

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LIMELIGHT NETWORKS, INC.,
Petitioner,

v.

AKAMAI TECHNOLOGIES, INC.,
Patent Owner.

Case IPR2016-01894
Patent 7,472,178 B2

Before GREGG I. ANDERSON, JENNIFER MEYER CHAGNON, and
JASON W. MELVIN, *Administrative Patent Judges*.

ANDERSON, *Administrative Patent Judge*.

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

I. INTRODUCTION

Limelight Networks, Inc. (“Petitioner”) filed a Petition (“Pet.,” Paper 1) pursuant to 35 U.S.C. §§ 311–319 to institute an *inter partes* review of claims 1, 2, and 9 (“the challenged claims”) of U.S. Patent No. 7,472,178 B2 (“the ’178 patent,” Ex. 1001), which was filed on April 1, 2002.¹ The Petition is supported by the Declaration of Michael J. Freedman, Ph.D. (“Freedman Declaration,” Ex. 1003). Akamai Technologies, Inc. (“Patent Owner”) filed a Preliminary Response (“Prelim. Resp.,” Paper 7). We instituted an *inter partes* review of the challenged claims (Paper 8, “Institution Decision” or “Inst. Dec.”).²

Patent Owner filed a Response (“PO Resp.,” Paper 13) and Petitioner filed a Reply (“Pet. Reply,” Paper 19). Patent Owner’s Response is supported by the Declaration of Eric W. Burger, Ph.D. (“Burger Declaration,” Ex. 2001). Dr. Freedman was deposed by Patent Owner. (“Freedman Deposition,” Ex. 2002). Dr. Burger was deposed by Petitioner (“Burger Deposition,” Ex. 1020). An oral hearing was held on December 5,

¹ The ’178 patent claims priority to U.S. Provisional Patent Application No. 60/280,917, which was filed on April 2, 2001. Ex. 1001, [65], 1:6–7.

² The Institution Decision considered issues raised in Patent Owner’s Preliminary Response that are not raised in its Response and, therefore, are waived. See Scheduling Order (Paper 9), 6. Specifically, we found Chaudhri (Ex. 1004) is prior art without reliance on the filing date of the Chaudhri Provisional Application (Ex. 1005). Inst. Dec. 17–18. We also found that, although Speedera (Ex. 1006) was cited to the Examiner during prosecution of the application for the ’178 patent in an information disclosure statement (“IDS,” see Ex. 1002, 12, 105, 126), Speedera was not substantively discussed during prosecution, and we declined to exercise our discretion under 35 U.S.C. § 325(d) to deny *inter partes* review. Inst. Dec. 18–19.

2017 and a transcript thereof has been entered into the record (“Tr.,” Paper 29).

Patent Owner filed a Motion to Exclude (“Motion,” “Mot.,” Paper 20), Petitioner filed an Opposition (“Opp.,” Paper 24), and Patent Owner filed a Reply to Opposition (Paper 25). Patent Owner’s Motion to Exclude is dismissed as moot.

The Board has jurisdiction under 35 U.S.C. § 6. 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 not shown by a preponderance of the evidence that claims 1, 2, and 9 are unpatentable.

A. Related Proceedings

The parties advise us that the ’178 patent is involved in co-pending litigation captioned *Limelight Networks, Inc. v. XO Communications, LLC*, No. 3:15-cv-00720-JAG (E.D. Va. Nov. 30, 2015). Pet. 1, Paper 4, 3.

B. Technology and the ’178 Patent (Ex. 1001)

The ’178 patent relates to networked storage of Internet content, including “graphics, images, streaming media files, software, and other digital objects.” Ex. 1001, 1:21–23.

1. Technology

“Content providers often have a need to store persistently the digital content they make available over the Internet.” Ex. 1001, 1:25–26. One business solution to use a third-party, “a so-called storage service provider (SSP),” which provides a managed storage service. *Id.* at 1:26–31. SSPs typically “operate single-location as opposed to replicated solutions.” *Id.* at 1:31–32. In addition, SSPs may not provide hosting or content delivery, and may offer a lower level of service. *Id.* at 1:33–36. Instead of using an SSP,

the content provider may manage its own internal network, incurring significant capital and overhead expenses. *Id.* at 1:37–47.

2. *The '178 Patent*

The '178 patent describes another means “for content storage on behalf of participating content providers [that] begins by having a given content provider identify content for storage.” Ex. 1001, Abstract. The content provider identifies content for storage, which may be “an image file, a streaming media file, a graphic file, a software download, or any other digital file identifiable by a locator such as a Uniform Resource Locator (URL).” *Id.* at 2:24–28.

“The first step in using the distributed storage system of the present invention is to have a participating content provider upload content to a storage site.” Ex. 1001, 6:61–63. The upload is accomplished via a client program executing any industry standard file transfer protocol (“FTP”). *Id.* at 6:64–67. The content provider does not identify a particular storage site, but instead enters into an agreement with a service provider. *Id.* at 7:11–17. The content provider is given FTP access to the service via the customer’s “unique domain name of the form: customername.upload.cdnspace.com, where cdnspace is the name of the service provider.” *Id.* at 7:17–21. The “customername.upload portion of the domain is used to cue a Domain Name Service (DNS)-based request routing mechanism to identify the optimal storage site from a set of mirrored sites.” *Id.* at 7:21–24. Content is available for download when upload “completes and is not delayed until the replication completes.” *Id.* at 7:50–53.

Figure 3 of the '178 patent is reproduced below.

