

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner

v.

SANDPIPER CDN, LLC,
Patent Owner

Case IPR2025-00826
U.S. Patent No. 9,021,112

**PATENT OWNER PRELIMINARY RESPONSE
UNDER 37 C.F.R. § 42.107(a)**

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PATENT OWNER’S UPDATED EXHIBIT LIST

Exhibit No.	Description
2001	“Cloud CDN: content delivery network,” <i>Google Cloud</i> , accessed at https://cloud.google.com/cdn (last accessed July 2, 2025)
2002	Non-Final Office Action, U.S. Application No. 14/164,925 (Dec. 1, 2015)
2003	National Judicial Caseload Profile – United States District Courts (March 2025)
2004	<i>Sandpiper CDN, LLC v. Google LLC</i> , 2:24-cv-03951, ECF No. 1 (C.D. Cal. May 10, 2024)
2005	<i>Sandpiper CDN, LLC v. Google LLC</i> , No. 2:24-cv-03951, Invalidity Contentions (April 22, 2025)
2006	<i>Sandpiper CDN, LLC v. Google LLC</i> , No. 2:24-cv-03951, ECF No. 82 (C.D. Cal. June 24, 2025)
2007	<i>Sandpiper</i> , No. 2:24-cv-03951, ECF No. 28 (C.D. Cal. Sept. 16, 2024)
2008	FAQs for Interim Processes for PTAB Workload Management, accessed at https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management
2009	<i>Gestures Tech. Partners LLC. v. Apple Inc. et al.</i> , Petition for Writ of Certiorari, Case. No. 24- (filed June 11, 2025)
2010	<i>Intentionally Left Blank</i>
2011	<i>Intentionally Left Blank</i>
2012	Interim Processes for PTAB Workload Management Memorandum (March 26, 2025)
2013	Declaration of Samuel H. Russ, Ph.D.
2014	Curriculum Vitae of Samuel H. Russ, Ph.D.

Exhibit No.	Description
2015	“CDN Stands For Content Delivery Network: History and Evolution,” <i>BlazingCDN</i> , accessed at https://blog.blazingcdn.com/en-us/cdn-stands-for-content-delivery-network-history-and-evolution (last accessed August 7, 2025)
2016	“What is a CDN (Content Delivery Network)?” <i>Amazon Web Services</i> , accessed at https://aws.amazon.com/what-is/cdn/ (last accessed August 7, 2025)
2017	“How Anycast Works to Bring Content Closer to Your Visitors,” <i>Imperva</i> , accessed at https://www.imperva.com/blog/how-anycast-works/ (last accessed August 7, 2025)

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<i>In-Depth Geophysical, Inc. v. ConocoPhillips Co.</i> , IPR2019-00850, Paper 56 (PTAB Sept. 3, 2020)	23
<i>Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.</i> , 821 F.3d 1359 (Fed. Cir. 2016)	23
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<i>Sirona Dental Sys. GmbH v. Institut Straumann AG</i> , 892 F.3d 1349 (Fed. Cir. 2018)	24
<i>Sisvel Int’l. S.A. v. Sierra Wireless, Inc.</i> , 81 F.4th 1231 (Fed. Cir. 2023)	12
<i>TQ Delta, LLC v. Cisco Systems, Inc.</i> , 942 F.3d 1352 (Fed. Cir. 2019)	26
<i>Virtek Vision Int’l ULC v. Assembly Guidance Sys., Inc.</i> , 97 F.4th 882 (Fed. Cir. 2024)	29, 30
<i>Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.</i> , 200 F.3d 795 (Fed. Cir. 1999)	12
<i>Xerox Corp. v. Bytemark, Inc.</i> , IPR2022-00624, Paper 9 (PTAB Aug. 24, 2022)	26

I. INTRODUCTION

U.S. Patent No. 9,021,112 (“the ’112 patent”) provides novel techniques for distributing content to end users via a content delivery network. These techniques address challenges arising from increased requests for Web content, enabling content to be provided to end users with minimal latency.

Petitioner presents 10 grounds challenging the claims of the ’112 patent, where each “A” Ground is based on Glines (EX1002) and each “B” Ground is based on a combination of Glines and Gupta (EX1003). Pet., 1. Petitioner fails to establish that any of the ’112 patent’s independent claims are rendered obvious under any presented Ground.

First, for independent claim 1, the Petition fails to establish that the cited art renders obvious “causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server.” Petitioner relies on Glines’s local DNS resolver for the claimed “Internet Service Provider (ISP) DNS server,” but Glines’s local DNS resolver does not perform any address resolution, as claim 1 requires. Nor does Petitioner provide a reason to substitute Gupta’s client DNS server for Glines’s local DNS resolver.

Second, the Petition fails to establish that the cited art renders obvious the “plurality of content providers” limitations of independent claims 13, 18, 22, and 23. Petitioner uses a simple table to refer back to its analysis with respect to claim

1. But claim 1 does not recite “a *plurality* of content providers,” as required by these independent claims. Hence, nowhere does the Petition actually explain where the prior art teaches a “*plurality* of content providers,” or how Glines’s architecture would operate to support multiple content providers. This omission is fatal to Petitioner’s analysis.

Third, the Petition fails to establish that the cited art renders obvious the “switch” limitations of independent claims 13, 18, 19, 21, and 22. Although Glines mentions a Layer 4 switch, neither Glines nor Petitioner explains how that switch is used to select a content server from among a plurality of content servers, as required by these claims.

Finally, Petitioner fails to establish a motivation to combine Glines and Gupta for any “B” ground. As Patent Owner’s expert, Dr. Russ, explains, Glines and Gupta disclose fundamentally different architectures. Neither Petitioner nor its expert provide any reason why a person of ordinary skill in the art (“POSITA”) would combine Glines and Gupta, how the combination would operate, or why the combination would be successful. This failure to establish a motivation to combine is dispositive as to every “B” ground of unpatentability presented by Petitioner.

For these reasons, the Board should deny institution of this proceeding.

II. BACKGROUND

The challenged patent arises from pioneering technology directed to delivering content across a network. Content delivery networks (CDNs) provide the critical services that enable content providers like Google to quickly deliver online content to millions of consumers simultaneously over the Internet. EX2013, ¶25. The technology underlying these CDNs was made possible through a series of inventions developed by a California start-up called Sandpiper Software Consulting, LLC, a predecessor of Patent Owner Sandpiper CDN, LLC.

