

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AKAMAI TECHNOLOGIES, INC.,
Petitioner,

v.

LIMELIGHT NETWORKS, INC.,
Patent Owner.

Case IPR2017-00377
Patent 9,015,348 B2

Before JUSTIN T. ARBES, GREGG I. ANDERSON, and
JENNIFER MEYER CHAGNON, *Administrative Patent Judges*.

ARBES, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.108

Petitioner Akamai Technologies, Inc. filed a Petition (Paper 3, “Pet.”) requesting *inter partes* review of claim 1 of U.S. Patent No. 9,015,348 B2 (Ex. 1001, “the ’348 patent”) pursuant to 35 U.S.C. § 311(a). Patent Owner Limelight Networks, Inc. filed a Preliminary Response (Paper 7, “Prelim. Resp.”) pursuant to 35 U.S.C. § 313. Pursuant to 35 U.S.C. § 314(a), the Director may not authorize an *inter partes* review unless the information in the petition and preliminary response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” For the reasons that follow, we have decided not to institute an *inter partes* review.

I. BACKGROUND

A. The ’348 Patent

The ’348 patent discloses “a system for dynamically selecting from among a plurality of acceleration techniques implemented in a Content Delivery Network (CDN) using attributes associated with content requests.” Ex. 1001, col. 1, ll. 40–43. A CDN is “a large distributed system of servers deployed in multiple data centers throughout the Internet,” and is used to “serve content to end-users with high availability and high performance.” *Id.* at col. 1, ll. 15–18. “CDNs can include geographically distributed points of presence (POPs) to locate edge servers close to end users.” *Id.* at col. 1, ll. 21–23. The disclosed system includes “a network interface that receives . . . content requests from a plurality of client systems for content stored in” geographically distributed edge servers, and “an intermediate server that accelerates access to the content stored in the . . . edge servers” using various “acceleration techniques.” *Id.* at col. 1, ll. 44–59.

Figure 3A of the '348 patent is reproduced below.

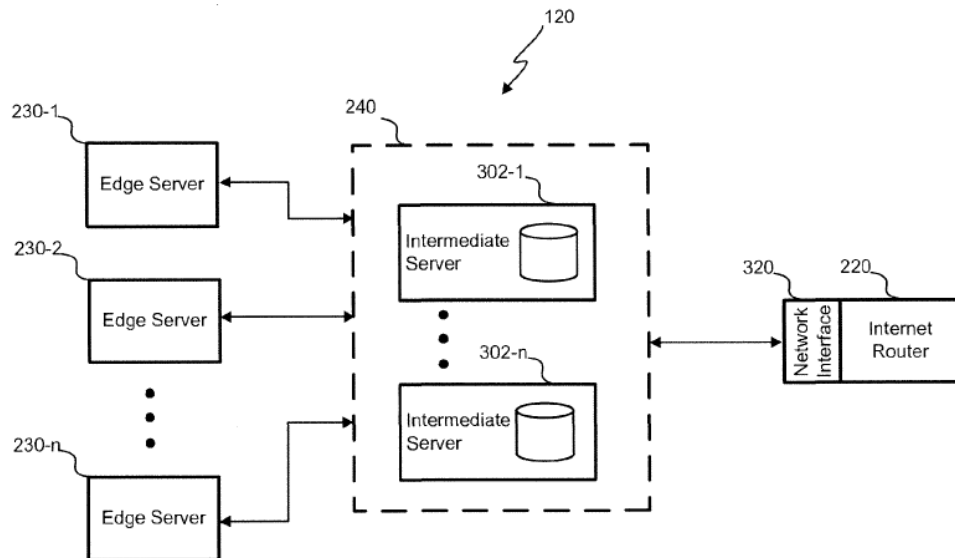


FIG. 3A

Figure 3A depicts POP 120 comprising edge servers 230-1 through 230-n, switching fabric 240 with intermediate servers 302-1 through 302-n, and network interface 320 connected to the Internet via Internet router 220. *Id.* at col. 7, ll. 42–57. “Instead of providing webpage content directly between the edge servers 230 and a client system, traffic may instead be routed through one or more of the intermediate servers 302,” which have “acceleration engines configured to apply acceleration techniques,” such as caching, compression, and HTML optimization. *Id.* at col. 7, ll. 3–41, col. 7, l. 59–col. 8, l. 7.

Figure 4A of the '348 patent is reproduced below.

