

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

GOOGLE LLC,  
Petitioner,

v.

SANDPIPER CDN, LLC,  
Patent Owner.

---

Case IPR2025-01010  
Patent No. 10,057,322

---

**PETITIONER'S REPLY TO PATENT OWNER'S  
RESPONSE**

**TABLE OF CONTENTS**

|      |                                                                                                                                                                |    |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| I.   | Introduction.....                                                                                                                                              | 1  |
| II.  | Claim Construction.....                                                                                                                                        | 1  |
| A.   | “direct link to a node within the content delivery network” .....                                                                                              | 1  |
| 1.   | The plain meaning of a “direct link” is a link pointing to a specific server.....                                                                              | 1  |
| 2.   | Patent Owner’s contentions confirm this plain meaning .....                                                                                                    | 2  |
| 3.   | Patent Owner’s contrary arguments should be rejected .....                                                                                                     | 3  |
| B.   | “with a tag” .....                                                                                                                                             | 6  |
| C.   | “API” .....                                                                                                                                                    | 7  |
| 1.   | The API may include the application functionality .....                                                                                                        | 7  |
| 2.   | The API does not require a specific input-output.....                                                                                                          | 9  |
| III. | The Petition Establishes Claims 1-15 Are Unpatentable .....                                                                                                    | 11 |
| A.   | Verma Discloses the Claimed “direct link” .....                                                                                                                | 11 |
| B.   | Verma and Lewin Render Obvious the Claimed “tag” .....                                                                                                         | 13 |
| 1.   | Lewin discloses an embedded resource “with a tag” .....                                                                                                        | 13 |
| 2.   | A POSITA Would Have Combined Verma and Lewin.....                                                                                                              | 15 |
| a.   | Requesting an “HTML document” was conventional.....                                                                                                            | 15 |
| b.   | Verma and Lewin render obvious providing a tag with the original embedded resource and parsing that tag to initiate fetching a modified embedded resource..... | 16 |
| 3.   | Verma and Lewin render obvious obtaining a modified embedded resource upon identification of a tag .....                                                       | 21 |

|     |                                                                                 |    |
|-----|---------------------------------------------------------------------------------|----|
| C.  | Verma Discloses an API .....                                                    | 24 |
| 1.  | The Board correctly found Verma discloses an API .....                          | 24 |
| 2.  | Verma also discloses an API even under Patent Owner’s<br>new construction ..... | 25 |
| IV. | Conclusion .....                                                                | 27 |

**TABLE OF AUTHORITIES**

|                                                                                                                        | <b>Page(s)</b> |
|------------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Cases</b>                                                                                                           |                |
| <i>Allied Erecting &amp; Dismantling Co. v. Genesis Attachments, LLC</i> ,<br>825 F.3d 1373 (Fed. Cir. 2016) .....     | 20             |
| <i>Amazon.com, Inc. v. Barnesandnoble.com, Inc.</i> ,<br>239 F.3d 1343 (Fed. Cir. 2001) .....                          | 3              |
| <i>Apple Inc. v. Gesture Tech. Partners, LLC</i> ,<br>127 F.4th 364 (Fed. Cir. 2025) .....                             | 18             |
| <i>Atlanta Gas Light Co. v. Bennett Regulator Guards, Inc.</i> ,<br>IPR2015-00826, Paper 31 (PTAB Aug. 19, 2016) ..... | 3              |
| <i>Cisco Sys., Inc. v. K.Mizra LLC</i> ,<br>No. 2022-2290, 2024 WL 3841809 (Fed. Cir. Aug. 16, 2024) .....             | 17             |
| <i>GE Lighting Sols., LLC v. AgiLight, Inc.</i> ,<br>750 F.3d 1304 (Fed. Cir. 2014) .....                              | 2              |
| <i>InterDigital Commc'ns, LLC v. ITC</i> ,<br>690 F.3d 1318 (Fed. Cir. 2012) .....                                     | 3, 4           |
| <i>LBT IP I LLC v. Apple Inc.</i> ,<br>No. 2022-1613, 2023 WL 3914920 (Fed. Cir. June 9, 2023) .....                   | 17             |
| <i>Liebel-Flarsheim Co. v. Medrad, Inc.</i> ,<br>358 F.3d 898 (Fed. Cir. 2004) .....                                   | 6, 8           |
| <i>Luminara Worldwide, LLC v. Liown Elecs. Co.</i> ,<br>814 F.3d 1343 (Fed. Cir. 2016) .....                           | 2              |
| <i>Oatey Co. v. IPS Corp.</i> ,<br>514 F.3d 1271 (Fed. Cir. 2008) .....                                                | 4, 5           |
| <i>Shockwave Med., Inc. v. Cardiovascular Sys., Inc.</i> ,<br>142 F.4th 1371 (Fed. Cir. 2025) .....                    | 20             |

## **I. Introduction**

The Petition established claims 1-15 are unpatentable. Patent Owner has failed to rebut that showing in its Response. Instead, it provides flawed claim constructions for “direct link,” “API,” and “with a tag” that ignore the intrinsic record and violate core claim-construction principles. On the merits, Patent Owner recycles arguments the Board correctly rejected at institution. As shown in the Petition, and as explained below, Google respectfully requests the Board find claims 1-15 unpatentable.

## **II. Claim Construction**

### **A. “direct link to a node within the content delivery network”**

Patent Owner submits that “all claim terms should be accorded their plain and ordinary meaning” (POR, 11), but then offers a construction for “direct link” divorced from that plain meaning. The plain and ordinary meaning of a “direct link” is a link pointing to a specific server. This is the meaning Patent Owner applied in litigation, and is reinforced by the claims, specification, and prosecution history.