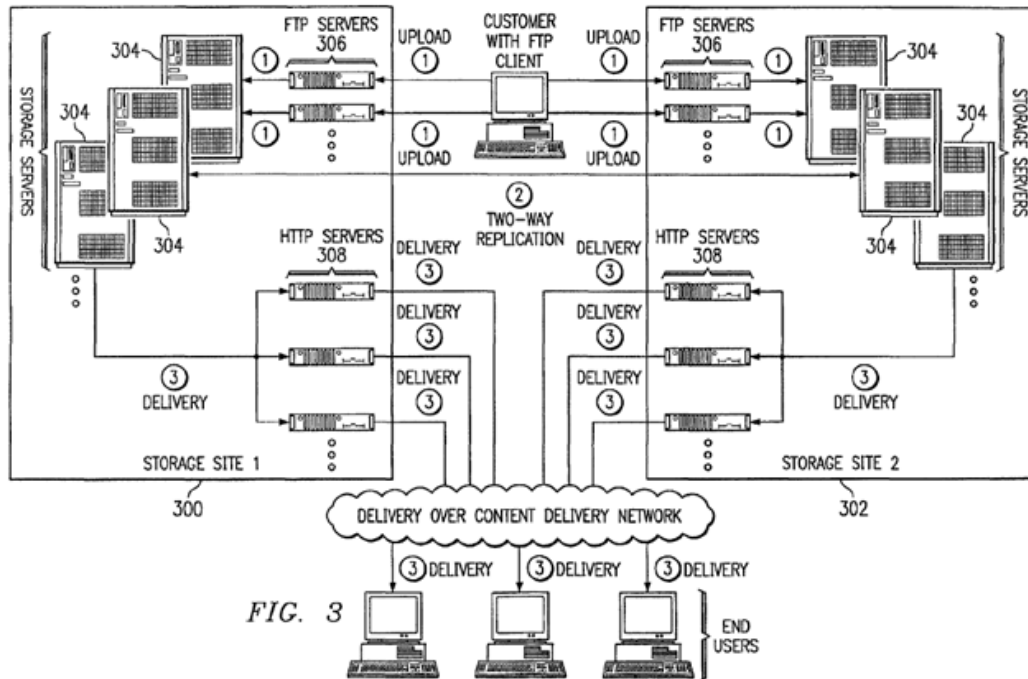


Figure 3 “illustrates the content storage system in detail, showing how the upload, replication and download services provide a full end-to-end storage environment.” Ex. 1001, 9:6–8. Figure 3 shows “two geographically-dispersed storage sites 300 and 302.” *Id.* at 9:9–10. “Each storage site includes a set of storage servers 304, a set of FTP (upload) servers 306, and . . . a set of HTTP (download) servers 308.” *Id.* at 9:10–12. A “participating content provider machine 308” establishes an FTP or other file transfer connection “to one of the storage sites 300, 302, preferably under the control of a global traffic manager product [(‘GTM’)], system or managed service.” *Id.* at 9:12–17, 9:45–47. The “GTM resolves a storage URL domain . . . to the optimal storage site based on, for example, real-time Internet traffic and server load mapping.” *Id.* at 9:49–53.

“Once content is uploaded and stored on the storage servers 304, the replication mechanism provides two-way replication such [that] the content

becomes available from both sites even though it was only uploaded to one of them.” *Id.* at 9:19–23. “[E]nd users (e.g., client machines running HTTP compatible browser software with appropriate media players for streaming content) request that content, which is then delivered on an as-needed basis from either the CDN edge servers or the HTTP download servers 308 via the content delivery network (CDN).” *Id.* at 9:25–31.

C. Illustrative Claim

Of the challenged claims, method claim 1 is the only independent claim. Challenged claims 2 and 9 each depend from claim 1. Claim 1 is reproduced below:

1. A method of content storage and delivery, operative in a content delivery network (CDN) deployed, operated and managed by a service provider on behalf of participating content providers, where the participating content providers are distinct from the service provider, comprising:
 - (a) deploying a content delivery network that comprises (i) a plurality of CDN content servers that are organized into sets, (ii) one or more CDN storage sites that are distinct from the plurality of content servers; and (iii) one or more CDN-managed domain name servers each of which is authoritative to resolve predetermined CDN specific hostnames, where each such hostname has a first portion uniquely associated with a given participating content provider and a second portion associated with the service provider;
 - (b) for a first participating content provider:
 - (i) establishing a first content storage directory at a storage site;
 - (ii) providing the first participating content provider with a first CDN-specific hostname for use in association with the first content storage directory, the first CDN-specific hostname having a first portion

- uniquely associated with the first participating content provider, and the second portion;
- (iii) receiving, via upload, and storing, in the first content storage directory at the storage site, first content, where the first content is one of: a web object, a media file, or a software download that the first participating content provider desires to be stored and delivered over the CDN;
- (c) for a second participating content provider distinct from the first content provider:
 - (i) establishing a second content storage directory at a storage site;
 - (ii) providing the second participating content provider with a second CDN-specific hostname for use in association with the second content storage directory, the second CDN-specific hostname having a first portion uniquely associated with the second participating content provider, and the second portion;
 - (iii) receiving, via upload, and storing, in the second content storage directory at the storage site, second content, where the second content is one of: web object, a media file, or a software download that the second participating content provider desires to be stored and delivered over the CDN;
- (d) upon receipt by a CDN-managed domain name server of a DNS query associated with the first CDN-specific hostname:
 - (i) identifying one or more CDN content servers;
 - (ii) receiving a request for the first content at one of the identified content servers;
 - (iii) if the first content is available to be served, serving the first content; and

- (iv) if the first content is not available to be served, obtaining a copy of the first content from the first content storage directory as needed to respond to the request for the first content;
- (e) upon receipt by a CDN-managed domain name server of a DNS query associated with the second CDN-specific hostname:
 - (i) identifying one or more CDN content servers;
 - (ii) receiving a request for the second content at one of the identified CDN content servers;
 - (iii) if the second content is available to be served, serving the second content; and
 - (iv) if the second content is not available to be served, obtaining a copy of the second content from the second content storage directory as needed to respond to the request for the second content;

where the second portion is common to each of the first and second CDN-specific hostnames, and where the first CDN-specific hostname also has associated therewith a value that identifies the first content storage directory from which the copy of the first content can be obtained, and where the second CDN-specific hostname also has associated therewith a value that identifies the second content storage directory from which the copy of the second content can be obtained;

wherein the one or more CDN storage sites include first and second CDN storage sites that are each located in different Internet-accessible locations and operate asynchronously and autonomously from one another.

Ex. 1001, 23:63–25:11.

D. Asserted Grounds of Unpatentability

Petitioner challenges claims 1, 2, and 9 of the '178 patent as unpatentable on the following grounds. Pet. 3, 15–83.

References	Basis	Claims Challenged
Speedera ³ and Apache ⁴	§ 103(a)	1, 2, and 9
Chaudhri ⁵ and Apache	§ 103(a)	1, 2, and 9

II. ANALYSIS

A. Claim Construction

In *inter partes* review, claim terms are given their broadest reasonable interpretation in light of the specification in which they appear. See 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142 (2016). We presume that claim terms have their ordinary and customary meaning. See *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1061–62 (Fed. Cir. 2016) (“Under a broadest reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history.”); *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a special definition or other consideration, “limitations are not to be read into the claims from the

³ U.S. Patent No. 6,405,252 B1, to Ajit Kumar Gupta et al., issued June 11, 2002 (“Speedera,” Ex. 1006). The Petition refers to Exhibit 1006 as “Speedera,” referencing the Assignee listed on the face of the patent. For consistency with the Institution Decision, we refer to this exhibit also as “Speedera.” We note, for clarification, that Patent Owner refers to this exhibit as “Gupta,” referencing the first named inventor.