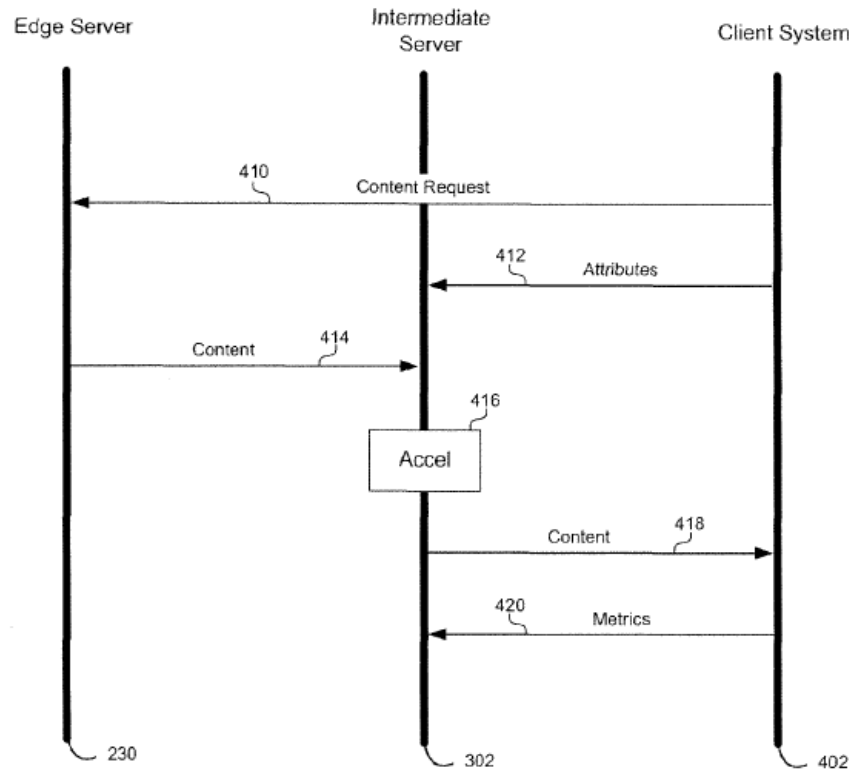


FIG. 4A

Figure 4A is a “flow diagram of content requests and responsive content processed by an intelligent acceleration system.” *Id.* at col. 12, ll. 21–23. At step 410, client system 402 sends a content request to a website and the CDN determines the appropriate edge server 230 to handle the request. *Id.* at col. 12, ll. 23–40. At step 412, client system 402 sends attributes associated with the request, which are intercepted by intermediate server 302. *Id.* at col. 12, ll. 52–56. Intermediate server 302 receives the content provided for the user at step 414, applies one or more acceleration techniques (selected based on comparing the received attributes to a lookup table of stored “acceleration profiles”) at step 416, and provides the content to client system 402 using those techniques at step 418. *Id.* at col. 12, ll. 41–52, col. 13, ll. 8–11, col. 17, ll. 37–55, Fig. 6B.

The '348 patent also discloses a “feedback loop” at step 420 to “collect metrics describing the speed and correctness with which the content was provided and displayed on the client system 402.” *Id.* at col. 13, ll. 17–21. For example, intermediate server 302 may include a “beacon”—a “software routine configured to send information from the client system to a content source, CDN, edge server, and/or intermediate server,” such as “a small snippet of JavaScript at the bottom of a source code page of HTML for a website”—with the content that causes client system 402 to send back “metrics on webpage load times and/or correctness.” *Id.* at col. 14, l. 66–col. 15, l. 36. After receiving the metrics, intermediate server 302 “updat[es] the acceleration technique selection process based on the metrics.” *Id.* at col. 19, ll. 19–21, Fig. 7A (step 712). For example, “[i]f the received timing and/or correctness metrics indicate that the default acceleration profile is performing worse than expected, a new acceleration profile may be generated that combines acceleration functions 604 in ways that remedy the performance shortfall.” *Id.* at col. 17, ll. 59–64. Because the lookup table of acceleration profiles is updated continually based on incoming metrics, “a content provider . . . may make continuous changes to their website content and the acceleration system of the CDN will automatically adjust itself to continually optimize the acceleration techniques applied for each client system or request type.” *Id.* at col. 17, l. 65–col. 18, l. 4.

