* ¶ 8. The SDP body "contains a list (set) of codecs that the [first end-point] is able and willing to support for the session." *Id.* ¶ 9. The second end-point responds with a message including an SDP body which "contains a second list of codecs indicating the codecs that the [second end-point] is able and willing to support for the session." *Id.* The result of this negotiation is that the second end-point is informed "which of the AMR codec options (modes/bit rates) are supported by both the [first end-point] and the network entities," *id.* ¶ 103, and, in a preferred embodiment, "the AMR bit rate which is actually used for transmission is the same for both directions that is from [the first end-point] to [the second end-point] and vice versa," *id.* ¶ 114.

2. Claim 10

Claim 10 depends from claim 1 and recites "wherein the negotiating, by the controller, to reserve far-end resources for the terminating end-point includes negotiating a video codec for use with the connection to avoid

video codec conversion between the originating and terminating end-points." Ex. 1001, 8:37–41.

a. Petitioner's Arguments

Petitioner argues QBone in combination with Surdila and Requena teaches the limitation recited in claim 10. *See* Pet. 57–59 (citing Ex. 1014 ¶¶ 6, 7, 65; Ex. 1017, 14, 15; Ex. 1018 ¶¶ 7, 9, 103, 104, 114; Ex. 1025 ¶¶ 278–289).

Petitioner further argues that a person of ordinary skill in the art would have combined the teachings of Requena with the combined teachings of QBone, Surdila, and Li. *Id*. at 55–57. Specifically, Petitioner argues Surdila teaches using SIP messages to communicate and "contemplates codecs being agreed upon between the endpoints." *Id*. (citing Ex. 1014 ¶¶ 34, 64, 65; Ex. 1025 ¶¶ 271–273). Petitioner further argues that because Surdila does not explicitly teach how the end-points reach an agreement regarding codecs, a person of ordinary skill in the art "would have been motivated to look at the well-known techniques for codec negotiation and use in the context of the [bandwidth broker] negotiation of QBone and Surdila." *Id*. at 55–56 (citing Ex. 1025 ¶ 274). Petitioner argues Requena, which "provides details on how to arrive upon one or more agreed codecs between endpoints in a SIP environment," is an example of such a reference that a person of ordinary skill in the art would have turned to. *Id*. at 55. According to Petitioner, a person of ordinary skill in the art would have combined "the teachings of Requena with the teachings of Surdila [to] provide[] the advantage of supporting a bandwidth usage of a given codec, as well as supporting the indication of a particular bit rate for codecs that support multiple bit rates." *Id*. (citing Ex. 1018 ¶¶ 11, 21). Petitioner also

argues the combining the teachings of Requena with Surdila's SIP messaging and QBone's bandwidth broker framework would have been within the skill of a person of ordinary skill in the art and "[s]uch a combination would have yielded the predictable result of the endpoints reaching agreed codecs, via QBone/Surdila's BB, by the negotiation teachings in Requena resulting in the same codec usage across the connection." *Id*. at 57 (citing Ex. 1025 ¶ 277).

b. Patent Owner's Arguments

Patent Owner argues that the references do not teach the limitations recited in claim 1 and that "Petitioner has not described 'how' the references could or would be combined." PO Resp. 39–40. Additionally, Patent Owner argues Petitioner does not address "how SIP protocols in one reference would work with non-SIP protocols in the reference" which Patent Owner argues is "a significant technical point." *Id.*

c. Our Analysis

We disagree. As an initial matter, Patent Owner's argument regarding the "significant technical point" is attorney argument not support by any evidence or testimony. *See* PO Resp. 40. "Attorney's argument in a brief cannot take the place of evidence." *In re Pearson*, 494 F.2d 1399, 1405 (CCPA 1974). Instead, as discussed below, we find Dr. Reddy's contrary testimony on this point credible.

Moreover, Petitioner has sufficiently shown which parts of Requena would have been combined with which parts of QBone and Surdila, and why a person of ordinary skill in the art would have combined the teachings of Requena with Surdila and QBone. Specifically, Surdila's SIP message includes an agreed upon codec but does not describe how the end-points

negotiate that codec. Ex. 1014 ¶¶ 34, 64, 65; Ex. 1025 ¶¶ 271–274. Requena teaches how a codec is negotiated by the end-points. *See* Ex. 1018 ¶¶ 9. Because Requena contains the teaching missing from Surdila on how the end-points negotiate for an agreed upon codec, a person of ordinary skill in the art would have turned to Requena to fill in the blanks of Surdila.