#### **1. The plain meaning of a “direct link” is a link pointing to a specific server**

The '322 patent claims require a “modified embedded resource” that provides “a direct link to a node within the [CDN].” EX1001, 10:13-18, 11:1-4, 12:12-15. This “direct link” points to a specific server for content retrieval. The claim language does not narrowly define the form a “direct link” must take. POR, 12-14. It could be

a hostname, IP address, virtual IP address, or the like. Nor does this claim language prohibit all DNS processing.

The only discussion of DNS processing appears in the specification. EX1001, 3:6-14. To the extent some sort of disavowal could be gleaned from such a statement (it cannot), it at most states that alternatives to DNS were sought to *select* the node for content retrieval. *Id.*; *GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1307-10 (Fed. Cir. 2014) (“[S]tandards for finding lexicography and disavowal are exacting.”). It *does not preclude* using DNS when making a one-to-one translation of a hostname to an IP address when that hostname is bound to a specific CDN node (i.e., single node is already chosen). For example, the specification states “[a]spects of the present disclosure” provide an alternative to using DNS “for edge selection.” EX1001, 3:6-14. Applicant confirmed this during prosecution, stating “bypass[ing]” DNS occurs “[i]n examples of the present application.” EX1002, 69. Absent a clear disavowal, the plain meaning governs, which here means a link pointing to a specific server. *Luminara Worldwide, LLC v. Liown Elecs. Co.*, 814 F.3d 1343, 1353 (Fed. Cir. 2016).

## **2. Patent Owner’s contentions confirm this plain meaning**

This plain meaning of “a direct link” being a link pointing to a specific server is supported by Patent Owner’s infringement contentions in a related litigation. EX1019, 7-8. Patent Owner accused hostname links and argued they “provid[e] a

direct link (e.g., *a link pointing to [a] specific cache server*).”<sup>1</sup> *Id.* It cannot walk away from that here. *Atlanta Gas Light Co. v. Bennett Regulator Guards, Inc.*, IPR2015-00826, Paper 31, 28-29 (PTAB Aug. 19, 2016); *Amazon.com, Inc. v. Barnesandnoble.com, Inc.*, 239 F.3d 1343, 1351 (Fed. Cir. 2001).

### **3. Patent Owner’s contrary arguments should be rejected**

Patent Owner contends the “direct link” is limited to a single embodiment that requires the CDN to return an “IP address” and bypass all possible DNS processing. POR, 12-14. This proposal violates the doctrine of claim differentiation and ignores the broader teachings in the specification and prosecution history.

*First*, Patent Owner contends that its construction requires “embedding an IP address” for a direct link to avoid DNS. *Id.*, 12-13. This construction, however, violates the doctrine of claim differentiation, which is strongest “where the limitation that is sought to be ‘read into’ an independent claim already appears in a dependent claim.” *InterDigital Commc’ns, LLC v. ITC*, 690 F.3d 1318, 1324-25 (Fed. Cir. 2012) (citation omitted). Claim 11 recites a “modified embedded resource providing a direct link to a node,” but claim 14, which depends from claim 11, recites “the modified embedded resource includes at least one of an IP address.” EX1001, 11:1-4, 11:17-12:4. Claim 11’s use of “direct link” is broad enough to include *not only*

---

<sup>1</sup> All emphases and annotations added unless otherwise stated.

claim 14’s IP address, *but also* other links, like hostnames, that might require DNS resolution to make a one-to-one translation to an IP address, where that hostname is bound to a specific node. This attempt to read claim 14’s “IP address” into claim 11 violates the doctrine of claim differentiation and should be rejected. *InterDigital*, 690 F.3d at 1324-27 (“code” in independent claim not limited to a spreading code).

*Second*, Patent Owner’s focus on the singular “IP address” embodiment reads out other embodiments, like a hostname. POR, 14 (citing EX1001, 6:50-7:1). This is improper. *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1276-78 (Fed. Cir. 2008) (“We normally do not interpret claim terms in a way that excludes embodiments disclosed in the specification.”). The specification explains operation 330 returns “an absolute URL from which the content may be retrieved, *and/or* a list of *hostnames[,] and/or IP addresses* that could ... construct the URLs at the calling application.” EX1001, 6:50-53. Consistent with claim 14, these are “link” options that may be used to point to a node. *Id.*; *see also id.*, 11:17-12:4 (claim 14 reciting “IP address,” “virtual IP address,” and “absolute uniform resource locators” as alternatives).<sup>2</sup> After listing these alternatives, the specification states that “[w]hen the user selects the link, the

---

<sup>2</sup> Patent Owner does not argue that Verma does not disclose claim 14, which maps one of the alternative options: an “absolute uniform resource locator[.]” *See* POR; Pet., 33-34.

browser *will directly contact the node* for the content.” *Id.*, 6:60-62. To suggest the claims cannot include a “direct link” other than an “IP address” disregards these alternative embodiments. *Oatey*, 514 F.3d at 1276-78.

To the extent Patent Owner contends that the specification “equates ‘directly’ connecting with bypassing DNS through an embedded IP address” and that all forms of DNS processing are precluded (POR, 13 (quoting EX1001, 5:27-32)), that argument is likewise unavailing. At most, the specification explains one goal of its purported invention was to offer an alternative to using DNS to *select* a node. EX1001, 3:9-14; EX1002, 69-72. The specification explains “[a]spects of the present disclosure” provide an “alternative to using conventional ... (DNS) servers for edge selection.” EX1001, 3:6-14. The specification at no point states that the invention as a whole avoids all DNS processing, much less for translating a hostname into an IP address when that hostname is bound to a specific node (i.e., a direct link).