In the early 1990s, the World Wide Web saw increasing adoption, becoming a household staple. This mass adoption led to data congestion issues from the ever-growing number of users seeking to simultaneously access Internet content. EX2013, ¶25. A typical computer server in the 1990s could only handle a limited number of simultaneous connections before becoming overloaded. Moreover, signals take time to traverse routers and move through content-congested internet cables. Consumers living far from the physical server(s) hosting content experienced sluggish load times and high latency due to problems such as overloaded servers, congested network segments, and geographic separation. EX2013, ¶26.

In the mid-1990s, Andrew Swart and David Farber were among the first individuals to develop services that allowed content providers to distribute their

content over the Internet, while avoiding the common congestion and performance issues that plagued Internet transmission at that time. Sandpiper's solution was to deploy CDN servers around the world, replicate appropriate content from customers' origin servers to appropriate CDN servers, and transparently rendezvous end-users requesting that content to the "best" CDN server to deliver that content, all while providing their customers with control over their content and user experience. This service and its architecture was quickly imitated by many others in the industry. EX2013, ¶27.

Using solutions developed by Mr. Swart and Mr. Farber, end-users would connect to an optimal edge server—one that that was closer to them or that had available capacity. Distributing content across a network of servers alleviated data congestion issues, and allowing consumers to connect to edge servers located near them reduced latency. EX2013, ¶¶27-28. Swart and Farber developed and built systems and methods for propagating data from origin servers to edge servers (known as "caching") based on network demand and for seamlessly routing users to the optimal edge server with the correct content. Using caching to perform the replication process within the CDN framework flew in the face of conventional wisdom. EX2013, ¶28.

In 1996, Mr. Swart and Mr. Farber founded Sandpiper Networks Inc. ("Sandpiper Networks") to further develop and commercialize their novel concept

for a content delivery network. Sandpiper Networks was based in Thousand Oaks, California. There, the inventors designed and built a CDN ultimately referred to as “Footprint.” By at least May 24, 1996, the Sandpiper team had conceived techniques for delivering static and dynamic content, including streaming resources, such as audio and video, using Sandpiper’s CDN.

Sandpiper Networks labored not only to build and implement its CDN, but also to protect their groundbreaking innovation through the patent system. Recognizing that its invention could revolutionize content delivery worldwide, Sandpiper Networks (and its successor companies, including Patent Owner) filed numerous patent applications directed to its foundational CDN technology, including the patent challenged in this Petition.

By at least May 1998, Sandpiper Networks was caching content and delivering cached content to end users of content providers using its CDN. Sandpiper Networks’ first paying customer was the L.A. Times, which paid Sandpiper Networks to host the report of Independent Counsel Ken Starr on his investigation of President Bill Clinton (“the Starr Report”) beginning on September 11, 1998. Sandpiper Networks’ CDN was capable of caching, and was used to cache and deliver Internet resources including inter alia, pictures, text files, dynamic resources, and streaming multimedia resources.

In the early-to-mid 2000s, demand for CDNs exploded. EX2013, ¶¶29-32.

Sandpiper Networks continued to commercialize its technology and compete in this expanding market, doing business as various entities including Digital Island, Inc. and a company called “Level 3.” It also created Patent Owner, Sandpiper CDN, LLC (“Patent Owner” or “Sandpiper”). Other businesses also entered the market by misappropriating Sandpiper’s innovations and directly competing with Sandpiper for market share.

One such company is Google. Google built its own in-house CDN, which uses technology described and claimed by Sandpiper’s patents. Additionally, YouTube, which Google purchased in 2006, relies upon CDN technology to meet its enormous data streaming needs, as well as for Google’s video search results (powered by YouTube). EX2001. Google did not license this patented technology from Sandpiper, Level 3, and/or its predecessors. Accordingly, Sandpiper brought suit against Google in district court for patent infringement. Google filed IPR Petitions against all of Sandpiper’s asserted patents in response.

III. THE ’112 PATENT

A. The ’112 patent provides novel content delivery techniques using anycast-addressable content caching.

The ’112 patent is a divisional application of U.S. Patent Application No. 09/982,721, filed on October 18, 2001, and “relate[s] generally to information

retrieval in a network and, more particularly, to hosting and distributing content on a content delivery network such as the Internet.” EX1001, 1:16-19; EX2013, ¶33.

As the ’112 patent explains, “[a]s the Web server content provided by World Wide Web has continued to grow over time, so too has the number of users demanding access to such content.” EX1001, 1:36-38. “Unfortunately, the ever-increasing number of end users requesting Web content from Web sites has resulted in serious bandwidth and latency issues, which manifest themselves in delay to the end user.” *Id.*, 1:38-41; EX2013, ¶33.

Therefore, when offering CDN services, there is a need to respond to requests by providing content quickly and without unnecessary network traffic to more distant sources. EX2013, ¶34. Providers of CDN services, however, face challenges related to serving content in a timely manner from multiple servers while maintaining a positive user experience. EX2013, ¶34; EX1001, 1:36-59.

The ’112 patent sought to provide solutions using DNS technology and anycast addressing in a CDN context in which the DNS infrastructure routes content requests to “a content site nearest the requestor” that is able to serve the requested content. EX1001, 1:63-2:24. Such techniques allow “the load from many end users [to be] distributed among multiple systems and across different parts of the network,” and “[b]ecause DNS uses a stateless protocol (UDP) for routing, the

solution can handle anycast addressable caching without the problems associated with anycast service.” *Id.*, 2:11-24; EX2013, ¶35.

Figure 3 of the ’112 patent illustrates embodiments of “a content distribution network (‘CDN’) 60.” EX1001, 4:18.