⁴ Manuel Alberto Ricart, *Apache Server Survival Guide* (New Riders, Nov. 12, 1996) (“Apache,” Ex. 1007).

⁵ US 2002/0116444 A1, to Imran Chaudhri et al., published August 22, 2002 (“Chaudhri,” Ex. 1004).

specification.” *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). “[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.” *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

Petitioner did not propose constructions for any claim terms. Pet. 15. In the Institution Decision we construed “CDN storage sites” from claim 1 and the preamble term “deployed, operated and managed.” *See* Inst. Dec. 8–11. Patent Owner does not propose any constructions, but does argue patentability of the challenged claims over the references because certain limitations allegedly are not taught. *See* PO Resp. 17–24, 39–47 (limitation 1a-ii,⁶ “CDN storage sites”); *id.* at 25–30, 47–51 (limitation 1b-iii and 1c-iii, “receiving, via upload, and storing . . . at the storage site” (“upload” limitation)), *id.* at 30–34, 51–53 (limitation 1-i, “CDN storage sites” that “operate asynchronously”). Each of Patent Owner’s patentability arguments is based, in part, on Patent Owner’s implicit construction of the term at issue.⁷

⁶ We adopt Petitioner’s numbering format for identifying the claim limitations, which substantially matches like numbering in the claims as printed. In some instances, Petitioner breaks out limitations into parts or adds additional numbering for limitations not specifically numbered in the printed patent. *See, e.g.*, Pet. 18–31 (referring to limitation 1a-iii with two sub-labels, 1a-iii-a and 1a-iii-b); *id.* at 43–47 (adding labels for limitations 1f, 1g, 1h, and 1i).

⁷ For example, Patent Owner also argues that the limitations 1d-i and 1e-i, “identifying one or more CDN content servers,” are not taught by any of the references. Pet. 35–39, 53–56. Patent Owner’s argument is based on the

Each of the parties' arguments at the oral hearing began with and emphasized the meaning of the "upload" limitation ("receiving, via upload, and storing . . . at the storage site"). *See, e.g.*, Tr. 3:17–19 (Petitioner); *id.* at 13:3–6, 14:10–11 (Patent Owner). As discussed below, we find that Petitioner has not shown that any of the references teach the "upload" limitation.⁸ Thus, the construction of the "upload" limitation is dispositive of the dispute and no other term requires construction.

1. *"receiving, via upload, and storing . . . at the storage site"*

Petitioner did not offer any express construction for the "upload" limitation in the Petition, and the Institution Decision did not construe this limitation. Patent Owner did not argue the "upload" limitation or any other claim limitation in its Preliminary Response, arguing only procedural issues. *See* Inst. Dec. 20. Patent Owner presents arguments regarding the "upload" limitation for the first time in its Response. *See* PO Resp. 24–30 (arguing Speedera does not disclose the "upload" limitation), *id.* at 47–51 (arguing Chaudhri does not disclose the "upload" limitation). At the oral hearing, Petitioner was "troubled" by the timing of Patent Owner's raising the "upload" limitation, but agreed that Patent Owner is entitled to change its

construction of "CDN content server" and/or how a person of ordinary skill would understand "content server." *See, e.g.*, PO Resp. 35 (arguing Speedera's "DNS server identifies a 'POP SERVER,' not a 'content server'").

⁸ Petitioner does not rely on Apache to show the "upload" limitation. *See* Pet. 35–37 (Speedera), 72–74 (Chaudhri) (relying only on Speedera and Chaudhri to teach the "upload" limitation).

position between the Preliminary Response and Response.⁹ See Tr. 30:13–31:1.

Patent Owner’s Response argues that “upload,” as used in the Specification of the ’178 patent, refers to “the initial operation of a content provider sending the content it desires to be stored and delivered over the CDN to one of the CDN’s storage sites.” PO Resp. 25. In support of its proposed construction, Patent Owner points to the Specification as explaining that “the content provider ‘uploads’ the content it ‘desires to be stored and delivered over the CDN’ onto the CDN storage sites.” *Id.* (citing Ex. 1001, 2:22–30, 6:61–7:2). Patent Owner also cites to the Specification’s description of Figure 2 that “***the first step in using the distributed storage system of the present invention is to have a participating content provider upload content to a storage site.***” *Id.* at 26 (quoting Ex. 1001, 6:61–7:2). Patent Owner concludes the claimed “upload” is “at the content provider’s instigation and is not triggered by a request for content from an end user or content server.” *Id.* at 26–27 (citing Ex. 1001, 3:53–57).¹⁰

Patent Owner also quotes the claim language of the “upload” limitations, which recite, in part, that “‘upload[ed]’ content is what the

⁹ Petitioner must make its case in the Petition. “[T]he burden of persuasion is on the petitioner to prove ‘unpatentability by a preponderance of the evidence’” and “that burden never shifts to the patentee.” See, e.g., *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (quoting 35 U.S.C. § 316(e)). Patent Owner can do as little or as much as it wants to defend patentability in the Preliminary Response. In this instance, Patent Owner chose to focus on other issues in the Preliminary Response.

¹⁰ Patent Owner also cites to our description of the ’178 patent from the Institution Decision. PO Resp. 26–27 (citing Inst. Dec. 2, 3).

‘content provider *desires* to be stored and delivered over the CDN.’” PO Resp. 27 (quoting Ex. 1001, claim limitations 1b-iii and 1c-iii). Relying in part on the Burger Declaration as supported by the description of the ’178 patent, Patent Owner contends that only after “the content provider has uploaded the content” to the CDN storage site can the CDN content servers request that content. *Id.* (citing Ex. 1001, 1:64–67, 23:36–41; Ex. 2001 ¶ 63).

Patent Owner argues that the ’178 patent and the claims distinguish between “upload” and “download.” PO Resp. 27–28. For example, the Specification uses the word “‘upload’ more than 120 times and ‘download’ more than 60 times.” *Id.* at 27 (citing Ex. 1001, 2:22–30, 6:61–7:2 (describing upload); *id.* at 2:35–43, 7:50–52 (describing download); *id.* at 13:10–34, 13:59–14:7 (describing both upload and download)). Patent Owner concludes “‘upload’ is the initial operation to get desired content onto the storage site. In contrast, ‘download’ is a later operation that happens when a content server has a cache miss and needs to obtain (download) content from an origin source.” PO Resp. 27–28 (citing Ex. 2001 ¶¶ 64–65).