*Third*, Applicant’s statements during prosecution confirm that any discussion of avoiding DNS processing (as Patent Owner argues) is at most limited to selecting a node. EX1002, 69-72. During prosecution, Applicant distinguished the prior art by arguing it “requires the client to either (a) *communicate with the DNS server of the CDN to determine the node ...*; or (b) execute translation code to ask the CDN for translation information, which translation information may include the address of

the node that will be used to deliver the content.” *Id.*, 70-72. Neither option gave the client a link pointing to a particular node, they instead used other routing schemes. EX1036, [0021]-[0022], [0032] (DNS routing selecting nodes), [0047], [0064] (translation code/information routing).

Nothing in these statements suggests the alleged point of novelty is avoiding *all* DNS processing, but simply having a direct link so that DNS would not be needed to *select* the specific edge server. EX1001, 3:9-14; EX1002, 70-72. This aligns with the plain meaning of “a direct link,” which provides a link pointing to a single node.

**B. “with a tag”**

Patent Owner effectively construes “with a tag” to require the tag to be “embedded inside or is the URL string.” POR, 29. This is not supported by the intrinsic record. “[E]mbedded resource with a tag” should receive its plain meaning, which requires an embedded resource to have a “tag” identifying, associated with, or included in it. Indeed, the specification distinguishes embodiments “with a tag” more broadly from embodiments “including a tag.” EX1001, 1:57-62, 2:7-18.

Patent Owner’s contrary construction impermissibly reads a lone embodiment into the claims. POR, 29; *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 913 (Fed. Cir. 2004). As Patent Owner notes, one embodiment provides “[t]he embedded resource may *include a tag*.” EX1001, 4:32-36. But this embodiment is exemplary and permissive. *Id.*, 3:43-45 (“one example”), 1:57-60 (embodiments using broad

“with a tag”). It does not compel the narrow construction Patent Owner proposes.

**C. “API”**

The Board correctly construed “API” when it found “the API ‘may include’ the functionality of the engine”; it “need not be separate from the engine executing on the server.” ID, 10. This is supported by the intrinsic record. EX1001, 7:22-25, 5:1-12, 7:51-56, 9:3; *infra* § II.C.1.

Patent Owner now seeks another unsupported construction that should also be rejected, arguing “API” means “a defined programmatic interface that specifies the inputs a calling system must supply and the output the receiving system will return.” POR, 50.

**1. The API may include the application functionality**

First, Patent Owner contends that the Board’s construction reads “API” out of the claims, and the API cannot be collapsed with the compute engine. *Id.*, 40-41; *see also id.*, 41-43 (arguing that EX1001, 7:10-25, discusses an unclaimed, alternative embodiment). Not so.

As the Board found, the specification provides: “the API may include the functionality of the engine and not necessarily be considered a discrete mechanism from the computing engine functions.” EX1001, 7:22-25; ID, 10. The specification also identifies “API/compute engine” as one component, and explains “[i]n some instances, only an API is referenced[,] but it should be recognized that such reference

includes not only the interface but also the associated compute routine, function, and the like.” EX1001, 5:1-12, 7:51-56, 9:3. The plain claim language of “application programming interface (API)” of the CDN is, thus, broad enough to capture the full scope contemplated in the specification.

Patent Owner instead focuses on this language’s placement following “[i]n an alternative implementation” to contend it is meant to signal an embodiment in which “the CDN handles address resolution internally” instead of by “call[ing] an external API exposed by the CDN.” POR, 42-43. In Patent Owner’s view, the claims cover the latter. *Id.* But when properly read, the paragraph explains other implementations exist, some implementations “may also involve an API,” and “API may include the functionality of the engine and not necessarily be considered a discrete mechanism from the computing engine functions.” EX1001, 7:10-25. That an alternative might not use “a customer origin server or other devices outside the CDN” (*id.*) does not detract from express disclosure that an API, as contemplated by the specification and claims, can comprise the engine.

Patent Owner next points to “API 26” and “computing engine 30” of Figure 1 to contend the two components must be separate. POR, 43. But Figure 1 is “one example network configuration.” EX1001, 3:43-45. And Patent Owner’s efforts to narrow the claims to a single embodiment should be rejected. *Liebel-Flarsheim*, 358 F.3d at 913.

Finally, Patent Owner contends that “API” is rendered superfluous unless it is discrete from the computing engine. POR, 43-44. Not so. Claims 11 and 15 recite an API that receives information for the CDN, but the claims flexibly leave open where generating the modified embedded resource may occur (i.e., at the API or elsewhere in the CDN). EX1001, 10:59-11:9, 12:5-20. This comports with the specification’s definition that an API may or may not include the compute-engine functionality. *Id.*, 7:16-25. “API” is not superfluous if the Board’s construction is adopted.

## **2. The API does not require a specific input-output**

Patent Owner’s new<sup>3</sup> construction of “API” requires a “specific input-output relationship.” POR, 49-51. It argues that any other construction improperly captures “forwarding a request through an internal CDN pipeline.” *Id.* This is unsupported by the intrinsic record.