Moreover, Dr. Reddy testified that combining the teaching was within the skill of a person of ordinary skill in the art:

> Implementing the teachings of Requena into the SIP messaging of Surdila, and particularly the bandwidth broker framework of QBone, would have been well within the skill of a person having ordinary skill in the art. Surdila already relied upon SIP messaging to facilitate its operations, and Requena merely provides additional teachings regarding that SIP messaging, by and with the bandwidth broker according to QBone and Surdila, with respect to the codecs specifically. Such a combination would yield the predictable result of the endpoints reaching agreed codecs, via the bandwidth broker as in QBone and Surdila, by the negotiation teachings in Requena that result in the same codec usage across the connection in Requena.

Ex. 1025 ¶ 277. In light of Dr. Reddy's detailed discussions of Surdila and Requena (*see id*. ¶¶ 269–277), we find his testimony credible. Additionally, Patent Owner has not directed us to any evidence—as opposed to attorney argument—demonstrating that the combination would have been beyond the ability of a person of ordinary skill in the art. *See* PO Resp. 38–40.

Based on the totality of the record, we are persuaded by Petitioner's analysis that the combination of QBone, Surdila, and Requena teach the additional limitation recited in claim 10. Accordingly, having considered the entirety of the evidence submitted by the parties, Petitioner has shown by a preponderance of the evidence that claim 10 of the '119 patent would have

been obvious over the combined teachings of QBone, Surdila, Li, and Requena.

3. Claims 13–15

Claim 13 is an independent claim. Ex. 1001, 8:50-9:10. In addition to having substantially the same limitations as recited in claim 1, claim 13 further recites "communicating, by the controller, with the originating and terminating end-points to ensure that the connection is free from video codec conversion." *Compare id*. at 7:43–8:7, *with id*. at 8:50-9:10. This additional limitation is similar to the limitation recited in claim 10 and discussed above.

Petitioner relies on substantially the same evidence and arguments for claim 13 as for claims 1 and 10. *See* Pet. 59–63. Additionally, Petitioner argues QBone and Surdila teaches a plurality of portals in the network. *Id*. at 60–63 (citing Ex. 1017, 7, 10, 13, 15, 22; Ex. 1014 ¶¶ 36, 81, Fig. 6; Ex. 1025 ¶¶ 296–304).

Patent Owner makes several arguments directed to claim 13. First, Patent Owner argues that, because Petitioner relies on four different references, the combination is the result of improper hindsight: "To render this claim allegedly obvious, Petitioner relies upon *QBone, Surdila, Li* and *Requena*. How could an artisan have combined four disparate references to render this very detailed claim obvious, other than by using hindsight and the claim itself as a roadmap?" PO Resp. 41. Second, Patent Owner argues Petitioner does not rely on Requena to cure any of the deficiencies with respect to claim 1. *Id*. at 41–42. Third, Patent Owner argues "Petitioner's arguments are legally insufficient to render obvious the features of Claim 13 as no description of 'how' the references would be combined has been provided." *Id*. at 42.

These arguments are not persuasive. First, reliance on a large number of references when arguing a claim is unpatentable, without more, does not weigh against the obviousness of the claimed invention. *See In re Gorman*, 933 F.2d 982 (Fed. Cir. 1991) (court affirming a rejection of a claim based on thirteen prior art references). Because Petitioner has persuasively argued with specific evidence and articulated reasoning why a person of ordinary skill in the art would combine the various teachings of the different references, improper hindsight was not used. *See Plantronics*, 724 F.3d at 1354 (holding that an articulated reasoning "is especially important to guard against the dangers of hindsight bias"). Second, we are not persuaded of any deficiencies with respect to claim 1 for the reasons discussed above. Third, we find that Petitioner has articulated sufficiently which part of Requena would have been combined with which parts of QBone and Li.

Based on the totality of the record, we are persuaded by Petitioner's analysis that the combination of QBone, Surdila, Li, and Requena teach the limitations recited in claim 13.