Petitioner acknowledged at oral hearing that were we to adopt Patent Owner’s proposed construction of the “upload” limitation (i.e., if upload includes an initiation requirement), then “there[i]s a question with regard to the references” teaching the limitation. *See* Tr. 32:15–33:4. Petitioner, however, argues in its Reply that the plain meaning of “upload” does not require the content provider to initiate a content transfer. Pet. Reply 13–16. Petitioner characterizes Patent Owner’s position that the content provider initiate an upload as being based on a “special definition” in the ’178 patent.

Id. at 13. Petitioner argues that *inter partes* review was instituted without express construction of the “upload” limitation and that Patent Owner’s proposal narrows the meaning of the term, which has a plain and ordinary meaning and is “generic and broad.” *Id.*

Petitioner contends Patent Owner’s proposal is improper because it would “exclude occasions wherein a content transfer is initiated by the ‘CDN storage site.’” Pet. Reply 13. In support of this argument, Petitioner cites to the Specification as describing other alternatives to uploading initiated by the content provider include “hav[ing] a given one of the storage site(s) *dynamically pull the content from the content provider origin site* if the content were not otherwise already available to the distributed storage system.” *Id.* at 14 (quoting Ex. 1001, 7:6–10) (emphasis added). According to Petitioner, the claim language “require[s] that the ‘CDN storage site’ receive content via upload” and does not require any specific entity (e.g., the content provider versus the CDN storage site) to be “the initiator of content transfer.” *Id.* at 15. Petitioner cites to dictionary definitions for “upload” and “download” in support of its position that the plain meaning of “upload” includes “transferring files from a one computer system to another – e.g., transferring from a content provider to a CDN storage site – regardless of which entity *initiates* the file transfer.” *Id.* at 15–16 (citing MERRIAM-WEBSTER’S COLLEGIATE DICTIONARY (11TH Ed. 2007), 376, 1375 (Ex. 1018); IEEE 100 THE AUTHORITATIVE DICTIONARY OF IEEE STANDARDS TERMS (7th Ed., 2000), 337, 1240 (Ex. 1019)). Petitioner concludes that the plain meaning of “upload” should apply. *Id.* at 16.

We start our analysis with the claim language of the “upload” limitation, which recites “receiving, via *upload*, and storing, in the first [or

second] *content storage directory* at the storage site, first [or second] *content* . . . that the first [or second] participating *content provider desires to be stored and delivered over the CDN.*” Ex. 1001, claim limitations 1b-iii (“first”) and 1c-iii (“second”)¹¹ (emphasis added). Consistent with the preceding claim language, the claimed “storage directory” receives an “upload” of whatever “content” the “content provider” “desires to be stored and delivered.” The language states that “upload” is the first step or, as Patent Owner argues, “upload” is “the initial operation” of the content provider.

Other limitations of claim 1 support Patent Owner’s proposed construction. *Cf. ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1088 (Fed. Cir. 2003) (in an infringement context, “[w]hile certain terms may be at the center of the claim construction debate, the context of the surrounding words of the claim must also be considered in determining the ordinary and customary meaning of those terms.”). For example, limitation 1d recites, in pertinent part, “upon receipt by a CDN-managed domain name server of a DNS query associated with the first CDN-specific hostname,” “if the first content *is available*” over the CDN, it is served. Ex. 1001, 24:42–44, 24:48–49 (limitations 1d, 1d-iii). Alternatively, limitation 1d-iv recites that “if the first content *is not available* to be served . . . a copy of the first content [is obtained] from the first content storage directory as needed to respond to the request for the first content.” *Id.* at 24:50–53. In either event, the content (i.e., that which the “content provider desires to be stored and delivered”) is obtained from the “content storage directory,” where it has

¹¹ Hereafter, we do not differentiate between “first” and “second” and refer only to limitation 1b-iii.

been previously stored after being “receiv[ed] via upload,” as per limitation 1b-iii. In other words, the “content storage directory” receives the content via “upload” from the content provider before it can be “served.”

That the “upload” to a content storage directory is the first step of the claimed method is also supported by the Specification. We agree with and adopt Patent Owner’s arguments based on the Specification that “the first step in using the distributed storage system of the present invention is to have a participating content provider upload content to a storage site.” PO Resp. 26 (quoting Ex. 1001, 6:61–7:2). We also agree that the Specification distinguishes between “upload” and “download,” i.e., serving the content. *See id.* at 27–28.

Though we need not resort to extrinsic evidence to construe the “upload” limitation, the Burger Declaration is consistent with our determination. The Burger Declaration relies on the disclosures of the Specification and concludes that only after the content provider has uploaded the content to the CDN storage site can the CDN content servers request that content. Ex. 2001 ¶ 63 (citing Ex. 1001, 1:65–67, 23:36–41). Petitioner’s expert, Dr. Freedman, does not construe the “upload” limitation and did not provide a declaration responsive to Dr. Burger’s testimony. Accordingly, Dr. Burger’s testimony is unrebutted.

Petitioner’s arguments are not persuasive, and the evidence relied upon is consistent with our construction. Consistent with our determination, Petitioner quotes that part of the Specification upon which Patent Owner relies, i.e., “the first step in using the distributed storage system of the present invention is to have a participating content provider upload content to a storage site.” Pet. Reply 14 (quoting Ex. 1001, 6:61–63).

Petitioner's primary argument relies on an alternative arrangement described in the Specification where a storage site "dynamically pull[s] the content from the content provider origin site." Ex. 1001, 7:6–10. To rely on this alternative embodiment, Petitioner asserts that the "first step" description is "merely representative." Pet. Reply 14 (quoting Ex. 1001, 7:2–3). "A claim need not cover all embodiments," however. *Intamin Ltd. v. Magnetar Techs., Corp.*, 483 F.3d 1328, 1336–37 (Fed. Cir. 2007). Petitioner's argument based on the claim language is that the claims "do not limit the meaning of 'upload'; they merely require that the 'CDN storage site' receive content via upload." Pet. Reply 15. In contrast, the "first step" or "initial operation" construction we adopt is supported expressly by the claim language. Further, because the "alternative" on which Petitioner relies does not use the term "upload," there is no indication in the Specification that "upload" includes that alternative. Rather, we conclude that the "dynamically pull" embodiment is an alternative to the "upload" embodiment, further supporting Patent Owner's construction.