The specification allows for flexible inputs, explaining “[t]he API may obtain information used in determining the address from various sources.” EX1001, 5:16-34, 6:13-23. This “information” may be in the “request from the origin server,” or it

---

<sup>3</sup> Patent Owner previously submitted a declaration by Dr. Russ explaining that an API is “the bridge establishing the connection” between a client and server. ID, 12-13. Patent Owner now seeks to cast aside that definition, proposing a narrower input-output-based construction. POR, 49-51.

may be obtained via other means—there is no strict formula. *Id.* For example, “the origin server may obtain geographic information for the client, ... or may transmit the IP address to the API, which may obtain geographic information for the client.” *Id.* It may pass “policy information, political information, restrictions, etc.,” but this “may also be stored separately at the CDN or otherwise separately accessible by the CDN.” *Id.*, 5:65-6:23. So too may the API provide outputs in different forms: “API returns an absolute URL ..., and/or a list of hostnames and/or IP addresses.” *Id.*, 6:50-53. Requiring a specific interface having a “specified input-output contract,” as Patent Owner contends, introduces concepts found nowhere in the claim language or specification. POR, 51.

Patent Owner’s alleged differentiation between claims 1, 11, and 15 also fails. *Id.*, 45-46. It argues that claim 1 “encompasses broader forms of communication between the ‘origin server’ and the ‘content delivery network’ aside from calling an exposed API,” whereas claims 11 and 15 recite an API. *Id.* Not so. Claim 1 *does not require* that the origin system pass information to the CDN; it simply recites “*using* at least one delivery parameter to obtain, by the origin system, a modified embedded resource from a” CDN, without also requiring the CDN to receive the delivery parameter from the origin system. EX1001, 10:5-18. It logically follows that claim 2 introduces an API because it recites steps for “passing information” to the CDN. *Id.*, 10:19-33. The Board’s construction does not render “API” superfluous in claims 11

and 15 because those claims recite specific steps for passing information to the CDN that claim 1 does not. *Id.*, 10:5-18, 10:59-11:9, 12:5-20.

### **III. The Petition Establishes Claims 1-15 Are Unpatentable**

#### **A. Verma Discloses the Claimed “direct link”<sup>4</sup>**

As the Petition explains, Verma discloses a prepended URL that “provides a direct link to a CDN node ..., as it ‘comprises a link to a content server or a cache server[,]’ allowing a client to directly contact the node” to receive content. Pet., 23-24; EX1003, ¶¶119-121. No more is required. *Supra* § II.A.

Patent Owner contends this mapping “equates ‘direct link’ with any URL that, when followed, ultimately reaches a particular cache server.” POR, 22. Not so. Verma’s URL “provides a direct path bound to a single cache server node,” which is not just any URL that may reach a particular cache server—it is a URL *directly pointing to only one server*. Pet., 23-24. Verma’s URL precludes DNS from selecting the node because the specific node is selected and returned to the client before the client contacts any DNS. Verma’s URL is also unlike the “translation code” embodiment that Applicant distinguished during prosecution, which required executing translation code rather than directly providing a specific node. EX1002, 70-72.

---

<sup>4</sup> Google does not rely on Raciborski or Lewin for the “direct link.” POR, 25-27.

Patent Owner also contends that Verma simply “substitutes a CDN hostname” instead of using “an IP address,” and thus cannot disclose a “direct link” since DNS processing is required to resolve the hostname. POR, 22-25. This contention relies on Patent Owner’s construction, which lacks intrinsic record support and deviates from Patent Owner’s previous litigation statements. *Supra* § II.A.

To the extent the alleged invention purports to avoid DNS, node selection is the focus. *Supra* § II.A.3. Verma teaches node selection that does not require DNS. Verma’s prepended/rewritten URL is “a direct link to a CDN node” because node selection is performed by Verma’s broker; rather than using DNS to select the node, Verma’s broker returns a modified embedded resource to the content provider “provid[ing] a direct path bound to a single cache server node.” Pet., 23-24 (citing EX1005, [0027], [0029], [0037], FIG. 2). Dr. Mowry explains, at most, Verma uses DNS to translate a hostname to a numerical IP address of a node that is already selected:

[W]hen the host name has a unique mapping to a specific IP address, it will always return the same mapping. And, in this case, the content delivery network has selected this host name so *because it corresponds directly to a particular cache server*. So although it goes through DNS[,] it will always return the same IP address. And so, it is an absolute URL. *It is pointing to a specific cache server*.

EX2016, 57:6-17. This translation always returns *the same IP address* because

Verma's broker returns a modified embedded resource pointing to a specific node. *Id.* Patent Owner does not dispute Verma selects a node *without* DNS. POR, 21-27. Nor does it dispute Verma's prepended URL corresponds to a single IP address. *Id.* Instead, it focuses on Verma's limited use of DNS to translate a "hostname to an IP address." *Id.* But this is irrelevant for purposes of the claims. *Supra* § II.A. Verma's broker provides a link directly pointing to a specific node without using any DNS to select that node. This meets the claims.