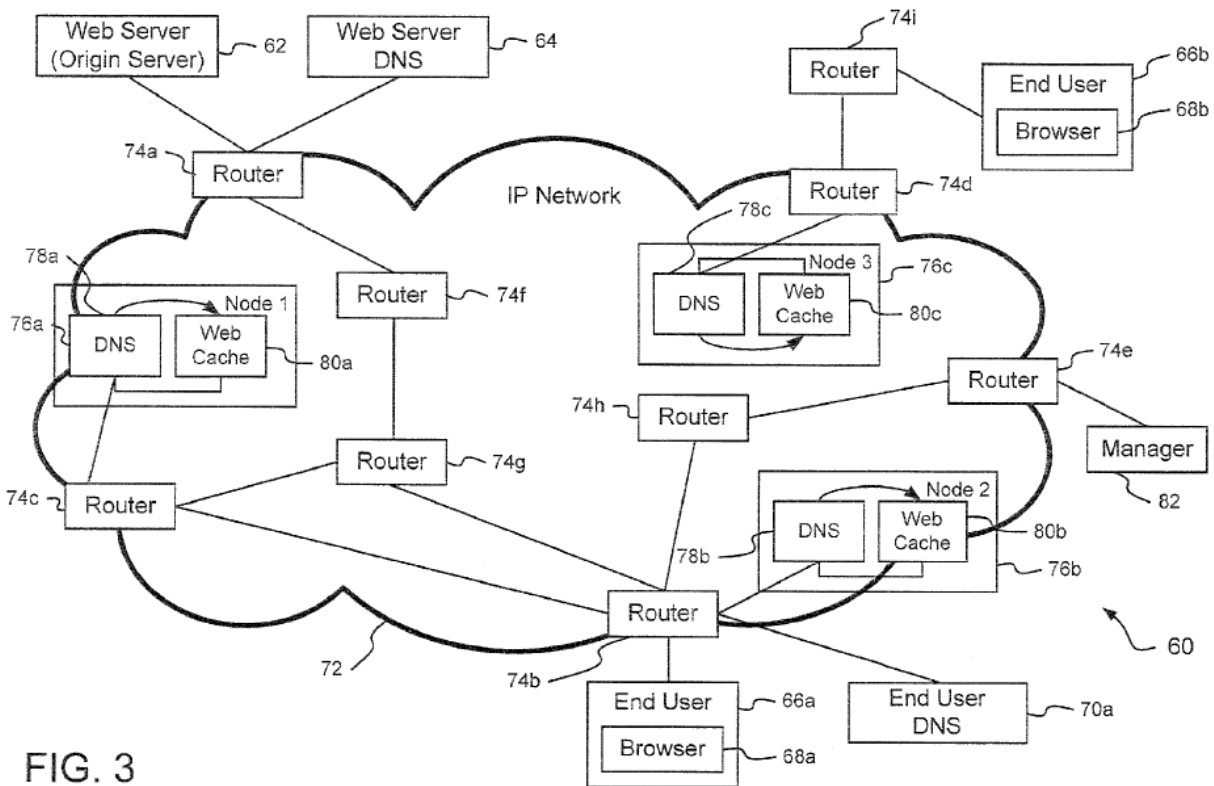


FIG. 3

EX1001, FIG. 3.

“The CDN 60 includes at least one Web server, shown as a Web server 62, a DNS system 64 for Web server 62, and end-user stations 66a and 66b, all connected to a network 72.” EX1001, 4:19-21. The end-user clients “execute Web browsers 68a and 68b, respectively.” *Id.*, 4:22-23. “Also connected to the network 72 are multiple content distribution nodes 76a, 76b and 76c, which support

distributed content delivery services for one or more Web sites on the network 72.”

Id., 4:27-30; EX2013, ¶¶36-37.

As illustrated in Figure 3, “[e]ach of the CDN nodes 76 includes a DNS system 78 coupled to and associated with a Web content server system or site 80.” EX1001, 4:34-36. Nodes 76 are “geographically dispersed ... so as to be as close as possible to various network entry points, exchanges or both.” *Id.*, 5:11-13. “The caching servers 80 have unique IP addresses,” and “[t]he DNS systems 78 share a common IP address as well as have unique IP addresses.” *Id.*, 5:19-21. As the patent explains, “[o]ne way to implement this content distribution configuration is to use an anycast address as the common address,” which is “a unicast address that is used in multiple places.” *Id.*, 5:32-35. This anycast address is advertised to end-user clients “using a dynamic routing protocol, the Border Gateway Protocol,” and when a content request is received, “the selected DNS system resolves to the address of the cache server in the DNS system’s node.” *Id.*, 5:59-6:32. In this manner, “the DNS anycast routing, in essence, serves to select the local content site (cache) from which content will be served.” *Id.*, 6:27-31; EX2013, ¶38.

B. Prosecution History

The ’112 patent was filed as U.S. Application No. 12/050,648 (“the ’648 application”) on March 18, 2008. The ’112 patent is a divisional application of U.S. Application No. 09/982,721, filed October 18, 2001. As noted below, the ’112

patent and its related family received a thorough prosecution on the merits, including multiple Office actions. During prosecution, Patent Owner filed seven information disclosure statements citing a multitude of prior-art references including U.S. Patent Nos. 6,405,252 to Gupta et al. (EX1003, “Gupta”) and 6,006,264 to Colby et al. (EX1006, “Colby”), both of which are included in Petitioner’s grounds.

During prosecution, the Office issued seven Office Actions, thoroughly evaluating multiple prior-art references, before allowing the claims. EX1007, 64-348. Of note, Patent Owner amended independent claim 1 during prosecution to clarify its operation:

1. (Currently Amended) A method of content delivery in a network, the method comprising:
 - (A) providing a plurality of Domain Name System (DNS) servers associated with a Content Delivery Network (CDN), said plurality of CDN DNS servers sharing a common anycast address, wherein each CDN DNS server is associated with a respective plurality of content servers;
 - (B) causing said plurality of CDN DNS servers to be authoritative for a hostname associated with a content provider by causing said common anycast address to be associated with said hostname;
 - (C) responsive to a request for content associated with the content provider and issued by a client, said request including at least said hostname,
 - (c1) causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server ~~associated with an Internet Service Provider (ISP)~~; and then
 - (c2) by one of said plurality of CDN DNS servers, resolving said hostname to identify an IP address for use by the client to retrieve the content from a content server.

EX1007, 132.