B. The Challenged Claim

Claim 1 of the '348 patent recites:

1. A system for dynamically selecting from among a plurality of acceleration techniques implemented in a Content

Delivery Network (CDN) using attributes associated with content requests, comprising:

- a network interface that receives the content requests from a plurality of client systems for content stored in a plurality of edge servers distributed geographically throughout the CDN, wherein:

- the content requests comprise a first content request for first content;

- the first content request originates from a first client system in the plurality of client systems; and

- the first content request is associated with one or more attributes; and

- an intermediate server that accelerates access to the content stored in the plurality of edge servers, the intermediate server comprising:

- a first interface coupled to the network interface;

- a second interface configured to communicate with at least one of the plurality of edge servers of the CDN;

- one or more memory devices having stored thereon:

- instructions for executing each of the plurality of acceleration techniques; and

- a plurality of acceleration profiles, wherein each of the plurality of acceleration profiles specifies at least one of the plurality of acceleration techniques; and

- a processor configured to:

- access the one or more attributes associated with the first content request;

- select one or more acceleration techniques from the plurality of acceleration techniques, wherein:

the one or more acceleration techniques are selected based on the one or more attributes; and

the one or more acceleration techniques modify the content;

use the one or more acceleration techniques to provide the content to the first client system;

receive metrics from the first client system, wherein the metrics are associated with a performance in providing the first content to a user of the first client system;

dynamically update a process by which the one or more acceleration techniques are selected based on the metrics; and

use the updated process to select acceleration techniques for subsequent requests associated with similar attributes.

C. The Prior Art

Petitioner relies on the following prior art:

U.S. Patent Application Publication No. 2007/0156845 A1, published July 5, 2007 (Ex. 1004, “Devanneaux”); and

U.S. Patent Application Publication No. 2013/0166634 A1, published June 27, 2013 (Ex. 1003, “Holland”).

D. The Asserted Ground

Petitioner challenges claim 1 as unpatentable over Holland and Devanneaux under 35 U.S.C. § 103(a).¹

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103. Because the challenged claim of the ’348 patent has an effective filing date before the effective date of the

E. Claim Interpretation

The Board interprets claims in an unexpired patent using the “broadest reasonable construction in light of the specification of the patent in which [they] appear[.]” 37 C.F.R. § 42.100(b); *see also Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). The parties provide proposed interpretations for various claim limitations, and cite a district court decision construing certain limitations. *See* Pet. 35–36; Prelim. Resp. 2–4; Ex. 1005, 8–10. After reviewing the parties’ papers, we determine that no claim terms require express interpretation for purposes of this Decision.

II. DISCUSSION

A. Obviousness Ground Based on Holland and Devanneaux

Petitioner contends that claim 1 is unpatentable over Holland and Devanneaux² under 35 U.S.C. § 103(a), citing the testimony of Samrat Bhattacharjee, Ph.D. as support. Pet. 37–68 (citing Ex. 1002). We are not persuaded that Petitioner has established a reasonable likelihood of prevailing on its asserted ground for the reasons explained below.

1. Holland

Holland describes a “performance monitoring and measurement system” in a CDN, which includes “an intermediary device, such as a web proxy server, that receives requests for content from clients.” Ex. 1003 ¶ 18.

applicable AIA amendment, we refer to the pre-AIA version of 35 U.S.C. § 103.

² Devanneaux was considered during prosecution of the ’348 patent, but Holland was not. *See* Ex. 1001.

servers or edge servers, and may be grouped together with other functionality into POP 107. *Id.* ¶ 7.

Figure 3 of Holland is reproduced below.