Petitioner's argument and evidence regarding a proposed construction for "upload" were not presented until it filed its Reply.¹² Based, in part, on

¹² Petitioner's only discussion regarding claim construction in the Petition stated: "Petitioner does not seek specific construction of any of the terms in the Challenged Claims, and believes no specific constructions are required under the BRI standard." Pet. 15. Further, no portion of the "upload" limitation was construed in the Institution Decision. "The Patent and Trademark Office, including the Board, must provide the patent owner with timely notice of 'the matters of fact and law asserted,' and an opportunity to submit facts and argument." *Novartis AG v. Torrent Pharms.*, 853 F.3d 1316, 1324 (Fed. Cir. 2017) (citing 5 U.S.C. §§ 554(b)–(c), 557(c); *Dell Inc. v. Acceleron, LLC*, 818 F.3d 1293, 1301 (Fed. Cir. 2016)). However,

the dictionary evidence, Petitioner argues the plain meaning of “upload” is to “transfer some collection of data” from some storage location or memory to computer memory or some other computer. *See* Pet. Reply 15 (definitions from Ex. 1019, A and B).

We need not rely on extrinsic evidence, including Petitioner’s dictionary evidence, in order to construe the “upload” limitation. Based upon our review of the Specification, we agree with Patent Owner and determine that the “upload” limitation requires “the initial operation of a content provider sending the content it desires to be stored and delivered over the CDN to one of the CDN’s storage sites.” *See Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015) (holding that claims “‘should always be read in light of the specification and teachings in the underlying patent,’” and “[e]ven under the broadest reasonable interpretation, the Board’s construction ‘cannot be divorced from the specification and the record evidence.’” (citations omitted)).

B. Obviousness Analysis

A claim is unpatentable under 35 U.S.C. § 103(a) 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. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying

because we ultimately agree with and adopt Patent Owner’s proposed construction, we need not decide whether Petitioner’s arguments and evidence submitted in the Reply are timely.

factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness.¹³ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

1. Level of Ordinary Skill

Petitioner contends a person of ordinary skill in the art, at the time of the earliest filing date claimed in the application for the '178 patent, “would have at least a Bachelor’s degree in Computer Science, Computer Engineering, or the equivalent, and several years’ experience in the field of distributed systems, name services, or Internet content delivery.” Pet. 14 (quoting Ex. 1003 ¶ 28).¹⁴

Without commenting on Petitioner’s proposal, Patent Owner proposes a similar level of ordinary skill to that proposed by Petitioner. PO Resp. 2 (citing Ex. 2001 ¶ 16). Patent Owner adds “Electrical Engineering” to the Bachelor’s Degrees of the educational component. *Id.* Concerning work experience, Patent Owner lists one to two years of work experience in “computer networking and/or distributed systems, particularly as those systems relate to content delivery technology.” *Id.*

The parties are in virtual agreement as to level of ordinary skill. We adopt Petitioner’s proposed level of ordinary skill from the Institution Decision and modify it with Patent Owner’s proposal, which Petitioner does

¹³ The parties have not directed us to any such objective evidence.

¹⁴ Petitioner mistakenly cites to “§ X,” entitled “Claim Construction” in the Freedman Declaration. Section VI (including ¶¶ 20–29), is the “Level of Ordinary Skill in the Art” section of Dr. Freedman’s Declaration. The Petition and paragraph 28 of the Freedman Declaration include the same language. We insert the correct citation.

not contest. For purposes of this Decision the level of ordinary skill is at least a Bachelor's degree in Computer Science, Computer Engineering, Electrical Engineering, or the equivalent, and one to two years of experience in the field of computer networking, distributed systems, name services, or content delivery over a network, including the Internet.

2. Obviousness over Speedera and Apache

Petitioner alleges claims 1, 2, and 9 would have been obvious to a person of ordinary skill in the art over Speedera and Apache. Pet. 15–50. Petitioner cites the Freedman Declaration in support of its positions. See Ex. 1003 ¶¶ 86–90.

As noted in Section II.A above, Patent Owner argues Speedera does not disclose four separate limitations of claim 1, including limitations 1b-iii and 1c-iii, the “upload” limitation. See PO Resp. 25–30, 47–51 (discussing the “upload” limitation). Petitioner provides a table that identifies the “upload” limitation as being disclosed in Speedera and not in Apache. Pet. 15. As stated above, the “upload” limitation is dispositive and we analyze it below.

a. Speedera (Ex. 1006)

Speedera describes a computer server network that “integrate[s] load balancing and content delivery computer network [‘CDN’].” Ex. 1006, 1:66–67. A point of presence (“POP”) network stores “content such as HTML, images, video, sound, software, or the like on the network for fast and highly available access by clients (end users).” *Id.* at 2:9–12, *see also id.* at 2:6–7. The network also “provides load balancing and high availability for servers outside the network,” including customers with their own content and content servers. *Id.* at 2:13–14.

Figure 1 of Speedera is reproduced below.

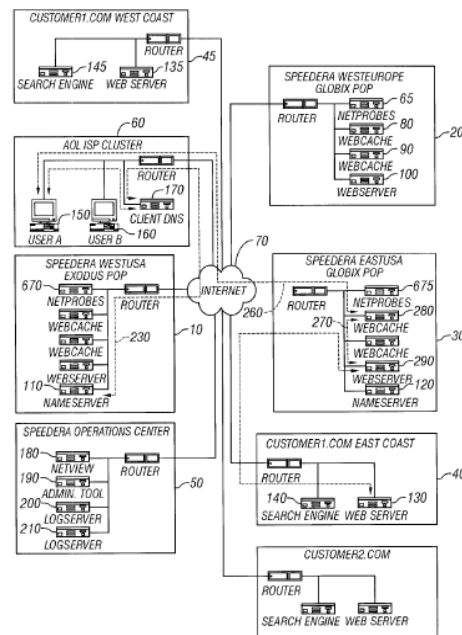


FIG. 1

Figure 1 is a block diagram of one embodiment illustrating a series of POP “servers 10, 20, and 30, customer Web servers (POP servers) 40 and 45, a monitoring POP server 50, and an ISP cluster 60.” Ex. 1006, 4:47–49. The servers and ISP 60 are “typically coupled via a computer network 70, such as the Internet.” *Id.* at 4:50–51.

“[S]erver 10 and 20 may include a server 110 and 120 that includes Domain Name Server (DNS) software.” *Id.* at 4:65–66. The DNS software maps from domain name to IP address so that when the DNS software is queried to resolve a hostname the DNS software returns an IP address of a Web server. *Id.* at 5:33–37. The selected Web server has the bandwidth to respond to the request to quickly provide the requested Web content. *Id.* at 5:37–40.

Still with reference to Figure 1, “customer Web servers 40 and 45 typically include Web servers 130 and 135 and servers 140 and 145.”