**B. Verma and Lewin Render Obvious the Claimed "tag"**

**1. Lewin discloses an embedded resource "with a tag"**

Lewin discloses an embedded resource "with a tag" because the tag is next to, associated with, and identifies the embedded resource. Pet., 47-48. As the Petition explains, Lewin's URLs are "specif[ied]" by "tags," and thus these tags identify the URLs. *Id.* (citing EX1007, [0028], [0030], [0049]; EX1003, ¶198). Lewin's Figure 6 shows the placement of "tag[s]" "with" the URLs (embedded resources):

```
<html>
<body>
<!--personalized greeting (1)-->
Hello ${HTTP_COOKIE{"username"}}

<!--targeted ad (2)-->
<esi:choose>
<esi:when test="${GEO{country_code}}='US' ">
  <esi:include src=us_ad.html/>
</esi:when>
<esi:when test="${GEO{country_code}}='Canada' ">
  <esi:include src=canada_ad.html/>
</esi:when>
<esi:otherwise>
  <esi:include src=generic_ad.html/>
</esi:otherwise>
</esi:choose>

<!--Static navigation bar (3)-->
<a href=...> <a href=...> <a href=...> <a href=...>

<!--Personalized recommendations (4)-->
<esi:include src=recommendations.html/>

<!--Static links, copyright,etc (5)-->
<a href=...> <a href=...> <a href=...> <a href=...>
Copyright 2001, etc.
</body>
</html>
```

FIG. 6

EX1007, FIG. 6 (tags in blue); Pet., 47-48. This meets the “with a tag” limitation.

*Supra* § II.B.

Patent Owner’s argument distinguishing tag identification at an origin server from tag identification at an edge server (POR, 31) is also unavailing for the reasons discussed below, for it would have been obvious to parse Lewin’s tags on Verma’s origin system. *Infra* § III.B.2.b.

**2. A POSITA Would Have Combined Verma and Lewin**

**a. Requesting an “HTML document”<sup>5</sup> was conventional**

The Petition explains that “requesting ... HTML pages from a client browser[] was well-known, routine, and conventional.” Pet., 5-7; EX1009, FIG. 2, 5:23-32; EX1003, ¶¶73-80; EX1014, 3:13-15; EX1013, 15:20-25. This was advantageous, as “typing lengthy URLs into a browser for each content item sought is inconvenient.” Pet., 45-47, 21 (citing EX1003, ¶115; EX1016, 2:24-26). A POSITA would have been motivated to request an HTML page having embedded links having tags to advantageously enable a browser to survey movies without needing to manually type a lengthy URL to access each movie (which is Verma’s existing method). *Id.* Moreover, the Petition identifies additional advantages of embedding URLs in webpages, such as personalizing content and improving performance. *Id.*, 21 (citing EX1009, 2:31-37, 2:43-57, 3:4-16; EX1003, ¶¶113-115; EX1005, [0007]; EX1007, [0006], [0028], [0039]-[0040]), 48-49 (citing EX1003, ¶¶199-211). Patent Owner does not address this. POR, 33-34. Still, this advantageous method for browsers to access webpages would have been obvious. Pet., 48-49, 21.

---

<sup>5</sup> Ground 3, claim 13 relies on Lewin’s HTML document, and only the motivation to combine for the HTML document is required for claim 13. Pet., 62.

**b. Verma and Lewin render obvious providing a tag with the original embedded resource and parsing that tag to initiate fetching a modified embedded resource**

The Board correctly found the POSITA would have been motivated to use Lewin’s tags with Verma. ID, 21. As the Petition explains, Lewin explains “the ability to fetch and include files that comprise a web page” is a “central” webpage-development feature, and that “tag[s]” “may be used for this purpose.” Pet., 49-50 (citing EX1007, [0028], [0030], [0049]; EX1003, ¶212). Lewin’s tags identify URLs, and a POSITA would have been motivated to incorporate tags in Verma to have a uniform, efficient way to identify URLs. *Id.*, 49-50 (citing EX1007, [0049]; EX1003, ¶¶213-217), 5-7 (citing EX1003, ¶¶73-80). The Board agreed, explaining “this appears to provide adequate reason to combine.” ID, 21. Patent Owner’s arguments fail to rebut this showing. POR, 32.

*First*, Patent Owner argues “Verma already discloses markup for identifying URLs,” and “Petitioner provides no reason why [the] POSITA would have sought to modify Verma’s existing markup scheme,” arguing that the combination is purpose-defeating redundancy. *Id.*, 32-33. Not so.

There is no redundancy in the Verma-Lewin combination because it does not require replacing an existing tag scheme in Verma; none is expressly disclosed in Verma *with the original embedded resource*, which is why Lewin is incorporated. Pet., 47-52, 54-56. As the Petition explains, “Verma suggests URLs with tags in its

modified embedded resource,” and that helps inform what the POSITA would have understood. *Id.*, 51. Indeed, Verma’s “suggest[ion of] URLs with tags in its modified embedded resource” shows using Lewin’s tags with Verma’s embedded resource “would have required no more than the application of conventional technology” (tags in an HTML document). *Id.*; EX1005, [0029]; *LBT IP I LLC v. Apple Inc.*, No. 2022-1613, 2023 WL 3914920, at \*7 (Fed. Cir. June 9, 2023) (teachings related to “different signaling circuitry” not redundant); *Cisco Sys., Inc. v. K.Mizra LLC*, No. 2022-2290, 2024 WL 3841809, at \*5-6 (Fed. Cir. Aug. 16, 2024) (Board erred “by concluding that [first reference’s message] provides the same benefit as [secondary reference’s notification]” because the first did not include such disclosure). Patent Owner’s reference to Verma’s “href” tag is misplaced; it conflates this disclosure, which pertains to a modified embedded resource (EX1005, [0029]), with Lewin’s use of tags with an original embedded resource (EX1007, [0049]-[0050]). POR, 32-33. Patent Owner’s expert, Dr. Russ, never contends that these “href” tags are with the original embedded resource. EX2015, ¶77. There is no redundancy.