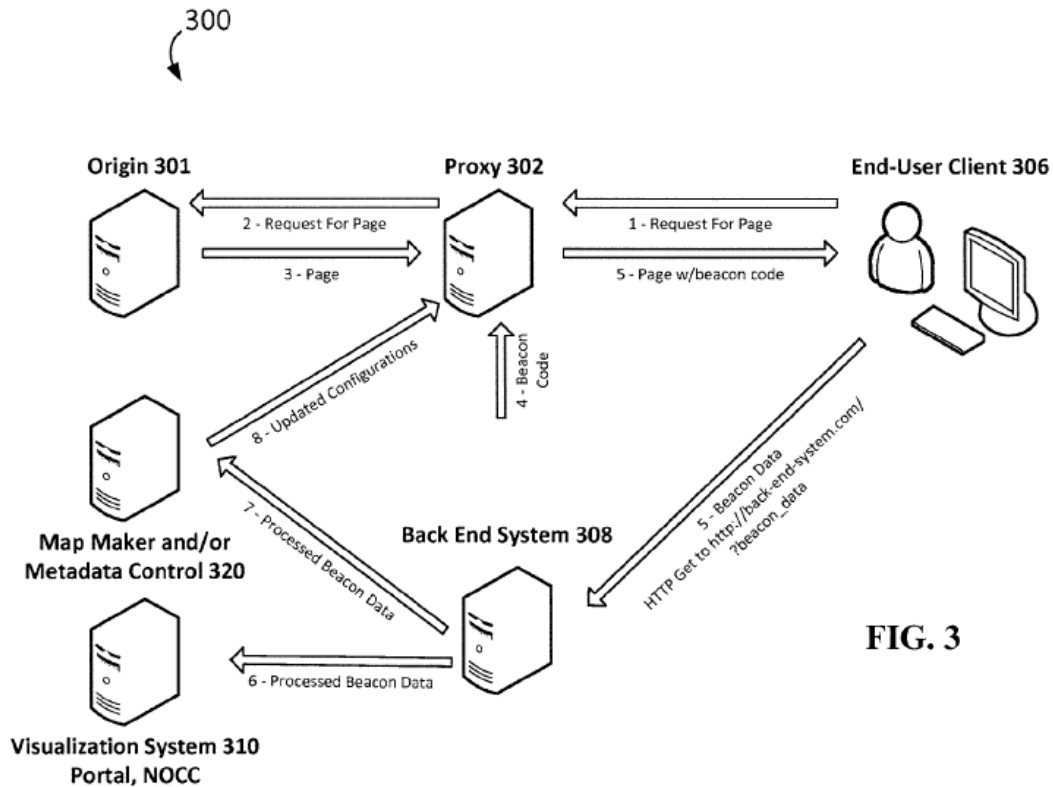


FIG. 3

Figure 3 depicts performance measurement and monitoring system 300 comprising client 306, proxy server 302, origin/source server 301, control system 312,³ visualization system 310, and back-end system 308. *Id.* ¶ 30. Client 306 requests a web page from proxy server 302, which retrieves it from origin/source server 301 or from an internally cached copy. *Id.* Proxy server 302 then modifies the content “by applying one or more performance-enhancing optimizations,” such as “in-lining content, resource consolidation, . . . image optimization, . . . [or] compression and/or de-duplication of content.” *Id.* ¶¶ 18, 36, 97.

³ The control system appears to be numbered incorrectly as “320” in Figure 3. See Ex. 1003 ¶¶ 36, 96.

As shown in Figure 3, back-end system 308 also provides beacon code, such as “a small, relatively fixed body of JavaScript,” which proxy server 302 inserts into the web page provided to client 306. *Id.* ¶¶ 30–32. Back-end system 308 receives the beacon data from client 306 and provides processed data, for example, to control system 312. *Id.* ¶ 34. Holland discloses that

control system 312 can be used to process the performance information and identify and address performance issues affecting the operation and performance of the CDN platform. The system may identify, for example, that certain web page optimizations/treatments are causing a problem for a particular content provider or particular category of client (e.g., a client device running a particular browser). It might determine, by way of further example, that a particular set of end-user clients is receiving poor performance because certain proxy servers are functioning sub-optimally, or those proxy servers are being mapped to sub-optimal cache hierarchy parents, or those clients are being mapped sub-optimally to the proxy servers, or otherwise. Using this kind of information, new control information to address the performance issue, in the form of an updated configuration file for example, can be fed back to the proxy server [302] (or to another component of the CDN such as the mapmaker in FIG. 1).

Id. ¶ 36. Finally, Holland states that “the allocation of functions to particular machines is not limiting, as the functions recited [in Holland] may be combined or allocated amongst different machines in a variety of ways.”

Id. ¶ 20.

2. Devanneaux

Devanneaux describes a CDN edge server that is “configured to provide one or more extended content delivery features on a domain-specific, customer-specific basis, preferably using configuration

Figure 3 of Devanneaux is reproduced below.