To differentiate from the cited art, Patent Owner explained that independent claim 1 “includes: (c1) causing the hostname to be resolved to the common anycast address by an ISP DNS server; and then (c2) by one of said plurality of CDN DNS servers, resolving said hostname to identify an IP address for use by the client to retrieve the content from a content server.” EX1007, 139. Thus, as the Patent Owner explained, “in response to a request associated with a content provider (the request including a hostname), the hostname is resolved to the common anycast address by an ISP DNS and then to an IP address for one of the content servers by one of the CDN DNS servers.” *Id.*, 140 (emphasis in original). In other words, claim 1 requires “two DNS servers performing two resolves,” which none of the prior art taught. *Id.*, 36.

Upon consideration of this and other arguments, the Examiner allowed the claims. EX1007, 10. The ’112 patent issued on April 28, 2015. EX1001, (45).

C. Level of Ordinary Skill in the Art

A POSITA is presumed to be aware of all pertinent art. A POSITA possesses the “understandings and knowledge reflected in the prior art,” and thinks along conventional wisdom. *See Abbott Labs. v. Andrx Pharms., Inc.*, 452 F.3d 1331, 1336 (Fed. Cir. 2006). At this stage, Patent Owner submits that the Board does not need to resolve the appropriate level of skill for a POSITA for purposes of

deciding institution because the Petition fails under any reasonable articulation of a POSITA.

D. Claim Construction

Absent lexicography or disavowal, claim terms in an IPR are given their plain and ordinary meaning in light of the specification and prosecution history. *Sisvel Int’l. S.A. v. Sierra Wireless, Inc.*, 81 F.4th 1231, 1236 (Fed. Cir. 2023). At this preliminary stage, no term requires express construction beyond its plain and ordinary meaning, as would have been understood by a POSITA at the time of the invention in light of the specification and the patent’s prosecution history. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

IV. OVERVIEW OF THE PRIMARY REFERENCES

A. Glines

Glines discloses a “technique for redirecting client computer requests for content files to the closest replica of the requested content, by using anycast messaging.” EX1002, Abstract. In Glines, name servers are distributed throughout the network and are “addressable via a common anycast address, as well as being individually addressable via a unicast address unique to each such name server.” *Id.*, 6:8-11. Each name server is paired with a content server “that contains (or can serve) desired content file replicas via unicast addressing.” *Id.*, 6:11-13. “Each name server also advertises itself as being authoritative for the domains associated

9:18-21. Glines's purported "invention uses a particular addressing scheme to advertise the availability of alternative or replica name servers 53-1, 53-2, 53-3 for the domain located at the origin server 40," and "[t]he name servers 53-1, 53-2, 53-3 are peered with content file servers 51-1, 51-2, 51-3 that contain replica copies of files stored at the origin server 40." *Id.*, 10:19-25.

When a user enters a URL into the web browser, "[t]he DNS resolver 18 determines whether or not the requested content file is available locally." EX1002, 13:27-14:1. "For example, it determines if 'example.com' is located in the local web server 20." *Id.*, 14:1-2. If the content is not available locally, "a request to resolve the location of 'example.com' is then sent to a root DNS server 38," which "will be recursively worked through multiple root servers associated with the Internet 30 (not shown in Fig. 1) to resolve the IP address for a DNS server authoritative for the requested domain name." *Id.*, 14:8-12. The root DNS server returns the common anycast address for the authoritative name server, and "the browser then sends out a DNS request for the IP address of 'www.example.com,'" which is "formulated as a UDP datagram specifying the common anycast address." *Id.*, 15:6-10; *see also id.*, 7:6-12. "The server pair that receives the request then responds by reporting the unique (unicast) address of the associated content replica server" *Id.*, 7:18-19, 15:26-16:2. The browser then sends a request to the

reported unicast address of the content replica server to retrieve the requested content. *See id.*, 7:20-22, 16:3-8; EX2013, ¶¶46-47.

B. Gupta

Gupta discloses “a network of point of presence (POP) computers that provides a solution for integrated content hosting and traffic management.” EX1003, 2:5-8. In contrast to Glines, which resolves client requests to anycast IP addresses, Gupta uses only unicast addressing in its DNS resolution. EX2013, ¶48; EX1003, 6:4-6. When a user requests a webpage with a domain within the POP network, “[t]he user’s computer sends a request for name resolution of the domain name they are requesting content from to the configured local DNS server (LDNS) for that users computer.” EX1003, 2:24-29. The LDNS resolves the IP address by sending a query to an authoritative DNS server for the domain name. *See id.*, 2:29-33.

The authoritative DNS server identifies a subset of servers on the POP network addressable by the requested domain name, and “selects the optimal server/servers for the user based on rules defined in the POP network configuration.” EX1003, 2:37-47. “These rules define how criteria such as POP/customer server health, latency from POP/customer servers to the user making the request, packet loss experienced at each POP, cost associated with each POP/customer server, and the like.” *Id.*, 2:47-51. “These factors are then combined

to define the optimal server for a given user making a request for a given domain name.” *Id.*, 2:51-53; EX2013, ¶49.

V. PETITIONER FAILS TO SHOW THAT GLINES, ALONE OR IN COMBINATION WITH GUPTA, RENDERS OBVIOUS ANY CHALLENGED CLAIM.

The ’112 patent includes seven independent claims directed to methods and systems for delivering content to a client device over a network. The Petition fails to establish a reasonable likelihood that any of these claims are rendered obvious by the cited art.

First, for independent claim 1, the Petition fails to establish that the cited art renders obvious “causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server.” EX1001, Claim 1 (element [1d]¹). Petitioner relies on Glines’s local DNS resolver for the claimed “Internet Service Provider (ISP) DNS server,” but Glines’s local DNS resolver does not perform any address resolution, as claim 1 requires. And Petitioner does not explain how substitution of Gupta’s client DNS server for Glines’s local DNS resolver would operate to satisfy the claim language.

¹ To reduce confusion, Patent Owner uses Petitioner’s element identifiers, as set forth in the Petition. Pet., viii-xiv.

Second, the Petition fails to establish that the cited art renders obvious the “plurality of content providers” limitations of independent claims 13, 18, 22, and 23. EX1001, Claim 13 (element [13b]), Claim 18 (elements [18p] and [18b]), Claim 22 (element [22b]), Claim 23 (element [23b]). For this and most features of these independent claims, Petitioner uses a simple table to merely refer back to its analysis with respect to claim 1. But claim 1 does not recite the required “*plurality* of content providers.” Thus, the Petition does not provide any argument for where the prior art teaches a “*plurality* of content providers,” or how Glines’s architecture would operate to support multiple content providers.