Even assuming that Verma’s conventional HTML tags were also present with the original embedded resource, Lewin’s tags provide additional advantages. Lewin expressly discloses standard HTML tags (“href” tags) and its server side include tags (e.g., esi) in the same HTML document:

```
<html>
<body>
<!--personalized greeting (1)-->
Hello ${HTTP_COOKIE{"username"}}

<!--targeted ad (2)-->
<esi:choose>
<esi:when test="${GEO{country_code}}='US' ">
    <esi:include src=us_ad.html/>
</esi:when>
<esi:when test="${GEO{country_code}}='Canada' ">
    <esi:include src=canada_ad.html/>
</esi:when>
<esi:otherwise>
    <esi:include src=generic_ad.html/>
</esi:otherwise>
</esi:choose>

<!--Static navigation bar (3)-->
<a href=...> <a href=...> <a href=...> <a href=...>

<!--Personalized recommendations (4)-->
<esi:include src=recommendations.html/>

<!--Static links, copyright,etc (5)-->
<a href=...> <a href=...> <a href=...> <a href=...>
Copyright 2001, etc.
</body>
</html>
```

*FIG. 6*

EX1007, FIG. 6. Lewin also explains that these server-side include tags offer additional advantages beyond tag identification, like “the ability to fetch and include files that comprise a web page,” which is a “central” webpage-development feature. Pet., 49-50 (citing EX1007, [0028], [0030], [0049]; EX1003, ¶212). There is no redundancy whenever the POSITA “would still perceive benefits in implementing” the combined features. *Apple Inc. v. Gesture Tech. Partners, LLC*, 127 F.4th 364, 371 (Fed. Cir. 2025).

*Second*, Patent Owner contends adding Lewin's tags to Verma would merely introduce "unnecessary and undesired complexity." POR, 33. This misunderstands the Petition's combination. Lewin supplies express disclosure where no tag scheme is disclosed with the embedded resource, and thus there is no undesired complexity. Pet., 47-52, 54-56. Even assuming that Verma's "href" tags were with the embedded resource, Lewin's disclosure of "href" and server side includes tags together, which provides additional advantages and eliminates possible hindsight. EX1007, FIG. 6.

*Third*, Patent Owner argues combining Lewin with Verma "would not achieve the claimed invention" as "Lewin's ESI tag-processing architecture is fundamentally incompatible" with element 1[b]. POR, 32, 34-35. Patent Owner argues, "[i]n Lewin, that processing direction is reversed." *Id.*, 34-35. This argument ignores that a prior art reference is relevant for all it teaches, and the combination does not seek to bodily incorporate Lewin into Verma.

The combination uses Lewin for its broad teachings of identifying tags with embedded resources to initiate fetching. Pet., 47-52, 54-60. Lewin's tags and their related identification apply to "any server[-]side scripting language or other server-based functionality." EX1007, [0028]. Although Lewin's "preferred embodiment" parses tags at an edge server, when tags are parsed to identify URLs, Lewin explains the tags may be "other server[-]side scripting language[s]," not just those implemented on an edge server. *Id.*, [0049]; EX2016, 61:17-63:13, 64:4-21, 65:7-

66:19, 73:17-74:9, 82:11-16. Patent Owner disregards the breadth of such disclosure and its relevance to Verma. *Shockwave Med., Inc. v. Cardiovascular Sys., Inc.*, 142 F.4th 1371, 1384 (Fed. Cir. 2025) (“standard for obviousness requires consideration of the prior art combination taken as a whole”).

Further, the combination does not bodily incorporate the processing direction of Lewin’s preferred embodiment into Verma, nor does obviousness require such. “‘The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference,’ ... but rather whether ‘a skilled artisan would have been motivated to combine the teachings of the prior art.’” *Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (citations omitted).

Verma teaches claim 1’s processing direction from client device to origin and back. EX1005, FIG. 1, [0025]-[0027]; Pet., 43-52, 56-60. The combination relies on Lewin’s broad teachings of how a server advantageously “parses the HTML page looking for tags that specify dynamic assembly instructions including[] ... URLs” to fetch. Pet., 55; EX1007, [0028], [0049]-[0050]; EX1003, ¶¶205-206, 234, 243. As correctly noted at institution, the relevant inquiry is whether it was obvious to parse and identify tags with embedded resources on Verma’s content provider server, not whether Lewin’s primary embodiment bodily incorporates into Verma. *Allied Erecting*, 825 F.3d at 1381; ID, 21.

Although the Petition cites an example of Lewin's ESI tags in Figure 6, this does not detract from Lewin's broader teachings. Pet., 47-48. A POSITA would have understood Lewin's teachings apply to Verma's conventional processing direction (client device to origin server and back). *Id.* Lewin explains constructing a webpage "conventionally 'requir[es] a full round-trip from browser to origin server and back.'" EX1003, ¶¶205-206; EX1007, [0008]; Pet., 48. As Dr. Mowry explained, "Lewin seeks to improve upon this conventional system," and "Lewin describes conventional web content access framework, i.e., the concept of requesting an HTML page, parsing the HTML for [tags] ..., and then fetching or modifying the embedded content before serving the page to the client user." EX1003, ¶¶205-206. "[A] POSITA would have been motivated to combine Lewin's teachings with Verma's that ... use[] conventional content requests between a browser and content provider." *Id.*, ¶¶205-207. That Lewin describes a primary embodiment with a different processing direction does not impact its combinability to implement tag parsing on Verma's origin server. *Id.*