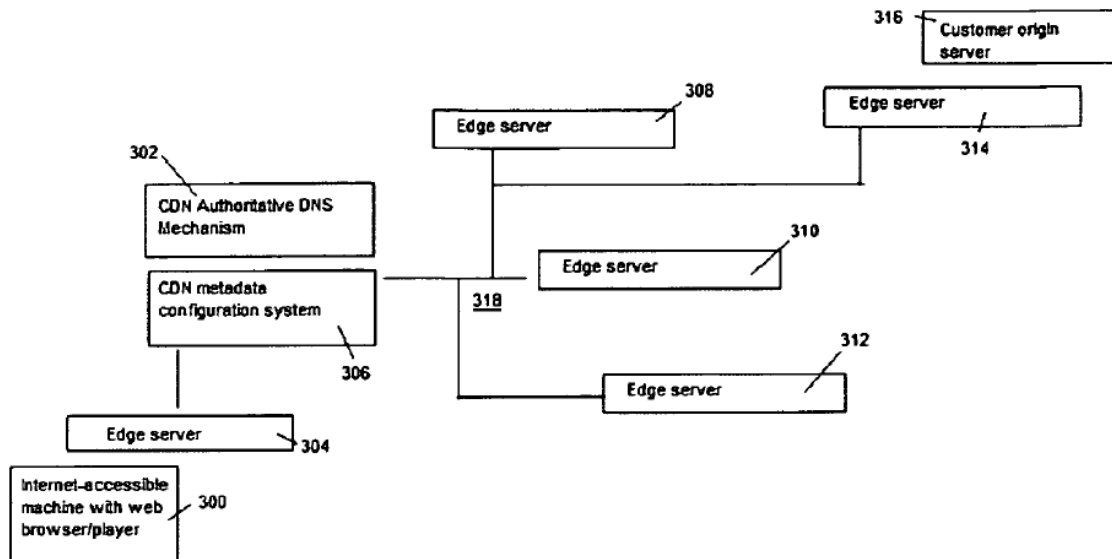


Figure 3

Figure 3 depicts a portion of the CDN where the customer, operating customer origin server 316, “has off-loaded all or some of its content delivery requirements to the CDN service provider.” *Id.* ¶ 19. “An Internet-accessible client 300 (e.g., an end user client machine having a browser and media player) has been directed by CDN authoritative [domain name system (DNS)] mechanism 302 to a nearby edge server 304.” *Id.* “Content handling rules are configured into each edge server, preferably via a metadata configuration system 306,” and “the configuration system provides edge server content control metadata via links 318, which themselves may include other infrastructure (servers, and the like).” *Id.* ¶ 20.

In the disclosed system, “a given CDN edge server is configured to provide one or more extended content delivery features” on a customer-specific basis using an Extensible Markup Language (XML)-based “configuration file” with “content handling rules and directives that

facilitate” the features. *Id.* ¶ 21. “[W]hen an edge server management process receives a request for content, it searches an index file for a match on a customer hostname associated with the request” and, “[i]f there is a match, the edge server process loads metadata from the configuration file to determine how it will handle the request.” *Id.* The metadata may control, for example, implementing a “content prefetch function.” *Id.* “[A] set of content handling directives [is] set forth in the XML configuration file for a given customer domain and used to control the edge server to provide these advanced functions.” *Id.* In addition to content prefetching, the functions include “path optimization, TCP connection optimization, content compression optimizations, and the like.” *Id.* ¶¶ 23, 83.

3. Level of Ordinary Skill in the Art

Section 103(a) forbids issuance of a patent when “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.”

KSR Int’l Co. v. Teleflex Inc., 550 U.S. 398, 406 (2007) (quoting 35 U.S.C. § 103(a)). Petitioner argues that a person of ordinary skill in the art at the time of the ’348 patent would have had “a Bachelor’s Degree in Computer Science or Computer Engineering, or equivalent experience, and one to two years of experience in the field of computer networking and/or distributed systems, particularly as those systems relate to Internet content delivery.” Pet. 36 (citing Ex. 1002 ¶ 41). Patent Owner does not propose a different definition in its Preliminary Response. Based on the record before us, including our review of the ’348 patent and the types of problems and

solutions described in the '348 patent and cited prior art, we agree with Petitioner's assessment of the level of ordinary skill in the art and apply it for purposes of this Decision.