Third, the Petition fails to establish that the cited art renders obvious the “switch” limitations of independent claims 13, 18, 19, 21, and 22. EX1001, Claim 13 (element [13e]), Claim 18 (element [18f]), Claim 19 (element [19f]), Claim 21 (element [21e]), Claim 22 (element [22g]). Although Glines generally refers to a Layer 4 switch, neither Glines nor Petitioner explains how that switch is used to “select[] the content server from said respective plurality of content servers associated with said resolving DNS server,” as required by independent claim 19, and by similar limitations of independent claims 13, 18, 21, and 22. *Id.*

Moreover, Petitioner fails to establish a motivation to combine Glines and Gupta for any ground. Although both references discuss resolution of DNS requests, as Patent Owner’s expert notes, their architectural similarity ends there as

they use disparate operational techniques. Neither Petitioner nor its expert provide any reason why a POSITA would combine Glines and Gupta, how the combination would operate, or why the combination would be successful. That Glines's and Gupta's architectures separately existed in the prior art is insufficient to establish a motivation to combine.

The Petition's myriad of flaws span across all seven independent claims. Therefore, the Petition does not establish a reasonable likelihood of success with respect to any claim. Institution should be denied.

A. The Petition fails to establish that the cited art renders obvious “causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server” (independent claim 1, element [1d]).

Claim 1 recites, “(c1) causing said hostname to be resolved to said common anycast address by an Internet Service Provider (ISP) DNS server.” EX1001, 9:11-13 (element [1d]). The Petitioner alleges that “Glines, alone or combined with Gupta, discloses this limitation.” Pet., 19. The Petition, however, does not identify “an Internet Service Provider (ISP) DNS server” that resolves “said hostname ... to said anycast address,” as required by element [1d]. EX1001, 9:11-13.

Specifically, Petitioner alleges that Glines's “**local DNS resolver 18 ... is an ISP DNS server**” because when a user enters a URL, “local DNS resolver 18 sends a request to a root DNS server 38” to “return the anycast address” corresponding to the URL. Pet., 20-21 (citing EX1002, 13:24-15:4) (emphasis

added). Petitioner’s mapping fails to meet the claim language because claim 1 requires “causing said hostname **to be resolved** to said common anycast address **by an Internet Service Provider (ISP) DNS server.**” EX1001, 9:11-13 (emphasis added). Petitioner, however, does not allege that Glines’s “local DNS resolver 18” performs any resolution. Pet., 20-22. Instead, Petitioner relies on “root DNS server 38” for that purpose. *Id.*, 20-21 (“**[R]oot DNS name server 38** is ‘programmed to ... **return the anycast address ...**.’” (emphasis added)); EX2013, ¶52. Glines’s “local DNS resolver 18” thus cannot satisfy the claim requirements because it does not resolve “said hostname ... to said anycast address,” as element [1d] requires. EX2013, ¶52.

Petitioner goes on to argue that even if “local resolver 18” is not the “ISP DNS server,” it would be obvious to implement or modify “local resolver 18” to be an “ISP DNS server.” Pet., 22. Petitioner argues that “ISP-provided DNS servers are typically located in close proximity to a user’s physical location, making them faster and more efficient than more distant DNS servers,” and that this change would “have been nothing more than the simple substitution of known elements to yield predictable results” *Id.* But Petitioner does not explain how this supposed change would satisfy the claim language. Petitioner does not rely on Glines’s “local DNS resolver 18” for performing the resolution recited in element [1d]—it relies on Glines’s “root DNS server 38.” Pet., 20-22; EX2013, ¶52. Therefore,

even if Petitioner’s hindsight-driven, unexplained modifications were undertaken, the alleged resolution of the hostname to an anycast address would still not be performed by Glines’s modified local resolver 18 under Petitioner’s theory.

Recognizing Glines’s deficiencies, Petitioner goes on to argue that even if Glines does not teach the claimed “Internet Service Provider (ISP) DNS server,” then “[i]t ... would have been obvious to combine Glines and Gupta to arrive at this feature.” Pet., 23. Specifically, Petitioner alleges that Gupta’s “client DNS server 170” provides the claimed “ISP DNS server” because “users 150 and 160 ... connect with ISP 60” and that “client DNS server 170 is typically provided within ISP 60.” *Id.* Petitioner further alleges that a “POSITA would have understood Gupta’s ISP 60 to be an obvious substitute for Glines’s local resolver 18.” *Id.*, 24. Again, Petitioner does not rely on Glines’s “local DNS resolver 18” for performing the resolution recited in element [1d], Pet., 20-22, so substituting Gupta’s ISP 60 for Glines’s “local DNS resolver 18” does not satisfy the claim language. EX2013, ¶53.

Moreover, Gupta’s “ISP 60” (and its included “client DNS server 170”) would not be “an obvious substitute for Glines’s local resolver 18” because Glines relies on a fundamentally different architecture than Gupta. Pet., 24; EX2013, ¶54. In particular, Glines’s “local resolver 18” functions as a cache, rather than DNS server. Glines states that when “local resolver 18” receives a request from a

browser, it “determines **whether or not the requested content file is available locally.**” EX1002, 13:24-14:1 (emphasis added). “For example, it determines if ‘example.com’ is located in the **local** web server 20.” *Id.*, 14:1-2 (emphasis added). EX2013, ¶54.

Thus, unlike Gupta’s “client DNS server 170” that is used “to resolve a host name into an IP address,” EX1003, 6:4-9, Glines’s “local resolver 18” is designed to determine whether requested content is available locally—not to resolve host names, EX1002, 13:24-14:1; EX2013, ¶55. This architecture allows Glines’s “local resolver 18” to function as a cache server, rather than a DNS server, obviating the need to perform any resolution for locally available content. EX2013, ¶55.