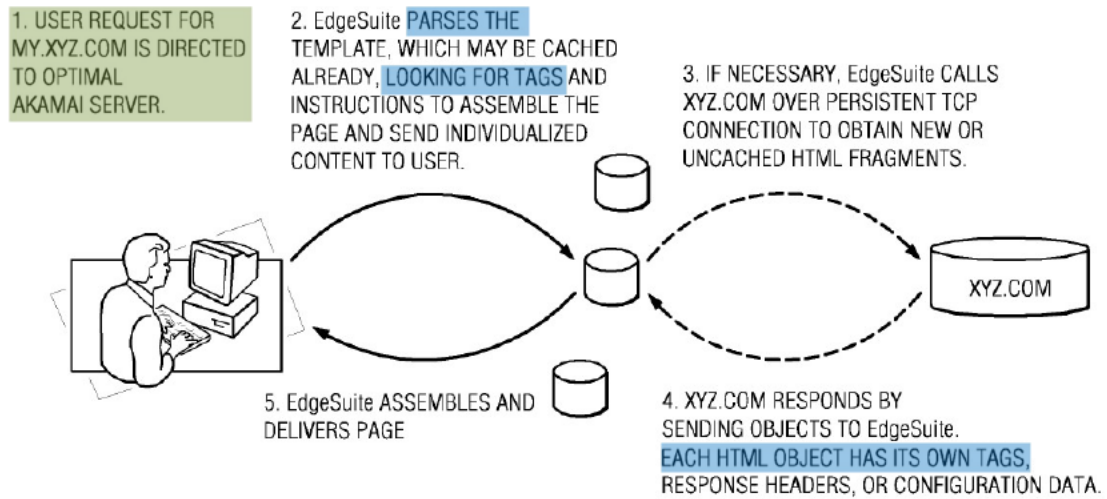
**3. Verma and Lewin render obvious obtaining a modified embedded resource upon identification of a tag**

Patent Owner contends the claims "impose[] a specific functional sequence," wherein the origin system identifies a tag, and that triggers the origin system to use a delivery parameter to obtain a modified embedded resource from the CDN.

POR, 35-36. It argues the Verma-Lewin combination “leaves the connective tissue of this sequence entirely unexplained.” *Id.* This disregards the Petition’s mapping.

The Petition explains that Lewin discloses that a server “parses the HTML page looking for tags” (identifying tags) that specify URLs, and this identification initiates incorporating content into the final HTML page (which could be “CDN-modified resource locators,” i.e., modified embedded resources). Pet., 55, 58 (citing EX1007, [0028], [0049]-[0050]; EX1003, ¶¶234, 243). Lewin’s tags trigger fetching content because tags are used to “fetch and include files that comprise a webpage,” and these tags “provide a way” for a “server to add dynamically-generated content to an existing HTML page.” Pet., 47-50, 55; EX1007, [0028], [0030]; EX1003, ¶¶197-198, 212-213, 234, 243.

Because Lewin parses an HTML page looking for tags specifying “dynamic assembly instructions,” a POSITA would have understood that tag identification initiates assembly, like fetching and incorporation of content “into the final HTML page.” Pet., 55, 58; EX1007, [0049]-[0050]; EX1003, ¶¶234, 243. Lewin’s final HTML page “may contain URLs or other CDN-modified resource locators,” which a POSITA would have understood constitute fetched modified embedded resources. Pet., 55, 58; EX1007, [0050]; EX2016, 59:15-60:14, 62:18-63:13, 66:8-19, 67:19-68:11, 75:8-16, 77:6-7, 78:8-18, 79:15-16, 80:18-81:9.



EX1007, FIG. 9.

The Petition then explains how Lewin’s tag parsing and fetching would have combined with Verma: “It would have been obvious for a POSITA to parse an HTML webpage for tags ... to utilize and identify advantageous embedded content by providing a solution for dynamic identification and execution of the URLs.” Pet., 56; EX1003, ¶235. Likewise, a “POSITA would have reasonably expected success in ‘pars[ing] the HTML page looking for tags’ in Verma to identify URLs for objects to fetch.” Pet., 56; EX1003, ¶237. Elsewhere, it explains that “[i]t would have been obvious for Verma’s ‘URL 28’” (embedded resource) “to be embedded in an HTML page, and specified by a ‘tag[,]’” and that a “POSITA would have reasonably expected success [with] implementing Lewin’s ‘request[.]’ for an ‘HTML page’ with ‘URLs’ designated by ‘tags’ in Verma.” Pet., 49-50; EX1003, ¶¶212, 218-219; EX1005, [0025]; EX1007, [0028], [0030], [0049].

It would have been obvious Lewin’s tag parsing would initiate Verma’s URL rewrite mechanism, where Verma’s content provider evaluated an HTML document with Verma’s URLs embedded, like Lewin’s tags initiate fetching content (which may be CDN-modified links). Pet., 49-50, 56; EX1003, ¶¶212, 218-219, 235, 237; EX1005, [0025]; EX1007, [0028], [0030], [0049]-[0050]. This shows how the combination maps to the claim element. There is no purported gap filling. POR, 37-39. The Board (correctly) rejected Patent Owner’s contention that the Petition does not explain how Lewin’s tags initiate obtaining a modified embedded resource. ID, 19-20. It should reject those same arguments again here.