4. Analysis

Petitioner relies on Holland for the majority of the limitations of claim 1. Pet. 37–66. For example, Petitioner argues that Holland teaches a network interface that receives content requests from “client systems” (i.e., end user client machines 122) for content stored in “edge servers” (i.e., machines 102) distributed geographically throughout the CDN, where a content request is associated with one or more “attributes” (e.g., “the client IP address, geographic location of the client, and characteristics of [the] client device”). *Id.* at 43–46. Petitioner further contends that Holland teaches an “intermediate server” (i.e., proxy server 302) that “accelerates access to the content” via various types of optimizations, and includes a “first interface,” “second interface,”⁴ “one or more memory devices” that store instructions for executing acceleration techniques, and a “processor” configured to access the attributes for a request, select appropriate acceleration techniques to modify the content, and receive “metrics” (i.e., timing data returned by the beacon code) in response. *Id.* at 46–61.

⁴ Petitioner also argues that the “first interface” and “second interface” limitations of claim 1 are “indefinite and lacking support in the written description” of the '348 patent, and the “dynamically update” limitation “lacks support in the written description.” Pet. 49 n.1, 62 n.3. We need not reach these issues, however, as the asserted ground fails because Petitioner has not provided sufficient reasoning for why a person of ordinary skill in the art would have combined the teachings of the references, as explained herein.

Petitioner cites Devanneaux in its analysis for certain limitations of claim 1. With respect to the preamble and the limitation of “one or more memory devices having stored thereon . . . a plurality of acceleration profiles, wherein each of the plurality of acceleration profiles specifies at least one of the plurality of acceleration techniques,” Petitioner cites Holland’s “configuration files” that include “content handling rules and directives,” as well as Devanneaux’s specific use of an index file to match a customer hostname for an incoming request and load corresponding metadata to perform “content handling directives.” *Id.* at 37–43, 53–55 (quoting Exs. 1003, 1004). According to Petitioner, “[a] person of ordinary skill in the art would read the [cited] disclosures of Holland and Devanneaux as using the attributes associated with the content request to select acceleration techniques to be applied to the content.” *Id.* at 42 (citing Ex. 1002 ¶ 92). Similarly, with respect to the limitation of “a processor configured to . . . select one or more acceleration techniques from the plurality of acceleration techniques, wherein” the one or more acceleration techniques “are selected based on the one or more attributes” and “modify the content,” Petitioner cites Holland’s teaching of proxy server 302 selecting optimizations and Devanneaux’s teaching of searching an index file for a match on a customer hostname and loading corresponding metadata to perform acceleration techniques, which, according to Petitioner, is “the same as that described in the ’348 patent in which a lookup table is used.” *Id.* at 57–59.

Petitioner concludes its analysis by arguing that “[a] person of ordinary skill in the art would have been motivated to look to incorporate *the details of the configuration files described [in] Devanneaux* into the

configuration files described in Holland.” *Id.* at 66 (citing Ex. 1002 ¶ 126) (emphasis added). Thus, based on the above, Petitioner’s position appears to be that a person of ordinary skill in the art would have combined Holland’s general teaching of selecting acceleration techniques with Devanneaux’s specific way of doing so using an index file lookup for a matching customer hostname. *See id.* at 37–43, 53–55, 57–59. Petitioner provides three rationales for why an ordinarily skilled artisan allegedly would have combined the references’ teachings in that manner. *Id.* at 67–68. Patent Owner responds that Petitioner’s reasoning is insufficient. Prelim. Resp. 8–22. Having reviewed the arguments of both parties, we agree with Patent Owner.

A patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. “Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention.” *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). For an obviousness analysis, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does.” *KSR*, 550 U.S. at 418. “Although the *KSR* test is flexible, the Board ‘must still be careful not to allow hindsight reconstruction of references . . . without any explanation as to *how* or *why* the references would be combined to produce the claimed invention.’” *Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016) (citation omitted); *Merck & Cie v. Gnosis S.P.A.*, 808 F.3d 829, 833 (Fed. Cir. 2015)

(Even “[i]f all elements of the claims are found in a combination of prior art references, . . . the factfinder should further consider whether a person of ordinary skill in the art would [have been] motivated to combine those references, and whether in making that combination, a person of ordinary skill would have [had] a reasonable expectation of success.”). Further, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); *In re Nuvasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (stating that “conclusory statements” amount to an “insufficient articulation[] of motivation to combine”; “instead, the finding must be supported by a ‘reasoned explanation’” (citation omitted)).