Petitioner’s motivation to combine Glines and Gupta is thus based on a false premise that “Gupta’s ISP 60 [] performs the same functions as Glines’s local DNS resolver 18.” Pet., 24; EX2013, ¶55. Petitioner provides no reason to alter Glines’s architecture—that it could be done is insufficient. *Adidas AG v. Nike, Inc.*, 963 F.3d 1355, 1359 (Fed. Cir. 2020) (“The obviousness inquiry does not merely ask whether a skilled artisan could combine the references, but instead asks whether ‘they would have been motivated to do so.’ ... Fundamental differences between the references are central to this motivation to combine inquiry.” (internal citations omitted)).

B. The Petition’s blanket table referring back to a non-existent feature in claim 1 fails to establish that the cited art renders obvious the “plurality of content providers” limitation of independent claims 13, 18, 22, and 23.

Independent claim 13 recites, “(B) configuring each DNS server and respective plurality of content servers to support content delivery **for a plurality of content providers**, wherein each of the plurality of content providers has a respective hostname associated therewith.” EX1001, 9:61-65 (element [13b]) (emphasis added). Independent claims 18, 22, and 23 recite similar features. *See* EX1001, 10:41-52 (elements [18p] and [18b]) (“A content delivery system for delivering content **on behalf of a plurality of content providers**, ... said plurality of DNS servers being authoritative for said hostnames associated with **said plurality of content providers**” (emphasis added)), 12:9-11 (element [22b]) (“wherein the DNS server is authoritative for hostnames **associated with a plurality of content providers**” (emphasis added)), 12:29-32 (element [23b]) (“wherein each DNS server and respective plurality of content servers is configured to support content delivery **for a plurality of content providers**” (emphasis added)). Petitioner, however, presents no theory as to how Glines’s system is configured to serve “a plurality of content providers,” as required by the claims. Therefore, Petitioner cannot meet its burden to establish obviousness of these claim elements.

Specifically, for claims 13, 18, and 23, Petitioner uses a simple table to merely refer to its analysis of element [1b] with no further explanation. *See* Pet., 41, 48, 54. First, claim 1 does not recite a *plurality* of content providers. Second, in discussing element [1b], the Petition alleges that Glines’s discussion of “www.example.com” discloses the claimed *singular* “content provider.” Pet., 16-18 (citing EX1002, 6:23-7:13, 13:15-15:10). However, Petitioner offers no theory of how Glines’s discussion of the single provider “www.example.com” renders obvious “a plurality of content providers,” as required by claims 13, 18, 22, and 23. EX1001, 9:61-65, 10:41-49. Indeed, Petitioner fails to address this claim language anywhere in its analysis.

Petitioner’s failure to address this language of the claims is alone dispositive as to independent claims 13, 18, and 23. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (cleaned up) (“It is of the utmost importance that petitioners ... adhere to the requirement that the initial petition identify ‘with particularity’ the ‘evidence that supports the grounds for the challenge to each claim.’” (quoting 35 U.S.C. § 312(a)(3))). Petitioner “must ‘specify where each element of the claim is found in the [relied upon] prior art patents.’” *In-Depth Geophysical, Inc. v. ConocoPhillips Co.*, IPR2019-00850, Paper 56 at 27 (PTAB Sept. 3, 2020) (quoting 37 C.F.R. § 42.104(b)(4)). Petitioner raises no theory identifying how Glines’s disclosure renders obvious these

elements of independent claims 13, 18, and 23, and the Board cannot “deviate from the grounds in the petition and raise its own obviousness theory.” *Sirona Dental Sys. GmbH v. Institut Straumann AG*, 892 F.3d 1349, 1356 (Fed. Cir. 2018); *SAS Inst., Inc. v. Iancu*, 584 U.S. 357, 365-367 (2018).

The Petition is similarly deficient with regard to its analysis of independent claim 22. Here, Petitioner points to element [13p], arguing that “Glines expressly discloses that its system may be used with either a ‘single provider’ or ‘multiple providers,’ and thus discloses content delivery on behalf of a plurality of content providers, as claimed.” *See* Pet., 53 (citing Pet., 39-40), 40 (citing EX1002, 17:3-9). Petitioner’s citations mischaracterize Glines.

In particular, the cited portions of Glines do not refer to “content providers,” as required by the claims, but rather to network providers. The complete paragraph of Glines, of which Petitioner merely cites to a portion of, discloses:

The selection of routing protocol may have profound effects on the propagation [sic] and convergence of group membership changes. “Membership” in the group is contingent [sic] upon distributed routing state. In the case of deployment **within a single provider, where the anycast routing is internal to that network** (and transparent to the outside - the Internet), and an internal routing protocol like iBGP or OSPF is used, propagation [sic] of changes should be fast. In the case of deployment across **multiple providers**, full fledged external BGP (“eBGP”) preferably would be used. Membership changes would be

effected in such a scenario when the state change propagates at least half the way towards each other member in the anycast group, and that should cover all of external routers which would tag a particular anycast advertisement as “closest.” State changes would possibly take longer, but would not require flooding over the entire Internet.

EX1002, 17:3-14 (emphasis added).

It is clear from the cited disclosure that Glines’s “provider” refers to a network provider, not the claimed “content provider” because it discloses, for example: (1) “deployment **within a single provider, where the anycast routing is internal to that network**” (e.g., deployment on a network); (2) “deployment **across multiple providers,**” (e.g., deployment across multiple networks; and (3) routing protocols (e.g., how messages are communicated within and across networks). EX1002, 17:3-14 (emphasis added).

The Petition further alleges, “[a] POSITA would have understood Glines’s disclosure of providing content from an origin source would have included supporting more than one origin source (e.g., more than one website or content provider)” because “[a]dding origin servers and content providers to Glines’s system ... would have been nothing more than replicating Glines’s teaching of storing and providing content associated with one origin server, with expected results.” Pet., 40 (citing EX1002, 12:11-22, 13:21-14:3).

Petitioner’s citations to Glines again contain no discussion of multiple content providers. Rather, Petitioner’s citations refer to content servers storing

“replicas of one or more ... content files” of a *single* content provider. EX1002, 12:11-12. Moreover, Petitioner does not explain how “Glines’s teaching of storing and providing content associated with one origin server” would operate, or why such a modification would achieve “expected results.” Pet., 40. Petitioner’s expert does not fill the gaps of the Petition, merely repeating the Petition’s conclusory assertions verbatim with no further reasoning or evidence. *Compare* Pet., 12, with EX1008, ¶93; *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (PTAB Aug. 24, 2022) (holding that testimony that “merely repeats, *verbatim*, the conclusory assertion for which it is offered to support ... is entitled to little weight”); *TQ Delta, LLC v. Cisco Systems, Inc.*, 942 F.3d 1352, 1359 (Fed. Cir. 2019) (“This court’s opinions have repeatedly recognized that conclusory expert testimony is inadequate to support an obviousness determination ...”).