Ex. 1006, 5:54–56. Web servers 130 and 135 “provide static content, such as text and graphics” while “servers 140 and 145 provide non-static content or content that changes in response to a user query.” *Id.* at 5:56–59.

“Typically, customer POP Web servers 40 and 45 are mirrors of each other, and are designed to improve the perceived responsiveness of a Web site with respect to a user.” *Id.* at 5:61–64. “POP server 10 and 20 may include a server 110 and 120 that includes Domain Name Server (DNS) software.” *Id.* at 6:18–20. The POP server network provides both traffic management and content hosting for multiple customers. *Id.* at 7:8–11.

b. Apache (Ex. 1007)

Apache is a guide to the “Apache Server,” which is an “inexpensive, secure alternative to other web servers.” Ex. 1007, 1. Apache is not relied on to teach the “upload” limitation and further description of its disclosure is unnecessary.

c. Claim 1 – Speedera and Apache

Limitation 1b-iii is illustrative of the “upload” limitation¹⁵ and is reproduced below.

(iii) receiving, via upload, and storing, in the first content storage directory at the storage site, first content, where the first content is one of: a web object, a media file, or a software download that the first participating content provider desires to be stored and delivered over the CDN;

Ex. 1001, 24:20–25.

¹⁵ Petitioner argues that limitation 1c-iii is met “for the same reasons described with respect to limitation 1b-iii.” Pet. 37; *see also id.* at 74 (same assertion as between limitations 1b-iii and 1c-iii for the challenge based on Chaudhri and Apache).

For the “upload” limitation, Petitioner identifies evidence, including an annotation of Figure 1 of Speedera, indicating Speedera discloses that “a customer would provide content, e.g., ‘HTML, images video sound, software, or the like’ (Ex. 1006 at 2:9–17) to the WebServer storage sites so content would be stored on and served by the POP network instead of the customer’s own web servers.” Pet. 35 (quoting, citing Fig. 1). Petitioner cites to and emphasizes Speedera’s teaching that “customer web server 40 provides the static content to WebServer server 290, which in turn stores the static content to disk.” *Id.* (citing Ex. 1006, 11:1–3). Petitioner also relies on the following disclosure from Speedera:

the customer does not want web server 130 to have the burden of providing static content to many different users. In this embodiment, the POP network provides the content hosting of the static content. Accordingly, the URL addresses of the static content typically include textual domain names specifying the POP server network.

Id. (citing Ex. 1006, 9:51–57; *see also* Ex. 1012¹⁶, at 1bii).

Part of Exhibit 1012, an Annotated Figure 1 of Speedera, Figure 1 being shown in Section II.B.2.a above, appears in the Petition and is reproduced below.

¹⁶ We did not give any weight to Exhibit 1012, a 52 page claim chart, in the Institution Decision. Inst. Dec. 13–16. In this Decision we dismiss as moot Patent Owner’s Motion to Exclude Exhibit 1012, and a second claim chart Exhibit 1008. *See* Section II.C *infra*.

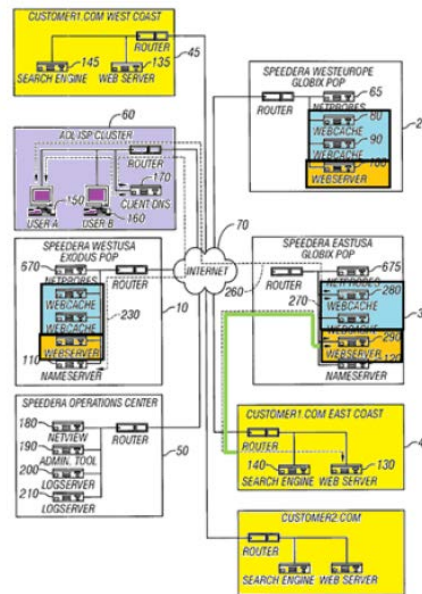


FIG. 1

ANNOTATED FIGURE 1 OF SPEEDERA PET. 36

Petitioner points to Annotated Figure 1 of Speedera as showing that “[p]roviding this content would necessarily involve receiving the content as well as storing that content at the WebServers (e.g., as shown in FIG. 1 where Customer1 (yellow) uploads (green) content to the WebServer in Speedera’s EastUSA Globix POP (orange).” Pet. 35.

Patent Owner contends the Petition relies on Speedera’s teaching of what is actually a “‘download’ from the origin site of a customer.” PO Resp. 25. Relying on the Burger Declaration, Patent Owner contends the ’178 patent differs from Speedera “because it allows **content providers** to control what content they store on the CDN and when.” *Id.* (citing Ex. 2001 ¶¶ 59–61, 66). Patent Owner contends that “the storage site (not the content provider) may afterwards act as an origin source storing the content and making it available for download to content servers when needed.” *Id.* (citing Ex. 2001 ¶ 62).

Patent Owner argues that Petitioner “conflates what [Speedera] itself describes as a download operation with the recited ‘upload.’” PO Resp. 28. Specifically, Patent Owner points to Speedera’s teaching that it is the WebServer 290 (shown in orange in Annotated Figure 1 of Speedera above) that determines if it has the requested content and, if it does, provides it. *Id.* at 28 (citing Ex. 1006, 10:51–58). If the WebServer does not have the content, it sends a request to a customer web server, rather than to a content storage directory at a CDN storage site to which the content previously has been uploaded and stored as required by the claim. *See id.* (citing Ex. 1006, 10:51–58). Patent Owner notes that Petitioner relies only on a part of Speedera, specifically that the “customer web server 40 provides the static content to WebServer server 290.” PO Resp. 28–29 (citing Ex. 1006, 11:1–3; Ex. 2001 ¶ 67); *see* Pet. 35. Patent Owner contends that the disclosure relied on by Petitioner is a “cache miss,” i.e., when the WebServer 290 does not have the requested content, the customer web server 40 (shown in yellow in Annotated Figure 1 of Speedera above) provides it (the alleged “upload”¹⁷ shown in green line in Annotated Figure 1 of Speedera above). *Id.* at 29.

Patent Owner concludes that Speedera does not teach the “upload” limitation because the portion relied on by Petitioner does not show “a customer-instigated upload to a CDN storage site to initiate use of the storage site.” Instead, Petitioner relies on a cache miss at a content server, which is “obtaining” or “downloading,” not “uploading.” *Id.* (citing Ex. 1001, claim 1, 8:4–13, 8:51–56, 9:44–57; x. 1006, 13:23–30). The Burger Declaration is cited as evidence supporting this conclusion. *Id.*

¹⁷ Speedera never uses the word “upload.”