Petitioner’s first rationale for combining Holland and Devanneaux is that the references have similar disclosures, namely that both references disclose “content delivery systems that use configuration files,” “describ[ing] the content delivery network and the configuration files using nearly identical language” and referring to metadata in configuration files as “control information.” Pet. 67 (citing Ex. 1003 ¶¶ 9, 11; Ex. 1004 ¶¶ 9, 21; Ex. 1002 ¶ 127). As Patent Owner points out, the fact that the references operate on similar systems and use similar terminology does not explain why a person of ordinary skill in the art would have had reason to incorporate Devanneaux’s specific configuration file functionality into the system of Holland. See Prelim. Resp. 10–13. At most, it is an “analytical starting point” and helps show that the references are sufficiently similar that a person of ordinary skill in the art would have been capable of combining

their teachings, not that such an individual *would have* done so in the manner asserted by Petitioner. *See id.*; *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (“[O]bviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention.”); *InTouch Techs., Inc. v. VGo Comm’cns, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014) (determining that a conclusory assertion that an ordinarily skilled artisan could have combined the teachings of references was insufficient to show that the artisan “*would have been motivated to do so*”).⁵

Second, similar to its first rationale, Petitioner argues that “Holland and Devanneaux teach the same use for the configuration files.” Pet. 67–68. According to Petitioner, “Devanneaux explains in great detail how to use the metadata in the configuration files to determine and apply the acceleration techniques (the directives),” and Holland explains how the directives are used and “how to obtain the attributes associated with a content request” and “gather performance metrics . . . to update the configuration file.” *Id.* (citing Ex. 1003 ¶¶ 14, 36, 100; Ex. 1004 ¶¶ 39–89; Ex. 1002 ¶ 128). This assertion largely repeats the disclosures of each reference that Petitioner relies on for the respective limitations of claim 1, and does not shed any further light on why a person of ordinary skill in the art would have incorporated Devanneaux’s configuration file functionality into Holland’s system. *See id.*

⁵ *See also Microsoft Corp. v. Enfish, LLC*, 662 F. App’x 981, 990 (Fed. Cir. 2016) (unpublished) (holding that the Board did not err in finding that the mere fact that two references “were directed to the same art or same techniques” was “inadequate to show persuasively that a relevant skilled artisan would have been motivated to combine the references”).

at 46–68. For example, Petitioner does not explain why doing so would have been considered an improvement or advancement to the system of Holland, or why Devanneaux’s configuration file process is more advantageous in some respect than that of Holland. *See* Prelim. Resp. 13–15.

Third, Petitioner asserts that “Holland and Devanneaux are both assigned to [Petitioner], and a person of ordinary skill in the art would have naturally looked to other teachings by [Petitioner] if more information about the configuration files were needed.” Pet. 68 (citing Ex. 1002 ¶ 129). We are not persuaded that this amounts to a sufficient reason to combine either. As Patent Owner points out, the references do not list any common inventors and are not part of the same patent application family, and Petitioner has numerous other patents and published applications. *See* Prelim. Resp. 16, 18–19 (citing Exs. 2001, 2002). The mere fact that these two applications were both assigned to Petitioner, without further explanation, is not sufficient to show that a person of ordinary skill in the art would have combined their teachings in the manner asserted. Petitioner merely states that a person of ordinary skill in the art would have looked to other applications assigned to Petitioner “if more information about the configuration files were needed,” but does not explain sufficiently why additional information would have been needed in this context or why an ordinarily skilled artisan would have looked to Devanneaux’s configuration file teachings in particular. *See* Pet. 68; Prelim. Resp. 17.

Finally, we note that Dr. Bhattacharjee’s testimony is virtually identical to what Petitioner argues in the Petition, and does not provide any additional explanation as to why a person of ordinary skill in the art would

have combined the references' teachings. See Prelim. Resp. 19–22; compare Pet. 66–68, with Ex. 1002 ¶¶ 126–129. Petitioner has not set forth a sufficient rationale for combining the teachings of Holland and Devanneaux in reaching a conclusion of obviousness. Accordingly, Petitioner has not shown a reasonable likelihood of prevailing on its assertion that claim 1 is unpatentable over Holland and Devanneaux.

B. Conclusion

We conclude that Petitioner has not demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the '348 patent challenged in the Petition. Therefore, we do not institute an *inter partes* review on the asserted ground as to the challenged claim.

III. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is denied as to the sole challenged claim of the '348 patent.

IPR2017-00377
Patent 9,015,348 B2

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