For these reasons, the Petition fails to establish that Glines renders obvious independent claims 13, 18, 22, and 23.

C. The Petition fails to establish that the cited art renders obvious the “switch” limitations of independent claims 13, 18, 19, 21, and 22.

Independent claim 19 recites, “by at least one switch, selecting the content server from said respective plurality of content servers associated with said resolving DNS server.” EX1001, 11:21-23 (element [19f]). Independent claims 13, 18, 21, 22, and 23 recite similar limitations. *Id.*, 10:8-11 (element [13e]), 10:63-67

(element [18f]), 12:1-4 (element [21e]), 12:20-21 (element [22g]). The Petition's conclusory assertions with respect to these claim elements are unsupported by its citations to Glines, and thus Petitioner cannot meet its burden to establish obviousness of these claim elements.

For each of these claim elements, Petitioner refers back to its analysis with respect to claim 11. Pet., 42, 49, 52, 53. Petitioner's entire analysis consists of one paragraph, asserting that "Glines describes a Layer 4 switch used for 'standard load balancing' among multiple content servers to apply a load balancing policy and select a content server." Pet., 39 (referring to EX1002, 19:10-16). But Glines does not disclose a layer 4 switch used to "determine[] which content server should be selected," Pet., 39, as Petitioner contends.

Instead, Glines discloses that "standard load balancing" is accomplished by "returning multiple local IP addresses to a name lookup" that correspond to "multiple content servers," rather than a switch selecting the appropriate content server. EX1002, 19:13-16. In other words, the DNS server returns the IP addresses for the content servers to the browser, which then requests content from one of the servers. *Id.*, 15:26-16:8 ("[T]he name server 53 associated with this closest rate will then respond by reporting the unique IP address of its associated replica content server 51."). While Glines generally mentions the use of "layer 4 switches," it does not teach that those switches are used to "select[] the content

server from said respective plurality of content servers associated with said resolving DNS server,” as required by the claims, and Petitioner provides no reason to modify Glines to do so. Pet., 39.

For these additional reasons, the Petition fails to establish that Glines renders obvious independent claims 13, 18, 19, 21, and 22.

D. The Petition’s motivation to combine Glines and Gupta is legally insufficient and, in any event, a POSITA would not have been motivated to combine Glines with Gupta in the manner suggested by Petitioner for any Ground.

Beyond the Petition’s failures with respect to element [1d] of claim 1, the Petition fails to articulate any reason *why* a person of ordinary skill in the art (“POSITA”) would have been motivated to combine Glines and Gupta. Again, every “B” Ground (Grounds 1B, 2B, 3B, 4B, and 5B) in the Petition relies on the combination of Gupta and Glines.

In particular, Petitioner provides a section titled, “Motivation to Combine Glines with Gupta.” Pet., 7-8. The sum total of Petitioner’s motivation-to-combine analysis provided in that section consists of comparing Glines and Gupta, determining that they each include similar elements, and concluding that a POSITA would have been motivated to combine the references based on these similarities. *See* Pet., 7-8; EX1008, ¶¶68-74 (providing similar conclusory analysis). For example, Petitioner contends that “Glines and Gupta share a similar architecture to one another,” and “[g]iven their similarities and shared desire to

increase content delivery performance, a POSITA would have understood that Glines and Gupta were analogous art.” Pet., 7-8. The Federal Circuit, however, has consistently held that the existence of similar arrangements in the prior art “does not provide a reason that a skilled artisan would have substituted” one for the other. *Virtek Vision Int’l ULC v. Assembly Guidance Sys., Inc.*, 97 F.4th 882, 887 (Fed. Cir. 2024) (“*Virtek*”). And Patent Owner’s expert, Dr. Russ, demonstrates that Glines and Gupta have technically disparate architectures and operations that were not obvious to combine. EX2013, ¶¶57-64.

Virtek is instructive. In *Virtek*, the Federal Circuit reversed the Board’s findings of obviousness based on an insufficient motivation to combine. *Id.* at 886-888. The patent at issue discussed aligning a laser projector on a work surface, and the claims required identifying targets in a 3D coordinate system. *Id.* at 884-885. The petitioner relied on a two-reference combination. *Id.* at 886. Although the primary reference disclosed identifying the angular direction of each target, the petitioner substituted in the secondary reference to teach identifying targets in the 3D coordinate system. *Id.* at 886.

Recognizing that “obviousness 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,” the court found that neither reference provided “any reason why a skilled artisan would use 3D

coordinates instead of angular directions in a system.” *Id.* at 886-87 (quoting *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) (emphasis added)). Moreover, the Federal Circuit stated that “[i]t does not suffice to meet the motivation to combine requirement to recognize that two alternative arrangements ... were both known in the art.” *Id.* at 886. That is, the mere existence of these different arrangements was not a reason to combine them. *Id.* at 887.

The Petition suffers from the same fatal flaws as the petition in *Virtek*. The Petition makes four assertions: (1) both references disclose delivering content over the Internet; (2) both references resolve DNS requests; (3) both references disclose similar network architectures; and (4) both references desire to increase content delivery performance. *See* Pet., 7-8. After listing these similarities, Petitioner simply concludes that Glines and Gupta were analogous art teaching well-known methods, and “a POSITA would have had a reasonable expectation of success in the combination.” *Id.*

Notably absent from the Petition is any reason why a POSITA would combine Glines and Gupta, how the combination would operate, or why the combination would be successful. As highlighted by the Federal Circuit’s *Virtek* decision, that a POSITA could combine Glines and Gupta because of their similarities is insufficient to establish a motivation to combine. *Virtek*, 97 F.4th at 887; *Adidas*, 963 F.3d at 1359.