(citing Ex. 2001 ¶¶ 68, 69 (Speedera “describes retrieving content from the content provider server after a cache miss—i.e., downloading, not uploading.”)). Patent Owner argues Petitioner’s reliance on the POP server network fails to include any explanation of how the content is obtained. *Id.* (citing Pet. 35; Ex. 1006, 9:51–57). Petitioner responds that Patent Owner’s construction requiring a “customer instigated upload” is incorrect because it is too narrow. Pet. Reply 16. Petitioner restate its reliance on the portion of Speedera it relied on in the Petition. *Id.* (citing Ex. 1006, 11:1–3); *see* Pet. 35; *see also* PO Resp. 28–29 (citing Ex. 1006, 11:1–3; Ex. 2001 ¶ 67) (quoting from Speedera that “customer web server 40 provides the static content to WebServer server 290”).

Claim 1 includes the “upload” limitation, limitation 1b-iii. The Petition does not explain specifically how Speedera teaches the “upload[ing]” portion of limitation 1b-iii. *See* Pet. 35–36. Neither does the Petition argue, based on expert testimony or otherwise, that the “via upload” portion of limitation 1b-iii would have been obvious if not explicitly taught by Speedera. Indeed, the “via upload” requirement of limitation 1b-iii is addressed only cursorily. *Id.* We find that the cited portions of Speedera in the Petition “have nothing to do with uploading content,” as we have construed the term. *See* PO Resp. 30. Petitioner’s showing all but reads the “upload” limitation out of the claim. *See id.* (citing *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (“It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify with particularity the evidence that supports the grounds for the challenge to each claim.” (internal quotation omitted))); *Harmonic, Inc. v. Avid Tech, Inc.*, 815 F.3d 1356, 1363

(Fed. Cir. 2016) (“In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.”)). Stated another way, while the Petition may show “receiving . . . first content,” it does not show that the content is content “that the first participating content provider desires to be stored and delivered over the CDN” and is “receiv[ed] via upload.”

We agree with and adopt Patent Owner’s factual arguments, which conclude that Speedera does not disclose “uploading” in the first instance from the content provider. As previously analyzed, we have construed the “upload” limitation consistent with Patent Owner’s assertions. See Section II.A.1 above. When the claim is read as a whole, the first step is to upload content from the content provider. *Id.* We have considered, and rejected, Petitioner’s arguments against the adoption of Patent Owner’s proposed construction.

d. Claims 2 and 9 – Speedera and Apache

Claim 2 depends from claim 1 and recites “wherein a CDN content server is directed to a CDN storage site upon the occurrence of a cache miss at the CDN content server.” Ex. 1001, 25:12–14. Claim 9 depends from claim 1 and recites “wherein the first and second content storage directories are located on respective first and second CDN storage sites.” *Id.* at 26:14–16. Having already determined that claim 1 is patentable over Speedera and Apache, dependent claims 2 and 9 are likewise patentable.

e. Summary

Petitioner’s argument and supporting evidence have failed to show by a preponderance of the evidence that claims 1, 2, and 9 would have been obvious over Speedera and Apache.

3. *Obviousness over Chaudrhi and Apache*

Petitioner alleges claims 1, 2, and 9 would have been obvious to a person of ordinary skill in the art over Chaudhri and Apache. Pet. 50–83. Petitioner provides a table that identifies specifically those limitations of claim 1 that are disclosed in Chaudhri and those limitations disclosed by Apache. *Id.* at 50. Petitioner cites the Freedman Declaration in support of its positions. See Ex. 1003 ¶¶ 91–96.

a. *Chaudhri (Ex. 1004)*

Chaudhri discloses a CDN that is designed to “provide improved acceleration and/or content distribution of computer formatted content” for content providers. Ex. 1004 ¶ 9. Chaudhri “addresses the problem of how to deliver content more quickly and effectively, given that there are different CDN (Content Distribution Network) providers with different cache systems, different methods for translating or redirecting addresses (such as URLs) to indicate cached content, different requirements for establishing acceleration policies.” *Id.* “[T]o address this problem, [Chaudhri] adds a management/intermediate function or module or system between various competing CDN systems and publishers.” *Id.* ¶ 10.

In one embodiment, “one or more retargetter systems or retargetter functions [are relied upon] to manage distribution of content from publishers to CDNs systems and to redirect viewer content requests to appropriate CDNs or CDN source.” *Id.* ¶ 48. Figure 3 of Chaudhri is reproduced below.

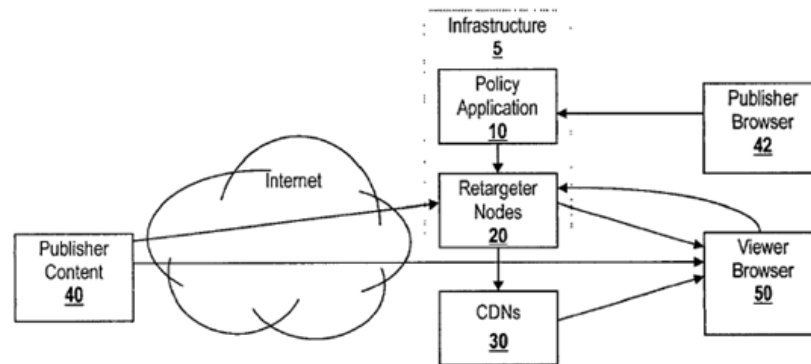


FIG. 3

Figure 3 is a block diagram showing a system operating according to one embodiment. *Id.* ¶ 49. “This embodiment comprises a Web-based application 10 that accepts desired operating parameters.” *Id.* “This information is provided in real-time to a set of distributed retargetters 20,” which provide real-time rerouting of HTML pages. *Id.* These retargetters provide real-time rerouting of the HTML pages or other standard content. *Id.* Content 40 from a publisher’s servers is connected to the most desirable, based on response time or cost, “content distribution network (CDN) 30 as determined either wholly or in part by each individual viewer.” *Id.*

Several different acceleration policies are disclosed. Ex. 1004 ¶¶ 71–79. In one such policy, “[t]he browser retrieves content indicated by the URLs, some of which may have been translated by the retargetter.” *Id.* ¶ 78. “These translated URLs can indicate data from one or more selected CDNs, from the retargetter, or from the publisher’s site, or from external data sources.” *Id.* The steps performed start with the “viewer’s browser contact[ing] the publisher’s content server at the publisher’s normal URL (e.g. www.pub.com).” *Id.* ¶ 84. In the next step, “[t]he publisher’s server redirects the viewer to retargetters via techniques such as URL translation

(e.g. fast.fasttide.com/WWW.pub.com/ . . .) or via a DNS name change to a name delegated to the retargetters by the publisher, e.g. wwwl.pub.com.”