Claim 14 depends from claim 13 and recites the additional step of "negotiating, by the controller, to reserve far-end resources on the terminating end-point." Ex. 1001, 9:11–13. Petitioner argues QBone in combination with Surdila and Li teaches the limitation recited in claim 14. *See* Pet. 64–65 (citing Ex. 1017, 14; Ex. 1014 ¶ 62; Ex. 1018 ¶ 9; Ex. 1025 ¶¶ 311–18).

Patent Owner does not argue that the prior art does not teach the additional limitations recited in claim 14. *See* PO Resp. 42–43. Instead, Patent Owner argues the references do not teach the limitations recited in

claim 13 and that "Petitioner has again provided no hint as to *how* the features in the references would be combined." *Id.*

Based on the totality of the record, we are persuaded by Petitioner's analysis that QBone, Surdila, and Li teach the additional limitation recited in claim 14 and that claim 14 would have been obvious over the combination of QBone, Surdila, Li, and Requena.

Claim 15 depends from claim 14 and recites "wherein the negotiating is performed with one of another controller associated with the terminating end-point or directly with the terminating end-point." Ex. 1001, 10:1–4. Petitioner argues QBone teaches the additional limitation of claim 15 (Pet. 65 (citing Ex. 1025 ¶¶ 319–320)) and Patent Owner does not separately argue the patentability of claim 15 (*see* PO Resp. 43). We are persuaded by Petitioner's analysis and find Petitioner has shown that claim 15 would have been obvious over the combined teachings of QBone, Surdila, Li, and Requena.

Accordingly, having considered the entirety of the evidence submitted by the parties, Petitioner has shown by a preponderance of the evidence that claims 13–15 of the '119 patent would have been obvious over the combined teachings of QBone, Surdila, Li, and Requena.

G. Obviousness over QBone, Surdila, Li, and Chen

As discussed below, we find that all of the claim limitations required by claims 9 and 12 in the specific arrangement required by the claims are found in the teachings QBone, Surdila, Li, and Chen (Ex. 1019), and further, it would have been obvious to a person of ordinary skill in the art to combine them in the manner suggested by the Petitioner. *See* Pet. 66–71; *see also* Ex. 1025 ¶¶ 321–346. Having considered the entirety of the evidence before us,

we find that Petitioner has demonstrated by a preponderance of the evidence that claims 9 and 12 of the '119 patent would have been obvious to a person of ordinary skill in the art based on the combined teachings of QBone, Surdila, Li, and Chen.

1. Summary of Chen

Chen "relates to a method and apparatus for providing admission control and network Quality of Service (QoS)." Ex. 1019, 1:18–20. More specifically, Chen teaches using a "centralized bandwidth broker" that "has control over the entire domain and centrally handles bandwidth allocation requests." *Id.* at 2:33–35. "The centralized bandwidth broker 210 validates the request against policies, compares the request against the current allocation of bandwidth for accepted traffic, and configures the edge devices 250 and 260 with information needed to mark and shape (or police) incoming packets for the flow." *Id.* at 2:43–48.

2. Claims 9 and 12

Claim 9 depends from claim 1 and recites "wherein the negotiating, by the controller, to reserve far-end resources for the terminating end-point includes negotiating directly with the terminating end-point." Ex. 1001, 8:33–36. Claim 12 depends from claim 1 and recites "wherein the connection is a point-to-multipoint connection between one of the originating and terminating end-points and the other of the originating and terminating end-points and at least one other end-point." Ex. 1001, 8:45–49.

Petitioner argues the combination of QBone, Surdila, and Chen teaches the limitation recited in claim 9. Pet. 67–70 (citing Ex. 1014 ¶ 65; Ex. 1017, 3, 7, 12, 13; Ex. 1019, 2:32–48, Fig. 2A; Ex. 1025 ¶¶ 328–340). Petitioner also argues the combination of QBone and Chen teaches the

limitation recited in claim 12. *Id*. at 70–71 (citing Ex. 1019, 2:57–58; Ex. 1025 ¶¶ 341–346).