**C. Verma Discloses an API**

**1. The Board correctly found Verma discloses an API**

The Board correctly found Verma discloses an API. ID, 12-14. As the Petition explains, “Ver[m]a’s client browser sends a URL 28 to a content provider 22, which is then forwarded to broker 25,” and broker 25 “selects the appropriate cache server to serve the content and returns a re-written URL to the content server that received the client request.” *Id.*, 13 (citing EX1003, ¶67; EX1005, [0012], [0026]-[0027], [0037]); Pet., 10-12. The Board found Dr. Mowry’s testimony persuasive. ID, 13. It noted that “this function of Ver[m]a’s broker fulfills Dr. Russ’s characterization of an API as acting as bridge establishing a connection between client and server,” as well as “Dr. Russ’s characterization of an API as ‘an interface that allows the client

to communicate with an application executing on the server.” *Id.*, 13-14 (citing EX2010, ¶¶50, 53). Patent Owner’s arguments do not alter this determination.

Patent Owner’s argument that Verma does not disclose an API relies on its new construction (POR, 49-51), which should be rejected. *Supra* § II.C. It does not meaningfully dispute Verma’s disclosure of an “API” under the proper construction. POR, 39-51.

Patent Owner instead tries to walk away from the original definition it offered in its preliminary response, as supported by its expert’s first declaration. *Id.*, 49-50. Patent Owner contends that Dr. Russ’s definition “was not intended to define the metes and bounds of the API limitation.” *Id.* It admits its initial definition used “Dr. Russ’s general characterization of an API,” and “Dr. Russ’s description of an API as a ‘bridge’ was a general explanation of what an API is as a concept in the field of computer science.” *Id.* Defining the metes and bounds of the claim is exactly what Dr. Russ did. POPR, 22 (citing EX2010, ¶¶50). Patent Owner cannot walk away from this construction simply because the Board credited it when finding that Verma discloses an “API.”

**2. Verma also discloses an API even under Patent Owner’s new construction**

Even if Patent Owner’s new “API” definition is adopted, Verma discloses “a defined interface contract, defined parameters, or a defined output,” and accordingly

discloses an “API.” POR, 50-51.

First, Verma discloses a “defined interface contract.” Patent Owner contends Verma is only a “CDN-internal scheduling and routing component,” instead of “an interface through which an external origin server invokes CDN” functionality, for it simply “‘negotiate[s] with the [CDN]’ to ‘determine the start time, end time, and the cache server where the content file will [be].’” *Id.*, 46-47 (quoting EX1005, [0038]). This fails to capture Verma’s full disclosure. Verma states “content server 22 will negotiate with the content delivery network (CDN) through the broker 25,” and the content provider “has a business relationship with the [CDN],” confirming Verma’s broker is a dedicated interface for the content provider (origin system) to contact the CDN. EX1005, [0038]; Pet., 13-14 (quoting EX1005, [0025]; EX1003, ¶92). Like the ’322 patent, Verma’s broker provides “a convenient and efficient way for disparate systems to uniformly and predictably pass information to the computing engine[,] and for the computing engine to return information.” EX1001, 7:16-20; Pet., 11-12; EX1003, ¶87.<sup>6</sup>

---

<sup>6</sup> Dr. Mowry did not “refuse[] to answer ... whether he had even ‘consider[ed] any distinction between calling an API or otherwise querying the CDN.’” POR, 48-49. Patent Owner sought answers “outside of the context of the ’322 patent.” EX2016,

Second, Verma discloses defined inputs and outputs. For example, Verma's content provider "request[s]" the broker "for a content file delivery to a location close to the client" and provides delay tolerance. EX1005, [0015], [0025]-[0026]. "[L]ocation" and delay tolerance are defined parameters that Verma's content provider provides to the broker to obtain a modified embedded resource. *Id.* Further, Verma's broker returns a prepended URL to the content provider, and that prepended URL is a defined output. Pet., 25-26; EX1005, [0012], [0022], [0026], cl. 18; EX1003, ¶¶124-126. Thus, even under Patent Owner's flawed construction (*supra* § II.C), Verma's broker still constitutes the claimed "API."

#### **IV. Conclusion**

For the reasons above and in the Petition, Google requests the Board find claims 1-15 unpatentable.

Dated: June 8, 2026

Respectfully submitted,

/Erika H. Arner/

Erika H. Arner, Lead Counsel  
Reg. No. 57,540

---

91:15-19. Dr. Mowry explained that his declaration mapped prior art with an API (Verma's broker), and that he could complete his analysis using that art. *Id.*, 113:7-20, 92:19-124:6.

**CERTIFICATE OF COMPLIANCE**

Pursuant to 37 C.F.R. § 42.24(c)(1), the undersigned hereby certifies that the foregoing **Petitioner's Reply to Patent Owner's Response** contains 5,598 words, excluding the parts exempted under 37 C.F.R. § 42.24(c), as measured by the word-processing system used to prepare this paper.

/Erika H. Arner/

Erika H. Arner, Lead Counsel  
Reg. No. 57,540

**CERTIFICATE OF SERVICE**

The undersigned certifies that a copy of the foregoing **Petitioner's Reply to Patent Owner's Response** was served electronically via email on June 8, 2026, in its entirety on the following:

Jason D. Eisenberg  
jasone-PTAB@sternekessler.com

Daniel S. Block  
dblock-PTAB@sternekessler.com

Steven M. Pappas  
spappas-PTAB@sternekessler.com

PTAB@sternekessler.com

Dated: June 8, 2026

/Daniel E. Doku/  
\_\_\_\_\_  
Daniel E. Doku  
Senior Litigation Paralegal  
Finnegan, Henderson, Farabow,  
Garrett & Dunner, LLP