Id. ¶ 85.

b. Claim 1 – Chaudhri and Apache

With respect to the disputed “upload” limitation, Petitioner identifies evidence indicating Chaudhri’s Figure 1 discloses “a general method as follows: receiving content and policies from publishers for acceleration (Step A1).” Pet. 72 (quoting Ex. 1004 ¶ 40); *see id.* at 73 (citing Ex. 1004 ¶¶ 8, 45, 80, Fig. 1). Petitioner argues that “[a] publisher’s content, such as images, audio, or video files, would be received by and stored in a CDNSP’s retargetter nodes as described with respect to limitation 1b-i.” *Id.*

Patent Owner argues that Petitioner’s showing on Chaudhri, like Speedera, is a “download,” not an “upload.” PO Resp. 48 (citing Ex. 2001 ¶ 95). Patent Owner quotes from the Petition’s showing that “[a] publisher’s content . . . would be received by and stored in a CDNSP’s retargetter nodes as described with respect to limitation 1b-i.” *Id.* at 48–49 (quoting Pet. 72). Patent Owner argues that “none of the evidence cited for limitation 1(b)(i) (see Petition at 69-70) establishes ‘uploading.’” *Id.* at 49. Patent Owner further quotes from the Petition “that the retargetters ‘**retrieve**’ content, and quotes Paragraph 51’s statement that ‘[t]he retargetter **retrieves** content (such as HTML content) **from publisher’s servers.**’” *Id.* (quoting Pet. 69). Patent Owner concludes that “retrieving” and storing content is downloading, not “uploading.” *Id.* (citing Ex. 1001, 8:10–12 (“the given entities are CDN edge servers that, in the event of a cache miss, retrieve (download) the stored content from a selected one of the storage site(s)”).

Patent Owner further argues that Chaudhri does not “migrate” content at the “instigation” of the content provider but rather “at the instigation of the retargetter (in response to a user request).” PO Resp. 49 (citing Ex. 1004 ¶¶ 84–92; Ex. 2001 ¶ 96). Patent Owner argues the Petition’s citation to paragraph 80 of Chaudhri teaching that the retargetter “request[s] pages” is a download request, not an upload. *Id.* (citing Ex. 2001 ¶ 97); *see also id.* at 50 (“‘receiv[ing] content from publishers for acceleration.’ . . . does not teach ‘uploading.’”) (citing Ex. 1004 ¶¶ 51, 71–80, 84–92; Ex. 2001 ¶¶ 98–100). Patent Owner concludes that the Petition does not disclose “uploading” and Petitioner has not met its burden of proving obviousness. *Id.* at 50–51 (citations omitted). Petitioner’s Reply restates the evidence it relied on in the Petition. *See, e.g.,* Pet. Reply 16–17 (citing Pet. 72–73). Petitioner argues that the “upload” limitation is met by Chaudhri’s teaching of “receiving [at a retargetter] **from** publishers.” *Id.* at 17; *see* Ex. 1004 ¶ 40.

Simply stated, Chaudhri does not disclose uploading and Petitioner cites no expert testimony that would suggest it does. As we have construed the claim language, Petitioner has not shown how the content provider uploads content in the first instance.¹⁸ We adopt Patent Owner’s argument and supporting evidence, and specifically find that Chaudhri’s retargetters “retrieve” content and do not upload it. *See* PO Resp. 49 (citing Ex. 1001, 8:10–12). We also find that the Petition fails to show uploading, or that any

¹⁸ At the oral hearing, Petitioner agreed that if Patent Owner’s construction of “upload” were accepted Chaudhri would not disclose “upload.” *See generally*, Tr. 32:15–33:13, *id.* at 33:5–13 (As to Patent Owner’s “upload” construction, “Chaudhri would be the issue.”).

arguable upload in Chaudhri is at the “instigation” of the content provider, rather than “at the instigation of the retargetter (in response to a user request).” *Id.* (citing Ex. 1004 ¶¶ 84–92; Ex. 2001 ¶ 96).

c. Claims 2 and 9 – Chaudhri and Apache

Having already determined that claim 1 is patentable over Chaudhri and Apache, dependent claims 2 and 9 are likewise patentable.

d. Summary

Petitioner’s argument and supporting evidence have failed to show by a preponderance of the evidence that claims 1, 2, and 9 would have been obvious over Chaudhri and Apache.

C. Patent Owner’s Motion to Exclude Exhibits 1008 and 1012

Patent Owner’s Motion moves to exclude claim charts for Chaudhri (Ex. 1008) and Speedera (Ex. 1012) as exceeding the word count provided by our rules (37 C.F.R. § 42.24(a)(1)(i)) and as an improper incorporation by reference. Mot. 1–2 (citing 37 C.F.R. § 42.24(a)(1)(i); 37 C.F.R. § 42.6(a)(3)).¹⁹ Petitioner opposes, arguing the claim charts were prepared by its Expert, Dr. Freedman, and “correspond to the invalidity grounds that were presented in the Petition.” Opp. 1–2.

We addressed both Exhibits 1008 and 1012 in our Institution Decision, and declined to consider them but still found Petitioner made a sufficient showing to institute trial. Inst. Dec. 13–16. We determined, *inter alia*, that absent improper incorporation by reference, certain citations to the

¹⁹ Patent Owner references Exhibit 1020, the Burger Deposition, as the subject of the Motion. Mot. 1. We understand this to be an error as the Motion is otherwise directed to Exhibits 1008 and 1012. *Id.* at 1–3.

prior art relied upon in the claim charts are neither included nor explained in the Petition. *Id.* at 15–16 (citing 37 C.F.R. § 42.6(a)(3)).

Petitioner does not rely on the Exhibits to overcome Patent Owner’s arguments in the Response nor does it make any use of them in making its case in the Petition. We did not rely on Exhibits 1008 and 1012 in rendering this Final Written Decision. In any event, the claim charts do not add anything, not in the Petition, relevant to the “upload” limitation. Thus, even if we were to consider the claim charts, Petitioner still would not show by a preponderance of the evidence that the claims are unpatentable in view of the cited references.

Accordingly, the Motion is *dismissed* as moot.

III. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, based on a preponderance of the evidence, claims 1, 2, and 9 of U.S. Patent No. 7,472,178 B2 have not been shown to be unpatentable; and

FURTHER ORDERED that Patent Owner’s Motion to Exclude (Paper 20) is *dismissed* as moot.

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

IPR2016-01894
Patent 7,472,178 B2

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