Petitioner further argues that a person of ordinary skill in the art would have combined Chen with QBone's bandwidth broker (as modified by Surdila and Li). *Id*. at 66–67. Specifically, Petitioner argues "QBone teaches that the BB in the originating domain receives the connection request and is the entity that works with the terminating end-point to reserve resources at the far end." *Id*. at 66 (citing Ex. 1025 ¶¶ 323–324). Petitioner further argues that a person of ordinary skill in the art "would have been motivated from the teachings of QBone, to look at the different implementation details of the [bandwidth broker] architecture in different domain combinations, including a single domain." *Id*. (citing Ex. 1025 ¶ 325).

According to Petitioner, Chen is "an example of a single domain network and teaches an approach for admission control using a centralized BB that has control over the entire domain between end-points." *Id*. (citing Ex. 1019, 2:31–35). Petitioner argues that a person of ordinary skill in the art would have combined those teachings of Chen with QBone in order to "provide[] details of the example case of originating and terminating end-points on the same domain." *Id*. at 66–67 (citing Ex. 1019, 3:36–53, 5:50–6:40; Ex. 1025 ¶ 326). The combination would also "benefit from QBone's guaranteed QoS in a single domain network" and provide the benefit's of Chen multicast communication session. *Id*. at 67 (citing Ex. 1025 ¶ 327). Petitioner also argues that any modifications would have been within the skill of the person of ordinary skill in the art because it is "nothing more than the combination of prior art elements according to

known methods to yield the predictable result of QBone's end-to-end reservations with Chen's simplified, single-domain use case." *Id*. at 67 (citing Ex. 1025 ¶ 327).

Patent Owner argues that Petitioner provides absolutely no indication as to how the references would be combined. PO Resp. 43–45. We disagree. Petitioner has sufficiently shown why a person of ordinary skill in the art would have combined the teachings of Chen with Surdila and QBone. A person of ordinary skill in the art would have recognized that QBone could be implemented in different ways, including a single domain. Ex. 1025 ¶¶ 324–325. Chen teaches using a centralized bandwidth broker that that "has control over the entire domain and centrally handles bandwidth allocation requests." Ex. 1019, 2:31–35; *see also* Ex. 1025 ¶ 326. A person of ordinary skill in the art would have combined the teachings of Chen with QBone because Chen "provides details of the example case of QBone where there is a single domain" and teaches bandwidth brokers that "support multicast sessions." Ex. 1025 ¶ 326. Additionally, the unchallenged evidence demonstrates that the combination of the teaching of the references would have been within the ability of a person of ordinary skill in the art:

> It would have been within the skill of one having ordinary skill in the art to combine the teachings of Chen regarding a single domain between end systems because it is a simple use case of the teachings of QBone. This would have been nothing more than the combination of prior art elements according to known methods to yield the predictable result of QBone's end-to-end reservations with Chen's simplified, single-domain use case. The resulting combination would benefit from QBone's guaranteed QoS in a single domain network. Similarly, the desirability of multicast communication sessions were well known and implementation as taught by Chen would have yielded known benefits.

Id. ¶ 327.

Accordingly, having considered the entirety of the evidence submitted by the parties, Petitioner has shown by a preponderance of the evidence that claims 9 and 12 of the ’119 patent would have been obvious over the combined teachings of QBone, Surdila, Li, and Chen.

H. Obviousness QBone, Surdila, Li, Requena, and Pillai

As discussed below, we find that all of the claim limitations required by claims 16 in the specific arrangement required by the claim are found in teachings of QBone, Surdila, Li, Requena, and Pillai (Ex. 1011), and, further, it would have been obvious to a person of ordinary skill in the art to combine them in the manner suggested by Petitioner. *See* Pet. 71–76; *see also* Ex. 1025 ¶¶ 347–374. Having considered the entirety of the evidence before us, we find that Petitioner has demonstrated by a preponderance of the evidence that claim 16 of the ’119 patent would have been obvious to a person of ordinary skill in the art based on the combined teachings of QBone, Surdila, Li, Requena, and Pillai.

1. Summary of Pillai

Pillai “relates to the integration of electronic and software systems and subsystems used in the operation of a telecommunications enterprise, such as a wireless service provider.” Ex. 1011 ¶ 2. Pillai can be used “to support combined and integrated billing and rating for both voice and data services in a distributed wireless cellular architecture.” *Id.* ¶ 71.