Moreover, as Patent Owner's expert, Dr. Russ, explains, a POSITA would have recognized that Glines and Gupta disclose fundamentally different architectures and techniques for accomplishing content delivery. EX2013, ¶¶57-63. Glines uses anycast addressing to direct requests to one of multiple "alternative or replica name servers 53-1, 53-2, 53-3" that "are peered with content file servers 51-1, 51-2, 51-3 that contain replica copies of files stored at the origin server 40," as illustrated in Figure 1 below. EX1002, 10:19-25; EX2013, ¶57.

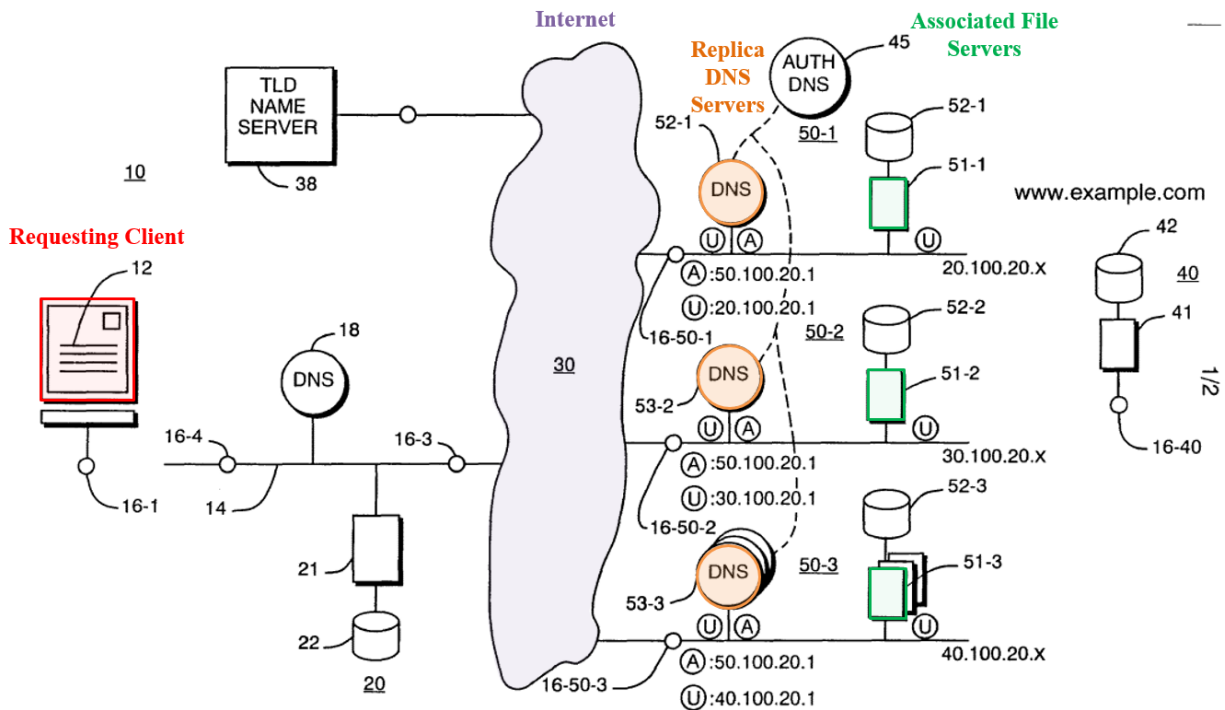


FIG. 1

EX1002, FIG. 1 (annotated).

This architecture allows requests to be routed “to the closest available DNS server,” and, in turn, to the file server 51 located near the DNS server. EX1002,

4:30-5:1, 13:3-8 (“Each name server 53 and file server 51 associated with particular content server 50 are considered to be connected in a peering arrangement. That is, they operate quite closely together and, in fact, are preferably located physically near one another”); EX2013, ¶58.

In contrast to Glines’s anycast addressing and peering arrangement between DNS servers and file servers, Gupta uses only unicast addressing schemes, offloading its content server selection to a separate “network probe server” coupled to the DNS server. EX2013, ¶59; EX1003, Abstract. In Gupta’s architecture, a “local DNS server (LDNS)” “resolves the IP address of the domain name the user’s computer has queried for by sending a query to the Authoritative DNS server (ADNS) for that domain name.” EX1003, 2:30-33. The ADNS is “coupled to [a] first network probe server,” which is “configured to determine traffic loads of a plurality of customer web servers” that “stor[e] a web page.” *Id.*, Abstract, 3:26-32; EX2013, ¶60. To select the appropriate web server, the network probe server determines the “customer web server having a traffic load lower than traffic loads of remaining customer web servers from the plurality of customer web servers” and “provide[s] the IP address of the customer Web Server to the user.” EX1003, 3:35-42; *see also id.*, 9:1-5 (“NameServer server 110 typically uses the latency and traffic load information associated with the customer’s web sites that

was determined in step 390, to select an appropriate customer web server to return to the user, step 440.”); EX2013, ¶61.

In other words, Glines uses anycast addressing to select an appropriate replica DNS server and peered file server based on proximity to the user, while Gupta uses a disparate technique that offloads the selection of a web server to a network probe server coupled to the DNS server and selects the web server using standard load balancing techniques. EX2013, ¶¶62-63. Neither Petitioner nor its expert provides any reason why a POSITA would have had reason to replace or augment Glines’s anycast addressing and peered DNS and file server techniques with Gupta’s disparate load allocation techniques. Pet., 7-8; EX1008, ¶¶68-72; EX2013, ¶¶63-64.

Accordingly, Petitioner fails to establish a motivation to combine Gupta and Glines.

VI. CONCLUSION

For at least the foregoing reasons, Petitioner has failed to show a reasonable likelihood of prevailing with respect to any challenged claim.

Therefore, the Board should deny institution.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

1. This Patent Owner Preliminary Response complies with the type-volume limitation of 14,000 words, comprising 6,933 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

2. This Patent Owner Preliminary Response complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14-point Times New Roman font.

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CERTIFICATE OF SERVICE (37 C.F.R. § 42.6(e))

I certify that the above-captioned **PATENT OWNER PRELIMINARY RESPONSE UNDER 37 C.F.R. § 42.107(a)** and associated Exhibits 2013-2017 were served in their entireties on August 13, 2025, upon the following parties via electronic mail:

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