Pillai teaches a “separate control element, a Real-Time Universal Resource Consumption Monitor (RURCM) 300” that tracks “ongoing usage [o]f system resources,” and which “applies prepaid service definitions to effectively regulate network usage.” *Id.* ¶ 87. “The RURCM agent 300 is

responsible for maintaining real-time active connections with the network elements, such as the MSC 100 and the PDSN 150, which regulate the user's ongoing calls/sessions." *Id.* ¶ 88.

2. Claim 16

Claim 16 depends from independent claim 13 and recites the additional steps of "receiving, by the controller, a notification from the portal that traffic on the connection has exceeded an authorized limit[] and instructing the portal, by the controller, whether to terminate or allow the connection to continue." Ex. 1001, 10:5–10. Petitioner argues to the extent QBone in combination with Surdila and Requena does not explicitly teach the additional limitations recited in claim 16, those limitations are taught by Pillai. Pet. 74–76 (citing Ex. 1025 ¶¶ 359–374; Ex. 1017, 8; Ex. 1014 ¶ 49; Ex. 1011 ¶¶ 87–89).

Petitioner further argues that a person of ordinary skill in the art would have combined Pillai with the teachings of QBone and Surdila in order to provide "the advantage of managing prepaid services ([ERIC-1011], ¶[0087]) as well as 'ensuring that the customer only has access to whatever was specified in the prepaid contract.'" *Id.* at 73 (citing Ex. 1025 ¶¶ 354–356). Petitioner also argues to the extent any modifications were needed to the QBone bandwidth broker to accommodate the teachings of Pillai, those modifications would have been with the ability of a person of ordinary skill in the art. *Id*. (citing Ex. 1025 ¶¶ 357–358).

Patent Owner argues that Pillai does not cure any of the deficiencies associated with claim 13. PO Resp. 46. This argument is inapposite. As discussed above, there are no deficiencies regarding claim 13 that need to be cured.

Additionally, Patent Owner argues "the Petition is void of a discussion suggesting '*how*' one would make this five-reference combination." *Id.* We do not agree. Petitioner has sufficiently shown why a person of ordinary skill in the art would have combined the teachings of Pillai with QBone and Surdila. Although QBone and Surdila contemplate various authorization, authentication, and accounting ("AAA") functions, they do not explicitly address all of the AAA functions that may be used, including how to make use of tracking and monitoring usage information. Ex. 1025 ¶ 352–353. Accordingly, a person of ordinary skill in the art would have turned to other references, such as Pillai, that teach "certain uses of monitoring/tracking usage data and functions based on that information that a controller may implement in a telecommunications context." *Id*. ¶¶ 353–354.

Pillai states it "relates to the integration of electronic and software systems and subsystems used in the operation of a telecommunications enterprise" and specifies particular ways in which to "support combined and integrated billing and rating for . . . data services in a distributed wireless architecture; to support prepaid integrated . . . data services in cellular network architectures . . . ." Ex. 1011 ¶¶ 2, 71. Moreover Pillai teaches that it can "be applied to other types of systems, and are not limited for use with wireless telecommunication systems." *Id*. ¶ 50.

"Using these teachings from Pillai with the bandwidth broker in QBone provides the advantage of managing prepaid services . . . as well as 'ensuring that the customer only has access to whatever was specified in the prepaid contract.'" Ex. 1025 ¶ 356 (citing Ex. 1011 ¶¶ 87, 93).

Furthermore, a person of ordinary skill in the art would be able implement Pillai's teachings in the QBone bandwidth broker. Ex. 1025 ¶¶ 357–358

Accordingly, having considered the entirety of the evidence submitted by the parties, Petitioner has shown by a preponderance of the evidence that claim 16 of the '119 patent would have been obvious over the combined teachings of QBone, Surdila, Li, Requena, and Pillai.

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 1–16 of the '119 patent would have been obvious.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–16 of the '119 patent are held *unpatentable*;

FURTHER ORDERED that pursuant to 35 U.S.C. § 318(b), upon expiration of the time for appeal of this Decision, or the termination of any such appeal, a certificate shall issue cancelling claims 1–16 in U.S. Patent No. 8,036,119 B2; 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.

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